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SONY

3-CCD Color Video Camera

# DXC-990/990P



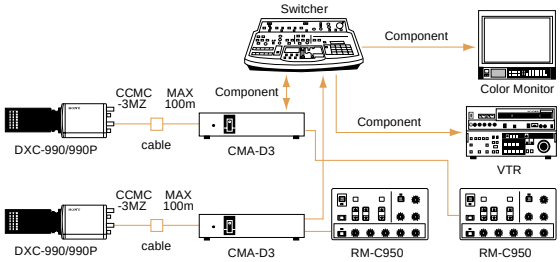

ExwaveHAD™

The Sony DXC-990/990P is a 1/2 type DSP 3-CCD color video camera which incorporates ExwaveHAD™ technology – a new Sony technology that greatly improves camera sensitivity (F11 at 2000 lx) while reducing smear.
The DXC-990/990P not only inherits all of the advanced functions of its predecessor, the DXC-950/950P, but also includes improved technology and innovative features for versatile operation in the same body size. Allowing use of a high quality Bayonet mount lens, and providing a resolution of 850 TV lines and high S/N ratio, the DXC-990/990P is ideal for applications such as microscopy, industrial inspection and remote camera systems where picture accuracy and detail are important. Incorporating new 10-bit DSP technology, a user friendly on-screen menu allows for simple control of various features including a DynaLatitude™ function, Partial Enhance, and a wide selection of Automatic Exposure (AE) modes.

# With high picture quality and so many functions, the DXC-990/990P is the ideal choice for a variety of applications

## Remote Camera System



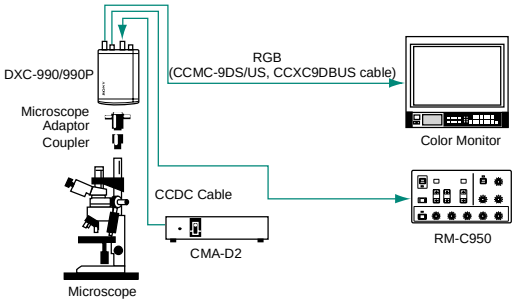



### Useful DXC-990/990P functions include:

Motorized remote control lens, Selectable AE speed, User-defined AE area

## Microscopy

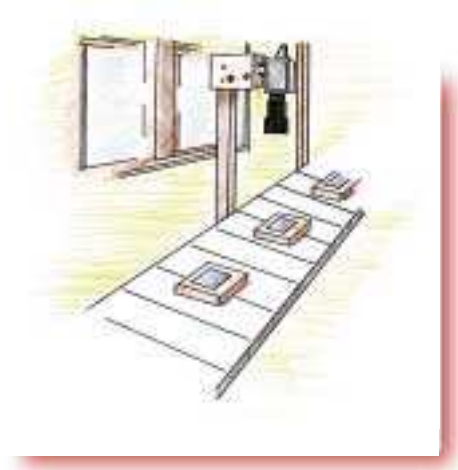


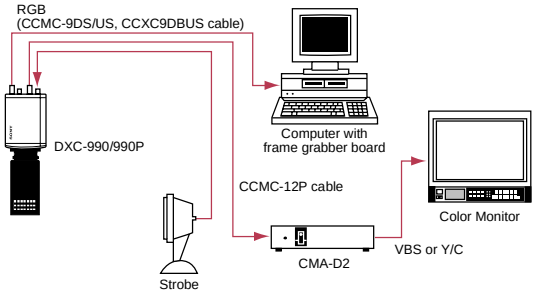



### Useful DXC-990/990P functions include:

DynaLatitude, Digital Detail, Partial Enhance, Color Shading Compensation

## Industrial Inspection






### Useful DXC-990/990P functions include:

Strobe trigger function, WEN output, RGB sync, RS-232C Interface, Extended Genlock (VBS GENLOCK and HD/VD In/Out)

# Features

## Superior Picture Quality – New ExwaveHAD™ CCDs

The DXC-990/990P incorporates newly developed 1/2 type IT (Interline Transfer) ExwaveHAD technology. Inheriting the unique sensing technology of the DXC-950/950P, the DXC-990/990P attains a high sensitivity of F11 at 2000 lx while the improved HAD sensor structure drastically reduces smear level. This permits images of the highest quality to be captured in difficult lighting conditions. With the high packing density of these CCD image sensors and their accurate spacial offsetting, a remarkably high horizontal resolution of 850 TV lines is achieved. The combination of ExwaveHAD technology, improved electronic circuitry and advanced video processing results in a high signal-to-noise ratio of 63 dB (NTSC) and 62 dB (PAL).

