INVENTRA

SURVEILLANCE SYSTEMS

REDBOOK

CATALOGUE

1 0 1

National Technology Movement

All Products within the Catalogue are Designed, Manufactured, Integrated and Qualified in TURKEY

v2026.07

Infinite Customization, Endless Solutions:

Designed by You, Engineered by Us

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THE COMPANY

Inventra - a name that embodies the perfect fusion of innovation and art. It's a name that speaks to our company's mission to push the boundaries of creativity and technology, and to bring cutting-edge solutions to our clients.

The name Inventra is derived from a blend of two words - "invent," which represents the act of creating something new, and "art," which is reverse written. It symbolizes our commitment to breaking new ground and challenging conventional thinking.

At Inventra, we believe that innovation and art go hand in hand. Our team is made up of the brightest minds in both fields, and we work tirelessly to develop solutions that are not only technologically advanced but also visually stunning.

So, whether you're looking to bring your wildest ideas to life or simply need a partner who can help you stay ahead of the curve, Inventra is here to deliver. Our name is a reflection of our passion for innovation and creativity, and we can't wait to work with you to bring your vision to life.

Turn Key Surveillance

Define the payload; let us handle your positioning, elevation and mobilization requirements combined.

Unlimited Configurations

All products can be configured according to your needs, with a typical delivery time of 4 weeks.

Inventra Inc. provides turnkey surveillance solutions with its integrated design, manufacture and test capabilities.

The sky is a canvas of opportunity, and our turnkey military surveillance systems are the brushstrokes of your success.

Our product line mainly includes;

- **Multi-Channel Stabilized Thermal Imaging Gimbals**
- **Single and Dual Axis Ultra Precision Positioners**
- **Masts up to 15m**
- **Tripods**

All products diversify by means of actuating mechanisms, including electromechanical and manual types.

The sky is a canvas of opportunity, and our turnkey military surveillance systems are the brushstrokes of your success.

Research and Development Center

Our company's R&D Department is located at **Teknopark Ankara Technology Development Zone.** We provide turnkey surveillance solutions with extended technical competencies including;

- Parametric Electromechanical Design
- Multi Body Dynamics (MBD)
- Finite Element Analysis
- Hardware in the Loop Simulation(HIL)
- Embedded Software Implementation

Manufacturing and Integration Center

All designs come alive in our manufacturing and integration center. Parts are manufactured 5 axis CNC machines and measured with 5 axis CMM machine to validate part accuracy. All machines, which are 2 years old or younger, are equipped with latest cutting edge technologies.

- 5 Axis CNC Vertical Machining Center
- 5 Axis CNC Turning Center
- 5 Axis Coordinate Measuring Machine
- Hot/Cold Test Chamber
- Humidity Test Chamber

LOCATIONS

Headquarters
Teknopark Ankara Technology Dev. Zone
2224. St. 1/115, 06378
Yenimahalle-Ankara/TURKEY
+90 312 911 12 20

Manufacturing and Integration Center
Ahi Evran St. 134, 06374,
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In a world of uncertainty, our precision surveillance systems are your eyes and ears necessary for critical operations.

TOP LEVEL PLATFORMS

Surveillance Systems

CORE TECHNOLOGIES

Electro-Optics and Thermal Imagers

Ultra-Precision Positioners

Mast and Tripods Systems

Cross Combination Guide: Unlock Infinite Possibilities

Discover Our Cross Combination Guide. Seamlessly combine our range of cutting-edge products to create unique solutions tailored to your needs. Explore the endless potential of cross-product compatibility and transform your vision into reality

		Thermal Imagers				Positioners			Telescopic Masts							Tripods		
		SEG10	SEG12	SEG14	SEG20	SEB20	PED08	PED10	PES10	MES01	MES10	MES20	MEM10	MMS20	MMT10	MMT20	TML10	TMM10	TMH10
Thermal Imagers	SEG10									●	●	◐	◐	◐	◐	◐	○	◐	◐
	SEG12									●	●	◐	◐	◐	◐	◐	○	◐	◐
	SEG14									◐	◐	◐	◐	◐	◐	◐	○	◐	◐
	SEG20										●	◐	●			○		○	◐
	SEB20						○	●			●	◐	●						◐
Positioners	PED08					○				○	●	●	◐	◐	◐	◐	○	●	●
	PED10					●					●	◐	●	○		◐	○	●	●
	PES10										●	◐	●	○		◐	○	●	●
Telescopic Masts	MES01	●	●	◐			○												
	MES10	●	●	◐	●	●	●	●	●										
	MES20	◐	◐	◐	◐	◐	●	◐	◐										
	MEM10	◐	◐	◐	●	●	◐	●	●										
	MMS20	◐	◐	◐			◐	○	○										
	MMT10	◐	◐	◐			◐												
	MMT20	◐	◐	◐	○		◐	◐	◐										
Tripods	TML10	○	○	○			○	○	○										
	TMM10	◐	◐	◐	○		●	●	●										
	TMH10	◐	◐	◐	◐	◐	●	●	●										

● Highly Compatible: Qualified and delivered combination; the best and most common match, with seamless mechanical, electrical and control integration.

◐ Recommended: Supported combination within the published payload, weight and interface limits; an interface kit may be required.

○ Less Common: Technically possible but close to a published limit (payload, wind load or centre-of-gravity offset); please consult Inventra before specifying.

1. Thermal Imagers

Behold, the marvel of modern technology - the stabilized thermal imaging system. With great intricacy and meticulous attention to detail, this feat of engineering seamlessly integrates an array of advanced components - a thermal camera, an electro-optic day camera, a laser range finder, and a laser designator - to create a masterpiece that is a sight to behold.

What sets this system apart from its peers is its remarkable ability to maintain steadfast stability and accuracy, even in the face of intense vibration and shock. Its rugged and durable design makes it the ideal companion for military vehicles, where it can withstand the most demanding conditions with ease.

It is a tool that could mean the difference between life and death, between victory and defeat. And so, soldiers trusted in the system, knowing that it would help them achieve their objectives on the battlefield.

Watchful Eyes, Secured Skies.

Highlights

- Two Axis Stabilization, Target Tracking and Recognition
- Top Notch Rugged Design Against Vibrations and Shock to Use in Ground Vehicles
- Uncooled or Cooled Thermal Imaging Sensor Options
- Plug-Play Easy Integration to Electromechanical Mast Family

Thermal Imagers Comparison Chart

When it comes to selecting a thermal imaging system, the choices can be overwhelming. Just as a musician must carefully select the right instrument for a particular sound, choosing the right thermal imaging system is essential to achieving the desired outcome.

This guide born of necessity, designed to empower you with knowledge and insight. With this guide, you can create your own symphony in the world of thermal imaging systems.

	SEG10	SEG12	SEG14	SEG20	SEB20
Body Type	Gimbal - 2 Axis	Gimbal - 2 Axis	Gimbal - 2 Axis	Gimbal - 2 Axis	Black Box Type
Target Platform	**Unmanned Ground Vehicles**	**Unmanned Ground Vehicles**	**Armored Vehicles, Long Range Surveillance**	**Armored Vehicles, Long Range Surveillance**	**Weapon Systems, Main Battle Tanks, Long Range Surveillance**
Qualifications	MIL-STD-810G – Tactical Armored Vehicle Class Vibration and Shock (all models)				
Stabilization Accuracy	0.1°	0.05°	–	0.005°	0.003°
Positioning Accuracy	0.1°	0.04°	–	0.008°	0.005°
Electro-Optical Resolution	1920×1080p	1920×1080p	1920×1080p	1920×1080p	**1920×1080p**
EO Optical Zoom	30X	30X	30X	30X	**90X**
EO Digital Zoom	12X	12X	12X	12X	16X
Thermal Imager	LWIR 640x512p	LWIR 640x512p	LWIR 640x512p	**MWIR 640x512p**	**MWIR 1280x1024p**
IR Optical Zoom	X	X	3.2X	**15X**	**20X**
IR HFOV	17.7°	17.7°	19.9° - 6.3° (DFOV)	28° - 1.9°	23.5° - 1.17°
Video Output Format	Ethernet / HD-SDI / HDMI	Ethernet HD-SDI	Ethernet / HD-SDI	Ethernet HD-SDI	Ethernet HD-SDI
Laser Range Finder	X	4500m	32000m	**32000m**	**32000m**
Laser Pointer	X	Optional	Available	Optional	Optional
Laser Designator	X	X	X	X	**Optional (LD050)**
Target Tracker	Available	Available	Available	Available	Available
Video Compression	Available	Available	Available	Available	Available
IP Level	IP65	IP65	IP65	IP65	IP65
Weight	4.4kg	4.6kg	<8.0 kg	20.8 kg	18.4 kg *
Combinable Mast Platforms	**MES01 / MES10**	**MES01 / MES10**	**MES01 / MES10**	**MEM10 / MES10**	**MEM10 / MES10**
Combinable Positioners	**X**	**X**	**X**	**X**	**PED10**

X: Not available | –: Not specified in this revision | * SEB20 weight is given without the positioner. Dimensions and weight may change with different sensor options.

SEG10 – Dual Channel (EO-LWIR) Stabilized Gimbal System

Ruggedized Dual Channel Thermal Imaging System for,

Unmanned Ground Vehicles, EOIR Defense & Surveillance

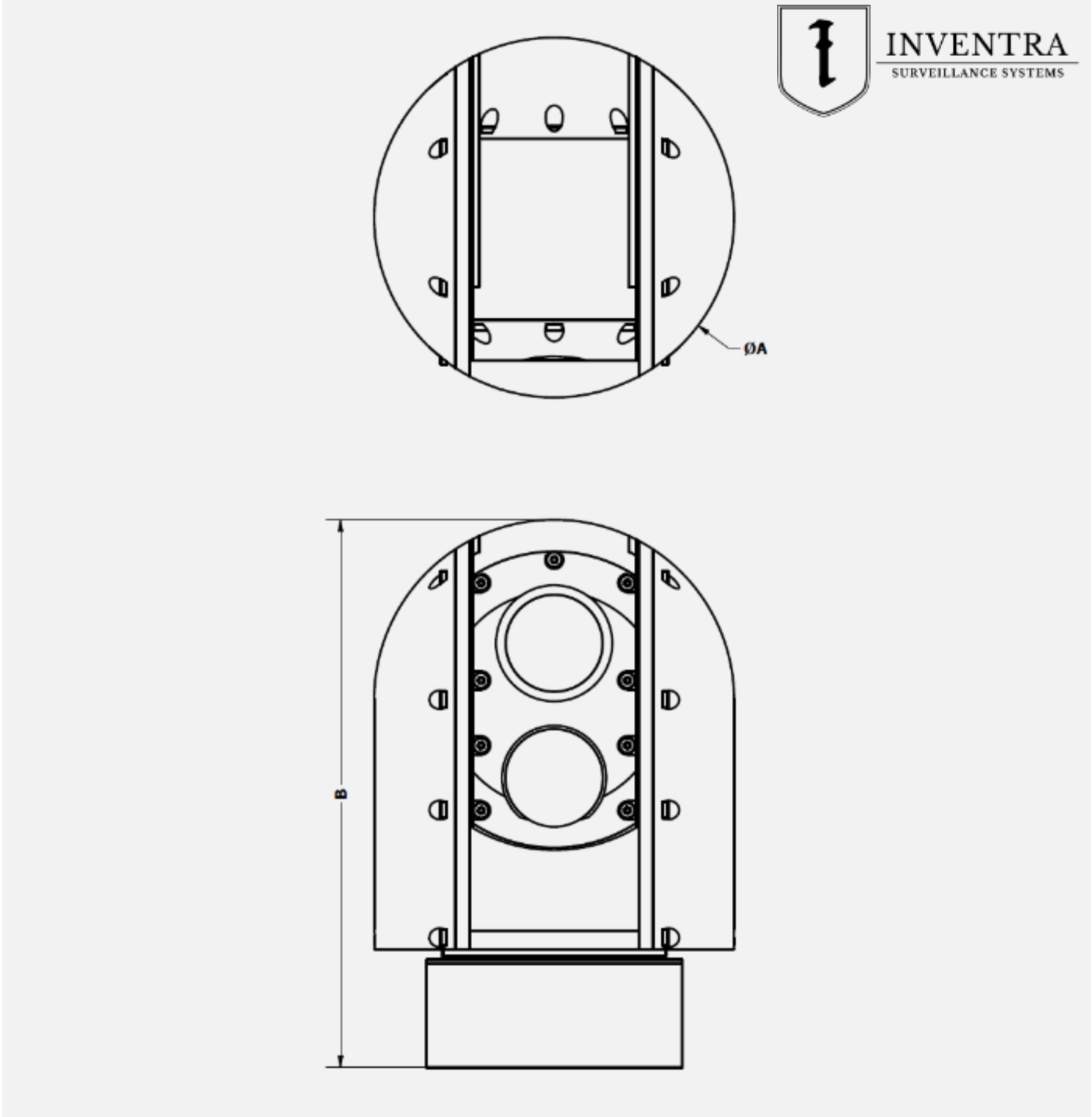
Distinctive Features

- **Ruggedized Design for Ground Vehicles:** Designed to endure harsh conditions, the gimbal features a highly ruggedized design that effectively mitigates vibrations and shocks. This resilience makes it an ideal choice for integration onto ground vehicles.
- **Dual-Sensor Clarity and Stabilization:** The gimbal provides a sharp and clear image through its 1080p full HD EO sensor with 30x optical zoom, coupled with a 640x512 LWIR thermal sensor. Simultaneously displaying thermal and day sensors on a single screen enhances situational awareness. The 2-axis stabilization ensures the gimbal can effectively lock onto and track moving targets.

Main Features

- Sharp and clear image with 1080p full HD EO - 30x Optical Zoom and 640x512 LWIR thermal sensors
- Simultaneous display of thermal and day sensors on a single screen
- Locking on moving targets with 2 axis stabilization

Configuration Breakdown	S (Sensors) – E (Electromechanical) – Gimbal (G) – 10 (Product Class) – Thermal Imager (**L**WIR-**6**40x512-**12**µ) – EO Camera (1080p – 30X) – Customization Codes
Part Number	SEG10-L0612-E30
Available Customizations	Communication Protocol, Output Speed, FOV, Video Output Format, Mechanical Interfaces
Combinable Sub-Platforms	MES01 – Ultra Compact Electromechanical Mast MES02 – Compact Locked Electromechanical Mast MES10 – Locked Electromechanical Mast



	Parameters / Configurations		SEG10-L0612-E30
PERFORMANCE PARAMETERS	Pan/Tilt Axis Speed	°/s	180°/s
	Pan/Tilt Axis Range	°	Pan: 360° Continuous / Tilt: ±45°
	Connector Type	-	MIL-DTL-38999
	Communication to the Unit	-	RS-485
	Operating Voltage	V	20-32
	Power Consumption (Max)	W	150
	Weight	kg	4.4
	Video Output	-	HD-SDI, HDMI, Ethernet
	Diameter (ØA)	mm	155
	Height (B)	mm	235
TRACKER	Data Refresh Rate	Hz	25 Hz
	Output Lag	ms	<100 ms
	Stabilization	-	Two Axis IMU and Encoder Based Dual Loop Stabilization
	Target Size	pixels	16x16 ~ 128*128
THERMAL IMAGER	Wave Length	µm	Uncooled Longwave (8 µm - 14 µm)
	Detector Pixels	-	640 X 512
	Pixel Size	µm	12µm
	Focusing	-	Athermalized
	Emissivity Correction	-	0.01 ~ 1 (Adjustable)
	NETD	mK	≤50mK @25°C
	MRTD	mK	≤500mK
	HFOV	°	17.7°
	Automatic Non-Uniformity Correction Function	-	Yes
	Digital Zoom	-	2X 3X 4X

EO CAMERA	**Image Sensor**		-	1/2.8-type Exmor R CMOS
	Resolution		-	1920 X 1080
	Minimum Illumination	**High Sens.**	-	0.01 lx (F1.6, AGC On, 1/30s)
		Normal Mode	-	0.1 lx (F1.6, AGC On, 1/30s)
	S/N Ratio		**dB**	> 50 dB
	Gain		**dB**	0 dB - 50.0dB
	Shutter Speed		**1/s**	1/1s - 1/10,000s, 22 Steps
	Exposure Control		-	Automatic
	Aperture Control		-	16 Steps
	Lens		-	30x Optical Zoom f = 4.3mm (Wide) - 129.0mm (Tele) f1.6 - f4.7"
	Digital Zoom		-	12x (360x With Optical Zoom)
	Focusing System		-	Automatic
	Horizontal Viewing Angle (H-FOV)		°	63.7° (Wide) - 2.3° (Tele)
	Minimum Object Distance		**mm**	10mm (Wide) - 1200mm (Tele)
ENVIRONMENTAL QUALIFICATIONS	**Temperature**		**°C**	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration		-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock		-	MIL-STD-810G, Method 516.6 Procedure I Functional Shock, 20g 11ms
	Rain		-	MIL-STD-810G, Method 506.5 Procedure I – Rain

SEG10 – Dual Channel (EO-LWIR) Stabilized Gimbal System

Barkan – Autonomous Unmanned Ground Vehicle Developed by **Havelsan**
Aslan – Armed Unmanned Ground Vehicle" Developed by **Aselsan**

SEG12 – Multi Channel (EO-LWIR-LRF) Stabilized Gimbal System

Ultra Compact, Low Cost of Ownership, Multi Sensor Gimbal for,

Unmanned Ground Vehicles, EOIR Defense & Surveillance

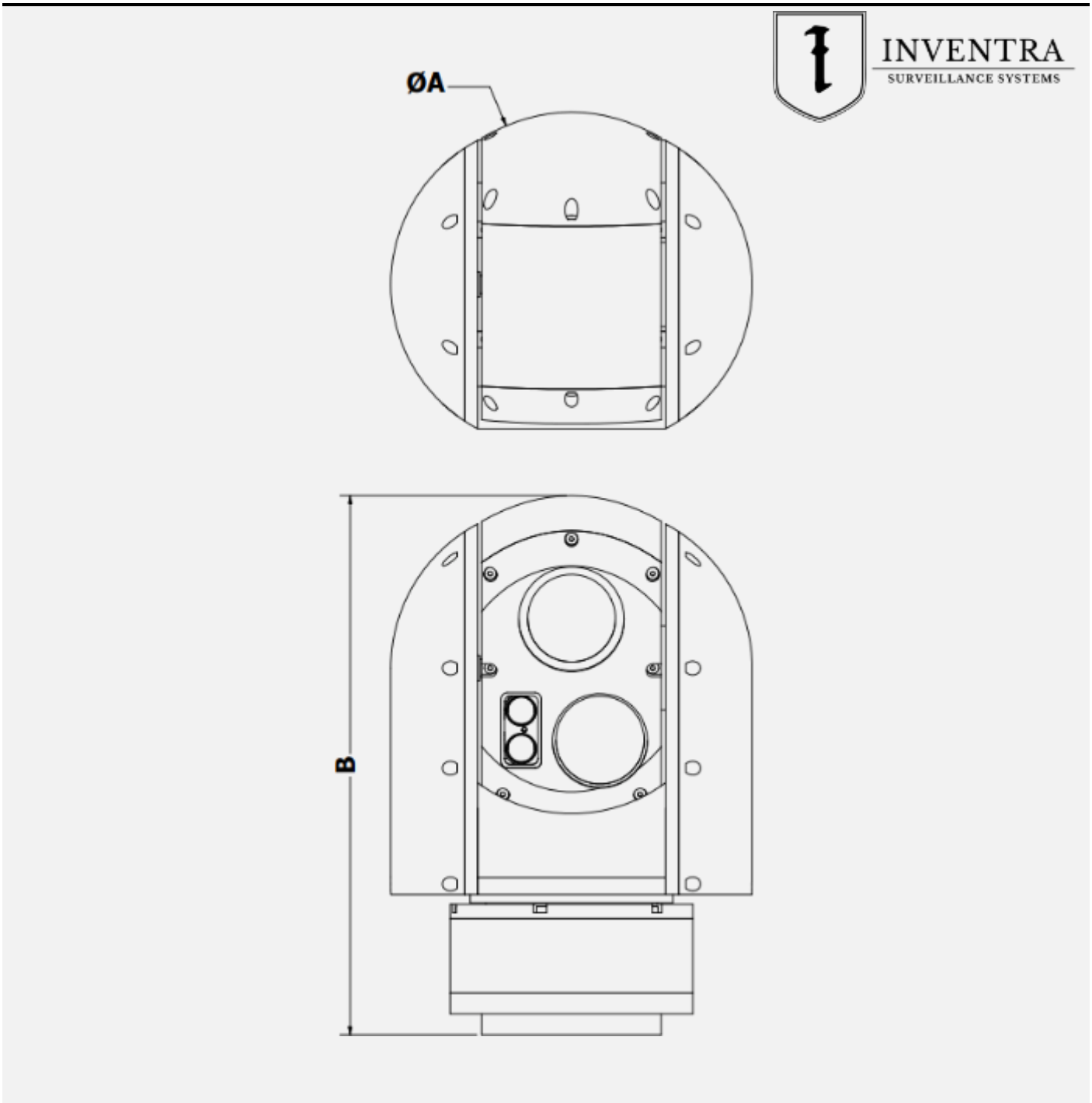
Distinctive Features

- **Advanced Digital Image Blending:** The gimbal offers full digital image blending, seamlessly combining thermal and color displays within a single video channel downlink. This innovative feature enhances situational awareness by providing comprehensive visual information in one view.
- **Pinpoint-Precise Motor Control:** Equipped with true servo drive technology utilizing brushless motors and high-resolution encoders, the gimbal achieves remarkable motor control accuracy with precision of ±0.01°. This level of control ensures accurate and steady pointing of the gimbal.
- **Triple Channel Simultaneous Functionality:** The gimbal allows simultaneous data acquisition and command through its triple channel capabilities, encompassing EO (electro-optical), LWIR (long-wave infrared), and LRF (laser rangefinder) channels.

Main Features

- Simultaneous data acquisition and command through triple channel (EO, LWIR, LRF)
- Uncooled thermal technology enables long-term operation with a high MTBF and low cost of ownership.
- Sharp and clear image with 1080p full HD EO - 30x optical zoom and 640x512 LWIR thermal sensors

Configuration Breakdown	**S**ensors – **E**lectromechanical – **G**imbal – 10 (Product Class) – Thermal Imager (**L**WIR-**6**40x480-**17**µ) – EO Camera (1080p – 30X) – Laser Range Finder – Customization Codes
Part Number	SEG12-L0617-E30-L05
Available Customizations	Laser Range Finder, Communication Protocol, Output Speed, FOV, Video Output Format, Mechanical Interfaces
Combinable Sub-Platforms	MES01 – Ultra Compact Electromechanical Mast MES02 – Compact Locked Electromechanical Mast MES10 – Locked Electromechanical Mast



	Parameters / Configurations		SEG12-L0617-E30-L05
PERFORMANCE PARAMETERS	Pan/Tilt Axis Speed	°/s	180°/s
	Pan/Tilt Axis Range	°	Pan: 360° Continuous / Tilt: ±45°
	Communication to the Unit	-	RS-485
	Operating Voltage	V	20-32
	Power Consumption (Max)	W	150
	Weight	kg	4.6
	Video Output	-	HD-SDI, Ethernet
	Diameter (ØA)	mm	160
	Height (B)	mm	256
LRF	LRF Ranging Scope	m	5-4500 m
	LRF Wavelength	µm	1.5 µm
THERMAL IMAGER	Wave Length	µm	Long Wave
	Detector Pixels	-	640 X 512
	Pixel Size	µm	17µm
	Focusing	-	Athermalized
	Emissivity Correction	-	0.01 ~ 1 (Adjustable)
	NETD	mK	≤50mK @25°C
	MRTD	mK	≤500mK
	HFOV	°	17.7°
	Automatic Non-Uniformity Correction Function	-	Yes
	Digital Zoom	-	2X 3X 4X
TRACKER	Data Refresh Rate	Hz	25 Hz
	Output Lag	ms	<100 ms
	Stabilization	-	Two Axis IMU and Encoder Based Dual Loop Stabilization
	Target Size	pixels	16x16 ~ 128*128

EO CAMERA	**Image Sensor**		-	1/2.8-type Exmor R CMOS
	Resolution		-	1920 X 1080
	Minimum Illumination	**High Sens.**	-	0.01 lx (F1.6, AGC On, 1/30s)
		Normal Mode	-	0.1 lx (F1.6, AGC On, 1/30s)
	S/N Ratio		**dB**	> 50 dB
	Gain		**dB**	0 dB - 50.0dB
	Shutter Speed		**1/s**	1/1s - 1/10,000s, 22 Steps
	Exposure Control		-	Automatic
	Aperture Control		-	16 Steps
	Lens		-	30x Optical Zoom f = 4.3mm (Wide) - 129.0mm (Tele) f1.6 - f4.7"
	Digital Zoom		-	12x (360x With Optical Zoom)
	Focusing System		-	Automatic
	Horizontal Viewing Angle (H-FOV)		°	63.7° (Wide) - 2.3° (Tele)
	Minimum Object Distance		**mm**	10mm (Wide) - 1200mm (Tele)
ENVIRONMENTAL QUALIFICATIONS	**Temperature**		**°C**	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration		-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock		-	MIL-STD-810G, Method 516.6 Procedure I Functional Shock, 20g 11ms
	Rain		-	MIL-STD-810G, Method 506.5 Procedure I – Rain

Barkan – Autonomous Unmanned Ground Vehicle Developed by **Havelsan**

SEG14 – Multi Channel (EO-LWIR-LRF) Stabilized Gimbal System

Thermal Imager with Optical Zoom and Long Range LRF

Designed for Precision Targeting, Surveillance, and Intelligence Gathering

Main Features

- SEG14 is a cutting-edge multi-channel gimbal system that combines 1080p 30x optical zoom EO Camera, 640x512 LWIR thermal imager and long range laser range finder
- It delivers precise, stable imaging and tracking, supported by advanced motor control technology for military applications.
- Integrated with brushless motors and advanced servo drive technology, it delivers precision control at ±0.01° while providing clear imaging through 30x optical zoom and thermal sensors.

Distinctive Features

- Triple Channel Acquisition: Real-time data from EO, LWIR, and LRF channels for comprehensive surveillance.
- True Servo Drive Control: Achieves exceptional control precision using brushless motors and high-resolution encoders.
- Digital Image Blending: Seamlessly combines thermal and EO data into a single video feed for enhanced situational awareness.
- Long-Range Laser Range Finder: Effective up to 12,000 m for precise targeting and distance measurements.

