

## OS33C-CS-5M

### Safety Laser Scanner

#### EN Quick Reference Guide

Thank you for purchasing the OS33C Series Safety Laser Scanner.

The OS33C Series Safety Laser Scanner is electro-sensitive, protective equipment designed to guard personnel working around hazardous machinery.

Only qualified personnel trained in professional electrical technique should handle the OS33C. Thoroughly read this document together with related manuals, and understand the installation, operation checks, and maintenance procedures before using the product. Please refer to the Related Manuals list below for the documents to be referenced. Keep this document ready to use whenever needed. Please consult your OMRON representative if you have any questions or comments. Make sure that information written in this document are delivered to the final user of the product.

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Instructions in the EU languages and a signed EU Declaration of Conformity are available on our website at <https://industrial.omron.eu/en/products/safety>

### Declaration of Conformity

OMRON declares that the OS33C is in conformity with the requirements of the following EU Directives:

EU: Machinery Directive 2006/42/EC, EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU

### Safety Standards

The OS33C is designed and manufactured according to the following standards:

IEC 61496-1 (Type 3 ESPE), IEC 61496-3 (Type 3 AOPDDR), IEC 61508, Parts 1-7 (SIL 2), EN ISO 13849-1:2015 (PL d)

### Safety Precautions

#### Meaning of Warning and Caution indications

#### WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in serious injury or moderate injury, or may result in property damage.

#### CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

#### Meaning of alert symbols

	Indicates prohibited actions.
	Indicates mandatory actions.
	Indicates prohibiting disassembly.
	Indicates a precaution for electric shock.

Qualified personnel in this document is an individual who understands, is trained on, and demonstrates competence with the construction, operation or maintenance of the machinery and the hazards involved.

#### User Requirements

#### WARNING

The OS33C Safety Laser Scanner should only be installed, verified and maintained by qualified personnel.

The OS33C Safety Laser Scanner must be installed, configured, and incorporated into a machine control system by a sufficiently trained and qualified person. The entire configuration, including the proper sequencing of multiple zone configurations, must be Checked, Verified, and Tested, at installation, maintenance, adjustment, repair or modification. An unqualified person may not be able to perform these operations properly, which may cause a person to go undetected, resulting in serious injury.

#### Machine Requirements

#### WARNING

The guarded machine must be able to stop anywhere in its cycle, and it must have a consistent stopping time or have a known worst-case stopping time that can be used in the calculation of safety distance. Never use the OS33C Safety Laser Scanner for the machine systems whose outage time is indeterminate or that cannot stop immediately such as a press with a full-revolution clutch. The machine may not be able to stop in time, and serious injury or death may possibly occur.

All safety-related machine control elements must be designed so that an alarm in the control logic or failure of the control circuit does not lead to a dangerous failure.

#### Installation Requirements

#### WARNING

Serious injury or death may possibly occur. The installer is responsible for assessing the risk and to ensure that the zone of limited detection does not create a safety hazard. If a hazard exists, additional countermeasure must be taken, which may require additional guarding measures.

Make sure to calculate the safety distance correctly when you set or modify the safety system. Make sure to install the OS33C Safety Laser Scanner at the safety distance from the hazardous part of the machine. If multiple zone sets are used, be sure to calculate the time that includes the switching of the zone sets. Otherwise the machine may not stop before a person reaches the hazardous part, resulting in serious injury or death.

The OS33C Safety Laser Scanner cannot detect translucent objects or non-transparent objects with less than 1.8% reflectivity. A worker wearing clothes or tools with a reflectivity of less than 1.8% may go undetected, resulting in a dangerous condition.

The OS33C Safety Laser Scanner has a configurable minimum object resolution of 30 mm, 40 mm, 50 mm or 70 mm. Select an appropriate object resolution for the application, or serious injury or death may occur.

Never use the OS33C Safety Laser Scanner in applications for finger protection, or serious injury could result.

When a person drives a vehicle equipped with OS33C Safety Laser Scanner, do not use it as a safety device. If the OS33C Safety Laser Scanner fails to work properly, serious injury or death could result.

The OS33C Safety Laser Scanner must be securely mounted using genuine mounting brackets. Its cables and connectors must be tightly attached to the OS33C. The cables must be properly routed, protected and secured to ensure damage does not occur. If the protection zone shifts or short circuit occurs between signals, the machine cannot stop correctly, resulting in serious injury or death.

Serious injury or death may possibly occur. A start switch to release interlock must be installed where an operator can observe the monitored zone as a whole and cannot operate the switch within the hazardous zone.

Never install the OS33C Safety Laser Scanner in areas in flammable, explosive or corrosive atmosphere.

The OS33C Safety Laser Scanner must not be mounted behind glass or within a secondary enclosure. Failure to follow this instruction will cause a reduction in detection capability, which can cause serious injury or death.

A protective mechanism must be installed to prevent a hazardous condition in the event of a subsequent machine component failure. The OS33C Safety Laser Scanner does not protect against ejected flying material.

