

# TU20 Pro

## LED Playback Control Processor



Specifications

## Change History

| Document Version | Release Date | Description                                                                                                                                                                                                                                                                          |
|------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.5.3           | 2025-09-02   | Updated the operating and storage environment temperatures.                                                                                                                                                                                                                          |
| V1.5.2           | 2025-02-20   | Updated the sensor connector description.                                                                                                                                                                                                                                            |
| V1.5.1           | 2024-11-07   | Updated the dimensional drawings.                                                                                                                                                                                                                                                    |
| V1.5.0           | 2024-06-24   | <ul style="list-style-type: none"> <li>• Updated product introduction and certification details.</li> <li>• Added support for controlling the LED screen with a remote.</li> <li>• Updated the application diagram.</li> <li>• Updated the media decoding specifications.</li> </ul> |
| V1.4.0           | 2024-03-25   | Added media decoding specifications.                                                                                                                                                                                                                                                 |
| V1.3.0           | 2023-11-07   | <ul style="list-style-type: none"> <li>• Support temperature and humidity sensor.</li> <li>• Support the synchronous playback function.</li> </ul>                                                                                                                                   |
| V1.1.0           | 2023-08-11   | Updated the output description.                                                                                                                                                                                                                                                      |
| V1.0.1           | 2023-06-19   | Added a dimensions diagram of the device with antennas and hanging brackets installed.                                                                                                                                                                                               |
| V1.0.0           | 2023-03-17   | First release                                                                                                                                                                                                                                                                        |

## Introduction

The TU20 Pro is a playback control processor specially designed by Xi'an NovaStar Tech Co., Ltd. (hereinafter referred to as NovaStar) for indoor LED screens. It integrates the Android system and sending card functions into one unit, and allows third-party apps to run on it, featuring powerful interaction and playback control capabilities.

The TU20 Pro allows users to control the LED screen with a remote and supports wireless screen mirroring from Windows, macOS, iOS, and Android devices. It offers four different modes tailored for various applications, ensuring the best display quality for document presentations, video playback, and remote meetings.

The TU20 Pro has no requirements of redesigning or changing the screen structure and can be mounted on the wall or placed on a surface, allowing for quick environment setup and use. It can be widely used in corporate exhibition halls, meeting rooms, government and corporate educational halls, hotel lobbies, telemedicine consultation and other LED single-screen application scenarios.

## Certifications

CE, FCC, IC, SRRC, MIC, KC, CB, RoHS

If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact NovaStar to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or NovaStar has the right to claim compensation.

## Features

### Inputs and Outputs

- 2x HDMI 1.3 inputs
- 3x USB 2.0 inputs for multimedia playback and function extension
- 6x Ethernet outputs, capacity up to 3.9 million pixels
- 2x audio outputs
- 1x SPDIF digital audio output
- 1x 3.5-mm audio output
- Output image scaling
  - Width range: 64 to 4096 pixels
  - Height range: 64 to 1920 pixels
  - Total device load capacity  $\leq$  3.9 million pixels

### System Functions

- Android 11 based desktop UI system, supporting third-party apps
- Wireless screen mirroring from multiple platforms  
Mirror from Windows, macOS, iOS and Android terminals.
- Screen drawing and commenting
- Working with the ViPlex Handy app to achieve reverse control  
The speaker can reversely control the LED screen via the terminal.
- Powerful processing performance
  - Quad-core 1.8 GHz ARM A55 processor
  - Support high-definition video decoding of H.264 and H.265 at 4K@60Hz.
  - 4GB of RAM
  - 32GB of storage space
- Excellent playback performance
- Supports playback of 1 stream of 4K video, 2 streams of 1080p video, 2 streams of 720p video, 3 streams of 480p video, or 3 streams of 360p video.
- Playback control via different terminals
  - Intelligent control via mobile app: Install ViPlex Handy on your smartphone for program editing and publishing and screen control.
  - Convenient playback control via remote: Perform playback control of local programs and simple program editing on the screen.
  - USB playback: Support standalone playback, plug and play, copy and play.
- Dual Wi-Fi modes  
Allow for Wi-Fi and wireless hotspot connections at the same time.
- Image quality enhancement  
Improve the display effect from the three dimensions of image contrast, detail and color. So that the overall sense of image gradation is richer and more delicate; the edge details are clear and sharp; the color is bright and vivid.
- Effect adjustment  
Offer 4 display modes including standard, meeting, vivid and skin, and allow you to adjust the brightness, color temperature, saturation, contrast, etc.
- Eye comfort mode

