

Safety Laser Scanner OS32C

Compliant with PLd/Safety Category 3

Compact, Lightweight and Easy-To-Use Safety Laser Scanner



» Saves power consumption greatly.

» Supports various applications with simple operation.

» Easy settings with a PC

Low profile allows installation in small spaces

For collision avoidance of AGVs (Automated Guided Vehicles)

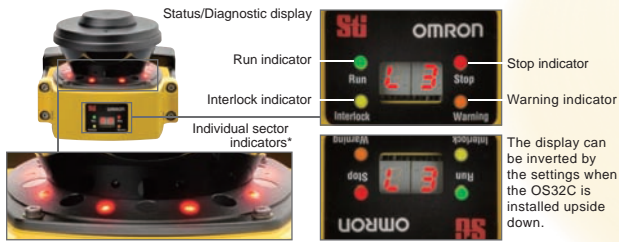
For intrusion detection through an entrance

For presence detection within a machine's hazardous area



Operating state can be determined at a glance

Eight sector indicators* show the direction of intrusion. Front display shows operating state and error codes.



* US patent No. for individual sector indicators: US 6,753,776 B2

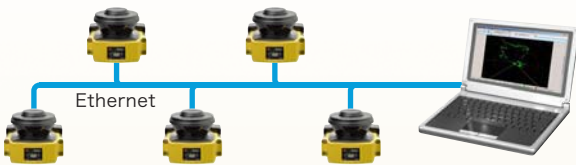
104.5mm



Integrated management via Ethernet

Industry's first Ethernet-compliant Safety Laser Scanner allows the user to check operating state and analyze the cause of an emergency stop via LAN even in large-scale applications using multiple scanners.

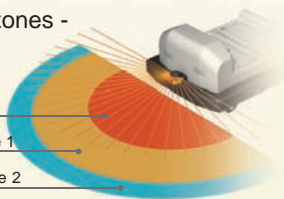
* Multiple OS32Cs cannot be monitored simultaneously.



Setting 70 combinations

For complex AGV applications, up to 70 combinations - each with one safety zone and two warning zones - can be set. The two warning zones can be set to support various purposes such as warning sound and speed control.

Safety Zone
Warning Zone 1
Warning Zone 2



Simplified Wiring

OMRON STI's innovative I/O method requires fewer inputs when configuring multiple zones. Only 4 inputs are required to select from 6 zone sets. If all 8 inputs are used, up to 70 zone sets are available.

Features



**Compact size allows:
3 m* safety zone,
270° detection angle.**

* The minimum object resolution is 50/70 mm.

World's Most Compact Level*

Small size

104.5 mm *As of January, 2013

Compact and versatile safety laser scanner

Lightweight

1.3 kg

Lightweight body for easy handling and installation

Low Power Consumption

5 w

Power saving, low power consumption
(3.75 W in standby mode)

**Response time can be set from
80 ms to 680 ms**

Response time adjustment can filter out erroneous detections (machine stoppage) caused by pollutants in the environment.

**Provides Safety Category 3 safety circuit
without a dedicated controller**

Compliant to global safety standards

ISO 13849-1 PLd

SIL2

CE

UL LISTED

Operating Theory of OS32C

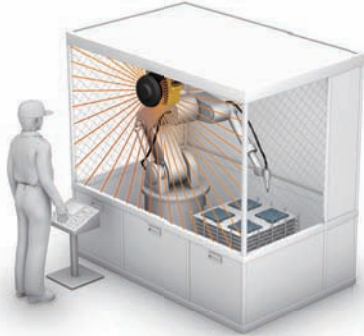
The OS32C uses time-of-flight (TOF) measurement to determine distance. The scanner emits a laser pulse, when the pulse hits an object the signal is reflected to the scanner. The OS32C then compares the distance/position of the object against the defined safety zone.

Applications

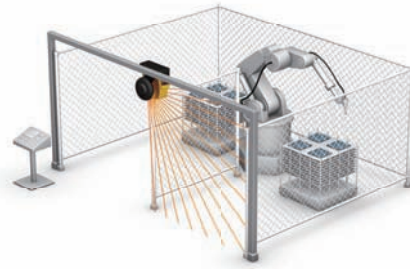
Intrusion Detection

Reference Boundary Monitoring function supports intrusion detection without physically blocking the entrance. Supports various operation patterns by switching zone sets.

Arm detection can also be made possible by changing the minimum object resolution to 30, 40, 50 or 70 mm through use of the configuration tool. However, the maximum size of the safety zone varies depending on the configured minimum object resolution.



Intrusion detection with vertical installation



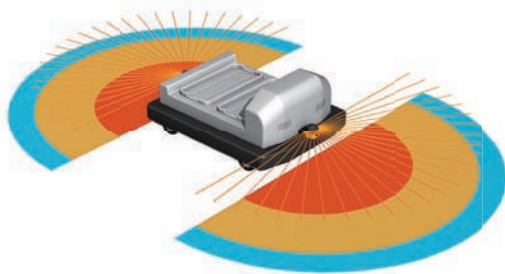
Safety zone can be selected

Collision Avoidance

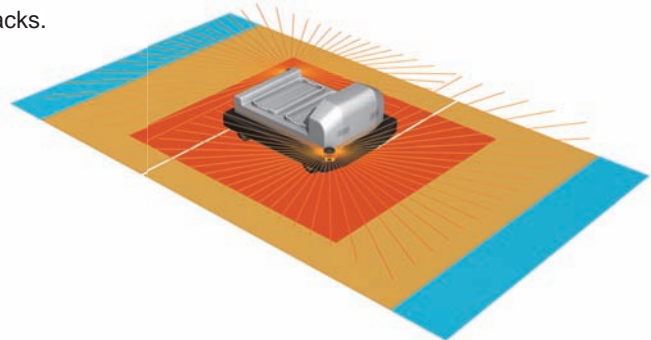
Small, light and compact body provides for easy installation on an AGV.

Low power consumption (5 W) reduces battery load on the AGV. (3.75 W in standby mode)

Up to 70 zone set combinations support complex AGV tracks.



Front/Rear monitoring



All-around Monitoring

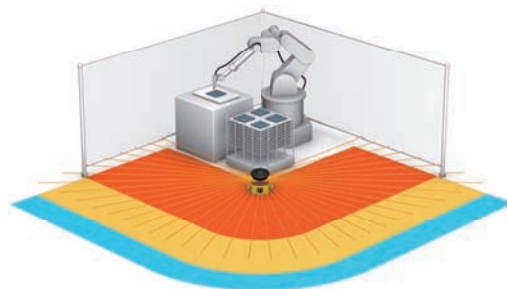
Presence Detection

Compact body allows for use inside the machine.

Detection angle of 270° provides coverage of two sides with one scanner.



Guarding inside the machine

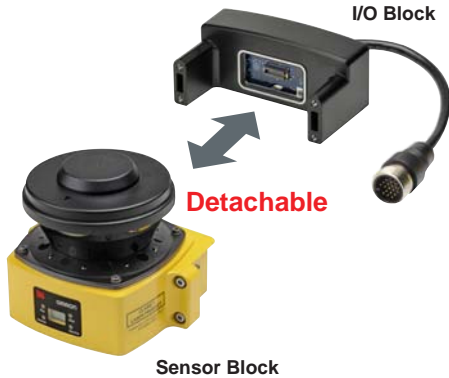


Presence detection of 270°

New convenient and easy-to-use functions

Replacable sensor, no reprogramming needed

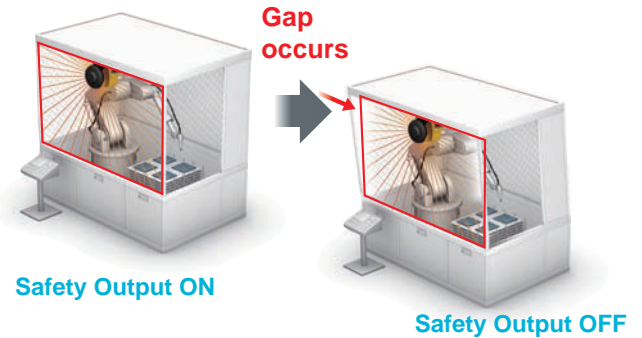
No reprogramming needed, the configuration is stored in the I/O block. Replacing a damaged sensor is fast and easy.



Reference Boundary Monitoring function

The OS32C constantly monitors reference points and turns OFF the safety outputs when a shift in its position is detected.

(Per international standard IEC 61496-3, area scanners used in applications where the angle of approach exceeds +/- 30 degrees with respect to the detection plane, must use RBM in the detection zone.)



Cable Access Options

To tailor the OS32C to your installation, two options are available for the location of the power and ethernet connections:

OS32C-BP/OS32C-BP-DM (Cable access from the back)

OS32C-SP1/OS32C-SP1-DM (Cable access from the left side)

These can be selected according to the needs of AGV or facilities design.