Never install the OS33C Safety Laser Scanner more than 300 mm above the floor. Otherwise the OS33C cannot detect access of personnel underneath the protection zone, serious injury or death may possibly occur. Additional guarding may be required to prohibit access to dangerous areas that are not covered by the OS33C Safety Laser Scanner.

Never use mirrors or mirror-like objects in the protection plane as they can hide part of the area to be monitored. Otherwise the machine cannot stop correctly, and serious injury or death may possibly occur.

Additional measurement error, arising from reflective backgrounds, may need to be added to the measurement error of the OS33C Safety Laser Scanner to prevent a human hazard resulting in death.

Never allow fingerprints or dirt on the window of the OS33C Safety Laser Scanner. Make sure to clean the window as soon as possible if there is any dust or pollution on it.

If there is any damage to the window, replace it as soon as possible. Otherwise the OS33C Safety Laser Scanner may fail to work properly. Take preventive measures when performing replacement work so that dust does not enter the OS33C Safety Laser Scanner.

The Window Replacement Procedure must only be performed by qualified personnel, in a clean environment, and at ambient temperature (5 to 35°C), to prevent the internal optical surfaces from contamination. Make sure the inside and the outside of the replacement window is clean and free from scratches, dust, and fingerprints.

The Window Calibration Procedure must only be performed by qualified personnel at ambient temperature (5 to 35°C). Before performing the window calibration of the new scan window, make sure that the window is clean from scratches, dust and fingerprints. Failure to inspect the window or set the proper environmental conditions during the Window Calibration Procedure may cause a reduction in the detection capability of the OS33C Safety Laser Scanner.

Serious injury or death may possibly occur. Make sure to remove any retro-reflector from the field of view of the OS33C Safety Laser Scanner when in Reference Boundary Monitoring (RBM) mode.

If an insufficient Zone Set Switching Delay is used for the actual worst case switching time of the installation, the OS33C Safety Laser Scanner might start monitoring the wrong zone during the switching of the zone set and the machine cannot stop correctly, resulting in serious injury or death.

Monitoring zone parameters are subject to a number of constraints that include projective consistency, maximum radius, and angle limits. As a result, an imported zone may not correspond exactly to the zone defined in the file. The user must visually verify the imported zone when the zone coordinate import process is complete.

#### Wiring Requirements

#### WARNING

Never connect the OS33C Safety Laser Scanner to a power supply with more than 30 VDC (24 VDC +25%) or an AC voltage. Use double-insulation or reinforced insulation from hazardous voltage (such as 230 VAC). The OS33C Safety Laser Scanner may be damaged and result in electrical shock.

For the OS33C Safety Laser Scanner to meet IEC 61496-1 and UL 508, its DC power supply unit must satisfy all of the following conditions:

- Within rated voltage (24 VDC +25% / -30%)
- Complying with EMC directives (industrial environments)
- Double-insulation or reinforced insulation between primary and secondary circuits
- Automatic return for overcurrent protection
- Output retention time of 20 ms or longer
- Satisfy output characteristics requirements of Class 2 circuit or limited voltage/current circuit defined in UL 508.
- Power supply complying with regulations and standards of EMC and safety of electrical equipment in a country or a region where the OS33C Safety Laser Scanner is used. (Example: In EU, a power supply must comply with the EMC and Low Voltage Directives.)

Serious injury or death may possibly occur. Make sure to perform wiring while the power supply is OFF. Properly perform the wiring after confirming the signal names of all the terminals. When wiring the OS33C Safety Laser Scanner to external devices, make sure to follow the color and coding schemes per EN 60204-1.

Cable extensions must be within the specified lengths, otherwise it may result in a failure of the safety functions.

The OS33C Safety Laser Scanner requires a functional earth connection. Never connect Functional Earth to a positive ground system. If it is connected to positive ground, the guarded machine to be controlled may NOT stop, resulting in serious injury or death.

Never use the OS33C Safety Laser Scanner in environments where strong electromagnetic fields may be produced. Be sure to route the OS33C cable separate from high-potential power lines or route it through an exclusive conduit. Otherwise, it may cause the safety functions to stop working properly.



#### Additional Warnings and Cautions

### WARNING

Never modify the OS33C Safety Laser Scanner. Never replace or fix any component of the OS33C Safety Laser Scanner other than the ones specified in this document. Doing so may result in a failure of this device to function correctly, causing serious injury or death.



The tests outlined in this document must be performed at the time of installation, according to the employer's regular inspection program and after any maintenance, tooling change, set up, adjustment, or modification to the OS33C Safety Laser Scanner or the guarded machine. Where a guarded machine is used by multiple operators or shifts, it is suggested that the test procedure be performed at each shift or operation change and also if there is a change in the operating mode or defined zone sets of the OS33C Safety Laser Scanner. Testing ensures that the OS33C and the machine control system are working properly to stop the machine. Failure to test properly could result in serious injury or death.



