0.3M / 1.2M Monochrome / Color Vision Sensor (Internal illumination)

VG2 Series

INSTRUCTION MANUAL

TCD240015AE

Autonics

Thank you for choosing our Autonics product.
Read and understand the instruction manual and manual thoroughly before using the product.
For your safety, read and follow the below safety considerations before using.
For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
Keep this instruction manual in a place where you can find easily.

Visit Autonics website (www.autonics.com or QR code) for the latest information. Manuals, CAD files, certifications, software, etc. are available. The dimensions, specifications, certifications, etc. are subject to change without notice for product improvement. Certain models may be discontinued without notice.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in economic loss, personal injury or fire.
02. Do not use or store the unit in the place where flammable/explosive/ corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.
Failure to follow this instruction may result in fire or explosion.
03. Do not use this product for protecting human body or part of body.
04. Do not see light LED directly or direct beam at person.
Failure to follow this instruction may result in damage on eyes.
05. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.
06. Check connections and connect cables.
Failure to follow this instruction may result in fire.
07. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.
02. Use dry cloth to clean the unit. Do not use water or organic solvent when cleaning the unit.
Failure to follow this instruction may result in fire.
03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.
04. When replacing filters, lights, or polarizing covers, avoid applying static electricity to the inside of the product. Reassemble it correctly.
Failure to follow this instruction may result in product damage or protection structure may be damaged.
05. Do not touch the case while the product is in operation or immediately after the power is turned off.
There is a risk of burns when touching the case (excluding buttons).
06. Do not expose the lens part of the product to excessive light for a long period of time.
Failure to follow this instruction may result in lens to burn or product malfunction.

Cautions during Use

- Follow instructions in Cautions during Use.
  Otherwise, it may cause unexpected accidents.
- This product is intended to be supplied by a UL Listed Power Supply Unit marked Class 2 or LPS or PS2.
- Prevent power wire from short to other wires in power I/O cable.
- In order to avoid malfunction from static electricity or noise, ground shield wire of the power I/O cable.
- Do not disconnect the power supply while setting operation or saving set information. It may cause data loss.
- Do not disconnect the power supply while updating firmware. It may cause product damage.
- Keep optical section of the product away from the contact with water, dust and oil. It may cause malfunction.
- When changing the light or filter, use the assembly tool and observe installation instruction.
- When the product is not used for a long time, separate the power cable to store.
- When connecting network, connection must be operated by technical expert.
- In the following case, disconnect the power supply immediately. It may cause fire or product damage.
  - When water or foreign substance is detected in the product
  - When the product is dropped or case is damaged
  - When smoke or smell is detected from the product
- Do not use the product in the place where strong magnetic field or electric noise is generated.
- Avoid sudden temperature changes in the product and peripheral devices. It may cause condensation.
- This unit may be used in the following environments.
  - Indoor (in the environment conditions in specifications)
  - Altitude max. 2,000m
  - Pollution degree 2
  - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

VG2 - ❶ ❷ ❸ - ❹ ❺

❶ Image element
M: Mono CMOS
C: Color CMOS

❷ Resolution
03: 0.3 MP (640 × 480 pixel)
12: 1.2 MP (1,280 × 960 pixel)

❸ Color of light
W: White
R: Red
B: Blue

❹ Effective focal length
Number: Effective focal length (unit: mm)

❺ Communication
E: Ethernet (TCP/IP)

Product Components

- Product
- Instruction manual

Sold Separately

- Bracket A (BK-VG2-A)
- Bracket B (BK-VG2-B)
- Ethernet connector protection cover (P96-M12-1)
- Polarizing cover (CVR-□-VG2)
- Light (LM-□-8-VG2), Filter (FL-□-VG2)
- M12 connector cable (C□D12-□, C□DM12-□-A)
- M12 connector communication cable (C□M8-□PR(-A), C□8-□PR(-A))

Software

Download the installation file and the manuals from the Autonics website.

■ atVision

The program allows setting of vision sensor parameters and management of monitoring data such as inspection status and status information.

Network Setting

IP address	192.168.0.2
Subnet mask	255.255.255.0
Gateway	192.168.0.1

- Configure the network settings of vision sensor via atVision.
- For initial IP address, refer to the table.

Installation Order

For more information, refer to the atVision software manual.

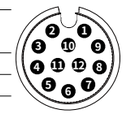
01. Install the vision sensor.
Secure the vision sensor to the installation location.
⚠ The product may become hot during operation. Heat dissipation measures are required during installation.
It is recommended to use the dedicated bracket (BK-VG2-□, sold separately).
Do not use insulators on the bracket or surface during installation. This will reduce the heat dissipation effect. Use a metal bracket and fix it to a metal surface. Metal has high thermal conductivity and can effectively dissipate heat.
02. Install the vision sensor program, atVision, to PC.
Download the software provided by Autonics website.
03. Connect the vision sensor and the PC, and set the network.
Refer to the Network Setting.
Use GigE communication for stable operation.

Connections

■ Power I/O connector cable (M12 12-pin connector, Plug - Male)

- When the power is unstable, ground the shield of the provided cable.

Pin	Cable color C□DM12-□-A	Cable color C□D12-□	Signal	Function
1	Brown	Brown	VCC	Power input 24 VDC⎓
2 01)	Blue	Blue	GND	Ground
3	White	White	NC	Not connected
11	Gray / Pink	Sky	Input COMMON	
4	Green	Green	IN0	Trigger input, Work group change Bit 0,1
5	Pink	Orange	IN1	
6 01)	Yellow	Yellow	RS232 TX	RS232 transmit
8 01)	Gray	Gray	RS232 RX	RS232 receive
7	Black	Black	OUT0	Inspection complete, inspection result output (PASS / FAIL), external trigger, alarm, product work
9	Red	Red	OUT1	
10	Purple	Purple	OUT2	
12	Red / Blue	Bright green	OUT3	



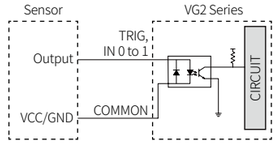
01) Connect RS232C as follows.