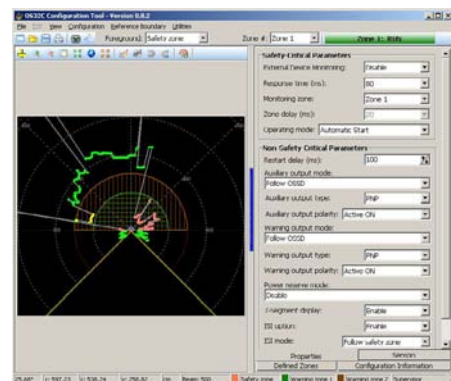
OS32C with cable access from the back (OS32C-BP/OS32C-BP-DM)



OS32C with cable access from the left side (OS32C-SP1/OS32C-SP1-DM)

Easy configuration of complex zones

The configuration of the safety zone and warning zones can be done in real time using a PC. Configurations can also be created or modified offline.



EtherNet/IP™ for Status and Measurement Data **NEW**

The OS32C system status, zone status, and measurement data can all be monitored over EtherNet/IP.



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Safety Laser Scanner

OS32C

Compact (104.5 mm), lightweight (1.3 kg) and easy-to-install Safety Laser Scanner



- Provides a safety circuit of PLd/Safety Category 3 (ISO13849-1) without a dedicated controller.
- Type 3 Safety Laser Scanner complies with IEC61496-1/-3.
- 70 sets of safety zone and warning zone combinations are available, supporting complicated changes in working environments.
- A safety radius up to 3 m and warning zone(s) radius up to 10 m can be set.
- The minimum object resolution can be changed to 30, 40, 50 or 70 mm.
- The response time is configurable from 80 ms to a maximum of 680 ms.
- Reference Boundary Monitoring function prevents unauthorized changes in the scanner position.
- Minimal down time, sensor block can be replaced without the need to reprogram.







 Refer to "Safety Precautions" on page 18.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Ordering Information


OS32C (Power cable is sold separately.)

Appearance	Description	Model	Remarks
	OS32C with back location cable entry	OS32C-BP *2	CD-ROM (Configuration tool) OS supported: Windows 2000, Windows XP (32-bit version, Service Pack 3 or later) Windows Vista (32-bit version), Windows 7 (32-bit version) For configuration tool version, refer to page 21.
	OS32C with side location cable entry *1	OS32C-SP1 *2	
	OS32C with EtherNet/IP and back location cable entry	OS32C-BP-DM <i>NEW</i>	
	OS32C with EtherNet/IP and side location cable entry *1	OS32C-SP1-DM <i>NEW</i>	


*1. For OS32C-SP1(-DM), each connector is located on the left as viewed from the back of the I/O block.

*2. When ordering, add "VER2" to the end of the model number.
(OS32C-BP VER2, OS32C-SP1 VER2)

Power Cable


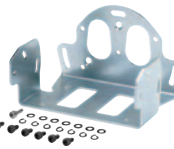




Appearance	Description	Model	Remarks
	Cable length: 3 m	OS32C-CBL-03M	One cable is required per sensor.
	Cable length: 10 m	OS32C-CBL-10M	
	Cable length: 20 m	OS32C-CBL-20M	
	Cable length: 30 m	OS32C-CBL-30M	

Ethernet Cable

Appearance	Description	Model	Remarks
	Cable length: 2 m	OS32C-ECBL-02M	Required for configuration and monitoring.
	Cable length: 5 m	OS32C-ECBL-05M	
	Cable length: 15 m	OS32C-ECBL-15M	






Note: An ethernet cable with an M12, 4-pin connector is required.

Mounting Brackets

Appearance	Description	Model	Remarks
	Bottom/side mounting bracket	OS32C-BKT1	Bottom/side mounting bracket x 1, unit mounting screws x 4 sets
	XY axis rotation mounting bracket	OS32C-BKT2	XY axis rotation mounting bracket x 1, unit mounting screws x 6 sets, bracket mounting screws x 1 set (must be used with OS32C-BKT1)
	Simple mounting bracket	OS32C-BKT3	Simple mounting brackets x 2, unit mounting screws x 4 sets *
	Protective cover for window	OS32C-BKT4	
	Mounting stand	OS32C-MT	When using a mounting stand, use an OS32C with side location cable entry (OS32C-SP1(-DM)). The OS32C with back location cable entry (OS32C-BP(-DM)) cannot be mounted. Use with mounting brackets (OS32C-BKT1 and OS32C-BKT2).
	Hardware kit for mounting stand	OS32C-HDT	Mounting screws x 3 sets Use this when mounting a bracket to the mounting stand.

* There are eight OS32C mounting screws: four screws for singular use, and four screws for protective cover for window.

Accessories

Appearance	Description		Model	Remarks
	Scan window		OS32C-WIN-KT	Spare for replacement
	Sensor block without I/O block		OS32C-SN	Spare for replacement
	Sensor block without I/O block for EtherNet/IP		OS32C-SN-DM <i>NEW</i>	Spare replacement for EtherNet/IP
	I/O block	With cable access from the back	OS32C-CBBP	Spare for replacement
		With cable access from the left side	OS32C-CBSP1	Spare for replacement

Rating/Performance

Sensor Type	Type 3 Safety Laser Scanner	
Safety Category	PLd/Safety Category 3 (ISO13849-1)	
Detection Capability	Configurable; Non-transparent with a diameter of 30, 40, 50, 70mm (1.8% reflectivity or greater) (default: 70 mm)	
Monitoring Zone	Monitoring Zone Set Count: (Safety Zone + 2 Warning Zones) x 70 sets	
Operating Range	Safety Zone: 3.0 m (min. obj. resolution of 50 mm or 70 mm) 2.5 m (min. obj. resolution of 40 mm) 1.75 m (min. obj. resolution of 30 mm) Warning Zone: 10.0 m	
Maximum Measurement Error	100 mm *1	
Detection Angle	270°	
Angular Resolution	0.4°	
Laser Beam Diameter	6 mm at optics cover, 14 mm (typical) at 3 m.	
Laser Scan Plane Height	67mm from the bottom of the scanner (see "External Dimensional Drawings" on page 14 for more detail.)	
Response Time	Response time from ON to OFF: From 80 ms (2 scans) to 680 ms (up to 17 scans) Response time from OFF to ON: Response time from ON to OFF + 100 ms to 60 s (Configurable)	
Zone Switching Time	20 to 320 ms	
Line Voltage	24 VDC +25%/-30% (ripple p-p 2.5 V max.) *2	
Power Consumption	Normal operation: 5 W max., 4 W typical (without output load) *3 Standby mode: 3.75 W (without output load and laser emission is stopped)	
Emission Source (Wavelength)	Infrared Laser Diode (905 nm)	
Laser Protection Class	Class 1: IEC/EN60825-1 (2007) Class 1: JIS6802 (2005) Class I: CFR21 1040.10, 1040.11	
Safety Output (OSSD)	PNP transistor x 2, load current of 250 mA max., residual voltage of 2 V max., load capacity of 2.2 µF max., leak current of 1 mA max. *3, *4, *5	
Auxiliary Output (Non-Safety)	NPN/PNP transistor x 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max. *4, *5, *7	
Warning Output (Non-Safety)	NPN/PNP transistor x 1, load current of 100 mA max., residual voltage of 2 V max., leak current of 1 mA max. *4, *5, *7	
Operation Mode	Auto Start, Start Interlock, Start/Restart Interlock	
Input	External Device Monitoring (EDM)	ON: 0 V short (input current of 50 mA), OFF: Open
	Start	ON: 0 V short (input current of 20 mA), OFF: Open
	Zone Select	ON: 24 V short (input current of 5 mA), OFF: Open
	Stand-by	ON: 24 V short (input current of 5 mA max.), OFF: Open
Connection Type	Power Cable: 18-pin mini-connector (pigtail) Communication Cable: M12, 4-pin connector	
Connection with PC	Communication: Ethernet *6 OS Supported: Windows 2000, Windows XP (32-bit version, Service Pack 3 or later), Windows Vista (32-bit version), Windows 7 (32-bit version)	
Indicators	RUN indicator: Green, STOP indicator: Red, Interlock Indicator: Yellow, Warning/Auxiliary Output Indicator: Orange Status/Diagnostic Display: 2 x 7-segment LEDs, Individual Sector Indicators: Red LED x 8	
Protective Circuit	Protection against output load short and reverse power connection	
Ambient Temperature	Operation: -10 to 50 deg. C, Storage: -25 to 70 deg. C	
Ambient Humidity	Operation & Storage: 95% RH max., non-condensing	
Ambient Operation Illumination	Incandescent lamp: Illumination on receiving surface 1500 lx max. (an angle of laser scanning plane and disturbance light must be +/-5 degrees or more)	
Insulation Resistance	20 mega-ohm or higher (500 VDC)	
Dielectric Withstand Voltage	350 VAC, 50/60 Hz, 1 minute	
Enclosure Rating	IP65 (IEC60529)	
Enclosure	Sensor head: Die-cast aluminum, optical cover: Polycarbonate, I/O block: Die-cast aluminum	
Dimensions (WxHxD)	133.0 x 104.5 x 142.7 mm (except cable)	
Impact Resistance	98 m/s ² 1,000 times for each of X, Y, and Z directions (IEC60068-2-29)	
Vibration	10 to 55 Hz double-amplitude of 0.7 mm, 20 sweepings for X, Y, and Z directions (IEC60068-2-6)	
Weight (Main Unit only)	1.3 kg	
Power Cable	Up to 30 m	
Communication Cable	Up to 100 m for 100BASE-TX cable	
Approvals	Certificated by: TÜV Rheinland, UL Major Standards: IEC61496-1/-3 Type 3, ISO13849-1 Category 3, IEC61508 SIL2, UL508, UL1998	

*1. An additional measurement error may need to be added due to reflective backgrounds.