Serious injury or death may possibly occur. If the OS33C Safety Laser Scanner is operated under automatic start, make sure that the machine stops and does not restart as long as an object is detected in a protection zone. Check the operation by placing a test piece into the protection zone. An example of the test piece is a white cylinder with a diameter equal to the minimum object resolution, a minimum length of 0.2 m and a minimum reflectivity of 80%. It is recommended to perform the test at least after a shift change or 24 hours of operation.



Serious injury or death may possibly occur. If the safety system or the machine fails any of these tests in the test procedure, never run the machine. Immediately tag or lock out the machine to prevent its use and notify the appropriate supervisor.



Serious injury or death may possibly occur. Make sure to set a suitable IP address, before connecting an OS33C Safety Laser Scanner to the network.



Serious injury or death may possibly occur. System parameters, zone status parameters and measurement data monitored over EtherNet/IP (non-safety CIP) are to be used for usability purposes only. Never use them in safety-critical functions.



Never use information of Floating dust, Standby and Waning Zone Status in Safety Input Assembly Data for control purposes including safety interlock purposes. These are non-safety information and are data for monitoring during debugging.



Never use non-safety signals, including tag data links, explicit messages, and exposed variables, as safety signals. Serious injury may possibly occur due to the loss of required safety functions.



Serious injury or death may possibly occur. The safety reaction time must be calculated, including the network reaction time.



Serious injury or death may possibly occur. Before transferring data from the PC to the OS33C Safety Laser Scanner, make sure to verify the safety parameters are configured as intended for the application. When more than one OS33C Safety Laser Scanner is connected to the network, it is necessary to visually check the diagnostic code on the Status display.



For setting of CIP Safety, if you select "Open Only" for the Open Type setting, make sure to verify that the originator/target have the correct configurations. Serious injury may possibly occur due to the loss of required safety functions.



### CAUTION

Keep the packaged product in a secured place to prevent it from dropping onto a person from a high place like a shelf. Do not drop the product with or without a package. Serious damage and injury may occur.



### Precautions for Safe Use

Do not install, use or store the OS33C in the following types of environments, or moderate/minor human hazard may possibly occur:

- Areas exposed to water, oil or other liquids
- Areas with a temperature or humidity out of the specified range
- Areas with high humidity where condensation is likely to occur
- Areas exposed to vibration or shock levels higher than in the specification provisions
- Areas where the pollution degree is harsher than 3, such as outdoor environment
- Areas where the OS33C may be exposed to intense interference light, such as direct sunlight

Environmental conditions such as smoke, fog and dust may affect the operation of the OS33C, causing it to unexpectedly enter a Machine Stop state.

Operation of the OS33C Safety Laser Scanner may be affected by light in the environment, such as sunlight, incandescent light, strobe light, flashing beacon and light from a photosensor using infrared light.

When using more than one OS33C Safety Laser Scanner, mutual interference should be minimized, or unintended Machine Stop state may occur. This may require different scanner positions or physical shields to be installed.

Do not install the product at a facility with an elevation higher than 2,000 m.

Sharing the power supply with other devices may cause the OS33C Safety Laser Scanner to be affected by noise or voltage drop. It is recommended that the safety-related devices use a dedicated power supply, not shared with other devices.

This is a class A product (for industrial environments). In residential areas it may cause radio interference, in which case the qualified personnel may be required to take adequate measures to reduce interference.

Before using the OS33C Safety Laser Scanner, inspect it for damage. If it is used in a damaged state, minor/moderate human hazard may possibly occur.

Do not use thinner, benzene, acetone or other organic solvents for cleaning. They will adversely affect the product's resin parts, paint on the case and labels containing identification information. The product may not operate normally.

Dispose of the product in accordance with the relevant rules and regulations of the country/region where the product is used.

### Precautions for Correct Use

If you remove a network cable from a cascaded OS33C Safety Laser Scanner or interrupt the power supply to it during maintenance, the operation of another OS33C Safety Laser Scanners coupled to it will be affected.

The OS33C Safety Laser Scanner cannot be connected to the EtherCAT port on the Machine Automation Controller (NX102-□□□□).

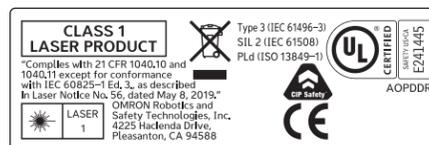
If multi-cast connections are used, use an Ethernet switch that has multi-cast filtering. Otherwise, the tag set is received by all nodes in the network.

### Laser Safety

Please follow the regulations and standards of laser safety in a country or a region where the OS33C Safety Laser Scanner is used. The following are the laser classes and references of regulations and standards of Japan, the U.S., China, and EU.

