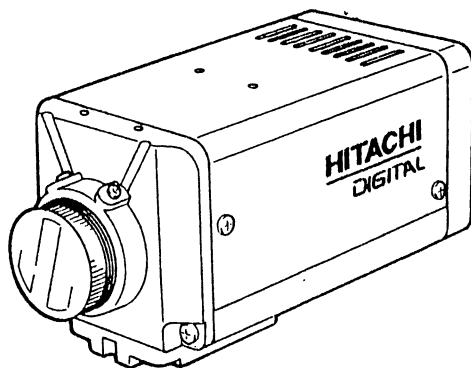


## CCD Color Camera

# KP-D591



### OPERATION MANUAL

Thank you for procuring this fine Hitachi Denshi color CCD camera.

Before using the camera, please read this operation manual carefully and keep this manual on file for ready reference in the future.

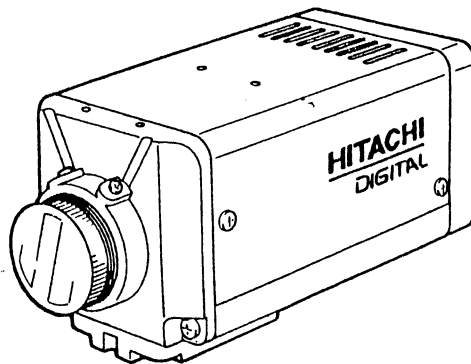
 **Hitachi Denshi, Ltd.**

#### Notes

The CCTV committee of the EIAJ (Electronic Industries Association of Japan) has recently approved a uniform pin arrangement of the connector used with an auto-iris lens of a surveillance CCTV camera. As a member of the EIAJ, Hitachi Denshi intends to comply with the newly standardized pin arrangement. See Lens connector on Page 9.

## CCD Color Camera

# KP-D28



### OPERATION MANUAL

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 **Hitachi Denshi, Ltd.**

#### Notes

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## Operating considerations

### Power supply

- Be sure to use the power source specified in the Major Specifications.
- Before plugging or unplugging a connector, be sure to turn off power.  
To plug or unplug a connector, be sure to hold the connector section.
- Note that it will take several seconds until a picture is displayed on the monitor after power on.

### Handling

- Do not attempt to remove cover.
- When installing or removing a lens, be sure to use care that water or dust does not enter the inside of the camera.

### Installing and storage

- Avoid installing or storing the camera in the following environments.
- Environments exposed to direct sunlight, rain or snow
  - Environments where combustible or corrosive gas exists
  - Excessively warm or cold environment (Operating ambient temperature: -10 to 50°C)
  - Humid or dusty environment
  - Place subjected to excessive vibration or shock
  - Environment exposed to strong electric or magnetic field

- Do not aim the camera lens at the sun.
- Do not shoot strong light or a scene including strong light.  
When such a scene is shot, vertical trailings will appear. However, this is not due to failure.  
In case strong light enters the camera through the lens, partial deterioration in picture quality will result.

### To obtain stable performance for long time

When the camera is used continuously for long time under high ambient temperature, the inside electrical parts become deteriorated, resulting in shortening its life.

To use the camera continuously for long time, the highest temperature must be below 40°C.

### Cleaning

- Use a blower or a lens brush to remove dusts on the lens or the optical filter.
- Wipe dirt on the case off with dry soft cloth. If dirt is hardened, wipe them off with cloth moistened with neutral detergent liquid; wipe the cover with dry cloth.
- Do not use benzene, thinner, alcohol, liquid cleaner or spray-type cleaner.

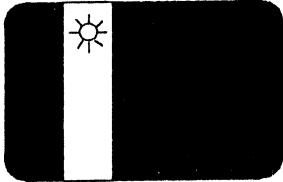
# Phenomena inherent to CCD imaging device

Following are the phenomena inherent to a CCD imaging device, and not defects

## 1) Smear and blooming

When strong light (lamp, fluorescent lamp, reflected light, etc.) is shot, pale bands are displayed vertically above and below the light.

In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.



## 2) Fixed pattern noise

When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.

## 3) Moire

When fine patterns are shot, moire may be displayed.

## 4) Burning

When excessively intense light comes to the CCD for a long time, the spectral filter in the CCD pixel may be deteriorated, and the color of the corresponding portion may change. Avoid using the camera under such condition.

3

# Section names and functions

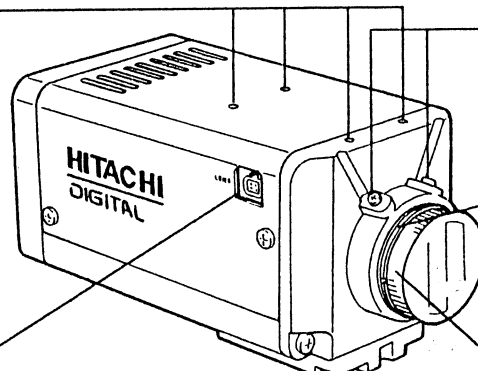
## Tripod adaptor holes

See camera installation on page 11.

## Lens connector

Connect lens cable when using an auto iris lens. See page 9.

Camera mounting hole



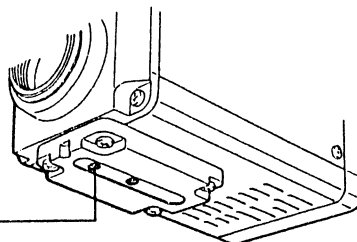
Lens mount screws

Lens mount ring

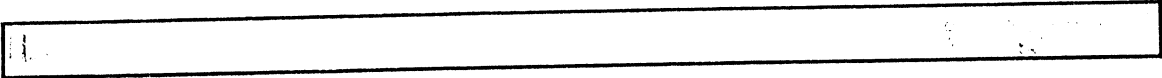
See flangeback adjustment on page 10.