Configuration Breakdown	**S**ensors – **E**lectromechanical – **G**imbal – 14 (Product Class) – Thermal Imager (**L**WIR-**6**40-**12**µ) – EO Camera (1080p – 30X) – Laser Range Finder – Customization Codes
Part Number	SEG14-L0612-E30-L12
Available Customizations	Laser Range Finder, Communication Protocol, Output Speed, FOV, Video Output Format, Mechanical Interfaces
Combinable Sub-Platforms	MES01 – Ultra Compact Electromechanical Mast MES10 – Locked Electromechanical Mast

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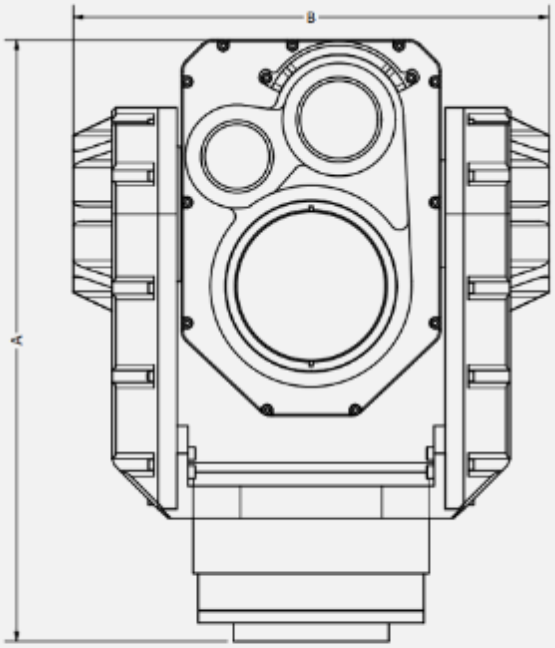

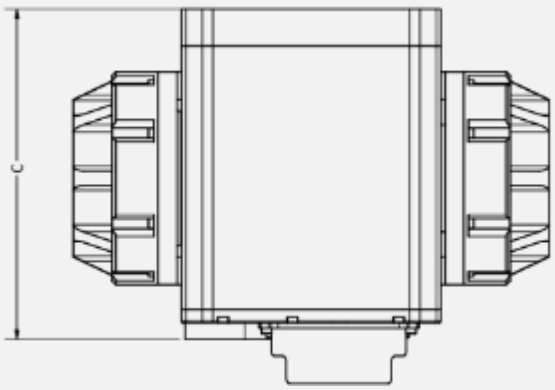

	Parameters / Configurations		SEG14-L0612-E30-L12
PERFORMANCE PARAMETERS	Pan/Tilt Axis Speed	°/s	180°/s
	Pan/Tilt Axis Range	°	Pan: 360° Continuous / Tilt: ±45°
	Communication Options	-	RS422/RS485/Ethernet
	Operating Voltage	V	20-32
	Power Consumption (Max)	W	150
	Weight	kg	<8.0 kg
	Video Output Options	-	HD-SDI/Ethernet
	Dimensions	mm	325 x 257 x 178
LRF	LRF Ranging Scope	m	Up to 32.000 m
	LRF Wavelength	nm	1500 nm
	Laser Pointer	nm	635 nm, Class 1, Eye Safe
THERMAL IMAGER	Wave Length	µm	Long Wave
	Resolution Options	-	640 × 512 (1280 × 1024 optional)
	Pixel Size	µm	12µm
	NETD	mK	≤30mK @25°C
	Optical Zoom Options	-	28 – 90 mm (3.2X) or 15 – 75 mm (5X)
	DFOV	°	19.92° @28mm ~ 6.26° @90mm
	Calibration	-	Shutter Calibration / Scene Calibration
TRACKER	Stabilization	-	Two Axis IMU and Encoder Based Dual Loop Stabilization
	Output Lag	ms	<100 ms
	Target Size	pixels	16x16 ~ 128*128
EO CAMERA	Resolution	-	1920 X 1080
	Lens	-	30x Optical Zoom f = 4.3mm (Wide) - 129.0mm (Tele) f1.6 - f4.7"
	Digital Zoom	-	12x (360x With Optical Zoom)
	Focusing System	-	Automatic
	Horizontal Viewing Angle (H-FOV)	°	63.7° (Wide) - 2.3° (Tele)
QUALIFICATIONS	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I Functional Shock, 20g 11ms
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain

SEG14 – Multi Channel (EO-LWIR-LRF) Stabilized Gimbal System

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SEG20 – Multi Channel (EO-MWIR-LRF) Gimbal System

Ultimate Gimbal Solution That Can Withstand High Vibration and Shock Environments for

Armored Ground Vehicles, EOIR Defense & Surveillance

Distinctive Features

- **Advanced MWIR Camera and Laser Rangefinder:** The SEG20 gimbal is equipped with a powerful MWIR (Mid-Wave Infrared) camera and an advanced laser rangefinder.
- **Stable and Clear Video in Various Environments:** Whether operating in moving vehicles or high-wind environments, the SEG20 gimbal ensures stable and clear video output. This stability provides operators with exceptional clarity, enabling them to effectively observe and analyze targets.
- **Precision Tracking with Laser Rangefinder:** The gimbal's advanced laser rangefinder (LRF) offers precise distance measurements, facilitating accurate target tracking and identification even at long distances.

Main Features

- Built to last, with cutting-edge technology that ensures stability, precision, and clarity in any situation.
- With its high-resolution sensor and advanced optics, system can capture detailed images with exceptional clarity, even in no-light or no-visibility conditions.
- Highly Ruggedized Design against Vibrations and Shocks for Armored Ground Vehicles

Configuration Breakdown	**S**ensors – **E**lectromechanical – **G**imbal – 10 (Product Class) – Thermal Imager (MWIR-**6**40x512-**15**µ) – EO Camera (1080p – 30X) – Laser Range Finder – Customization Codes
Part Number	SEG20-M0615-E30-L32
Available Customizations	LRF Distance, Optical Zoom, Communication Protocol, Output Speed, FOV, Video Output Format, Mechanical Interfaces
Combinable Sub-Platforms	MEM10 – Ultra Stable Electromechanical Mast MES02 – Compact Locked Electromechanical Mast MES10 – Locked Electromechanical Mast

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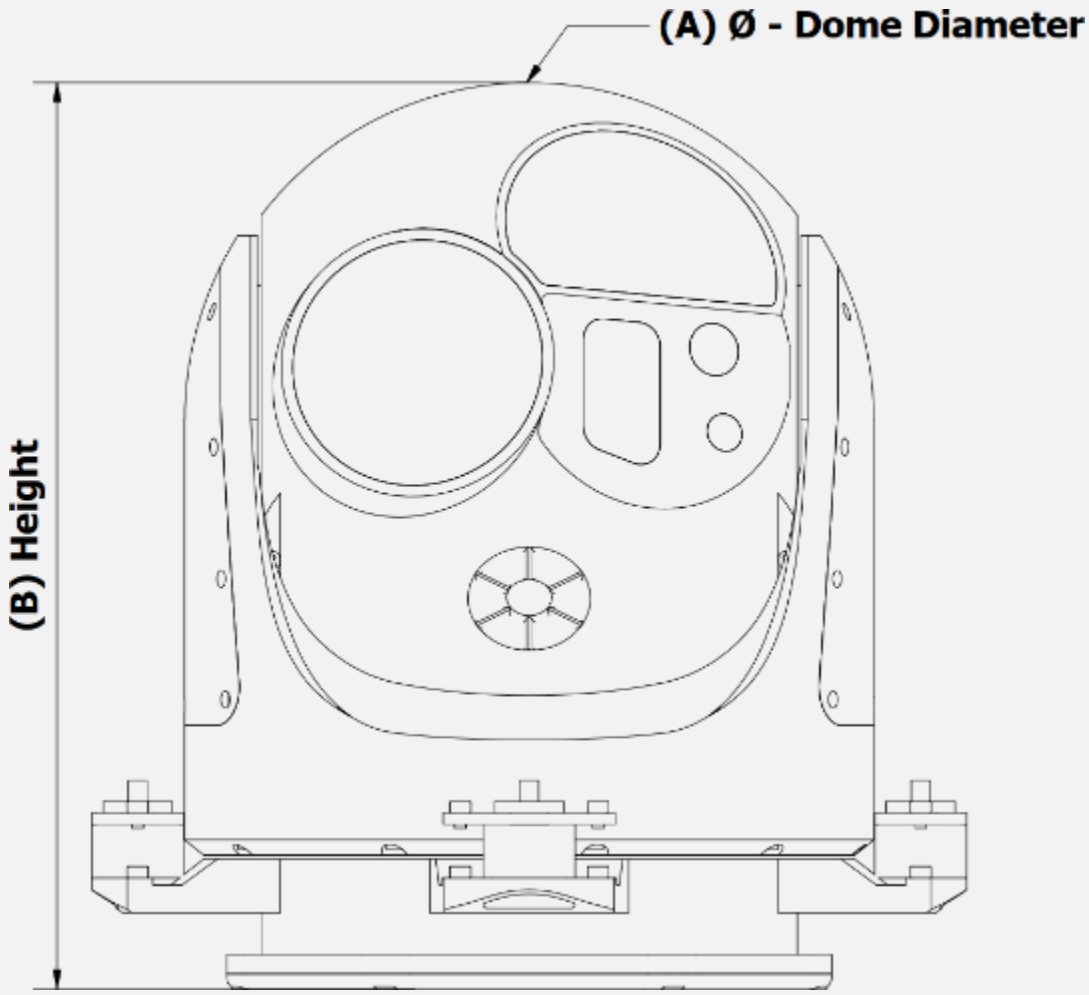


	Parameters / Configurations		SEG20-M0615-E30-L32
PERFORMANCE PARAMETERS	Pan/Tilt Axis Speed	°/s	180°/s
	Pan/Tilt Axis Range	°	Pan: 360° Continuous / Tilt: ±45°
	Communication to the Unit	-	RS-422
	Operating Voltage	V	20-32
	Power Consumption (Max)	W	200
	Weight	kg	20.8
	Video Output	-	HD-SDI, Ethernet
	Diameter (ØA)	mm	280
	Height (B)	mm	390
LRF	LRF Ranging Scope	m	5-32000 m
	LRF Wavelength	µm	1.5 µm
THERMAL IMAGER	Wave Length	µm	Midwave (3 µm -5 µm)
	Resolution	-	640 X 512
	Optical Zoom	-	15X
	Digital Zoom	-	2X 3X 4X
	HFOV	°	28° - 1.9°
	Automatic Non-Uniformity Correction Function	-	Yes
TRACKER	Data Refresh Rate	Hz	25 Hz
	Output Lag	ms	<100 ms
	Stabilization	-	Two Axis IMU and Encoder Based Dual Loop Stabilization
	Target Size	pixels	16x16 ~ 128*128

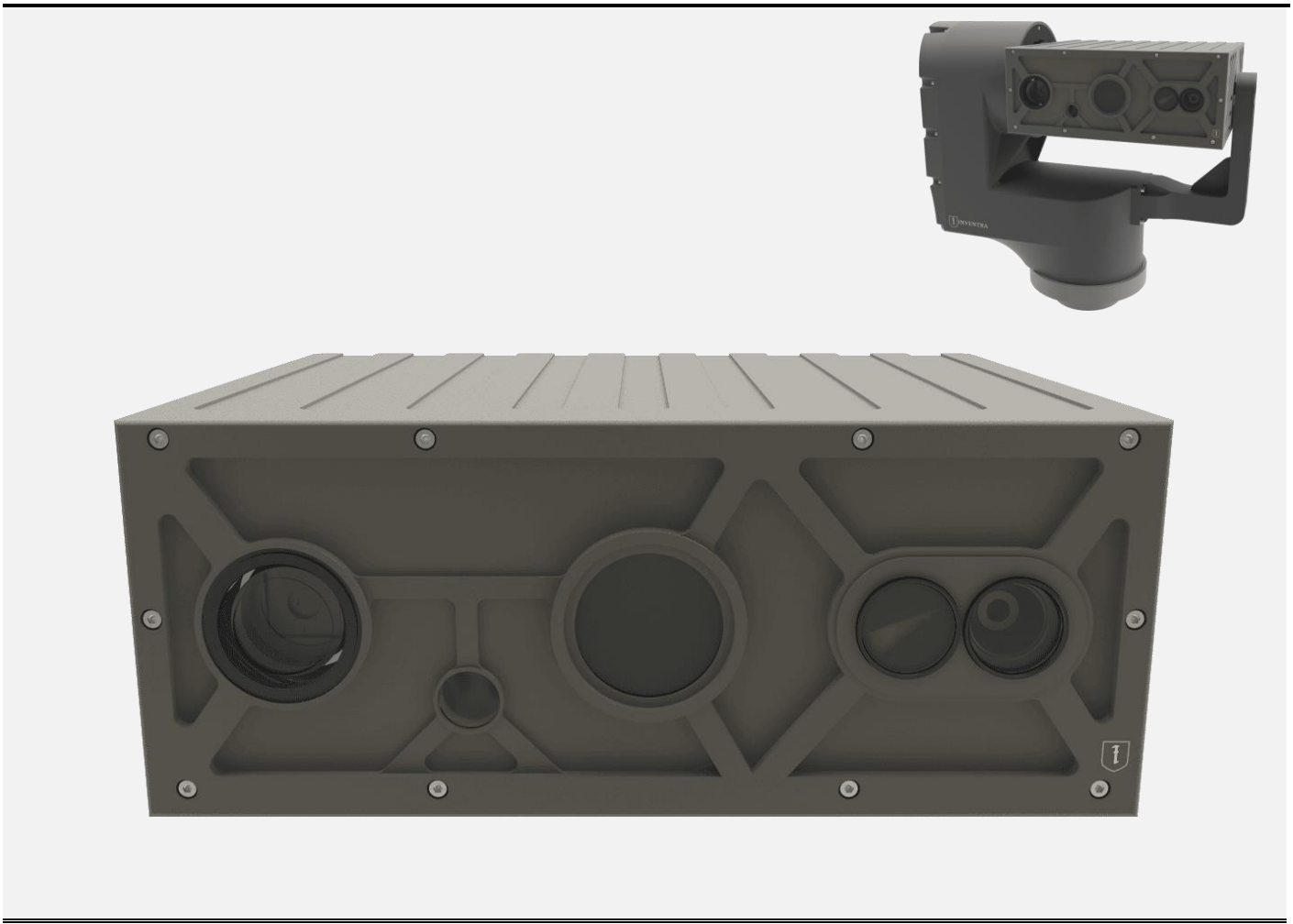
EO CAMERA	**Image Sensor**		-	1/2.8-type Exmor R CMOS
	Resolution		-	1920 X 1080
	Minimum Illumination	**High Sens.**	-	0.01 lx (F1.6, AGC On, 1/30s)
		Normal Mode	-	0.1 lx (F1.6, AGC On, 1/30s)
	S/N Ratio		**dB**	> 50 dB
	Gain		**dB**	0 dB - 50.0dB
	Shutter Speed		**1/s**	1/1s - 1/10,000s, 22 Steps
	Exposure Control		-	Automatic
	Aperture Control		-	16 Steps
	Lens		-	30x Optical Zoom f = 4.3mm (Wide) - 129.0mm (Tele) f1.6 - f4.7"
	Digital Zoom		-	12x (360x With Optical Zoom)
	Focusing System		-	Automatic
	Horizontal Viewing Angle (H-FOV)		°	63.7° (Wide) - 2.3° (Tele)
	Minimum Object Distance		**mm**	10mm (Wide) - 1200mm (Tele)
ENVIRONMENTAL QUALIFICATIONS	**Temperature**		**°C**	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration		-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock		-	MIL-STD-810G, Method 516.6 Procedure I Functional Shock, 20g 11ms
	Rain		-	MIL-STD-810G, Method 506.5 Procedure I – Rain

INVENTRA
SURVEILLANCE SYSTEMS

SEB20 – Multi Channel (EO-MWIR-LRF-LD) Thermal Imager

A State-of-The-Art Thermal Imager with a Laser Designator for,

Weapon Systems, Main Battle Tanks and Long Range Surveillance



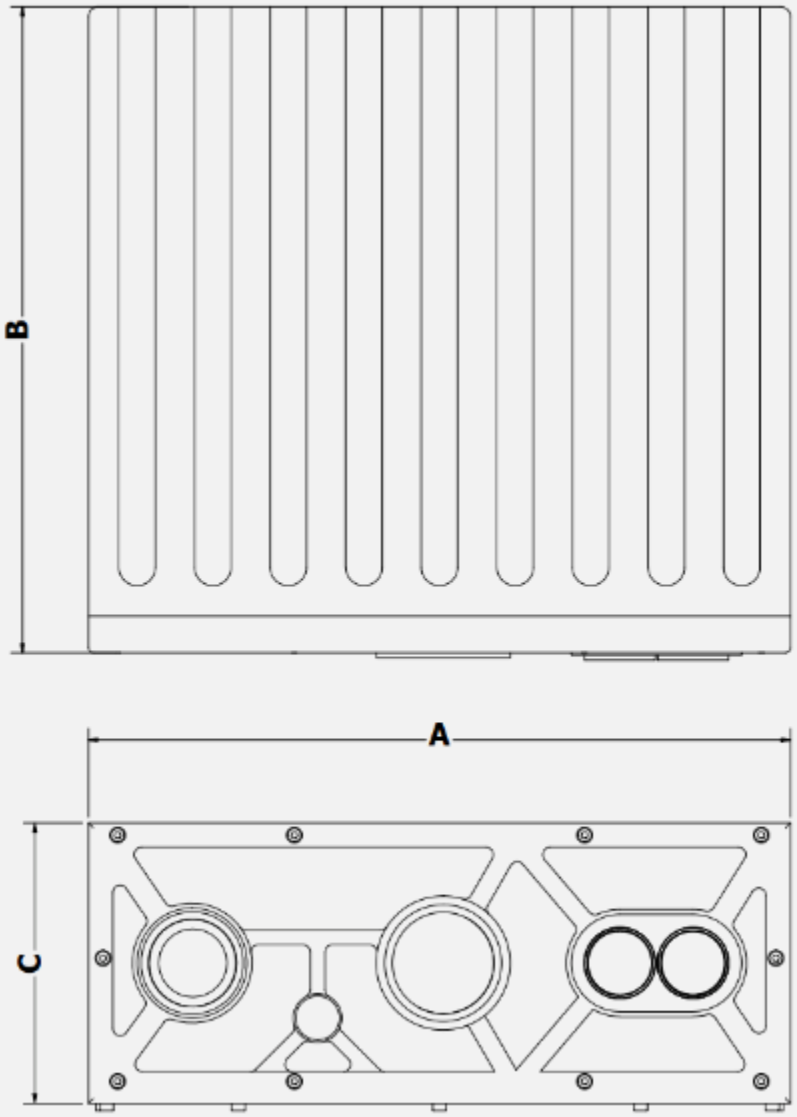
Distinctive Features

- **Precision Targeting and Missile Guidance:** The thermal imager's state-of-the-art technology enables precise targeting and tracking, making it an invaluable tool for designating targets and guiding missiles with exceptional accuracy and precision.
- **Extreme Durability:** Engineered to endure the most challenging environments, the thermal imager is built to withstand harsh conditions. Its rugged construction ensures reliability, making it an essential component for any weapon system.
- **Quad-Channel Functionality: With quad-channel capabilities encompassing EO (electro-optical), MWIR (mid-wave infrared), LRF (laser rangefinder), and Laser Designator, the thermal imager facilitates simultaneous data acquisition and command.**
- Our thermal imager is engineered to withstand even the harshest conditions, ensuring that it is a reliable and essential tool for any weapon system.

Main Features

- With the ability to guide a missile to hit it with pinpoint accuracy, our thermal imager is the ultimate tool for any combat situation.
- Simultaneous data acquisition and command through quad channel (EO, MWIR, LRF, Laser Designator)
- Sharp and clear image with 1080p full HD EO - 90x optical zoom and 1280x1024 MWIR thermal sensors

Configuration Breakdown	**S**ensors – **E**lectromechanical – **B**ox Type – 20 (Product Class) – Thermal Imager – EO Camera – Laser Range Finder – Laser Designator - Customization Codes
Part Number	SEB20-XXXX-XXX-L32-LD050 (Check Available Options Below)
Available Customizations	Laser Designator Output Energy and Beam Divergence, LRF Distance, Optical Zoom, Communication Protocol, Output Speed, FOV, Video Output Format, Mechanical Interfaces
Combinable Sub-Platforms	PED10 – Ultra Precision Electromechanical Pan-Tilt



Example Configuration Breakdown:
SEB20 – Thermal Imager – EO Camera – LRF – LD – Customization Codes

SEB20-M1212-E50UL-L32-LD050-PA02
SEB20 – Midwave Thermal Imager (1280x1024 / 12µm) + Electro-Optic Camera (1080p / 50X Optical Zoom / Ultra Low Light Sensor) + Laser Range Finder (32km Range) + Laser Designator (50mJ Output Energy) – Color Finish (Powder Coat Desert Tan)

THERMAL IMAGER OPTIONS

Parameters	L0612	L1212	M0615	M1212
Resolution	640×512	1280×1024	640×512	1280×1024
Spectral Range	LWIR (8~14µm)		MWIR (3.7µm±0.2µm - 4.8µm±0.2µm)	
Pixel Size	12µm	12µm	15µm	12µm
NETD	≤30mK	≤50mK	≤15mK	≤20mK
Lens	30-150mm	30-180mm	15-300mm	37.5-750mm
Optical Zoom	5X	6X	20X	20X
FOV (Narrow End)	2.93° x 2.35°	4.89° x 3.91°	1.83° x 1.47°	1.17° x 0.94°

EO CAMERA OPTIONS

Parameters	E90	E68L	E50UL	E30
Resolution	1920x1080	1920x1080	1920x1080	1920x1080
Lens	6-540mm	6-408mm	6-300mm	4.3-129mm
Optical Zoom	90X	68X	50X	30X
FOV	65.2°-0.8°	66.0°-1.0°	61.9°-1.3°	63.7°-2.3°
Min. Illumination	Standard 0.01 Lux	Low Light 0.005 Lux	Ultra Low Light 0.001 Lux	Standard 0.1 Lux

LRF

Parameters	L32
LRF Ranging Scope	5-32000 m
LRF Wavelength	1.5 µm

DESIGNATOR

Parameters	LD050
LD Pulse Codes	STANAG 3733 I&II
LD Pulse Width	10-25 ns
LD Wavelength	1064 nm
LD Output Energy	>50 mJ

	Parameters		SEB20-XXXX-XXX-L32-LD050
GENERAL PARAMETERS	Positioning Accuracy (with Positioner)	µrad	<50 µrad (≈ 0.003°)
		µrad	<100 µrad (≈ 0.006°)
	Operating Voltage	V	20-32V
	Video Output	-	HD-SDI, Ethernet
	Communication to the Unit	-	RS-422
	Width (A)	mm	325
	Depth (B)	mm	360
	Height (C)	mm	155
	Weight W/O Positioner	kg	18.4
TRACKER	Data Refresh Rate	Hz	25 Hz
	Output Lag	ms	<100 ms
	Stabilization	-	Fiber Gyro and Encoder Based Dual Loop Stabilization
	Target Size	pixels	16x16 ~ 128*128
ENVIRONMENTAL QUALIFICATIONS	IP Rating	-	IP65
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I Functional Shock, 40g 11ms
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours Salt Fog and 24 Hours Desiccation

***Dimensions and weight may change due to different sensor options.**

SEB20 – Multi Channel Thermal Imager
PED12 – Ultra Precision Pan-Tilt Unit
TMH10 – Heavy Duty Tripod

2. Precision Positioners

We believe in merging innovation and art to create the ultimate products. And that's exactly what we've done with our high-performance positioner family. These machines are not just tools; they are works of art - true titans of the surveillance.

With their unparalleled precision capabilities, our positioners effortlessly carry high payloads, and can be mounted on a tripod, mast, or even a rugged military vehicle, making them perfect for even the toughest conditions.

Our positioners also boast optional two-axis stabilization systems that ensure maximum precision and stability in any situation. These powerhouses of engineering are the testament to the merging of innovation and art. Choose our positioners and experience the ultimate in precision engineering.

Our positioners are the tuning keys that ensure your surveillance system is always in perfect pitch, with unmatched precision and control.

Highlights

- True Servo Drive System with Brushless Motors
- Axis Speed Up to 180°/s
- Positioning Accuracy Down to 0.028° with Zero Gear Backlash
- Up to 76 Line Slipring Options (1Gbit Ethernet, HD-SDI Video)

Main Configurations

- PED08 – Compact Electromechanical Pan-Tilt Unit
- PED10 – Ultra Precision Electromechanical Pan-Tilt Unit
- PED12 – Stabilized Electromechanical Pan-Tilt Unit
- PES10 – Ultra Precision Electromechanical Rotator Unit
- PEG03 – Lightweight Goniometer
- PMD01 – Lightweight Manual Pan-Tilt Unit

Positioners Comparison Chart

As a leading developer of advanced military technology, we understand the critical importance of reliable and precise positioning in tactical operations. Our positioners are designed to meet the demands of even the most challenging military applications, delivering outstanding accuracy, durability, and versatility in the field.

In this selection guide, you will find detailed information on our range of products, including technical specifications, features, and benefits. Whether you require a compact and lightweight system for mobile operations or a heavy-duty unit for extreme environments, our positioners are engineered to meet your exact requirements.

We are committed to providing the best solutions for our military customers, and this guide is designed to help you make the right choice for your needs.