### Device Controls

- Gigabit Ethernet control port with TCP/IP protocol support
- Low-power (less than 0.5 W) mode during standby, and wakeup from standby via Infrared remote
- A relays can be connected for convenient power management of LED screen
- Intelligent control via mobile app
- Download and install VNNOX Care on your smartphone to easily configure the LED screen within just 10 minutes. The app also allows you to scan QR codes to set up screens, connect and adjust the topology using photos, and monitor the status of your devices.
- Control the LED screen with a remote
- Bluetooth 5.1
- Can connect to the Bluetooth voice remote, Bluetooth mouse, Bluetooth keyboard, Bluetooth sound system and other common peripherals.
- Support peripherals such as camera, sound system and infrared touch frame.
- Please contact NovaStar technical support for information on supported peripheral device models.

## Appearance

## Front Panel



| Name           | Description                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status LED     | <ul style="list-style-type: none"> <li>• Solid green: The device is running normally.</li> <li>• Off: The device is not running.</li> </ul>                                                                                                                                                                                                                                                   |
| Standby button | <ul style="list-style-type: none"> <li>• Press the button to power on the device or put it on standby.</li> <li>• Hold down the button to restart the device.</li> </ul>                                                                                                                                                                                                                      |
| USB 2.0        | Support a mouse, keyboard, USB drive and other common USB devices. <ul style="list-style-type: none"> <li>• Supported image formats: *.jpg, *.bmp, *.png, *.gif, *.webp</li> <li>• Supported video formats: *.avi, *.mpg, *.vob, *.mov, *.mkv, *.mp4, *.ts, *.flv, *.3gp, *.asf, *.webm</li> <li>• Support FAT32 and NTFS file systems. Do not support exFAT or FAT16 file system.</li> </ul> |

## Rear Panel



| Type  | Connector   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input | HDMI IN 1–2 | 2x HDMI 1.3 (Type A) <ul style="list-style-type: none"> <li>• Max resolution: 2048×1152@60Hz</li> <li>• Min resolution: 800×600@60Hz</li> <li>• Custom resolutions supported               <ul style="list-style-type: none"> <li>Width range: 800–3840 pixels (Forced)</li> <li>Height range: 600–3840 pixels (Forced)</li> </ul> </li> <li>• Supported frame rates: 30 Hz, 50 Hz, 60 Hz</li> <li>• Do NOT support interlaced signal input.</li> <li>• HDCP 1.4 compliant, backwards compatible</li> </ul> |
|       | USB 2.0 1–2 | 2x USB 2.0 to support a mouse, keyboard, USB drive and other common USB devices <ul style="list-style-type: none"> <li>• Supported image formats: *.jpg, *.bmp, *.png, *.gif, *.webp</li> </ul>                                                                                                                                                                                                                                                                                                             |

