



CCTV MOTORIZED ZOOM LENS

Y33Z15RH Series

Instruction Manual

株式会社 ヴイ・エス・テクノロジー

VS Technology Corporation

Thank you for choosing our CCTV Motorized Zoom Lens for your system.

Before handling, connection, and operation, please read this instruction manual carefully, especially to avoid any accident or damage.



WARNING

If the instructions below are not followed, it may cause death or serious injury.

- **Don't disassemble or modify the lens.**
 - ✧ It could damage lens circuit board and cause a fire or electrical leakage.
 - ✧ Optical performance may drop.
- **Don't let lenses get wet.**
 - ✧ It may cause a fire, electrical leakage and electrical shock.

If the incident occurs, turn off the power supplied to the lens immediately.
- **Don't damage cables or wires.**
 - ✧ It could cause short circuits which may cause a fire.
- **Fix the lens to housing of Pan and Tilt System firmly.**
 - ✧ If the lens isn't fixed firmly, it may drop from housing from high place, which causes severe accidents.
- **Don't look at the Sun or strong light source directly through lens with eyes.**
 - ✧ It could damage your eyes, and you lose eyesight.



CAUTION

If the instructions below are not followed, it may cause injury or substantial damage.

- **Make sure to turn it off when making switch setting.**
 - ✧ IC may get damaged if any switch on a lens is switched while the power is on.
- **Make sure to confirm that all the switch settings are correct before turning on the power.**
 - ✧ Circuit boards may get damaged if the power is turned on with a wrong switch setting.
- **Handle the lens with care. / Don't give a shock to the lens.**
 - ✧ The lens is assembled with sensitive alignment on many parts inside. If shock is given to the lens, optical performance may drop.
- **Don't drop the lens.**
 - ✧ If the lens is dropped, it may cause injury.
 - ✧ If the lens is dropped, it may cause damage or malfunction on lens. Also, optical performance may drop.

- **Hold the lens by hand when it's attached or removed from housing.**
 - ✧ If camera is held instead of the lens, lens C-mount may get damaged or removed from the lens and the lens may drop.
- **Don't supply the power to the lens before or during wire connection.**
 - ✧ It may cause electrical leakage or electrical short, which may cause a fire.
- **Don't pull cables or wires.**
 - ✧ It may damage them and cause contact failure.
- **Don't hold wires by edge of fingernail or something sharp such as tweezers.**
 - ✧ It may damage or cut wires.
- **Make sure all the wires are connected correctly and properly.**
 - ✧ Miswiring may cause damage to the circuit boards of the lens or may cause a fire.
 - ✧ Poor terminal connection assembly may cause contact failure.
- **Make sure all the input voltage to the lens is correct.**
 - ✧ Excess voltage will damage a circuit board.
- **Read instruction manual of other equipment.**
 - ✧ To connect or attach the lens properly with other equipment such as camera, controller and housing, read and follow the instruction manuals of those equipment as well as this lens' instruction manual.
- **Don't fix lens and camera separately on two separate bases or plates.**
 - ✧ When the system is given strong shock, lens C mount may get damaged. Lens and camera must be fixed onto one base or plate using both lens's tripod screw and camera tripod screw.
- **Fix the lens using tripod screws.**
 - ✧ Since the lens is heavy, make sure the lens' tripod screws are used to be fixed.



RECOMMENDED

- ✧ Using IR corrected zoom lens, it is highly recommended to make anti-reflection coating on both sides of window glass of housing to avoid light reflection inside the housing and the lens.

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1. General Features

- **Optical Near Infrared Corrected (True NIR)**

Focus positions between visible light and near infrared light are almost the same position and no refocusing is needed when using NIR illuminator at night. Super Low Dispersion Glasses are used.

- **Visible Light Cut Filter (VC filter /Haze Cut filter)**

By using the VC filter, the object hidden by haze can be seen.

- **Thermal Compensation System (TCS) (For the lens with TCS only)**

TCS automatically adjusts the back focus in correct position every 2 °C by monitoring lens body temperature with thermal sensor every 3 minutes. By using TCS, it is no need to re-set preset positions when the temperature changes widely throughout the year. It also enables autofocus to maintain good performance regardless of temperatures.

- **Auto Focus (AF) (For the lens with AF only)**

Yamano AF has two modes. One is "Quick Scan AF" and the other is "Full Scan AF" By pushing AF button less than 1sec., Quick Scan AF will activate and focus on the object in the distance between 100m and infinity. By pushing AF button more than 1sec., Full Scan AF will activate and searching focus on the object in the distance between 25m and infinity.

2. Environmental Conditions in Use

Yamano zoom lenses are guaranteed for proper operation under the following conditions.

- Temperature : -10°C ~ +50°C (Subject to no dew condensation)
- Humidity : 30% ~ 70% (Subject to no dew condensation)

3. Important Notice before Installation

- Make sure all DIP switches of a lens are set correctly before the power is turned on.
- Make sure all switches of camera, controller, and lens are turned off before connection.
- Do not touch the surface of lens. When the surface of lens gets soiled, wipe it with clean cloth soaked with lens cleaner liquid or cleaning paper.
- Before connecting wires, confirm the input voltage indicated in the electrical specification in this manual.
- For longer life, it is recommended to move the zoom and focus functions daily to prevent the grease

*Specifications and appearance are subject to change without notice

from evaporating earlier.

- As the zoom lens, especially optical system, is assembled by delicate adjustments to maintain optical performance, please handle the lens very carefully to prevent it from strong shock by dropping or hitting hard which may affect the optical performance.
- Do not pull wires hard, which may cause malfunctions of connections.
- Zoom lens is heavy. When fixing a lens to a housing, please make sure the lens tripod screws are used to fix the lens firmly onto a base plate. Also use camera tripod screw to fix the camera onto the same base plate firmly to prevent lens' C mount from getting damaged by shock and vibration during transportation.

4. Lens Mounting to a Camera

Before mounting a lens to a camera, please check the mount of camera (C or CS). When C mount zoom lens is mounted to a CS mount camera, CS mount adaptor ring (t=5mm) has to be attached between the camera and the lens to obtain nearly correct back focus length.

To adjust camera position:

With the mount friction mechanism, angle of mounted lens (Rotational angle) can be varied.

When a lens mounts to a camera, rotate a lens to the last end of thread, and then rotate it back slowly up to a desired angle.

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5. Selection of Control circuit

Select either “CVS circuit” or “DVS circuit” for the zoom and focus circuit with DIP switches. The differences between CVS circuit and DVS circuit are as follows.

