# ROME EPRIX - 14 APRIL 2018

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|---|---|---|
| **From** | The Stewards of the Meeting | **Bulletin N° 02** |
| **To** | All Competitors and Drivers | |

The Stewards inform all competitors that:

**1 – The attached Michelin Tyre working range** from 12 April 2018 is valid for the 2017-2018 FIA Formula E Championship – Rome ePrix.

**2** - **Summary of mandatory media activities** is attached for your information

**3** – The Stewards inform all competitors with the attached list **Race numbers vs. joker status** with the status after the Punta del Este EPrix

**5** – The Stewards inform all competitors with the attached list **Clarification Note No 5** concerning the Article 23.15

**6** – The Stewards inform all competitors with the attached list **Clarification Note No 6** concerning the Article 37.6

**7** – The Stewards inform all competitors with the attached **Informative Note**.

| | | |
|---|---|---|
| Hans-Joachim Stuck<br>**Chairman of the Panel** | Eric Barabino<br>**Steward (international)** | Paolo Longoni<br>**Steward (national)** |
| **Date: 13 April 2018** | **Time: 12:30** | **Document: 3** |

# MICHELIN FORMULA E

## *Rome ePrix 2018*

## *Michelin Pilot Sport EV2 Tyre working range*

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## 12th April 2018

**To** : FIA, All Formula E teams, Race Director, Stewards, FEH
**Date** : 12th April 2018
**Subject** : Rome ePrix 2018 Michelin Pilot Sport EV2 Tyre working range

Dear Competitors,

Please find below the tyre working range for the Rome ePrix 2018 as per article 25.11 of the sporting regulations

**FORMULE E tyre working range recommendations**

This document defines the tyre working range recommendations applicable to the tyres :
- Pilot Sport EV2 : F146941B/F146942B
- Typhoon : F146991E/F146992E
- Showcar : E146941A/E146942A

Definition :
**Starting** tyre pressure : Pressure measured at all time during the event, when the set of tyres is fitted to the car ready to run.
**Running** pressure : Pressure measured at all time during the event, after running.
Note: The allowed minimum **starting** pressure **do not guarantee** to reach the allowed **running** pressure.

| Pilot Sport EV / Typhoon tyres | | | | | |
|---|---|---|---|---|---|
| **Front** | **Maximum number of kilometers for Front Tyre F146941B / F146991E** | | | | |
| **Starting tyre pressure** | **1.30b minimum** | | | | |
| Camber \ Running pressure | <1.60b | 1.60b | 1.70b | 1.80b | 1.90b |
| Camber higher than -0.5 or lower than -3.5° | 0 km | 0 km | 0 km | 0 km | 0 km |
| Camber from -0.5 to -3.5° included | 0 km | 240 km | 240 km | 240 km | 240 km |
| **Rear** | **Maximum number of kilometers for Rear Tyre F146942B / F146992E** | | | | |
| **Starting tyre pressure** | **1.30b minimum** | | | | |
| Camber \ Running pressure | <1.60b | 1.60b | 1.70b | 1.80b | 1.90b |
| Camber higher than -0.5 or lower than -2.5° | 0 km | 0 km | 0 km | 0 km | 0 km |
| Camber from -0.5 to -2.5° included | 0 km | 240 km | 240 km | 240 km | 240 km |

We remain at your disposal for any further enquiries

Best regards

***MICHELIN MOTORSPORT***

MICHELIN
MOTORSPORT

Date 12 April 2018

FIA FORMULA E CHAMPIONSHIP 2017-18

# ROUND 7 – ROME E-PRIX

**From** Tom Wood – FIA Formula E Media Delegate

**To** Frederic Espinos – FIA Formula E Championship Manager

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## Summary of mandatory media activities