## Picture Contrast Controls

### DynaLatitude Function

Automatically adjusts contrast corresponding to the brightest signal level of the entire image. Clear images can be captured if both bright and dark areas exist within the image.


OFF


ON

(Simulated picture)

### DCC+ (Dynamic Contrast Control Plus)

Avoids hue factor distortion that can occur when subjects are very bright. DCC+ also automatically adjusts the knee point according to the contrast of the image.


OFF


ON

(Simulated picture)

### Black Stretch

Black stretch/compress enhances the gradation of the dark area by stretching or compressing the range of the image.

### Knee Control

By adjusting the knee, a knee point and knee slope are set so that the highlighted areas of the picture can be clearly reproduced.
High/Normal/Low switchable

## On-Screen Menu

The on-screen menu feature allows for quick and easy picture adjustments while viewing the image. All camera control functions are accessible from the side panel of the camera or through the optional RM-C950.

## DSP (Digital Signal Processing)

The DXC-990/990P incorporates a new Sony 10-bit DSP technology.
DSP enables a variety of enhancement features and increases picture reliability that cannot be achieved with analog signal processing.
The DXC-990/990P features several DSP functions for powerful picture controls.

## Picture Enhancement Controls

### Digital Detail

Adjusts the sharpness of the object outline with minimal noise.
This feature also enables horizontal detail frequency control.

### Linear Matrix

Provides sophisticated electronic adjustment for accurate color reproduction by adjusting color saturation and hue.


OFF


STANDARD


R.ENHANCE


G.ENHANCE


B.ENHANCE

### Partial Enhance

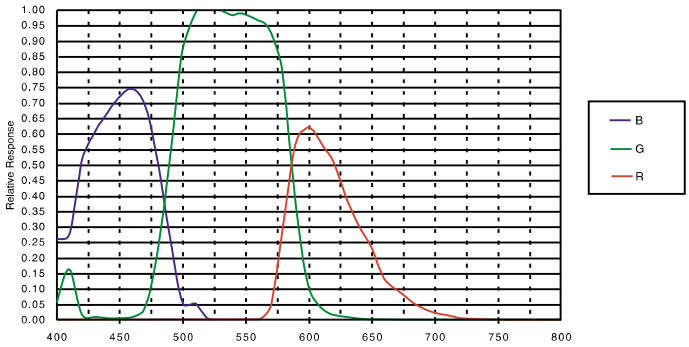
Allows a particular color to be selected, and its hue, saturation and detail altered. In addition, the detail produced by the high resolution of the camera can be softened or emphasized in certain parts of the image by the Partial Enhance function.


OFF


ON

### Characteristics of Spectral Sensitivity of DXC-990 & DXC-990P

(This includes CCD, PRISM and Optical Filter Data)



## AE(Automatic Exposure)

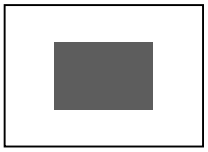
AE automatically controls the level of brightness by varying the exposure times. This is done by combining the CCD IRIS® function, AGC (Automatic Gain Control), and Auto Iris function of the lens. The DXC-990/990P is equipped with a number of convenient AE modes.

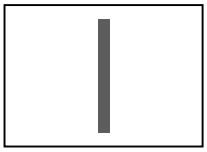
### AE Level
Adjusts the standard brightness level by up to + / - 0.5 F-stop in a lens iris.

### AE Speed
Selectable AE conversion speed to suit applications under varying lighting conditions.

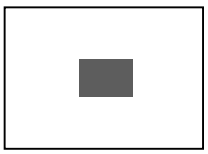
### AE Area
AE Area is a light metering system that includes six different modes.


Multi


Mid


Slit


Large


Spot


Manual

## Electronic Shutter Functions

### Variable speeds
A variable speed electronic shutter is built into the CCD imager, making it possible to capture blur-free, clear images of high speed moving objects. The DXC-990/990P features 11 different shutter speeds (OFF to 1/100,000), including flickerless mode.