【CVS Circuit】 (Conventional control circuit/Factory setting)

CVS circuit is a circuit that keeps the voltage applied to the motor below a certain voltage to protect the motors (zoom/focus motors rated voltage 6V, iris motor rated voltage 3V). Therefore, it is not possible to change the operating speed by changing input voltage to zoom & focus motors from the external controller.

Be sure to select CVS circuit when using autofocus function or serial communication control function.

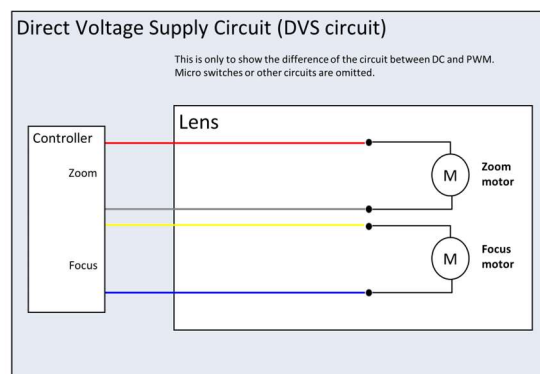
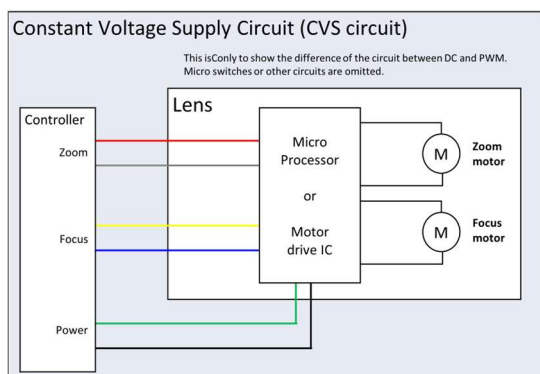
【DVS Circuit】 (Newly added control circuit)

DVS circuit is a circuit that controls zoom motor and focus motor by applying a voltage directly from an external controller to each motor without going through any circuit. Therefore, it is possible to change the operating speed to any speed by changing the voltage applied from the external controller to the motor.

However, because there is no circuit to protect zoom motor and focus motor, care must be taken not to apply a voltage higher than the rated voltage of the motors.

Also, when selecting DVS circuit, both focus circuit and zoom circuit will become DVS circuit. Refer to the next section “【Switch setting method】” to set the switches.

Main application: For PWM control of focus motor to fine-tune focus, etc.



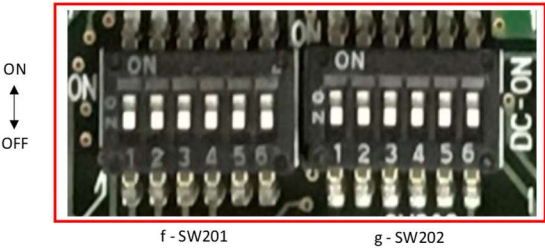
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【Switch setting method】

If the two DIP switches are set as shown in the table below with the power turned off, both the zoom and focus circuits will switch to either CVS circuit or DVS circuit at the same time.

Caution: Turning on the power with the wrong SW setting will damage circuit boards.

	SW201	SW202
DVS circuit	ALL ON	ALL OFF
CVS circuit(Default)	ALL OFF	ALL ON

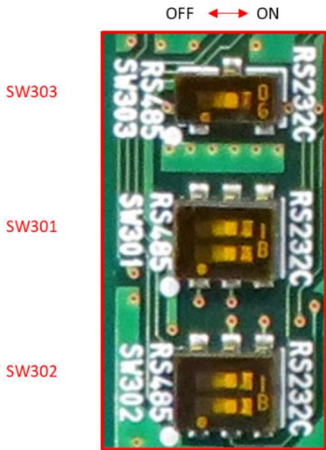


The picture left shows a example of wrong setting.
(All switches are set "OFF".)

If all the switches are set "ON", PCB will get damaged.

6. Selection of Serial control function

(1) Select either RS-232C or RS-485 with the DIP switches below.



	SW303	SW301	SW302
RS-232C	RS232C	RS232C	RS232C
RS-485	RS485	RS485	RS485

Caution: Turning on the power with the wrong SW setting will damage circuit boards.

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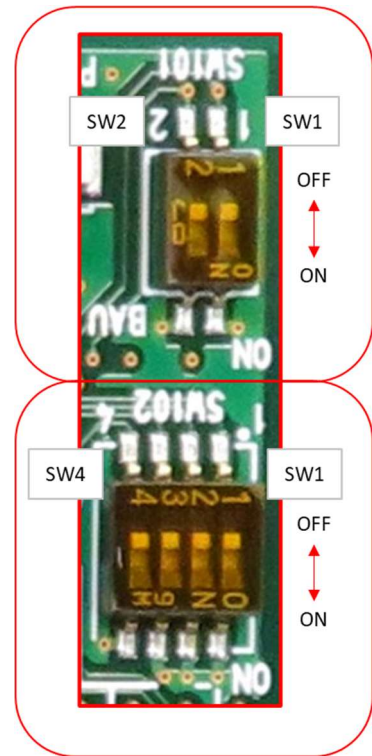
(2) Baud Rate Setting

Set Baud Rate according to the table below.

(Factory setting: 9600bps)

Baud Rate : SW101

Baud Rate	SW1	SW2
4800 bps	OFF	OFF
9600 bps	ON	OFF
19200 bps	OFF	ON
38400 bps	ON	ON



(3) Lens address setting

Set Lens address according to the table below.

(Factory setting: Address=1)

Lens Address : SW102

Address	SW1	SW2	SW3	SW4
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	OFF	ON	ON
4	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON
6	OFF	ON	ON	OFF
7	OFF	ON	ON	ON
8	ON	OFF	OFF	OFF
9	ON	OFF	OFF	ON
10	ON	OFF	ON	OFF
11	ON	OFF	ON	ON
12	ON	ON	OFF	OFF
13	ON	ON	OFF	ON
14	ON	ON	ON	OFF
15	ON	ON	ON	ON