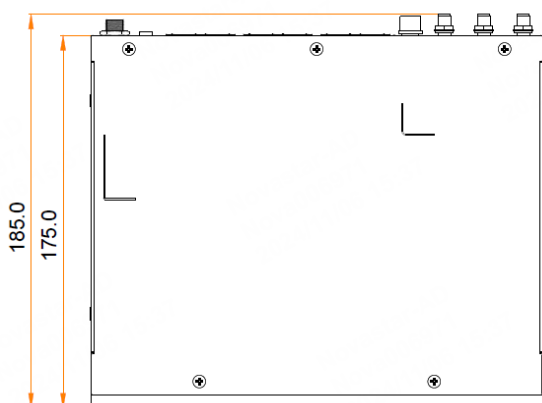
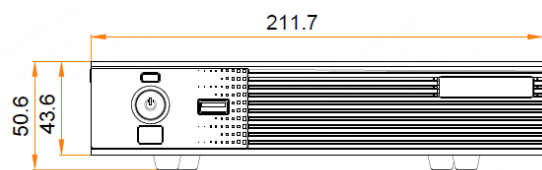
|         |                            |                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                            | <ul style="list-style-type: none"> <li>Supported video formats: *.avi, *.mpg, *.vob, *.mov, *.mkv, *.mp4, *.ts, *.flv, *.3gp, *.asf, *.webm</li> <li>Supported file systems: FAT32, NTFS; not supported: exFAT, FAT16</li> </ul>                                                                                                                                                     |
| Output  | 1–6                        | 6x RJ45 (1Gbps)                                                                                                                                                                                                                                                                                                                                                                      |
|         | HDMI OUT                   | Support output of standard 1080p video.                                                                                                                                                                                                                                                                                                                                              |
|         | AUDIO                      | 3.5-mm audio output                                                                                                                                                                                                                                                                                                                                                                  |
|         | SPDIF                      | For digital fiber optic audio output                                                                                                                                                                                                                                                                                                                                                 |
| Control | ETHERNET                   | Connect to external network or to the NovaLCT software on the control PC.                                                                                                                                                                                                                                                                                                            |
|         | SENSOR                     | Sensor connector to connect to light, temperature or humidity sensors.                                                                                                                                                                                                                                                                                                               |
|         | Phoenix connector (4 pins) | 1x RS232 central control connector (4 pins) to connect to the central control device <ul style="list-style-type: none"> <li>Baud rate: 115200 bps</li> <li>Data bits: 8; stop bits: 1; no parity bit; no flow control</li> </ul>                                                                                                                                                     |
|         | Phoenix connector (6 pins) | <ul style="list-style-type: none"> <li>1x IR IN (Reserved)</li> <li>1x IR OUT (Reserved)</li> <li>1x I/O (Reserved)</li> <li>1x RELAY               <ul style="list-style-type: none"> <li>Connect to a relay to control the switch on and off of the connected device.</li> <li>Voltage: 30 V DC; max current: 3 A</li> </ul> </li> <li>1x GND<br/>A grounding connector</li> </ul> |
| Antenna | Wi-Fi AP 1–2               | Specifications: 2T2R. Connect to the Wi-Fi antenna and Bluetooth antenna.                                                                                                                                                                                                                                                                                                            |
|         | Wi-Fi STA                  | Specifications: 1T1R. Connect to the Wi-Fi antenna                                                                                                                                                                                                                                                                                                                                   |
| Power   | DC 12 V $\pm$ 10%          |                                                                                                                                                                                                                                                                                                                                                                                      |

#### Note

When using the scaling function, the maximum load capacity is 3.9 million pixels, while the maximum pixel load for pixel-to-pixel display is 2.88 million. For any questions, please contact NovaStar technical support.

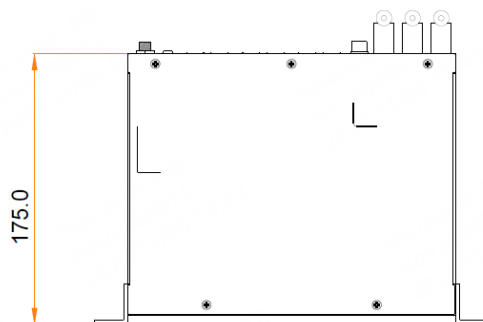
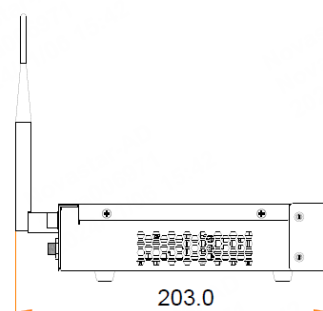
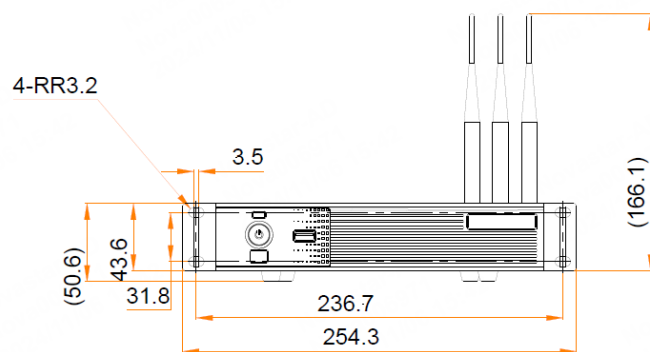
## Dimensions

### TU20 Pro



Tolerance:  $\pm 0.3$  Unit: mm

### TU20 Pro with Antennas and Hanging Brackets Installed



Tolerance:  $\pm 0.3$  Unit: mm

## Applications

### LED Screen



#### Note

The TU20 Pro product package in this diagram is described in the packing list in the specifications table.