*2. For power source specification, refer to "Safety Precautions" on page 18.

*3. Rated current of OS32C is 1.025 A max. (OS32C 210 mA + OSSD A load + OSSD B load + Auxiliary output load + Warning output load + Functional Inputs).

Where functional inputs are: EDM input ... 50 mA Start input ... 20 mA Standby input ... 5 mA Zone X input ... 5 mA x 8 (eight zone set select inputs)

*4. Output voltage is Input voltage - 2.0 VDC.

*5. Total consumption current of 2 OSSDs, auxiliary output, and warning output must not exceed 700 mA.

*6. An ethernet cable with an M12, 4-pin connector is required.

*7. Output polarity (NPN/PNP) is configurable via the configuration tool.

OS32C

Connection

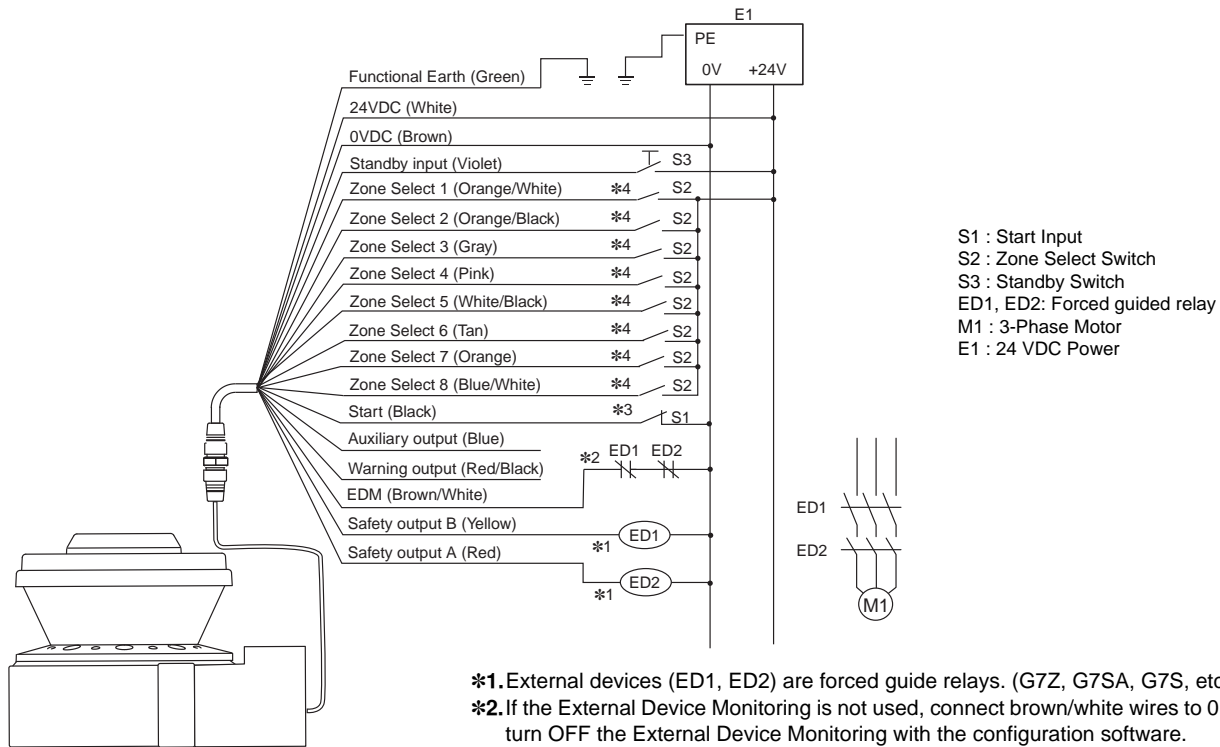
Basic connection with single OS32C unit

PL/safety category	Model	Stop category	Reset
PLd/3 equivalent	Safety Laser Scanner OS32C Safety Relay G7Z/G7SA	0	Manual

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

Application Overview

- The power supply to the motor M is turned OFF when an intrusion is detected in the safety zone.
- The power supply to the motor M is kept OFF until the start input is pressed after the safety zone is clear.



OS32C Configuration
 - External Device Monitoring Enabled
 - Start/Restart Interlock

- *1. External devices (ED1, ED2) are forced guide relays. (G7Z, G7SA, G7S, etc)
- *2. If the External Device Monitoring is not used, connect brown/white wires to 0 V, and then turn OFF the External Device Monitoring with the configuration software.
- *3. Use NC-contact for a start input.
- *4. For zone select switch setting, refer to OS32C Series User's Manual (Man.No.Z296-E1).
 When using only one zone, no connection is needed for the zone select inputs.

Connecting to AGV Controls

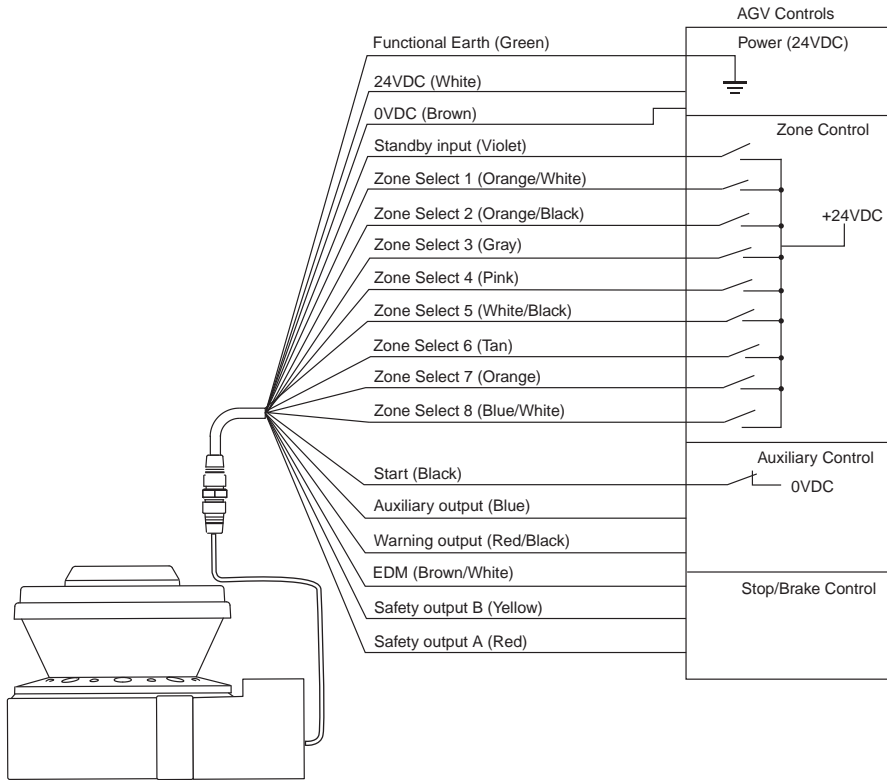
PL/safety category	Model	Stop category	Reset
PLd/3 equivalent	Safety Laser Scanner OS32C	1	Auto

The circuit configuration of the stop/deceleration control must meet the requirements of category 3.

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

Application Overview

- Stop/deceleration is performed when an intrusion is detected in the safety zone.
- Stop/deceleration is released when the safety zone is clear.