1. Japan  
Class 1 laser product (JIS C6802:2014)
2. U.S.  
Class 1 laser product (CFR 1040.10, 1040.11)
3. China  
1 类激光产品 (GB/T 7247.1-2024)
4. EU  
Class1 Laser Product (EN 60825-1:2014 / EN 60825-1:2014+A11:2021)

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

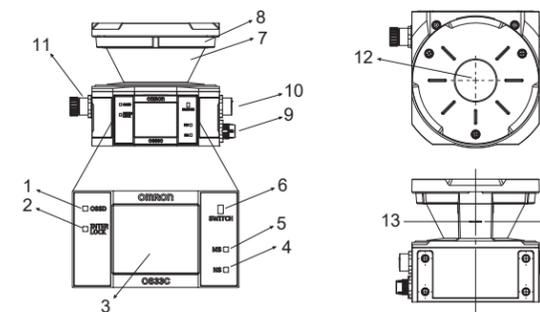


### Related Manuals

Manual name	Cat. No.	Model numbers
OS33C Series Safety Laser Scanner User's Manual	Z450	OS33C-□□-□M
OS33C Series Safety Laser Scanner EtherNet/IP and CIP Safety Communications User's Manual	Z454	OS33C-□□-□M

Please download user documents and other tools by visiting:  
<https://automation.omron.com/os33c-product-support>, or  
<https://industrial.omron.eu/en/products/safety>

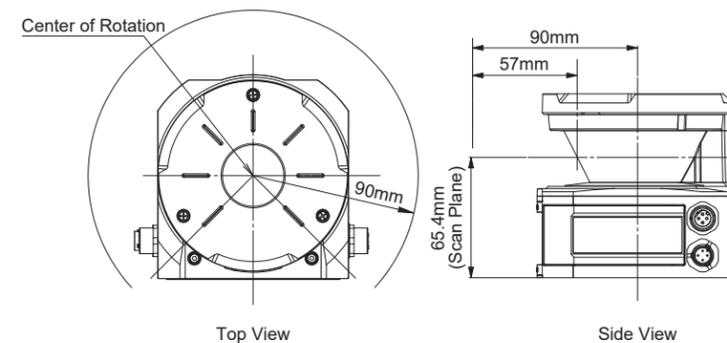
### Names of Components



Number	Component	Function
1	OSSD indicator (green/red)	Green: Turns green when protection zone is clear. Red: Turns red when at least one intrusion is detected or a fault occurs.
2	Interlock (INTERLOCK) indicator (yellow)	Flashes under Fault (at 1Hz), and flashes under Configuration (at 4Hz).
3	Status display	The scanner's status, Configuration/Operation, or Failure is displayed.
4	Network status (NS) indicator (green/red)	Shows the EtherNet/IP network connection status of OS33C. - Green: Normal operation - Red: Fault - OFF: Link down
5	Module status (MS) indicator (green/red)	Shows the operation status of OS33C. - Green: Normal operation - Red: Fault
6	Display switch	Shows followings when the switch is turned ON. To turn it ON, block within 1mm in front of this switch. - During normal operation: IP address - When a fault occurs: 2D barcode (Used to check the website for troubleshooting)
7	Scan window	Laser light is transmitted and received.
8	Individual Sector Indicators (ISI)	Shows the operation status of OS33C. - Green: Normal operation (neither intrusion nor fault) - Red: Intrusion to protection zone is detected or a fault which causes machine stop occurs. - Yellow: Intrusion to warning zones is detected or warnings which do not cause machine stop is signaled.
9	Power connector	M12, 4-pin connector.
10	Communication connector Port 1	Provided for M12 Ethernet interface.
11	Communication connector Port 2	
12	Center of rotation	Indicates the location of the axis around which the laser irradiates from.
13	Scan plane mark	Represents the scan plane height of the OS33C.

### Zone of Limited Detection Capability

The OS33C Safety Laser Scanner has a zone of limited detection capability that extends up to 57 mm from the front window, or up to 90 mm from the center of rotation. Objects with very low reflectance, less than 1.8% in this area, may not be detected.