The TB1304 mirroring dongle (Type-C connector) is not included with the TU20 Pro product package and must be purchased separately. To use the TB1304 dongle with the TU20 Pro, you will need to connect it using a Type-C to USB adapter (provided with the TB1304).

## Specifications

|                           |                         |                                                                                                                                                                                                                                                                                    |
|---------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical Specifications | Input voltage           | DC 12V 3A, Negative Outside Positive Inside (power adapter input)                                                                                                                                                                                                                  |
|                           | Rated power consumption | 21 W                                                                                                                                                                                                                                                                               |
| Storage Space             | RAM                     | 4 GB                                                                                                                                                                                                                                                                               |
|                           | Internal storage        | 32 GB                                                                                                                                                                                                                                                                              |
| Operating Environment     | Temperature             | –20°C to +50°C                                                                                                                                                                                                                                                                     |
|                           | Humidity                | 0% RH to 80% RH, non-condensing                                                                                                                                                                                                                                                    |
| Storage Environment       | Temperature             | –20°C to +70°C                                                                                                                                                                                                                                                                     |
|                           | Humidity                | 0% RH to 95% RH, non-condensing                                                                                                                                                                                                                                                    |
| Physical Specifications   | Dimensions              | 211.7 mm × 185.0 mm × 50.6 mm                                                                                                                                                                                                                                                      |
|                           | Net weight              | 1.12 kg                                                                                                                                                                                                                                                                            |
|                           | Gross weight            | 2.9 kg<br>Note: It is the total weight of the product, accessories, and packing materials packed according to the packing specifications.                                                                                                                                          |
| Packing Information       | Dimensions (L×W×H)      | 387 mm × 359 mm × 173 mm                                                                                                                                                                                                                                                           |
|                           | List                    | <ul style="list-style-type: none"> <li>• 1x TU20 Pro</li> <li>• 1x Power adapter</li> <li>• 1x Bluetooth voice remote</li> <li>• 1x Ethernet cable</li> <li>• 1x HDMI cable</li> <li>• 3x Antennas</li> <li>• 2x Hanging brackets</li> <li>• 1x Certificate of Approval</li> </ul> |

The current and power consumption may vary depending on the product settings, usage environment and measuring status.

### Optional Accessories

| Item Code | Description                                         | Note                                                                                                                                                                                |
|-----------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 710010020 | Wireless mirroring activation code – 4-split screen | To use the 4-split screen feature, please purchase this item separately.                                                                                                            |
| 710010073 | Wireless mirroring activation code – 9-split screen | To use the 9-split screen feature, please purchase this item separately.                                                                                                            |
| 710010027 | Whiteboard activation code                          | To use the whiteboard feature, please purchase this item separately.                                                                                                                |
| W01010277 | MEECUS_Dongle_TB1304                                | To use the mirroring dongle, please purchase this item separately (it has a Type-C connector but can also be used with a USB port and comes with a Type-C to USB adapter included). |

## Media Decoding Specifications

### Image

| Type | Decoding              | Resolution                       | Format    | Note                                                                                  |
|------|-----------------------|----------------------------------|-----------|---------------------------------------------------------------------------------------|
| JPEG | JFIF file format 1.02 | 16×16 pixels to 4096×2160 pixels | JPG, JPEG | Non-interlaced scanning not supported.<br>Support SRGB JPEG<br>Support Adobe RGB JPEG |
| BMP  | BMP                   | 16×16 pixels to 4096×2160 pixels | BMP       | N/A                                                                                   |
| GIF  | GIF                   | 16×16 pixels to 4096×2160 pixels | GIF       | N/A                                                                                   |
| PNG  | PNG                   | 16×16 pixels to 4096×2160 pixels | PNG       | N/A                                                                                   |
| WEBP | WEBP                  | 16×16 pixels to 4096×2160 pixels | WEBP      | N/A                                                                                   |