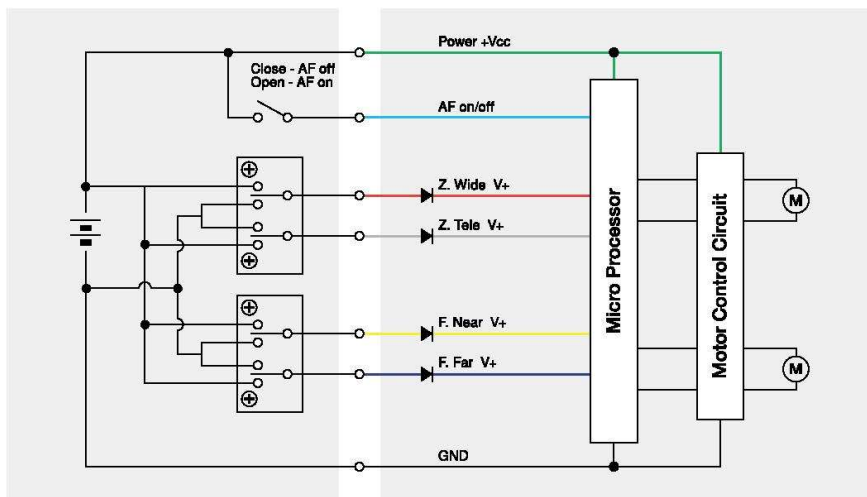


*Specifications and appearance are subject to change without notice

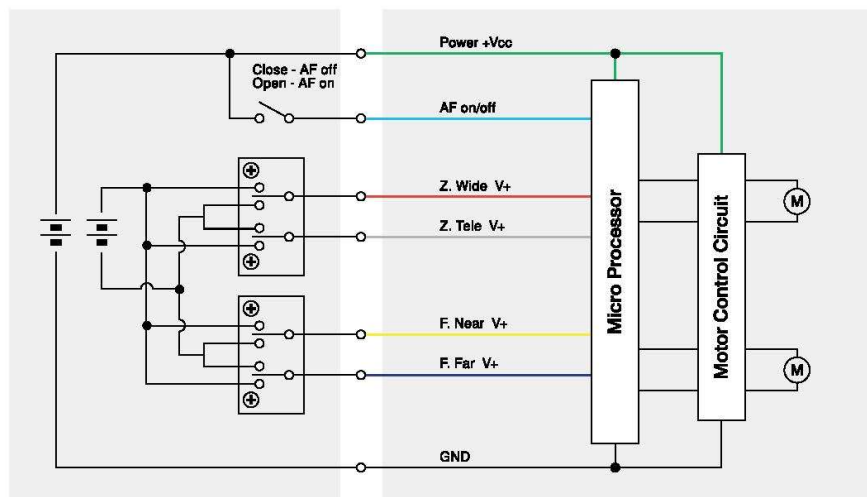
7. Circuit Diagram of Controller for Auto Focus (only for the AF Model)

Yamano New AF Zoom Lens requires the following control circuit. A conventional zoom lens controller can be used as well as a special AF zoom lens controller which our current users of our products have been using to make an operation. Either Controller No. 1 or Controller No. 2 can be used.

- (1) Controller No.1 : Common Ground Type (The controller used by current Yamano AF users)



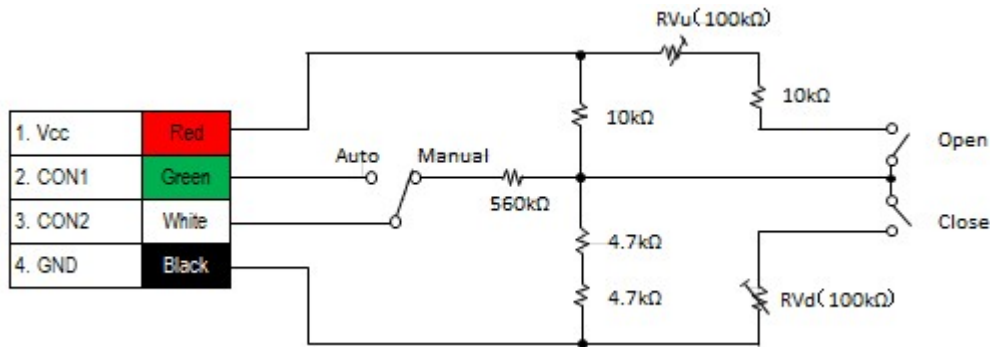
- (2) Controller No.2 : Independent Ground Type (Conventional zoom lens controller)



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8. Circuit Diagram for Iris Manual Override (M/O) (only for Video AI)

With Iris manual override, the iris can be switched from auto iris to manual iris. The iris manual override is an option for the lens of Video Iris type only. To control the M/O, the following control circuit is prepared by users.

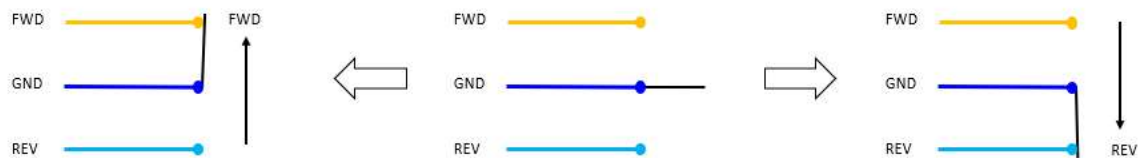


* RVu = 100kΩ By making the volume of resistance lower, can get faster speed of iris opening.

* RVd = 100kΩ By making the volume of resistance lower, can get faster speed of iris closing.

9. How to control for Turret Filter (only for the Turret filter Option)

【Analogue Control】

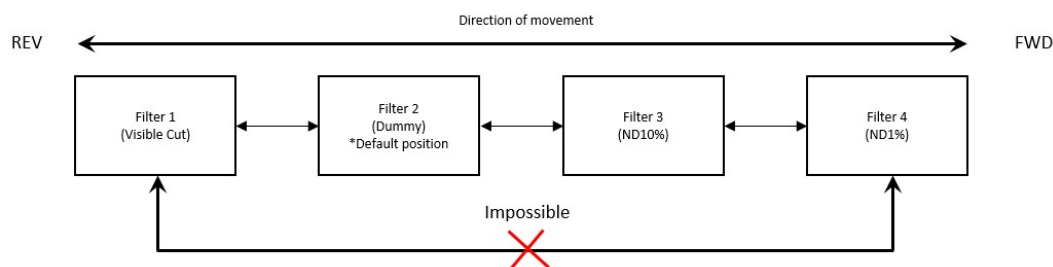


*It is programmed to automatically move to a next filter when either "FWD" or "REV" circuit is closed once to the GND ($\geq 100\text{ms}$).

For example, to change position from Filter 1 to Filter 3, close "FWD" circuit twice.

