

# DHI-TPC-SD2241-T

## Thermal Network Hybrid Speed Dome Camera



### System Overview

With its dual lens design, Thermal Network Hybrid Speed Dome Camera provides an all-in-one solution for video surveillance in outdoor and indoor scenarios. It adopts Thermal and Visible Technology to capture vivid, detailed images even in dark, small areas. Through its thermal camera, it can capture clear images even in poor or dark lighting, and can detect and reveal details through its visible camera that has Smart IR.

### Functions

#### Uncooled VOx Technology

Dahua thermal cameras use uncooled VOx sensor technology. The detector is small-sized, and highly sensitive allowing the camera to reveal images in greater detail, giving you more visual information on a monitored site. It also improves the accuracy of temperature measurements, ensuring that even minute temperature changes are detected.

#### High Sensitivity

High thermal sensitivity ( $\leq 40$  mK) makes these cameras capture images in fine detail, and detect subtle and large temperature changes.

#### Temperature Measurement (–20 °C to +550 °C)

Dahua thermal cameras (-T models) remotely monitor temperatures. They are customizable, allowing you to freely set threshold alarms. Whether day or night, the temperature of objects can be monitored, making the camera ideal for use in power plants or at oil extraction sites where overheating can be dangerous. When the temperature exceeds the set threshold, an alarm is immediately triggered. The camera can function in temperatures ranging from –20 °C to +550 °C (–4 °F to +1022 °F).

- Vanadium oxide uncooled focal plane detector.
- 4Megapixel progressive scan CMOS.
- Offers various AI functions such as intrusion, target filtering, heat detection, smoking detection, and calling detection.
- Temperature measurement range of –20 °C to +550 °C (–4 °F to +1022 °F).
- Built-in white light and speaker that produce light and sound alarms to deter intruders.
- Built-in IR LED, and the max. illumination distance is 35 m.
- Wide monitoring range: Pan: 0° to 360° endless tilt: –15° to +90°.
- Dual image fusion (visible and thermal images).
- 12 VDC  $\pm$  20%/PoE+ power supply.
- IP66 rated.

### Heat Detection & Alarm

With its extended detection range, the camera can detect heat sources that are in locations distant to it. It is also highly sensitive to temperature changes, allowing the accuracy of its heat source detection to be higher than cameras that work in the visible light range.

### Smoking Detection

Empowered by deep learning AI technology, the camera can automatically detect and trigger alarms for people smoking, providing intelligent sound and light warnings to dissuade smokers, and avoid potential risks and loss. It multi-tasks in extracting elements from the visible light and thermal image at the same time to detect smoke and the person that is actively smoking.

### Environment (–30 °C to +60 °C)

Developed to operate in extreme conditions, the camera can function in temperatures ranging from –30 °C to +60 °C (–22 °F to +140 °F). It was subjected to rigorous dust and water immersion tests, gaining its IP67 certification, making it suitable for demanding outdoor applications. For environments with rain, sleet, snow and fog, an integrated wiper (optional) provides users with clear visibility at all times.

### Protection

The camera supports wide range voltage input, making it suitable for even the most unstable conditions. It has 6 kV lightning certification, providing strong protection for both the camera and its structure against lightning, making it ideal for outdoor applications.

### Scene

It is highly suitable for warehouses, waste stations, factories, laundries and more.