C-mount adaptor

See installation of CS-mount lens on page 8.



4

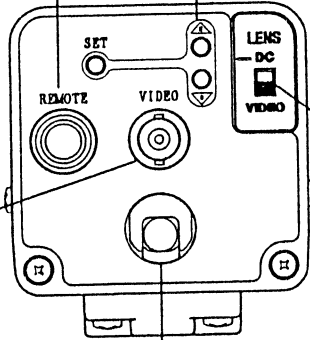


**Remote connector**  
Use for remote menu operations.  
See page 32.

**Set up buttons**  
Use when setting up and adjusting the camera with reference to the on-screen menu.  
See page 14.

**Video output connector(VIDEO)**  
See Connections on page 6.

AC cord.



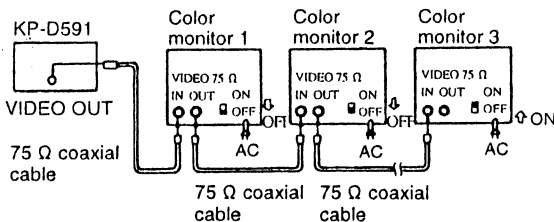
**Lens select switch (DC/VIDEO)**  
Set according to the type of lens.  
See page 9.  
**DC:**  
Select when using a lens having a DC control voltage input.  
**VIDEO:**  
Set to position when using a lens controlled by a video signal input.

## Connections

### Video output connection

Connect the video output of the camera to the video input of a monitor or other equipment. When using a "loop through" connection of two or more monitors, set the 75Ω switch of only the final monitor to ON. Determine the type of cable according to the distance of the connected equipment. The maximum cable lengths indicated below are recommended for avoiding appreciable picture degradation.

- 3V-2V : 150 meters
- 5C-2V : 200 m
- 7C-2V : 300 m
- 10C-2V : 400 m



Set the 75Ω switch of only the final monitor to on. Set the 75Ω switch of other monitors to off.

# Lens

## Recommended lenses

Select a lens from the following table

Type		Lens model	Specification			DC/VIDEO switch
Manual iris	1/2	HS316	3.7	mm	f1.6	DC
		H614B	6	mm	f1.4	
		HS1214D	12	mm	f1.4	
Auto iris (with iris amp)	1/2	HS316TE	3.7	mm	f1.6~90	VIDEO
		HS614TE	6	mm	f1.4~90	
		HS1214TE	12	mm	f1.4~90	
	1/3	HS316E	3.7	mm	f1.6~300	
		HS614E	6	mm	f1.4~300	
		HS1214E	12	mm	f1.4~300	
Auto iris (without iris amp)	1/3	TG2616AFCS-3	2.6	mm	f1.6~64	DC
		TS212E(MI)	2.8	mm	f1.2~200	
		TS412E(MI)	4	mm	f1.2~200	
		TS812E(MI)	8	mm	f1.2~200	
		TS2V214E(MI)	2.8~6	mm	f1.4~200	
		TS2V314E(MI)	3.5~8	mm	f1.4~200	
		TS2V616E(MI)	6~12	mm	f1.6~200	
		TS6ZME-3(MI) (6×)	6.3~38	mm	f1.2~360	
		TS10ZME-3(MI) (10×)	5.8~58	mm	f1.2~360	
		TS15ZME-3(MI) (15×)	6~90	mm	f1.2~720	
		T21Z5816DC-CS-H12 (21×)	5.8~121.8	mm	f1.6~560	

- Notes:**
1. Lenses other than the above may not provide full performance or not fit to install.
  2. Please appoint wiring of plug as EIAJ (Electronic Industries Association of Japan) when a lens is ordered.

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### Note on lens selection

- 1) Observe the maximum size limit (A in the figure) when installing the lens. Internal damage can occur if a larger lens is used.
- 2) Avoid using a lens that is heavier than the camera. If unavoidable, be sure to fix the lens itself on a support.

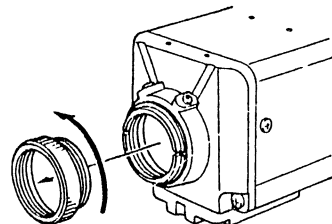
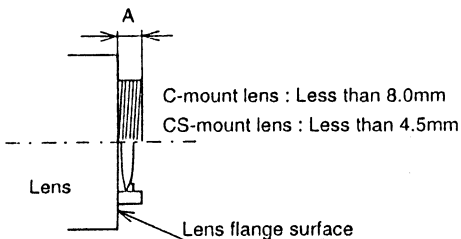
### Caution:

A heavy lens can disturb the balance with respect to the camera and possibly result in damage.

### Installation of CS-mount lens

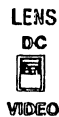
C-mount adaptor is provided for the camera in the factory.

When using a CS-mount lens, unscrew and remove the C-mount adaptor. Save the C-mount adaptor for possible future use.



### Lens selector switch

Set the switch according to the type of auto-iris lens. The factory setting is DC.



**DC :** Set to **DC** when using a lens having a DC control voltage input.

**VIDEO :** Set to **VIDEO** when using a lens having a video signal input.

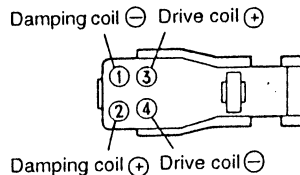
### Notes

1. To the extent possible, set the lens response to Average. Hunting can occur toward the Peak setting.
2. Set the switch to DC when using a manual iris lens with auto electronic shutter (AES) at the same time.

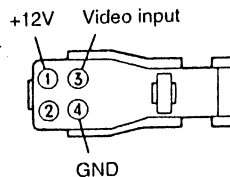
### Lens connector

When using an auto iris lens, install the lens plug on the lens cable as indicated in the figures. Refer to the lens instructions regarding the signals and wire colors.