| Date | Time | Activity | Location | Driver |
|---|---|---|---|---|
| Friday | 12:00-12:15 | FIA Press Conference Part 1 | Media Centre | Luca Filippi<br>Sebastien Buemi<br>Edoardo Mortara |
| | 12 :15-12:30 | FIA Press Conference Part 2 | Media Centre | Jean Todt<br>Alejandro Agag<br>Angelo Sticchi Damiani<br>Virginia Raggi |
| | 12:30-13:00 | Media Pen | Outside Media Centre | All drivers |
| | 13:00-13:10 | E-Race Qualifying (A) | Gaming Arena | Antonio Felix da Costa<br>Sam Bird<br>Jose Maria Lopez<br>Mitch Evans<br>Luca Filippi<br>Andre Lotterer<br>Maro Engel |
| | 13:10-13:20 | E-Race Qualifying (B) | Gaming Arena | Tom Blomqvist<br>Lucas di Grassi<br>Alex Lynn<br>Nelson Piquet Jr.<br>Nick Heidfeld<br>Nico Prost<br>Oliver Turvey<br>Edoardo Mortara |
| | 13:20-13:30 | E-Race Qualifying (C) | Gaming Arena | Daniel Abt<br>Jerome D'Ambrosio<br>Felix Rosenqvist<br>Jean-Eric Vergne |
| | 16:45 | Qualifying Group Lottery | Briefing Room | All drivers |
| Saturday | 13:45-14:00 | E-Race | Gaming Arena | Qualifying drivers |
| | 14:00-14:30 | Autograph Session | Podium | All drivers |
| | 15:00-15:10 | Driver Parade | Pit lane | All drivers |
| | 15:40-15:43 | Group photograph | Front of grid | All drivers |
| | 17:25-17:40 | FIA Press Conference | Media Centre | Top 3 drivers |
| | 17:40-18:10 | Media Pen | Outside Media Centre | All drivers |

FIA FORMULA E CHAMPIONSHIP 2017-18

**Race number vs joker status**
**Gearbox, motor, inverter and battery changes**
Status on 17th March 2018

| | | | Round 1&2 - Hong-Kong | Round 3 - Marrakesh | Round 4 - Santiago | Round 5 - Mexico | Round 6 - Punta del Este | Round 7 - Rome | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Lucas di Grassi | Audi Sport ABT Schaeffler | | #1black_Change request<br>1001621_Inverter-joker | | | | | | | | |
| 2 | Sam Bird | DS Virgin Racing | | | #2red_Change request<br>1001639_GBX-joker | | | | | | | |
| 3 | Nelson Piquet Jr. | Panasonic Jaguar Racing | | | | | #3red_Change request<br>6354_GBX-joker<br>#3red_Change request<br>1001960_RESS-joker | | | | | |
| 4 | Edoardo Mortara | Venturi Formula E Team | | | | | | | | | | |
| 5 | Maro Engel | Venturi Formula E Team | | #5black_Change request<br>1001585_MGU-joker | | | | | | | | |
| 6 | José Maria Lopez | Dragon Racing | | | | | | | | | | |
| 7 | Jérôme d'Ambrosio | Dragon Racing | | | | | | | | | | |
| 8 | Nicolas Prost | Renault eDAMS | | | | | | | | | | |
| 9 | Sebastien Buemi | Renault eDAMS | | | | #9black_Change request<br>1001766_GBX Joker | | | | | | |
| 16 | Oliver Turvey | NIO Formula E Team | | | #16black_Change request<br>1001692_Inverter-joker | | | | | | | |
| 18 | Andre Lotterer | Techeetah | | #18red_Change request<br>1001552_GBX-joker<br>#18red_Change request<br>1001550_RESS-joker | | | | | | | | |
| 19 | Felix Rosenqvist | Mahindra Racing | | | | | #19 black_Change request<br>1001884_MGU-joker | | | | | |
| 20 | Mitch Evans | Panasonic Jaguar Racing | | | | | #20red_Change request<br>6353_GBX-joker | | | | | |
| 23 | Nick Heidfeld | Mahindra Racing | | | #23black_Change request<br>1001642_Inverter-joker | #23black_Change request<br>1001813_GBX Joker | | | | | | |
| 25 | Jean-Eric Vergne | Techeetah | | | | | | | | | | |
| 27 | Tom Blomqvist | Andretti Formula E | | | #27black_Change request<br>1001645_GBX-joker | | | | | | | |
| 28 | Antonio Felix da Costa | Andretti Formula E | | | | | #28red_Change request<br>1001942_GBX-joker | | | | | |
| 36 | Alex Lynn | DS Virgin Racing | | #36red_Change request<br>1001543_GBX-joker<br>#36black_Change request<br>1001544_Inverter-joker | | | | | | | | |
| 66 | Daniel Abt | Audi Sport ABT Schaeffler | | #66black_Change request<br>1001546_Inverter-joker | | | | | | | | |
| 68 | Luca Filippi | NIO Formula E Team | | | | | | | | | | |