### Clear Scan™ Function
The Clear Scan feature eliminates the horizontal bands that appear across the screen when shooting a computer display. This is achieved by matching the camera shutter speed with the display scanning frequency.

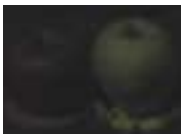
### CCD IRIS Function
When the level of incoming light exceeds the auto iris adjustment range, the CCD IRIS function automatically reduces the exposure in a range equivalent to 10 F-stops.

# Other Features

### Bayonet mount
The DXC-990/990P is equipped with a bayonet mount so it can adapt various kinds of high quality, professional lenses. The strong points of bayonet mount lenses include higher sensitivity and lower color shading compared with C-mount lenses. A hot-shoe connection is also provided to eliminate the need for a lens-to-camera interconnecting cable, providing easy remote control of zoom, focus and iris functions.

### Scene Files and User Files
Scene Files: The preset files are set to accommodate four different situations (Standard/Microscope/Full Auto/Strobe). Copying the settings between two files is also possible (File A/B).
User Files: Allows user to set two custom parameters in the menu for instant recall.

### Hyper Gain (+30 dB)
High sensitivity mode used for shooting objects in very low light conditions.


GAIN (0 dB)


GAIN (18 dB)


HYPER GAIN

### Color Shading compensation
Allows for verification of color on a microscope.

### RGB, component, Y/C and composite video outputs

### RS-232C controllable
Easy control and operation of the camera by an external computer is possible.

### Field or Frame integration mode
The DXC-990/990P has the ability to switch between Field or Frame CCD integration modes. Field integration is effective for capturing moving objects, while Frame integration is ideal for capturing still images.

### White Balance modes
AWB, ATW-Normal/Wide, MANU, Preset 3200K/5600K

### Extended Genlock (VBS Genlock and HD/VD in/out)
Allows for synchronization of signals with frame grabber boards.

### Synchronization capabilities (Strobe function, WEN output)
Realizes full vertical resolution of fast moving objects.

# Rear panel image and description

## Optional Accessories



| Models | VCL-707BXM | VCL-714BXEA | VCL-717BXEA | YH12x48KTSB (by Canon) | YH18x67KTSB (by Canon) | S17X66BMD (by Fujinon) |
|---|---|---|---|---|---|---|
| Mount | Bayonet | Bayonet | Bayonet | Bayonet | Bayonet | Bayonet |
| Focal length | 7.5-52.5 mm | 7.5-105 mm | 7-119 mm | 4.8-58 mm | 6.7-121 mm | 6.6-112 mm |
| Zoom ratio | 7x | 14x | 17x | 12x Wide Angle | 18x | 17x |
| Zoom control | Manual | Remote | Remote | Remote | Remote | Remote |
| Focus control | Manual | Remote | Remote | Remote | Remote | Remote |
| Iris control | Manual | Remote | Remote | Remote | Remote | Remote |
| Maximum aperture ratio | 1 : 1.6 | 1 : 1.4 | 1 : 1.4 | 1 : 1.5 (44.6 mm)<br>1 : 1.95 (58 mm) | 1 : 1.4 (91 mm)<br>1 : 1.85 (121 mm) | 1 : 1.5 (90 mm) |
| Minimum object distance | 0.3 mm | 1.1 mm | 1.0 mm | 0.4 mm | 0.9 mm | 0.9 mm |
| Macro | Not applicable | Applicable | Not Applicable | Applicable | Applicable | Applicable |
| Filter size | M58 x 0.75 mm | M72 x 0.75 mm | M86 x 1.0 mm | 105 mm P1.0 | 82 mm P0.75 | 82 mm P0.75 |
| Mass | 560 g (1 lb 4 oz) | 1.13 kg (2 lb 6 oz) | 1.7 kg (3 lb 12 oz) | 1.73 kg (3 lb 13 oz) | 1.4 kg (3 lb 1 oz) | 1.3 kg |
| Dimensions | 60 (dia.) x 125 (L) mm (2 3/8 x 5 inches) | 110 (dia.) x 185.9 (L) mm (4 3/8 x 7 3/8 inches) | 107 (W) x 117 (H) x 181.5 (D) mm (4 1/4 x 4 5/8 x 7 1/4 inches) | 162.2 (W) x 101 (H) x 211.7 (L) mm (6 1/2 x 4 x 8 3/8 inches) | 114.5 (W) x 93 (H) x 117.8 (L) mm (4 5/6 x 3 3/4 x 7 inches) | 111.5 (W) x 82.5 (H) x 179.5 (L) mm |
| Notes | – | Zoom/Focus/Iris functions can be remotely controlled from the RM-C950. | | | | |