■ Ethernet connector cable (M12 8-pin-RJ45 connector, Socket - Female)

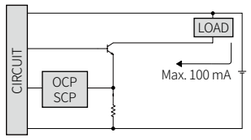
M12 8-pin	RJ45	Signal
1	5	MX2-
2	7	MX3+
3	8	MX3-
4	2	MX0-
5	3	MX1+
6	1	MX0+
7	4	MX2+
8	6	MX1-

Inner Circuit

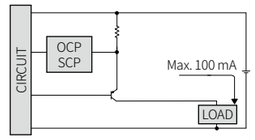
■ External trigger (TRIG), Work group change input



■ NPN open collector output



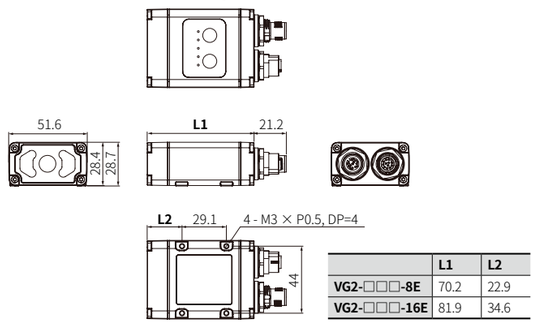
■ PNP open collector output



- OCP (over current protection), SCP (short circuit protection)
- If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

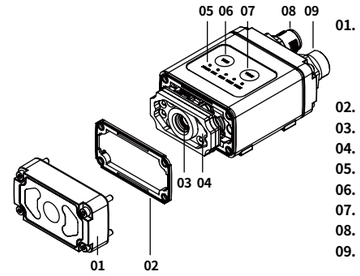
Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.



	L1	L2
VG2-□□□-8E	70.2	22.9
VG2-□□□-16E	81.9	34.6

Unit Descriptions



01. Front cover:
Do not touch the lens with your hands. Be careful not to scratch it.
02. Gasket
03. Lens
04. Light LED module
05. Indicator
06. Trigger button
07. TUNE button
08. Power I/O connector
09. Ethernet connector

■ Indicator

Indicator	Color	Name	Function
POWER	Green	Power indicator	Turns ON when power is supplied.
LINK	Green	Ethernet connection indicator	Turns ON in Ethernet communication status.
DATA	Green	Data transmit indicator	Flashes when data is transmitted between product and PC.
USER 1	Green / Red	User setting indicator	Turns ON or flashes in operation of inspection complete, inspection result (PASS, FAIL), external trigger, alarm, and product work.
USER 2			

Specifications

Model	VG2-□□□-8E	VG2-□□□-16E
Effective focal length	8 mm	16 mm
Min. working distance	40 mm	
Image filter	Preprocessing, external filter (filter, polarizing cover)	
Image element	1/2.9 inch mono CMOS / color CMOS model, 3.45 × 3.45 μm pixel	
Shutter	Global shutter	
Exposure time	30 to 1,400,000 μs	
Lens type	f8 mm Board Lens	f16 mm Board Lens
	Liquid Lens (auto focus function)	
eMMC	8 GB	
DDR4	4 GB	
Inspection work group 01)	64 (simultaneous inspection: 32)	
Light ON / OFF method	Pulse	
Trigger mode	Continuous, External Trigger, Manual, Ethernet, RS232	
Communication	Ethernet (TCP/IP, 10 / 100 / 1000 Base-T), Modbus (TCP, RTU)	
FTP trans. output	YES	
Certification	CE UK c UL us LISTED KC	
Unit weight (package)	≈ 182 g (≈ 242 g)	≈ 202 g (≈ 262 g)

01) Up to 4 can be used when changing work groups through external input.

Model	VG2-□03□-□E	VG2-□12□-□E
Resolution	0.3 MP (640 × 480 pixel)	1.2 MP (1,280 × 960 pixel)
Max. No. of images collected per second 01)	≤ 60 fps	≤ 45 fps

01) Based on the min. exposure, no trigger delay, inspection function / pre-processing not being configured and no Ethernet connection.

Power supply	24 VDC⎓ ± 10 %
Current consumption	600 mA
Rated input signal	24 VDC⎓ ± 10 %
Output signal	NPN-PNP open collector output setting (software)
Load voltage	24 VDC⎓
Load current	≤ 100 mA
Residual voltage	≤ 2 VDC⎓
Protection circuit	Output short overcurrent protection circuit, reverse voltage polarity protection circuit
Insulation resistance	≥ 100MΩ (500 VDC⎓ megger)
Dielectric strength	500 VAC~ 50/60 Hz for 1 min.
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	300 m/s² (≈ 30 G), 11 ms in each X, Y, Z direction for 3 times
Ambient temperature	0 to 45 °C, storage: -20 to 70 °C (non-freezing or non-condensation)
Ambient humidity	35 to 85%RH, storage: 35 to 85%RH (non-freezing or non-condensation)
Protection structure	IP66, IP67 (IEC standard) , IP69K (DIN standard)
Connection	Connector type
Connector spec.	Power I/O: M12 12-pin, Ethernet: M12 8-pin (cable tightening torque: 0.4 N m)
Material	Case: Die-cast Aluminum Housing, Window: Glass, Gasket: Silicon

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