FEDERATION INTERNATIONALE DE L'AUTOMOBILE

**2017–2018 FIA FORMULA E CHAMPIONSHIP**

**Clarification Note No. 5 – to all FIA Formula E Championship Competitors**

Geneva, 12 March 2018

Dear Competitors,

We are pleased to inform you that the last World Motor Sport Council has approved the addition of the following article to the 2017-2018 FIA Formula E Championship Sporting Regulations for safety reasons, with immediate effect:

**Article 23.15**

**All team personnel carrying out any work on a car in the pit lane when the car is in its pit stop position during a race pit stop (including inside the garage as defined in Article 23.4), must be wearing helmets which meet or exceed the requirements of ECE 22.05 - European motorcycle road helmet, DOT - USA motorcycle road helmet or JIS T8133-2015, class 2 – JPN protective helmets for motor vehicle users.**

We would like to once again draw your attention to Article 4 of Chapter III of Appendix L of the International Sporting Code:

*"Safety Belts: Drivers must be properly restrained in their seat by safety belts in conformity with the technical regulations for the vehicle concerned, at all times during a competition when it is mobile on a circuit, pit lane, special stage or competition course."*

**It is the responsibility of the driver (and the team) to correctly fasten and tighten his safety harness at all times. This will be duly verified by the sporting authorities, including by monitoring the Belt Tension Device on the two shoulders straps as per article 15.6 of the Technical Regulations: *"The BTD will be used to assist the FIA in ensuring that drivers comply with Art. 4, Chapter III of Appendix L of the ISC".***

Yours faithfully,

**Frédéric Bertrand**
**FIA Circuit Racing Championships Director**

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FEDERATION INTERNATIONALE DE L'AUTOMOBILE

**2017–2018 FIA FORMULA E CHAMPIONSHIP**

**Clarification Note No. 6 – to all FIA Formula E Championship Competitors**

Geneva, 13 March 2018

Dear Competitors,

**Please find below a clarification regarding the 2017–2018 FIA Formula E Championship Sporting Regulations.**

## Article 37.6 – Mandatory change of car

***a) The mandatory change of car must take place inside the box allocated to the driver. A maximum of two (2) team personnel can help the driver.***

***b) Before leaving his car, the driver must make sure that the "car ready to move" status is inactive (white indicator and red light off).***

***It is prohibited to activate the "car ready to move" status, with power bus energised (white indicator and red light on), before the driver is seated in his car with his seat belt fastened.***

***c) Before leaving his pit, the driver must fasten and tighten his safety harness and comply with the safety rules. (Article 15.6 of the Technical Regulations and article 4, Chapter III Appendix L of the International Sporting Code).***

***d) Priority is given to cars running in the fast lane.***

***e) Any other pit stops must be made in front of each team's designated pit or location under the responsibility of the designated Team Manager and no reference time will apply.***

For safety reasons, and in order to ensure that the safety harness is consistently used in compliance with Article 4, Chapter III of Appendix L of the International Sporting Code, it is mandatory to respect the following requirements:

- Drivers must be properly restrained in their seat by safety belts at all times when the car is moving. It is prohibited to unbuckle their safety belts when the car is moving.
- It is prohibited to remove the steering wheel when the car is moving.
- It is prohibited to buckle any safety belts before the driver is seated in his car.
- The Belt Tension Device must only be activated when the driver is seated in his car with his seat belt fastened.

The Sporting Authorities will use all the means and images available to ensure that the rules are respected. From the Roma EPrix, one camera will be installed on top of each car. Its installation and operation will be each team's responsibility.

Yours faithfully,

**Frédéric Bertrand**
**FIA Circuit Racing Championships Director**

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**2017–2018 FIA FORMULA E CHAMPIONSHIP**

**Informative Note – to all FIA Formula E Championship Competitors**

Geneva, 05 April 2018

Dear Competitors,

As previously stated in Clarification Note No.6, cameras are to be installed in each garage from the Rome ePrix onwards to control the mandatory change of car. Video footage from these cameras will be used by FIA officials and displayed in Race Control, and could be reviewed and analysed after the race if necessary.

The cameras will be fitted and connected by the FIA supplier (Al Kamel Systems) at the beginning of each event; however its operation shall be the responsibility of the team, as it is currently for the garages cameras. Each team must provide the Camera Control Operator with access to the cameras whenever necessary. In order to avoid any doubts, the operator name will be published in each race Visa (as defined in article 9 of the 2017-2018 FIA Formula E Championship Sporting Regulations).

Two cameras will be provided per team, which must be installed above each of the OUT cars during the car change. Technical details and dimensions of the camera are shown in Appendix A of this note.

