



Safety Laser Scanner  
SZ-V Series

Maximum safety standard for scanners

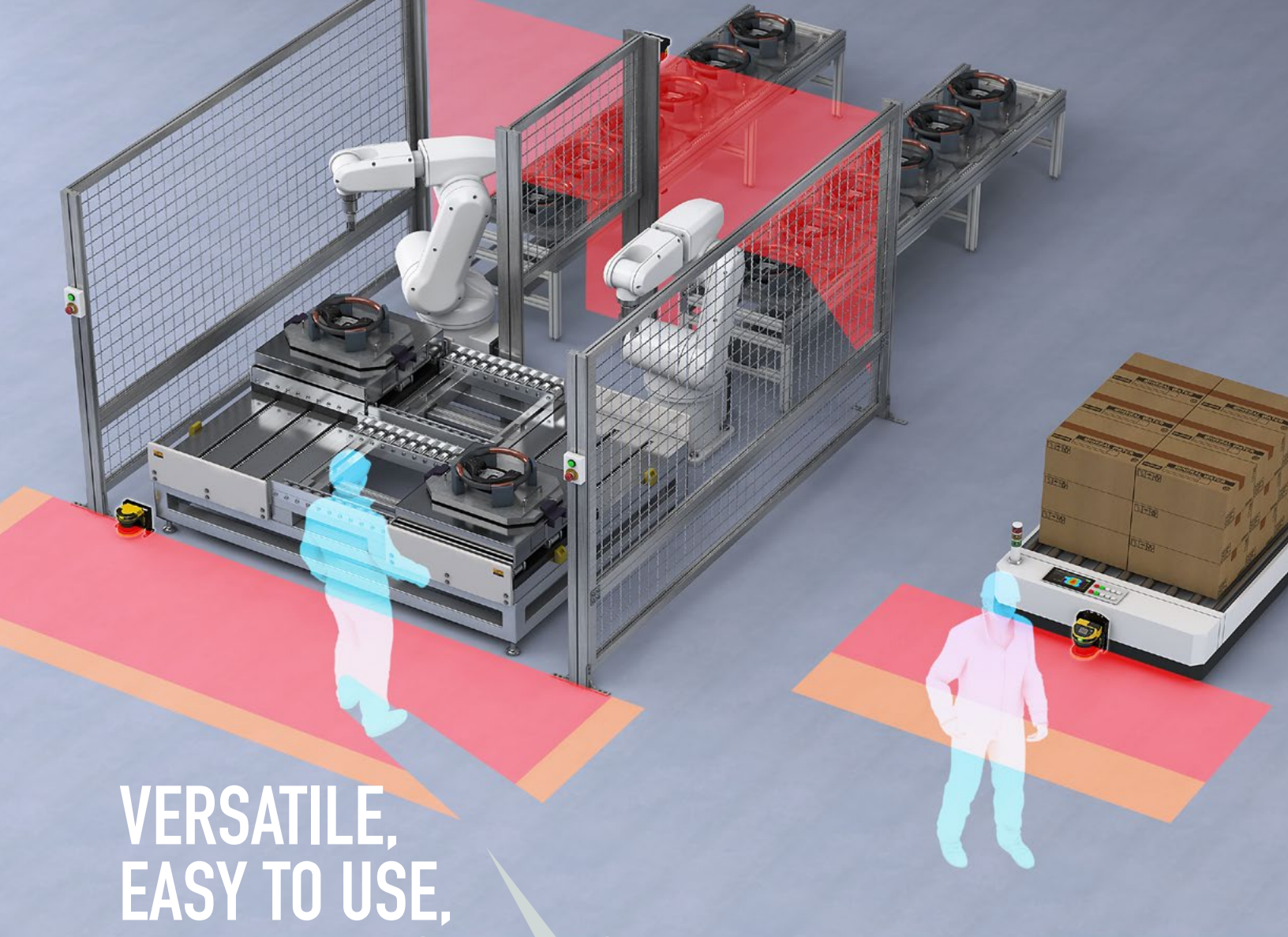
Type3 SIL2 Category3 PLd



Industry Leading  
Safety Laser Scanner



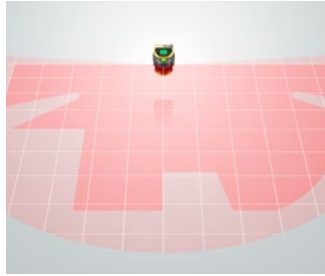
SZ-V Series



# VERSATILE, EASY TO USE, AND TRULY SUPERIOR SAFETY SCANNER



Innovative Way of Guarding  
Time-of-Flight Based Detection



## VERSATILE

- Large Customizable Zones
- Monitor Multiple Areas
- Protect Countless Hazards



## EASY TO USE

- USB and Network Compatible
- Easy to Navigate Software
- Quickly Customized Zones



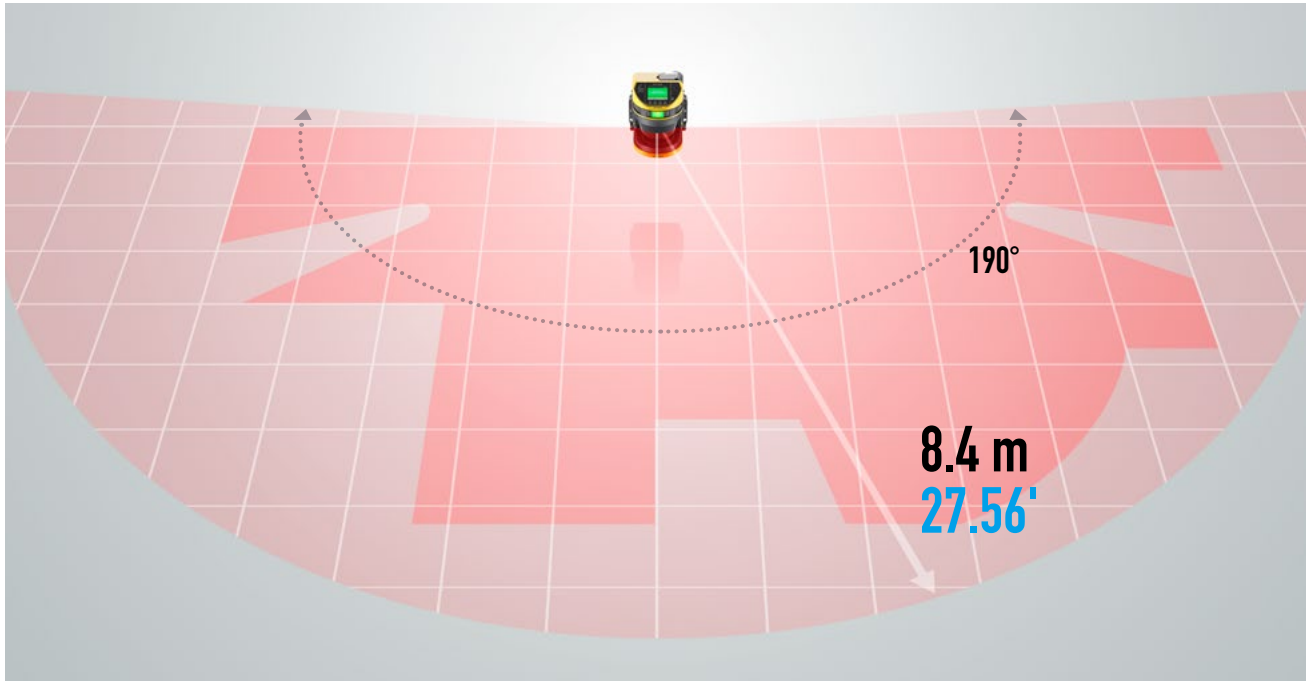
## TRUE SUPERIORITY

- Advanced Features
- Unmatched Stability
- Visual Innovation



# VERSATILE

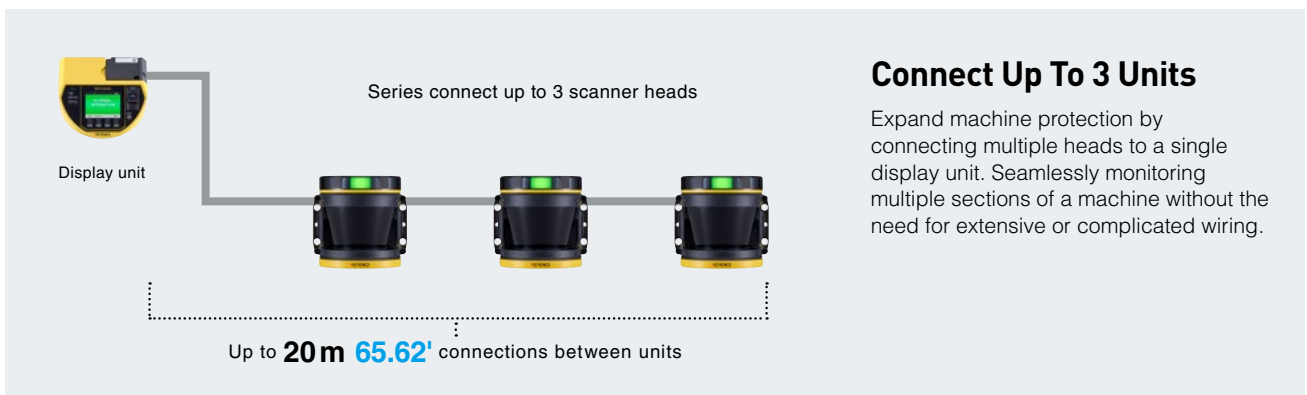
## LARGE CUSTOMIZABLE ZONES



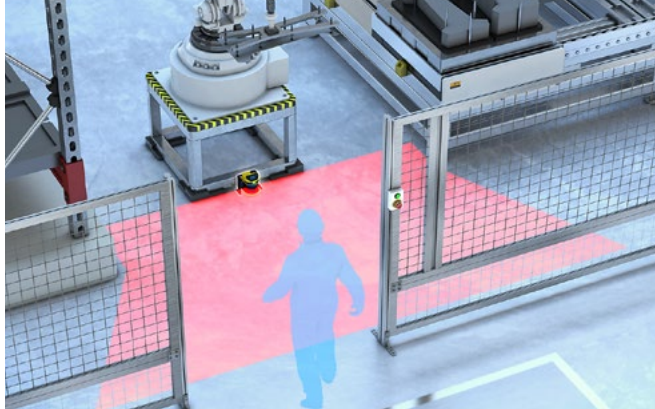
**190°** Field of View | **8.4 m 27.56'** Protection Zone | **26 m 85.30'** Warning Zone

Boasting a large customizable zone, the SZ-V Series offers a truly unique safety solution compared to other types of safety equipment. The reflective nature of the scanner allows for versatile mounting, coupled with user-defined protection and warning zones, to cover any hazardous location.

## PROTECT MULTIPLE AREAS ON A SINGLE MACHINE

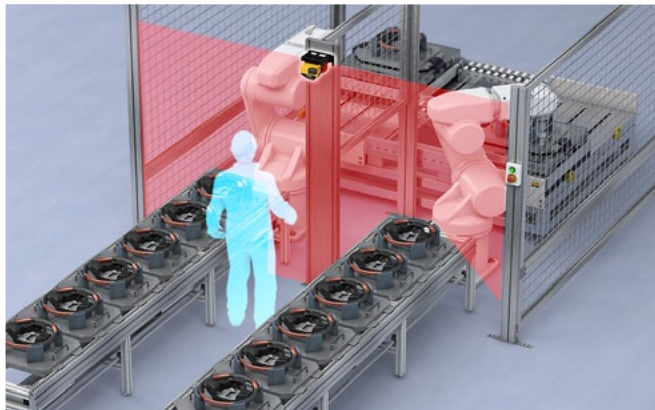


## SAFELY PROTECT COUNTLESS TYPES OF HAZARDS



### Area Protection

Safety scanners prevent hazards from operating when an unintended object or person is in a dangerous area. Unlike safety mats, safety scanners can be unobtrusively mounted to avoid damage or potential impact, while still protecting complex shaped areas.



### Access Protection

The SZ-V also allows for vertical mounting to detect any undesirable entrances into a hazardous area. This is ideal in locations where it would be too difficult to effectively mount light curtains.



### AGV/AGC

A safety laser scanner can be mounted on an automated guide vehicle to eliminate the risk of collisions with objects or people in the environment. The features of the SZ-V Series help to ensure proper operation without danger or unnecessary stoppage.

# EASY TO USE

## ■ SIMPLE AND DIRECT COMMUNICATION



■ **USB/Ethernet** Direct Connection

■ **PROFINET/EtherNet/IP®** Network Communication

Directly connect to SZ-V Series scanners through either USB or Ethernet to easily modify the units program, monitor the current status of the scanner, or check recent interruptions. The SZ-V Series can also communicate directly with PLCs via several different communication protocols, including EtherNet/IP®, PROFINET, and UDP, as well as the following safety rated protocols, CIP Safety and PROFIsafe.

\*Network communication only available on designated models.

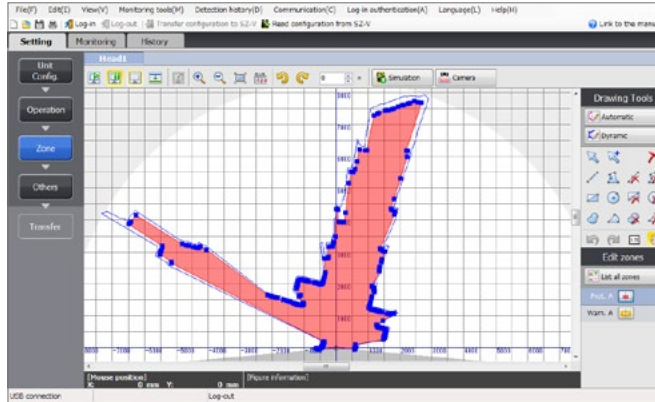
## ■ EASY TO NAVIGATE SOFTWARE

Simplified step-by-step menus.

Clean and concise page layouts provide a seamless flow between settings.