OS32C Configuration
 - External Device Monitoring Disabled
 - Automatic Start

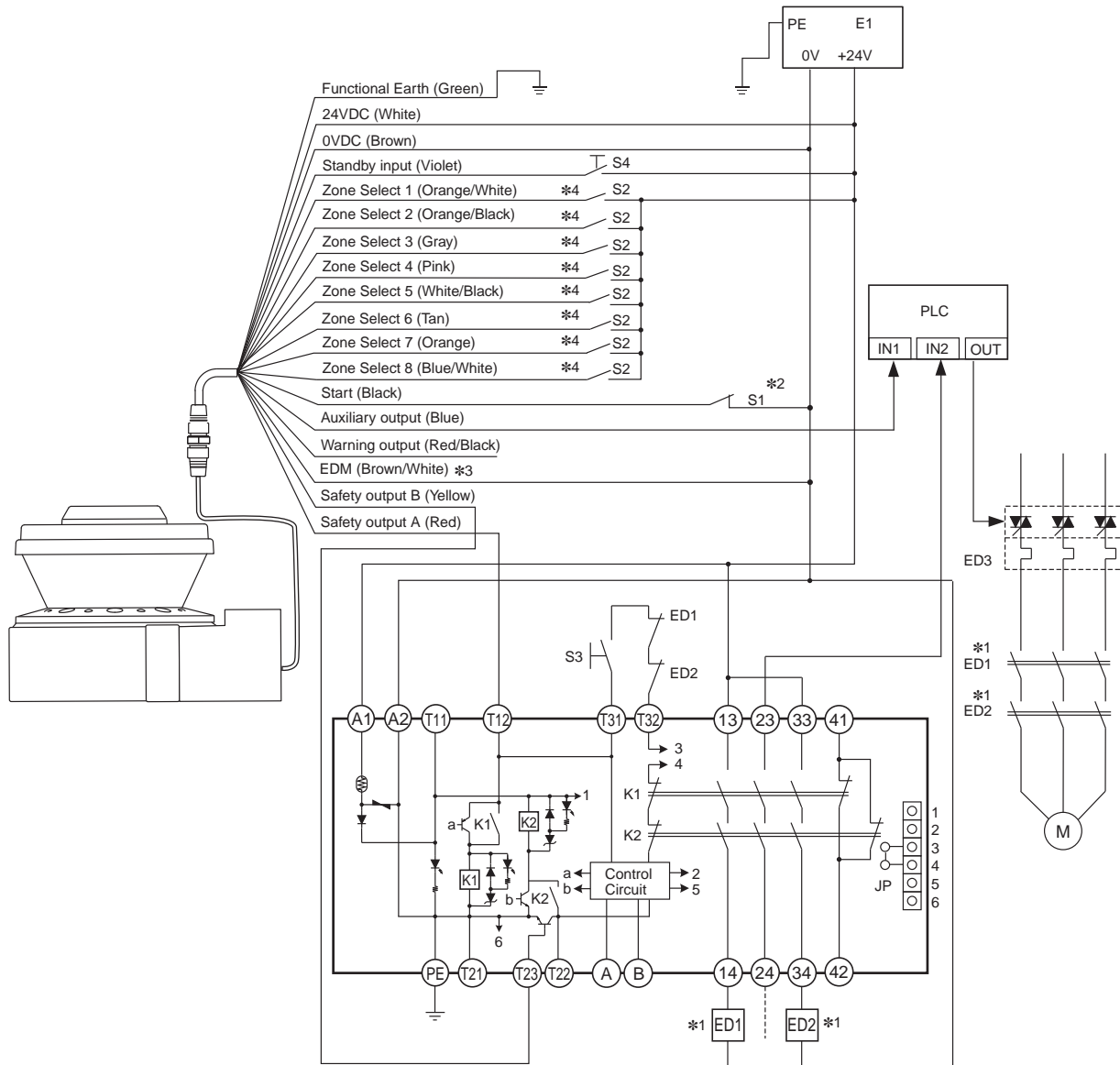
Connecting to the Controller G9SA-301

PL/safety category	Model	Stop category	Reset
PLd/3 equivalent	Safety Laser Scanner OS32C Safety Relay Unit G9XSA-301 Safety Relay G7Z/G7SA	0	Auto

Note: The above PL is only the evaluation result of the example. The PL must be evaluated in an actual application by the customer after confirming the usage conditions.

Application Overview

- The power supply to the motor M is turned OFF when an intrusion is detected in the safety zone.
- The power supply to the motor M is kept OFF until the safety zone is clear.

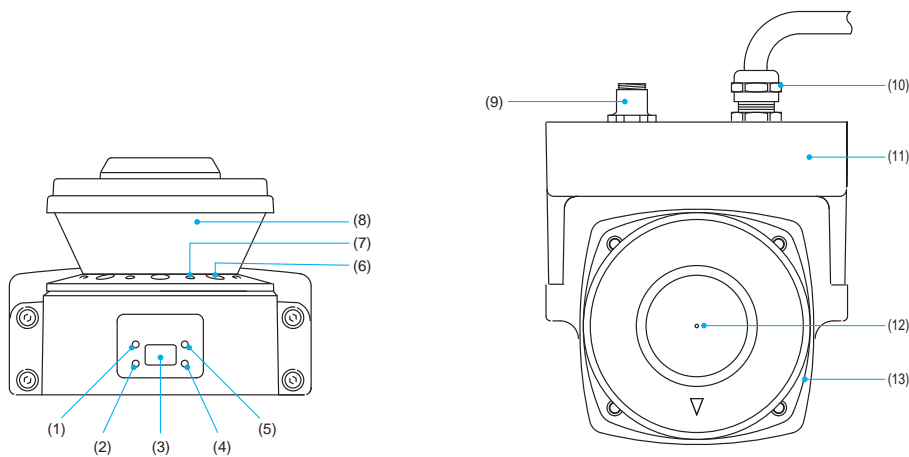


ED1, ED2: Forced guided relay
 ED3: Solid state contactor (G3J)
 M : 3-Phase Motor
 S1 : Start Input (use for releasing lockout)
 S2 : Zone Select Switch
 S3 : Reset Switch
 S4 : Standby Switch
 E1 : 24 VDC Power
 PLC: Programmable Controller (This is for monitoring only and unrelated to a safety system)

- *1. External devices (ED1, ED2) are forced guide relays. (G7Z, G7SA, G7S, etc)
- *2. Use NC-contact for a start input.
- *3. If the External Device Monitoring is not used, connect brown/white wires to 0V, and then turn OFF the External Device Monitoring with the configuration software.
- *4. For zone select switch setting, refer to OS32C Series User's Manual (Man.No.Z296-E1). When using only one zone, no connection is needed for the zone select inputs.

System Components and Functions

Main Unit



Number	Component	Function
(1)	RUN indicator (green)	Will turn ON when safety zone is clear and OSSDs are ON.
(2)	Interlock Indicator (yellow)	Will turn ON when in interlock state, blink under lockout, and blink in case of a failure.
(3)	Status/Diagnostic Display	The scanner status, configuration/operation, or failure is displayed.
(4)	Warning Output Indicator (orange)	Will turn ON when the warning output is ON.
(5)	STOP indicator (red)	Will turn ON when safety zone is blocked, OSSD are OFF or under interlock state.
(6)	Dust Ring	Dust detection cover with reflective surface, for dust accumulation detection
(7)	Individual Sector Indicators	Will turn ON when an intrusion is detected in the safety zone, 8 sectors total. Each sector = 33.75°.
(8)	Scan window	The window where the laser light is emitted and received.
(9)	Ethernet Connector	Used for Ethernet cable connection. *
(10)	Power Connector	18-pin connector (pigtail). *
(11)	I/O Block	Connector module
(12)	Center of rotation	Indicates the location of the axis around which the laser emits.
(13)	Sensor block	Sensor head; field replaceable.

* For OS32C-SP1(-DM), each connector is located on the left as viewed from the back of the I/O block.