#### DC type lens



#### VIDEO type lens



After installing the plug on the cable, connect it to the Lens connector on the rear of the camera.

### Flangeback adjustment

Flangeback adjustment is needed in cases where focus cannot be obtained by normal lens focus operation or focus is lost at the maximum telephoto and wide angle settings of a zoom lens. In such cases, open the lens iris and adjust as follows.

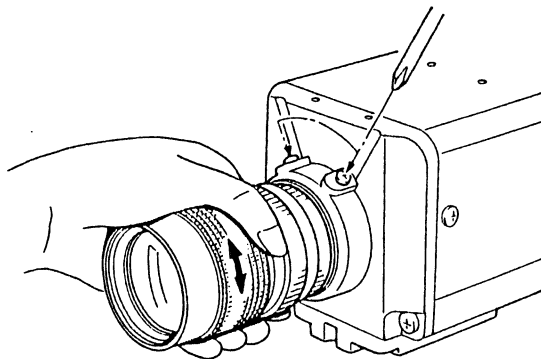
#### 1. Fixed focus lens

Set the lens focus ring to infinity and pickup a camera subject at least 20 meters distant. Loosen the lens mount setscrews (2 screws) and turn the lens and lens mount ring to adjust the focus. After adjusting, tighten the lens mount setscrews.

#### 2. Zoom lens

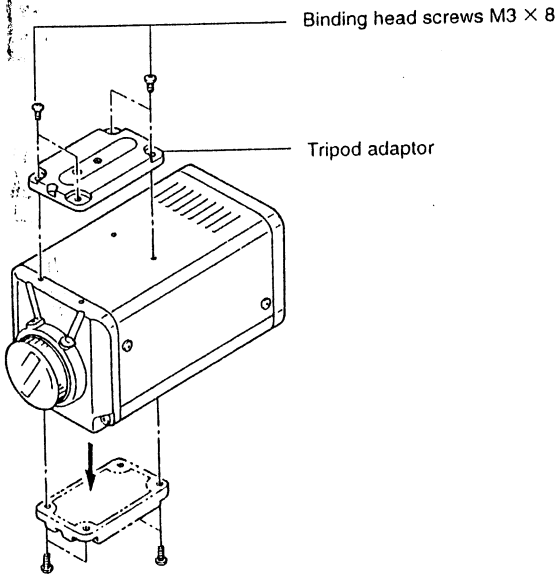
1) Set the lens to maximum telephoto and pickup a camera subject at least 3 meters distant. Loosen the lens mount setscrews (2 screws) and turn the focus ring to adjust the focus while using care not to turn the lens and lens mount ring .

2) Set the lens to maximum wide angle and pickup the same camera subject. While using care not to turn the lens focus ring, turn the lens and lens mount ring to adjust the focus. Repeat these steps until focus is obtained at both telephoto and wide angle settings. After adjusting, tighten the lens mount setscrews.



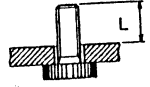
# Camera mounting

If the camera is to be suspended from the ceiling, change the position of the tripod adaptor from the bottom to the top of the camera, as indicated in the figure.



**Caution :** Use the following type of camera mounting screw.

Type : U 1/4-20  
 Length L : less than 7 mm  
 If longer than 7 mm, there is risk of internal damage to the camera.  
 Conversely, if too short, the camera will not be firmly secured and there is risk of dropping.



# Sync system setting

The power line frequency is specified below.  
 Do not use at other frequencies.

KP-D28 U type (NTSC) :  $60 \pm 1\text{Hz}$

KP-D28 E/K type (PAL) :  $50 \pm 1\text{Hz}$

The factory setting is internal sync.

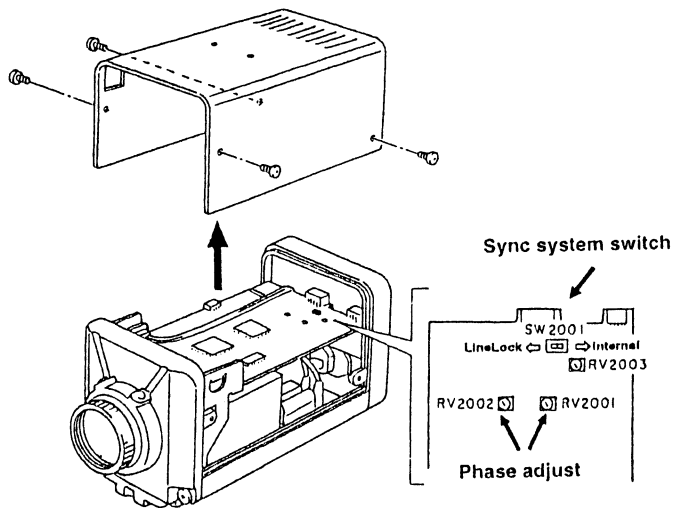
To use at line lock, remove the top cover and set as follows.

Set switch SW2001 to line lock position.