### Video

| Type       | Decoding   | Resolution                                                      | Max Frame Rate | Max Bit Rate (Ideal Condition) | Format                           | Note                                 |
|------------|------------|-----------------------------------------------------------------|----------------|--------------------------------|----------------------------------|--------------------------------------|
| MPEG-1/2   | MPEG-1/2   | 48×48 pixels to 1920×1088 pixels                                | 30fps          | 80 Mbps                        | MPG, VOB, TS                     | Support field coding                 |
| MPEG-4     | MPEG4      | 48×48 pixels to 1920×1088 pixels                                | 30fps          | 38.4 Mbps                      | AVI, MKV, MP4, MOV, 3GP          | MS MPEG4 v1/v2/v3, GMC not supported |
| H.264/AVC  | H.264      | 48×48 pixels to 4096×2304 pixels                                | 2304p@60fps    | 80 Mbps                        | AVI, MKV, MP4, MOV, 3GP, TS, FLV | Support field coding, MBAFF          |
| MVC        | H.264 MVC  | 48×48 pixels to 4096×2304 pixels                                | 2304p@60fps    | 100 Mbps                       | MKV                              | Only support stereo high profile     |
| H.265/HEVC | H.265/HEVC | 64×64 pixels to 4096×2304 pixels                                | 2304p@60fps    | 100 Mbps                       | MKV, MP4, MOV, TS                | Support main profile, tile & slice   |
| GOOGLE VP8 | VP8        | 48×48 pixels to 1920×1088 pixels                                | 30fps          | 38.4 Mbps                      | WEBM, MKV                        | N/A                                  |
| GOOGLE VP9 | VP9        | 64×64 pixels to 4096×2304 pixels                                | 60fps          | 80 Mbps                        | WEBM, MKV                        | N/A                                  |
| H.263      | H.263      | SQCIF(128×96)<br>QCIF(176×144)<br>CIF(352×288)<br>4CIF(704×576) | 30fps          | 38.4 Mbps                      | 3GP, MOV, MP4                    | H.263+ not supported                 |

| Type | Decoding | Resolution                       | Max Frame Rate | Max Bit Rate (Ideal Condition) | Format                 | Note |
|------|----------|----------------------------------|----------------|--------------------------------|------------------------|------|
| VC-1 | VC-1     | 48×48 pixels to 1920×1088 pixels | 30fps          | 45 Mbps                        | WMV, ASF, TS, MKV, AVI | N/A  |

## Notes and Cautions

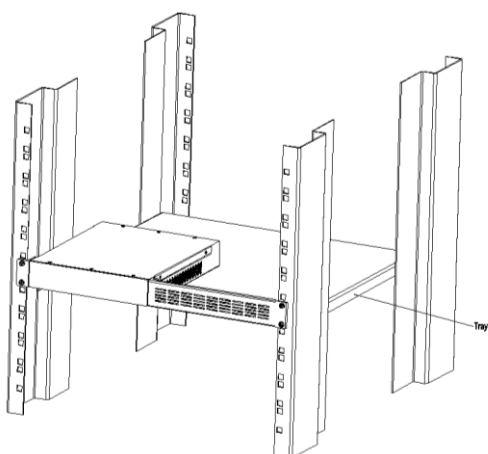
### Notes for Battery

- The battery is not intended to be replaced.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

### Notes for Installation

#### Installation scenario 1:

When the product needs to be installed on the rack, 4 screws at least M5\*12 should be used to fix it. The rack for installation shall bear at least 5kg weight.



#### Note

The connecting piece is not included in the TU20 Pro product package. It needs to be purchased separately.

#### Installation scenario 2:

When the product needs to be hung on the wall, 2 screws at least M4\*12 with an installation distance of 83mm should be used to fix it. The screws shall bear at least 10kg weight.

#### Other Notes and Cautions:

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading – Mounting of the equipment in the rack should be such that a hazardous condition is not

achieved due to uneven mechanical loading.

- **Circuit Overloading** – Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing** – Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

### FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### IC Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1) L'appareil ne doit pas produire de brouillage; 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with Industry Canada radiation exposure limits set forth for an uncontrolled environment.

Cet équipement est conforme à l'exposition aux rayonnements Industry Canada limites établies pour un environnement non contrôlé.

### **Radiation Exposure Statement**

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

### Others

This is Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

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