	PED08	PED10	PED12	PES10	PEG03	PMD01
Classification	Light Weight Cost/Performance Line	Ultraprecise Extended Lifespan Line	Stabilized High Capacity Line	Ultraprecise Single Axis Rotator Line	Lightweight Digital Goniometer (12 kg)	Lightweight Manual Head (10 kg)
Stabilization	X	Optional	Available	X	X	X
Number of Axes	2	2	2	1	2	2
Motor Type	**Brushless Servo**	**Brushless Servo**	**Brushless Servo**	Brushless Servo	Manual (Encoded)	Manual
Backlash	0.0°	**0.0°**	**0.0°**	0.0°	–	–
Positioning Accuracy	0.12°	0.032 – 0.038°	0.028 – 0.038°	0.042 – 0.065°	0.056°	–
Axis Resolution	0.02°	0.002°	0.002°	–	0.0056°	0.084°
Pan – Nominal Torque	85 Nm	185 Nm	185 Nm	1032 Nm	–	–
Pan – Max. Speed	48 °/s	180 °/s	180 °/s	25 °/s	Manual	Manual
Tilt – Nominal Torque	135 Nm	275 Nm	275 Nm	X	–	–
Tilt – Max. Speed	48 °/s	180 °/s	180 °/s	X	Manual	Manual
Slipring Lines (Max.)	76	76	76	36	X	X
Weight	9.0 kg	16.1 kg	16.1 kg	9.5 – 18.1 kg	<3.0 kg	<1.4 kg
Communication	Ethernet, RS485, RS422	Ethernet, RS485, RS422	Ethernet, RS485, RS422	Ethernet, RS485, RS422	X	X
Environmental Qual.	MIL-STD-810G	MIL-STD-810G	MIL-STD-810G	MIL-STD-810G	MIL-STD-810G	MIL-STD-810G
EMI/EMC Qual.	MIL-STD-461G	MIL-STD-461G	MIL-STD-461G	MIL-STD-461G	X	X
Combinable Sensor Units	X	SEB20	–	X	X	X
Combinable Mast Units	MES10 / MES20	MEM10 / MES10	–	MEM10 / MES10	X	MMS20 / MMT10
Combinable Tripod Units	TMM10 / TMH10	TMM10 / TMH10	TMH10	TMM10 / TMH10	TML10	TML10

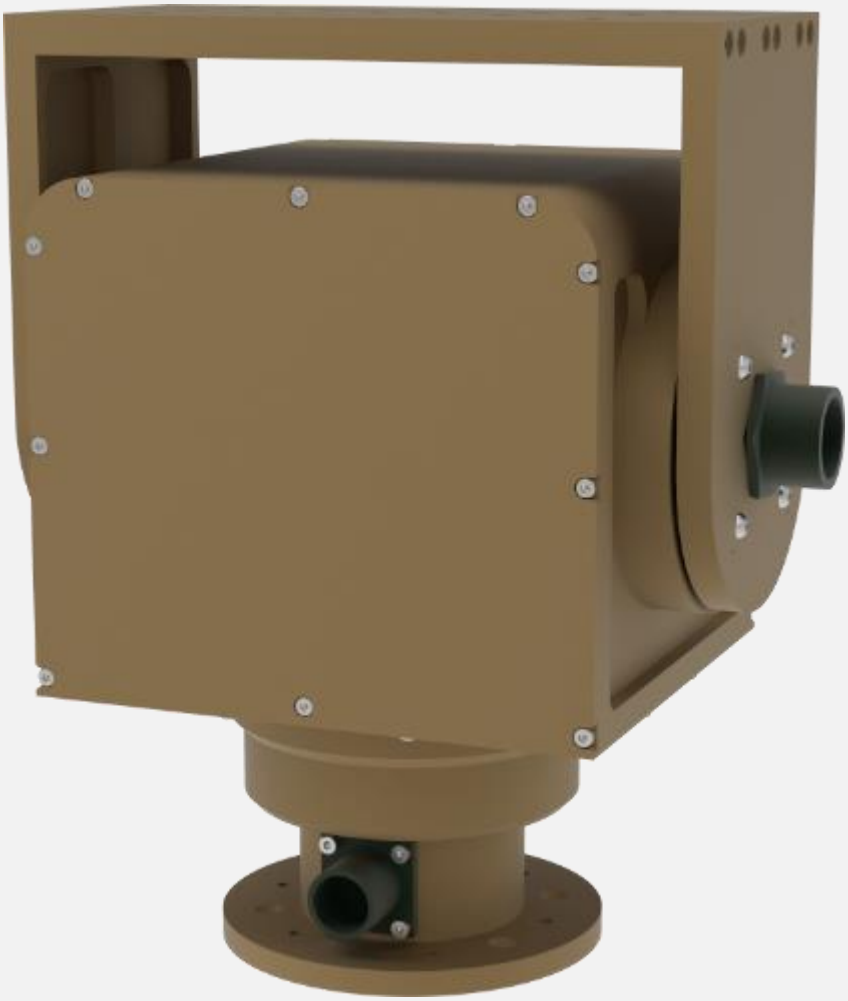
X: Not applicable | –: Not specified in this revision | Accuracy and torque figures are given as the range across the available speed/torque configurations.

INVENTRA
SURVEILLANCE SYSTEMS

PED08 – Compact Electromechanical Pan-Tilt

Lightweight, Reliable Pan-Tilt with True Servo Control for

Thermal Imagers and Directional Antennas



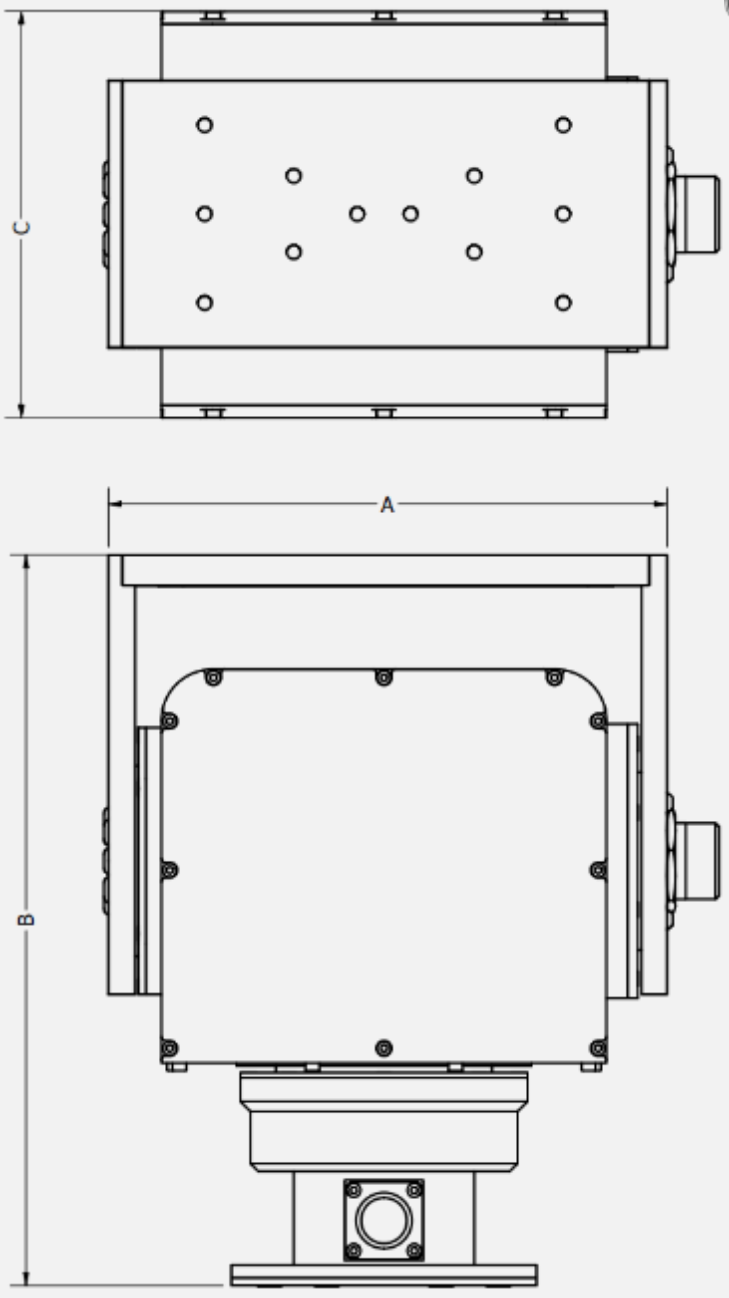
Distinctive Features

- **True Servo Drive System:** Utilizes brushless motors, enhancing accuracy over stepper motors.
- **Ultra-Low Power Consumption:** Operates at 10W with "Smart Driving Mode" for efficiency.
- **Active Disturbance Rejection:** MCU actively counters external interference for steady operation.
- **High-Resolution Positioning:** 22-bit encoders provide precise positioning and control.
- **MIL-STD-461G Compliant:** EMI/EMC standards ensure resilience in demanding environments.
- **Tripod Compatibility:** Mounts on TMH or TMM tripods for versatile field deployment.
- **Coastal and Seaborne Customization:** Options tailored for marine environments

Main Features

- The PED08 provides a combination of controllability, positional accuracy, and price/performance ratio, making it suitable for fixed installations as well as light vehicle applications
- It features MIL-STD-461G EMI/EMC compliance, making it suitable for installations across diverse environments, including ground-based and light vehicle-mounted setups.

Configuration Breakdown	**P**ositioner – **E**lectromechanical – **D**ual Axis – 08 (Product Class) – Pan Speed/Torque – Tilt Speed/Torque
Part Number	PED08-AX-ABX (Check Available Options Below)
Available Customizations	Communication Protocol, Output Speed, Output Torque, Number of Slipring Lines, Mechanical Interfaces
Combinable Platforms	SEBXX – Multi Channel Thermal Imager MES10 – Locked Electromechanical Mast Platform TMM10 – Medium Duty Tripod TMH10 – Heavy Duty Tripod



PED08 – AX – ABX

Speed/Torque Configuration Breakdown

PED08	AX – Pan Axis Speed/Torque Conf.	ABX – Tilt Axis Speed/Torque Conf.
Positioner – Electromechanical – Dual Axis	Any **"A type"** configuration is applicable	Any **"A type"** or **"B type"** configuration is applicable

	Speed/Torque Configuration		A1	A2	A3	A4	B1	B2
PARAMETERS	Nominal Speed	°/s	6	12	24	48	6	12
	Nominal Torque	Nm	85	60	45	30	135	85
	Peak Torque	Nm	120	120	60	50	225	210
	Momentary Peak Torque	Nm	200	200	180	125	400	400

- Nominal Speed / Nominal Torque represents operation range with 100% duty cycle.
- Peak Torque represent limits for acceleration and deceleration limits.
- Momentary Peak Torque represent limits impulsive shock limits device can absorb.

➢ **Most common configurations are given below. Any configuration is possible according to table.**

	Parameters / Configurations		PED08-A2-A1	PED08-A4-A1	PED08-A1-B1
PERFORMANCE PARAMETERS	**Pan – Speed (Nominal)**	**°/s**	12	48	6
	Pan –Torque (Nominal)	**Nm**	60	30	85
	Pan – Peak Torque	**Nm**	120	50	120
	Tilt – Speed (Nominal)	**°/s**	6	6	6
	Tilt – Torque (Nominal)	**Nm**	85	85	135
	Tilt – Peak Torque	**Nm**	120	120	225
	Pan – Axis Range	°		N x 360°	
	Tilt – Axis Range	°		±45°	
	Resolution	°		0.02	
	Accuracy	°		0.12	
	Operating Voltage	**VDC**		18-48	
	Weight	**kg**	9.0	9.0	10.5
	Communication to the Unit	-		Ethernet, RS-485, RS422 (Full Duplex), USB	
	Connector Type	-		MIL-DTL-38999	

OPTIONS	**Slipring**	-	Up to 76 lines including (10A Power, 1 Gbit Ethernet, RS422, RS232, HD-SDI)
	Stabilization	-	Available
	Dual-Loop Control	-	X
	Hand Controller	-	Available
	Multiple Payload Interface	-	Available
DIMENSION	**Width (A)**	**mm**	220
	Height (B)	**mm**	287 (Depend on slipring configuration)
	Depth (C)	**mm**	160
ENVIRONMENTAL QUALIFICATIONS	**Wind Load**	**km/h**	120
	IP Rating	-	IP65
	Temperature	**°C**	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Low Pressure	-	MIL-STD-810G, Method 500.5 Procedure I – Storage 37,000ft MIL-STD-810G, Method 500.5 Procedure I – Operational 10500ft
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Functional Shock, 20G 11ms, XYZ Axis, 3 Positive and 3 Negative Each Axis
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I – 90% Noncondensing @60°C, 11 Days
	Rain	-	MIL-STD-810G, Method 506.5 Procedure II
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours
	Dust and Sand	-	MIL-STD-810G, Method 510.5, Procedure I and Procedure II
EMI/EMC	**EMI/EMC Compliancy**	-	CE102 – Conducted Emissions, Power Leads CS101 – Conducted Susceptibility, Power Leads CS114 – Conducted Susceptibility, Bulk Cable Injection CS115 – Conducted Susceptibility, Bulk Cable Injection CS116 – Conducted Susceptibility, Damped Sinusoidal Transients CS118 – Conducted Susceptibility, Personnel Borne ESD RE102 – Radiated Emissions, Electric Field RS103 – Radiated Susceptibility, Electric Field

PED08 – Electromechanical Pan-Tilt Unit

TMM10 – Medium Duty Tripod Unit

INVENTRA
SURVEILLANCE SYSTEMS

PED10 – Ultra Precision Electromechanical Pan-Tilt

Zero Backlash, 0.002° Resolution, 180°/s Speed, 30M Revolutions without Maintenance Pan-Tilt Unit for,

Mission Critical Applications such as Thermal Imaging and Target Tracking

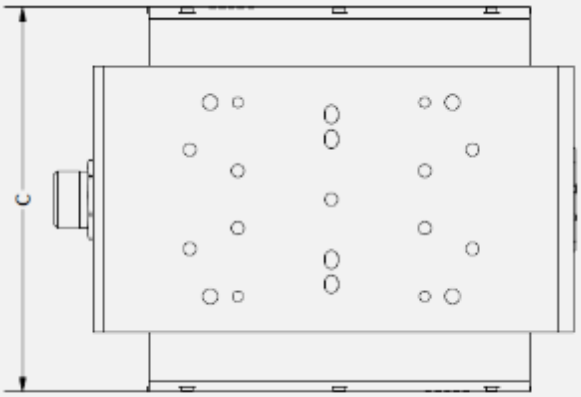
Distinctive Features

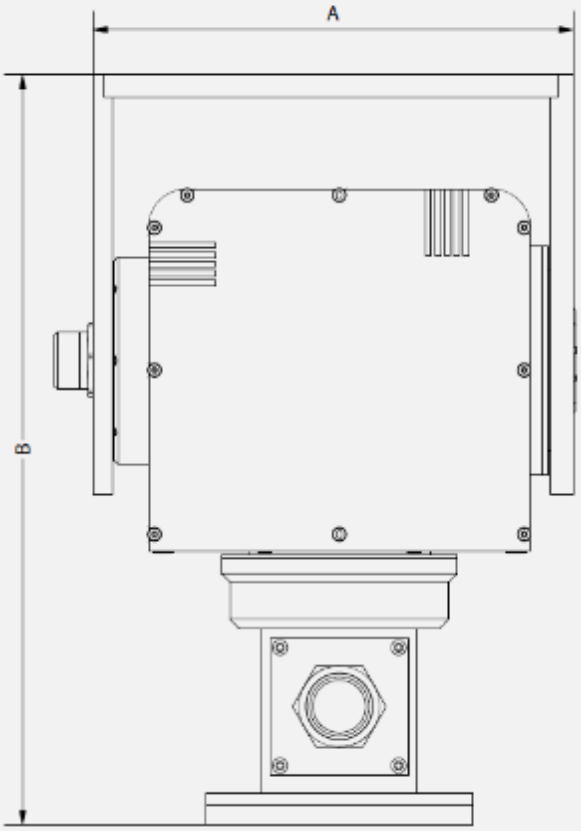
- Brushless Servo Precision: Zero-backlash for seamless tracking.
- High Torque Capacity: Up to 275 Nm nominal / 475 Nm peak tilt torque for heavy-duty use.
- HD-SDI and Ethernet Ready: Video and data transmission via slip ring.
- MIL-STD-461G Compliant: EMI/EMC approved for demanding applications.
- Long Lifecycle: 30 million cycles without maintenance needs.
- Dual-Loop Control System: Enhances precision up to 0.001° accuracy.

Main Features

- Engineered for high-speed, zero-backlash precision, the PED10 ensures 0.032° accuracy with 0.002° resolution and heavy payload handling, ideal for thermal and radar tracking.
- PED10 features brushless servo motors, a 76-line slip ring with HD-SDI, and operates continuously with smart power-saving modes.

Configuration Breakdown	**P**ositioner – **E**lectromechanical – **D**ual Axis – 10 (Product Class) – Pan Speed/Torque – Tilt Speed/Torque
Part Number	PED10-AX-ABX (Check Available Options Below)
Available Customizations	Communication Protocol, Output Speed, Output Torque, Number of Slipring Lines, Mechanical Interfaces
Combinable Platforms	SEB20 – Multi Channel Thermal Imager MES10 – Locked Electromechanical Mast Platform MEM10 – Ultra-Stable Electromechanical Mast Platform TMH10 – Heavy Duty Tripod





PED10 – AX – ABX

Speed/Torque Configuration Breakdown

PED10	AX – Pan Axis Speed/Torque Conf.	ABX – Tilt Axis Speed/Torque Conf.
Positioner – Electromechanical – Dual Axis	Any **"A type"** configuration is applicable	Any **"A type"** or **"B type"** configuration is applicable

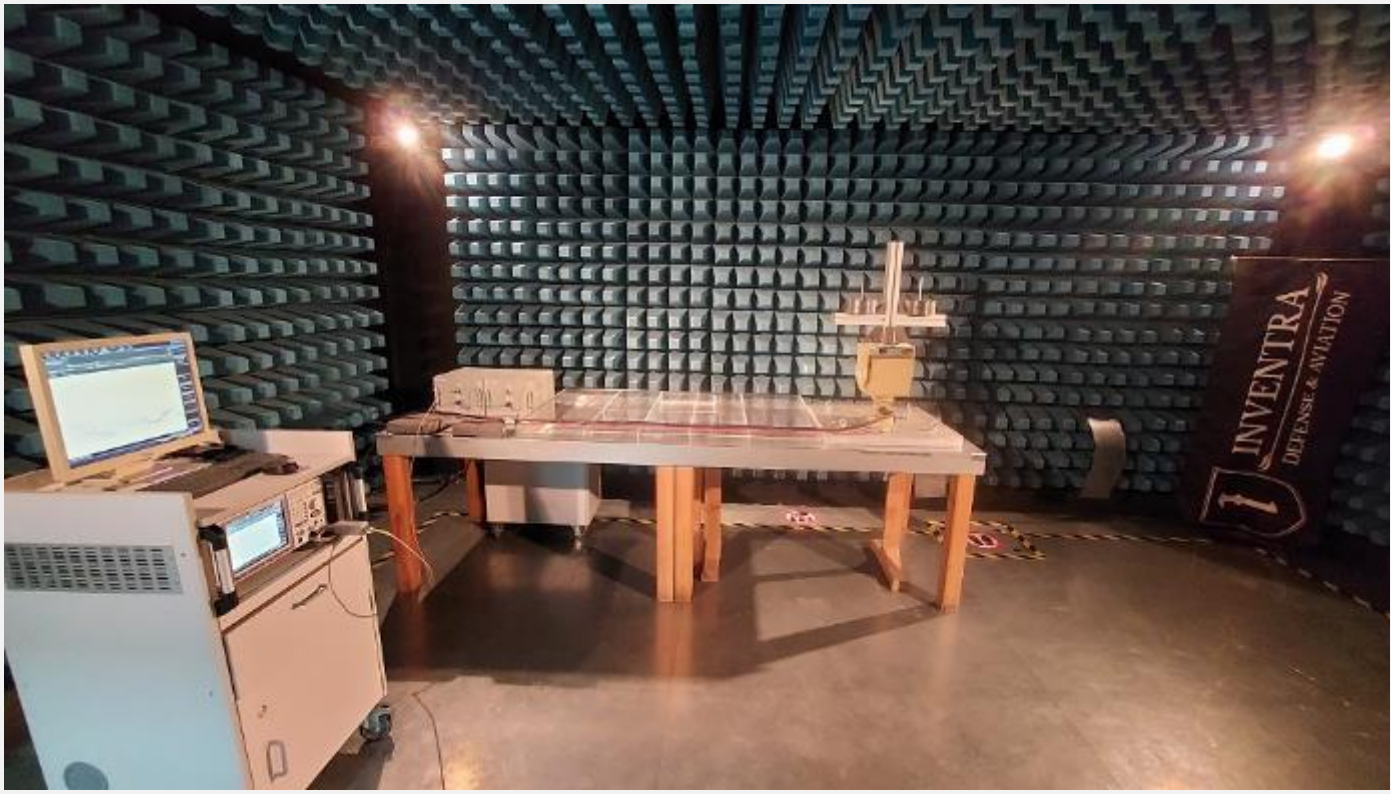
	Speed/Torque Configuration		A1	A2	A3	A4	B1	B2
PARAMETERS	Nominal Speed	°/s	28	48	96	180	28	48
	Nominal Torque	Nm	185	150	80	60	275	175
	Peak Torque	Nm	225	215	120	100	475	450
	Momentary Peak Torque	Nm	400	400	360	250	875	875

- Nominal Speed / Nominal Torque represents operation range with 100% duty cycle.
- Peak Torque represent limits for acceleration and deceleration limits.
- Momentary Peak Torque represent limits impulsive shock limits device can absorb.

➢ **Most common configurations are given below. Any configuration is possible according to table.**

	Parameters / Configurations		PED10-A2-A1	PED10-A4-A1	PED10-A1-B1
PERFORMANCE PARAMETERS	**Pan – Peak Torque**	**Nm**	215	100	225
	Pan –Torque (Nominal)	**Nm**	150	60	185
	Pan – Speed (Nominal)	**°/s**	48	180	28
	Tilt – Peak Torque	**Nm**	225	225	475
	Tilt – Torque (Nominal)	**Nm**	185	185	275
	Tilt – Speed (Nominal)	**°/s**	28	28	28
	Pan – Axis Range	°	N x 360°		
	Tilt – Axis Range	°	±45° (Configurable up to 90°)		
	Resolution	°	0.002		
	Accuracy	°	0.038	0.032	0.032
	Operating Voltage	**VDC**	18-48		
	Weight	**kg**	16.1	16.1	19.5
	Communication to the Unit	-	Ethernet, RS-485, RS422 (Full Duplex), USB		
	Connector Type	-	MIL-DTL-38999		

OPTIONS	**Slipring**	-	Up to 76 lines including (1 Gbit Ethernet, RS422, RS232, HD-SDI)
	Stabilization	-	Available
	Dual-Loop Control	-	Position Control at the Order of 0.001° with Secondary Encoder
	Hand Controller	-	Available
	Multiple Payload Interface	-	Available
DIMENSION	**Width (A)**	mm	250
	Height (B)	mm	Between 350 – 395 (Depend on slipring configuration)
	Depth (C)	mm	202
ENVIRONMENTAL QUALIFICATIONS	**Wind Load**	km/h	120
	IP Rating	-	IP65
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Low Pressure	-	MIL-STD-810G, Method 500.5 Procedure I – Storage 37,000ft MIL-STD-810G, Method 500.5 Procedure I – Operational 10500ft
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Functional Shock, 20G 11ms, XYZ Axis, 3 Positive and 3 Negative Each Axis
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I – 90% Noncondensing @60°C, 11 Days
	Rain	-	MIL-STD-810G, Method 506.5 Procedure II
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours
	Dust and Sand	-	MIL-STD-810G, Method 510.5, Procedure I and Procedure II
EMI/EMC	**EMI/EMC Compliancy**	-	CE102 – Conducted Emissions, Power Leads CS101 – Conducted Susceptibility, Power Leads CS114 – Conducted Susceptibility, Bulk Cable Injection CS115 – Conducted Susceptibility, Bulk Cable Injection CS116 – Conducted Susceptibility, Damped Sinusoidal Transients CS118 – Conducted Susceptibility, Personnel Borne ESD RE102 – Radiated Emissions, Electric Field RS103 – Radiated Susceptibility, Electric Field



RE102 and CE102 Test Setups

Ultra Precision Electromechanical Pan-Tilt Units are EMI/EMC complaint according to MIL-STD-461G

The PED10 Positioner and MMS10 Mast Systems carry payloads with a significantly offset center of gravity on a vehicle platform at the IDEF International Defense Industry Fair.

Investing in Precision: Long-Term Value of Brushless Motors and Zero Backlash Gear Drives

A straightforward guide to help you understand the differences between two types of positioning systems. We've broken down the technical aspects into easy-to-digest information, focusing on precision, smoothness of motion, dynamic performance, power consumption, complexity, maintenance, and cost.

	Inventra Pan-Tilt Units	**Alternative Systems**
	Brushless Motors + Zero Backlash Drive Gear	**Stepper Motors + Worm Gears**
Precision and Accuracy	Unmatched precision due to the inherently low hysteresis in brushless motors and the precise nature of zero backlash drive gear systems. These features result in minimal positioning errors and excellent repeatability.	The alternative system strives for precision, but the presence of worm gears may introduce unavoidable backlash, potentially impacting the overall accuracy, particularly in applications requiring ultra-precision alignment.
Smoothness of Motion	The continuous rotation of brushless motors, coupled with advanced Field Oriented Control (FOC) control algorithms, ensures exceptionally smooth motion profiles. This level of smoothness is crucial in applications demanding seamless and jitter-free movements.	Stepper motors in the alternative system may exhibit stepping behavior, especially during micro-movements or at low speeds, leading to less fluid motion. Resonance effects in stepper motors and worm gears could further contribute to motion irregularities.
Dynamic Performance	The high torque-to-inertia ratio of brushless motors enhances dynamic performance, enabling rapid acceleration and deceleration. This is advantageous in scenarios requiring quick repositioning and tracking of moving targets.	The alternative system, employing stepper motors, may face limitations in dynamic performance, with potential issues related to speed and responsiveness, especially in fast-paced environments.
Power Consumption	Brushless motors are known for their efficiency, drawing power only when necessary. The system's ability to maintain holding positions with minimal energy consumption contributes to overall energy efficiency.	Stepper motors in the alternative system may continuously draw current, leading to higher power consumption, particularly during static holding positions. This can result in increased energy costs over time.
Complexity and Maintenance	The simplicity of the zero backlash drive gear system contributes to the overall reliability of the system, requiring minimal maintenance. Fewer components and points of failure reduce the likelihood of unexpected downtime.	The alternative system, incorporating worm gears, may introduce additional complexity and points of potential failure. This complexity could result in higher maintenance requirements and increased susceptibility to wear and tear over time.
Cost	The higher initial cost of your system is justified by the long-term value it provides. The reduction in maintenance needs and time consumption translates into cost savings over the system's lifecycle.	While the alternative system offers a lower upfront cost, the potential for higher maintenance expenses and increased value consumption over time should be considered for a comprehensive cost analysis.