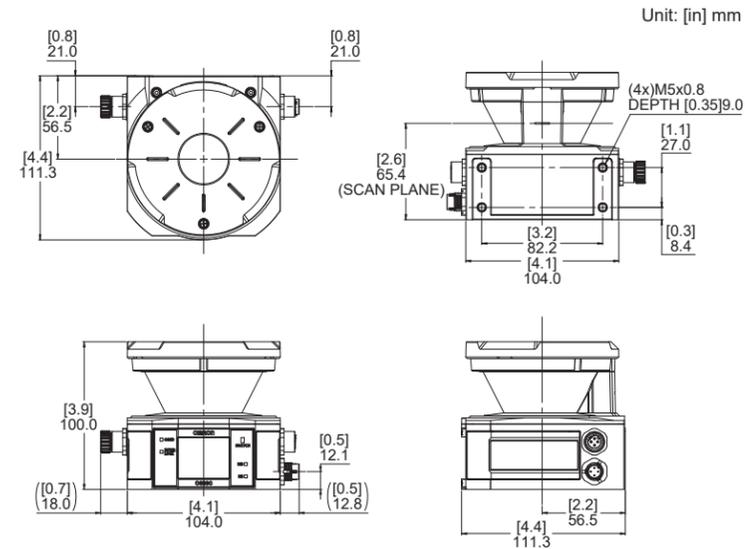
# Ratings and Specifications

Item		OS33C-CS-5M
Sensor type		Type 3 safety laser scanner
Performance Level (PL)/ Category (EN ISO 13849-1:2015)		PL d, Category 3
Functional safety of electrical/electronic/programmable electronic safety-related systems		SIL 2, PFH = $2.6 \times 10^{-8}$ Proof test interval = 20 years HFT = 1 Type B
Detection capability		Configurable via the Configuration Tool; Non-transparent with a diameter of 30, 40, 50 or 70 mm (1.8% reflectivity or greater)
Operating range	Protection zone	1.75 m (min. obj. resolution of 30 mm) 2.5 m (min. obj. resolution of 40 mm) 4.0 m (min. obj. resolution of 50 mm) 5.0 m (min. obj. resolution of 70 mm)
	Warning zone	40.0 m
Maximum measurement error		180 mm
Additional measurement error		950 mm (min. obj. resolution of 50 mm or less) 550 mm (min. obj. resolution of 70 mm) Please refer to A-1-1 Conditions of Background Influence of OS33C Series Safety Laser Scanner User's Manual (Cat. No. Z450).
Detection angle		270°
Angular resolution		0.1°
Laser beam diameter		8 mm at scan window, 27 mm at 5 m (typical)
Scan plane height		65.4 mm
Startup waiting time		40 s max. *1
Response time		From zone clear to intrusion: From 150 to 1,050 ms (4 or less simultaneous zones) From 170 to 1,220 ms (5 or more simultaneous zones) From zone intrusion to clear: Response time from zone clear to intrusion + Restart Delay time (0 to 60,000ms) Please refer to 2-3-1 Safety Parameters of OS33C Series Safety Laser Scanner User's Manual (Cat. No. Z450).
Zone set switching delay		Network response + 70 or 80 ms *2 70 ms (4 or less simultaneous zones) 80 ms (5 or more simultaneous zones)
Zone setting	Simultaneous zones	8 (Configurable, protection or warning zone)
	Max. zone sets	128
	Max. individually definable zones	256
Power supply voltage	For battery	SELV/PELV 24 VDC +25%/-30% (ripple p-p 1.2 V max.) *3
	For commercial power supply	SELV/PELV 24 VDC +25%/-20% (ripple p-p 1.2 V max.) *3
Power consumption	Normal operation	Max. 11 W (Typ. 7.2 W) *4
	Standby mode	Typ. 7 W
Emission source (wavelength)		Infrared diode (905 nm)
Laser *5 protection class		Class 1 Laser Product: IEC 60825-1:2014, EN 60825-1:2014+A11:2021 Class 1 Laser Product: JIS C 6802: 2014 Class I: 21 CFR 1040.10, 1040.11 1类激光产品: GB/T 7247.1-2024
Applicable network		Ethernet EtherNet/IP CIP Safety on EtherNet/IP
Available information via Ethernet		Data handled in the Configuration Tool
Available information via EtherNet/IP		Range profile for navigation (0.1° with time-stamp), reflectivity profile, scanner status, etc. *6

Item		OS33C-CS-5M
Operating mode		Automatic start, Standby
Standby input		ON: 24 V short (input current of 5 mA max.), OFF: Open
Connection type	Power and Input cable	M12, 4-pin connector x 1
	Communication cable	M12, 4-pin connector x 2
Connection to PC	OS supported	Windows 10 Pro 64bit
	Communication	Ethernet *7
Indicators	LED indicator	OSSD Green/Red INTERLOCK Yellow MS Green/Red NS Green/Red
	Status display	160 x 128 pixels, color Intuitive icons and 2D code for troubleshooting
	Individual Sector Indicator (ISI)	14 LEDs, 14 sections, Green/Yellow/Red
Protective circuit		Protection against reverse power connection
Ambient temperature		Operation: -10 to 50°C, Storage: -25 to 70°C
Ambient humidity		Operation and Storage: 95% max., non-condensing
Ambient operation illumination		Incandescent lamp: Illumination on receiving surface 1,500 lx max. (an angle of laser scan plane and disturbance light must be $\pm 5^\circ$ or more)
Insulation resistance		20 MΩ or higher (500 VDC)
Dielectric withstand voltage		350 VAC, 1 minute
Enclosure rating		IP65 (IEC 60529)
Enclosure	Sensor block	Die-cast aluminum
	Scan window	Polycarbonate (PC)
	Dust module	Polybutylene terephthalate (PBT)
Dimensions (W x H x D)		104.0 mm x 100 mm x 111.3 mm (except cable and connectors)
Display switch reaction distance		1 mm from switch front
Shock resistance		100 m/s <sup>2</sup> , 1,000 times for each of X, Y, and Z directions (IEC 60068-2-27) 5g 3 times for each of X, Y, and Z directions (IEC TR 60721-4-5 Class 5M1)
Vibration resistance		10 to 55 Hz, double-amplitude of 0.7 mm, 20 sweepings for X, Y, and Z directions (IEC 60068-2-6) 5 to 200 Hz, double-amplitude of 1.5 mm, 10 sweepings for X, Y, and Z directions (IEC TR 60721-4-5 Class 5M1, Sinusoidal vibration test)
Weight (main unit only, excludes accessories and cables)		900 g
Cable length	Power and Input cable	Up to 30 m (for commercial power supply) Up to 20 m (for battery)
	Communication cable	Up to 100 m for 100 BASE-TX cable