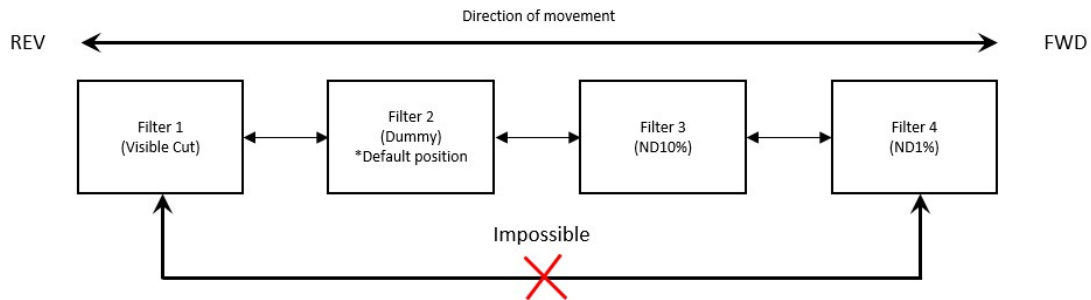
*If "REV" circuit is closed once when Filter 1 is selected, it will automatically move to Filter 4 passing through Filter 2 and Filter 3.

*If "FWD" circuit is closed once when Filter 4 is selected, it will automatically move to Filter 1 passing through Filter 3 and Filter 2.



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【Serial Communication Control】



For serial communication control, dedicated commands are assigned from Filter 1 to Filter 4. Therefore, just by sending the command of each Filter, it will automatically move to the specified filter. If the command of Filter 4 is sent when it is in the position of Filter 1, or if the command of Filter 1 is sent when it is in the position of filter 4, it moves to the specified filter via Filter 2 and Filter 3.

10. Turning on the power

Confirm all cables and wirings are connected correctly, and then turn on a camera and a controller, etc.

【Caution】 Please confirm the manual of each equipment, and turn on it following each instruction.

11. Adjustment

11.1. Back Focus

After a lens is mounted to a camera, the back-focus must be adjusted. Otherwise, a right focus cannot be obtained without the back-focus adjustment.

【Note】

- Lens BF adjustment mechanism is to be used only when camera doesn't have back focus adjustment mechanism.
- When it is necessary to adjust back focus using lens' BF adjustment mechanism, please refer to _ **"11.3. How to Adjust the BF and Optical Axis."**

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【Caution】

Before making BF adjustment, make sure TCS operation is stopped by listening to motor noise.

When the lens is turned on, TCS operation starts and completes within 10 sec. Please do not adjust back focus while TCS is in operation.

(1) Conditions of object

When adjusting the back-focus, it becomes easier if you adjust focus by shooting objects which is;

- in a distance from 15 to 20m
- flat surface at right angle to the optical axis of a lens
- having contrast

(2) Procedures of adjustments

*Please keep iris fully open by either using ND filter or remote control before back focus adjustment.

*This procedure in detail is explained on "11.3 How to Adjust the BF and Optical Axis."

- 1) Zoom in to the tele end, adjust the focus to get a right focus.
- 2) Zoom out to the wide end, then adjust flange back with camera's back focus adjustment mechanism to get a right focus.
- 3) Zoom in to the tele end again, adjust the focus to get a right focus.
- 4) Zoom out to the wide end again, if you can get a right focus, the adjustment of back-focus is completed.

【Caution】

After complete Back Focus adjustment, please make sure to tighten all the screws (7pcs.) including Optical Axis Adjustment Screws(4pcs.) and Back Focus Adjustment Ring Fixing Screws (3pcs.), then, apply adhesive on all the screws (7pcs.) to prevent them from loosening.

11.2. Optical Axis

Lens' optical axis is adjusted at factory. However, due to camera sensor assembly tolerance, optical axis may get off-center while zooming in/out. To avoid this, after mounting camera to lens, adjust optical axis with Lens' Optical Axis Adjustment Mechanism.

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【Note】

Please refer to "**11.3. How to Adjust the BF and Optical Axis.**" for how to make adjustment.

【Caution】

After completing Optical Axis adjustment, please make sure to tighten all the screws (7pcs.) including Optical Axis Adjustment Screws(4pcs.) and Back Focus Adjustment Ring Fixing Screws (3pcs.), then, apply adhesive on all the screws (7pcs.) to prevent them from loosening.

11.3. How to Adjust the BF and Optical Axis**【Characteristics】****1. Back Focus (BF) Adjustment Mechanism**

The Back focus can be easily adjusted with the BF adjustment ring, even when using a camera with no Back Focus adjustment mechanism.

Adjustment range: 17.526mm±0.5mm

2. Optical Axis Adjustment Mechanism

The optical axis can be adjusted without the center of the image shifting out of position for the entire zoom range (wide to tele).

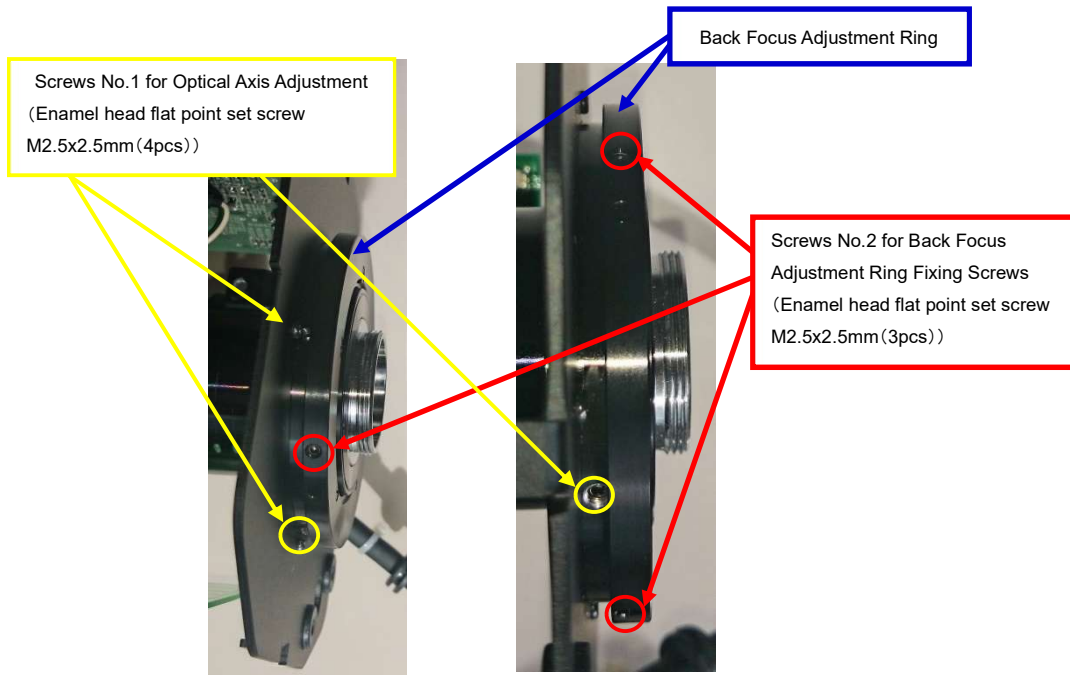
Adjustment range: ±0.4mm

*Note: This adjustment mechanism is designed to deal with the variations in the mounting accuracy of the camera sensor (i.e. the inclination of the sensor to the mount and shifting of the center).