### CMA-D2/D2MD
Standard Camera Adaptor
- Supplies DC power and transmits video/sync signal between the adaptor and the DXC-990/990P with CCMC 12-pin multi-core cable
- Complies with medical safety standard (CMA-D2MD Only)
- Dimensions: 210 (W) x 50 (H) x 200 (D) mm (8 3/8 x 2 x 7 7/8 inches)



- Max. cable length: 25 m with CCMC-12P25 cable

### CMA-D3
Camera Adaptor for cable extension
- Supplies DC power and transmits video/sync signal between the adaptor and the DXC-990/990P with CCZ-A cable and CCMC-3MZ cable.
- Connects with optional RM-C950 remote control unit
- AC IN/DC IN
- Composite, Y/C, RGB or component video signal output



- Dimensions: 210 (W) x 44 (H) x 210 (D) mm (8 3/8 x 1 3/4 x 8 3/4 inches)
- Max. cable length: 100 m with CCZ-A100 cable

### RM-C950
Remote Control Unit
- Full remote control of the DXC-990/990P camera functions and lens zoom/focus/iris functions via RS-232C
- Dimensions: 212 (W) x 41 (H) x 132 (D) mm (8 3/8 x 2 5/8 x 5 1/4 inches)



### LO-32BMT
2/3-inch Lens Mount Adaptor



### CCMC-12P02/US, 12P05/US, 12P10/US, 12P25/US
12-pin Multi Cable (2/5/10/25 m)



### CCDC-5/US, 10/US, 25/US, 50A/100A
DC Cable (5/10/25/50/100 m)



### CCXC-9DDUS
9-pin D-sub Cable
(5m, 9-pin D-sub <–> 9-pin D-sub)



### CCXC-9DBUS
9-pin D-sub Cable
(5m, 9-pin D-sub <–> BNCs (R/G/B/SYNC/VBS))



### CCMC-9DS/US
9-pin D-sub Cable
(5m, 9-pin D-sub <–> BNCs (R/G/B/SYNC), DIN 4-pin (Y/C))



### CCMC-3MZ
Camera Cable for use with CMA-D3
(3m, for CMA-D3 connection,
Capable of connecting to the
CCZ-A2/A5/A25/A50/A100 cables,
CCZZ-1E interconnection adaptor is supplied)