The camera must be positioned such that its field-of-view (FOV) provides an unobstructed view of the full car change sequence, including the cockpit opening of both cars, as shown by the example in Figure 1. The camera must be positioned as close as practical to a location directly above the OUT car cockpit, such that the view of the cockpit is not blocked by the top-deck or roll hoop of the car.

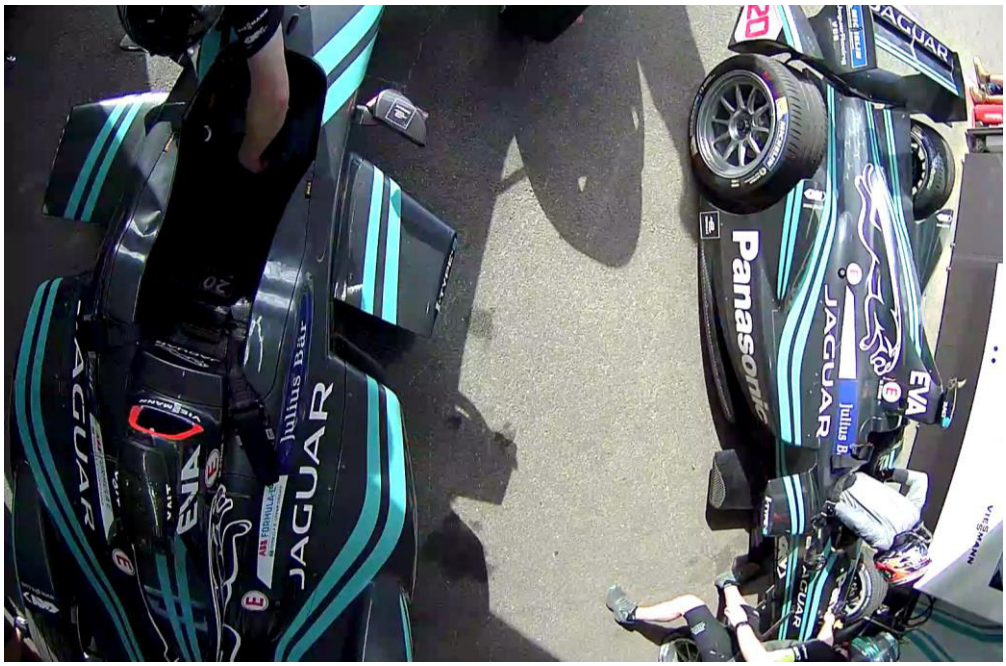


**Figure 1. FOV requirements for FIA cameras installed above each OUT car.**

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Some teams will require modifications to their gantry in order to position the camera in the required position, which may include an extension arm to which the camera is attached. It is solely the responsibility of each team to ensure that the modification of the gantry and the fixation of the camera does not pose any additional hazard(s) to drivers and team members at any point during the event.

Teams may be requested to adjust the position of the camera for the subsequent rounds of the season, especially in cases where the garage layouts differ from the previous event. Please consider this when defining your gantry modifications and camera fixation.

Operation (network connection, recording, submission to race control etc.) and general maintenance of the cameras will be provided by the FIA supplier (Al Kamel Systems).

I thank you in advance for your cooperation

Yours faithfully,

**Frédéric Bertrand**
**FIA Circuit Racing Championships Director**

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**Appendix A – Camera Technical Details and Dimensions**

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Panasonic
BUSINESS

# HD Weatherproof Network Camera
# WV-SPW532L


*i-VMD Type2 : Intruder Detection / Loitering Detection / Direction Detection / Scene Change Detection / Object Detection / Cross Line Detection