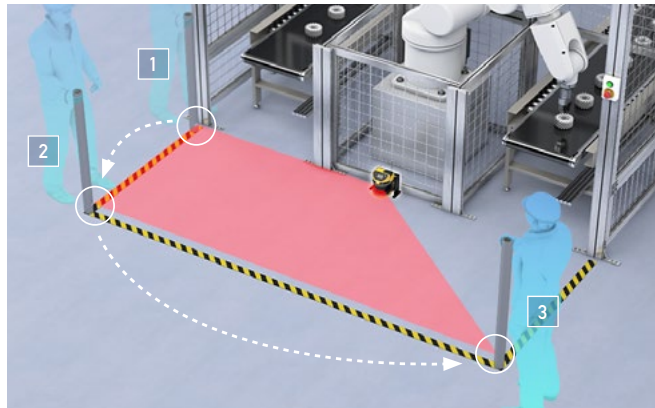
Drop-down menus and buttons make configuration faster than ever.

## QUICKLY CUSTOMIZED DETECTION ZONES (3 Methods)



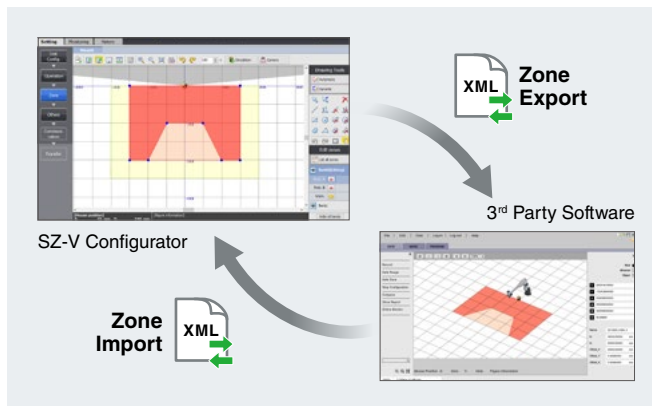
### Automatic Drawing Function

Instantly map out the protection zone with the push of a button! This innovative feature automatically draws around obstacles to ensure proper protection in complex environments.



### Dynamic Drawing Function

Using a specialty reflector, simply mark the corners of the desired zone for a truly unmatched zone creation technique. This function can be used to generate simple square zones, as well as complex polygonal areas.



### Upload Existing Zones

Speed up integration by uploading zones that have already been created in a 3rd party software (ex. robotics software) via an XML file. The reverse can also be realized by exporting zones created in the SZ-V software for use in other devices.

# SUPERIORITY Advanced Functionality

## IMPROVEMENTS

### System Memory

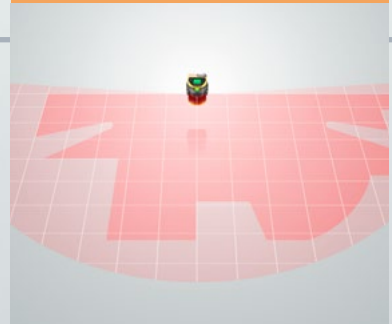
When replacing a unit, the original settings can be easily transferred by removing the system memory from the original unit and connecting it to the new unit.



Safety Laser Scanner  
SZ-V Series

### 8.4 m **27.56'** Detecting Range

Several KEYENCE innovations work together to provide an impressive 8.4 m **27.56'** detecting range for flexible scanner usage.



## INNOVATIONS

## Network Compatibility

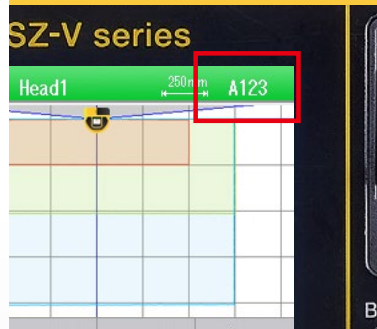
The SZ-V supports various networking options to enable remote monitoring.

SZ-V(U)32N(C)(X)



## CRC Code

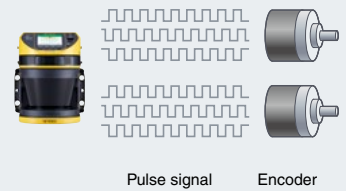
This 4 digit code is located in both the software and on the display unit, to verify that the settings have not been changed.



## Encoder Inputs

The SZ-V can take encoder inputs directly from an AGV/AGC to enable smooth profile transitions.

SZ-V(U)32N(X) SZ-V(U)32(X)



## 2 Scanners in 1 Unit

The SZ-V can protect two independent zones simultaneously, saving costs and wiring.

SZ-V(U)04(X) SZ-V(U)32N(C)(X)



## Muting Function

The built-in muting function ensures high productivity and efficiency, while still maintaining a safe working environment.

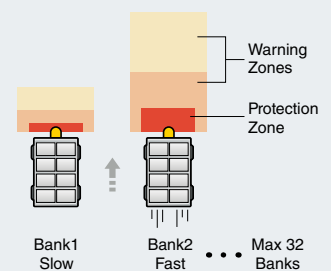
SZ-V(U)04(X) SZ-V(U)32N(X)



## 96 Programmable Profiles

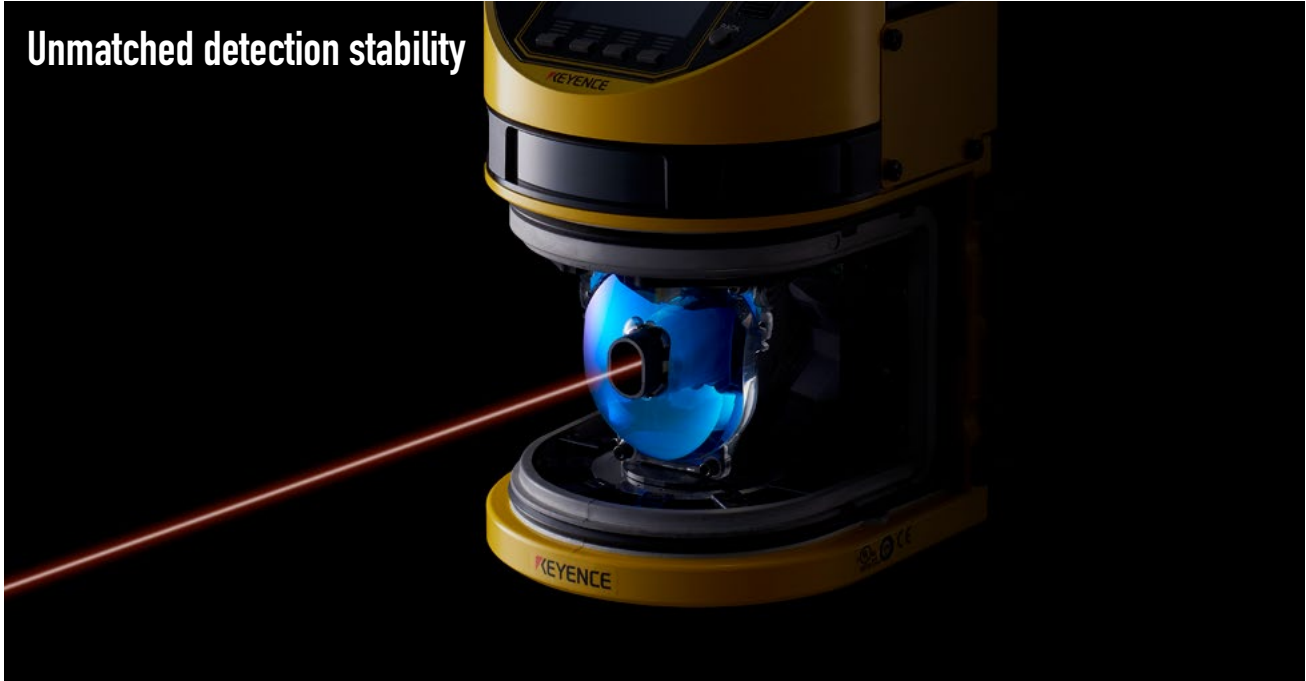
Provide precise and dynamic control of AGV/AGC operations using 32 banks, each containing 1 protection zone and 2 warning zones.

SZ-V(U)32N(X) SZ-V(U)32(X)



# SUPERIORITY Unmatched Stability

## IMPROVED ENVIRONMENTAL RESISTANCE



### Enhanced Detection

**0.1° Beam Pitch**

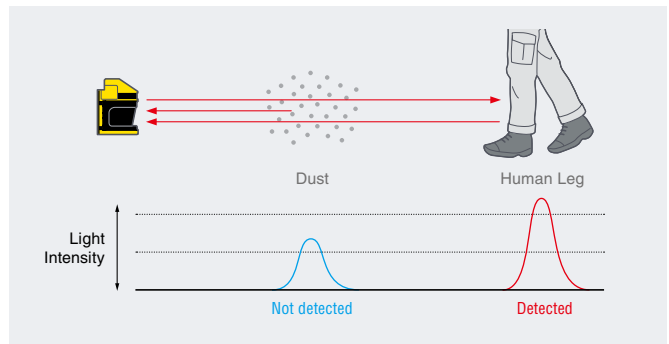
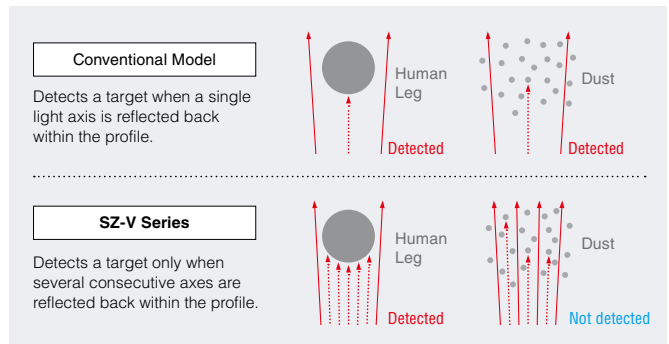
**Tight Beam Spot**

By reducing the spot diameter by 1/3\* and increasing the number of beam axes almost 4X\*, the SZ-V Series is able to stably detect targets while greatly decreasing the number of errant trips due to environmental factors. \*Compared to conventional models.

### Target Differentiation

**Intensity Comparison Algorithm (I.C.A.)**

The innovative Intensity Comparison Algorithm (I.C.A.) allows the scanner to analyze the amount of light returned to stably differentiate between people/objects and dust or mist.



## INCREASED FLEXIBILITY

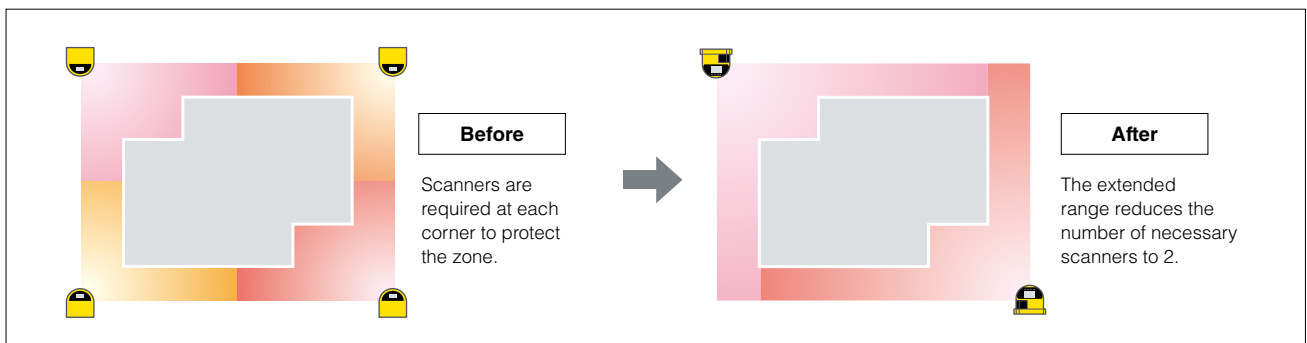
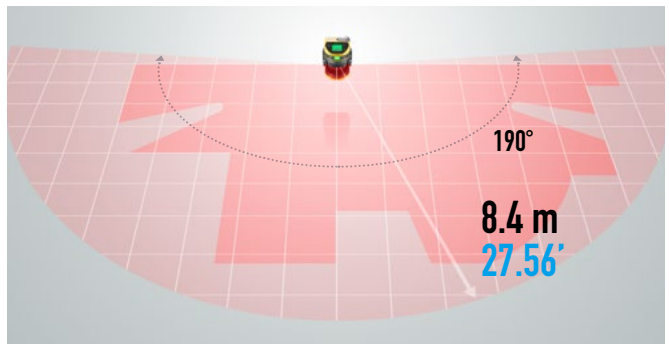


**More Coverage, Less Costs**

**8.4 m **27.56'** Detection Zone**

**26 m **85.30'** Warning Zone**

By deploying the new “Cannon Hole” structure, the SZ-V is able to detect further than ever before. This achievement eliminates the need for multiple scanners to cover the same location. This along with the intuitive customization provide for clear cost savings.



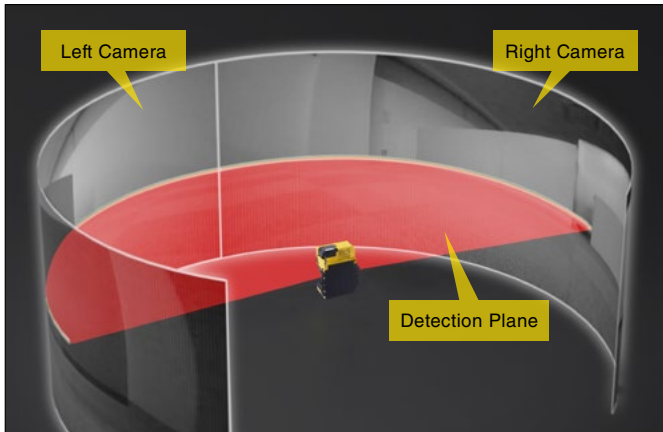
# SUPERIORITY Visual Innovation

STEP  
1

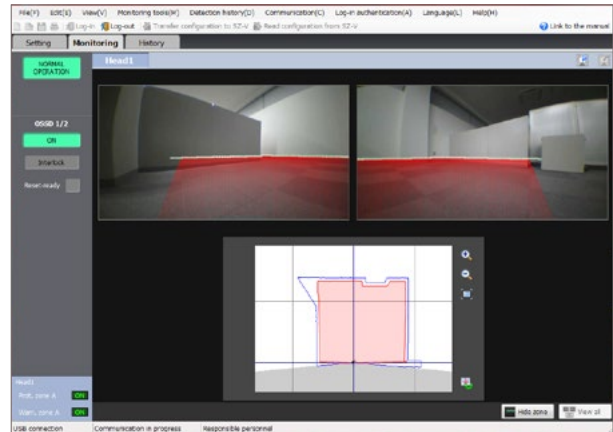
Installation

**Built-in Camera**

The SZ-V Series utilizes visualization in every aspect of scanner usage to provide a truly unique experience. Installation is now easier than ever with built-in cameras, available on specific models, to not only show what the scanner sees but also the actual detection plane.