Technical Specification	
Thermal	
Detector Type	Vanadium oxide uncooled focal plane detector
Effective Pixels	256 (H) × 192 (V)
Pixel Pitch	12 μm
Spectral Range	8 μm–14 μm
Sensitivity (NETD)	≤40 mK@f/1.0
Focal Length	3.5 mm; 7 mm; 10 mm
Field of View	3.5 mm: H: 50.6°; V: 37.8° 7 mm: H: 24°; V: 18° 10 mm: H: 17.3° V: 13.1°
Thermal Focus Control	Fixed-focal
Close Focus Distance	3.5 mm: 0.5 m (1.64 ft) 7 mm: 1 m (3.28 ft) 10 mm: 1 m (3.28 ft)
Detection Distance <sup>①</sup>	3.5 mm: Vehicle: 389 m (1,276.25 ft); Human: 146 m (479.00 ft) 7 mm: Vehicle: 778 m (2,552.49 ft); Human: 292 m (958.01 ft) 10 mm: Vehicle: 1,111 m (3,645.01 ft); Human: 416 m (1,364.83 ft)
Recognition Distance <sup>②</sup>	3.5 mm: Vehicle: 97 m (318.24 ft); Human: 38 m (124.67 ft) 7 mm: Vehicle: 194 m (636.48 ft); Human: 75 m (246.06 ft) 10 mm: Vehicle: 277 m (908.79 ft); Human: 107 m (351.05 ft)
Identification Distance <sup>③</sup>	3.5 mm: Vehicle: 49 m (160.76 ft); Human: 19 m (62.34 ft) 7 mm: Vehicle: 97 m (318.24 ft); Human: 38 m (124.67 ft) 10 mm: Vehicle: 138 m (452.76 ft); Human: 53 m (173.88 ft)
Note:	
① Detection Distance: Detects objects, but cannot recognize their characteristics (objects must cover more than 3.6 pixels of the image).	
② Recognition Distance: Classifies objects into general categories, such as human, vehicle (the object must cover more than 14 pixels of the image).	
③ Identification Distance: Classifies objects into specific categories based on their characteristics, such as engineering truck, car (the object must cover more than 28 pixels of the image).	
Digital Detail Enhancement (DDE)	Yes
Thermal Image Stabilization	Electronic Image Stabilization (EIS)
Digital Zoom	16 levels
Thermal AGC	Auto/Manual
Thermal Noise Reduction	2D NR/3D NR
Image Flip	180°
Color Palettes	18 (white hot/black hot/fusion/rainbow/golden autumn/midday/iron red/amber/jade/sunset/icefire/painting/pomegranate/emerald /spring/summer/ autumn/winter)

Temperature Measurement Range	High temperature mode: 0 °C to +550 °C (+32 °F to +1022 °F) Low temperature mode: –20 °C to +150 °C (–4 °F to +302 °F) Auto mode: –20 °C to +550 °C (–4 °F to +1022 °F)
Temperature Measurement Accuracy	Max. (±2 °C, ±2%); (Temperature: –20 °C to +60 °C)
Temperature Measurement Mode	Spot: 12 Line: 12 Area: 12 Supports 12 rules simultaneously
Visible	
Image Sensor	1/2.7" CMOS
Max. Resolution	2336 (H) × 1752 (V)
Pixel	4 MP
Horizontal Definition	≥1600 TVL
Min. Illumination	Color: 0.05 lux B/W: 0.005 lux 0 lux (IR on)
Visible AGC	Auto/Manual
Visible Noise Reduction	2D NR/3D NR
S/N Ratio	≥55 dB
White Balance	Auto; indoor; outdoor; tracking; manual; natural; street lamp
Defog	Electronic defog
Electronic Shutter Speed	1 s–1/30,000 s (auto/manual)
BLC	Yes
WDR	DWDR
HLC	Yes
Day/Night	Auto (ICR); Color; B/W
Iris Control	Fixed
Image Flip	180°
Exposure Compensation	Yes
Visible Focus Control	Fixed-focal
Focal Length	4 mm; 8 mm; 12 mm
Field of View	4 mm: H: 71.2°; V: 52° 8 mm: H: 33.4°; V: 25° 12 mm: H: 22° V: 16.6°
Close Focus Distance	4 mm: 1 m (3.28 ft) 8 mm: 2.5 m (8.20 ft) 12 mm: 2.5 m (8.20 ft)
Aperture	4 mm: F1.6 8 mm: F2.0 12 mm: F2.0
Illuminator On/Off Control	Auto/Manual
Illumination Distance	4 mm: ≥35 m (114.83 ft) 8 mm: ≥50 m (164.04 ft) 12 mm: ≥50 m (164.04 ft)
Audio and Video	
Video Compression	H.265; H.264; H.264H; H.264B; MJPEG