## Full HD / 1,920 x 1,080 30 fps H.264 Weatherproof Network Camera

### Key Features

- **1,080p Full HD** images up to **30 fps**
- Approximate 1/3 inches, high sensitivity MOS image sensor
- **Multiple H.264 (High profile) streams (max. 4 streams)** and JPEG streams ensure simultaneous real time monitoring and high resolution recording.
- Wide Dynamic Range and ABS (Adaptive Black Stretch) technologies deliver wider dynamic range compared with conventional cameras.
- **Smart coding Technology :** Group of Pictures (GOP) control function removes unnecessary information from the frame for realizing efficient encoding. With the latest bitrate reducing technology, GOP control, 3D-MNR(Multi process Noise Reduction) and FDF(Frequency Divided Filter), the network bandwidth and the disk space of recorder can be saved.
- High sensitivity with Day/Night (ICR*) function : 0.07 lx (Color), 0.01 lx (B/W) at F1.6 *ICR: IR Cut filter Removal
- **IR LED** equipped : The equipped infrared LED makes it possible to take pictures at zero lx.
- **IR LED** is controlled to match the environment, thereby the camera provides clear images of human faces without white blur.
- **ABF (Auto Back Focus)** ensures easy installation.
- Newly developed lens with aperture control function realizes the best focus in any environment.
- **VIQS** (Variable Image Quality on Specified area) technology allows the designated **eight areas** to retain higher image quality while the excluded area will have a decreased image quality, which enables to use lower image file size and bit rate.
- Cropping function enables to provide whole image and the part image simultaneously. Up to 4 image capture areas can be specified, and it is also possible to control the sequence.
- Face Wide Dynamic Range technology ensures clear face image.
- Lens distortion compensation for the distorted images can be adjusted 256 steps.
- Electronic sensitivity enhancement : Auto (Up to 16/30s) / OFF
- Selectable light control modes : **Outdoor scene,Indoor scene (50 Hz) / Indoor scene (60 Hz), Fix shutter** Indoor scene (50 Hz/60 Hz) : Flicker caused by fluorescent lightning will be automatically compensated.
- 3x extra optical zoom at 640 x 360 resolution
- 2x, 4x digital zoom controlled by browser
- VMD (Video Motion Detection) with 4 programmable detection areas, 15 steps sensitivity level and 10 steps detection size.
- Privacy Zone can mask up to 8 private areas, such as house windows and entrances/exits.
- Camera title display : Up to 20 alphanumeric characters on the browser
- JPEG Image compression ratio can be changed by alarm so that higher quality image can be provided.
- Prioritized stream control : One of the video streams can be prioritized when multiple recorders or client PCs are accessing the camera so that the recorder or the client PC can maintain the frame rate.
- **SDXC/SDHC/SD Memory card slot** for manual recording (H.264 / JPEG), alarm recording (H.264 / JPEG) and backup upon network failure (H.264 / JPEG). Realize long-term recording and auto backup function.
- Face detection function detects the position of human face and the information is sent by XML or video stream. (Extension Software)
- Can be added new intelligent extension software in addition to built-in VMD (Video Motion Detection), alarm function.
- **Fog compensation function** equipped as standard.
- **HLC (High Light Compensation)** technology reduces strong light sources such as vehicle headlights to prevent camera being blinded.
- **SCC (Super Chroma Compensation)** function realizes a better color reproducibility even in low illumination.
- H.264 max. bit rate/client and Total bit rate control allows flexible network traffic management. Frame rate priority mode controls bit rate and compression ratio to provide the specified frame rate.
- Internet mode : H.264 images can be transmitted over HTTP protocol.
- Multi-language : English / Italian / French / German / Spanish / Portuguese / Russian / Chinese / Japanese
- IPv4/IPv6 protocol supported
- Supports SSL, DDNS (viewnetcam, RFC2136)
- Still images (JPEG) can be viewed on mobile phones via Internet.
- ONVIF compliant model
- IP66 rated water and dust resistant. Compatible with IEC60529 measurement standard,Type 4X(UL50), NEMA 4X compliant.