The SZ-V camera models show real time images of what the scanner sees.



The software view combines the camera images and zone layout for a complete overview.

STEP  
2

Operation

**Separate Display**

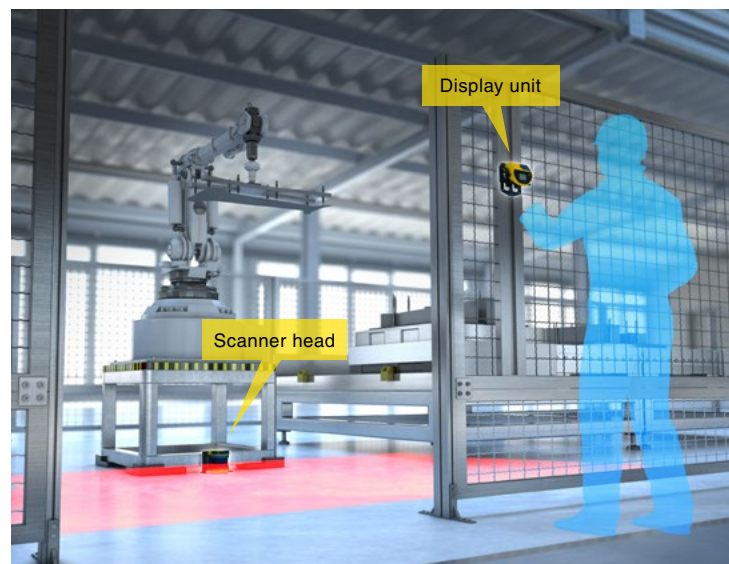
With conventional scanners, it was very difficult to monitor the scanner's status while the machine was operating. This is no longer a concern with the detachable SZ-V Display Unit which enables users to easily monitor the scanner at any time.



**Quick checks through the Display Unit**

**Detailed setting information through a laptop**

Ideal for mounting outside of the hazardous zone to prevent unnecessary machine stoppage.



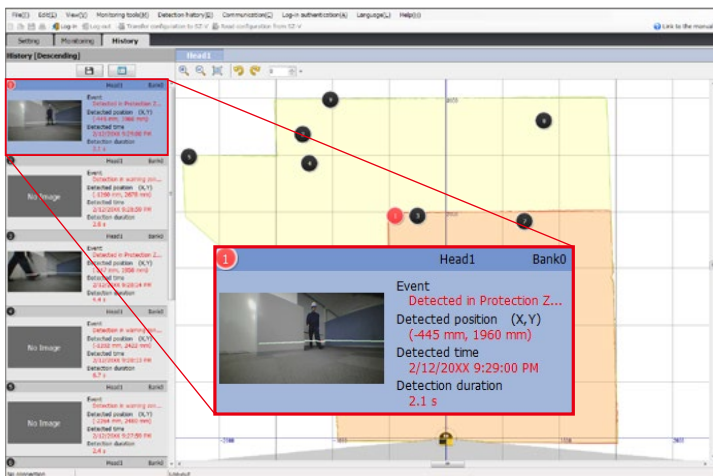
**STEP 3**

**Maintenance**

**Built-in Camera**   **Software**   **Separate Display**

The combination of the previous features, along with KEYENCE's innovative Detection History function, completely eliminate maintenance headaches. The SZ-V records WHEN and WHERE detections occur to provide a thorough archive of pertinent information that can be used to better understand scanner operations.

### (1) Detection History



#### Detection History Content

Time	Duration
Position	OSSD/Warning/Alert Status

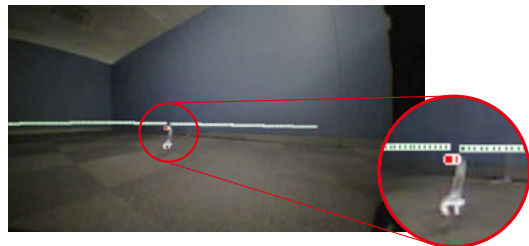
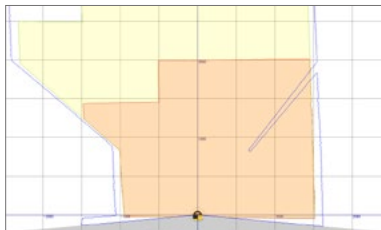
The Detection History feature allows SZ-V users to clearly visualize WHEN, WHERE, and for HOW LONG detections are occurring. With up to 500 events that can be saved, this feature provides crucial details to better understand machine shut downs.

### (2) Built-in Camera

With the built-in camera models, the SZ-V takes pictures or movies before and after the OSSD turn OFF. Now users can visually see the cause of trip and react accordingly.

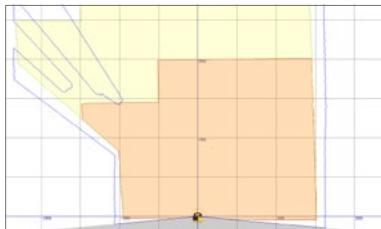
#### Cause: Dropped Tool

Event  
**Detected in Protection Z...**  
 Detected position (X,Y)  
**(606 mm, 765 mm)**  
 Detected time  
**2/12/20XX 9:16:39 PM**  
 Detection duration  
**0.3 s**



#### Cause: Worker In Zone

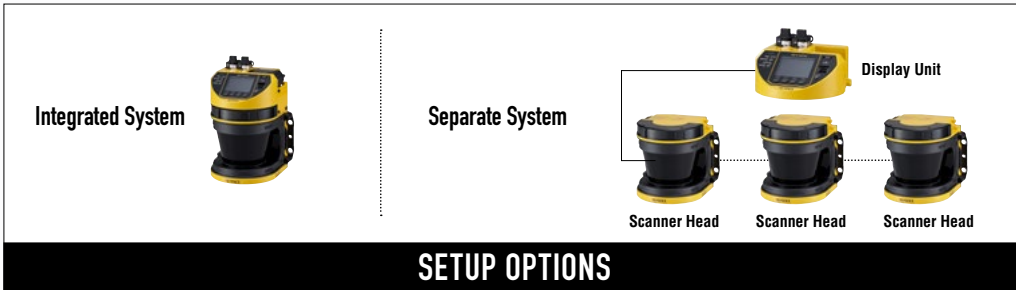
Event  
**Detected in Protection Z...**  
 Detected position (X,Y)  
**(-1297 mm, 1391 mm)**  
 Detected time  
**3/2/20XX 9:31:57 PM**  
 Detection duration  
**6.1 s**



# NETWORKING

## EXTENSIVE NETWORKING OPTIONS

The SZ-V32NC(X), SZ-V32N(X), and SZ-VU32N models contain an abundance of networking options that offer a wide variety of beneficial features. From programming the unit remotely to controlling machine stoppage through a Safety PLC, the SZ-V Series can adapt to almost any need.



## KEYENCE NETWORK ADVANTAGE

EtherNet/IP

PROFINET

CLIP Safety

PROSafe

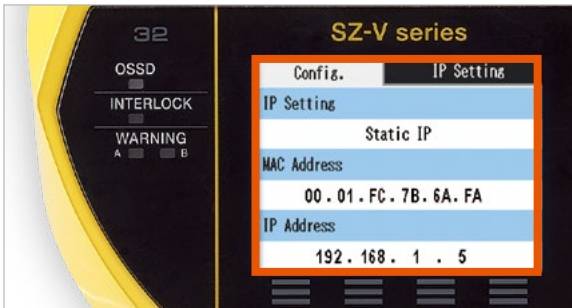
UDP

1

Easily Accessible Information

**Detachable and Detailed Display**

The highly detailed display utilized by the SZ-V Series provides a perfect platform to view all network related settings directly on the unit. As an added benefit, the display unit can also be separated and mounted in an easily accessible location.



**Quickly and Easily Check the Following:**

- IP Setting
- IP Address
- MAC Address

All can be seen directly on the display unit!

## SAFETY FUNCTIONS

- Control machine power through a safety PLC
- Check/protect different areas simultaneously
- Monitor the status of the scanner



Safety PLC

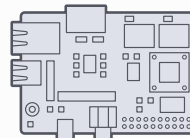


## NON-SAFETY FUNCTIONS

- Read measurement distance data
- Monitor the status of the scanner (AUX information)
- Send status information to an HMI



PLC or Industrial PC



AGV On-Board Computer



## SZ-V CONFIGURATOR FUNCTIONS

- Change/view all settings remotely
- View the history of OSSD trips and errors
- Monitor the protection area in real-time



Desktop PC and Laptop PC

**Ethernet**

## KEYENCE CIP Safety/PROFIsafe ADVANTAGE



2

Reduced Cost and Wiring

Series Connection

Dual Zone Control

By utilizing the SZ-V's CIP Safety and PROFIsafe compatibility, series connection capability, and dual zone control, the SZ-V is able to provide an easier and more cost-effective solution for protecting multiple machines or areas.

BEFORE

Conventional Network Scanners



AFTER

SZ-V Network Scanners



**Easier Wiring at Less Than 1/2 the Cost**

**Step 1**

Select separate or integrated system and required functions.

**1** Select system

**2** Select functions

**3** Select camera model or standard model

**Integrated system**



**Multi-OSSD/  
Muting**

Camera **SZ-V04X**

Standard **SZ-V04**

**Multi-bank**

Camera **SZ-V32X**

Standard **SZ-V32**

**Network Communication  
(PROFIsafe)  
Multi-bank  
Muting**

Camera **SZ-V32NX**

Standard **SZ-V32N**

**Network Communication  
(CiP Safety)  
Multi-bank**

Camera **SZ-V32NCX**

Standard **SZ-V32NC**

**Separate system**



**Multi-OSSD/Muting**



Camera Display unit: **SZ-VU04**  
Scanner head: **SZ-VH1X**  
System memory: **SZ-VSM**



Standard Display unit: **SZ-VU04**  
Scanner head: **SZ-VH1**  
System memory: **SZ-VSM**



**Multi-bank**



Camera Display unit: **SZ-VU32**  
Scanner head: **SZ-VH1X**  
System memory: **SZ-VSM**



Standard Display unit: **SZ-VU32**  
Scanner head: **SZ-VH1**  
System memory: **SZ-VSM**



**Network Communication  
(PROFIsafe)  
Multi-bank  
Muting**



Camera Display unit: **SZ-VU32N**  
Scanner head: **SZ-VH1X**  
System memory: **SZ-VSM**

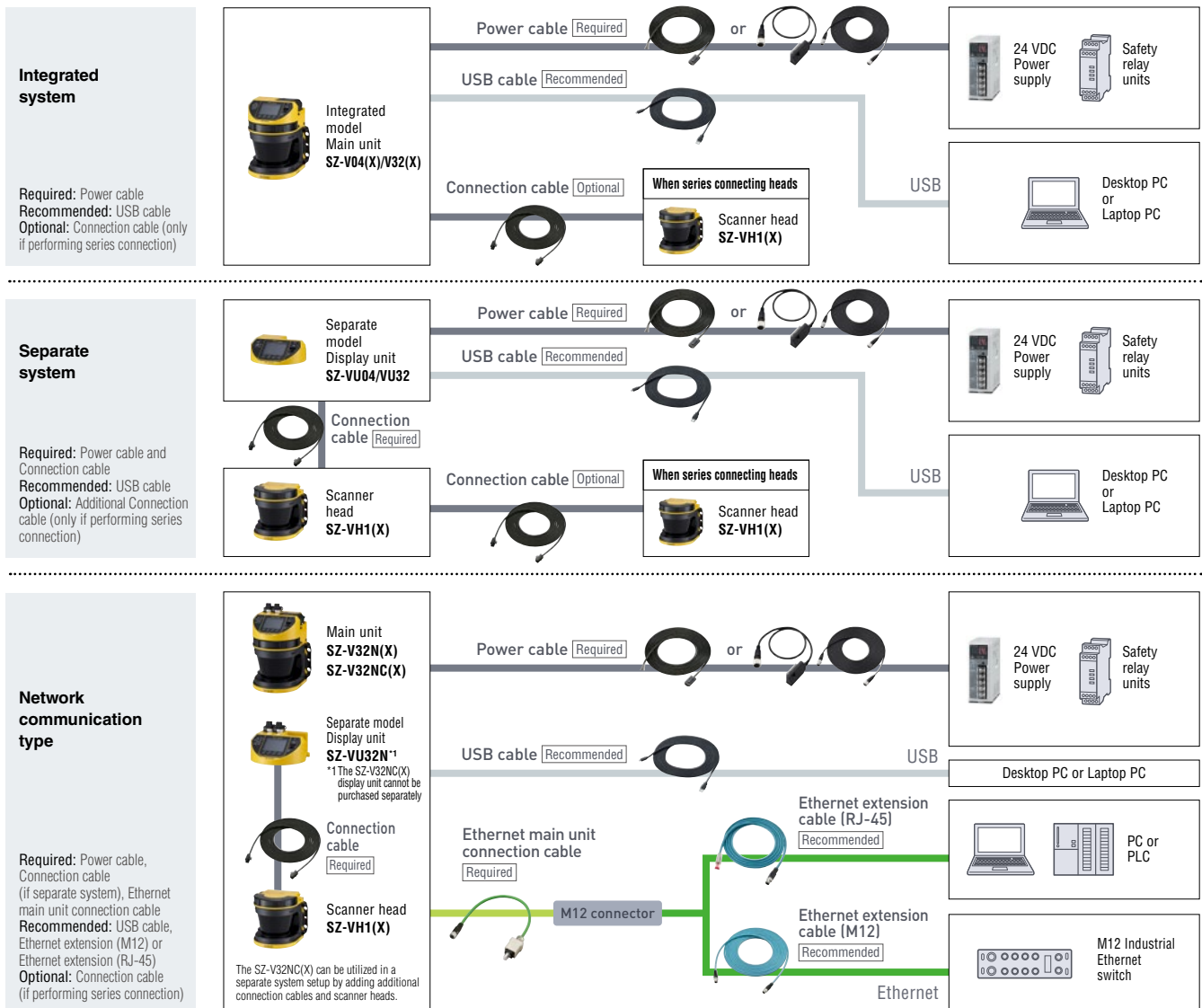


Standard Display unit: **SZ-VU32N**  
Scanner head: **SZ-VH1**  
System memory: **SZ-VSM**