Therefore, due to the assembling accuracy and individual differences of the camera, the sensor's assembling accuracy may exceed the optical axis adjustment range of the lens. Please note that in that case, the optical axis adjustment may be impossible.

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【Mechanism Description】



NOTE: The photo above is of Y33Z15R

【How to Adjust】

Note 1: Before adjusting back focus and optical axis, please loosen **Screws No.2** (3 positions) until they won't come out completely.

Also, after finishing back focus and optical axis adjustment, please tighten **Screws No.2** properly until the end.

Note 2: As both Back Focus and optical axis adjustments are carried out after loosening the **Screws No.1** (4 positions) for optical axis adjustment, please make sure that the optical axis adjustment is done after the back focus adjustment, and that **Screws No.1** are tightened correctly at the end of the procedure.

Note 3: Please make sure that thread locking glue is applied to the screws after tightening to prevent them from loosening.

If glue is not applied, the image may become blurred when the lens is exposed to vibration for a prolonged period, causing the screws to loosen.

1. Connect the lens drive cable to the lens controller and connect the iris cable (if auto iris) to the camera.
2. Turn on the power of the lens controller and the camera.
3. Adjust the Back Focus (please refer to the following Procedures a to i)

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a. Fully open the iris.

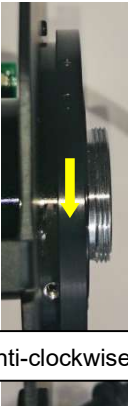
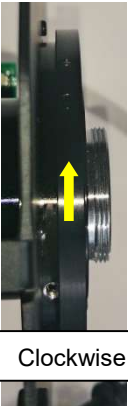
*For Manual iris lens: Open the iris via the lens controller.

For Video iris lens: Cover the front lens with the lens cap and make sure the image is dark. IN approximately 5 seconds the iris is fully opened. At that moment, disconnect the iris cable from the camera; the iris is fixed at the fully open state. If the image is still bright after covering the lens, slow down the camera's shutter speed and adjust to the correct exposure level

For DC iris lens: Set the camera's electronic shutter at the highest speed and make the image dark, gradually slow down the shutter speed until the image's brightness is at the correct level or slightly dark and fix the shutter speed, Then the iris is almost fully open. Or connect the lens iris cable to a specialized jig and force the iris to open fully.

*For auto iris lens, if the camera has an automatic back focus function, the camera will automatically open the iris fully so the procedures above will not be necessary. Please confirm with the camera manufacturer.

b. Loosen **Screws No.1** for optical axis adjustment (Enamel head flat point set screw M2.5x2 (Hole Diameter1.5mm) × 4 positions) with a hexagonal wrench (1.5mm). Please take care not to loosen the screws completely. When the screws are loose, adjustment can be done with the Back Focus adjustment ring. Back Focus adjustment ring can now be turned clockwise (as seen from the camera side) or anti clockwise, as in the photos below.

When the camera flange back is long	When the camera flange back is short
When the BF Adjustment ring is turned anti-clockwise the Flange Back becomes long. 	When the BF Adjustment ring is turned clockwise the Flange Back becomes short. 
Anti-clockwise	Clockwise

c. Bring the zoom to the tele-end and focus using the lens focus.

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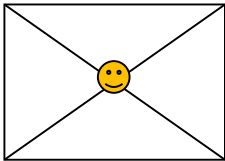
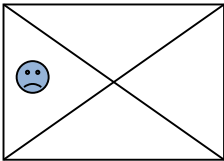
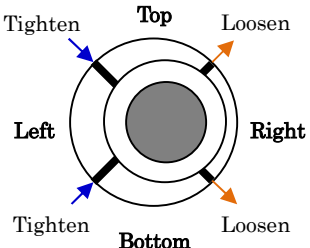
- d. Bring the zoom to the wide end.
- e. Focus with the camera's BF adjustment mechanism (if the function is available on the camera).
Focus with the BF adjustment mechanism of the lens (see photo above) (If the BF adjustment is not available on the camera)
- f. Bring the zoom to the tele-end and focus the lens.
- g. Bring the zoom from the tele-end to the wide-end and confirm that the lens is focused correctly.
- h. If the zoom is not focused, repeat procedures c to g.
- i. If the Back Focus adjustment is complete, lightly tighten **Screws No.2** (enamel head flat point set screw M2.5x2.5mm at 3 positions) to temporarily fix the Back Focus adjustment ring,
Prepare for the optical axis adjustment.

4. Adjust the optical axis. (Please refer to the following Procedures j to o)

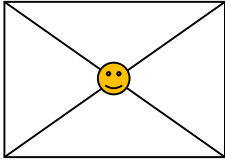
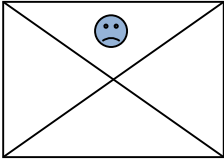
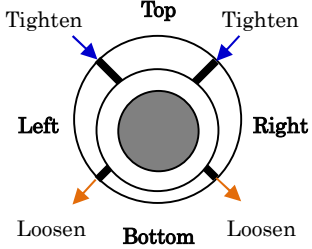
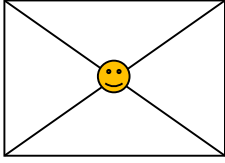
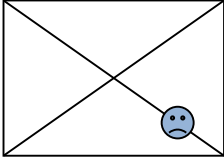
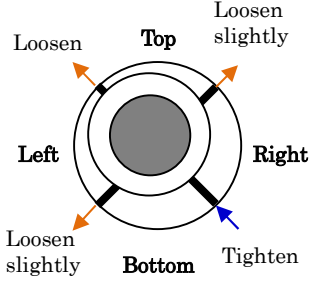
- j. Bring the zoom to the tele end and set the subject (to be the standard point) at the center of the image.
- k. Bring the zoom to the wide end and check the direction (top, bottom / left, right) to which the subject moved in the image.
- l. Based on the direction and amount of movement, tighten/loosen the **Screws No.1** for optical axis adjustment according to the following "Example of adjustment "and carry out the optical axis adjustment,

Example of adjustment

Note: In the following diagrams, the movements are indicated at a larger scale than the actual one, to make the adjustment method easier to understand. The optical axis adjustment range is $\pm 0.4\text{mm}$ from the center, it is difficult to confirm the C mount's movement. As the loosening/tightening of the screws is a delicate adjustment, please get familiar with the level of adjustment by actually doing it.