**Note** This switch must setting with the camera main power off.

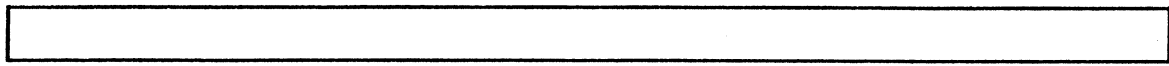
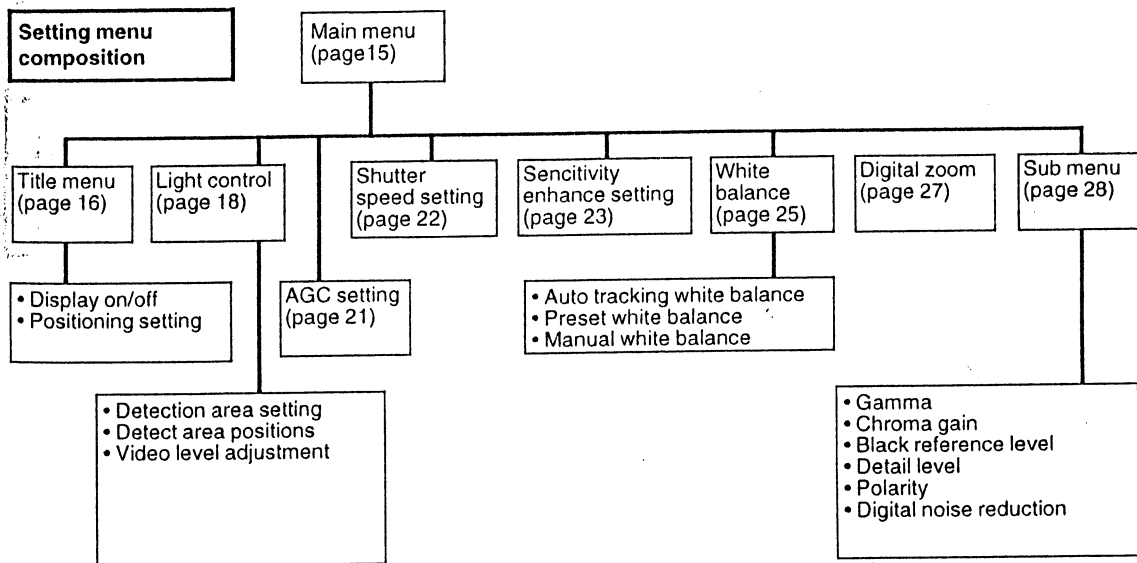
Adjust V sync phase with RV2001 and RV2002.

**Note:** Avoid disturbing RV2003. This adjusts the video output level when using a DC type lens.



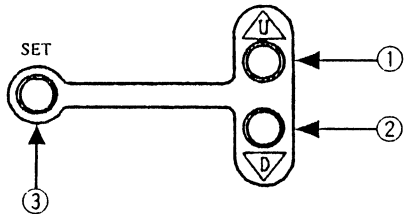
# Setting menu description

The camera settings and adjustments can be changed to conform to conditions of use. Use the setting menu indicated on the monitor screen to check and change the settings and adjustments. The setting menu is comprised as follows.



## Menu operations

Three rear panel setup buttons are used to shift the cursor and select items from the menus.



- ① **Up button:**  
Shift the cursor in the upward direction or increase an adjustment value.
- ② **Down button:**  
Shift the cursor in the downward direction or decrease an adjustment value.
- ③ **Set button:**  
Press to display the main menu or to change a setting.



## Main menu

- 1) Press the Set button for at least 2 seconds to display the main menu on the monitor screen.

```

<<< MAIN MENU >>>
>TITLE           : OFF ↓
· LIGHT CONTROL : OFF ↓
AGC              : ON (21dB)
SHUTTER SPEED  : OFF
SENS UP         : OFF
WHITE BALANCE  : ATW ↓
DIGITAL ZOOM   : OFF ↓
SUB MENU      : ↓
END
  
```

...Title menu  
 ...Light control menu  
 ...AGC setting  
 ...Shutter speed setting  
 ...Sensitivity enhance setting  
 ...White balance menu  
 ...Digital zoom  
 ...Sub menu  
 ...End

## Main menu

- 2) Check the present settings at the main menu.
- 3) Shift the cursor vertically by pressing the Up and Down buttons, then press the Set button to enable changing the setting of the selected item.
- 4) If changes are unnecessary, shift the cursor to End and press the Set button to return to the normal screen.
- 5) Changed settings are stored in the camera memory (EEPROM) and returned the next time the camera power is switched on.

When an item indicated by a ↓ mark is selected, pressing the Set button shifts to the next menu.

### Note:

If no button is pressed, the menu display extinguishes automatically after about 5 minutes.

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## Title menu

One line of up to 24 alphanumeric characters can be displayed on the screen. The display on/off and position are selected at the Title menu.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Title, then press the Set button to display the Title menu.

```

<< TITLE MENU >>
>MODE           : OFF
  
```

...Display on/off and position (top or bottom)  
 ...Return  
 ...End

## Title menu (off mode selected)

- 3) While the cursor is at Mode, press the Set button to shift the mode in the sequence Off, Top, Bottom.

### Off

Characters not displayed.

### Top

Characters displayed at top of screen.

### Bottom

Characters displayed at bottom of screen.

### Display character input

- 1) When the mode is Top or Bottom, the characters indicated in the figure can be used.
- 2) Press the Down button, then use the Up and Down buttons to shift the flashing cursor sequentially among the usable characters. Shifting is speeded when the button is held depressed.

```

<< TITLE MENU >>
>MODE           : TOP
  
```

...Display on/off and position (top or bottom)

```

0 1 2 3 4 5 6 7 8 9
A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
! ? # & ( ) . , : ; ~ * %
+ - x / = " '
  
```

...Blank, cursor shift (left, right), character delete  
 ...Display position (left, right), return, end  
 ...Input character display

Input character select table

## Title menu

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3) When the Set button is pressed, the selected character is entered in sequence beginning with the left-most of 24 dots shown at the bottom of the screen. Afterwards, each newly selected character is entered sequentially toward the right.

**Note:**  
At the end of character setting, remaining rightward dots are not shown on the monitor screen.

Additional commands of the title input menu are as follows.

**Space**  
To add a blank space, shift the flashing cursor to Space, then press the Set button.

←, →  
The input characters can be edited by using the arrow symbols.

- 1) Set the flashing cursor to either of the arrow symbols and press Set. The flashing cursor shifts in the arrow direction. Press the Set button repeatedly to where the flashing cursor overlaps the character to be changed.
- 2) Select the character to be inserted with the Up and Down buttons, then press Set to change the character.