## Step 2

### Select cables



Power cable (Standard)	Power cable extension (M12)	Power cable when using PROFIsafe or CIP Safety	Connection cable	Ethernet extension cable (RJ45)
5 m 16.40' SZ-VP5	0.3 m 0.98' SZ-VPC03	10 m 32.81' SZ-VP10PW	0.05 m 0.16' SZ-VS005	2 m 6.56' OP-88086
10 m 32.81' SZ-VP10	10 m 32.81' SZ-VCC10		5 m 16.40' SZ-VS5	5 m 16.40' OP-88087
20 m 65.62' SZ-VP20			10 m 32.81' SZ-VS10	10 m 32.81' OP-88088
30 m 98.43' SZ-VP30			20 m 65.62' SZ-VS20	

#### Select Power Cables

Model	Description	Safety Output		
		OSSD	PROFIsafe	CIP Safety
SZ-VP5/10/20/30	Standard Cable	✓	—	—
SZ-VP10PW	Power Cable	—	✓	✓
SZ-VPC03, SZ-VCC10	Power Cable Extension (M12)	▲*1	✓*2	✓*2

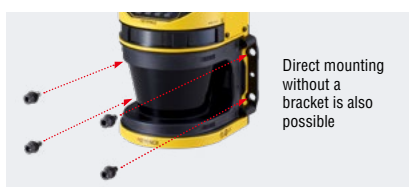
✓: Possible ▲: Possible with limitations —: Impossible

\*1 SZ-VPC03 is equipped with only 4 pins: 24 V, 0 V, OSSD1, OSSD2. \*2 OSSD1 & OSSD2 are disabled when using PROFIsafe or CIP Safety.

Ethernet main unit connection cable	
SZ-VNC03	
Ethernet extension cable (M12)	
2 m 6.56'	OP-88089
5 m 16.40'	OP-88090
10 m 32.81'	OP-88091
20 m 65.62'	OP-88092

## Step 3



### Select bracket [optional]



	Adjustable angle mounting bracket (horizontal) <b>SZ-VB01</b>		Adjustable angle mounting bracket (vertical) <b>SZ-VB02</b>		Floor bracket <b>SZ-VB03</b>
	Display unit standard bracket <b>SZ-VB11</b>		Display unit DIN rail mounting bracket (flat) <b>SZ-VB12</b>		Display unit DIN rail mounting bracket (slim) <b>SZ-VB13</b>




## Parts list

### Integrated models



Function			Model	Weight
	Multi-function type	Camera	<b>SZ-V04X</b>	Approx. 2100 g
		Standard	<b>SZ-V04</b>	Approx. 2100 g
	Multi-bank type	Camera	<b>SZ-V32X</b>	Approx. 2100 g
		Standard	<b>SZ-V32</b>	Approx. 2100 g
	Network type (PROFIsafe)	Camera	<b>SZ-V32NX</b>	Approx. 2300 g
		Standard	<b>SZ-V32N</b>	Approx. 2300 g
	Network type (CIP Safety)	Camera	<b>SZ-V32NCX</b>	Approx. 2300 g
		Standard	<b>SZ-V32NC</b>	Approx. 2300 g

\* Integrated models include display unit, scanner head, system memory and a connection cable (SZ-VS005).


### Display units

Function		Model	Weight
	Multi-function type	<b>SZ-VU04</b>	Approx. 420 g
	Multi-bank type	<b>SZ-VU32</b>	Approx. 420 g
	Network type	<b>SZ-VU32N</b>	Approx. 600 g


### Scanner heads

Function		Model	Weight
	Camera type	<b>SZ-VH1X</b>	Approx. 1600 g
	Standard type	<b>SZ-VH1</b>	Approx. 1600 g


### System memory

	Model	Weight
	<b>SZ-VSM</b>	Approx. 60 g

### Protection cover


	Model	Weight
	<b>SZ-VB21</b> *1	Approx. 1000 g

### Protection cover (visor)

	Model	Weight
	<b>SZ-VB22</b> *1	Approx. 660 g

\*1 The SZ-VB21/SZ-VB22 protection covers can be mounted over a mounting bracket.







### Replacement window

	Model	Weight
	<b>SZ-VHW</b>	Approx. 130 g

### Configuration software



Configuration software <Safety Device Configurator> can be downloaded from the KEYENCE website for free.

### Mounting brackets

Installation	Name - Model	Weight
	Adjustable angle mounting bracket (horizontal) <b>SZ-VB01</b>	Approx. 900 g
	Adjustable angle mounting bracket (vertical) <b>SZ-VB02</b>	Approx. 1800 g
	Floor bracket <b>SZ-VB03</b>	Approx. 1350 g
	Display unit standard bracket <b>SZ-VB11</b>	Approx. 700 g
	Display unit DIN rail mounting bracket (flat) <b>SZ-VB12</b>	Approx. 350 g
	Display unit DIN rail mounting bracket (slim) <b>SZ-VB13</b> *2	Approx. 350 g


\*2 SZ-VB13 cannot be used with SZ-VU32N.

### Power cable


	Type	Length	Model	Weight
	Standard	5 m <b>16.40'</b>	<b>SZ-VP5</b>	Approx. 400 g
		10 m <b>32.81'</b>	<b>SZ-VP10</b>	Approx. 800 g
		20 m <b>65.62'</b>	<b>SZ-VP20</b>	Approx. 1500 g
		30 m <b>98.43'</b>	<b>SZ-VP30</b>	Approx. 2200 g
	Power cable when using PROFIsafe or CIP Safety	10 m <b>32.81'</b>	<b>SZ-VP10PW</b>	Approx. 650 g
	M12 quick disconnect	0.3 m <b>0.98'</b>	<b>SZ-VPC03</b> *3	Approx. 80 g

\*3 SZ-VPC03 is equipped with only 4 pins: 24 V, 0 V, OSSD1, OSSD2.





### Extension cable (for use with SZ-VPC03)

	Type	Length	Model	Weight
	Power cable extension (M12)	10 m <b>32.81'</b>	<b>SZ-VCC10</b>	Approx. 750 g

### Connection cable

	Length	Model	Weight
	0.05 m <b>0.16'</b>	<b>SZ-VS005</b>	Approx. 80 g
	5 m <b>16.40'</b>	<b>SZ-VS5</b>	Approx. 350 g
	10 m <b>32.81'</b>	<b>SZ-VS10</b>	Approx. 700 g
	20 m <b>65.62'</b>	<b>SZ-VS20</b>	Approx. 1300 g

### Ethernet cable/USB cable

	Length	Model	Weight	
	Main unit connection cable	0.3 m <b>0.98'</b>	<b>SZ-VNC03</b>	Approx. 110 g
	Ethernet extension cable (RJ45)	2 m <b>6.56'</b>	<b>OP-88086</b>	Approx. 160 g
		5 m <b>16.40'</b>	<b>OP-88087</b>	Approx. 340 g
		10 m <b>32.81'</b>	<b>OP-88088</b>	Approx. 660 g
	Ethernet extension cable (M12)	2 m <b>6.56'</b>	<b>OP-88089</b>	Approx. 160 g
		5 m <b>16.40'</b>	<b>OP-88090</b>	Approx. 340 g
		10 m <b>32.81'</b>	<b>OP-88091</b>	Approx. 660 g
		20 m <b>65.62'</b>	<b>OP-88092</b>	Approx. 1280 g
	USB cable	2 m <b>6.56'</b>	<b>OP-51580</b>	Approx. 70 g
		5 m <b>16.40'</b>	<b>OP-86941</b>	Approx. 200 g

# Specifications

Model Name		SZ-V04(X)	SZ-V32(X)	SZ-V32N(X)	SZ-V32NC(X)		
Type		Multi-function Type	Multi-bank Type	Network Type (PROFIsafe)	Network Type (CIP Safety)		
Detection capability	Minimum detectable object size	Diameter 20, 30, 40, 50, 70, 150 mm 0.79', 1.18', 1.57', 1.97', 2.76', 5.91' (depends on the setting) Reflectance 1.8% min., Speed 1.6 m/s 5.25 ft/s max.*1					
	Detectable angle	190° (-5° to 185°)					
	Response time (ON to OFF)	Standard Mode*2	Scan Cycle A	160 ms (2scans) to 1280 ms (16scans)*3			
			Scan Cycle B	168 ms (2scans) to 1344 ms (16scans)*3			
			Scan Cycle C	176 ms (2scans) to 1408 ms (16scans)*3			
		High Speed Mode*2	Scan Cycle A	80 ms (2scans) to 640 ms (16scans)*3			
			Scan Cycle B	84 ms (2scans) to 672 ms (16scans)*3			
			Scan Cycle C	88 ms (2scans) to 704 ms (16scans)*3			
	Response time (OFF to ON)	Response time (ON to OFF) + 150 ms					
	Protection zone	Minimum detectable object size: 70 / 150 mm 2.76' / 5.91'	8.4 m 27.56' (Standard Mode)		5.7 m 18.70' (High Speed Mode)		
			5.6 m 18.37' (Standard Mode)		3.8 m 12.47' (High Speed Mode)		
			4.3 m 14.11' (Standard Mode)		2.9 m 9.51' (High Speed Mode)		
			2.9 m 9.51' (Standard Mode)		2.0 m 6.56' (High Speed Mode)		
		Warning zone	Minimum detectable object size: 50 mm 1.97'	26 m 85.30' (Standard Mode)		23 m 75.46' (High Speed Mode)*4	
				25 m 82.02' (Standard Mode)		21 m 68.90' (High Speed Mode)*4	
Minimum detectable object size: 40 mm 1.57'			24 m 78.74' (Standard Mode)		20 m 65.62' (High Speed Mode)*4		
			23 m 75.46' (Standard Mode)		18 m 59.06' (High Speed Mode)*4		
Minimum detectable object size: 30 mm 1.18'			21 m 68.90' (Standard Mode)		15 m 49.21' (High Speed Mode)*4		
			21 m 68.90' (Standard Mode)		15 m 49.21' (High Speed Mode)*4		
Additional safety distance	100 mm 3.94'*5						
Maximum measurement distance	60 m 196.85' *6						
Maximum number of banks	Max. 4 banks	Max. 32 banks	Max. 32 banks	Max. 16 banks			
Multiple scanner heads	Max. 3 scanner heads						
Camera monitoring area	Monitor area: over 190° (-5° to 185°)*7						
Display	QVGA 2.2inch color LCD						
Light source	Type, wavelength	Infrared laser diode, 905 nm					
	Laser Class	IEC	Class1 IEC/EN60825-1				
		FDA	Class1 FDA 21CFR 1040.10, 1040.11 (Laser Notice No.50)*8				
		JIS	Class1 JIS C6802				
Rating	Power voltage	24 VDC ±10% (Ripple P-P 10% or less): When using a converter power supply, 24 VDC +20%/ -30%: When using a battery					
Power consumption	11.8 W (without load), 55.0 W (with load)*9	11.8 W (without load), 55.0 W (with load)*9	13.4 W (without load), 50.8 W (with load)*9	13.4 W			
Control output (OSSD)	Output	Transistor outputs (NPN or PNP is selected in the software)			—		
	Number of outputs	4 outputs	2 outputs	2 outputs	—		
	Max. load current	500 mA*10			—		
	Residual voltage (during ON)	Max. 2.5 V (with a cable length of 5 m 16.40')			—		
	OFF-state voltage	Max. 2.0 V (with a cable length of 5 m 16.40')			—		
	Leakage current	Max. 1 mA*11			—		
	Max. capacitive load	2.2 µF (with a load resistance of 100 Ω)			—		
	Load wiring resistance	Max. 2.5 Ω			—		
Inputs	PNP	ON-voltage: 10 to 30 V, OFF-voltage: Open or 0 to 3 V, Short-circuit current: Approx. 2.5 mA (Approx. 10 mA for EDM)			—		
	NPN	ON-voltage: 0 to 3 V, OFF-voltage: Open or 10 V to Power voltage, Short-circuit current: Approx. 2.5 mA (Approx. 10 mA for EDM)			—		
Non-safety related output (AUX output)	Output type	Transistor outputs (NPN or PNP is selected by the dedicated PC software)			—		
	Number of outputs	6 outputs	4 outputs	4 outputs	—		
	Max. load current	Max. 50 mA			—		
	Residual voltage (during ON)	Max. 2.5 V (with a cable length of 5 m 16.40')			—		
Muting lamp	Incandescent lamp (24 VDC, 1 to 5.5 W) or LED lamp (load current: 10 to 230 mA) can be connected	—	Incandescent lamp (24 VDC, 1 to 5.5 W) or LED lamp (load current: 10 to 230 mA) can be connected	—			
Interface	USB	USB2.0					
	Ethernet	Standard	—	—	IEEE802.3u (100 BASE-TX)		
		Transmission rate	—	—	100 Mbps		
		Cable	—	—	STP (Shielded Twisted Pair) cable or UTP (Unshielded Twisted Pair) cable. Category5 or higher.		
		Connector	—	—	RJ45 (IP65) 2 ports		
Network function	—	—	PROFIsafe, PROFINET, EtherNet/IP®	CIP Safety, EtherNet/IP®, UDP			
Environmental resistance	Enclosure rating	IP65 (IEC60529)					
	Operating ambient temperature	-10 to +50°C 14 to 122°F (No freezing)					
	Storage ambient temperature	-25 to +60°C -13 to +140°F (No freezing)					
	Operating relative humidity	35% to 85% RH (No condensation)					
	Storage relative humidity	35% to 95% RH					
	Surrounding light	Incandescent lamp: 1500 lux or less*12					
	Vibration	10 to 55 Hz, 0.7 mm 0.03' compound amplitude, 20 sweeps each in X, Y, and Z directions					
Shock	100 m/s² 328.08 ft/s² (Approx. 10 G) 16 ms pulse, in X, Y, Z directions 1000 times each axis						
Material	Scanner head	Main unit case	Magnesium				
		Window	Polycarbonate, PEI				
		Indicator part	Aluminum, PES				
	Display unit	Case	Magnesium, PPS, Polycarbonate				
System memory	Case	Aluminum, PPE					
Cable length	Power and I/O cable	30 m 98.43' or less*13					
	Between scanner head and display unit	20 m 65.62' or less each*14					
	Ethernet cable	—	—	100 m 328.08' or less*15			
Approved standards	EMC	IEC61496-1, EN61496-1, UL61496-1 (Type 3 ESPE) EN55011 ClassA, FCC Part15B ClassA, ICES-003 ClassA					
	Safety	IEC61496-1, EN61496-1, UL61496-1 (Type 3 ESPE), IEC61496-3, EN61496-3 (Type 3 AOPDDR), IEC61508, EN61508, EN ISO13849-1, 2015 (PLd, Category3), UL508, UL1998, CSA C22.2 No.14, CSA C22.2 No.0.8					