- This time does not include the time required to establish EtherNet/IP connection.
- About network response, please refer to 4-2 Zone Set Switching Delay of OS33C Series Safety Laser Scanner EtherNet/IP and CIP Safety Communications User's Manual (Cat. No. Z454).
- For power source specification, refer to 5-1 Power Supply Unit of OS33C Series Safety Laser Scanner User's Manual (Cat. No. Z450).
- Rated current of OS33C is 425 mA max. (OS33C 420 mA + Standby input 5 mA) at 24V.
- The rated life of the laser diode used for this product is 6 years.
- Please refer to A-1 EtherNet/IP Assembly Data of OS33C Series Safety Laser Scanner EtherNet/IP and CIP Safety Communications User's Manual (Cat. No. Z454).
- An Ethernet cable with an M12, 4-pin connector is required.

# Dimensions

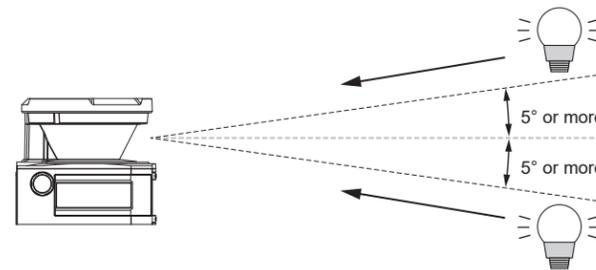


A cap is connected to the Ethernet connector on the left side when facing the front.

# Mounting Considerations

## Mounting Considerations

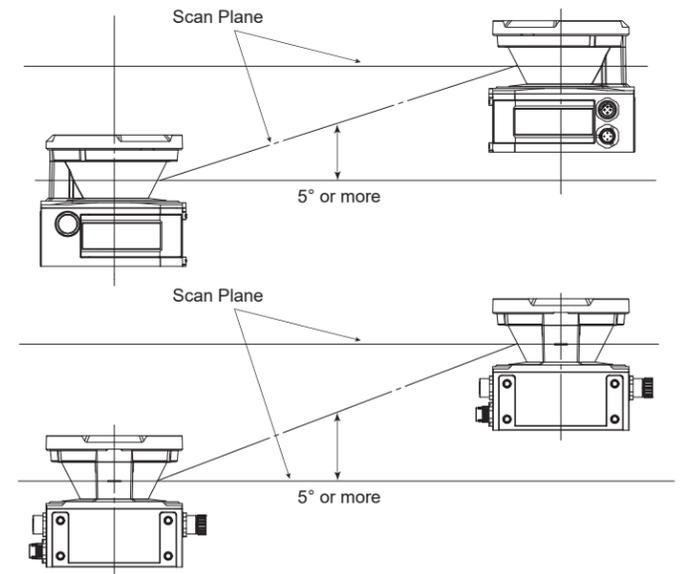
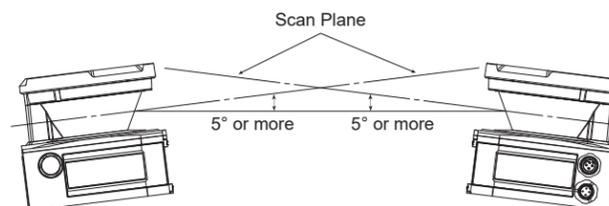
The following considerations should be taken into account when determining the mounting location for the OS33C. It is possible for ambient light to interfere with normal operation of the OS33C. Ambient light interference DOES NOT lead to a loss of safety, it may, however, cause false nuisance stops of the guarded equipment. Some installations may require that the OS33C be mounted in direct exposure to ambient light. In these situations you must assure that the separation between the scan plane of the OS33C and the light source be greater than  $\pm 5^\circ$ .



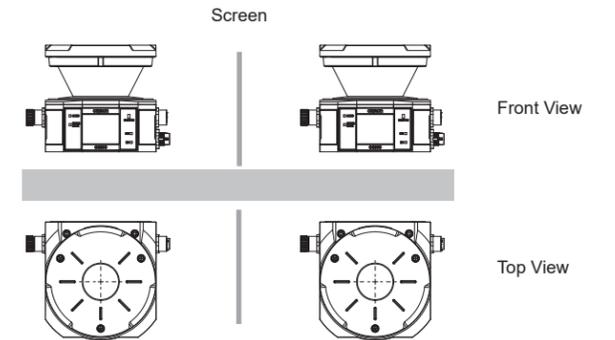
## Configuring Multiple Scanners

When not correctly mounted, the possibility exists that two OS33Cs may interfere with each other. To avoid this situation when using multiple OS33Cs in the same location, please review the following mounting recommendations.