**Reset**  
To delete all characters from the display, shift the flashing cursor to Reset, then press Set. After deleting, the flashing cursor returns to the start of the input character select table.

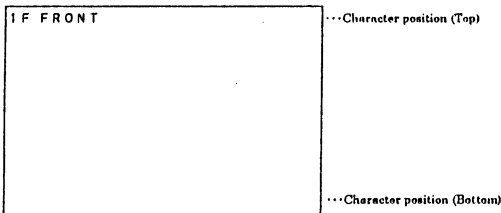
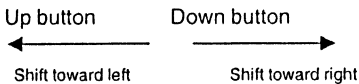
**RET**  
Position the flashing cursor to RET and press Set to exit the title menu and return to the main menu.

**End**  
Shift the cursor to End and press the Set button to close the menu and return to the normal screen.

**Title positioning setting**

**Position:**  
Use when the display position on the screen has been determined.

- 1) Shift the flashing cursor to Position and press Set to open the title position screen indicated in the figure. Screen top and bottom positions are determined respectively by Mode settings Top and Bottom.
- 2) Press the Up and Down buttons to shift the characters horizontally. Afterwards, press Set to confirm the display position and return to the main menu.

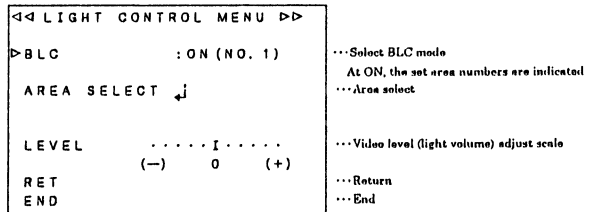


Title positioning screen (Top)

**Light control menu**

**Detection area setting**

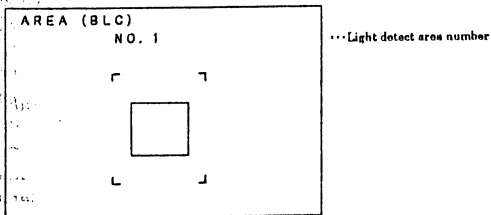
- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Light control; OFF/ON flashes. At ON, the presently set light detect area numbers are displayed. Press the Set button to then open the Light control menu.



Light control menu

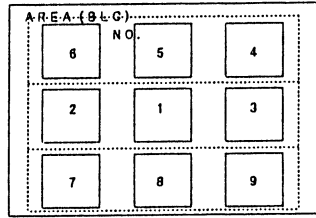
3) Shift the cursor to BLC and press the Set button to toggle between ON and OFF. When ON, Area Select is displayed.

4) Shift the cursor to Area Select and press the Set button to display the detection area select menu.



**Detect area indication (no. 1)**

Down button: 9→8→7→6→5→4→3→2→1  
(descending order)



**Detect area positions**

When using a DC control voltage type lens, the detection area can be selected from 9 locations shown in the figure.  
If using a video signal type lens, three horizontally adjacent locations (indicated by dotted lines in the figure) can be selected (any number in a horizontal group can be chosen).

5) There are 9 light detect areas selected by the Up and Down buttons. Select the areas from nos. 1 to 9 that include the subject of main interest.

Up button : 1→2→3→4→5→6→7→8→9  
(ascending order)

Down button: 9→8→7→6→5→4→3→2→1  
(descending order)

6) After deciding the detection areas, press the Set button to return to the light control menu.

**Back light compensation**

The lens iris closes in response to strong light (such as from a spotlight or window) entering the scene background to darken the subject of interest. When using a DC type lens, set BLC to ON to open the lens iris and avoid blacking out the subject of interest (set the detect areas to match the subject). The factory setting is OFF.

**Note:**  
When using a video signal type lens, the back light compensation is fixed, regardless of the setting.

**Video level adjustment**

The optimum video level is set at the factory. If necessary, the level can be changed as follows.

- 1) Use the Up and Down buttons to shift the cursor to Level, then press the Set button. The adjustment scale at the right of Level flashes.
- 2) Change the video level by pressing the Up and Down buttons. Holding a button depressed speeds the cursor shift.
- 3) Press the Set button to confirm the setting.
- 4) Return the initial (central) setting by simultaneously pressing the Up and Down buttons for two seconds.

When using a video signal type lens, setting the lens switch to Video extinguishes the scale and fixes the level to the factory setting. To adjust the video level, refer to the lens instructions and adjust the lens sensitivity.

### AGC setting

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to AGC; the AGC setting flashes. Then press Set to change the maximum gain.  
OFF→ON(6 dB)→ON(12 dB)→ON(21 dB)→ON(31 dB)  
Numerals indicate the maximum gain. The factory setting is ON (21 dB). When AGC is ON and the scene darkens to where the iris of an auto iris lens is fully open, the circuit gain is automatically increased within the maximum range to obtain a suitable video level.

```
<<< MAIN MENU >>>
TITLE           : OFF ↓
LIGHT CONTROL  : OFF ↓
▷AGC           : ON (21dB)
SHUTTER SPEED : OFF
SENS UP        : OFF
WHITE BALANCE : ATW ↓
DIGITAL ZOOM  : OFF ↓
SUB MENU      : ↓
END
```

### Main menu

### Note:

When the AGC is ON, although the sensitivity is raised as the scene darkens, video noise can become apparent. At ON (31 dB), if the maximum gain is raised more than necessary, the video noise can become obtrusive.

In this case, reduce the maximum setting. If noise is still objectionable, adjust the Level at the Light control menu.