INVENTRA
SURVEILLANCE SYSTEMS

PED12 –Stabilized Electromechanical Pan-Tilt

High-Capacity, Motorized Pan/Tilt for

Long-Range Surveillance, Homeland Security, Vehicle, and Fixed Installations

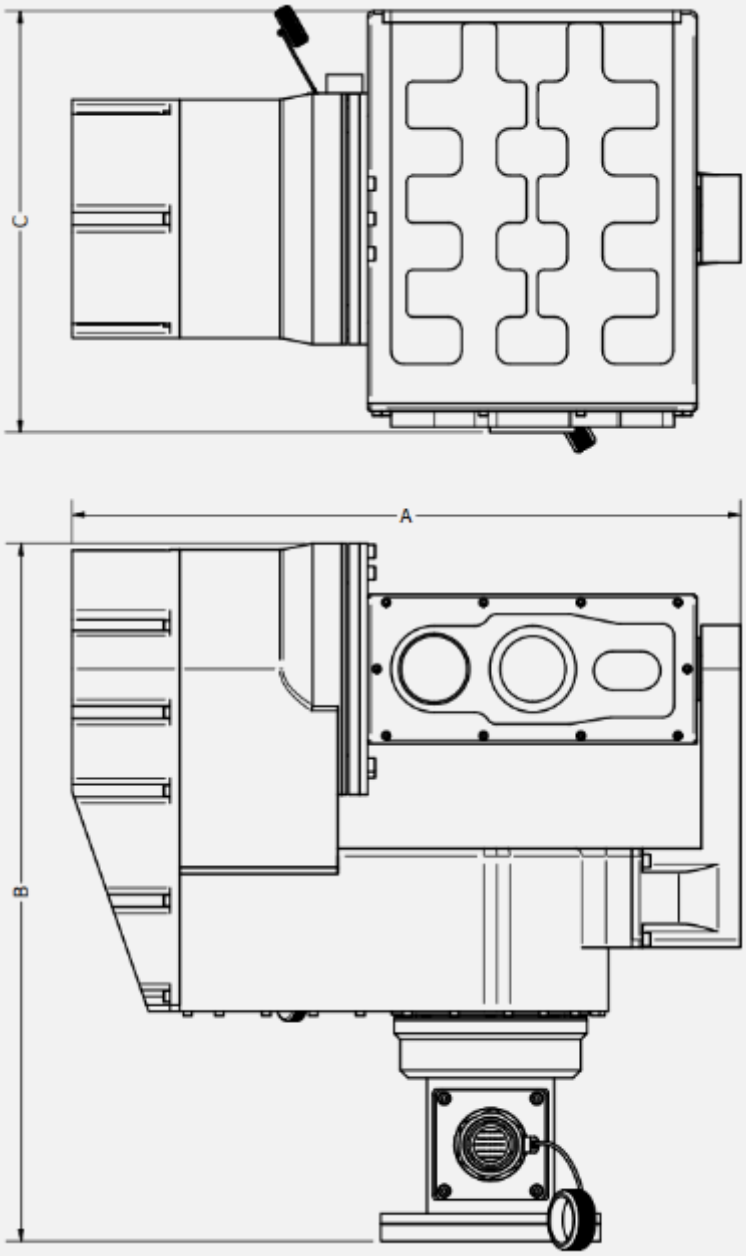
Distinctive Features

- **High Precision Positioning:** Provides fine control in fast-paced tasks.
- **Gyro Stabilization:** Ensures smooth tracking on unstable platforms.
- **Shock and Vibration Resistant:** Maintains stability in high-impact conditions.
- **Configurable U-Arm Mounting:** Allows width-adjustable payload balancing.
- **Marine-Compatible Build:** Resistant to corrosion in coastal operations.
- **Environmental Sealing (IP65):** Engineered for durability in harsh conditions.

Main Features

- The PED12's robust motorized design is engineered for sustained accuracy across a range of surveillance applications.
- Its configurable setup supports various sensor suites, featuring gyro-stabilization and video tracking options for enhanced operational versatility in coastal and rugged terrains.

Configuration Breakdown	**P**ositioner – **E**lectromechanical – **D**ual Axis – 12 (Product Class) – Pan Speed/Torque – Tilt Speed/Torque
Part Number	PED12-AX-ABX (Check Available Options Below)
Available Customizations	Communication Protocol, Output Speed, Output Torque, Number of Slipring Lines, Mechanical Interfaces
Combinable Platforms	SEBXX – Multi Channel Thermal Imager MES10 – Locked Electromechanical Mast Platform MEM10 – Ultra-Stable Electromechanical Mast Platform TMH10 – Heavy Duty Tripod



PED12 – AX – ABX

Speed/Torque Configuration Breakdown

PED12	AX – Pan Axis Speed/Torque Conf.	ABX – Tilt Axis Speed/Torque Conf.
Positioner – Electromechanical – Dual Axis	Any **"A type"** configuration is applicable	Any **"A type"** or **"B type"** configuration is applicable

	Speed/Torque Configuration		A1	A2	A3	A4	B1	B2
PARAMETERS	Nominal Speed	°/s	28	48	96	180	28	48
	Nominal Torque	Nm	185	150	80	60	275	175
	Peak Torque	Nm	225	215	120	100	475	450
	Momentary Peak Torque	Nm	400	400	360	250	875	875

- Nominal Speed / Nominal Torque represents operation range with 100% duty cycle.
- Peak Torque represent limits for acceleration and deceleration limits.
- Momentary Peak Torque represent limits impulsive shock limits device can absorb.

➢ **Most common configurations are given below. Any configuration is possible according to table.**

	Parameters / Configurations		PED12-A2-A1	PED12-A4-A1	PED12-A1-B1
PERFORMANCE PARAMETERS	**Pan – Peak Torque**	**Nm**	215	100	225
	Pan –Torque (Nominal)	**Nm**	150	60	185
	Pan – Speed (Nominal)	**°/s**	48	180	28
	Tilt – Peak Torque	**Nm**	225	225	475
	Tilt – Torque (Nominal)	**Nm**	185	185	275
	Tilt – Speed (Nominal)	**°/s**	28	28	28
	Pan – Axis Range	°		N x 360°	
	Tilt – Axis Range	°		Up to ±45°	
	Resolution	°		0.002	
	Servo Accuracy	°	0.038	0.032	0.028
	Stabilization Accuracy	°		0.04	
	Weight	**kg**	16.1	16.1	17.5
	Communication to the Unit	-		Ethernet, RS-485, RS422 (Full Duplex), USB	
	Connector Type	-		MIL-DTL-38999	

OPTIONS	**Slipring**	-	Up to 76 lines including (1 Gbit Ethernet, RS422, RS232, HD-SDI)
	Stabilization	-	Available
	Dual-Loop Control	-	Position Control at the Order of 0.001° with Secondary Encoder
	Hand Controller	-	Available
	Multiple Payload Interface	-	Available
DIMENSION	**Width (A)**	mm	430
	Height (B)	mm	445 (depends on slipring configuration)
	Depth (C)	mm	270
ENVIRONMENTAL QUALIFICATIONS	**Wind Load**	km/h	120
	IP Rating	-	IP65
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Low Pressure	-	MIL-STD-810G, Method 500.5 Procedure I – Storage 37,000ft MIL-STD-810G, Method 500.5 Procedure I – Operational 10500ft
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Functional Shock, 20G 11ms, XYZ Axis, 3 Positive and 3 Negative Each Axis
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I – 90% Noncondensing @60°C, 11 Days
	Rain	-	MIL-STD-810G, Method 506.5 Procedure II
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours
	Dust and Sand	-	MIL-STD-810G, Method 510.5, Procedure I and Procedure II
EMI/EMC	**EMI/EMC Compliancy**	-	CE102 – Conducted Emissions, Power Leads CS101 – Conducted Susceptibility, Power Leads CS114 – Conducted Susceptibility, Bulk Cable Injection CS115 – Conducted Susceptibility, Bulk Cable Injection CS116 – Conducted Susceptibility, Damped Sinusoidal Transients CS118 – Conducted Susceptibility, Personnel Borne ESD RE102 – Radiated Emissions, Electric Field RS103 – Radiated Susceptibility, Electric Field

PED12 – Electromechanical Pan-Tilt Unit

TMH10 – Heavy Duty Tripod Unit

INVENTRA
SURVEILLANCE SYSTEMS

PES10 – Ultra Precision Electromechanical Rotator

Zero Backlash, High Torque Single Axis Rotator Units for,

Radar and Directional Antenna Applications

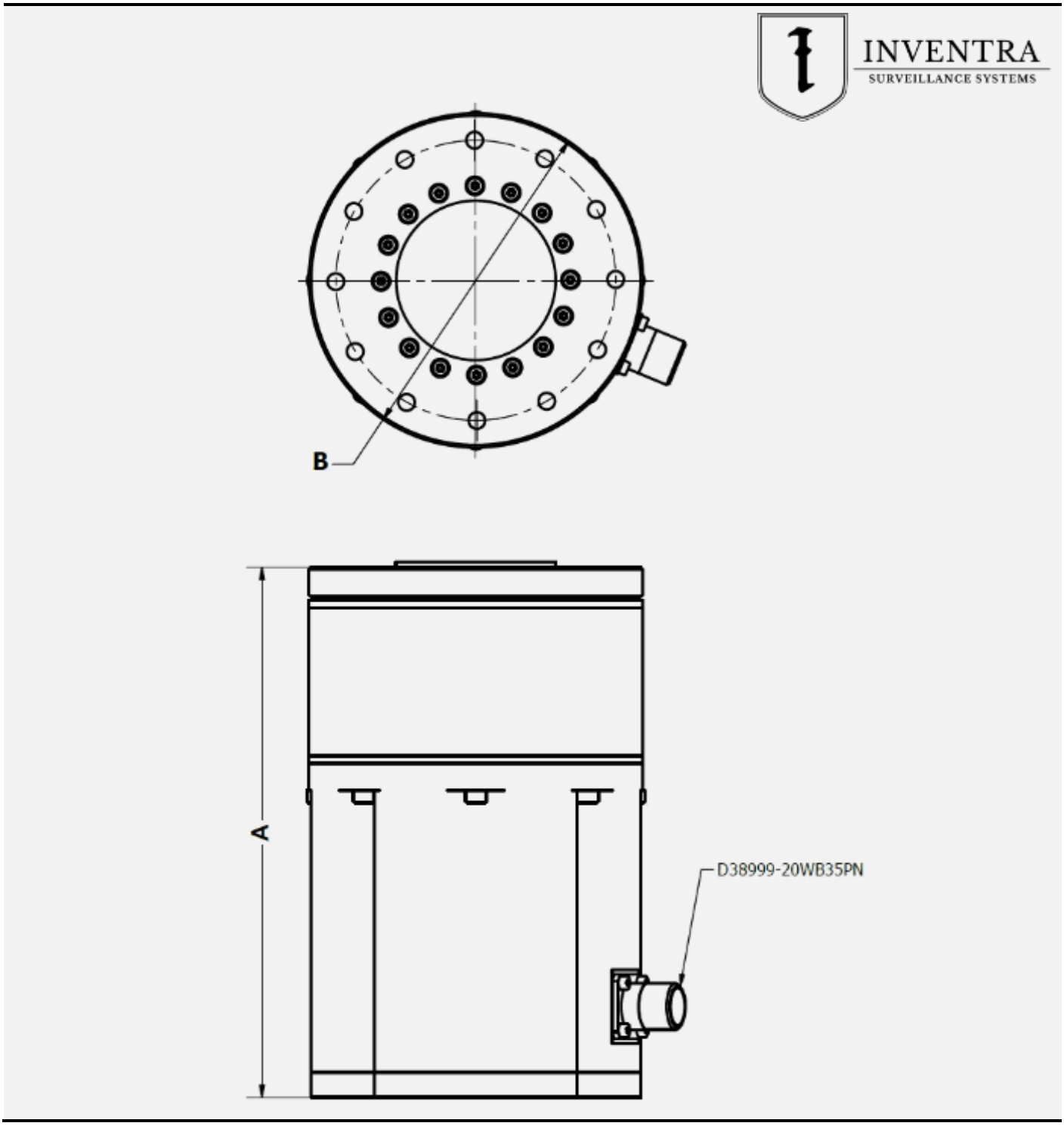
Distinctive Features

- Zero Backlash Design: Ensures precise, smooth positioning with no rotational play.
- Configurable Output Torque: Adjustable from 185 Nm to 1032 Nm for versatile applications.
- Brushless Drive Motors: Smooth, continuous motion control for demanding applications.
- 22-Bit Encoder Precision: Closed-loop encoder offers superior accuracy in control.
- High Durability Slipring: 30 million revolutions slipring supporting HD-SDI and 1 Gbit Ethernet transmission.
- MIL-STD-810G Compliance: Built to withstand severe environmental conditions.
- MIL-STD-461G Certification: Protected against electromagnetic interference for secure use.

Main Features

- The PES10 rotator delivers precision control with zero backlash, configurable torque options, and advanced closed-loop accuracy.
- Designed for military-grade reliability, it combines high-strength cross roller bearing support with a durable 36-line slipring, making it ideal for radar and antenna applications under MIL-STD-810G and MIL-STD-461G standards.

Configuration Breakdown	**P**ositioner – **E**lectromechanical – **S**ingle Axis –10 (Product Class) – Pan Speed/Torque
Part Number	PES10-X (Check Available Options Below)
Available Customizations	Communication Protocol, Output Speed, Output Torque, Number of Slipring Lines, Mechanical Interfaces
Combinable Platforms	MEM10 – Ultra-Stable Electromechanical Mast Platform MES10 – Locked Electromechanical Mast Platform TMH10 – Heavy Duty Tripod



	Parameter	Unit	PES10-185	PES10-435	PES10-756	PES10-1032
GENERAL PARAMETERS	Pan – Nominal Torque	Nm	185	435	756	1032
	Pan – Max. Torque	Nm	250	514	900	1114
	Pan – Axis Speed	deg/s	25	10	6	4.5
	Accuracy	°	0.042	0.045	0.051	0.065
	Repeatability	°	0.031	0.038	0.042	0.056
INTERFACE	Communication to the Unit	-	Ethernet, RS-485, RS422 (Full Duplex), USB			
	Connector Type	-	MIL-DTL-38999			
	Operating Voltage	V	24-48			
DIMENSIONS	Height (A)	mm	215	240	240	250
	Diameter (B)	mm	135	167	195	240
	Weight	kg	9.5	11.5	15.5	18.1
	Material	-	Aluminum 6061-T6 / Stainless Steel AISI 316			
ENVIRONMENTAL QUALIFICATIONS	IP Rating	-	IP65			
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C			
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3			
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms			
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h			
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing			
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours Salt Fog and 24 Hours Desiccation			
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand			
	Low Pressure	-	MIL-STD-810G Method 500.5 Procedure II-Operational 5000 ft MIL-STD-810G Method 500.5 Procedure I-Storage 15000 ft			

PES10 – Electromechanical Rotator Unit

INVENTRA
SURVEILLANCE SYSTEMS

PEG03 – Lightweight Goniometer

High-Resolution Digital Goniometer for

Military Surveillance, Target Acquisition, and Man-Portable Operations

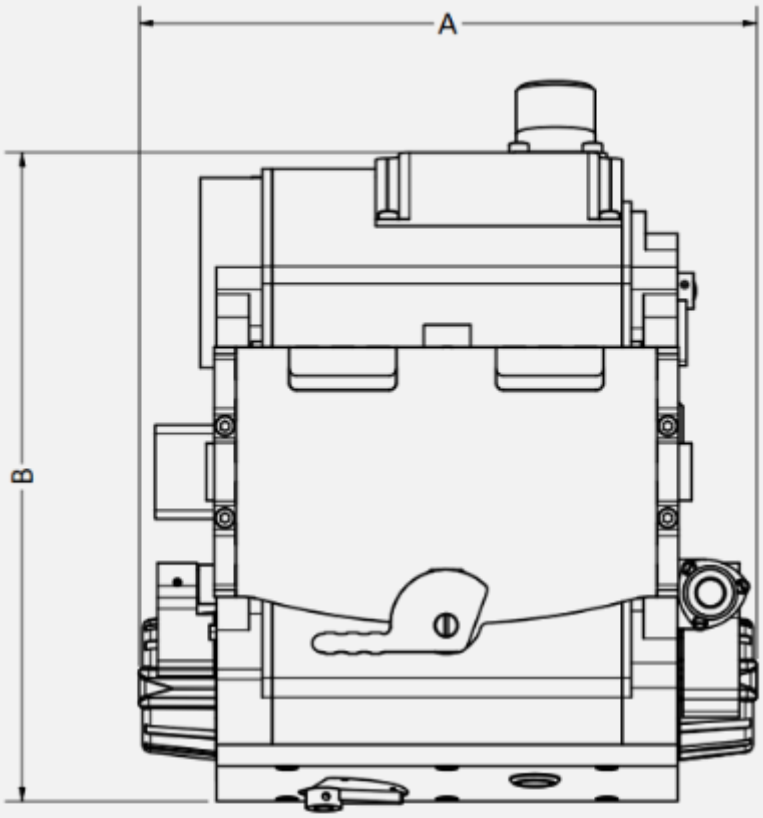
Distinctive Features

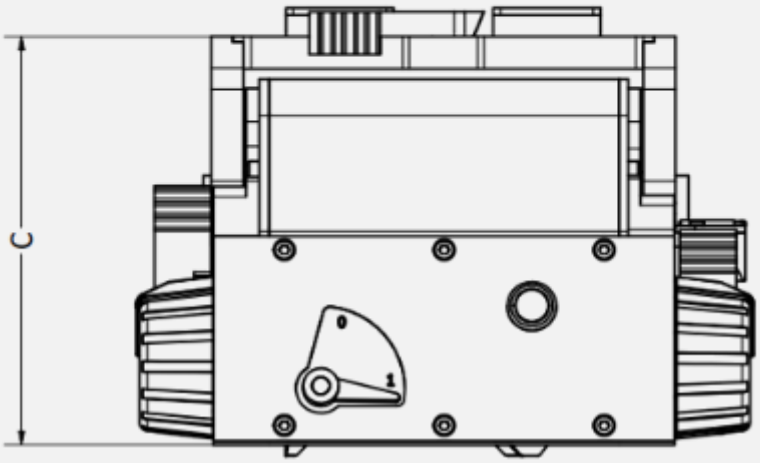
- **High-Resolution Encoders: 0.0056° (0.1 mil) resolution and 0.056° (1 mil) accuracy, ensuring superior alignment.**
- **Selectable Payload Counterbalance:** Ensures flexibility in payloads up to 12 kg for varying missions.
- **Independent Fine Adjustment:** Mechanisms in pan and tilt for exact sighting and continuous stability.
- **Low Power Consumption:** Extends operational endurance, making it suitable for prolonged field use.
- **Digital Magnetic Compass Compatibility:** Enhances navigation and directional accuracy during operations

Main Features

- PEG03 Digital Goniometer ensures accurate line-of-sight measurements, perfect for mission-critical surveillance and target acquisition tasks.
- It features fine pan/tilt adjustment mechanisms and operates with high-resolution encoders for exceptional precision.
- Ideal for man-portable deployments, its compact design suits versatile field needs.

Configuration Breakdown	**P**ositioner – **E**lectromechanical – **G**oniometer –01 (Product Class) – Payload Capacity (kg) – Resolution (bit)
Part Number	PEG03-12-16
Available Customizations	Mechanical Interfaces
Combinable Platforms	TML10 – Ultra Lightweight Tripod





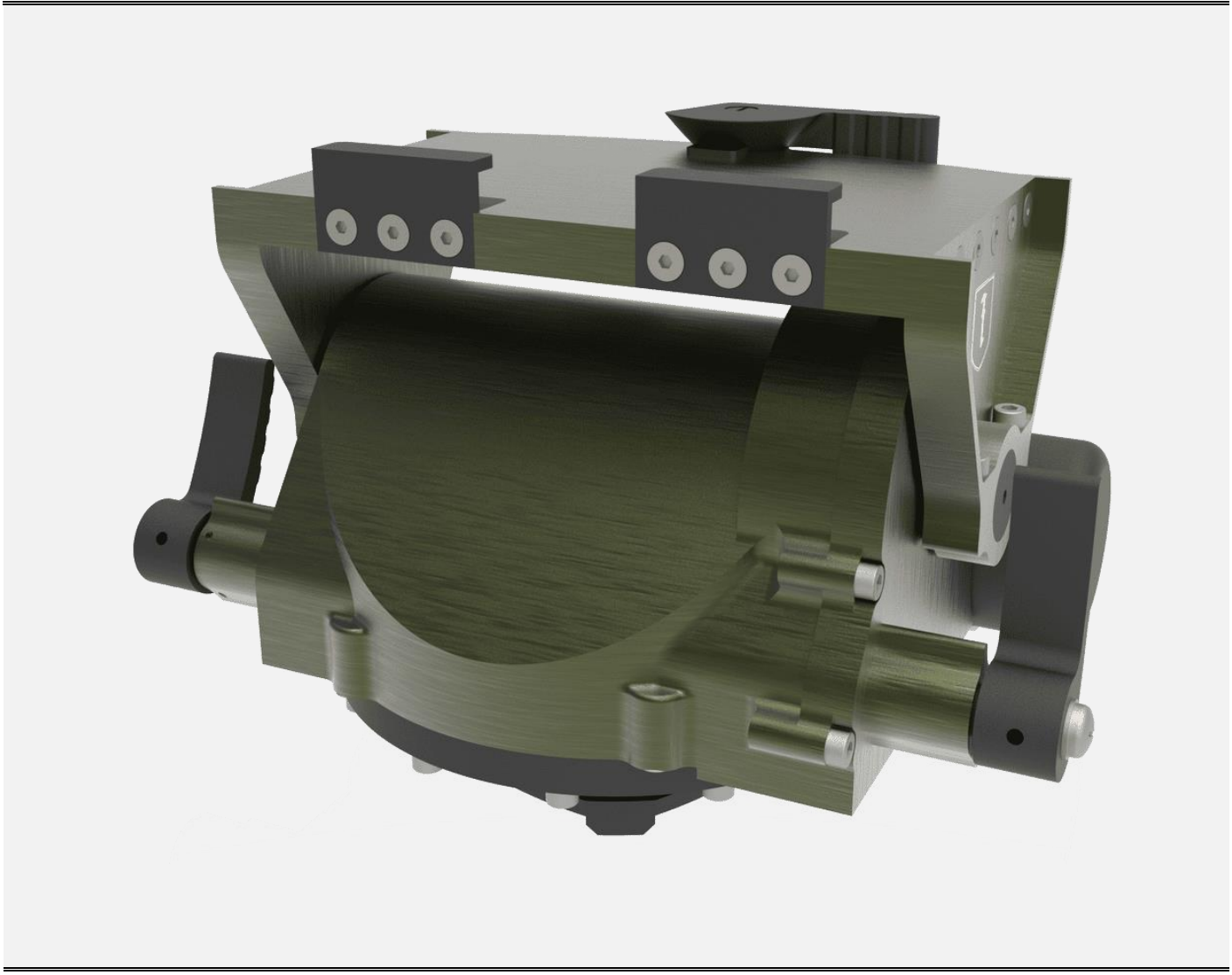
	Parameters / Configurations		PEG03-12
GENERAL PARAMETERS	Payload Capacity	kg	12 kg
	Pan Axis Range		n x 360°
	Tilt Axis Range		±45°
	Axis Resolution	°	0.0056° (0.1 mil) on Both Axis
	Accuracy	°	0.056° (1 mil) on Both Axis
	Weight	kg	<3.0 kg
	Independent Braking	-	Available on Both Axis
	Fine Adjustment Range	°	±0.8438° (15mil) on Both Axis
DIMENSIONS	Width (A)	mm	173
	Depth (B)	mm	183
	Height (C)	mm	115
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	120
	IP Rating	-	IP65
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Low Pressure	-	MIL-STD-810G, Method 500.5 Procedure I – Storage 37,000ft MIL-STD-810G, Method 500.5 Procedure I – Operational 10500ft
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Functional Shock, 20G 11ms, XYZ Axis, 3 Positive and 3 Negative Each Axis
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I – 90% Noncondensing @60°C, 11 Days
	Rain	-	MIL-STD-810G, Method 506.5 Procedure II
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours
	Dust and Sand	-	MIL-STD-810G, Method 510.5, Procedure I and Procedure II

INVENTRA
SURVEILLANCE SYSTEMS

PMD01 – Lightweight Manual Pan-Tilt

Lightweight, Precise, and Durable Pan/Tilt Head for Critical Alignment Application for

Military EO Sensors, Designators, and Long-Range Optics



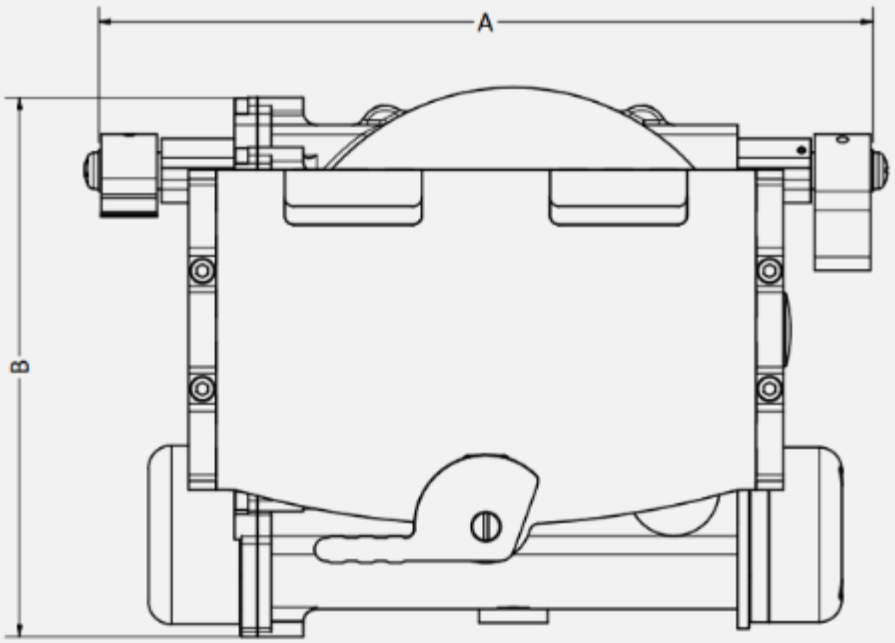
Distinctive Features

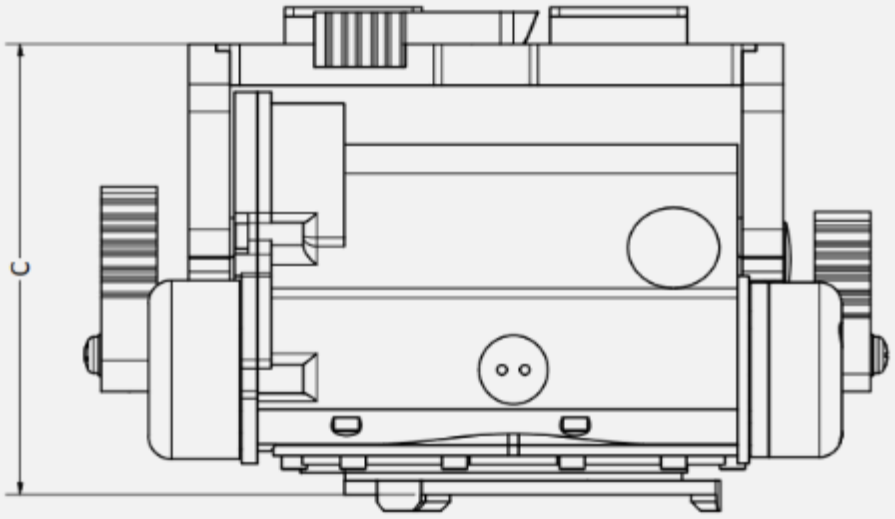
- **Fine Adjust Mechanism:** Provides precise adjustments for superior targeting accuracy.
- **Independent Braking:** Separate braking control for pan and tilt axis ensures operational stability.
- **Axis Damping Control:** Enhances precision tracking for moving objects and initial sensor alignment.
- **Magnetic Compass Compatibility:** Designed to work seamlessly with digital compasses for accurate orientation.
- **Elevation Scale:** Integrated elevation scale improves deployment accuracy in dynamic settings.