Example	The direction of the movement of the subject at the center of the image	Adjustment with optical axis screws
1	Tele  When the subject is at the center at Tele end, but has moved to the left at Wide end Wide 	

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2	Tele  Wide  When the subject is at the center at Tele end, but has moved to the top at wide end	
3	Tele  Wide  When the subject is at the center at Tele end, but has moved to the bottom right corner at wide end	

*1- The diagrams above are as seen from the camera side.

- m. Check that the center of the image does not shift at all zoom range.
- n. When the center is set at all zoom range, tighten the **Screws No.1** for optical axis adjustment (4 positions) little by little and in order while continually checking that the center of the image does not shift, and tighten to the limit,
- o. Finally, zoom in /out and confirm that the center of the image has not shifted,

5. Apply thread locking glue to Screws No.1 for optical axis adjustment (4 positions) and fix them.

- * Please leave it to dry for more than 6 hours.
- * If glue is not applied, the image may become blurred when the lens is exposed to vibration for a prolonged period, causing the screws to loosen.

6. Tighten the Screws No.2 for back focus adjustment (4 positions) properly until the end and apply thread locking glue to the screws No.2 and fix them.

- * Please leave it to dry for more than 6 hours.
- * If glue is not applied, the image may become blurred when the lens is exposed to vibration for a prolonged period, causing the screws to loosen.

Back Focus and optical axis adjustments are complete

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11.4. Auto Iris (only for Video Iris Lens)

The adjustment of Auto light control (ALC) or Level may be needed by a lens which has a Video Auto Iris. It is controlled by video output signal from a camera.

(1) ALC adjustment (Set at the middle position at factory)

It can change from the average mode to the peak mode continuously.

- Average mode

This mode uses the average value of the video signal on the whole screen to control the iris.

The volume needs to be turned to the average (A) side if the contrast is not enough to see the image.

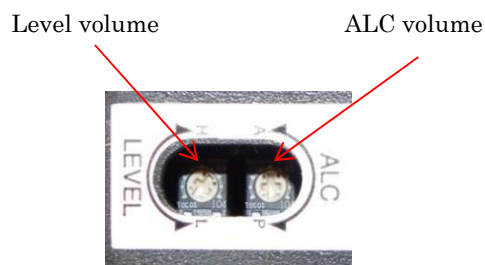
- Peak mode

This mode uses the peak value of the video signal on the whole screen to control the iris. The

volume needs to be turned to the peak (P) side if the contrast is so high that the blurred image occurs.

(2) Level adjustment (Set at 2 o'clock position at factory)

The brightness level needs to be adjusted in case the image is too bright or dark.



【Caution】

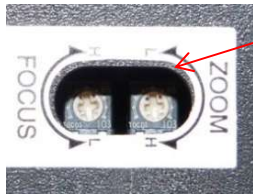
- Please make sure that iris hunting doesn't occur under any lighting conditions when the iris level is adjusted.
- Don't apply unusual forces on them by pushing them hard or turning them strongly to prevent them from being damaged when turning the volumes with a screwdriver.

11.5. Zoom Operation Speed

The zoom operation speed can be changed by turning around zoom volume on the top of the lens cover.

The zoom volume is set at middle position at the factory.

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- To get faster speeds - Turn to High (H)
- To get slower speeds - Turn to Low (L)

【Caution】

- Please set the volume between the middle and the maximum position. The zoom motor may not move especially under low temperature if the zoom volume is set at between minimum and middle position.
- Don't apply unusual forces on them by pushing them hard or turning them strongly to prevent them from being damaged when turning the volumes with a screwdriver.

11.6. Remote Focus Operation Speed

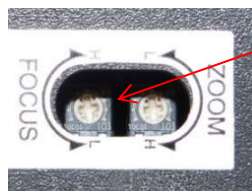
There are 2 modes to control the speed of the focus motor. They can be switched by using the volume.

(1) 2 Steps Speed Mode

The focus moves slowly for the first 3 seconds, and then the speed becomes faster automatically if the volume is set at the minimum position. This mode enables to focus on an object at a long distance easily. It is not recommended to use this mode if the preset function is used.

(2) Fixed Speed Mode

The focus motor moves in the same speed if the volume is set at between middle position and maximum position. The focus operation speed changes depending on the position of the volume. This mode needs to be applied if the preset function is used.



- To get faster speeds - Turn to High (H)
- To get slower speeds - Turn to Low (L)

【Note】

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- This function is not for improving the auto focus speed.
- A power restart is required for the speed adjustment setting to take effect.

【Caution】

- Don't apply unusual forces on them by pushing them hard or turning them strongly to prevent them from being damaged when turning the volumes with a screwdriver.

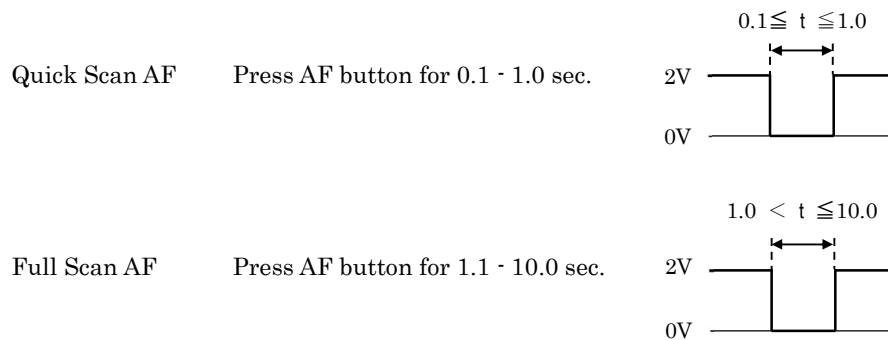
12. Operation of Auto Focus (only for the Lens with AF)

(1) One push AF

The One Push AF supports 2 modes depending on time to push the button. One mode is called "Quick Scan AF", the other one is "Full Scan AF".

A) AF Mode

"Quick Scan AF" searches focus point in the distance between 100m to infinity, which enables to focus on an object quickly. "Full Scan AF" searches a focus point in the distance between 25m to infinity, which enables to focus on an object in a short distance. It takes longer time in focusing than the Quick one.

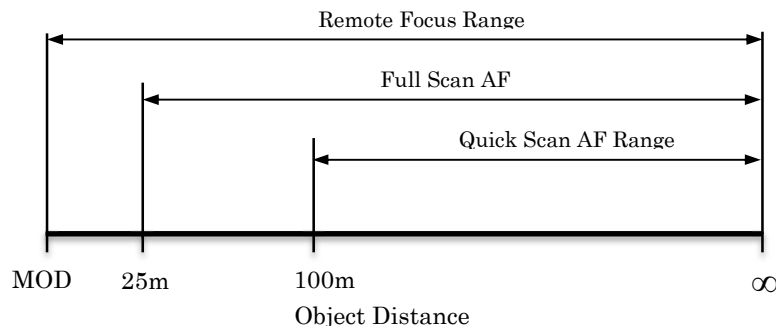


B) Focus Range

There are two focus ranges which are shown in the table below depending on AF Mode.