<b>Resolution</b>	<p>Thermal: Main stream: 1.3M (1280 × 960); XGA (1024 × 768); VGA (640 × 480/256 × 192); 1280 × 960 (default) Sub stream: VGA (640 × 480/256 × 192); 256 × 192 (default)</p> <p>Visible: Main stream: 2336 × 1752; 1080p (1920 × 1080); 720p (1280 × 720); D1 (704 × 576); 2336 × 1752 (default) Sub stream: 720p (1280 × 720); D1 (704 × 576); CIF (352 × 288); 352 × 288 (default)</p>
<b>Video Frame Rate</b>	<p>Thermal: Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 15 fps by default</p> <p>Visible: Main stream: 1 fps–25 fps, 25 fps by default Sub stream: 1 fps–25 fps, 15 fps by default</p>
<b>Audio Compression</b>	G.711a; G.711mu; PCM
<b>Image Encoding Format</b>	JPEG

## PTZ

<b>Pan/Tilt Range</b>	Pan: 0° to 360° endless Tilt: -15° to +90°
<b>Manual Control Speed</b>	Pan: 0.1°/s –200°/s Tilt: 0.1°/s –120°/s
<b>Preset Speed</b>	Pan: 240°/s Tilt: 200°/s
<b>Preset</b>	300
<b>Tour</b>	8 (up to 32 presets per tour)
<b>Pattern</b>	5
<b>Scan</b>	5
<b>Power-off Memory</b>	Yes
<b>Privacy Masking</b>	4 areas in the same view
<b>Idle Motion</b>	Activate Preset/Scan/Tour/Pattern/Pan

## Function

<b>Two-way Audio</b>	Yes
<b>Sound and Light Alarm</b>	Yes
<b>Network Protocol</b>	HTTPS; HTTP; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPoE; IPv4/v6; SNMP; QoS; UPnP; NTP
<b>Region of Interest (RoI)</b>	Yes
<b>Storage</b>	Micro SD card
<b>Micro SD Card (Max.)</b>	256 GB
<b>Interoperability</b>	ONVIF; CGI; Dahua SDK
<b>Browser</b>	IE: IE 9 and later (Edge is not supported) Chrome: 42 and earlier Firefox: 42 and earlier
<b>User/Host</b>	Up to 10 (total bandwidth: 100 MB)
<b>Security</b>	Authorized username and password; attached MAC address; encrypted HTTPS; IEEE 802.1x; controlled network access

<b>User Management</b>	Up to 10 users; supports multi-level user permissions (2 levels): management group and user group
<b>Malfunction Detection</b>	Network disconnection detection; IP conflict detection; memory card state detection; memory space detection
<b>Fusion Mode</b>	Warm color; cold color; fuse with iron oxide red
<b>PIP</b>	Yes (Intelligence automatically turns off when PIP is on)

## Intelligence

<b>Heat Detection</b>	Yes
<b>Cold/Hot Spot Trace</b>	Yes
<b>IVS (Perimeter Protection)</b>	Yes. Supports tripwire and intrusion.
<b>Target Distinction</b>	Human/Vehicle Classification
<b>Smoking Detection</b>	Yes
<b>Call Detection</b>	Yes

## Port

<b>Analog Output</b>	1-ch CVBS output, BNC port
<b>Network Port</b>	1 × RJ-45 (10/100 Base-T)
<b>Alarm Input</b>	2
<b>Alarm Output</b>	1
<b>Audio Input</b>	1
<b>Audio Output</b>	1
<b>RS-485</b>	1

## Power

<b>Power Supply</b>	12 VDC, 2 A ± 20%, PoE+ (802.3at)
<b>Power Consumption</b>	Basic: <12 W (12 VDC) Max: <24 W (12 VDC, adapter excluded)
<b>ePoE</b>	Yes

## Environment

<b>Operating Temperature</b>	-30 °C to +60 °C (-22 °F to +140 °F)
<b>Operating Humidity</b>	≤95%
<b>Storage Temperature</b>	-40 °C to +70 °C (-40 °F to +158 °F)

## Physical Characteristics

<b>Protection</b>	IP66
<b>Reliability</b>	Surge protection: 6 kV Air discharge of 15 kV Contact discharge of 8 kV

## Structure

<b>Product Dimensions</b>	295 mm × Φ160 mm (11.61" × Φ6.30")
<b>Packaging Dimensions</b>	267 mm × 267 mm × 437 mm (10.51" × 10.51" × 17.20") (W × L × H)
<b>Net Weight</b>	≤3.2 kg (7.05 lb)
<b>Gross Weight</b>	≤4.7 kg (10.36 lb)