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### Shutter speed setting

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to Shutter speed; the shutter speed setting flashes.
- 3) Press the Set button to select the speed sequentially in the following order.  
OFF→(1/60)→1/100→1/250→1/500→1/1000→1/2000  
→1/4000→1/10000→1/20000→1/30000→AES  
The factory setting is OFF (1/60 second).

```
<<< MAIN MENU >>>
TITLE           : OFF ↓
LIGHT CONTROL  : OFF ↓
AGC           : ON (21dB)
▷SHUTTER SPEED : OFF
SENS UP        : OFF
WHITE BALANCE : ATW ↓
DIGITAL ZOOM  : OFF ↓
SUB MENU      : ↓
END
```

### Main menu

### Auto electronic shutter (AES)

This function adjusts the light amount using only the CCD shutter. Use this function with a fixed iris lens. If using a DC type lens, fix the iris at fully open. The AES function cannot be set with a video signal type lens.

### Note:

In the following types of cases, use a different shutter speed.

Strong light enters the scene, such as from a spotlight or window.

Strong smear or blooming occurs in the scene.

Screen flicker or coloration occurs.

## Sensitivity enhance setting

The present camera includes a sensitivity enhancement function that increases the CCD exposure time and interpolates the image with an image stored in memory to effectively boost the sensitivity.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Use the Up and Down buttons to shift the cursor to SENS UP; the setting flashes.
- 3) Press the Set button to select the setting sequentially in the following order.

OFF→AUTOX2→AUTOX4→AUTOX6→AUTOX8→  
AUTOX10→AUTOX12→AUTOX32→AUTOX64→OFF→  
MANUALX2→MANUALX4→MANUALX6→  
MANUALX8→MANUALX10→MANUALX12→  
MANUALX16→MANUALX32→MANUALX64→  
MANUALX88→MANUALX128→MANUALX164→  
MANUALX256→MANUALX320→MANUALX420→  
MANUAL X510

### OFF

Sensitivity enhance function not used; factory setting.

### AUTO

As the scene darkens, the sensitivity is automatically enhanced by the selected multiple. Best mode for day/night continuous surveillance.

### MANUAL

Mode for fixed sensitivity boost. When AGC is ON, fixed at maximum gain.

```

<<<< MAIN MENU >>>>
TITLE           :OFF ↓
LIGHT CONTROL  :OFF ↓
AGC            :ON (21dB)
SHUTTER SPEED  :OFF
▷ SENS UP      :OFF
WHITE BALANCE  :ATW ↓
DIGITAL ZOOM   :OFF ↓
SUB MENU       ↓
END
```

Set to OFF by holding the Set button depressed for 2 seconds.

### Main menu

### Note:

Enhanced sensitivity can cause blurring of moving images. In the following types of cases, reduce the sensitivity multiple.

- 1) When operating via the Remote connector, the Remote commands have priority.
- 2) Noise increases at high sensitivity and further increases at high frequency.
- 3) The Shutter speed cannot be changed during Auto and Manual SENS UP settings. Temporarily set SENS UP to OFF when changing the Shutter speed.
- 4) If noise is objectionable at high sensitivity, set DNR of the Sub menu to ON. Conversely, if image lag of moving images is objectionable, set DNR to OFF.
- 5) White flaws may become apparent at high sensitivity, but these are not due to malfunction.

When SENS UP setting is Manual, the shutter speed setting is ineffective (off).

At SENS UP Auto, the shutter speed setting is as follows.

- 1) Shutter speed is 1/100 (PAL : 1/120) or effective during AES.
- 2) Shutter speed is 1/100 (PAL : 1/120) and ineffective (off) in modes other AES.

## Digital zoom

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Shift the cursor to Digital Zoom and press the Set button to open the digital zoom menu.

```

<<<< MAIN MENU >>>>

TITLE           :OFF  ↵
LIGHT CONTROL  :OFF  ↵
AGC            :ON (21dB)
SHUTTER SPEED :OFF
SENS UP       :OFF
WHITE BALANCE :ATW  ↵
▷DIGITAL ZOOM :OFF  ↵
SUB MENU     ↵
END
  
```

### Main menu

```

<< DIGITAL ZOOM MENU >>

▷MODE           :ON      ...Digital zoom mode on/off
ZOOM ADJ       :WIDE TELE ...Zoom magnification

RET            ...Return
END           ...End
  
```

### Digital zoom menu

- 3) Shift the cursor to Mode and press the Set button to toggle between on and off. At OFF (factory setting), the zoom magnification is fixed at 1. In the ON mode, Zoom Adj is displayed and indicates the previously set zoom magnification.
- 4) To change the zoom magnification, set the mode to ON. Shift the cursor with the Up and Down buttons to Zoom Adj and press the Set button.
- 5) Wide and Tele flash. Change the zoom magnification with the Up and Down buttons. Maximum setting is 4X.
- 6) Press the Set button to confirm the setting and stop the flashing.

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### Note:

The digital zoom function uses the internal memory to enlarge the image without utilizing a zoom lens. The picture quality deteriorates as the magnification increases. There may also be a change in video level. The function is not suitable for a video signal type auto iris lens. Use the digital zoom with a fixed or DC voltage type lens.

## Sub menu

The sub menu is used for changing the picture quality (video response) of the camera output image.

- 1) Press the Set button for longer than 2 seconds to display the Main menu.
- 2) Shift the cursor to Sub Menu and press the Set button to open the sub menu.

```

<< SUB MENU >>

▷GAMMA         :ON      ...Gamma on/off
CHROMA GAIN    : 000    ...Color level setting
PEDESTAL      : 000    ...Pedestal level setting
DETAIL        : 000    ...Detail level setting
POLARITY      : POSITIVE ...Negative/positive
DNR           :ON      ...Noise reduction on/off

RET            ...Return
END           ...End
  
```

### Sub menu

### **Gamma**

Shift the cursor with the Up and Down buttons to Gamma, then press the Set button to toggle on/off.

### **Chroma gain**

The optimum color level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Chroma Gain with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change. Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.
- 3) Press the Set button to confirm the setting and stop the flashing.

### **Pedestal (black reference level) setting**

The optimum black reference level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Pedestal with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change.

Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.