Main Features

- The PMD01 is a lightweight manual pan-tilt head engineered for applications demanding precision tracking and alignment.
- It offers fine adjustments in both axes, paired with viscous damping, ensuring optimal control for military surveillance and electro-optic sensor deployment.

Configuration Breakdown	**P**ositioner – **M**anual – **D**ual Axis –01 (Product Class) – Payload Capacity
Part Number	PMD01-10
Available Customizations	Mechanical Interfaces
Combinable Platforms	TML10 – Ultra Lightweight Tripod





	Parameters / Configurations		PMD01-10
GENERAL PARAMETERS	Payload Capacity	kg	10 kg
	Pan Axis Range		n x 360°
	Tilt Axis Range		±45°
	Pan Axis – Fine Adjustment Range	°	±2.50°
	Tilt Axis – Fine Adjustment Range	°	±1.13°
	Axis Resolution	°	0.084° (1.5mil) in Both Axis
	Weight	kg	<1.4 kg
	Independent Braking	-	Available on Both Axis
DIMENSIONS	Width (A)	mm	173
	Depth (B)	mm	120
	Height (C)	mm	110
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	120
	IP Rating	-	IP65
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Low Pressure	-	MIL-STD-810G, Method 500.5 Procedure I – Storage 37,000ft MIL-STD-810G, Method 500.5 Procedure I – Operational 10500ft
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Functional Shock, 20G 11ms, XYZ Axis, 3 Positive and 3 Negative Each Axis
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I – 90% Noncondensing @60°C, 11 Days
	Rain	-	MIL-STD-810G, Method 506.5 Procedure II
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours
	Dust and Sand	-	MIL-STD-810G, Method 510.5, Procedure I and Procedure II

PMD01 – Manual Pan-Tilt Unit
TML10 – Ultra Lightweight Tripod

3. Mast Systems

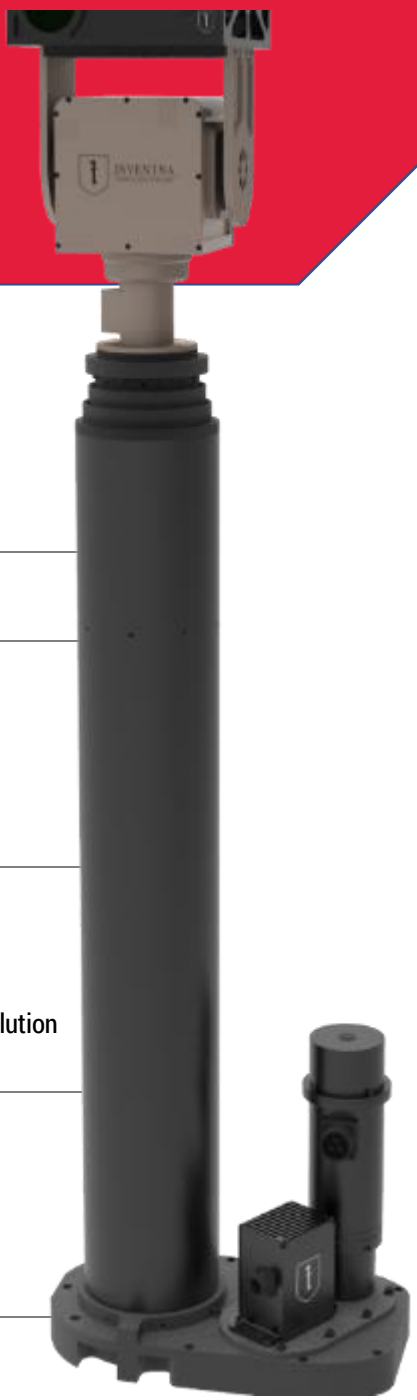
Inventra, a name that echoes with innovation and art, presents its military mast family - a marvel of engineering that blends precision, power, and flexibility in a single masterpiece.

From the unmanned ground vehicles that scout the uncharted terrains to the heavy armored vehicles that dare to venture into the warzones, this mast is the ultimate tool for military applications. It stands tall and proud at fixed places, guarding the borders with an unwavering gaze.

Its configurations are many, its potential limitless. It moves electromechanically with the grace of a dancer, rises with the strength of a titan, and can be operated manually, imbued with the human touch.

The mast has undergone rigorous testing and has been certified to meet the standards of MIL-STD-810G and MIL-STD-461G, proving its ability to withstand the harshest environments. From the scorching heat to the bone-chilling cold, from the low pressure at high altitudes to the electromagnetic interferences, it has faced them all and emerged victorious.

Elevate Your Surveillance Game with Our Military Grade Mast Systems.



Highlights

MES01 – Ultra Compact Electromechanical Mast System

- The World's Most Compact Electromechanical Mast System
- Widespread Usage in All Unmanned Ground Vehicles
- Plug-And-Play Design with Integrated the Actuating System, Control Cards and Internal Payload Cable Line

MES10 – Locked Electromechanical Mast System

- Reliable Latch System Proven in the Field Since 1977, Providing Peace of Mind
- Proven Track Record of Reliability and Durability
- Easy to Operate and Requires Minimal or No Maintenance, Making It a Cost-Effective Solution for Long-Term Use

MMT10/MMT20 –Manual Mast System

- Unlimited Configuration for Different Payload Structures
- Fixed Retracted Height and up to 15m Extended Height
- Portable Design Allows Mast and All Accessories Can Be Carried in a Single Bag
- One Person Installation – 5 to 30 minutes Depending on Configuration

Masts Comparison Chart

Welcome to our comprehensive comparison chart for telescopic mast systems, designed specifically for military applications. Our product family offers a range of versatile options for extending masts up to 15 meters in height. Whether you require manual or electromechanical actuation, we have the solution to meet your specific operational needs.

Our telescopic mast systems are engineered with precision and reliability in mind, providing the essential support and elevation required for a variety of military applications. From communication and surveillance equipment to tactical operations and reconnaissance missions, our masts deliver enhanced situational awareness and operational capabilities.

In this comparison chart, we aim to provide you with a detailed overview of our telescopic mast systems' key features, performance specifications, and actuation options. By exploring the chart, you'll gain valuable insights into the strengths and capabilities of each system, allowing you to make an informed decision based on your specific requirements.

We invite you to explore the comparison chart and discover the telescopic mast system that best suits your needs. Should you have any further questions or require additional information, our experienced team is always ready to assist you.

Choose our telescopic mast systems for unmatched performance, versatility, and reliability in your military operations.

Elevate your capabilities with confidence!

	Primary Application	Actuating Type	Minimum Mast Weight	Range of Extended Height	Range of Payload Capacity
MES01	**The World's Most Compact and Light Weight Motorized Mast System** for Unmanned Ground Vehicles	Motorized	4.0 kg	1.16 to 1.50 m	5.0 to 10.0 kg
MES10	Renowned "Locked Motorized Mast" for **All Kind of Applications** Including Heavy Land Vehicles	Motorized	35 kg	3.0 to 10.0 m	45.0 to 192.0 kg
MES20	Stainless Steel Wire Driven, Square Profile Motorized Mast or Shelters, Trailers, **Field Mounted Applications**	Motorized	32 kg	2.5 to 14.0 m	41.0 to 78.0 kg
MEM10	**The Lowest Twist and Deflection** for Ultra Precision Electro-Optics. Heavy Land Vehicles, Shelters, Trailers	Motorized	72 kg	2.2 to 7.2 m	100.0 to 125.0 kg
MMS20	**Easy Manual Setup**, Low Deflection and Twist Hand Cranked Shelter, Trailer, Field Mounted	Manual	32 kg	2.5 to 14.0 m	21.0 to 58.0 kg
MMT10	Long or Short Term Operations, **Economical** Light or Medium Duty, **Ultra-Portable**, Field Mounted	Manual	15 kg	2.0 to 15.0 m	10.0 to 60.0 kg
MMT20	Long or Short Term Operations, **Economical** **Heavy Duty**, **Portable**, Field Mounted	Manual	32 kg	2.0 to 15.0 m	35.0 to 90.0 kg

MES01 – Ultra Compact Electromechanical Mast System

The World's Most Compact and Lightweight Motorized Mast

for Unmanned Ground Vehicles

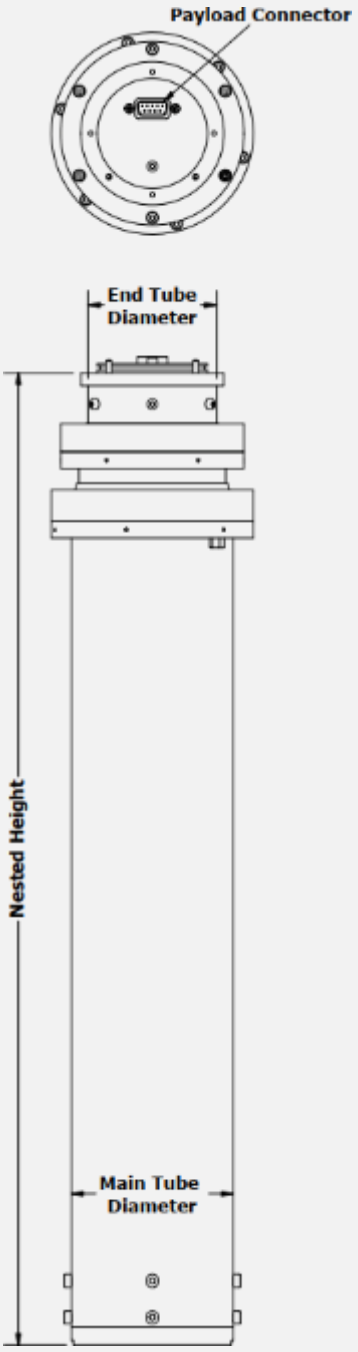
Distinctive Features

- **Unrivaled Compactness and Lightness:** The MES01 unit stands out as the world's most compact and lightweight motorized mast for unmanned ground vehicles.
- **Integrated All-in-One System:** The mast system's electromechanical setup incorporates the entire suite of components necessary for operation, including actuate motor, gear units, screw shafts, sensors, control cards, and payload cabling.
- **Effortless Plug-and-Play Interface:** The MES01 unit offers a plug-and-play mechanical and electronic interface, removing the requirement for flange support. This streamlined interface enhances ease of setup and reduces the complexity of integrating the mast system onto unmanned ground vehicles.

Main Features

- The MES01 is a groundbreaking mast system offering unmatched compactness and reliability for unmanned ground vehicles.
- Engineered with a maintenance-free, fully enclosed design, it supports up to 15 payload lines, providing seamless integration and sustained performance under demanding conditions.

Configuration Breakdown	**M** (**M**ast) – **E**lectromechanical – Actuating System (**S**crew Driven) – Product Class (01) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MES01-X-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Communication Protocol, Mechanical Interfaces
Combinable Platforms	SEG1X – Stabilized Gimbal Family



	Parameters		MES01-535-1160-05	MES01-700-1500-10
PERFORMANCE PARAMETERS	Retracted Height	mm	535	700
	Extended Height	mm	1160	1500
	Rated Payload Capacity	kg	5	10
	Weight	kg	4	8
	Opening Time	s	30	40
	Actuating Mechanism	-	Threaded Rod	
	Voltage (MIL-STD 1275)	V	28VDC	
	Communication to the Unit	-	TTL/RS485/RS422	
	Connector Type	-	MIL-DTL-38999	
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating	
DIMENSIONS	Retracted Height (A)	mm	535	700
	Node Diameter (ØB)	mm	92	100
	Number of Sections (S)	-	3	3
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	**60 @ 0.2m^2**	
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C	
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3	
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms	
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h	
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing	
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand	

Aslan – Armed Unmanned Ground Vehicle" Developed by Aselsan
Barkan – Autonomous Unmanned Ground Vehicle Developed by Havelsan

MES01- Ultra Compact Electromechanical Mast System

Aselsan Ertuğrul Bomb Disposal Robot

- **MES01- Ultra Compact Electromechanical Mast System**

MES10 – Locked Electromechanical Mast System

Reliable flange-lock mast with extensive payload capacity for

Electro-Optical Imaging, Radar and Communication Tasks

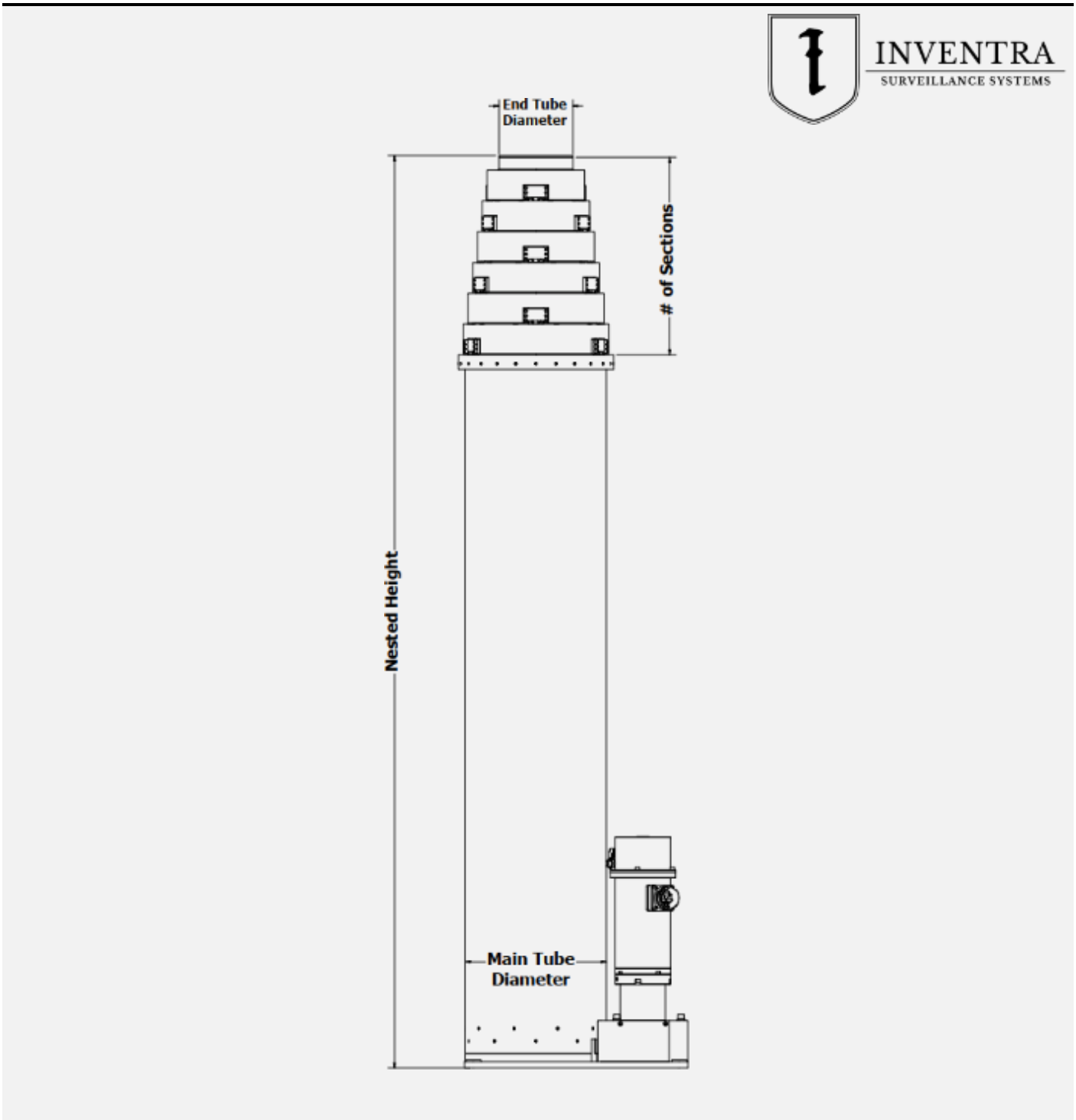
Distinctive Features

- **Proven Flange Locking System:** The MES10 mast unit employs a reliable flange locking system that has demonstrated its effectiveness in the field since 1977. This extensive track record of performance provides users with a high level of confidence and peace of mind regarding the system's reliability.
- **High Payload Capacity:** With the capability to support payloads of up to 192 kg, the MES10 mast system is engineered to handle substantial equipment and devices, making it suitable for a wide range of applications.
- **Adaptable for Various Environments:** The mast system's versatility shines through in its mechanical interfaces, which are designed to be compatible with armored ground vehicles, shelters, and open field installations.

Main Features

- The MES10 Mast System is built for maximum reliability, supporting high payload capacities of up to 192 kg and extending up to heights of 10 meters.
- Featuring a telescopic body with a minimal closed length, supports heavy payloads, and adapts to armored vehicles, shelters, and open field installations.

Configuration Breakdown	**M**ast – **E**lectromechanical – Actuating System (**S**crew Driven) – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MES10-X-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Communication Protocol, Mechanical Interfaces
Combinable Platforms	PEDXX – Electromechanical Positioner Family SEGXX – Stabilized Gimbal Family



MES10 – LOCKED ELECTROMECHANICAL MAST SYSTEM

Configuration Part Number *Customization is possible.	Retracted Height (mm)	Extended Height (mm)	Payload (kg)	Main Tube Diameter (mm)	End Tube Diameter (mm)	# Sections
MES10-1200-3005-72	1200	3005	72			
MES10-1450-4005-72	1450	4005	72			
MES10-1700-5005-61	1700	5005	61	150	90	4
MES10-1980-6005-61	1980	6005	61			
MES10-2260-7005-50	2260	7005	50			
MES10-1200-3005-102	1200	3005	102			
MES10-1450-4005-102	1450	4005	102			
MES10-1700-5005-91	1700	5005	91	170	110	4
MES10-1980-6005-91	1980	6005	91			
MES10-2260-7005-80	2260	7005	80			
MES10-1300-4005-82	1300	4005	82			
MES10-1500-5005-82	1500	5005	82			
MES10-1720-6005-71	1720	6005	71	170	90	5
MES10-1950-7005-71	1950	7005	71			
MES10-2180-8005-60	2180	8005	60			
MES10-1300-4005-122	1300	4005	122			
MES10-1500-5005-122	1500	5005	122			
MES10-1720-6005-111	1720	6005	111	210	130	5
MES10-1950-7005-111	1950	7005	111			
MES10-2180-8005-100	2180	8005	100			
MES10-1300-4005-192	1300	4005	192			
MES10-1500-5005-192	1500	5005	192			
MES10-1720-6005-181	1720	6005	181	250	170	5
MES10-1950-7005-181	1950	7005	181			
MES10-2180-8005-170	2180	8005	170			

MES10 – LOCKED ELECTROMECHANICAL MAST SYSTEM

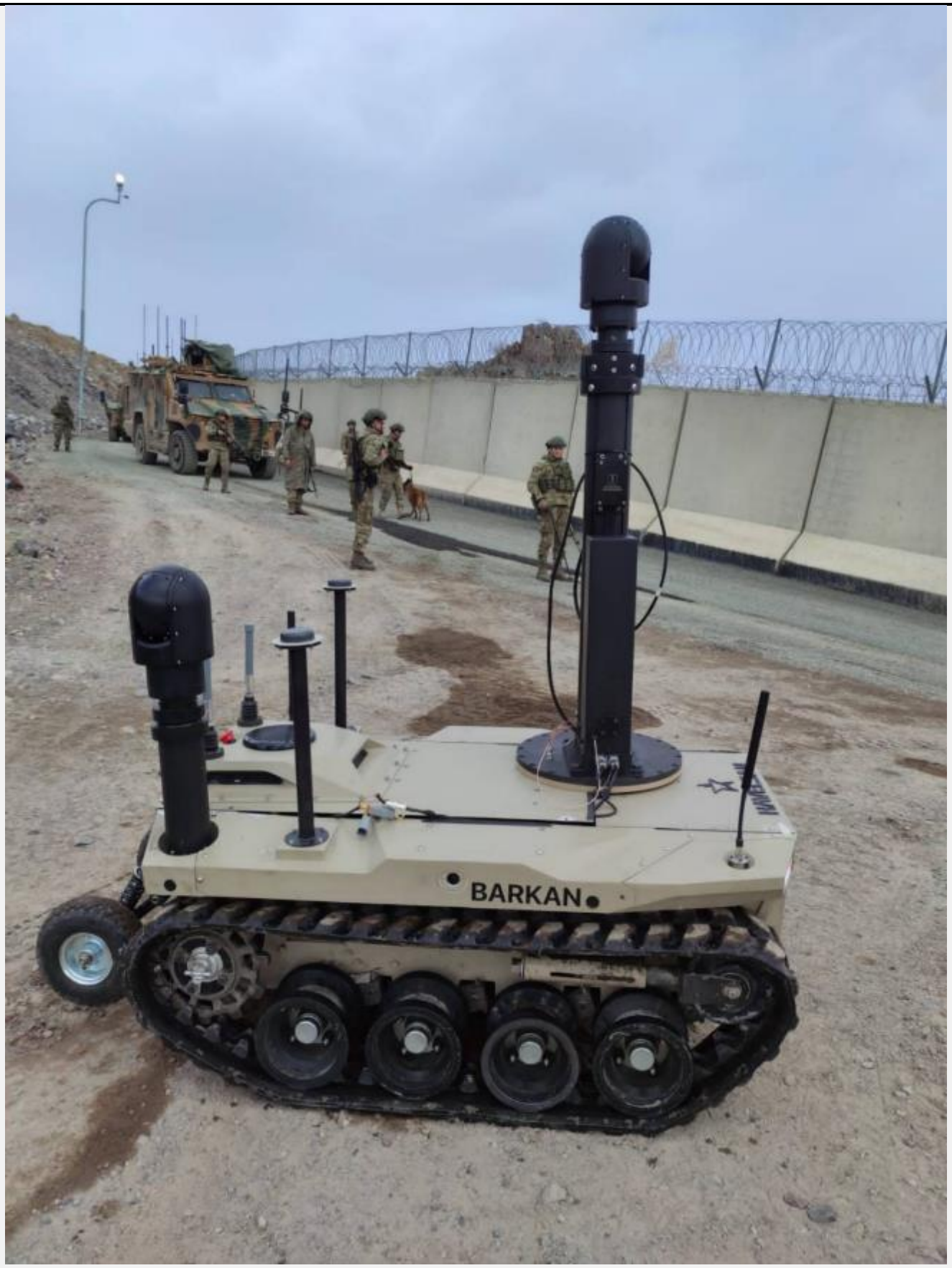
Configuration Part Number *Customization is possible.	Retracted Height (mm)	Extended Height (mm)	Payload (kg)	Main Tube Diameter (mm)	End Tube Diameter (mm)	# Sections
MES10-1200-4005-102	1200	4005	102			
MES10-1400-5005-102	1400	5005	102			
MES10-1580-6005-91	1580	6005	91			
MES10-1800-7005-91	1800	7005	91	210	110	6
MES10-1980-8005-80	1980	8005	80			
MES10-2150-9005-60	2150	9005	60			
MES10-2350-10005-60	2350	10005	60			
MES10-1200-4005-182	1200	4005	182			
MES10-1400-5005-182	1400	5005	182			
MES10-1580-6005-171	1580	6005	171			
MES10-1800-7005-171	1800	7005	171	250	150	6
MES10-1980-8005-160	1980	8005	160			
MES10-2150-9005-150	2150	9005	150			
MES10-2350-10005-150	2350	10005	150			
MES10-1150-4005-87	1150	4005	87			
MES10-1320-5005-87	1320	5005	87			
MES10-1490-6005-76	1490	6005	76			
MES10-1660-7005-76	1660	7005	76	210	90	7
MES10-1830-8005-65	1830	8005	65			
MES10-2000-9005-45	2000	9005	45			
MES10-2100-10005-45	2100	10005	45			
MES10-1150-4005-162	1150	4005	162			
MES10-1320-5005-162	1320	5005	162			
MES10-1490-6005-151	1490	6005	151			
MES10-1660-7005-151	1660	7005	151	250	130	7
MES10-1830-8005-140	1830	8005	140			
MES10-2000-9005-130	2000	9005	130			
MES10-2100-10005-130	2100	10005	130			

MES10 – LOCKED ELECTROMECHANICAL MAST SYSTEM

Configuration Part Number *Customization is possible.	Retracted Height (mm)	Extended Height (mm)	Payload (kg)	Main Tube Diameter (mm)	End Tube Diameter (mm)	# Sections
MES10-1270-5005-142	1270	5005	142	250	110	8
MES10-1415-6005-142	1415	6005	142			
MES10-1560-7005-131	1560	7005	131			
MES10-1705-8005-131	1705	8005	131			
MES10-1850-9005-120	1850	9005	120			
MES10-1995-10005-110	1995	10005	110			
MES10-1250-5005-122	1250	5005	122	250	90	9
MES10-1380-6005-122	1380	6005	122			
MES10-1510-7005-111	1510	7005	111			
MES10-1640-8005-111	1640	8005	111			
MES10-1770-9005-100	1770	9005	100			
MES10-1900-10005-90	1900	10005	90			