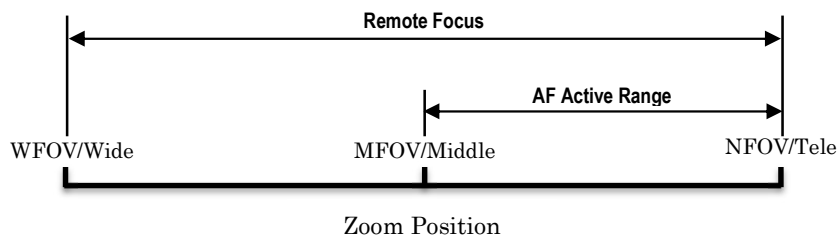
1. Quick Scan AF Mode : 100m - ∞
2. Full Scan AF Mode : 25m - ∞

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C) Zoom range to activate AF

AF works in the zoom range between middle position and tele-end position, but it doesn't work in the zoom range between wide-end position and middle position because the depth of field is big enough. Thus, Yamano AF avoids such waste motion. To avoid unnecessary motion reduces number of focus barrel movement, by which, it improves focus barrel life longer as much as possible.



D) Other AF motion

- To Restart AF : Press AF button while AF is in motion
- To Stop AF : Press zoom/focus button while AF is in motion

(2) How to use AF.

It is recommended that Auto Focus is usually switched off, and that AF is operated as necessary by one-push Auto Focus method. This procedure can avoid earlier worn-out at scraping points of lens.

【Note】

- Pressing AF button first time after lens is turned on, Full Scan AF is activated no matter how long the AF button is pressed.
- AF cannot be activated while zoom or focus is in motions

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- When sky blue wire is disconnected, AF will be activated automatically every after the zoom motion is stopped. However, it's not recommended to use AF in such way because lifetime of lens barrel gets shorter.

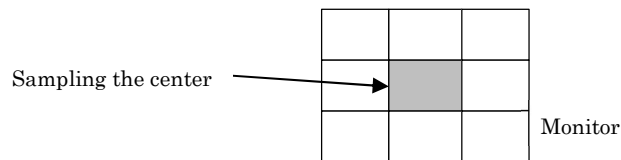
【Caution】

- If AF is always left on, images are often blurred and kept such conditions in certain times. It will also prompt worn outs of scraping points of focus barrel.

(3) Mechanism

Yamano AF operates by sampling analog composite video signal in the center of the monitor.

Composite video signal: Brightness signal, Vertical & Horizontal synchronized signal in NTSC/PAL/Progressive.



AF microprocessor converts the change rate of horizontal contrast into voltage and detects the highest point of the voltage by moving front lens to get focus. Therefore, in some conditions below, it may be difficult to obtain a correct focus, or it may focus on some unintentional spots. Also, AF microprocessor tries to keep searching, which will take a long time and you might want to abort the AF operation, then you can abort AF operation by pushing zoom button either tele or wide one time, then AF operation will stop.

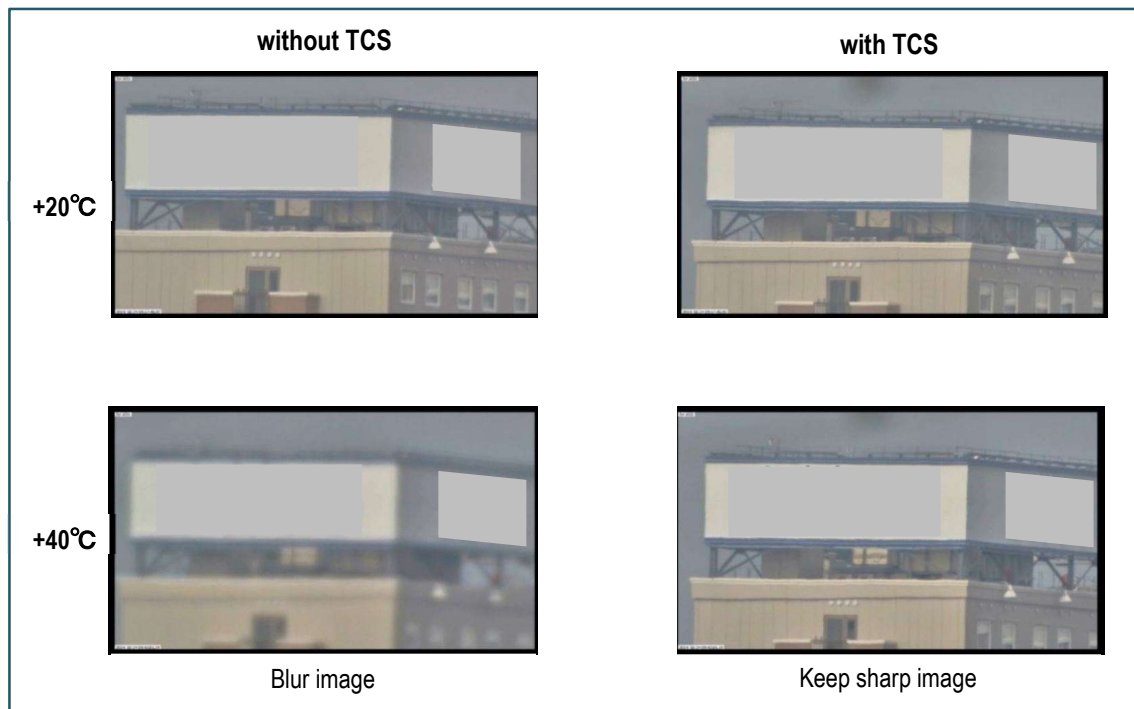
- Low contrast of an object (little difference of the converted voltage).
- The location is a bright environment such as beach or desert with strong sunlight.
- Two different objects in far distance and in near distance exist at a time in the center part of the monitor.
- A white part exists in the AF area. (The white part may be brighter when it's blurring than when it's in focus.)
- The Accumulation mode such as AGC of camera is turned on and in operation.
- The image is changed by panning or tilting while AF is in operation.
- The camera electric shutter is ELC mode. (Please set ALC mode instead. If ELC changes shutter speed while AF is in operation, it causes improper operation of AF.)