## Specifications

| | |
|---|---|
| Pick-up device | 1/2 type IT (Interline Transfer) ExwaveHAD CCD |
| Effective picture elements | DXC-990: 768 (H) x 494 (V) DXC-990P: 752 (H) x 582 (V) |
| Sensing area | 6.4 x 4.8 mm |
| Scanning system | 1/2 type interlaced |
| Horizontal frequency | 15.734 kHz |
| Vertical frequency | 59.94 Hz |
| Sync system | Internal or external with VBS, HD/VD |
| Horizontal resolution | 850 TV lines |
| Sensitivity | F11 (2000lx) |
| Minimum illumination | 1lux (F1.4, GAIN: HYPER) |
| S/N ratio | 63 dB (NTSC)/62 dB (PAL) |
| Gain | STEP/AGC (0-24 dB)/HYPER |
| Shutter speed | 0.5 - 1/100,000 s |
| Lens mount | Bayonet mount |
| AE area | Multi/Large/Medium/Spot/Slit/Manual |
| AE level | Variable |
| AE speed | Fast/Mid/Slow selectable |
| AE detect | Average/Peak selectable |
| Contrast effect | Manual/DynaLatitude/DCC+ selectable |
| Knee point | High/Normal/Low selectable |
| Black stretch | Variable |
| Gamma | On/Off |
| Pedestal | Master, R/B manual adjustable |
| Black balance | ABB |
| White balance | AWB/ATW normal/ATW wide/Manual/3200K/5600K selectable<br>AWB or ATW R/B paint, manual R/G gain |
| ATW area | Normal/Manual |
| ATW speed | Slow/Mid/Fast |
| Detail level | On (Variable)/Off |
| Detail frequency | High/Mid/Low |
| Linear matrix | On/Off |
| Linear matrix mode | STANDARD/R Enhance/G Enhance/B Enhance/Manual Selectable |
| Partial enhance | All/In/Out |
| CCD integration mode | Field/Frame |
| Shading compensation | On/Off (manual) |
| Trigger polarity | Positive edge trigger/Negative edge trigger selectable |
| Baud rate | 19200/9600/4800/2400/1200 selectable |
| Sync | RGB/G/OFF |
| Trigger | On/Off |
| User file | A/B |
| Scene file | Standard/Microscope/Full Auto/Strobe/File AorB |
| Output signals | VBS, RGB/SYNC, Y/C,Y/R-Y/B-Y |
| Serial data | RS-232C |
| Operational temperature | -5°C to 45°C (23°F to 113°F) |
| Storage temperature | -20°C to 60°C (-4°F to 140°F) |
| Power requirements | DC 10.5 V to 15.0 V |
| Power consumption | Approx. 8.0 W |
| Dimensions | 2 7/8 x 2 7/8 x 4 7/8 inches (70 x 72 x 123.5) |
| Weight | 1 lb 6 oz (630 g) |
| Connectors | RGB/SYNC (9pin D-sub), DC IN/VBS (12pin), VIDEO OUT (BNC),<br>TRIGGER IN (BNC),REMOTE (8 pin mini DIN), GEN LOCK IN (BNC),<br>LENS (6pin) |

## Supplied accessories

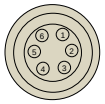
| | |
|---|---|
| | Lens mount cap, Stopper mount, Operation instruction manual,<br>Panel sheet for RM-C950 |

## Optional accessories

| | |
|---|---|
| Camera adaptor | CMA-D2/D2MD, CMA-D3 |
| Camera cable | CCMC-12P02/US, 12P05/US, 12P10/US, 12P25/US,<br>CCDC-5/US, 10/US, 25/US, 50A, 100A,<br>CCXC-9DDUS, CCXC-9DBUS, CCMC-9DS/US, CCMC-3MZ |
| Remote control unit | RM-C950 |
| Lens mount adaptor | LO-32BMT |
| Lens | VCL-707BXM/714BXEA/717BXEA, YH12X48KTSB/<br>YH18X67KTSB (by Canon), S17X66BMD (by Fujinon) |

## DXC-990/990P Connector Pin Assignments

6-pin



| MENU | LENS : REMOTE |
|---|---|
| 1 | NC |
| 2 | NC |
| 3 | DC OUT (G) |
| 4 | INTERNAL CONNECT |
| 5 | IRIS CONTROL |
| 6 | DC OUT (+) |

8-pin



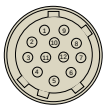
| | |
|---|---|
| 1 | INTER CONNECT |
| 2 | INTER CONNECT |
| 3 | DATA OUT |
| 4 | DC OUT (G) |
| 5 | DATA IN |
| 6 | NC |
| 7 | DATA OUT (+) |
| 8 | CMA DATA |