Status/Diagnostic Display

When powered up, the OS32C will display the configured minimum object resolution for 5 seconds, as indicated in the following table:

Digital Indication	Minimum object resolution
L3	30 mm
L4	40 mm
L5	50 mm
L7	70 mm (factory default)

OS32C

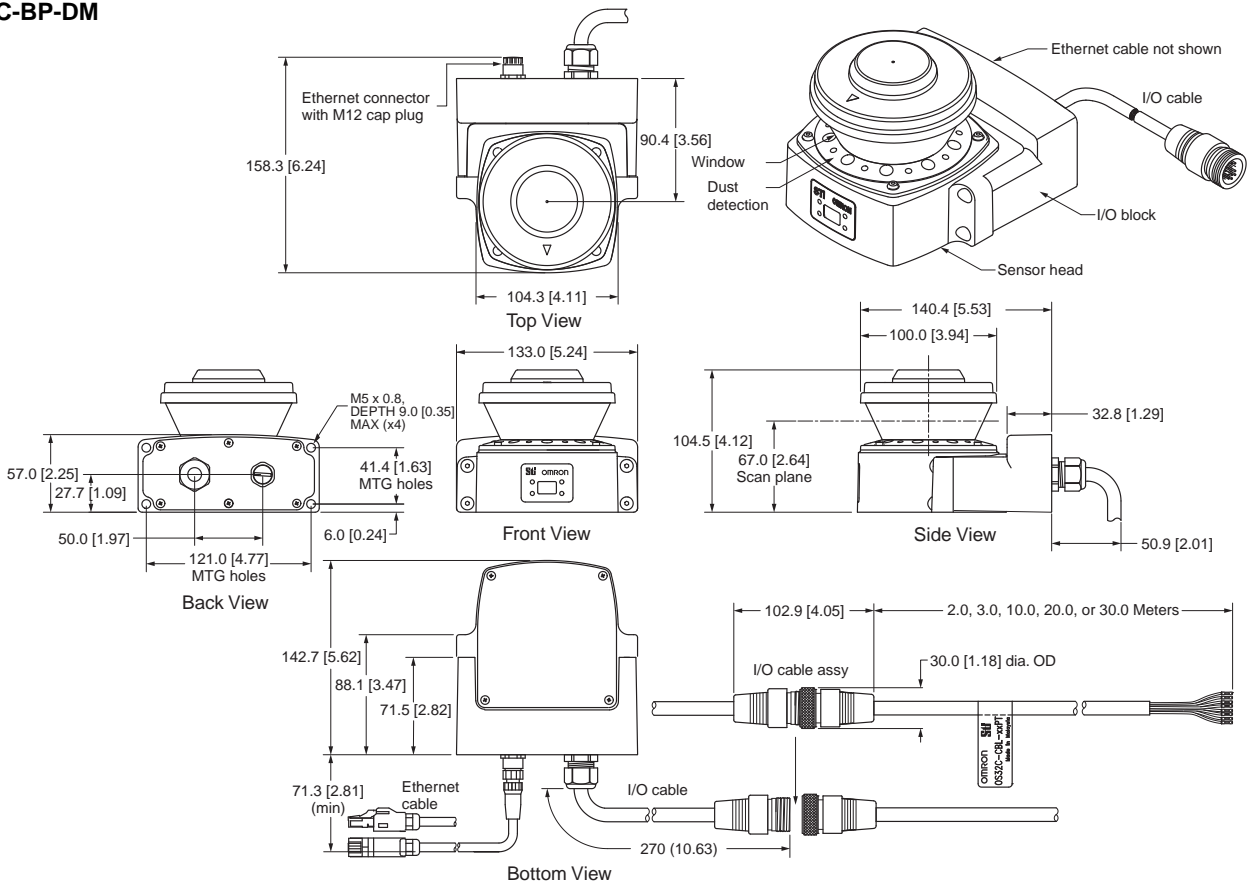
External Dimensional Drawings

(Unit: mm [inch])

OS32C with Back Location Cable Entry/with EtherNet/IP and Back Location Cable Entry

OS32C-BP

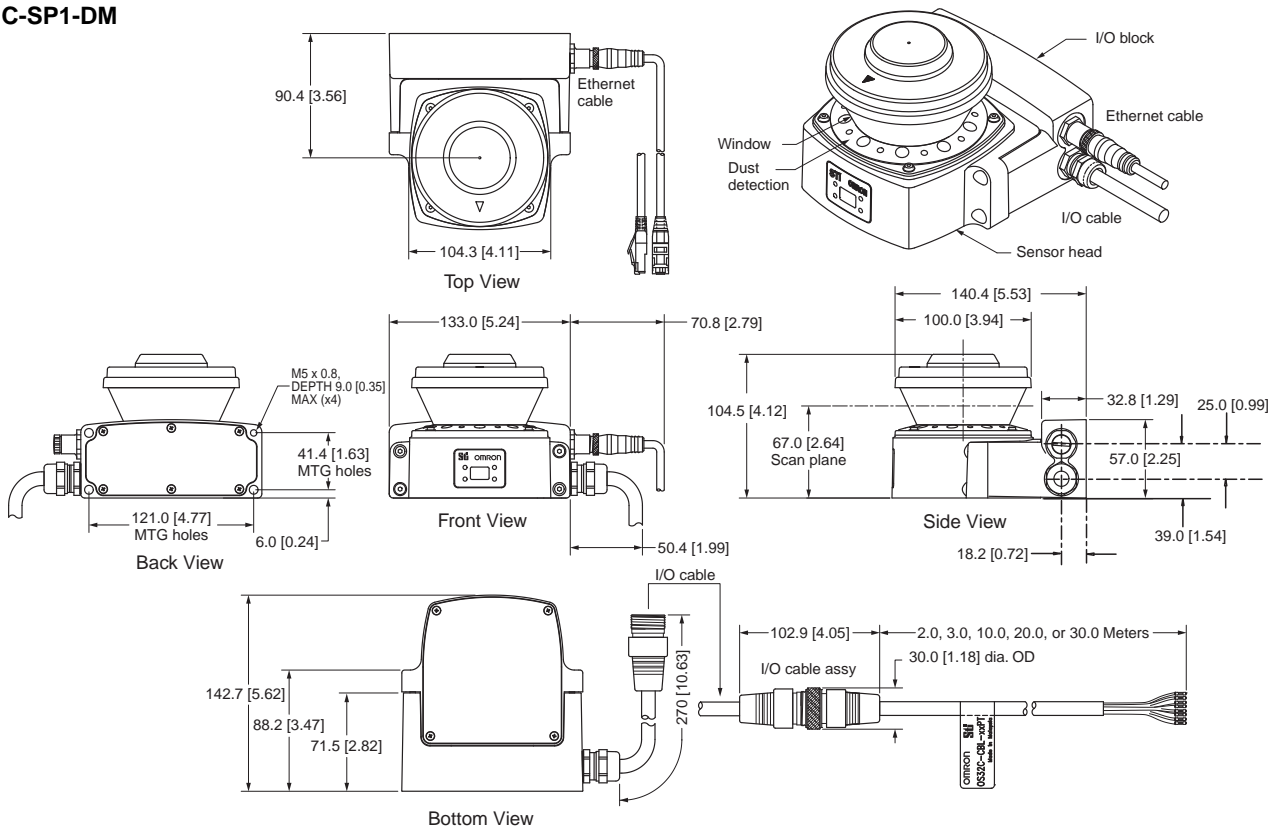
OS32C-BP-DM



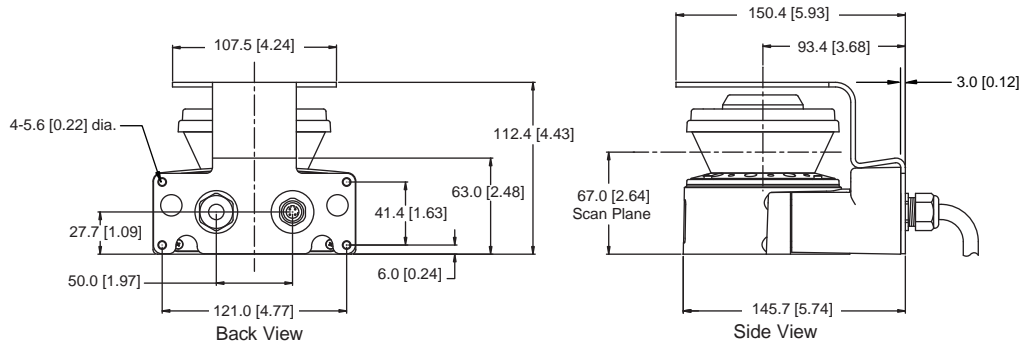
OS32C with Side Location Cable Entry/with EtherNet/IP and Side Location Cable Entry