- 3) Press the Set button to confirm the setting and stop the flashing.

### **Detail level**

The optimum detail level has been set at the factory. If necessary, this can be changed as follows.

- 1) Shift the cursor to Detail with the Up and Down buttons and press the Set button; the numerals flash.
- 2) Press the Up and Down buttons to change the level (-120 to 000 to +127). Press continuously to speed change. Press the Up and Down buttons simultaneously for 2 seconds to return the initial (000) setting.
- 3) Press the Set button to confirm the setting and stop the flashing.

### **Polarity**

The factory setting is positive. Shift the cursor to Polarity and press the Set button to toggle between positive and negative. The negative polarity is convenient when using negative material, such as negative film.

### **Digital noise reduction (DNR)**

DNR functions to reduce the noise component during enhanced sensitivity operation. Shift the cursor to DNR and press the Set button to toggle between on and off. The ON setting is recommended for reducing noise when there is little movement in the picture. The OFF setting is suggested if image lag is objectionable. The factory setting is ON.

#### **Note:**

Even if set, DNR does not operate unless SENS UP is X2 or greater.

With DNR ON, lag can become obtrusive with quickly moving images.

# Color Temperature and white balance adjustment

Color temperature is one of the properties of light. The unit is Kelvin (K), with 0 K equivalent to  $-273^{\circ}\text{C}$ . The color temperature of a light source is related to the type of illumination and sky conditions. It is not directly related to brightness. A high color temperature is bluish, while a low color temperature is reddish. Since the response of the human eye is adaptive, changes in color are not sensed even with changes in ambient illumination. However, a camera reproduces color temperature differences to result in different color appearance compared to direct viewing by eye. White balance adjustment serves to compensate for these differences in color temperature. This camera is provided with automatic tracking white balance (ATW ON) mode. The factory setting is ATW ON.

## Color temperature, illumination and sky conditions

Color temperature (K)	Sky conditions	Illumination
10,000	Clear blue sky	Xenon arc
8,000	Twilight	
7,000	Cloudy sky Bright rain Daylight	
5,000	Midday sunlight 2 hours after sunrise	Fluorescent lamp
4,000	1 hour after sunrise	Halogen lamp, Iodine lamp 100 W to 500 W gas filled bulb 100 W tungsten lamp
3,500		
3,000	Around sunrise	
2,500		60 W tungsten lamp
2,000		Candle

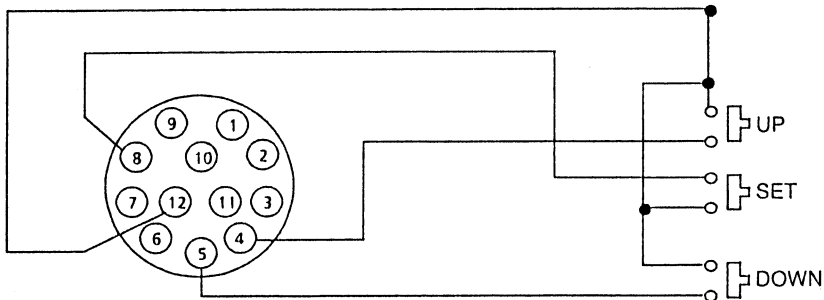
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# Remote menu operation

An optional remote plug is available to enable operating the camera direction and set buttons by remote control. Confirm the plug is properly wired as indicated in the figure and connect it to the rear panel Remote connector. Do not connect anything to the unused pins.

Keep the distance between the remote plug and external key switches to less than about 2 meters. Disconnect the remote plug from the camera Remote connector when not using the key switches.

**Note:** Be sure to switch off the camera power before connecting or disconnecting the remote plug.



Remote plug (option)

External key switch connections for remote operation

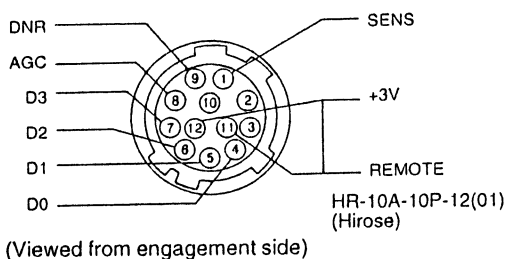


Pin	Signal	Abbrev.	Remarks
1	Not connected	N. C.	Do not connect
2*	Serial data + input	T <sub>X</sub>	Connect to RS-232C data terminal
3*	Serial data - input	R <sub>X</sub>	Connect to RS-232C data terminal
4	Up key	UP	Key switch connection
5	Down key	DOWN	
6	Not connected	N. C.	
7	Not connected	N. C.	
8	Set key	SET	
9	Not connected	N. C.	Do not connect
10*	GND	GND	Connect to RS-232C ground
11	Not connected	N. C.	Do not connect
12	+3 V for key switches	+3V	Remote key switch power supply

\*Data transmission software is required for remote control by serial data connection to pins 2,3 and 10.

## Remote sensitivity operation

An optional remote plug is available to enable remotely controlling the sensitivity setting, sensitivity mode (auto/manual), AGC and DNR functions. The plug is wired as shown in the figure and connected to the camera rear panel Remote connector. See page 38.



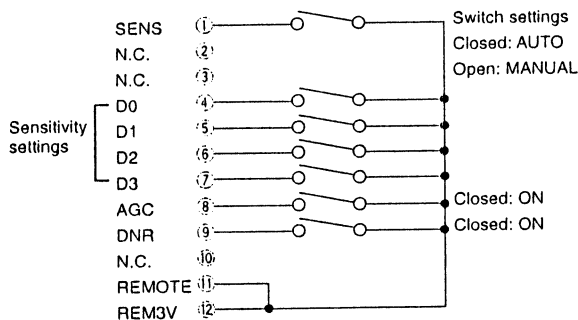
### Notes:

- When the plug is connected, remote operation has priority.
- Although the picture data increases at high sensitivity, noise also increases. High ambient temperature can also increase noise. As required, set noise reduction (DNR) to on.
- White specks can appear in the image at high sensitivity. This is not due to malfunction.