\*1 If the object to be detected moves parallel to the detection plane, SZ-V cannot detect the object moving at speed over 1.6 m/s 5.25 ft/s, regardless of the encoder setting. \*2 The response time, protection zone, and warning zone are affected by the operation mode. \*3 When using PROFIsafe, 6 ms is added to the response time. When using CIP Safety, 10ms is added to the response time. \*4 20% or more reflectance is necessary for the minimum detectable object in the warning zone. \*5 If there is a highly reflective background within 1.5 m 4.92' from the boundary of the protection zone, 200 mm 7.87' must be added as supplementary necessary distance to the protection zone when calculating the minimum safety distance. \*6 Even when using the network data output, the maximum measured output distance is 60 m 196.85'. \*7 Only applicable for the type with a camera. \*8 The laser classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50. \*9 When using the SZ-V with series connected sensor heads, it is necessary to add 9.4 W per scanner head. Also, power consumption may temporarily be higher (maximum 3.6 W). Power consumption will be within the specification after SZ-V moves to normal operation. \*10 For the SZ-V04 type and the SZ-V32 type, the load current calculation of the OSSD output and AUX output is 1.5 A or less when using one scanner head, 1.0 A or less when using two scanner heads, and 0.5 A or less when using three scanner heads. For the SZ-V32N type, the load current calculation of the OSSD output and AUX output is 1.2 A or less when using one scanner head, 0.8 A or less when using two scanner heads, and 0.3 A or less when using three scanner heads. \*11 Includes when the power is OFF. \*12 An ambient light source should not be located within ±5° of the detection plane. \*13 10 m 32.81' or less when supplying power from a battery. \*14 When supplying power from a battery, the length of each connection cable should be 10 m 32.81' or less when using two scanner heads, and 5 m 16.40' or less when using three scanner heads. \*15 Distance between SZ-V and Ethernet switch

## Functions

Model		SZ-V04 (X)	SZ-V32 (X)	SZ-V32N (X)	SZ-V32NC(X)	
		Type		Network		Network (CIP Safety)
		Multi-function	Multi-bank	Not using PROFSafe	Using PROFSafe	
Detection capability	Protection zone	✓ 2 zones	✓ 1 zone	✓ 1 zone	✓ 2 zones	✓ 2 zones
	Warning zone	✓ 2 zones	✓ 2 zones	✓ 2 zones	✓ 2 zones	✓ 2 zones
	Minimum detectable object size	Diameter 20, 30, 40, 50, 70, 150 mm 0.79", 1.18", 1.57", 1.97", 2.76", 5.91"				
Camera		✓ <sup>*1</sup>	✓ <sup>*1</sup>	✓ <sup>*1</sup>	✓ <sup>*1</sup>	✓ <sup>*1</sup>
Interlock function		✓	✓	✓	✓ <sup>*3</sup>	✓ <sup>*3</sup>
EDM function		✓	✓	✓	—	—
Bank function	Maximum number of banks	4	32	32	16	16
	Switching through wiring inputs	✓	✓	✓	—	—
	Switching through encoder inputs	—	✓	✓	—	—
	Monitoring multiple banks via network	—	—	—	✓	✓
Multi-OSSD function		✓	—	—	✓	✓
Muting function		✓	—	✓	—	—
Reference points monitoring function		✓	✓	✓	✓	✓
Number of AUX outputs		✓ 6 outputs	✓ 4 outputs <sup>*2</sup>	✓ 4 outputs <sup>*2</sup>	— <sup>*3</sup>	— <sup>*3</sup>
State information output		✓	✓	✓	— <sup>*3</sup>	— <sup>*3</sup>
Detection history		✓	✓	✓	✓	✓
Ethernet Communication		—	—	✓	✓	✓
Cascading scanner heads		Max. 3 units				

\*1 Only when using a scanner head with a camera.

\*2 The number of usable AUX outputs varies depending on the settings.

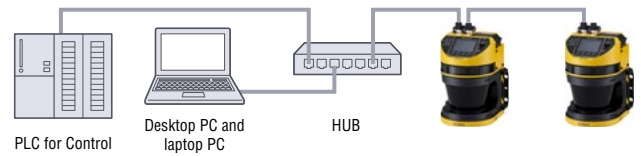
\*3 When using PROFSafe or CIP Safety, all physical I/O wires will be deactivated. Corresponding information can be read/written over PROFSafe (PROFINET) or CIP Safety (EtherNet/IP®) communication.

Reference: Depending on the settings, some functions cannot be used simultaneously. For details, refer to the SZ-V Series user's manual.

## Ethernet communication details

### Ethernet communication

SZ-V32N(X)/U32N and SZ-V32NC(X) can exchange data with a PC or PLC via Ethernet cable. Depending on the device to be connected, multiple communication options are available.



Functions available via communication	Communication to SZ-V Configurator	UDP Command*1	EtherNet/IP®, PROFINET*1*2	PROFIsafe*2	CIP Safety
Configure SZ-V protection zones	✓	—	—	—	—
Configure SZ-V functions	✓	—	—	—	—
Check detection status with monitor view	✓	—	—	—	—
Read distance measurement data	—	✓	▲	▲*3	▲*4
Read error status of SZ-V	✓	✓	✓	✓*3	✓*4
Read error history of SZ-V	✓	—	—	—	—
Check configuration code (CRC)	✓	✓	✓	✓*3	✓*4
Monitor camera image of SZ-V	✓*5	—	—	—	—
Use OSSD status for safety related controls	—	—	—	✓	✓
Monitor multiple banks	—	—	—	✓	✓
Send interlock reset signal to SZ-V	—	—	—	✓	✓
Typical devices to be connected	 Desktop PC and laptop PC	 Original program on board computers	 PLC or industry PC	 Safety PLC	
Application examples	Monitor remote SZ-V	AGV control using measurement data	Show scanner status on HMI	Safety related controls	

✓ Possible ▲ Possible with limitations — Impossible or not realistic

\*1 Information read through UDP Command Communication, EtherNet/IP® Communication, and PROFINET communication cannot be used for safety related part of the control system.

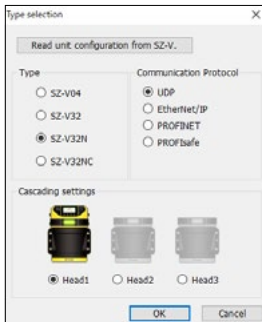
\*2 Only available with version 2 or later of Network Type models.

\*3 Can be read by PROFINET communication. PROFINET communication can be used simultaneously with PROFIsafe communication.

\*4 Can be read by EtherNet/IP® communication. EtherNet/IP® communication can be used simultaneously with CIP Safety communication.

\*5 Only when using a scanner head with a camera.

### Communication functions that can be used simultaneously



When using the SZ-V32N(X), it is necessary to select one of the following communication protocols.

The relation between a selected communication protocol and the communication functions that can be used is shown in the following table.

Selected communication protocol	Communication functions that can be used at the same time				
	Communication to SZ-V Configurator	UDP Command	EtherNet/IP®	PROFINET	PROFIsafe
UDP	✓	✓	—	—	—
EtherNet/IP®	✓	✓	✓	—	—
PROFINET	✓	✓	—	✓	—
PROFIsafe	✓	✓	—	✓	✓

### Network specifications

#### Ethernet General Specifications

Standard	IEEE 802.3u (100BASE-TX)
Transmission rate	100 Mbps
Cable	Category5 or higher STP (Shielded Twisted Pair) or UTP (Unshielded Twisted Pair) cable
Connector	RJ45 (IP65 connector) 2 ports

#### EtherNet/IP® Specifications\*\*

Compatible functions	Cyclic communication Compatible with UCMM and Class 3 messaging (Explicit messaging)
Number of connections	16
RPI (Transmission cycle)	5 to 10000 ms (0.5 ms unit) <sup>2</sup>
Tolerable communication bandwidth for cyclic	3000 pps
Conformance Test	Conform to CT12 <sup>3</sup>

\*1 The SZ-V32NC(X) supports DLR, QoS and ACD. \*2 When using CIP Safety, it is \*9ms to 999ms (9ms unit)\*\*.

\*3 The SZ-V32NC(X) conforms to CT17-ES.

#### PROFINET Specifications

Compatible Network	PROFINET IO Communication	
Basic Specifications	Compatible functions	Cyclic communication (Data I/O Communication) Acyclic communication (Record I/O Communication)
	Conformance Class	Conformance Class B
	GSDML version	Version 2.32
	Conformance Test Version	Based on version 2.33
	MRP	Available as client
	Applicable Protocols	LLDP, SNMP, MRP, DCP
Cyclic Specification	Netload	Class 3
	Update time	1 to 512 ms

#### PROFIsafe Specification

PROFIsafe Version	V2
-------------------	----

# PROFIsafe/CIP Safety communication

## Data available with PROFIsafe or CIP Safety communication

### INPUT (from SZ-V to Safety PLC)

Byte offset	Details	bit	Description
0	Zone Detection State / SZ-V Status	0	Protection Zone A State
		1	Protection Zone B State
		2	Warning Zone A State <sup>*1</sup>
		3	Warning Zone B State <sup>*1</sup>
		4	Interlock-Reset-Ready A <sup>*1</sup>
		5	Interlock-Reset-Ready B <sup>*1</sup>
		6	Normal Operation State <sup>*1</sup>
		7	Error State <sup>*1</sup>
1	SZ-V Status	0	Bank Number (A) <sup>*1</sup>
		1	Bank Number (B) <sup>*1</sup>
		2	Bank Number (C) <sup>*1</sup>
		3	Bank Number (D) <sup>*1</sup>
		4	Bank Number valid <sup>*1</sup>
		5	Laser off state <sup>*1</sup>
		6	Reserved
		7	Reserved
2	Window Pollution Information / Head1 State	0	Head1 Window Pollution State <sup>*1</sup>
		1	Head2 Window Pollution State <sup>*1</sup>
		2	Head3 Window Pollution State <sup>*1</sup>
		3	Reserved
		4	Head1 Protection Zone A State
		5	Head1 Protection Zone B State
		6	Head1 Warning Zone A State <sup>*1</sup>
		7	Head1 Warning Zone B State <sup>*1</sup>
3	Head2 State / Head3 State	0	Head2 Protection Zone A State
		1	Head2 Protection Zone B State
		2	Head2 Warning Zone A State <sup>*1</sup>
		3	Head2 Warning Zone B State <sup>*1</sup>
		4	Head3 Protection Zone A State
		5	Head3 Protection Zone B State
		6	Head3 Warning Zone A State <sup>*1</sup>
		7	Head3 Warning Zone B State <sup>*1</sup>
4	Protection Zone A State for each Bank <sup>*2</sup>	0	Protection Zone A State for Bank0
		...	...
		15	Protection Zone A State for Bank15
6	Protection Zone B State for each Bank <sup>*2</sup>	0	Protection Zone A State for Bank0
		...	...
		15	Protection Zone A State for Bank15
8	Warning Zone A State for each Bank <sup>*2</sup>	0	Warning Zone A State for Bank0 <sup>*1</sup>
		...	...
		15	Warning Zone A State for Bank15 <sup>*1</sup>
10	Warning Zone B State for each Bank <sup>*2</sup>	0	Warning Zone B State for Bank0 <sup>*1</sup>
		...	...
		15	Warning Zone B State for Bank15 <sup>*1</sup>

### OUTPUT (from Safety PLC to SZ-V)

Byte offset	Details	bit	Description
0	Output	0	Reset A
		1	Reset B
		2	Reserved
		3	Reserved
		4	Reserved
		5	Laser OFF <sup>*1</sup>
		6	Reserved
		7	Return to Normal Operation
1	Bank Number	0	Bank Number
		1	
		2	
		3	
		4	Bank Number (reverse) For each bit, specify opposite value of bit 0-3
		5	
		6	
		7	
2	Reserved	0	Reserved
		...	...
		15	Reserved
10	Reserved	0	Reserved
		...	...
		15	Reserved

<sup>\*1</sup> This data cannot be used as a safety output for the safety-related part of a machine control system.

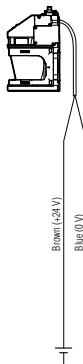
<sup>\*2</sup> Zone States on Byte offset 4 to 10 may be easily affected by mutual interference or other environmental factors, compared to states in Zone Detection Status (Byte offset 0)

## PROFIsafe / PROFINET diagnostics

SZ-V is compatible with PROFINET Diagnostics function. The following information can be sent to a safety PLC as PROFINET Diagnostic alert information.