OS32C-SP1

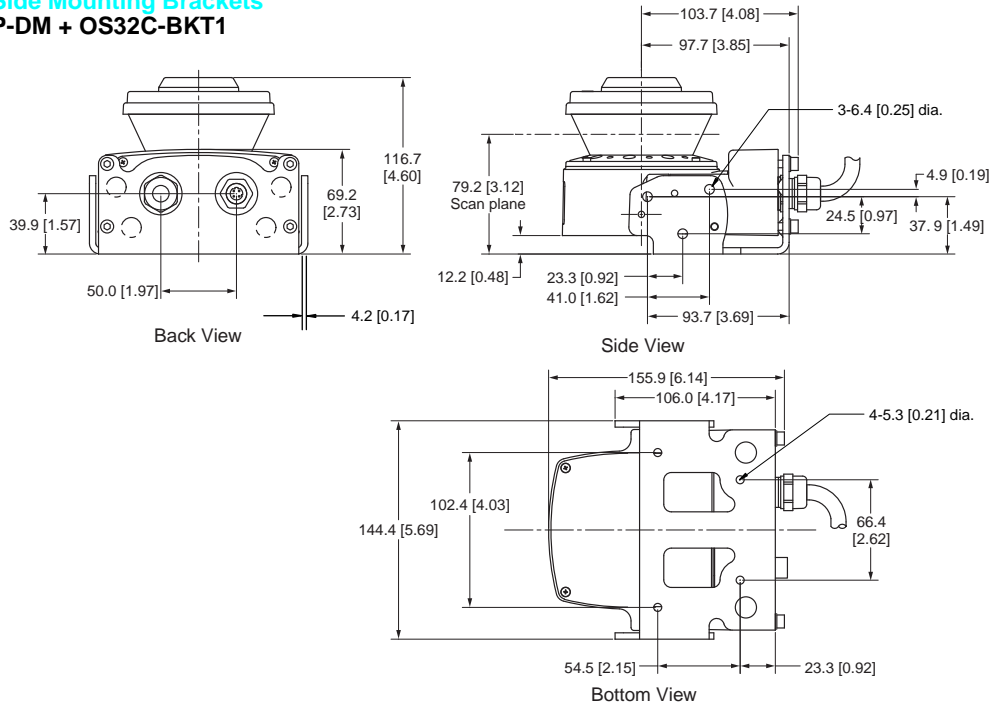
OS32C-SP1-DM



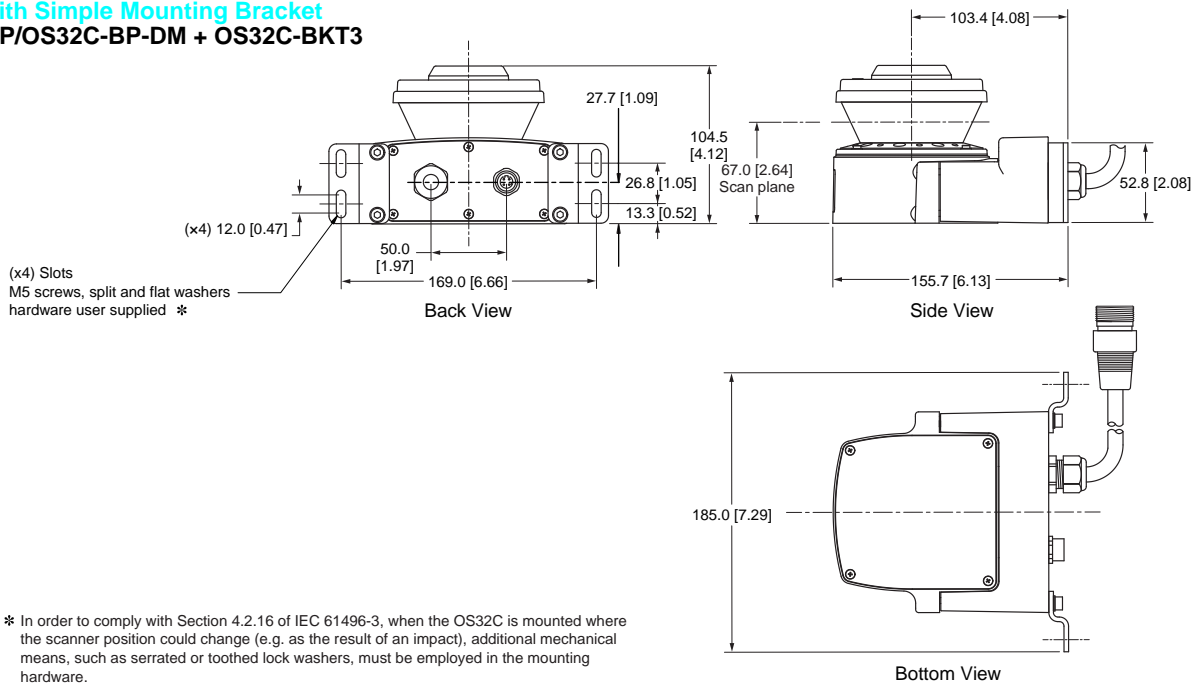
OS32C with Top Guard Kit
OS32C-BP/OS32C-BP-DM + OS32C-BKT4



OS32C with Bottom/Side Mounting Brackets
OS32C-BP/OS32C-BP-DM + OS32C-BKT1

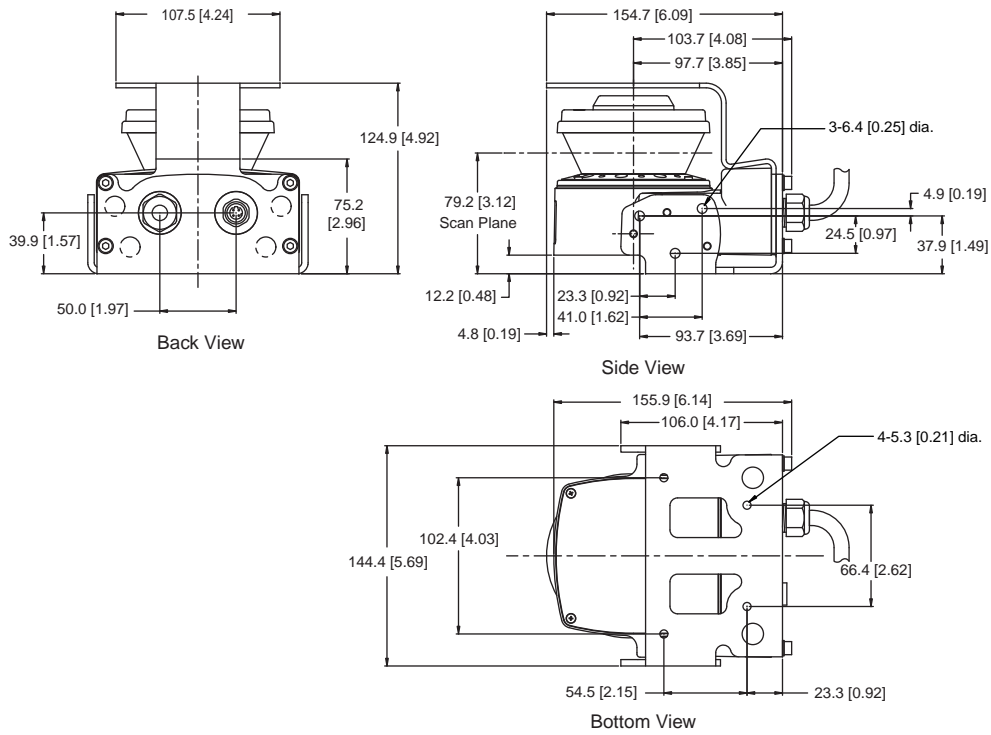


OS32C with Simple Mounting Bracket
OS32C-BP/OS32C-BP-DM + OS32C-BKT3

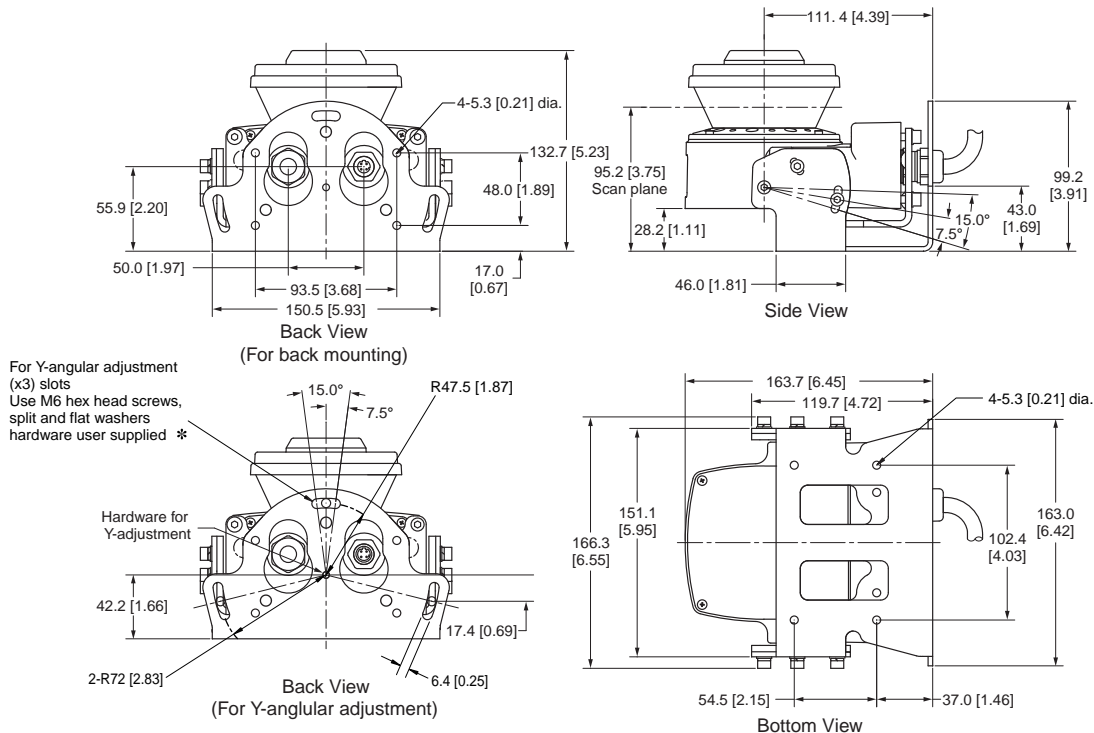


OS32C

OS32C with Bottom/Side Mounting Brackets and Top Guard Kit OS32C-BP/OS32C-BP-DM + OS32C-BKT1 + OS32C-BKT4