- Adjust the scanners to offset the scanning plane by tilting the OS33Cs.
  - Adjust the scanners to offset the scanning plane by mounting the OS33Cs at different heights.
  - Adjust the scanners to different scanning planes and additional sampling scans (response time) on the OS33Cs.
  - Install a barrier to block the direct path of possible signal crossing.
- The following figures illustrate the different options.



When installing the OS33Cs side by side, it is more effective to set their mounting heights differently. When adjusting the OS33C as tilted, it may be more effective to adjust the OS33C downward depending on the condition of the outside light source (natural light or halogen light).

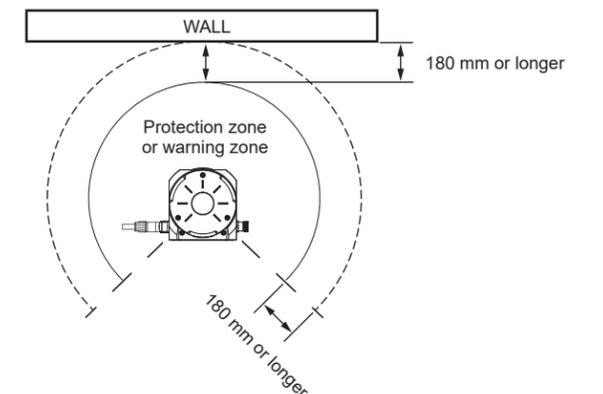


## Additional Information

Use of a screen may increase the effect of reflection depending on its material. Select a screen material with matte black finish that is resistant to reflection.

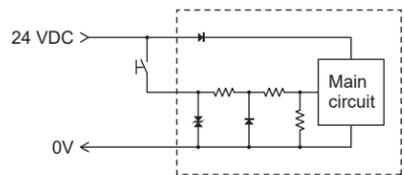
## Distance from Wall

The protection or warning zones must be configured so that they maintain a distance of 180 mm or greater from the wall or tooling fixture. If sculpting is performed, the distance is automatically configured with a minimum stand-off distance of 180 mm from walls.



## Input Circuit Diagrams by Function

### Standby input

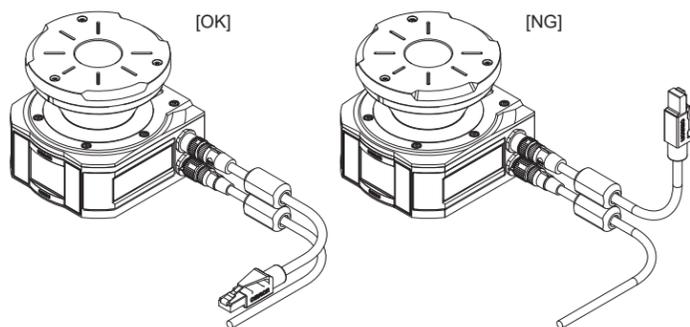


## Attaching Ferrite cores to Cables

Please attach the ferrite cores to the power cable and Ethernet cable. The ferrite cores are included in the OS33C box.

Mounting	Manufacturer	Model	Number and attaching
Power cable	TDK	ZCAT2035-0930A	Attach one to each cable within 20mm from the connector.

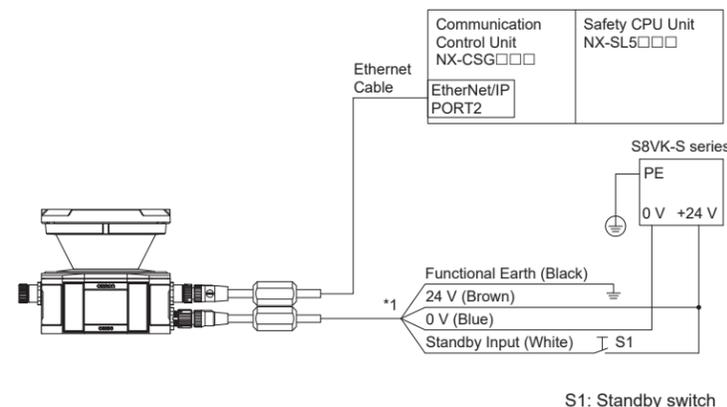
Wire so that the Ethernet cable and ferrite core do not protrude to the detection area.



For attaching ferrite cores, refer to 5 Wiring of OS33C Series Safety Laser Scanner Use's Manual (Cat. No. Z450).

## Safety Circuit Examples

For other circuit examples, please refer to 5-6 Safety Circuit Examples of OS33C Series Safety Laser Scanner User's Manual (Cat. No Z450).

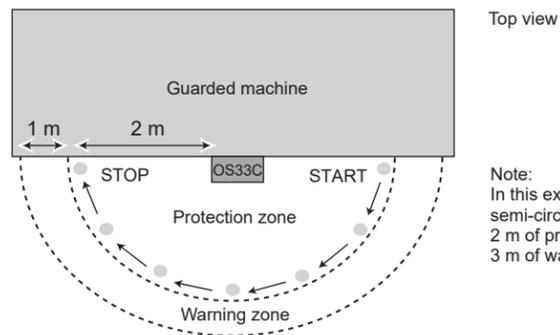


\*1. The conductor colors are for the XS5F-D421-□80-F (Power cable).