Alert notification item	PROFINET	PROFIsafe
PROFIsafe Parameter Error	—	✓
PROFIsafe Transmission Error	—	✓
Window pollution Alert	✓	✓
Window pollution Error	✓	✓
MI Error	✓	✓
Bank Input Error	✓	✓
Bank Sequence Error	✓	✓
Configuration Error	✓	✓
System Error	✓	✓
AUX Error	✓	—
EDM Error	✓	—
Encoder Error	✓	—
OSSD Error	✓	—
Other Error	✓	✓
Other Alert	✓	✓

## Wiring and cables for PROFIsafe or CIP Safety



\* When PROFIsafe or CIP Safety communication is used, all physical I/O wires (OSSDs, EDM, Reset, AUX, etc.) will be deactivated.

\* For Ethernet cable selection, please refer to the selection guide on p.16 as well as the figure below.

**M12-4pin, female**  
RJ-45  
0.3 m 0.98': SZ-VNC03

**M12-4pin, male**  
M12-4pin, male  
2 m 6.56': OP-88089  
5 m 16.40': OP-88090  
10 m 32.81': OP-88091  
20 m 65.62': OP-88092

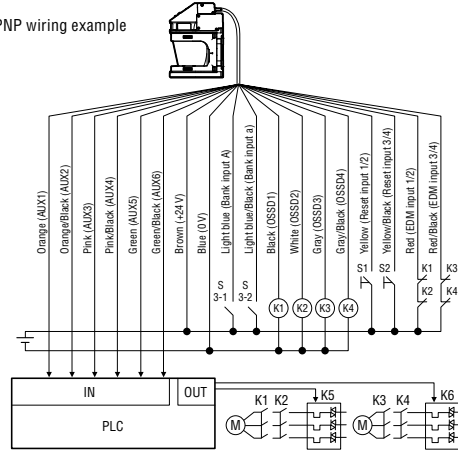
**RJ-45**  
M12-4pin, male  
2 m 6.56': OP-88086  
5 m 16.40': OP-88087  
10 m 32.81': OP-88088

# Examples of wiring

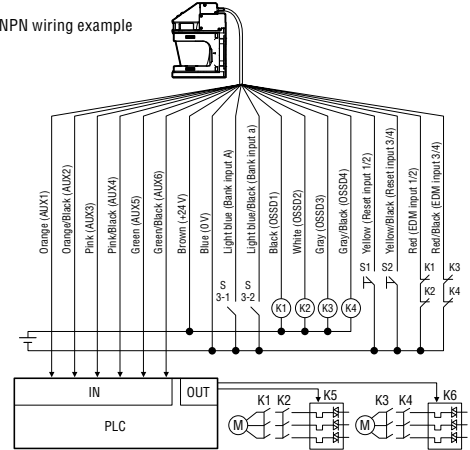
## SZ-V04 Type

OSSD3/4: Multi-OSSD  
 Bank switching: Used  
 Muting: Not used (usage not possible)  
 Interlock: Used  
 EDM: Used

PNP wiring example



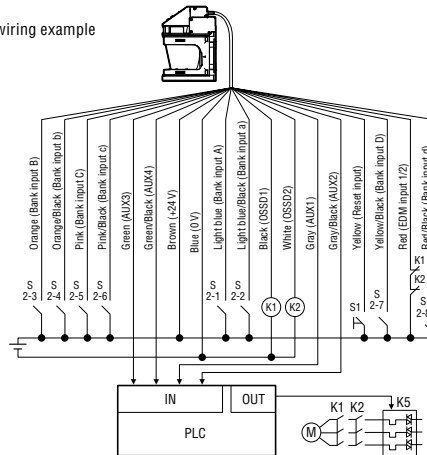
NPN wiring example



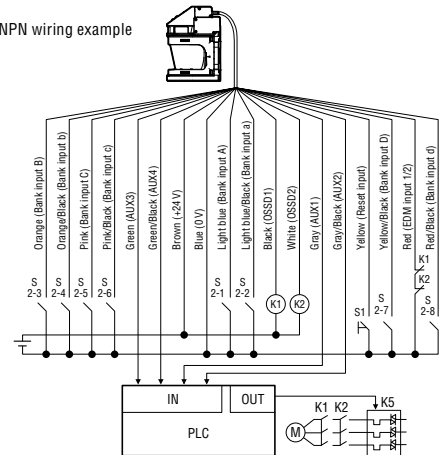
## SZ-V32 Type

Bank switching: Used  
 Bank switching method: Single or binary  
 No. of banks: Used  
 Single: 8 or less, Binary: 16 or less  
 Interlock: Used  
 EDM: Used

PNP wiring example



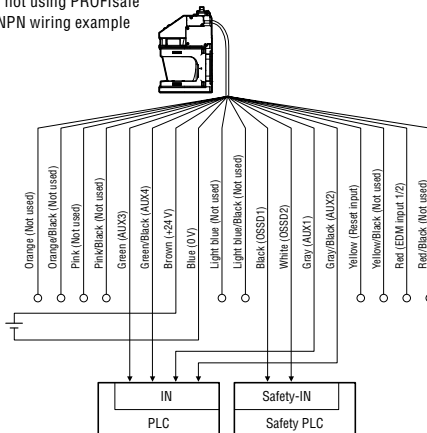
NPN wiring example



## SZ-V32N Type

Bank switching: Not used  
 Muting: Not used  
 Interlock: Not used  
 EDM: Not used

When not using PROFIsafe  
 PNP/NPN wiring example



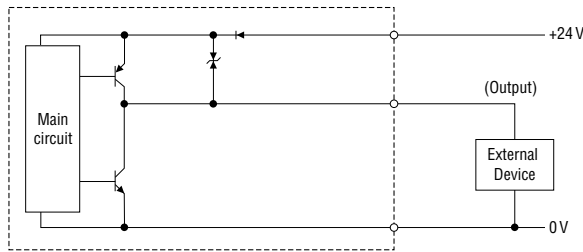
## Symbols

- K1, K2, K3, K4: External device (Safety relay, magnet contactor, etc.)
- K5, K6: Solid state contactor
- S1: Switch for resetting OSSD1/2 (N.O.)
- S2: Switch for resetting OSSD3/4 (N.O.)
- PLC: Used for monitoring, not for control systems related to safety.
- Safety PLC: Control systems related to safety.
- S2-1, S2-2, S2-3, S2-4, S2-5, S2-6, S2-7, S2-8: Switch for bank switching.
- M: 3-phase motor

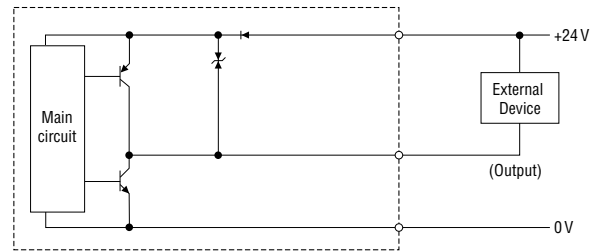
# Input and Output circuit

## OSSD output circuit (Safety output)

PNP output

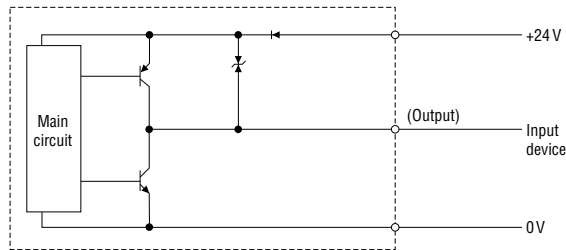


NPN output



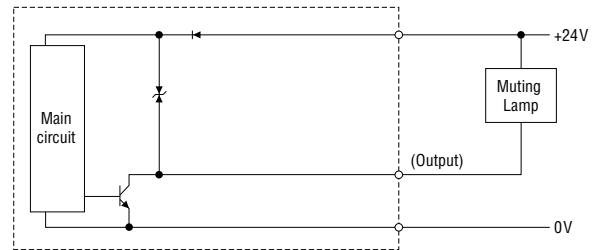
## AUX output circuit

Common for both PNP and NPN output



## Muting lamp output circuit

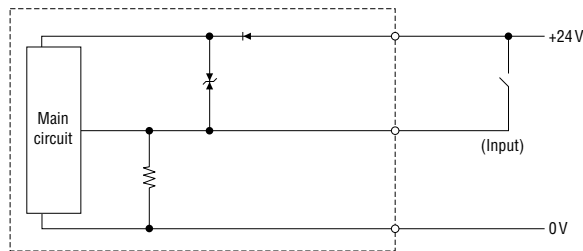
NPN output\*



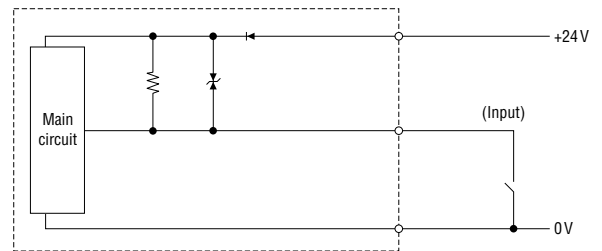
\*Muting lamp output will always be an NPN output regardless of what input and output polarity is selected.

## Input circuit

PNP input



NPN input



## OSSD output

The OSSD is a safety output for the safety-related part of a machine control system. When the SZ-V detects an object (someone or something) in the protection zone, the OSSD goes to the OFF-state.

OSSD 1/2 is a pair of safety outputs that are redundant. Similarly, OSSD 3/4 is also a pair of safety outputs that are redundant.

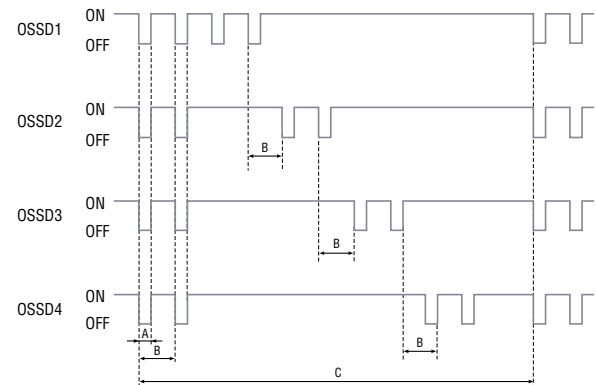
The SZ-V generates self-diagnosis signals on its internal control circuit to perform diagnostics on the OSSD. These signals periodically force the OSSD into a temporary OFF-state when the OSSD is in the ON-state (when the SZ-V detects no objects in the protection zone.).

The internal control circuit receives a feed-back signal (OFF-signal) based on the self-diagnosis, the SZ-V determines that its OSSD is operating normally. If the OFF-signal is not returned to the internal control circuit, the SZ-V determines that there is a problem with the OSSD or wiring and goes to an error state.

### Note:

The devices connected to the OSSD, such as safety relay or contactors, should not respond to these temporary, self-diagnostic OFF-signals.

## Self-diagnosis pulse



A: 50 µs (If a capacitive load is connected, max. 250 µs can apply.)

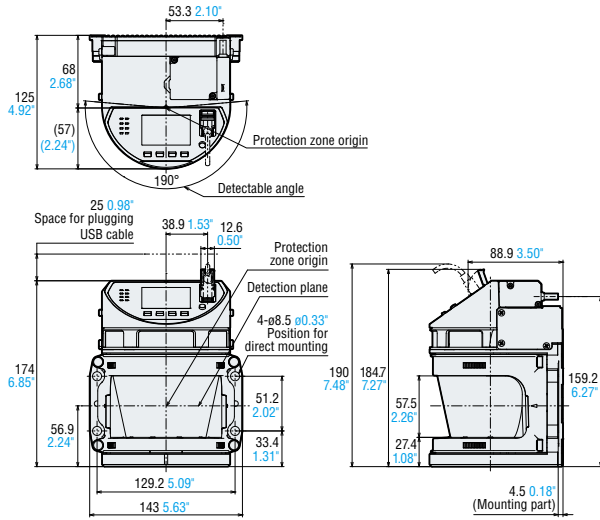
B: Approximately 60 ms

C: Approximately 920 ms

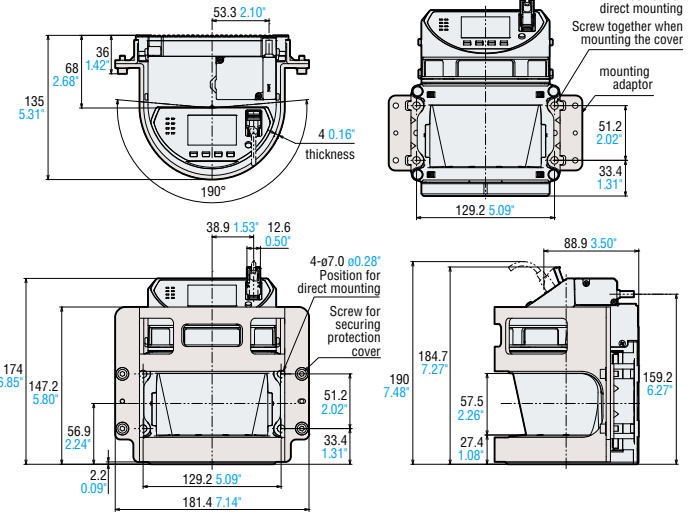
# Dimensions

Unit: mm inch

**SZ-V04(X) / V32(X)**



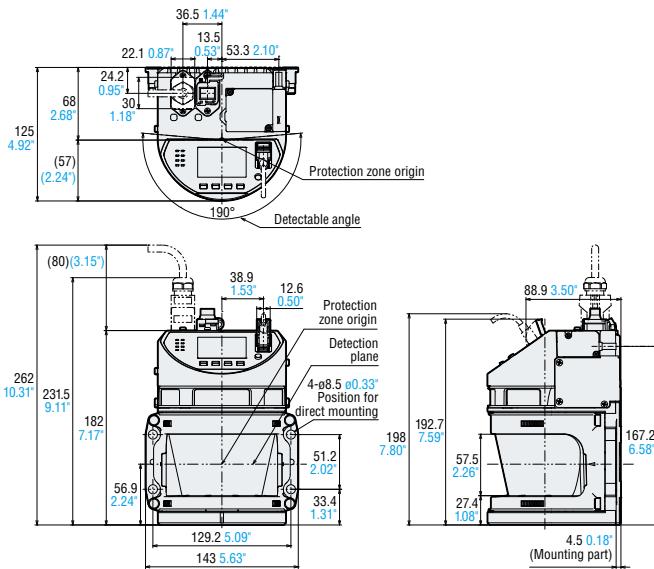
**SZ-V04(X) / V32(X) + SZ-VB21**



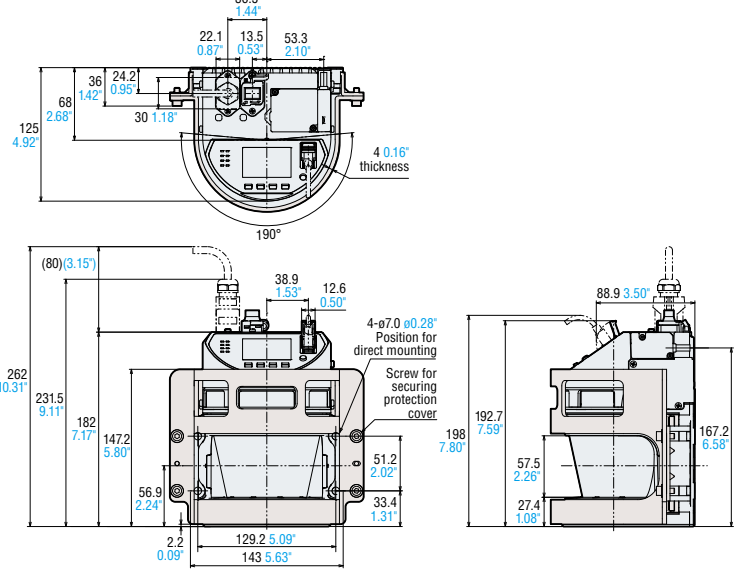
When protection cover is mounted

4- $\varnothing 7.0 \pm 0.28$ "  
Position for direct mounting  
Screw together when mounting the cover  
mounting adaptor