9-pin



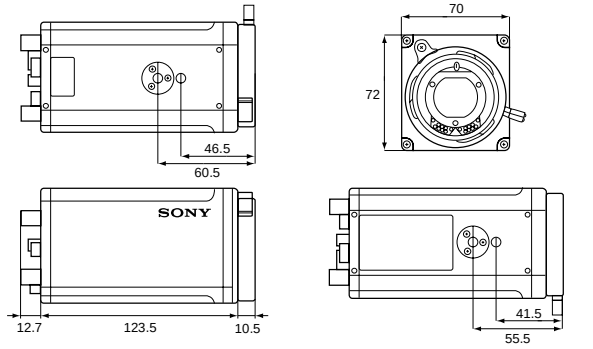
| MENU | D-sub OUT:RGB<br>D-sub VIDEO:VBS<br>D-sub SYNC:C.SYNC | D-sub OUT:RGB<br>D-sub VIDEO:VBS<br>D-sub SYNC:WEN | D-sub OUT:Y/C<br>D-sub VIDEO:VBS<br>D-sub SYNC:C.SYNC | D-sub OUT:RGB<br>D-sub VIDEO:Y/C<br>D-sub SYNC:WEN | D-sub OUT:Y/CR/CB<br>D-sub OUT:Y/C<br>D-sub SYNC:WEN | When using the<br>CMA-D3/CE |
|---|---|---|---|---|---|---|
| 1 | VBS OUT (G) | VBS OUT (G) | Y/C OUT (G) | VBS OUT (G) | Y/C OUT (G) | - (G) |
| 2 | RGB OUT (G) | RGB OUT (G) | RGB OUT (G) | RGB OUT (G) | RGB OUT (G) | VBS/Y/C OUT (G) |
| 3 | R OUT (X) | R OUT (X) | R OUT (X) | R OUT (X) | CR OUT(X) | VBS OUT (X) |
| 4 | G OUT (X) | G OUT (X) | G OUT (X) | G OUT (X) | Y OUT(X) | Y OUT (X) |
| 5 | B OUT (X) | B OUT (X) | B OUT (X) | B OUT (X) | CB OUT(X) | C OUT (X) |
| 6 | VBS OUT (X) | VBS OUT (X) | Y OUT (X) | Y OUT (X) | Y OUT (X) | - (X) |
| 7 | C.SYNC OUT (X) | WEN OUT (X) | C.SYNC OUT (X) | WEN OUT (X) | WENCOUT (X) | WEN OUT (X) |
| 8 | C.SYNC OUT (G) | WEN OUT (G) | C.SYNC OUT (G) | WEN OUT (G) | WEN OUT (G) | WEN OUT (G) |
| 9 | - (X) | - (X) | - (X) | C OUT (X) | C OUT (X) | - (X) |

12-pin

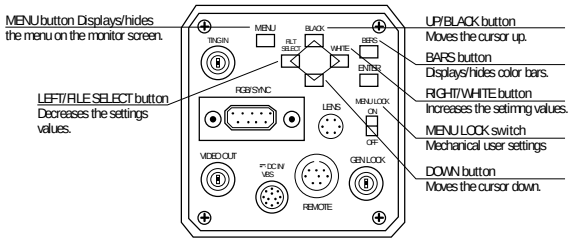


| MENU | D-sub VIDEO:VBS<br>12pin connector:IN | D-sub VIDEO:VBS<br>12pin connector:C.SYNC | D-sub VIDEO:VBS<br>12pin connector:HD/VD | D-sub VIDEO:Y/C<br>12pin connector:IN | D-sub VIDEO:Y/C<br>12pin connector:C.SYNC | D-sub VIDEO:Y/C<br>12pin connector:HD/VD |
|---|---|---|---|---|---|---|
| 1 | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) |
| 2 | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) |
| 3 | VBS OUT (G) | VBS OUT (G) | VBS OUT (G) | VBS OUT (G) | VBS OUT (G) | VBS OUT (G) |
| 4 | VBS OUT (X) | VBS OUT (X) | VBS OUT (X) | Y OUT (X) | Y OUT (X) | Y OUT (X) |
| 5 | -/HD IN (G) | - (G) | HD OUT (G) | -/HD IN (G) | - (G) | HD OUT (G) |
| 6 | -/HD IN (X) | - (X) | HD OUT (X) | -/HD IN (X) | - (X) | HD OUT (X) |
| 7 | VBS/VD IN (X) | C.SYNC OUT (X) | VD OUT (X) | VBS/VD IN (X) | C.SYNC OUT (X) | VD OUT (X) |
| 8 | - (G) | - (G) | - (G) | C OUT (G) | C OUT (G) | C OUT (G) |
| 9 | - (X) | - (X) | - (X) | C OUT (X) | C OUT (X) | C OUT (X) |
| 10 | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) | DC IN (G) |
| 11 | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) | DC IN (+) |
| 12 | VBS/VD IN (G) | C.SYNC OUT (G) | VD OUT (G) | VBS/VD IN (G) | C.SYNC OUT (G) | VD OUT (G) |

## Dimension




## Real Panel




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