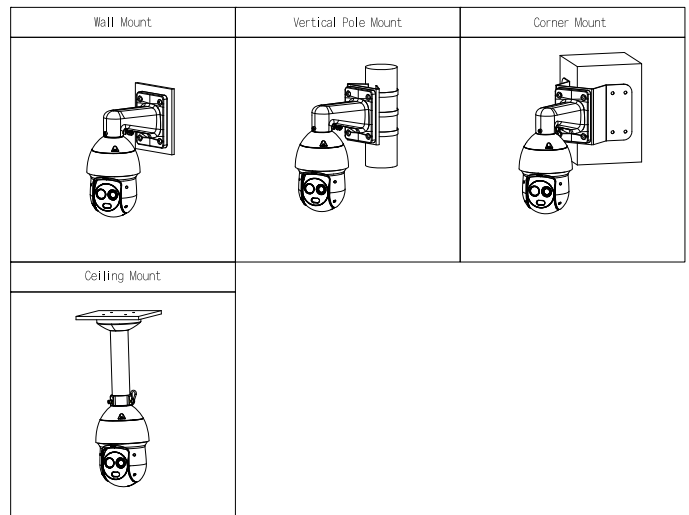
**Temperature Measurement Distance**

Focal Length	3.5 mm	7 mm	10 mm
Temperature Measurement Distance (Min.)	1 m (3.28 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)	3 m (9.84 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)	3 m (9.84 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)
Temperature Measurement Distance (Max.)	5 m (16.40 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)	8 m (26.25 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)	12 m (39.37 ft), target size: 0.1 m x 0.1 m (0.33 ft x 0.33 ft)

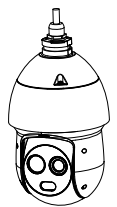
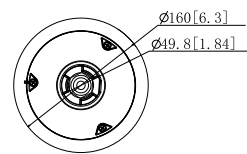
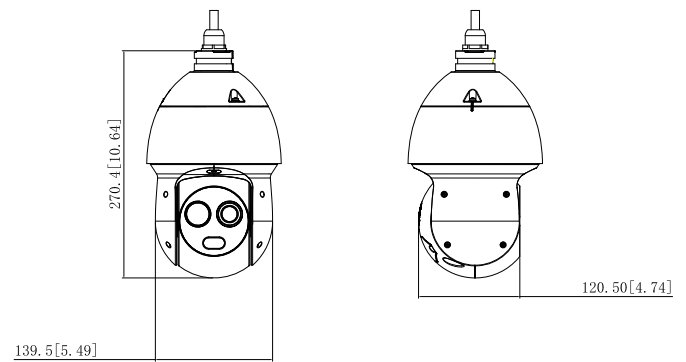
Note:  
The table displays the measured distances obtained from using the target size 0.1 m x 0.1 m for testing in an environment where the temperature is 23 °C and the relative humidity is below 60%. The table is for reference only. The distances within it are subject to actual conditions including atmospheric conditions, target size, the installation site, and more.

**Ordering Information**

Type	Model	Description
Thermal Camera	DHI-TPC-SD2241-TB3F4-DW-S2	Thermal: 3.5 mm; Visible: 4 mm
	DHI-TPC-SD2241-TB7F8-DW-S2	Thermal: 7 mm; Visible: 8 mm
	DHI-TPC-SD2241-TB10F12-DW-S2	Thermal: 10 mm; Visible: 12 mm
Accessories	PFB305W	Wall Mount Bracket
	PFB305W + PFA150	Wall Mount Bracket + Pole Mount Bracket (Pole Mount)
	PFB305W + PFA151	Wall Mount Bracket + Corner Mount Bracket (Corner Mount)
	PFA111 + PFB300C	Joint Connector + Hang Mount Bracket (Hang Mount)



**Dimensions (mm[inch])**



**Accessories**

Included:



PFB305W  
Wall Mount Bracket

Optional:



PFB305W + PFA150  
Wall Mount Bracket + pole Mount Bracket (Pole Mount)



PFB305W + PFA151  
Wall Mount Bracket + Corner Mount Bracket (Corner Mount)



PFA111 + PFB300C  
Joint Connector + Hang Mount Bracket (Hang Mount)