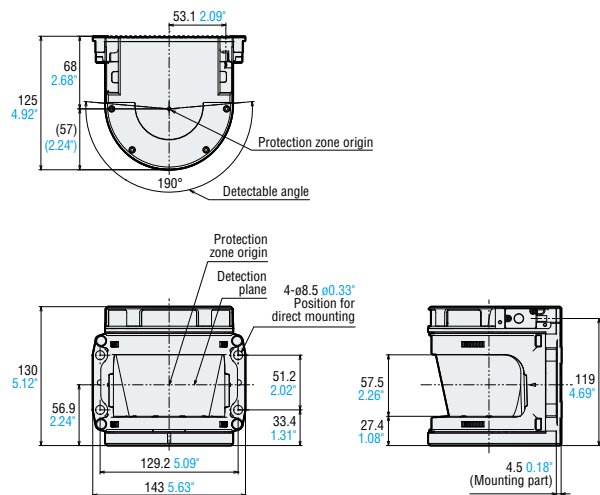
**SZ-V32N(X) / V32NC(X)**



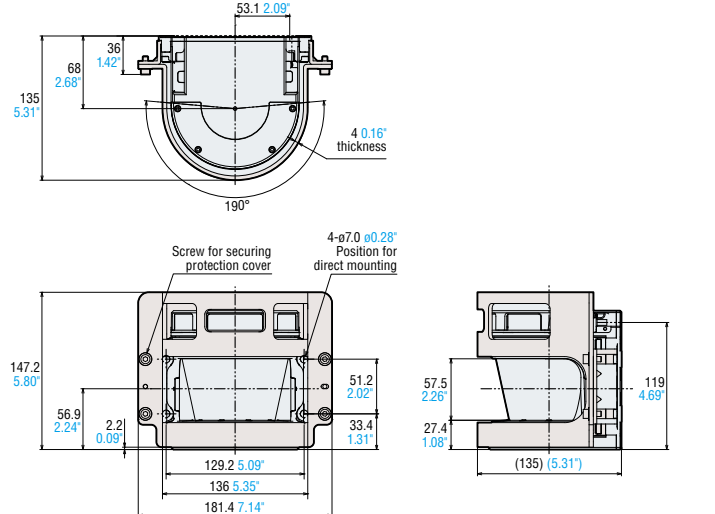
**SZ-V32N(X) / V32NC(X) + SZ-VB21**



**SZ-VH1(X)**

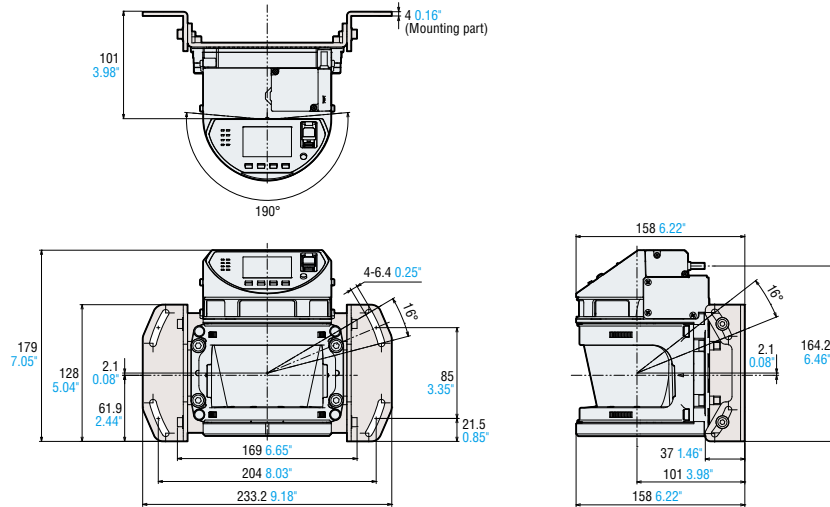


**SZ-VH1(X) + SZ-VB21**

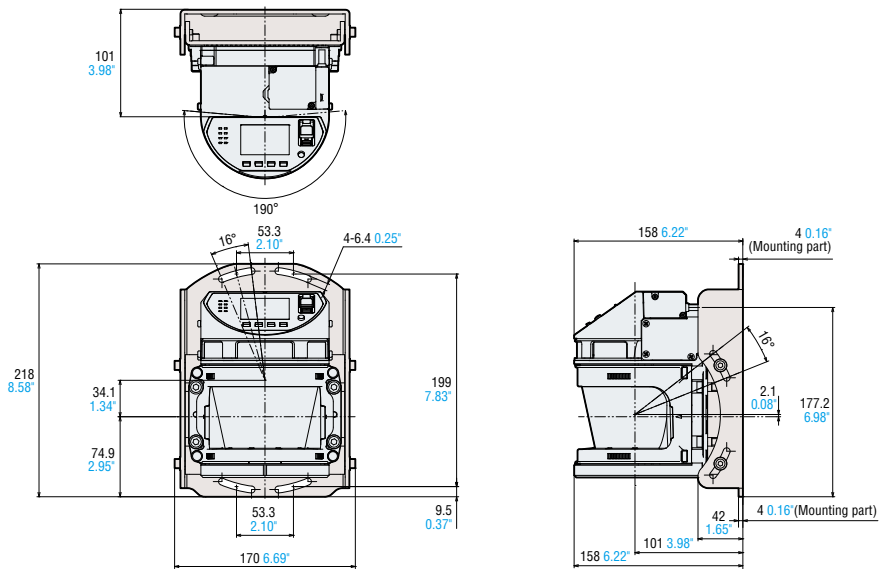


# Dimensions

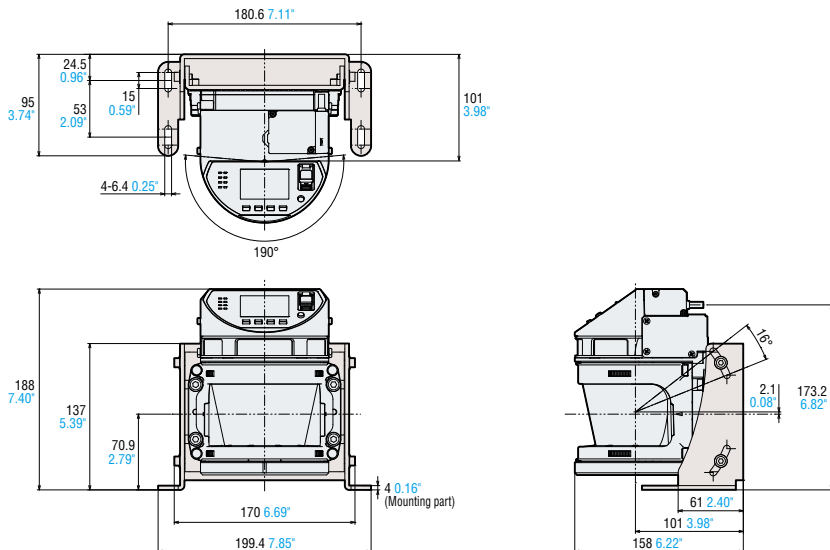
SZ-VB01 + SZ-V04(X) / V32(X)



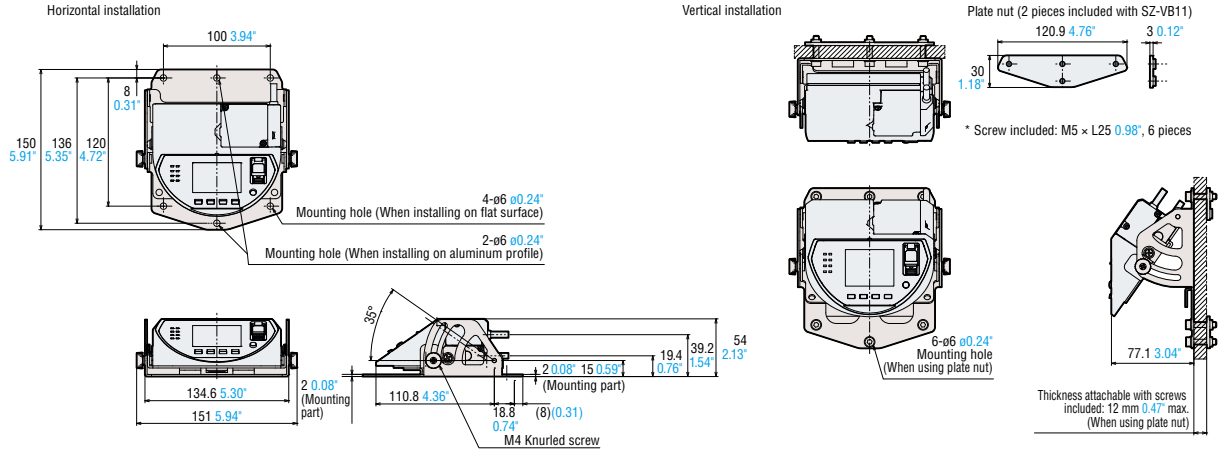
SZ-VB02 + SZ-V04(X) / V32(X)



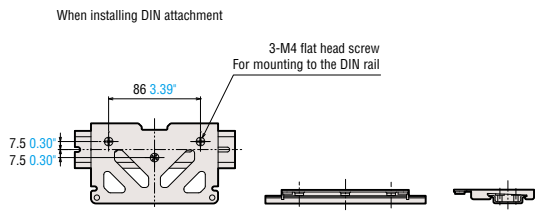
SZ-VB03 + SZ-V04(X) / V32(X)



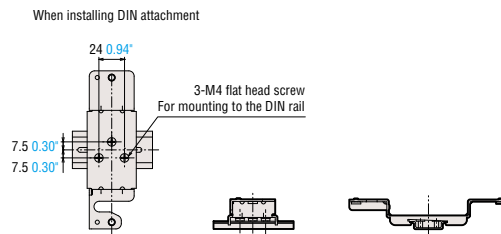
**SZ-VB11 + SZ-VU04 / VU32**



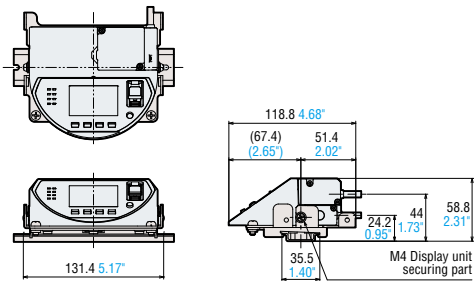
**SZ-VB12 + SZ-VU04 / VU32**



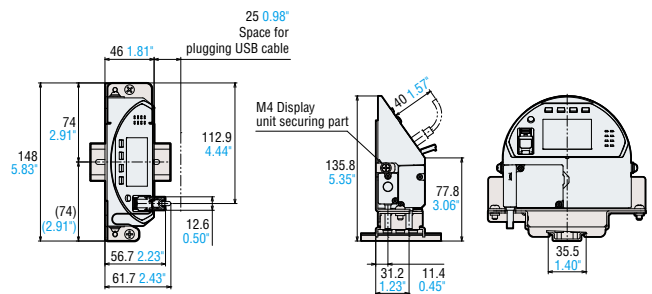
**SZ-VB13 + SZ-VU04 / VU32**



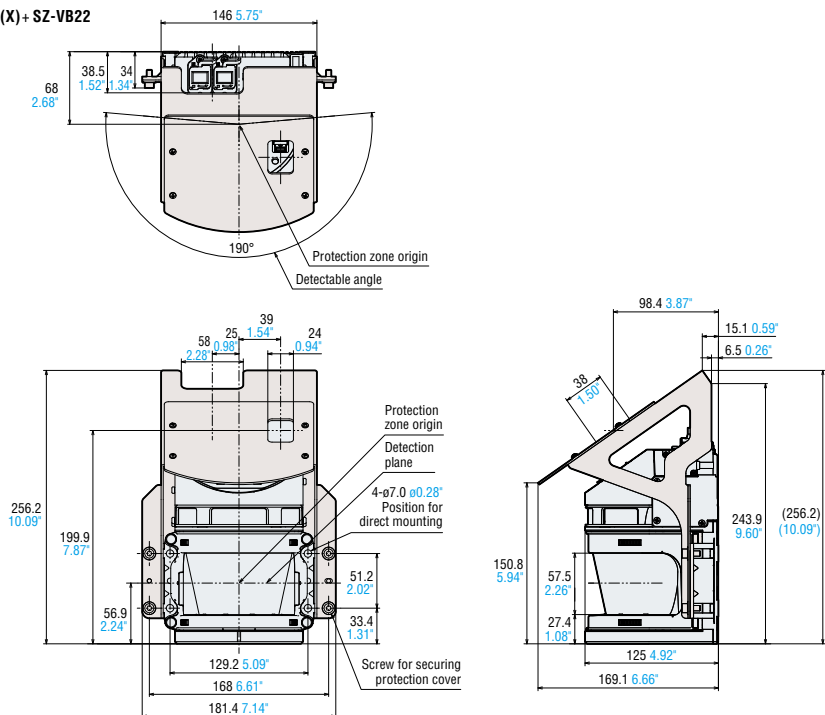
When installing display unit



When installing display unit



**SZ-V32N(X) / V32NC(X) + SZ-VB22**

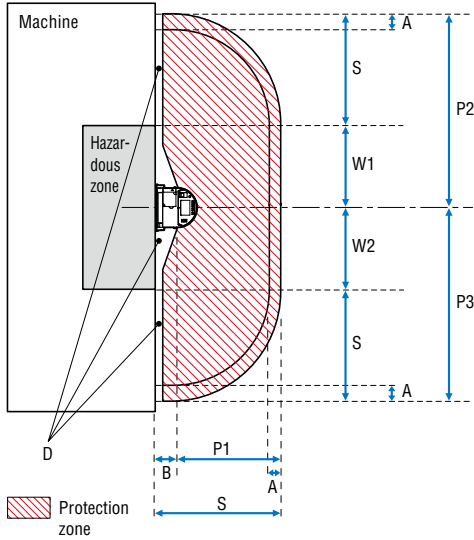


CAD DATA DOWNLOAD  
[www.keyence.com/sz-v\\_cad](http://www.keyence.com/sz-v_cad)