- The CCD integration time increases at high sensitivity and blurring can occur with moving objects.

### Remote sensitivity switch connections

Confirm the switches are wired as indicated in the figure.



### Notes:

- In case of this plug is connected, the menu can not be displayed.
- This plug must plug-in an plug-out with the camera main power off.

However, even if multiples 128 to 510 are set in AUTO, the sensitivity is fixed.

• Sensitivity setting

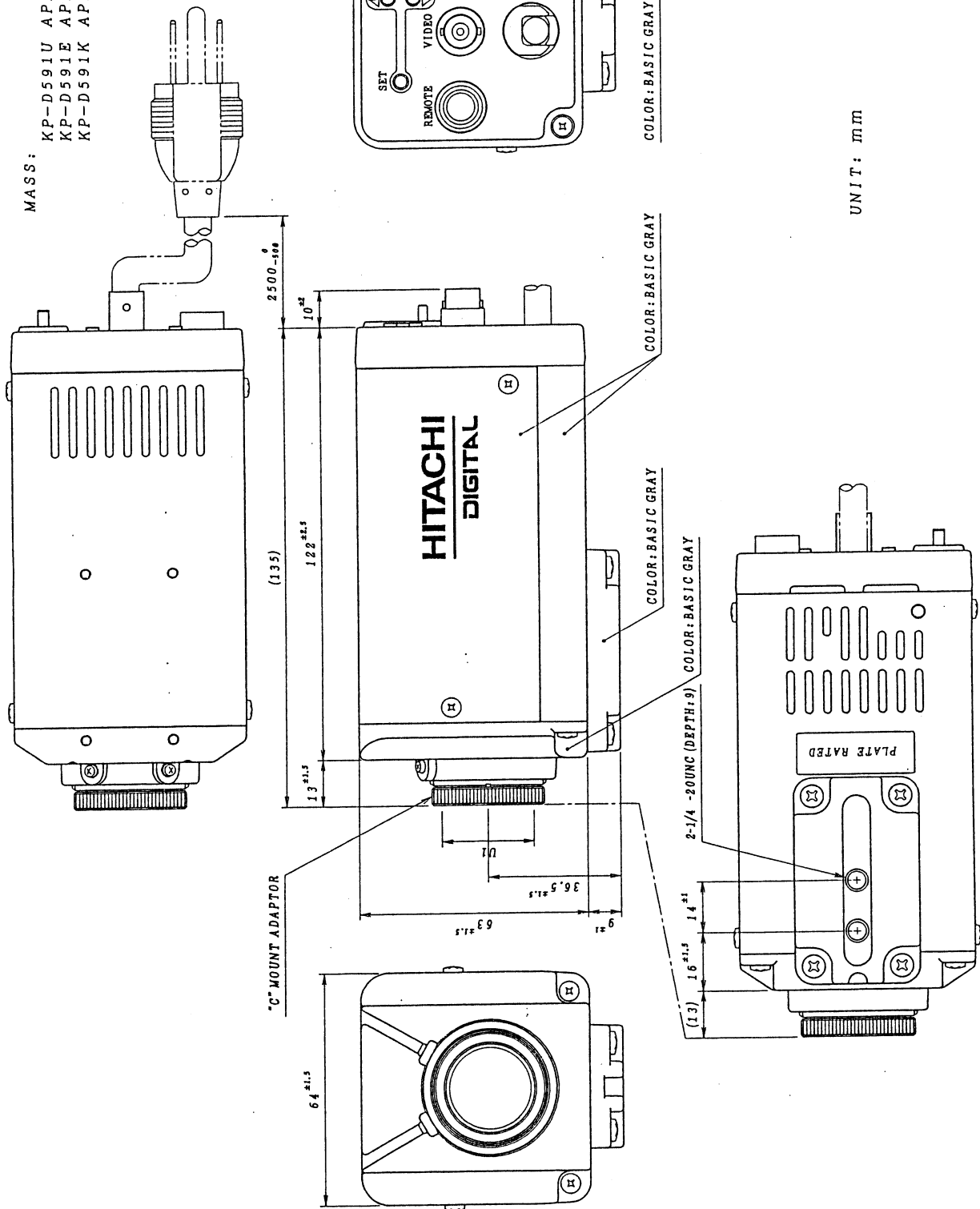
D3	D2	D1	D0	Multiple
0	0	0	0	1(OFF)
0	0	0	1	2
0	0	1	0	4
0	0	1	1	6
0	1	0	0	8
0	1	0	1	10
0	1	1	0	12
0	1	1	1	16
1	0	0	0	32
1	0	0	1	64
1	0	1	0	*128
1	0	1	1	*164
1	1	0	0	*256
1	1	0	1	*320
1	1	1	0	*420
1	1	1	1	*510

1: SW on (closed) 0:SW off (open)

Pin	Signal	Abbrev.	Remarks
1	SENS AUTO/MANU	SENS	Sensitivity boost mode select
2	N.C.	N.C.	Do not connect
3	N.C.	N.C.	Do not connect
4	D0	D0	Sensitivity setting
5	D1	D1	
6	D2	D2	
7	D3	D3	
8	AGC ON/OFF	AGC	AGC on/off select
9	DNR ON/OFF	DNR	Noise reduction on/off
10	N.C.	N. C.	Do not connect
11	REMOTE	REMOTE	Connect to pin 12 (+3 V) to control
12	+ 3 V for remote switches	REM3V	3 V power supply for remote control

**Note:** Error can occur if the camera set buttons are operated while the remote plug connected.

MASS: KP-D591U APPROX 740g  
 KP-D591E APPROX 750g  
 KP-D591K APPROX 700g



UNIT: mm