## Testing and Protection Zone

To test the OS33C's detection capability, guide the test object along the perimeter of the safety detection zone as shown in the figure below. The hazardous motion of the guarded equipment must stop within the predetermined accepted stop times. While in Automatic Start Mode, the OS33C MUST remain in the Machine stop state throughout the entire test. To test the OS33C, use a test object with a diameter appropriate for the selected resolution. (A test object does not come with the OS33C.)

### Testing a horizontal protection zone



Verify that all indicators and displays are operating properly and correspond to their defined functions of the OS33C. Inspect the OS33C housing and the exit window for signs of damage or manipulation. If the OS33C is used in a stationary guarding application, ensure that the protection zone(s) are clearly marked on the floor. For mobile applications, make sure that the vehicle stops moving within the limits set in the initial configuration. If the OS33C fails any of these tests, lock out the guarded equipment and contact the factory supervisor immediately.

## OS33C Status Check

The OS33C has the Status display on the front, which indicates status of the OS33C. Use the following table to identify the operating states and resolve diagnostic codes.

Indicators		Status display	Description	Corrective action
OSSD	INTER LOCK			
Green	□		Machine Run	—
Red	□		Machine Stop	—
Red	□		Standby mode	—
Red	□		Power On	—
Red	□		Configuration mode	—
Red	⊗		General fault - caused by internal problem or extreme environmental condition. It is possible that the device has been affected by excessive vibration, shock, or electrical noise. Please check if your environment is prone to such influences. Additionally, errors similar to those mentioned may occur in the case of detachment or damage to the window section. If there are no abnormalities in the operating environment, please inspect the window section. If the issue persists, consider replacing the OS33C or the window.	It is possible that the device has been affected by excessive vibration, shock, or electrical noise. Please check if your environment is prone to such influences. Additionally, errors similar to those mentioned may occur in the case of detachment or damage to the window section. If there are no abnormalities in the operating environment, please inspect the window section. If the issue persists, consider replacing the OS33C or the window.
Red	⊗			
Red	⊗			
Red	⊗			

Indicators		Status display	Description	Corrective action
OSSD	INTER LOCK			
Red	⊗		Error due to mutual interference	It's possible that mutual interference light or strong ambient light has been detected. Please check for other OS33C or ensure there is no interference with nearby retro reflective surfaces or strong ambient light.*1
Red	⊗		Error due to ambient light	It's possible that ambient light interference has been detected. Please check if there is ambient light interference in the environment.
Red	⊗		Error due to motor malfunction	It's possible that excessive vibration or impact has been experienced. Please check your environment for excessive vibration or impact to the OS33C.
Red	⊗		Error due to invalid configuration	There's a possibility that the configuration data is abnormal. Please double-check the settings or overwrite the OS33C settings with the default configuration.
Red	□		The stoppage is due to the invalid or undefined selection of the area set (Machine Stop)	There is a possibility that the area set selection is invalid or not defined. Please check the area set selection. If the safety parameter [Monitored Zone Set] is set to [Multiple Zone Set], specify the monitored target in the safety PLC.
Red	⊗		Error due to standby input voltage	There is a possibility that the standby input voltage is too high. Please check if the standby input is wired within the system power (DC24V + 25%).
Red	□		Stoppage due to a decrease in transparency of the window (Machine Stop)(See Fault 83, too)	There is a possibility that the window is dirty. Please clean the window. If the issue persists, please consider replacing the window.
Red	⊗		Error due to reduced transparency of the window	There may be an issue with the window. Please clean the window. If the issue persists, please consider replacing the window.
Red	⊗		Error due to reduced transparency of the window	It's possible the transparency of the window has been reduced. Please clean the window and the dust detection surface. If the issue persists, please consider replacing the window or the OS33C.
Red	□		Stoppage due to high transparency of the window (Machine Stop)(See Fault 80, too)	There is a possibility that the window is not installed. Please check the window is still in place and perform a window calibration.
Red	□		Stoppage due to detection of interference light (Machine Stop)	It's possible that mutual interference light or strong ambient light has been detected. Please check for other OS33C and ensure there is no interference with nearby reflective surfaces or strong ambient light.
Green	□		Warning due to floating dust (Machine Run)	There could be a lot of floating dust in the environment around the OS33C. Please check the dust conditions in the operating environment.

Indicators		Status display	Description	Corrective action
OSSD	INTER LOCK			
Green	□		Warning due to window contamination (Machine Run)	The window may be dirty. Please clean the window.
Red	⊗		Error due to internal temperature rise	There is a possibility that surrounding temperature is excessively high. Please check the ambient temperature.

\*1. Refer to 4 Unit Installation of OS33C Series Safety Laser Scanner User's Manual (Cat. No. Z450).

## SUITABILITY FOR USE

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases. NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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**Note:** Specifications subject to change without notice.