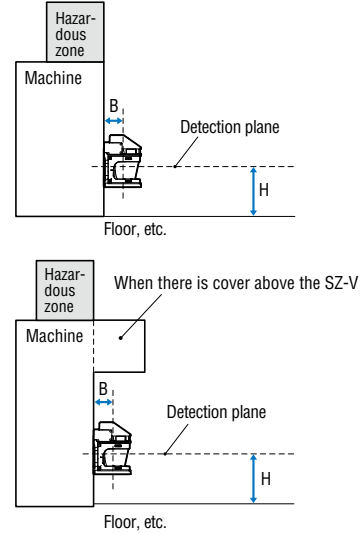
# Safety distance

Example of area protection (Direction of approach parallel to the protection zone)

## I Top view of the machine



## I Side view of the machine



$$Ds = K \times T + Dpf + A \quad [\text{ANSI B11.19}]$$

Ds: Safety distance

K: The maximum speed that an individual can approach the hazard

T: The total time that it takes for the hazardous motion to stop, or for the hazardous portion of the machine cycle to be completed. This value varies depending on machine type and/or the safeguarding device applied.

Dpf: Additional distance for horizontal sensing field applications without vertical sensing: 1200 mm / 48".

A: Additional safety distance (mm inch)

P1, P2, P3: Protection distances to be configured as the protection zones

W1, W2: Width of the hazardous area

B: Distance between the edge of the hazardous area and protection zone origin on the SZ-V

D: Unprotected space

## Example of safety distance calculation

$K = 1600 \text{ mm/s}$  62.99 inch/s

$T = t1 + t2 = 0.82 \text{ s}$  Overall response time

$t1 = 0.32 \text{ s}$  SZ-V response time (Changeable)

$t2 = 0.5 \text{ s}$  Max. time required to stop the machine after receiving the OSSD signal from SZ-V\*

$Dpf = 1200 \text{ mm}$  / 48"

$A = 100 \text{ mm}$  3.94" Additional safety distance of SZ-V

$B = 68 \text{ mm}$  2.68" Distance between the edge of the hazardous area and protection zone origin on the SZ-V

$W1 = W2 = 1000 \text{ mm}$  39.37" Width of the hazardous area

\* When using PROFIsafe or CIP Safety, please add communication and processing time required for the stop signal to reach the machine after SZ-V protection zone state turns OFF.

### Safety Distances

$$S = K \times T + Dpf + A = 1600 \times 0.82 + 1200 + 100 = 2612 \text{ mm}$$

62.99"    47.24"    3.94"    102.83"

### Protection distances to be configured as the protection zones

$$P1 = S - B = 2544 \text{ mm} \quad 100.16"$$

$$P2 = S + W1 = 3612 \text{ mm} \quad 142.20"$$

$$P3 = S + W2 = 3612 \text{ mm} \quad 142.20"$$

! The unprotected space (D) between the protection zone and the protective structure must be less than the minimum detectable object size when the SZ-V is installed, in order to prevent the machine operators from approaching into the hazardous area through this space (D). Additional countermeasures for protection must be provided if there is a space (D) between the protection zone and the protective structure that the minimum detectable object is not detected by the SZ-V.



! There is a risk of inadvertent undetected access beneath the detection plane (protection zone), if the height "H" of detection plane (protection zone) is greater than 300 mm 11.81" (200 mm 7.87" for non-industrial application, for example in the presence of children). The responsible personnel must perform the risk assessment with taking into account this factor in case of installation of the SZ-V. If necessary, the additional countermeasure must be taken by the responsible personnel.

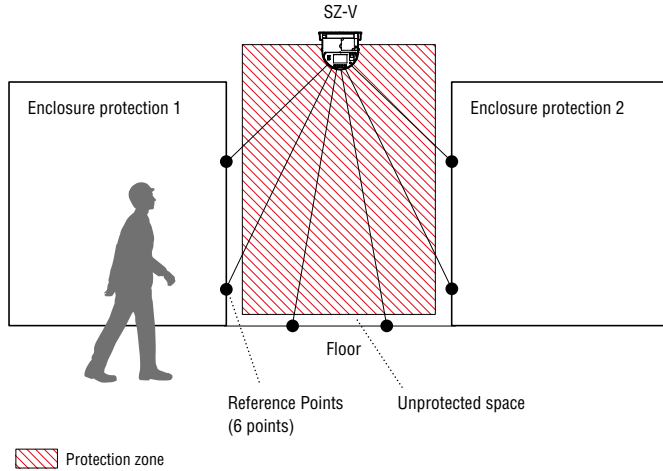
! In the protection zone setting, you cannot select the object size of 150 mm 5.91" when "H" (Height of detection plane) is 1000 mm 39.37" or less. You must select the object size of 70 mm 2.76" or smaller if you want to use SZ-V for area protection (direction of approach is parallel to the protection zone.)

! If there is a highly reflective background within 1.5 m 4.92' from the boundary of the protection zone, another 200 mm 7.87" must be added as supplementary necessary distance to the P1, P2 and P3 respectively.

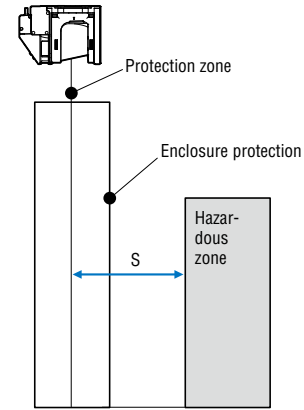
! We recommend you should have a marking on the floor for indicating the specified protection zone.

Example of access protection (Direction of approach normal to the protection zone)

Front view of the machine



Side view of the machine



$$S = K \times T + C \quad [\text{ISO13855 and IEC61496-3}]$$

- S: Minimum safety distance (mm inch)
- K: Approach speed of the body or parts of the body (mm/s inch/s)
- T: Overall Response time (t1 + t2) (s)
- t1: SZ-V response time (s)
- t2: Max. time required to stop the machine after receiving the OSSD signal from SZ-V (s)\*
- C: Additional distance, taking into accounts the intrusion prior to actuation of protective equipment (mm inch).

Example of safety distance calculation

- K = 1600 mm/s 62.99 inch/s Approach speed of the body or parts of the body
- T = t1 + t2 = 0.58 s Overall response time
- t1 = 0.08 s SZ-V response time (Changeable)
- t2 = 0.5 s Max. time required to stop the machine after receiving the OSSD signal from SZ-V
- C = 850 mm 33.46" (Constant)
- d = 70 mm 2.76" Minimum detectable object size (Changeable)

Safety Distance

$$S = K \times T + C = 1600 \times 0.58 + 850 = 1778 \text{ mm}$$

62.99      33.46      70.00

\* When using PROFSafe or CIP Safety, please add communication and processing time required for the stop signal to reach the machine after SZ-V protection zone state turns OFF.



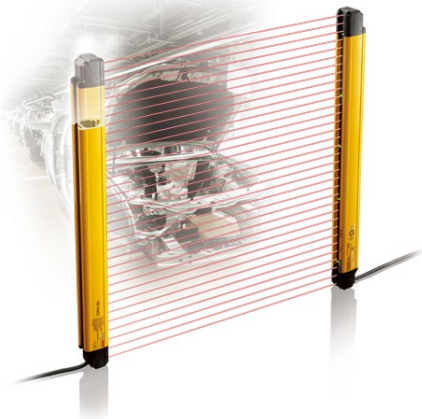
- Reference points monitoring function must be applied when the SZ-V is used for the access protection specified in IEC61496-3: 2008 Annex A.12 and A.13 (the application where the angle of the approach exceeds  $\pm 30^\circ$  to the detection plane). In this case, the tolerance for reference points must be  $\pm 100 \text{ mm } 3.94''$  or less and the response time must be 90 ms or less.
- The unprotected space between the protection zone and the protective structure must be less than the minimum detectable object size when the SZ-V is installed, in order to prevent the machine operators from approaching into the hazardous area through this space. Additional countermeasures for protection must be provided if there is a space between the protection zone and the protective structure that the minimum detectable object is not detected by the SZ-V.
- According to GB 19436.3-2008, "if the maximum distance between the AOPDDR and the reference boundary is greater than 4.0 m 13.12', displacement of the detection zone greater than 100 mm 3.94" shall be detected." In order to comply with this requirement for SZ-V, this may be achieved by limiting the width of the objects of the reference point to  $\leq 200 \text{ mm } 7.87''$ . For the case where the maximum protection distance of the protection zone is over 4.0 m 13.12', this limitation must be followed.

Have you experienced any of these common safety or machine guarding issues?

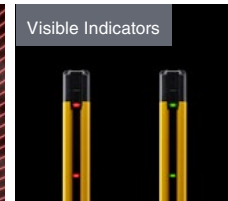
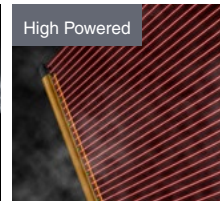


## > Safety Light Curtains

GL-R Series



- Built-in Guarding Prevents Damage From Impact
- Full-Length Protection with No Dead Zones
- Unbelievable Ease of Alignment

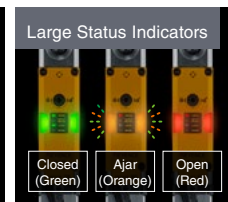
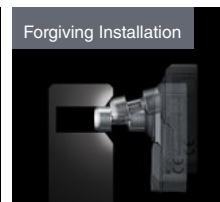


## > Safety Interlock Switches

GS Series



- Durable Design Ensures Operation in Harsh Environments
- Reliable Detection Ignores Vibration and Door Sag
- Understand Door Status from Anywhere with Huge Indicators



<b>Installation</b>	Confusing Wiring	Complex Programming	<b>Alignment</b>	Difficult to Align Properly	Vibration or Door Sag Causes Misalignment
<b>Operation</b>	Nuisance Trips	Confusing Troubleshooting	<b>Other</b>	Oil/Dust Build-Up or Intrusion	Difficulty Selecting Part Numbers

**> Safety Controllers** **GC Series**



- Connect Any Safety Device with Ease
- Program Your Entire Safety Setup in 5 Minutes
- Easy Troubleshooting with Built-In Display & Event History Log



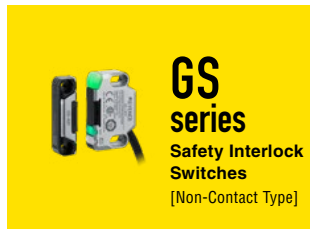
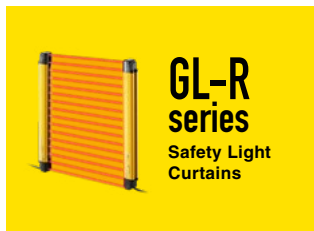
**> Safety Area Scanners** **SZ-V Series**



- Complex Zones can be Automatically Drawn in Seconds
- Improved Detection Capabilities Eliminate Nuisance Trips
- Built-in Camera Revolutionizes Troubleshooting



# KEYENCE Safety Solutions



CONTACT YOUR NEAREST OFFICE FOR RELEASE STATUS

## KEYENCE CORPORATION OF AMERICA

500 Park Boulevard, Suite 200, Itasca, IL 60143, U.S.A.

## KEYENCE CANADA INC.

6775 Financial Drive, Suite 202, Mississauga, ON L5N 0A4, Canada

## KEYENCE MÉXICO S.A. DE C.V.

Av. Paseo de la Reforma 243, P11, Col. Cuauhtémoc, C.P. 06500, Del. Cuauhtémoc, Ciudad de México, México

+1-201-930-0100 ✉ [keyence@keyence.com](mailto:keyence@keyence.com)

+1-905-366-7655 ✉ [keyencecanada@keyence.com](mailto:keyencecanada@keyence.com)

+52-55-8850-0100 ✉ [keyencemexico@keyence.com](mailto:keyencemexico@keyence.com)

CALL TOLL FREE

1-888-539-3623

**1-888-KEYENCE**

TO CONTACT YOUR LOCAL OFFICE

The information in this publication is based on KEYENCE's internal research/evaluation at the time of release and is subject to change without notice.  
Company and product names mentioned in this catalog are either trademarks or registered trademarks of their respective companies.  
The specifications are expressed in metric units. The English units have been converted from the original metric units. Unauthorized reproduction of this catalog is strictly prohibited.

Copyright © 2020 KEYENCE CORPORATION. All rights reserved.

03KA-2032-2

SZV-KA-C4-US 2013-3 611089