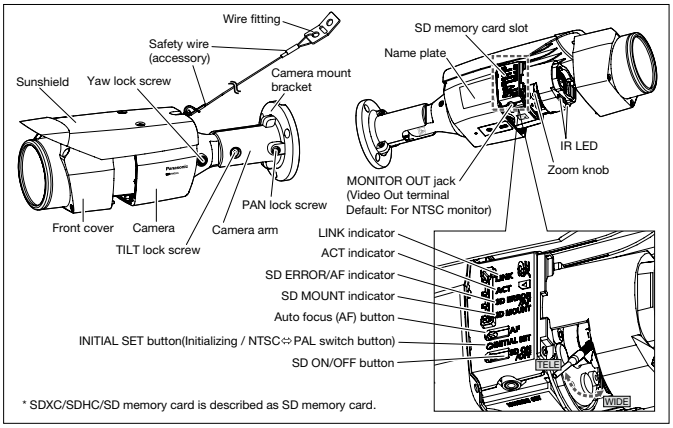
## Specifications

| | | | |
|---|---|---|---|
| **Camera** | Image Sensor | | Approx. 1/3 type MOS image sensor |
| | Scanning Mode | | Progressive scan |
| | Scanning Area | | 5.35 mm (H) x 3.34 mm(V) {7/32 inches (H) x 1/8 inches (V)} |
| | Minimum Illumination | | Color : 0.07 lx, BW : 0.01 lx (F1.6, Maximum shutter : Max. 1/30s, Gain : On(High))<br>BW : 0 lx (F1.6, Maximum shutter : Off(1/30 s), Gain : High, when the IR LED is lit)<br>Color : 0.005 lx, BW : 0.0007 lx (F1.6, Maximum shutter : Max. 16/30s, Gain : On(High)) *1 |
| | IR LED Light | | Off / Auto(High / Mid / Low) |
| | IR LED irradiation distance | | Approx. 30 m {98.43 feet} |
| | White Balance | | AWC (2,000 - 10,000 K), ATW1 (2,700 - 6,000 K), ATW2 (2,000 - 6,000 K) |
| | Light Control Mode | | Outdoor scene / Indoor scene (50 Hz) / Indoor scene (60 Hz) / Fix shutter |
| | Shutter Speed | | OFF(1/30), 3/100, 3/120, 2/100, 2/120, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 |
| | Wide Dynamic Range | | On / Off |
| | Face wide dynamic range | | On / Off (only when Wide Dynamic Range : On) |
| | Adaptive Black Stretch | | On / Off (only when Wide Dynamic Range : Off) |
| | Fog compensation | | On / Off (only when Wide Dynamic Range / Adaptive black stretch : Off) |
| | High light compensation(HLC) | | On / Off (only when Wide Dynamic Range / Adaptive black stretch : Off) |
| | AGC | | On (Low) / On(Mid), On(High) / Off |
| | Maximum shutter | | max. 1/1000 s, max. 1/500 s, max. 1/250 s, max. 1/100 s, max. 1/60 s, max. 2/100 s, max. 2/120 s, max. 1/30 s, max. 2/30 s, max. 4/30 s, max. 6/30 s, max. 10/30 s, max. 16/30 s |
| | Day/Night (ICR) | | Off / On / Auto1 (Normal) / Auto2 (IR Light) / Auto3 (SCC) |
| | Digital Noise Reduction | | High / Low |
| | Video Motion Detection | | 4 areas, Sensitivity : 15 steps, Detection size : 10 steps |
| | Privacy Zone | | Up to 8 zones |
| | VIQS | | Up to 8 zones |
| | Camera Title (OSD) | | Up to 20 characters (alphanumeric characters, marks) |
| | Focus Adjustment | | ABF / MANUAL (Html only) |
| | Lens Distortion Compensation | | 256 steps |
| **Lens** | Vari Focal Length | | 2.8 mm – 10 mm {1/8 inches – 13/32 inches} |
| | Angular Field of View | | [16 : 9 mode] Horizontal : 31 ° (TELE) - 112 ° (WIDE)<br>Vertical : 17 ° (TELE) - 60 ° (WIDE)<br>[4 : 3 mode] Horizontal : 26 ° (TELE) - 91 ° (WIDE)<br>Vertical : 19 ° (TELE) - 67 ° (WIDE) |
| | Maximum Aperture Ratio | | 1 : 1.6 (WIDE) - 1 : 3.4 (TELE) |
| | Focusing Range | | 0.3 m - ∞ |
| **Adjusting Angle** (Camera mount bracket) | Ceiling mounting | | Horizontal : ±180° (PAN rotation part)<br>Vertical : 0° to 90° (TILT rotation part)<br>Yaw : -190° to +100° (YAW rotation part) |
| | Wall mounting | | Horizontal : ±90° (TILT rotation part)*<br>Vertical : ±90° (TILT rotation part)*<br>Yaw : -190° to +100° (YAW rotation part) |
| **Browser GUI** | Cropping | | Off / JPEG(1) / JPEG(2) / JPEG(3) / H.264(1) / H.264(2) / H.264(3) / H.264(4) / H.264(all)<br>Alarm action On/ Off |
| | Camera Control | | Brightness, AUX On / Off |
| | Display Mode | | Spot, Quad : Image from 16 cameras can be displayed in 4 different Quad screens or 16 split screen (JPEG only). 20 characters camera title available. |
| | Digital Zoom | | 1x, 2x, 4x controlled by browser GUI |
| | Camera Title | | Up to 20 alphanumeric characters |
| | Clock Display | | Time : 12H/24H, Date : 5 formats on the browser, Summer time (Manual) |
| | Alarm Control | | Reset |
| | One Shot Capture | | A still picture will be displayed on a newly opened window. |
| | SD Memory Data Download | | Still or motion Images recorded in the SDXC/SDHC/SD memory card can be downloaded. |
| | GUI / Setup Menu Language | | English, Italian, French, German, Spanish, Portuguese, Russian, Chinese, Japanese |
| | System Log | | Up to 100 (Internal)<br>Up to 4,000 (SDXC/SDHC/SD memory when the recording format is set to JPEG.) error logs |
| | Supported OS *2 | | Microsoft® Windows® 8.1, Microsoft® Windows® 8,<br>Microsoft® Windows® 7,Microsoft® Windows Vista® |
| | Supported Browser | | Windows® Internet Explorer® 11 (32 bit),<br>Windows® Internet Explorer® 10 (32 bit),<br>Windows® Internet Explorer® 9 (32 bit),<br>Windows® Internet Explorer® 8 (32 bit),<br>Windows® Internet Explorer® 7 (32 bit),<br>Safari, Google Chrome, Mozilla Firefox |
| **Network** | Network IF | | 10Base-T / 100Base-TX, RJ45 connector |
| | Image Resolution | | **•2 mega pixel [16 : 9](30 fps mode)**<br>H.264(1), H.264(2)<br>1,920 x 1,080 / 1,280 x 720 / 640 x 360 / 320 x 180 / 160 x 90<br>H.264(3), H.264(4)<br>1,280 x 720 / 640 x 360 / 320 x 180 / 160 x 90<br>**•2 mega pixel [4 : 3](30 fps mode)**<br>H.264(1), H.264(2)<br>1,600 x 1,200 / 1,280 x 960 / 800 x 600 / VGA / 400 x 300 / QVGA / 160 x 120<br>H.264(3), H.264(4)<br>1,280 x 960 / 800 x 600 / VGA / 400 x 300 / QVGA / 160 x 120<br>**•3 mega pixel [4 : 3](30 fps mode)** * Used by super resolution technology<br>H.264(1), H.264(2)<br>2,048 x 1,536 / 1,280 x 960 / 800 x 600 / VGA / 400 x 300 / QVGA / 160 x 120<br>H.264(3), H.264(4)<br>1,280 x 960 / 800 x 600 / VGA / 400 x 300 / QVGA / 160 x 120 |
| | H.264 *3 | Transmission Mode | Constant bitrate / VBR / Framerate priority / Best effort / Advanced VBR |
| | | Frame Rate | 1 / 3 / 5 / 7.5 / 10 / 12 / 15 / 20 / 30 fps |
| | | Bit Rate/Client | 64 / 128 / 256 / 384 / 512 / 768 / 1,024 / 1,536 / 2,048 / 3,072 / 4,096 / 6,144 / 8,192 / 10,240 / 12,288 / 14,336 / 16,384 / 20,480 / 24,576 / 30,720*/ 40,960* kbps |
| | | Image quality (Constant bit rate/Best effort) | Low(Motion priority) / Normal / Fine(Image quality priority) |
| | | Refresh interval | 0.2 / 0.25 / 0.33 / 0.5 / 1 / 2 / 3 / 4 / 5s |
| | | Transmission Type | Unicast / Multicast |
| | JPEG | Image Quality | 10 steps |
| | | Refresh interval | 0.1 fps - 30 fps<br>(JPEG frame rate will be restricted when displaying both JPEG and H.264 images.) |
| | | Transmission Type | Pull / Push |
| | Total Bit Rate | | 64 / 128 / 256 / 384 / 512 / 768 / 1,024 / 2,048 / 4,096 / 8,192 kbps / Unlimited |
| | Supported Protocol | | IPv6 : TCP/IP, UDP/IP, HTTP, HTTPS, RTP, FTP, SMTP, DNS, NTP, SNMP, DHCPv6, MLD, ICMP, ARP<br>IPv4 : TCP/IP, UDP/IP, HTTP, HTTPS, RTSP, RTP, RTP/RTCP,FTP, SMTP, DHCP, DNS, DDNS, NTP, SNMP, UPnP, IGMP, ICMP, ARP |