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13. About Thermal Compensation System (TCS)

Yamano NIR Corrected Zoom Lens series with focal length over 500mm is integrated TCS as a standard function. TCS keeps correct back focus automatically by monitoring lens' barrel temperature. TCS is necessary for NIR Corrected Zoom Lens or Megapixel Zoom Lens which uses super low dispersion glass material in it. The SLD glass has high coefficient of thermal expansion which makes back focus shifted and image gets blur according to temperature change.

The pictures show the effectiveness of TCS. At 20°C, there is no difference in image quality, but when temperature goes up to +40°C, the picture with TCS doesn't change in image quality while the picture without TCS. TCS keeps image quality almost the same no matter how much temperature changes between -10°C to +50°C.

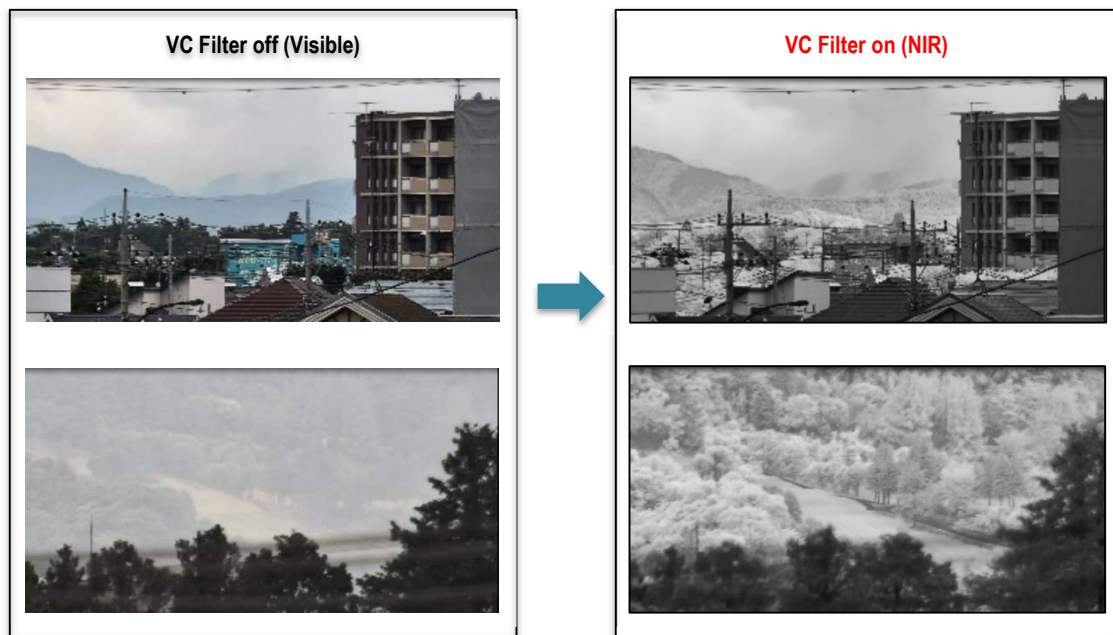


Another benefit using TCS is that when using lens in preset application, focus position related to object distance remains almost the same position when temperature changes, which means that it is unnecessary to reset preset positions of focus every time temperature changes and focus position changed.

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14. About the Visible Light Cut Filter System

The Visible Light Cut Filter (IR76) cuts wavelength under 760nm to see objects hidden by haze with near infrared light. This is used as haze/fog reduction in the daytime when there is enough brightness around objects.



15. Storing

- Avoid storing in such atmosphere as high temperature, high humidity, and corrosive atmosphere.
- Avoid storing for a long time, which may cause grease hardening.
- If a lens is brought into high temperature atmosphere from low temperature atmosphere, it may cause dew condensation inside a lens. It is recommended to leave the lens at normal temperature for a while before bringing it into high temperature atmosphere.

16. Maintenance

- To keep the focus and zoom moving smoothly
 - The lubricant is applied to the scraping points of the focus and zoom mechanism. It may harden or dry out unless these mechanisms are moved for a long time, and unexpectedly slow moving can be caused. Also, it may dry out in a shorter time than expected. To avoid the troubles mentioned above and to use lenses in good conditions for a long time, it is recommended to move them once a day to spread the lubricant to all the scraping points.

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17. International Compliance Information

This section details the worldwide compliance information for this product, which is manufactured to be compliant in the regions where it is sold.

17.1. CE Compliance Information (European Union)

Products with CE Marking comply with EMC Directive (2014/30/EU), RoHS Directive (2011/65/EU, (EU) 2015/863) issued by the Commission of the European Community. Compliance with these directives implies conformity to the following European Norms:

- EN 55032:2015+A11:2020 (Class A)
- EN 50130-4:2011+A1:2014 (It is applied under the condition of 3 meters or less in length of cable)
- EN IEC 63000:2018

The power supply filter which is shown below are used for EMC testing.

PBA10F-12 (COSEL Co., Ltd.)

EMC testing is required if other power supplies or other filters are used.

17.2. China Requirements — China RoHS

China RoHS refers to the Ministry of Industry and Information Technology Order No. 32, effective July 1, 2016, titled Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products. To comply with China RoHS, we determined this product's Environmental Protection Use Period (EPUP) to be 10 years in accordance with the Marking for the Restricted Use of Hazardous Substances in Electronic and Electrical Products, SJT 11364-2014.

Table of Hazardous Substances' Name and Concentration

Environmental Protection Use Period	Part Name	Hazardous Substances				
		Pb	Hg	Cd	PBB	PBDE
	Inner Box	○	○	○	○	○
	Molded Parts	○	○	○	○	○
	Lens	○	○	○	○	○
	Mounted Board	×	○	○	○	○
	Metal Parts	×	○	○	○	○

○ : Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

× : Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572.

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18. Warranty

All products are under 1 year warranty after delivery except in the following cases.

All failures caused by assembly problems or component problems that occur within one year after shipment will be repaired for free of charge, except for the damage caused by the following;

- improper handling
- handlings without following the instruction manual
- modifying or disassembling
- customer's responsibility
- natural disasters such as lightning, earthquakes, etc.

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Release Note :

日付	担当	修正点
2017/Nov/6	阿部	原産地証明項目を削除
2020/Mar/27	楠	新規発行
2021/Dec/10	楠	新基板（VLS100,VCU100,SIF100）対応版発行
2022/Nov./29	楠	Turret Filter コントロール方法追加
2022/Nov./30	楠	EU RoHS の適用規格を最新版に変更
2022/Dec./12	楠	BF と光軸調整方法の説明修正
2026/Apr/1	Homme	Transitioned to a new document number. Some English wording revised.

リリース・ノート

日付	担当	

*Specifications and appearance are subject to change without notice