	Parameters		Specifications
MAIN FEATURES	**Voltage (MIL-STD 1275)**	V	28VDC
	Communication to the Unit	-	Ethernet or RS422
	Connector Type	-	MIL-DTL-38999
	External Paint	-	Check Available Color Finishes
	Instant Height Information	-	Available
	Control Remote for Vehicle	-	Available
	Cable Bundling Interface	-	Available
QUALIFICATIONS	**Wind Load**	km/h	**120 km/h**
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand

Our Electromechanical MES10 Mast Platform combined with "PED10 Electromechanical Pan-Tilt System" and "SEB20 – Thermal Imaging System"



MES10 – Locked Electromechanical Mast System

MES01 - Ultra Compact Electromechanical Mast Systems

SEG10 – Dual Channel (EO-LWIR) Stabilized Gimbal System

MES20 – Modular Electromechanical Mast System

High Performance / Weight Ratio Mast Unit

Wide Configurations Suitable for Electro-Optical Imaging, Radar and Communication Tasks

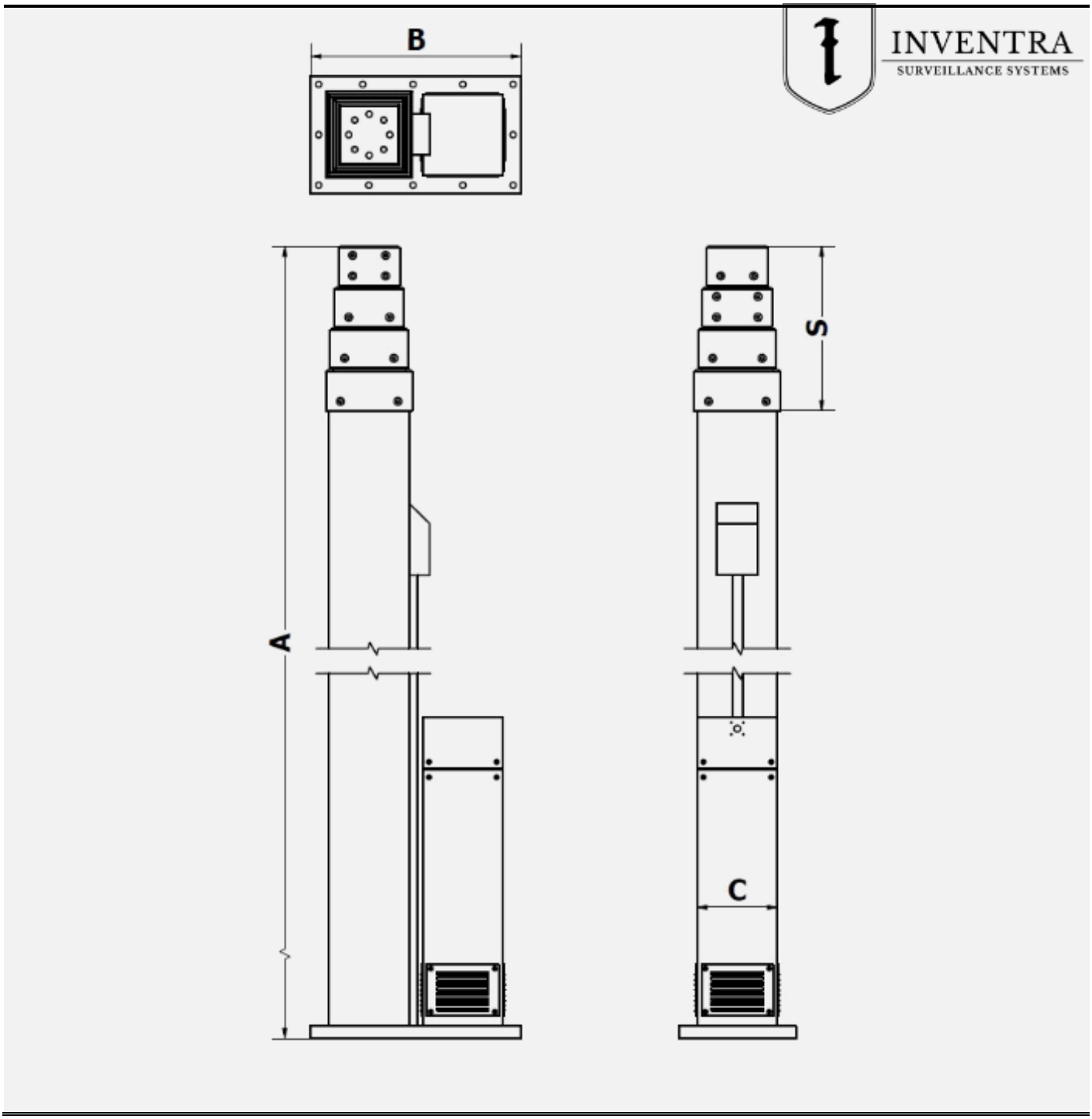
Distinctive Features

- **Patented Hybrid Drive Architecture:** The MES20 unit is equipped with an innovative and patented hybrid drive architecture centered around screw shafts. This unique design harnesses the power of screw shafts for the main actuation, setting it apart from conventional mast systems.
- **Synchronous Manual Mast Operation:** Unlike traditional mast systems, the MES20 offers a single mast design that can be opened synchronously using a single screw shaft. This simplifies the operation process, and the mast can be securely fixed at any point without relying on springs or complex mechanisms like flange locks.
- **Integrated High-Strength Design:** The MES20 unit is seamlessly integrated into a high-strength body structure, utilizing a square profile structure.

Main Features

- High performance with actuating based on hybrid screw shaft
- Configurable electromechanical or manual with crane arm
- MES20 unit is integrated into the high-strength body structure by using the square profile structure.

Configuration Breakdown	**M** (**M**ast) – **E**lectromechanical – Actuating System (**S**crew Driven) – Product Class (20) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MES20-X-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Communication Protocol, Mechanical Interfaces
Combinable Platforms	PEDXX – Electromechanical Positioner Family



	Parameters		MES20-1200-2500-78	MES20-1700-6000-72	MES20-2100-8000-70	MES20-3300-14000-41
PERFORMANCE PARAMETERS	Retracted Height	mm	1200	1700	2100	3300
	Extended Height	mm	2500	6000	8000	14000
	Rated Payload Capacity	kg	78	72	70	41
	Weight	kg	32	53	65	85
	Opening Time	s	60	90	120	150
	Actuating Mechanism	-	Threaded Shaft			
	Voltage (MIL-STD 1275)	V	28VDC			
	Communication to the Unit	-	RS-485/RS422			
	Connector Type	-	MIL-DTL-38999			
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating			
DIMENSIONS	Retracted Height (A)	mm	1200	1700	2100	3300
	Section Width (C)	mm	140	180	180	180
	Number of Sections (S)	-	3	5	5	5
OPTIONS	Instant Height Information	-	Available			
	Control Remote for in Vehicle	-	Available			
	Cable Bundling Interface	-	Available			
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	**120 km/h**			
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C			
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3			
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms			
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h			
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing			
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand			

General Product Family

MEM10 – Ultra Stable Electromechanical Mast System

Mast Unit with Minimum Twist and Deflection for

Long Range Thermal Imaging, Target Tracking Tasks

Distinctive Features

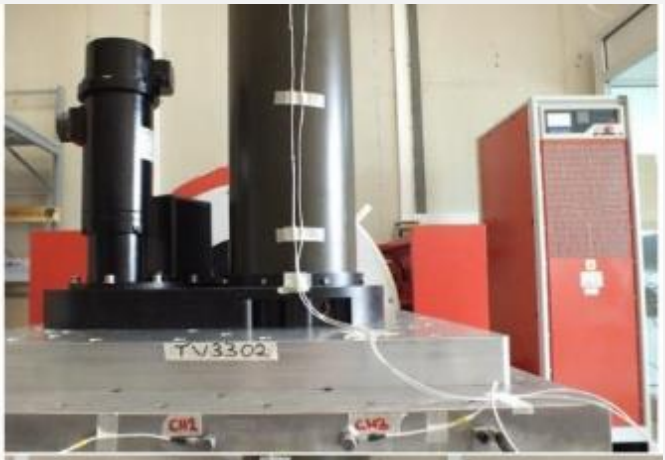
- **Innovative Telescopic Screw Shaft Actuation:** The MEM10 unit stands out with its innovative actuation system using telescopic screw shafts. Unlike traditional mast units driven by a single screw shaft, **the MEM10 employs individual steel telescopic screw shafts to support each outer body node, resulting in an exceptionally rigid system.**
- **High Rigidity and Wind Load Resistance:** The telescopic screw-shaft design, combined with 4-way keyways, contributes to minimum twist and deflection, resulting in an ultra-rigid structure. This structural strength translates to high wind load resistance, making the MEM10 suitable for various challenging environments.

Main Features

- Minimum Twist and Deflection with Telescopic Screw-Shaft and 4-way Keyways
- Able to Use in Extended Height while Vehicle on the Move
- High Wind Load Resistance with Ultra Rigid Structure
- Minimal or No Maintenance with Closed Mechanical Architecture

Configuration Breakdown	**M**ast – **E**lectromechanical – Actuating System (**M**ultiple Screw) – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MEM10-X-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Communication Protocol, Mechanical Interfaces
Combinable Platforms	PEDXX – Electromechanical Positioner Family SEGXX – Stabilized Gimbal Family

	Parameters		MEM10-1000-2200-125	MEM10-1200-3000-120	MEM10-1800-6000-100	MEM10-2000-7200-100
PERFORMANCE PARAMETERS	Retracted Height	mm	1000	1200	1800	2000
	Extended Height	mm	2200	3000	6000	7200
	Rated Payload Capacity	kg	125	120	100	100
	Weight	kg	72	106	144	219
	Opening Time	s	45	60	120	120
	Actuating Mechanism	-	Telescopic Threaded Rod			
	Voltage (MIL-STD 1275)	V	28VDC			
	Communication to the Unit	-	RS-485/RS422/Ethernet			
	Connector Type	-	MIL-DTL-38999			
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating			
DIMENSIONS	Retracted Height (A)	mm	1000	1200	1800	2000
	Node Diameter (ØB)	mm	180	200	230	230
	Number of Sections (S)	-	3	5	5	5
OPTIONS	Used in Motion	-				X
	Instant Height Information	-	Available			
	Control Remote for in Vehicle	-	Available			
	Cable Bundling Interface	-	Available			
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	**120 @ 1m^2**			
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C			
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3			
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms			
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h			
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing			
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand			



"MEM10 Ultra Stability Electromechanical Mast System" has successfully completed vibration and shock tests without **flange and body support.**

Mast Systems, Integration Workshop

MMS20 – Modular Manual Mast System

Minimal Deflection and Twist Performance Manual Mast Configurations for

Electro-Optical Surveillance, Radar and Communication Tasks

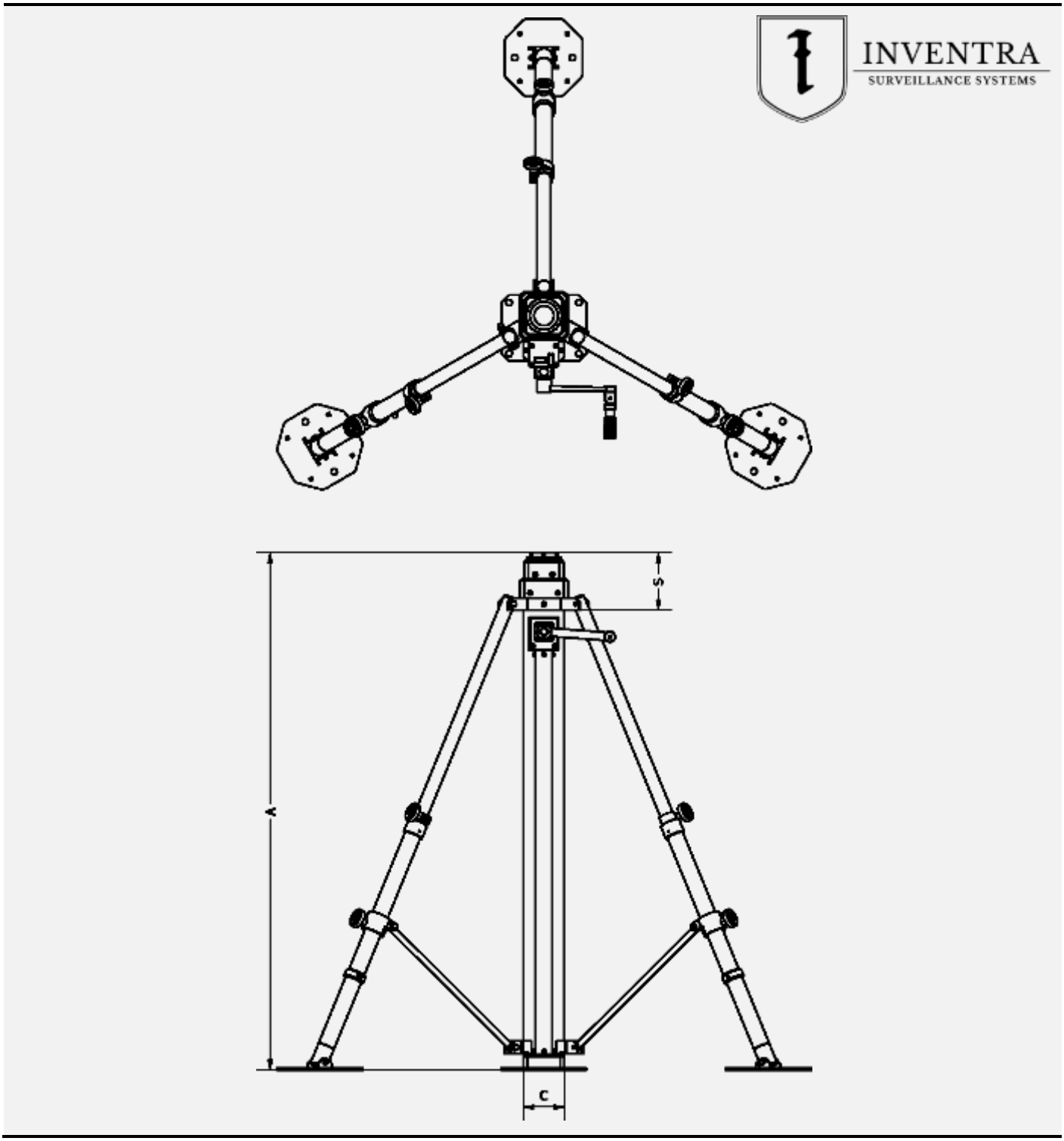
Distinctive Features

- **High-Performance Lightweight Actuator:** The MMS20 employs a patented hybrid actuator that combines trapezoidal screws and steel wires. This unique design results in a high-performance actuation mechanism that is both lightweight and robust, optimizing the mast's functionality while maintaining efficiency.
- **Synchronized Section Actuation:** The mast's sections are synchronized during actuation, ensuring smooth and coordinated movement. This feature contributes to the overall stability and reliability of the mast during deployment and retraction.

Main Features

- High performance, low weight patented hybrid actuator make use of trapezoidal screws and steel wires.
- Lightweight construction with high specific strength ratio materials
- Electromechanical and manual configurations are available.

Configuration Breakdown	**M**ast – **M**anual – **S**crew Driven – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MMS20-X-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PMD01 – Manual Pan-Tilt Unit



	Parameters		MMS20-1200-2500-58	MMS20-1700-6000-52	MMS20-2100-8000-40	MMS20-3300-14000-21
PERFORMANCE PARAMETERS	Retracted Height	mm	1200	1700	2100	3300
	Extended Height	mm	2500	6000	8000	14000
	Rated Payload Capacity	kg	58	52	40	21
	Weight	kg	32	53	65	85
	Actuating Mechanism	-	Manual Driven			
	Deployment Time	min	5	10	15	20
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating			
DIMENSIONS	Retracted Height (A)	mm	1200	1700	2100	3300
	Section Width (C)	mm	140	180	180	180
	Number of Sections (S)	-	3	5	5	5
ACCESSORIES	Straight and Flat Stakes	-	4/8	8/8	12/8	16/8
	Wheeled Carry Bag	-	Available			
	Installation Guide	-	Available			
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	**120 km/h**			
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C			
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3			
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms			
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h			
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing			
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand			

MMS20 – Modular Manual Mast System at IDEF International Defense Industry Fair

MMS20 Modular Manual Mast System

MMT10 – Ultra Portable Tripod/Mast System

Single Mast, Unlimited Configurations

Tactical and Commercial Communications, Video Surveillance and Wireless Data Configurations

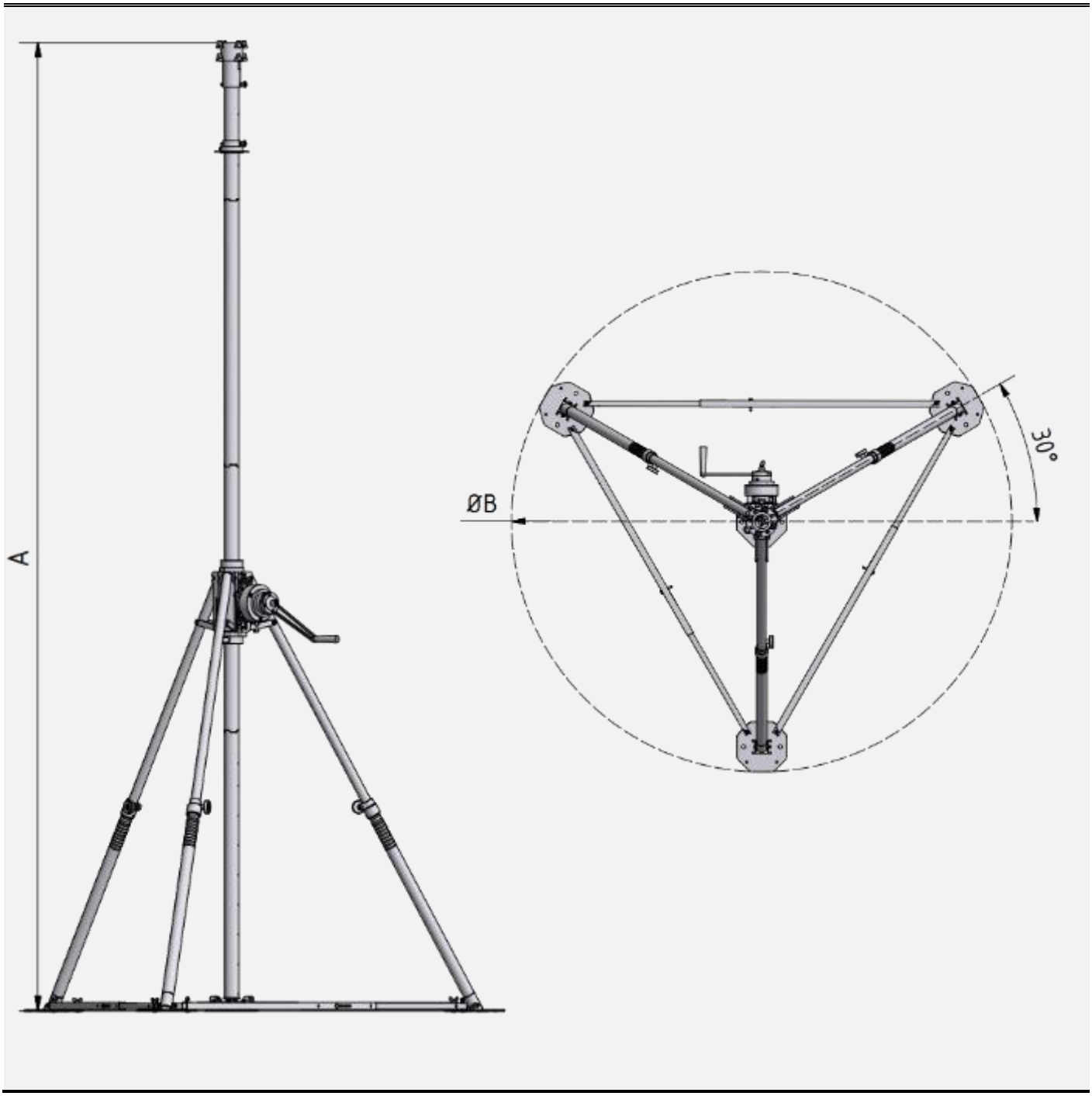
Main Features

- The MMT10 is an ultra-portable mast system designed for diverse tactical and commercial applications.
- The system is constructed with aerospace grade aluminum alloy and features a patented tripod design, ensuring stability and ease of deployment by a single operator.

Distinctive Features

- **Adaptable Height Expansion:** The MMT10 mast units offer a unique height expansion feature by adding nodes through the crane arm on the tripod's main body. This innovative design allows the mast to transition from a compact nested length to an impressive 15-meter open position
- **Effortless Single-Person Installation:** Designed as a multi-purpose portable mast, the MMT10 is engineered for quick and easy installation by a single person.
- **Patented Tripod and Cam Lock System:** Ensures stable setup and easy adjustment, with color-coded guy rings for directional accuracy.

Configuration Breakdown	**M**ast – **M**anual – **T**ripod Type – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MMT10-1110-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PEX – Electromechanical Positioners Family PMX – Manual Positioners Family



	Parameters		MMT10-1110-2000-60	MMT10-1110-3000-50	MMT10-1110-4000-45	MMT10-1110-5000-40
PERFORMANCE PARAMETERS	Retracted Height	mm	1110			
	Extended Height	mm	2000	3000	4000	5000
	Rated Payload Capacity	kg	60	50	45	40
	Weight (Mast & Tripod)	kg	15	16.5	17.5	19
	Number of Sections	-	2	3	4	5
	Wind Load	km/h	120 km/h @0.5m^2			

	Parameters		MMT10-1110-6000-35	MMT10-1110-7000-30	MMT10-1110-8000-28	MMT10-1110-9000-26
PERFORMANCE PARAMETERS	Retracted Height	mm	1110			
	Extended Height	mm	6000	7000	8000	9000
	Rated Payload Capacity	kg	35	30	28	26
	Weight (Mast & Tripod)	kg	21	23	25	27
	Number of Sections	-	6	7	8	9
	Wind Load	km/h	120 km/h @0.3m^2			

	Parameters		MMT10-1110-10000-24	MMT10-1110-11000-20	MMT10-1110-12000-16	MMT10-1110-13000-14
PERFORMANCE PARAMETERS	Retracted Height	mm	1110			
	Extended Height	mm	10000	11000	12000	13000
	Rated Payload Capacity	kg	24	20	16	14
	Weight (Mast & Tripod)	kg	30	32	34	36
	Number of Sections	-	10	11	12	13
	Wind Load	km/h	120 km/h @0.2m^2			

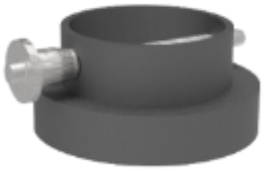
	Parameters		MMT10-1110-14000-12	MMT10-1110-15000-10
PERFORMANCE PARAMETERS	Retracted Height	mm	1110	
	Extended Height	mm	14000	15000
	Rated Payload Capacity	kg	12	10
	Weight (Mast & Tripod)	kg	40	42
	Number of Sections	-	14	15
	Wind Load	km/h	120 km/h @0.1m^2	

	Parameters		MMT10-1110-XX-XX
COMMON FEATURES	Reverse Drive	-	Available with Self-Locking
	Actuating Mechanism	-	Manual Push or Cable Driven
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating
	Base Diameter	mm	1900
	Deployment Time	min	5-30min Between (Depends on Number of Sections)
	IP Rating	-	IP65
	Material		Main Body: Aluminum 6XXX Series Connection Part: Stainless Steel Fasteners: Stainless Steel
	Guy Kits	unit	8 Straight Stake 4-16 Flat Stake 4-16 Guying rope
	Accessories	-	Wheeled Carry Bag Accessory Bag Antenna Mounting Adapter Hammer Stake Extractor
ENVIRONMENTAL QUALIFICATIONS	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand

MMT10-1110 Temperature Operational and Storage Test

PART NUMBER	FIGURE
Tripod with Removable Winch **10.5 kg** **PN: INV-MMT-01**	
Winch Handle **0.25 kg** **PN: INV-MMT-02**	
Base Support Beam - 1400 mm **1 kg** **PN: INV-MMT-03**	
Base Pole - 910 mm **1.3 kg** **PN: INV-MMT-04**	
Center Pole – 910 mm **1.3 kg** **PN: INV-MMT-05**	
Mounting Pole - 450 mm **0.5 kg** **PN: INV-MMT-06**	
Antenna Mounting Adapter **0.9 kg** **PN: INV-MMT-07**	

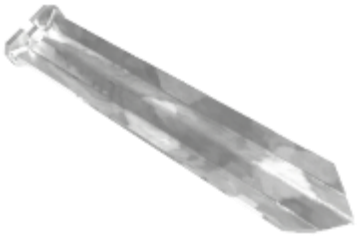
Primary Guy Ring
0.2 kg
PN: INV-MMT-08



Base Lift Plate
0.8 kg
PN: INV-MMT-09

Steel Stake – 380 mm
0.45 kg
PN: INV-MMT-10

Galvanized Guying Stakes
0.4 kg
PN: INV-MMT-11



Stake Extractor
0.35 kg
PN: INV-MMT-12

Hammer
1.25 kg
PN: INV-MMT-13

Wheeled Carry Bag
10.4 kg
PN: INV-MMT-14

Pole Bag
0.7 kg
PN: INV-MMT-15

Guying Ropes (Set)
3.6 kg
PN: INV-MMT-16

Accessory Bag
0.4 kg
PN: INV-MMT-17

Stake Kit
5.6 kg
PN: INV-MMT-18

8 X Steel Stake – 380 mm (INV-MMT-10)
1 X Stake Extractor (INV-MMT-12)
1 X Hammer – 1.25 kg (INV-MMT-13)
1 X Accessory Bag (INV-MMT-17)

Cable Driven Winch
2 kg
PN: INV-MMT-19

Multiple (3X) MMT10 – Ultra Portable Tripod/Mast System at IDEF International Defense Industry Fair