| | | |
|---|---|---|
| **Network** | FTP Client | Alarm image transmission, FTP periodic transmission (When the FTP transmission is failed, backup on an optional SDXC/SDHC/SD memory card is available.) |
| | No. of Simultaneous Users | Up to 14 users (Depends on network conditions) |
| | SDXC/SDHC/SD Memory Card (Option)<br>* Manufactured by Panasonic (SD speed class 4 or higher)<br>* Use the SD memory card that complies with UHS-1 (Ultra High Speed-1) in the case of SD Speed Class 10. | H.264 recording :<br>Manual REC / Alarm REC (Pre/Post) / Schedule REC /<br>Backup upon network failure Compatible (JPEG only)<br>JPEG recording :<br>Manual REC / Alarm REC (Pre/Post) / Backup upon network failure<br>Compatible SD (SDHC/SDXC) card:<br>Panasonic 2 GB, 4 GB*, 8 GB*, 16 GB*, 32 GB*, 64 GB**, 128 GB** model<br>*SDHC card, ** SDXC card (except miniSD card and microSD card) |
| | Cellular Phone Compatibility | JPEG image, AUX control (by access level) |
| | Mobile Terminal Compatibility | iPad, iPhone, iPod touch (iOS 4.2.1 or later), Android™ mobile terminal |
| **Alarm** | Alarm Source | VMD, Command alarm |
| | Alarm Actions | SDXC/SDHC/SD memory recording, E-mail notification,<br>HTTP alarm notification Indication on browser, FTP image transfer,<br>Panasonic protocol output |
| | Alarm Log | With SDXC/SDHC/SD memory card : Up to 50,000 logs for each SD memory card |
| | Schedule | Alarm / VMD / Access permission / H.264 recording / Scene file |
| **Input / Output** | Monitor Output (for adjustment) | VBS : 1.0 V [p-p]/75 Ω, composite, RCA jack<br>An NTSC or PAL signal can be outputted from camera<br>(either press the INITIAL SET switch quickly (within 1 second) or<br>use software to select either NTSC or PAL signal). |
| **General** | Safety | UL (UL60950-1), C-UL (CAN/CSA C22.2 No.60950-1), CE, IEC60950-1 |
| | EMS | FCC (Part15 ClassA), ICES003 ClassA, EN55022 ClassB, EN55024 |
| | Power Source and Power Consumption | When IR LED is On<br>PoE (IEEE802.3af compliant) : DC 48 V / 190 mA / Approx. 9.12 W (Class 0 device) |
| | Ambient Operating Temperature | –30 °C to +50 °C (–22 °F to 122 °F) |
| | Ambient Operating Humidity | 10 to 90 % (no condensation) |
| | Water and Dust Resistance | IP66, IEC60529 measuring standard compatible, Type 4X(UL50), NEMA 4X compliant |
| | Dimensions<br>* Installing using the base bracket | 95 mm (W) x 99 mm (H) x 326 mm (L)<br>{3-3/4 inches (W) x 3-57/64 inches (H) x 1ft 27/32 inches (L)} |
| | Mass (approx.) | Approx. 1.4 kg {3.1 lbs} |
| | Finish | Main body : Aluminum die cast, light gray<br>Front cover section clear part : Clear polycarbonate resin |