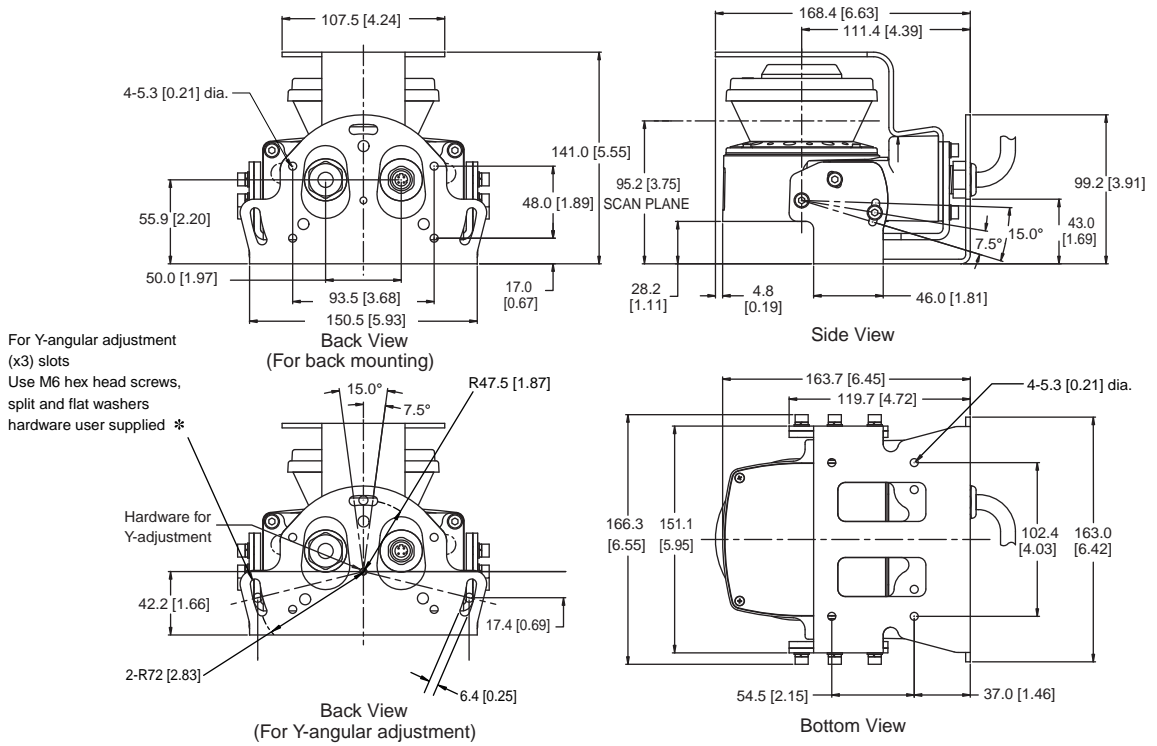


OS32C with Bottom/Side Mounting Brackets and XY Axis Rotation Mounting Kit OS32C-BP/OS32C-BP-DM + OS32C-BKT1 + OS32C-BKT2



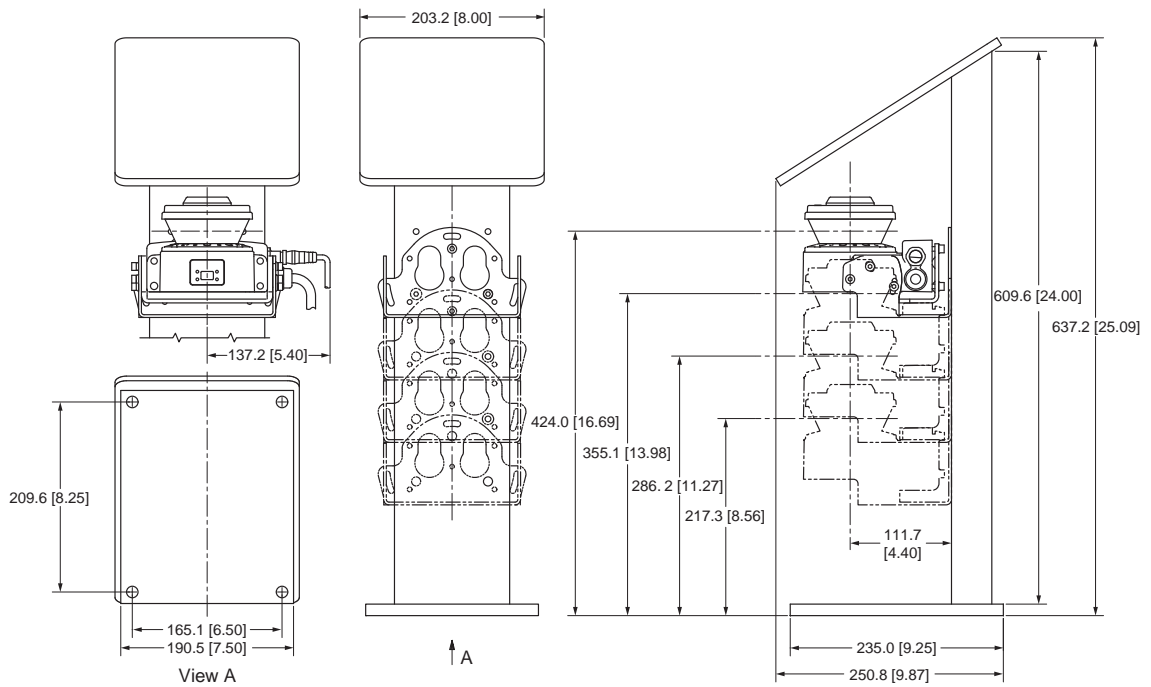
* In order to comply with Section 4.2.16 of IEC 61496-3, when the OS32C is mounted where the scanner position could change (e.g. as the result of an impact), additional mechanical means, such as serrated or toothed lock washers, must be employed in the mounting hardware.

OS32C with Bottom/Side Mounting Brackets, XY Axis Rotation Mounting Kit and Top Guard Kit
OS32C-BP/OS32C-BP-DM + OS32C-BKT1 + OC32C-BKT2 + OS32C-BKT4



* In order to comply with Section 4.2.16 of IEC 61496-3, when the OS32C is mounted where the scanner position could change (e.g. as the result of an impact), additional mechanical means, such as serrated or toothed lock washers, must be employed in the mounting hardware.

OS32C with Bottom/Side Mounting Brackets, XY Axis Rotation Mounting Kit, Mounting Stand and Mounting Stand Hardware Kit
OS32C-SP1/OS32C-SP1-DM + OS32C-BKT1 + OS32C-BKT2 + OS32C-MT + OS32C-HDT



⚠ WARNING

An OS32C is an electro-sensitive protective equipment designed to guard personnel working around hazardous machinery.



Whether a specific machine application and the OS32C system installation complies with safety regulations depends on the proper application, installation, maintenance and operation of the OS32C system. These items are the responsibility of the purchaser, installer and user.

**User****⚠ WARNING**

The administrator is responsible for the selection and training of personnel to properly install, operate, and maintain the machine and its safeguarding systems.



An OS32C system should only be installed, verified and maintained by a qualified person. A qualified person is defined as *"an individual who understands, is trained on, and demonstrates competence with the construction, operation or maintenance of the machinery and the hazards involved."* (ANSI/PMMA B155.1-2006)

**The machine requirements****⚠ WARNING**

The guarded machine must be able to stop anywhere in its cycle. Do not use an OS32C on a press with a full-revolution clutch.



The guarded machine must have a consistent stopping time and adequate control mechanisms.



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 failure to danger.



Do not use the auxiliary output or warning output for safety applications. A human body may not be detected even if a failure of OS32C occurs, resulting in serious injuries.

**Installation****⚠ WARNING**

The main unit must be securely mounted and its cable connectors must be tightly attached.



A start switch to release interlock must be installed where an operator can observe the monitored/guarded zone as a whole and cannot operate the switch within the hazardous zone.



A protective mechanism must be installed to prevent a hazardous condition in the event of a subsequent machine component failure. The OS32C does not protect against ejected flying material.



Severe smoke and particulate matter may degrade the efficiency of an OS32C, causing it to unexpectedly enter a Machine Stop state.