❖ MMT10 – Ultra Portable Tripod/Mast System with ASELSAN BUKALEMUN

MMT20 – Heavy Duty Portable Tripod/Mast System

Portable, Heavy-Duty Mast With Crane-Assisted Height Expansion for **Tactical and Commercial Communications, Video Surveillance and Wireless Data Configurations**

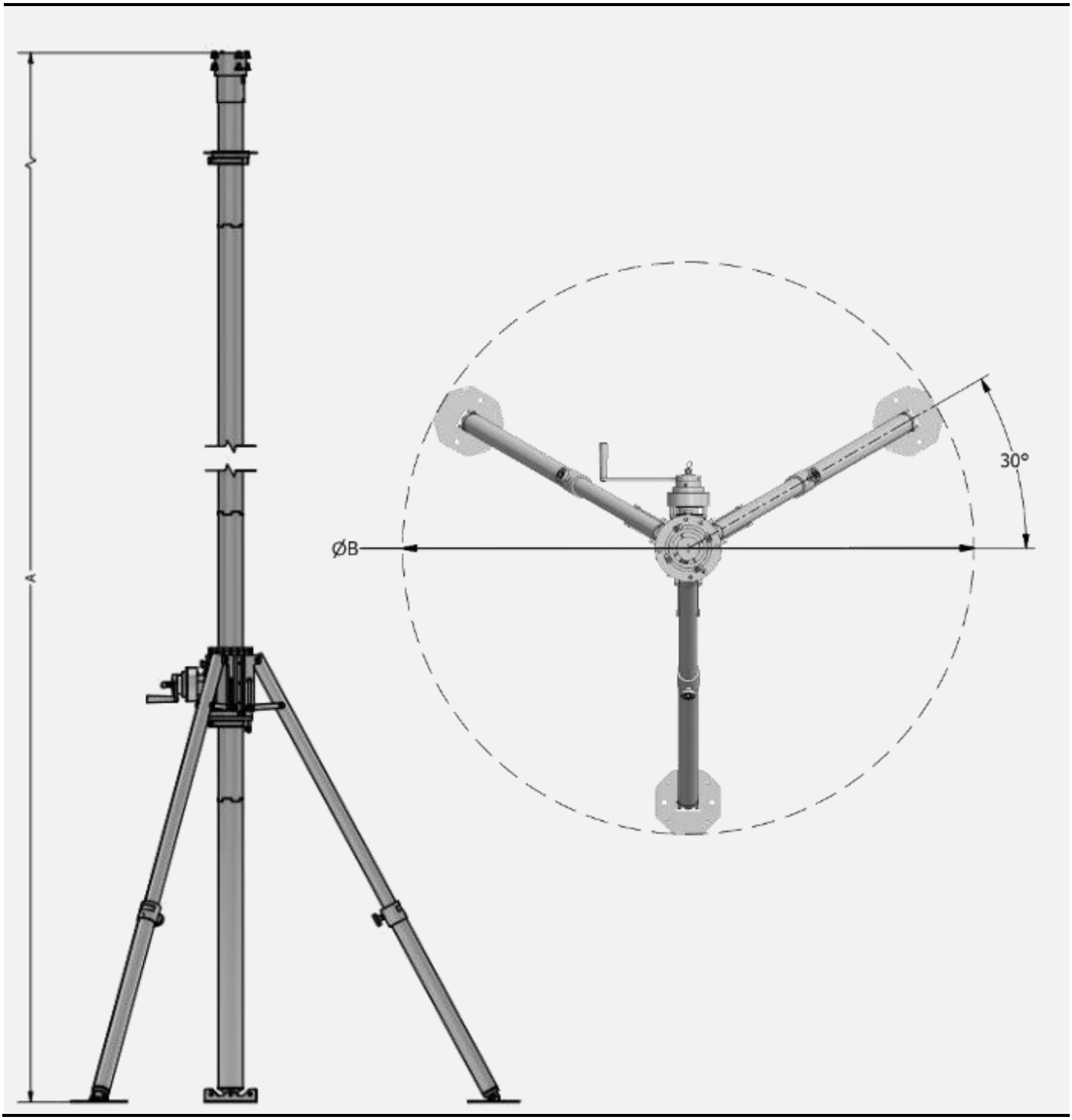
Main Features

- The MMT20 is a versatile, heavy-duty mast system designed for rapid deployment in tactical and commercial settings.
- Featuring a lightweight tripod and expandable height via crane-assisted nodes, it supports heavy payloads while ensuring stable performance in various environments.

Distinctive Features

- **Adaptable Height Expansion:** Similar to the MMT10, the MMT20 mast units offer the unique ability to increase height by adding nodes using the crane arm on the tripod's main body. This expandable design allows the MMT20 to transform from a compact nested length to an extended 15-meter open position
- **Heavy Payload Capability:** The mast system is specifically designed to accommodate heavy-class payloads, thanks to its reinforced body structure.
- **Effortless Single-Person Installation:** Following the legacy of the MMT10, the MMT20 maintains the multi-purpose portable mast architecture that can be quickly and easily installed by a single person.

Configuration Breakdown	**M**ast – **M**anual – Actuating System (**T**ripod) – Product Class (20) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	MMT20-1400-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PEX – Electromechanical Positioners Family PMX – Manual Positioners Family



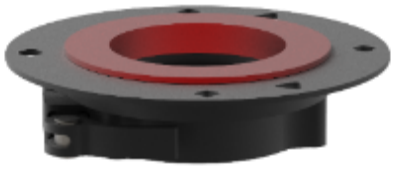
	Parameters		MMT20-1400-2000-90	MMT20-1400-3000-85	MMT20-1400-4000-80	MMT20-1400-5000-77
PERFORMANCE PARAMETERS	Retracted Height	mm	1400			
	Extended Height	mm	2000	3000	4000	5000
	Rated Payload Capacity	kg	90	85	80	77
	Weight (Mast & Tripod)	kg	32	37	41	45
	Number of Sections	-	2	3	4	5
	Wind Load	km/h	120 km/h @0.5m^2			

	Parameters		MMT20-1400-6000-73	MMT20-1400-7000-69	MMT20-1400-8000-65	MMT20-1400-9000-62
PERFORMANCE PARAMETERS	Retracted Height	mm	1400			
	Extended Height	mm	6000	7000	8000	9000
	Rated Payload Capacity	kg	73	69	65	62
	Weight (Mast & Tripod)	kg	50	54	58	63
	Number of Sections	-	6	7	8	9
	Wind Load	km/h	120 km/h @0.3m^2			

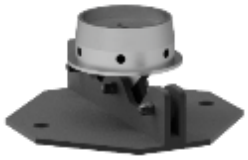
	Parameters		MMT20-1400-10000-58	MMT20-1400-11000-55	MMT20-1400-12000-50	MMT20-1400-13000-45
PERFORMANCE PARAMETERS	Retracted Height	mm	1400			
	Extended Height	mm	10000	11000	12000	13000
	Rated Payload Capacity	kg	58	55	50	45
	Weight (Mast & Tripod)	kg	68	73	78	82
	Number of Sections	-	10	11	12	13
	Wind Load	km/h	120 km/h @0.2m^2			

	Parameters		MMT20-1400-14000-40	MMT20-1400-15000-35
PERFORMANCE PARAMETERS	Retracted Height	mm	1400	
	Extended Height	mm	14000	15000
	Rated Payload Capacity	kg	40	35
	Weight (Mast & Tripod)	kg	87	92
	Number of Sections	-	14	15
	Wind Load	km/h	120 km/h @0.2m^2	

	Parameters		MMT20-1400-XX-XX
COMMON FEATURES	**Reverse Drive**	-	Available with Self-Locking
	Actuating Mechanism	-	Manual Push or Cable Driven
	External Paint	-	RAL 9005 MATTE Black Electrostatic Powder Coating
	Base Diameter (ØB)	mm	1900
	Deployment Time	min	5-30min Between (Depends on Number of Section)
	IP Rating	-	IP65
	Material		Main Body: Aluminum 6XXX Series Connection Part: Stainless Steel Fasteners: Stainless Steel
	Guy Kits	-	8 Straight Stake 4-16 Flat Stake 4-16 Guying rope
	Accessories	-	Wheeled Carry Bag Accessory Bag Antenna Mounting Adapter Hammer Stake Extractor
ENVIRONMENTAL QUALIFICATIONS	**Temperature**	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -40°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +60°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I Category 20, Figure 514.6C-3
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I – Functional Shock; 20g 11ms
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h
	Humidity	-	MIL-STD-810G, Method 507.5 Procedure I; 90% Noncondensing
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand

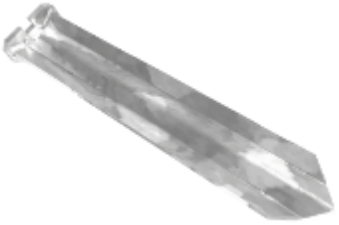
WEIGHT / PART NUMBER	FIGURE
Tripod with Removable Winch **17.4 kg** **PN: INV-MMT20-01**	
Winch Handle **0.25 kg** **PN: INV-MMT20-02**	
Base Pole - 1070 mm **2.7 kg** **PN: INV-MMT20-03**	
Center Pole – 1070 mm **2.7 kg** **PN: INV-MMT20-04**	
Mounting Pole - 535 mm **1 kg** **PN: INV-MMT20-05**	
Antenna Mounting Adapter **1.2 kg** **PN: INV-MMT20-06**	
Primary Guy Ring **0.9 kg** **PN: INV-MMT20-07**	
Secondary Guy Ring **0.9 kg** **PN: INV-MMT20-08**	

Base Lift Plate
1.1 kg
PN: INV-MMT20-09



Steel Stake – 380 mm
0.45 kg
PN: INV-MMT20-10

Galvanized Guying Stakes – 300 mm
0.4 kg
PN: INV-MMT20-11



Stake Extractor
0.35 kg
PN: INV-MMT20-12

Hammer
1.25 kg
PN: INV-MMT20-13

Wheeled Carry Bag
10.4 kg
PN: INV-MMT20-14

Primary Guying Ropes
0.9 kg
PN: INV-MMT20-16

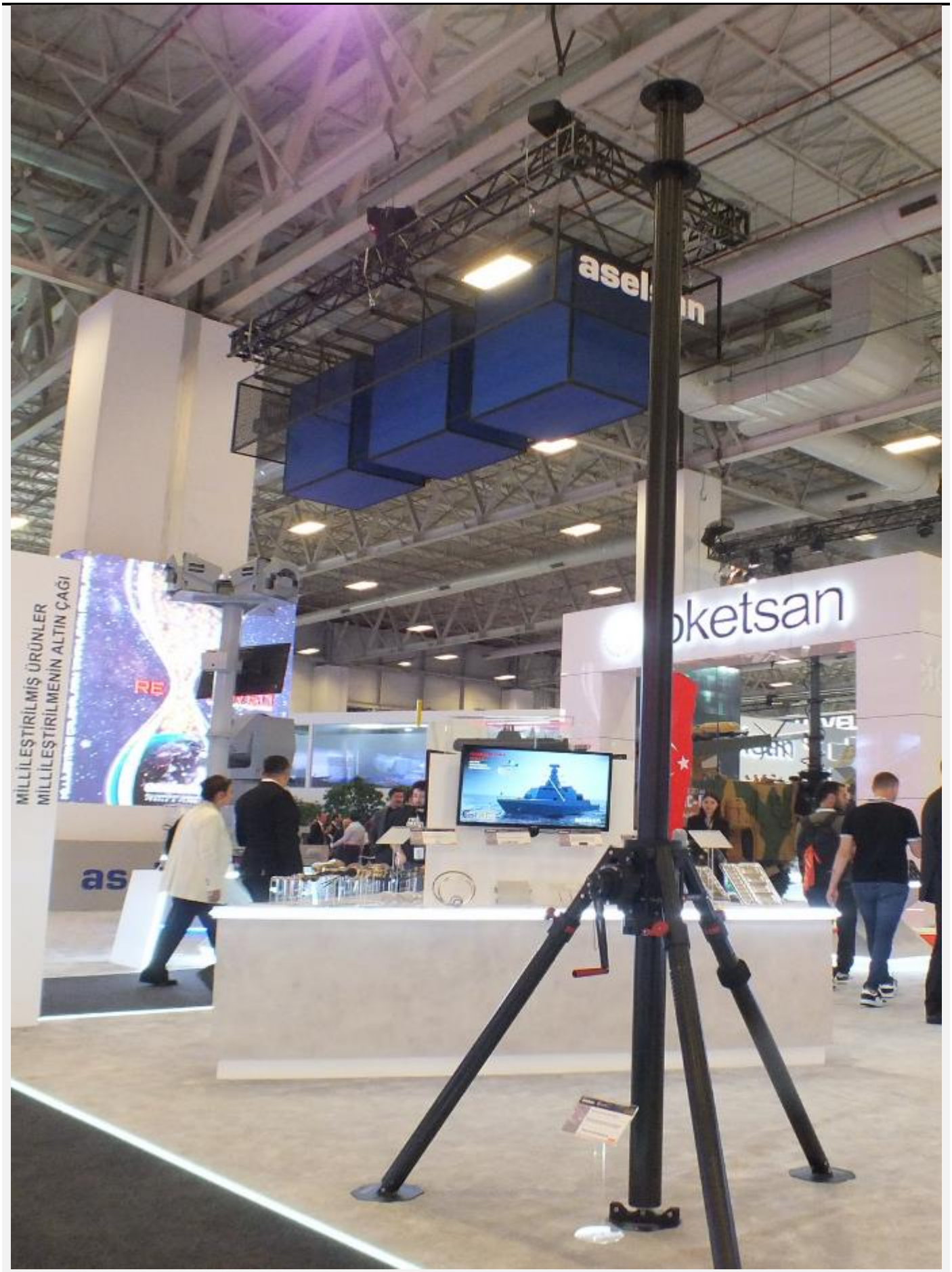
Secondary Guying Ropes
0.9 kg
PN: INV-MMT20-17

Accessory Bag
0.4 kg
PN: INV-MMT20-18

Stake Kit
5.6 kg
8 X Steel Stake (INV-MMT20-10)
1 X Stake Extractor (INV-MMT20-12)
1 X Hammer – 1.25 kg (INV-MMT20-13)
1 X Accessory Bag (INV-MMT20-18)
PN: INV-MMT20-19

Cable Driven Winch
2 kg
PN: INV-MMT20-20

MMT20-1400 Temperature Operational/Storage Test



MMT20 – Heavy Duty Tripod/Mast System at IDEF International Defense Industry Fair

4. Tripods

Amidst the rugged terrains of military grounds, our innovative minds at Inventra have crafted a masterpiece for precision and endurance - the military tripod family. It is not only a mere support system, but a robust backbone that carries the weight of high-tech thermal cameras, radars, and antennas.

With the ability to bear loads ranging from 25 kg to 150 kg, our military tripod family is the epitome of sturdiness and stability. Built with the highest grade materials, our tripods have undergone rigorous testing and have been MIL-STD-810G certified to withstand extreme conditions.

Our military tripod family stands tall and proud, ready to serve in any mission-critical application. From border surveillance to battlefield reconnaissance, it is the ultimate support system for any military operation. With unmatched precision, it ensures that your high-tech equipment is secure and steady.

So why settle for mediocrity when you can have the best? Choose Inventra's military tripod family for your next mission and elevate your military application to new heights.

Like the unassuming pawn on the chessboard, the military tripod plays a crucial role in the grand strategy of surveillance.

Highlights

TML10 – Ultra Lightweight Tripod

- Ultra-Light and Compact Mechanical Design (≤ 2.5 kg)
- Up to 35 kg Payload Capacity
- Zero Clearance - Including All Mechanical Connection Interfaces
- Rigid Structure Suitable for Thermal Imagers and Laser Designators at Long Distance (>15 km)

TMM10 – Medium Duty Tripod Unit

- Up to 60 kg Payload Capacity
- Thick-Walled Anodized Tubular Construction
- Tool-Free Foot Replacement and Digital Magnetic Compass Compatibility

TMH10 – Heavy Duty Tripod Unit

- 150 kg Payload Capacity
- High Strength “V” Design Architecture
- Wide Leg Spacing for Safe Handling of Off-Center and Unstable Payloads

Tripods Comparison Chart

Selecting the right military tripod for your mission can be a critical decision that can impact the success of your operation. Military tripods serve as a stable platform for a wide range of equipment, including weapons, surveillance devices, and communication equipment.

Choosing the right tripod can enhance accuracy, provide better stability, and enable quicker target acquisition. With so many different types of tripods available, selecting the right one for your specific needs can be a daunting task.

In this selection guide, we will provide you with a comprehensive overview of different types of military tripods, their features, capabilities, and limitations. By the end of this guide, you will have a clear understanding of what to look for when selecting a military tripod that meets your specific operational requirements.

	Configuration	Retracted Height (mm)	Extended Height (mm)	Rated Payload Capacity (kg)	# of Sections	Weight (kg)
TML10	TML10 – Ultra Lightweight Tripods					
	TML10-585-975-35	585	975	35	2	1.95
	TML10-600-1450-25	600	1450	25	3	2.5
TMM10	TMM10 – Medium Duty Tripods					
	TMM10-588-864-60	588	864	60	2	4.3
	TMM10-637-1266-40	637	1266	40	3	5.2
TMH10	TMH10 – Heavy Duty Tripods					
	TMH10-725-995-150	725	995	150	2	14.7
	TMH10-1055-1250-150	1055	1250	150	2	18.4

TML10 – Ultra Lightweight Tripod

Lightweight, Stable and Rugged High-Performance Tripod for

Military Observation and Border Surveillance, Handheld Sensors with Manual or Motorized Pan/Tilt Heads

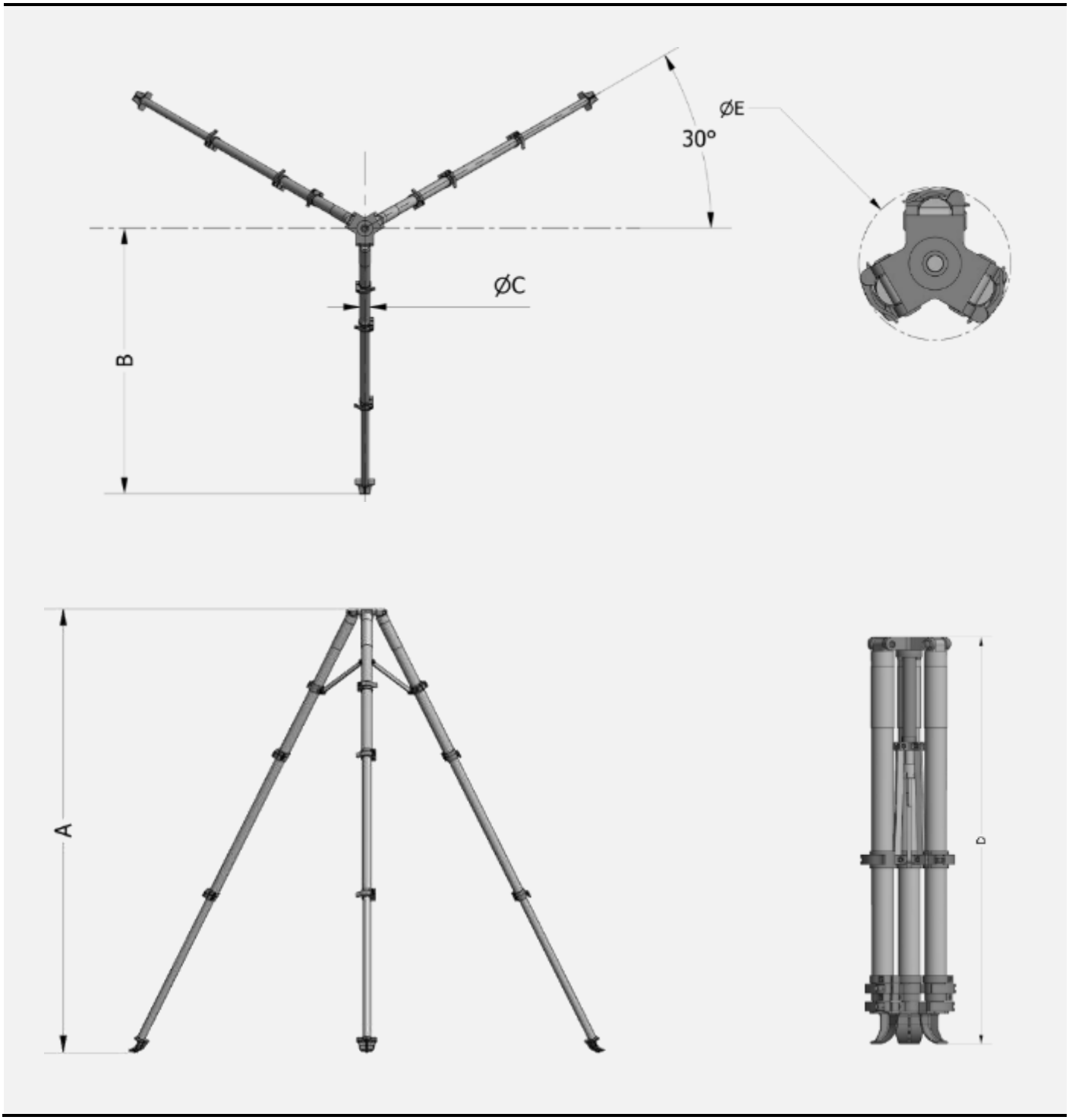
Main Features

- The TML10 is an ultra-lightweight, high-stability tripod engineered for rugged military applications.
- Constructed from aluminum, the TML10 features a durable general-purpose design with independently adjustable leg angles and lengths

Distinctive Features

- **Patented "Zero Clearance" Design:** The tripod features a patented "Zero Clearance" mechanical design, which enables its use in critical missions such as laser designator or long range thermal imagers.
- **Three Operational Heights:** Available in compact, medium, or high configurations, supporting prone, sitting, or standing positions.
- **One-Motion Lock Mechanism:** Secure all leg sections with a single action. Designed for fast, efficient setup in the field.
- **Adjustable Leg Angles & Telescopic Leg Lengths:** Independently configurable to adapt to any terrain.
- **Interchangeable Feet:** Interchangeable Clawfoot, Spikefoot, Ballfoot, and Flatfoot options.
- **Ground Anchor and Pinning Capability:** Equipped with ground anchor points for enhanced stability.

Configuration Breakdown	**T**ripod – **Manual** – **L**ight Duty – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	TML10-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PED08



	Parameters		TML10-600-1450-25	TML10-585-975-35
PERFORMANCE PARAMETERS	Minimum Working Height	mm	150	140
	Extended Height (A)	mm	1450	975
	Extended Radius (B)	mm	600	420
	Tube Diameter - Top (C)	mm	34	34
	Retracted Height (D)	mm	600	585
	Retracted Diameter (E)	mm	150	150
	Weight	kg	2.50	1.95
	Maximum Payload	kg	25	35
	Material	-	Aluminum 6061-T6	
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	80	80
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -40°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +80°C	
	Vibration	-	MIL-STD-810G, Method 514.6, 20-500Hz, 6dB/Octave Roll-Off	
	Humidity	-	MIL-STD-810G, Method 507.4, Aggravated Humidity - Temperature Cycle, 10 Cycle (24 Hours)	
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h	
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours Salt Fog And 24 Hours Desiccation	
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand	

TML10 - Ultra Lightweight Tripod at IDEF International Defense Industry Fair

INVENTRA
SURVEILLANCE SYSTEMS

TMM10 – Medium Duty Tripod

Payload Capacity up to 60 kg with superb torsional stability for

Tactical Radar, Reconnaissance Optics and Battlefield Communication Systems

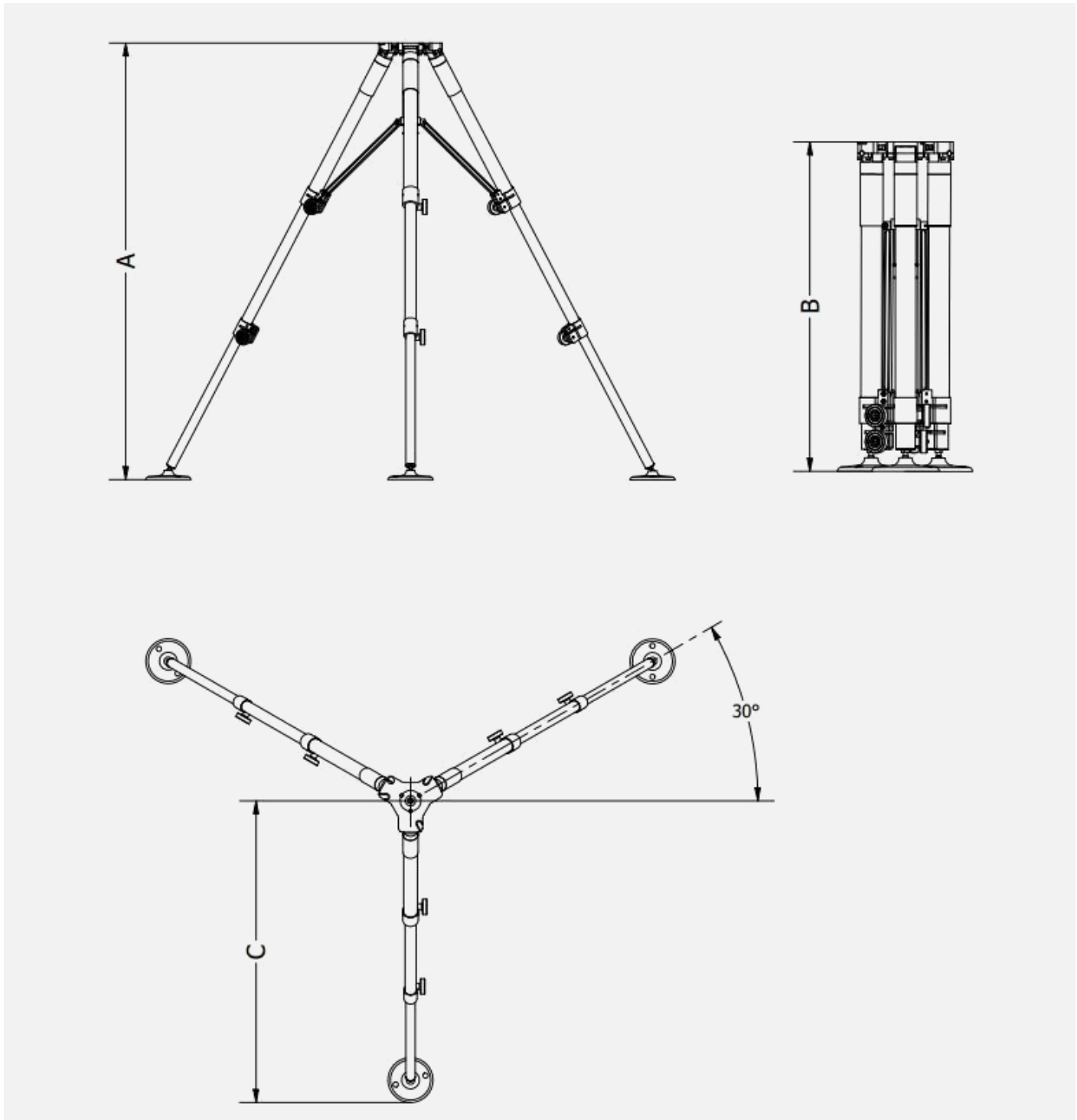
Main Features

- Thick-walled anodized tubular construction for long-lasting performance in harsh environments. Designed for easy transport and quick setup.
- Powder-coated finish and robust materials ensure dependable functionality under demanding conditions.