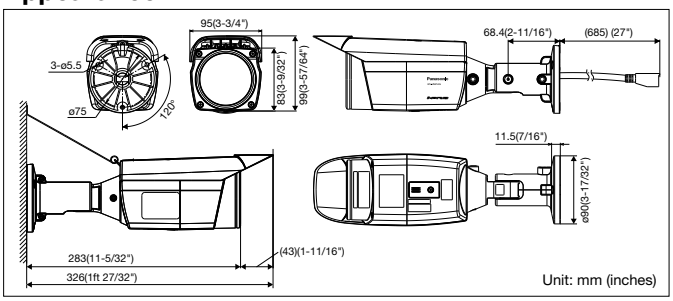
*1 Converted value
*2 Refer to "Notes on Windows Vista® / Windows® 7 / Windows® 8 / Windows® 8.1" on the provided CD-ROM for further information about system requirements for a PC and precautions when using Microsoft® Windows® 8.1 or Microsoft® Windows® 8 or Microsoft® Windows® 7 or Microsoft® Windows Vista®.
*3 Transmission for 4 streams can be individually set.

## Part Names and Functions




* SDXC/SDHC/SD memory card is described as SD memory card.

## Appearance




Unit: mm (inches)

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**Important**
– Safety Precaution: Carefully read the Important Information, Installation Guide and operating instructions before using this product.
– Panasonic cannot be responsible for the performance of the network and/or other manufacturers' products used on the network.

• Masses and dimensions are approximate. • Specifications are subject to change without notice.

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