Use of mirrors or mirror-like objects in the protection plane must be avoided, as they can hide part of the area to be monitored/guarded.



Additional guarding may be required to prohibit access to dangerous areas not covered by the OS32C system.



Perform the test procedure in this document at installation, after maintenance, adjustment, repair or modification to the machine controls, tooling or the OS32C system. Refer to OS32C Series User's Manual (Man.No.Z296-E1).



Perform only the test and repair procedures outlined in this manual.



Additional measurement error resulting from reflective backgrounds may need to be added to the measurement error of the OS32C.



To use the protective function of the OS32C, a safety zone must be properly defined and configured.



If the response time is changed, re-calculation of the safety distance is required. This may require re-configuration of the safety zones or re-installation of the OS32C. If the safety distance is not appropriate for the application, the machine may not stop before contact with the hazardous part, resulting in serious injuries or death.



When using more than one OS32C, mutual interference should be prevented. This may require different scanner positions or physical shields to be installed.



To ensure a protection degree of IP65, DO NOT use this product without proper sealing of the cable connector, I/O block, and scan window.



If the external zone switching device momentarily exceeds the configured number of active zone set select inputs during the zone switch, an additional Zone Delay may be incurred in the event that wiring of a zone set select input fails. The external zone switching device must properly sequence so the configured number of active inputs is not exceeded in order to guarantee that failed zone set select input wiring will be detected within the normal Zone Switching Time described below.



If an insufficient Zone Delay is used for the actual worst case switching time of the installation, the scanner might start monitoring the wrong zone during the switching period. Also, if an insufficient Zone Delay is used for the actual worst case switching time of the installation, there might be a fault condition during the zone switching period.



If tstart (switching start time) is configured without consideration of TmaxReaction (total maximum reaction time), object detection within the new safety zone after switching and turning OFF of the safety outputs may be delayed.



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. Refer to Checkout and Test Procedure Log on OS32C Series User's Manual (Man.No.Z296-E1)



Wiring connections

WARNING

Do not connect the OS32C to a power supply with more than 24VDC + 25% / -30%. Do not supply AC power to the OS32C, this may result in electrical shock.



For the OS32C to meet IEC 61496-1 and UL 508, its DC power supply unit must satisfy all of the following conditions:



- Within rated line 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
- Satisfying output characteristics requirements of Class 2 circuit or limited voltage/current circuit defined in UL508.
- Power supply complying with regulations and standards of EMC and safety of electrical equipment in a country or a region where OS32C is used. (Example: In EU, a power supply must comply with EMC directives for low-voltage)

To prevent electrical shock, use double-insulation or reinforced insulation from hazardous voltage (such as 230 VAC).



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



To use this product for a category 3 safety system, both safety outputs must be connected to the safety system. Configuring a safety system with only one safety output may result in serious injuries due to output circuit fault and a failure of the machine to stop.



Protection of Cable at Installation:
Care should be taken when installing the OS32C cable. The cable must be properly routed and secured to ensure that damage does not occur.



Functional Earth:
The OS32C system requires a functional earth connection.



Do not 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 severe operator injury.

Signal Connector Isolation:
The connectors used during installation must provide sufficient signal separation in order to prevent a short circuit condition of the input power and system signals.



Others

WARNING

Do not modify the main unit of the OS32C. Do not replace or fix any component of the OS32C other than the ones specified in this manual. Doing so may result in a failure of this device to function correctly.



If there is any damage to the window, replace them as soon as possible. Otherwise it may result in a failure of the OS32C. Take preventive measures when performing replacement work so that dust does not enter the OS32C.



Always detach all cables from the OS32C before replacing the scan window. Otherwise the motor may start rotating, resulting in injuries.



The tests outlined in this Test Procedure (Refer to OS32C Series User's Manual (Man.No.Z296-E1)) must be performed at time of installation, according to the employer's regular inspection program and after any maintenance, tooling change, set up, adjustment, or modification to the OS32C system 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 OS32C operating mode or defined zone sets. Testing ensures that the safety laser scanner and the machine control system are working properly to stop the machine. Failure to test properly could result in serious injury to personnel.



If the OS32C is operated under automatic start, make sure that the machine stops and does not restart as long as an object is detected in a safety zone. Check the operation by placing a test piece into the safety zone. It is recommended to perform the test at least after a shift change or 24 hours of operation.



If the safety system or the machine fails any of these tests, do not run the machine. Immediately tag or lock out the machine to prevent its use and notify the appropriate supervisor.



This laser scanner may not be sold or imported into, or used in, the Federal Republic of Germany prior to December 1, 2013.



System and zone status parameters monitored over EtherNet/IP are to be used for diagnostic purposes only, and must not be used in safety-critical functions.



Measurement data monitored over EtherNet/IP are to be used for diagnostic purposes only, and must not be used in safety-critical functions.



CAUTION

When transferring data from the PC to the OS32C and more than one OS32C is connected to the network, it is necessary to visually check the diagnostic code on the status/diagnostic display. It is recommended that the OS32C be installed in a position where the status/diagnostic display will be visible.



Take precautions to prevent dirt, dust or debris from entering the sensor and I/O block connectors. It is recommended that this be done on a clean workstation as contaminants may degrade the performance of the OS32C.



OS32C

Adhesion of dust to the scan window may cause a false operation. The OS32C will require periodic cleaning of the scan window and dust detection surface.



Operation of the OS32C may be affected by substances in the environment, such as fog, smoke, steam and other small particles.



Operation of the OS32C may be affected by light in the environment, such as incandescent light, strobe light and light from a photosensor using infrared light.



Ensure the measurement report configuration matches the expected measurement data format.



Firmware and Configuration Tool Features and Compatibility

Refer to the table below for supported features and compatibility with OS32C versions. Refer to the product labels to determine the OS32C version.

NOTE:

- Only the version of the sensor block and the configuration tool were updated to support the new features. No changes were made to the I/O block.
- The window replacement kit OS32C-WIN-KT can be used on any sensor block.



The part numbers have changed:
 OS32C-SN: 40591-0010 (old), 40591-0020 (current)
 OS32C-DM-SN: 40591-0040 (current)

	OS32C Version		OS32C-DM
	40591-0010	40591-0020	40591-0040
Configurable minimum object resolution	--	Supported	Supported
Standby mode with laser shutoff	--	Supported	Supported
Copy & paste zones and zone sets	--	Supported	Supported
Record system monitoring	--	Supported	Supported
Playback system monitoring	--	Supported	Supported
Support for inverting 7-segment display	--	Supported	Supported
Display configuration filename in config tool header	--	Supported	Supported
Additional zone shapes (180° semi-circle, 180° rectangle, 180° polygon)	--	Supported	Supported
Config tool support for switching between default OS32C configuration and the user's current working configuration	--	Supported	Supported
Troubleshooting tips displayed in fault log	--	Supported	Supported
Configuration checksum, safety checksum	Supported *1	Supported *1	Supported *1
Windows 7 support	--	Supported	Supported
Non-safety checksum	Supported *2	Supported *2	Supported *2
Maintenance access level	--	Supported *3	Supported *2
Import & Export Zone Coordinate Data	Supported *2	Supported *2	Supported *2
EtherNet/IP and Measurement Data	--	--	Supported

*1. Requires Configuration Tool Version 1.4.0 and up

*2. Requires Configuration Tool Version 1.6.0 and up

*3. If serial number of the sensor block is higher than AS08300 and Configuration Tool is version 1.6.0 and up

	Configuration Tool Version		
	before 1.4.0	1.4.0 and up	1.6.0 and up
Configurable minimum object resolution	--	Supported	Supported
Standby mode with laser shutoff	--	Supported	Supported
Copy & paste zones and zone sets	--	Supported	Supported
Record system monitoring	--	Supported	Supported
Playback system monitoring	--	Supported	Supported
Support for inverting 7-segment display	--	Supported	Supported
Display configuration filename in config tool header	--	Supported	Supported
Additional zone shapes (180° semi-circle, 180° rectangle, 180° polygon)	--	Supported	Supported
Config tool support for switching between default OS32C configuration and the user's current working configuration	--	Supported	Supported
Troubleshooting tips displayed in fault log	--	Supported	Supported
Configuration checksum, safety checksum	--	Supported	Supported
Windows 7 support	--	Supported	Supported
Non-safety checksum	--	--	Supported
Import & Export Zone Coordinate Data	--	--	Supported
Maintenance access level	--	--	Supported

Model	Sensor Head P/N	Configuration Tool Version		
		before 1.4.0	1.4.0 and up	1.6.0 and up
OS32C-SN	40591-0010	Supported	Supported	Supported
OS32C-SN	40591-0020	--	Supported	Supported
OS32C-SN-DM	40591-0040	--	--	Supported

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