Distinctive Features

- **60kg Nominal Payload Capacity:** Capable of supporting substantial equipment with compatible tripod interfaces.
- **Tool-Free Foot Replacement:** Easily switch between different foot types without the need for tools.
- **Additional Accessories:** Footplates, pin sets, and tie-down kits available for enhanced security and stability.
- **Ground Anchor and Pinning:** Enhanced stability through ground anchor points and pinning capability.
- **Digital Magnetic Compass-Compatible:** Constructed to prevent interference with magnetic instruments.

Configuration Breakdown	Tripod – Manual – Medium Duty – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	TMM10-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PEX – Electromechanical Positioners Family PMX – Manual Positioners Family



	Parameters		TMM10-637-1266-40	TMM10-588-864-60
PERFORMANCE PARAMETERS	Extended Height (A)	mm	1266	864
	Retracted Height (B)	mm	637	588
	Extended Radius (C)	mm	875	632
	Number of Sections	-	3	2
	Weight	kg	5.2	4.3
	Maximum Payload	kg	40	60
	Material	-	Aluminum 6061-T6 / Stainless Steel AISI 316	
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	80	80
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -40°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +80°C	
	Vibration	-	MIL-STD-810G, Method 514.6, 20-500Hz, 6dB/Octave Roll-Off	
	Humidity	-	MIL-STD-810G, Method 507.4, Aggravated Humidity - Temperature Cycle, 10 Cycle (24 Hours)	
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h	
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours Salt Fog And 24 Hours Desiccation	
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand	

TMM10 – Medium Duty Tripod

TMH10 – Heavy Duty Tripod

Payload Capacity up to 150 kg with Rigid, Stable and V Design Architecture for

Long-Range Thermal Imaging Devices, Sensor Arrays and Surveillance Radars

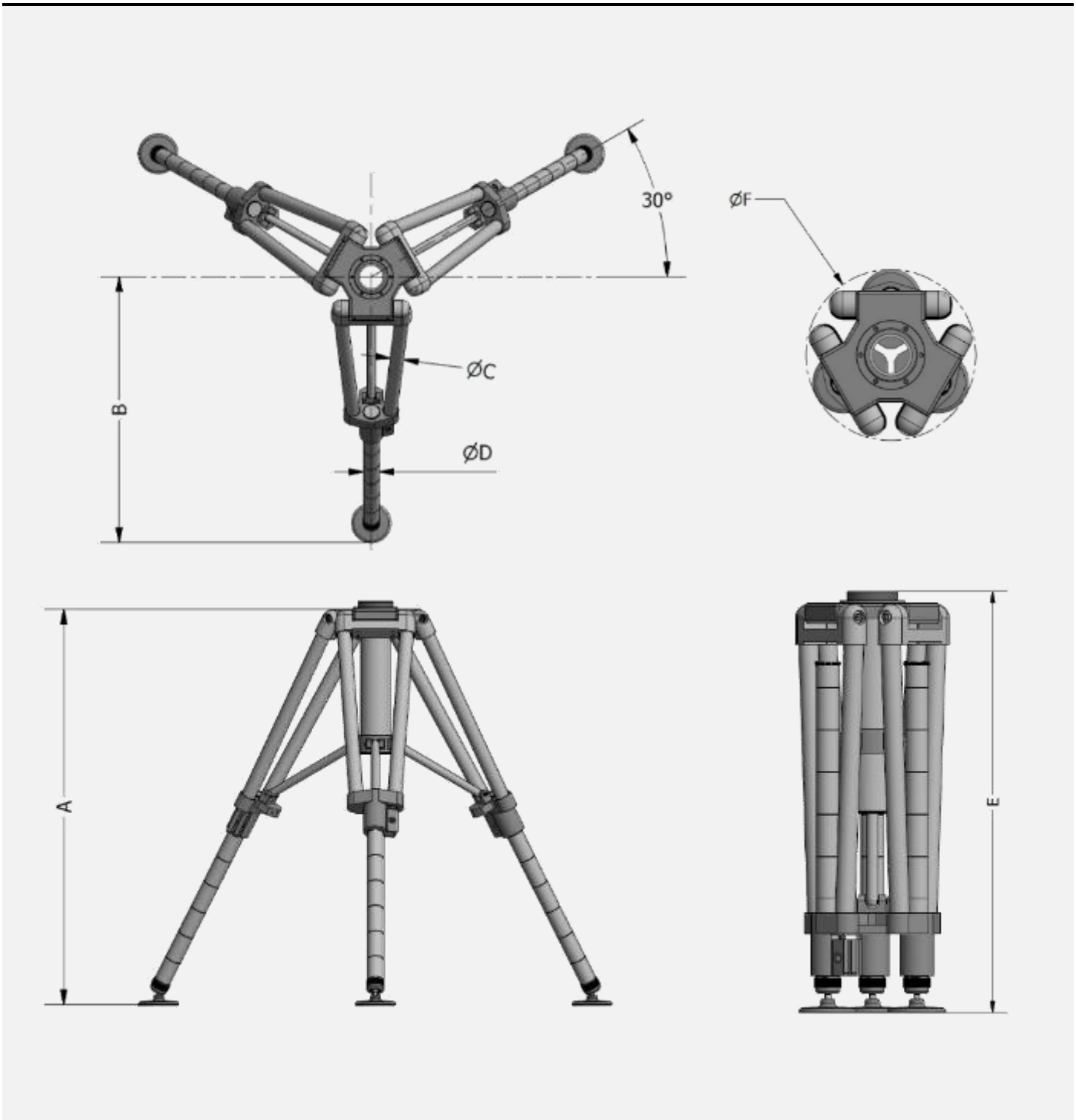
Main Features

- The TMH10 durable tripod is designed for heavy-duty applications, supporting payloads up to 150 kg with exceptional torsional stability.
- It features a wide working height range, independently adjustable telescopic leg lengths, and a rugged construction made of high-strength aluminum and corrosion-resistant steel.

Distinctive Features

- **Stable Payload Support with V Mechanical Design:** The TMH10 tripod unit stands out for its capability to support payloads with high stability, made possible by its unique V mechanical design architecture. This design enhances stability and reliability during various applications.
- **Low Twist and Deflection Performance:** Featuring a large center column structure, the tripod achieves low twist and deflection performance. This structural characteristic enhances its overall stability and precision, even when subjected to demanding conditions.
- **Versatile Foot Structure and Off-Center Payload Balancing:** The tripod's replaceable foot structure allows it to work effectively on various surfaces, enhancing its adaptability. Moreover, its large base diameter enables easy balancing of off-center payloads, ensuring stability during operations.

Configuration Breakdown	**T**ripod – **M**anual – **H**eavy Duty – Product Class (10) – Retracted Height (mm) – Extended Height (mm) – Rated Payload Capacity (kg) – Product Specific Codes
Part Number	TMH10-X-X (Check Available Options Below)
Available Customizations	Retracted/Extended Height, Payload Capacity, Mechanical Interfaces
Combinable Platforms	PEX – Electromechanical Positioners Family PMX – Manual Positioners Family



	Parameters		TMH10-725-995-150	TMH10-1055-1250-150
PERFORMANCE PARAMETERS	Minimum Working Height	mm	640	895
	Extended Height (A)	mm	995	1250
	Extended Radius (B)	mm	685	900
	Tube Diameter - Top (C)	mm	34.5	34.5
	Tube Diameter - Bottom (D)	mm	40	40
	Retracted Height (E)	mm	725	1055
	Retracted Diameter (F)	mm	280	280
	Weight	kg	14.7	18.4
	Maximum Payload	kg	150	150
	Material	-	Aluminum 6061-T6 / Stainless Steel AISI 316	
ENVIRONMENTAL QUALIFICATIONS	Wind Load	km/h	80	80
	Temperature	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -40°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +80°C	
	Vibration	-	MIL-STD-810G, Method 514.6, 20-500Hz, 6dB/Octave Roll-Off	
	Humidity	-	MIL-STD-810G, Method 507.4, Aggravated Humidity - Temperature Cycle, 10 Cycle (24 Hours)	
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain and Blowing Rain, 1.7 mm/h	
	Salt Fog	-	MIL-STD-810G, Method 509.5, 2 Cycles of 24 Hours Salt Fog And 24 Hours Desiccation	
	Dust and Sand	-	MIL-STD-810G, Method 510.5 Procedure I – Blowing Dusts MIL-STD-810G, Method 510.5 Procedure II – Blowing Sand	

Tripod Family

5. Supporting Equipment

Highlights

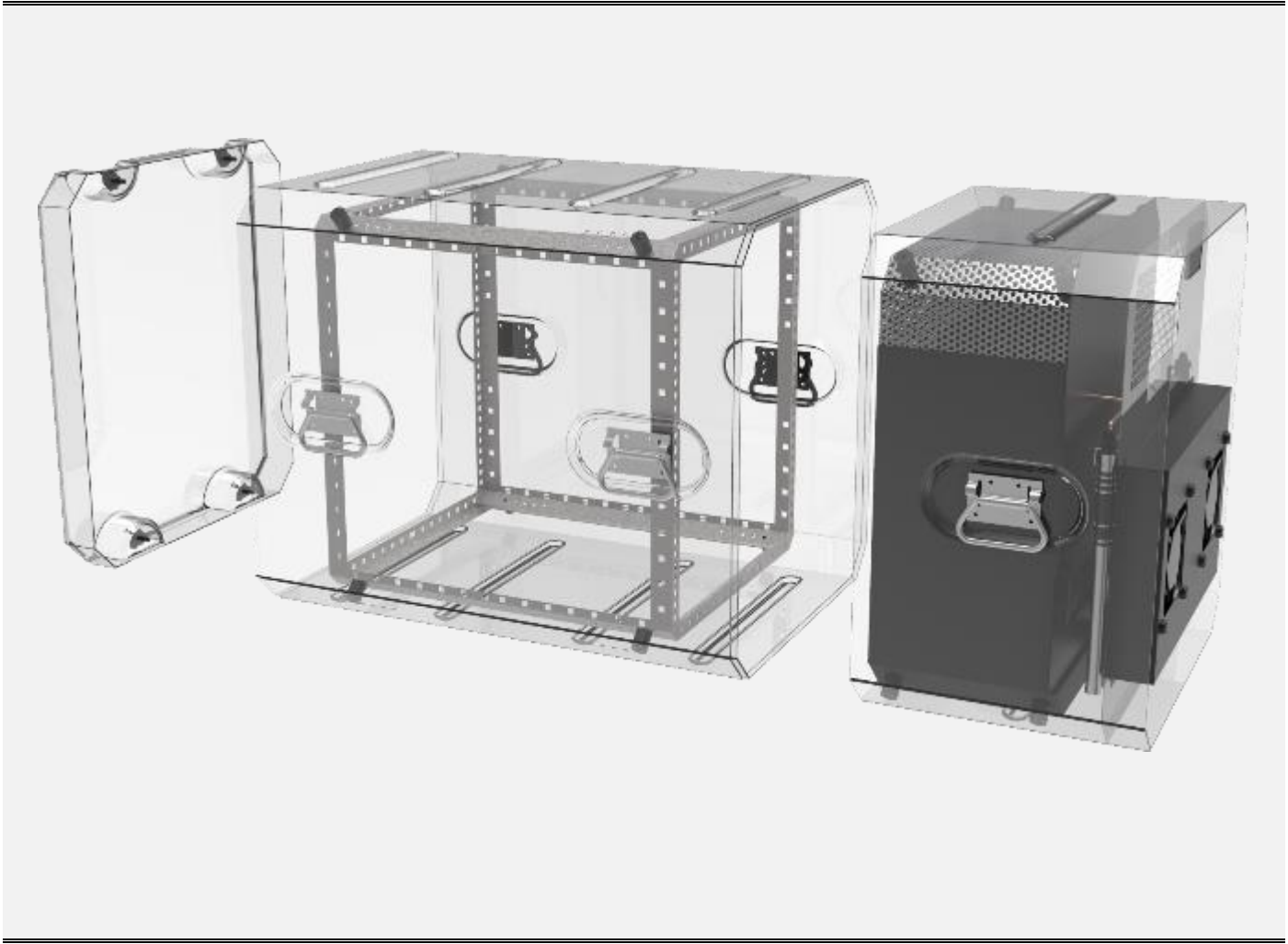
ACP20 – Portable Rack Cabins

- Climate Control with Air Conditioner
- Cooling Capacity up to 1500W | Heating Capacity up to 1500W
- Extensive Size Selection 8U to 18U

ACP20 – Portable Climatic Rack Cabins

Protective Equipment Cases for housing and transporting of

Electronic Equipment



Distinctive Features

- **Efficient Vapor Compression Cooling:** The air-conditioned rack cabin employs a Vapor Compression Cycle (VCC) based cooling system. This advanced technology utilizes a compressor to provide highly efficient air conditioning, offering cooling capacities of up to 1500W for effective temperature control.
- **Comprehensive EMI/EMC Protection:** The cabin ensures EMI/EMC protection through conductive gaskets, wire mesh braid, embedded wire, and Faraday cage features.
- **Robust Weather and Contamination Protection:** Designed with an IP65 rating and accredited to MIL-STD-810G, the rack cabin effectively shields essential electronics and equipment from contamination from water, dirt, dust, and sand.

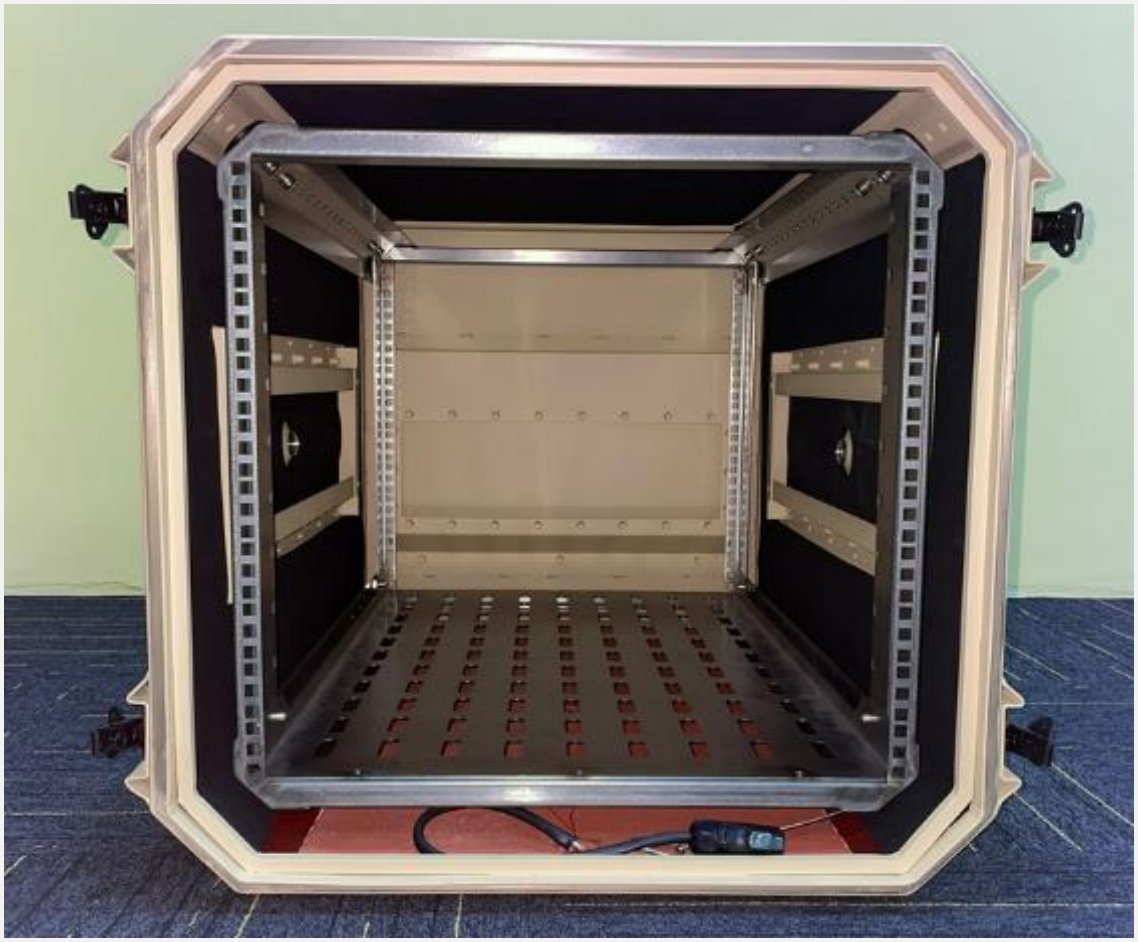
Main Features

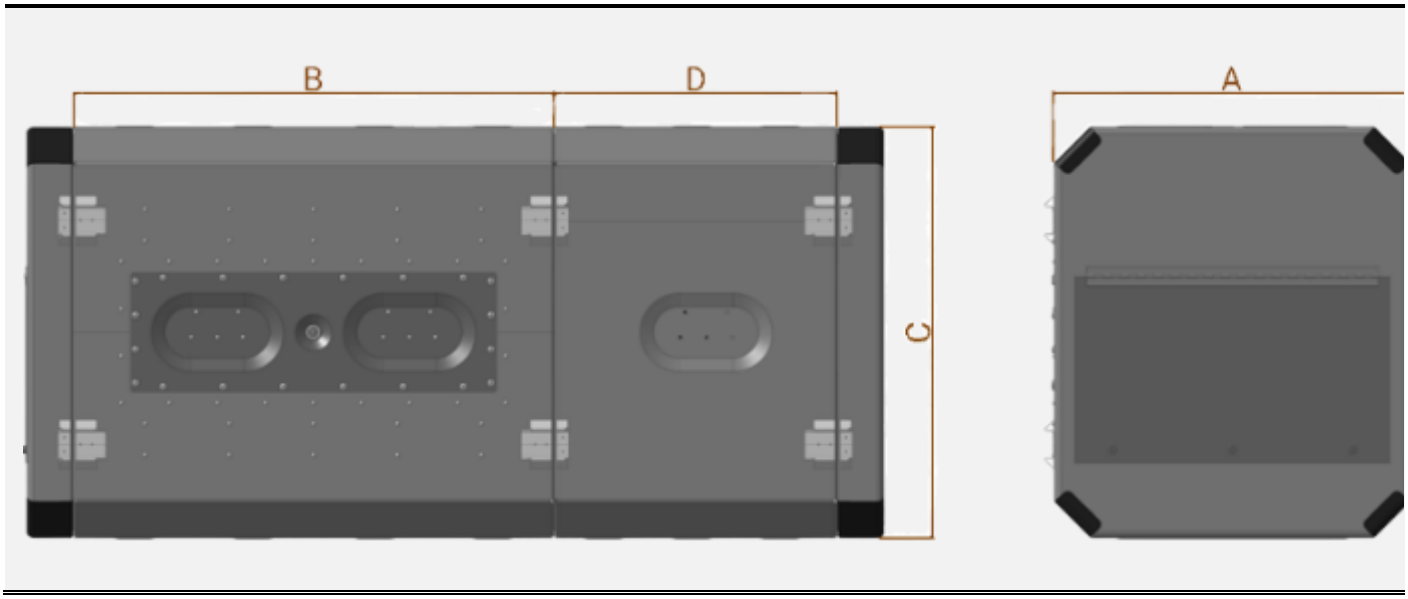
- All rack cabins can be fitted with accessories including stowage pouches, wheel kits, pressure relief valves.
- Heating available through low profile silicone heater mats having variable outputs (750W, 1500W)
- Multi-purpose portable rack cabin architecture that can be setup quickly and easily by one person

TECHNICAL LAYOUT

Part Number Description

A (Accessory) – C (Cabin) – P (Portable) – 20 (Product Class) – XX (U size) – XXX (Depth) – AC (Optional Air Conditioning) – E (Option EMI Protection) –WD (Optional Wheel Dolly)-XX(Paint)





	Parameters		ACP20-XX-XXX-XX-XX-XX
COMMON FEATURES	**Locking Mechanism**	-	Butterfly Latch
	External Paint	-	Electrostatic Powder Coating
	IP Rating	-	IP65
	Material		Main Body: Aluminum 5XXX and 6XXX Series Connection Part: Stainless Steel Fasteners: Stainless Steel
	EMI/EMC Shielding	-	Available
QUALIFICATIONS	**Temperature**	°C	MIL-STD-810G, Method 502.5 Procedure II – Operational, -32°C MIL-STD-810G, Method 501.5 Procedure II – Operational, +50°C MIL-STD-810G, Method 501.5 Procedure I – Storage; +70°C MIL-STD-810G, Method 502.5 Procedure I – Storage; -40°C
	Vibration	-	MIL-STD-810G, Method 514.6 Procedure I (Carrying Case)
	Shock	-	MIL-STD-810G, Method 516.6 Procedure I (Carrying Case)
	Rain	-	MIL-STD-810G, Method 506.5 Procedure I – Rain

A (Accessory) – C (Cabin) – P (Portable) – 20 (Product Class) – XX (U size) – XXX (Depth) – AC (Optional Air Conditioning) – E (Optional EMI Protection) –WD (Optional Wheel Dolly) -XX(Paint)

Example Configuration

- ACP20-10-610-AC-E-WD-DT
  Portable Cabin, Size 10U, Chassis Depth 610mm, Air Conditioned, EMI/EMC Shielded, Wheel Dolly, Desert Tan Color

- ACP20-12-740-E
  Portable Cabin, Size 12U, Chassis Depth 740mm, EMI/EMC Shielded

	Part Number	Width (A)	Depth (B)	Height (C)	Chassis Depth	U Size
ACCESSORY CABIN PORTABLE	ACP20-08-610	594	844	512	610	8
	ACP20-08-740	594	974	512	740	8
	ACP20-08-870	594	1104	512	870	8
	ACP20-10-610	594	844	601	610	10
	ACP20-10-740	594	974	601	740	10
	ACP20-10-870	594	1104	601	870	10
	ACP20-12-610	594	844	690	610	12
	ACP20-12-740	594	974	690	740	12
	ACP20-12-870	594	1104	690	870	12
	ACP20-15-610	594	844	780	610	15
	ACP20-15-740	594	974	780	740	15
	ACP20-15-870	594	1104	780	870	15
ACCESSORY CABIN PORTABLE	ACP20-18-610	594	844	860	610	18
ACCESSORY CABIN PORTABLE	ACP20-18-740	594	974	860	740	18

ACCESSORY CABIN PORTABLE	ACP20-18-870	594	1104	860	870	18

	Air Conditioning	Width (A)	Depth (D)	Height (C)	U Size
AC UNIT	VCC20-08	594	510	512	8
	VCC20-10	594	510	601	10
	VCC20-12	594	510	690	12
	VCC20-15	594	510	780	15
	VCC20-18	594	510	860	18

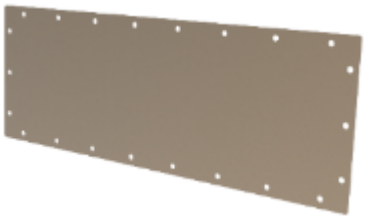
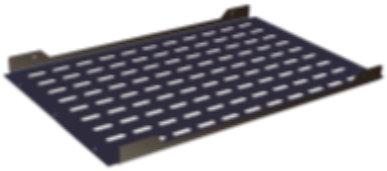
PAINT

RAL NUMBERS

DESERT TAN (DT)	CAMO GREEN (MG)	GRAY (G)
FED-STD-595 33446	FED-STD-595 34094	RAL 7001 (PA07)



ACCESSORIES

PART NUMBER	DESCRIPTIVE PHOTO
Mechanical Connection Set • 40 pcs M6 Bolt, Plastic Washer, Cage Nut PN: ACP20-A01	
4 Wheel Dolly • Payload Capacity: 300kg PN: ACP20-A02-XXX • Method 507.5, 509.5 Not Included • XXX: For 610/740/870 mm	
Silicon Heater Matt • Heating Capacity: 1500 Watt PN: ACP20-A03	
Connector Panel • XX: U Size • EMI/EMC Filter Option • With Fasteners • Not Painted PN: ACP20-A04-(E/NA)	
Support Shelf • Stainless Steel • Payload Capacity: 50 kg PN: ACP20-A05	
Labels PN: ACP20-A06-XX • XX: Code should be selected from Appropriate Labels Table Below	
EMI Gasket PN: ACP20-A07-XX • XX: Height for ACP Unit (8U-10U etc.)	

6. Customizations

6.1. Mechanical Interfaces

6.2. Color Finishes

Color Finishes

Description	Thumbnail	Part Number	Specification
Clear Anodize		AN01	Clear anodize is the standard commercial finish option for aluminum masts. It creates a hardened surface that protects the mast from dust, dirt, and precipitation. Clear anodize finish meets MIL-A-8625, Type II, Class 1.
Black Anodize		AN02	Black anodize is an economical color option that provides the same level of protection as the standard commercial clear anodize aluminum mast finish and meets MIL-A-8625, Type II, Class 2.
Powder Coat Black		PA01	Powder Coat Matte Black Color per RAL 9005
Powder Coat Desert Tan		PA02	Powder Coat Color 33446 per FED-STD-595
Powder Coat Beige		PA03	Powder Coat Beige Color per RAL 1001
NATO Green		PA04	British Standard BS381C #285
Yellow-Olive IRR		PA05	MIL-PRF-85285E, Type II, Class H, Color RAL 6014-F9 WB Paint item number 110004
Paint Camo Green		PA06	MIL-PRF-85285E, Type I, Class H, Color 34094 per FED-STD-595