

- PLC
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- COUNTER
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KOSTAC Safety AZ-C1

Safety

Need for Safety

What kinds of measures are effective towards eliminating workplace accidents? Japanese corporations conventionally aim to achieve "zero accidents" via "human education." They believe that accidents are caused by human errors and insufficient experience, and have developed the concept of preventing the occurrence of errors through strong management, manual-based education, and all kinds of regulations.

However, due to various reasons including a decrease in skilled workers resulting from aging population and an increase in part-time workers and foreign workers, ensuring safety dependent only on "humans" cannot be achieved any more. In the first place, the responsibility for ensuring safety lies not with employees but with corporations. Not only human errors and mechanical failures but also risks themselves should be reduced. Such concepts originating from Europe and the United States are also gradually spreading among Japanese corporations.

In the world of today, the ISO and IEC are playing central roles in promoting the international standardization of standards concerning mechanical equipment. Of course, Japan is no exception. The WTO member countries, including Japan, are required to make each country's own standards comply with the international standards of ISO and IEC based on the Agreement on Technical Barriers to Trade. Preventing risks by actively using safety devices even if human errors and mechanical failures unfortunately occur, or "zero risks" ... this is the new common sense for ensuring safety.

Change in the Concept of Safety in Japan

Conventional concept in Japan → Zero accidents

[Observe correct operations in order not to cause accidents / disasters]

- Operators' responsibility
- Responsibility of education
- Thorough training

Concept of Europe and the U.S. → Zero risks

[Perform risk assessments / take reduction measures and design machines with safety control]

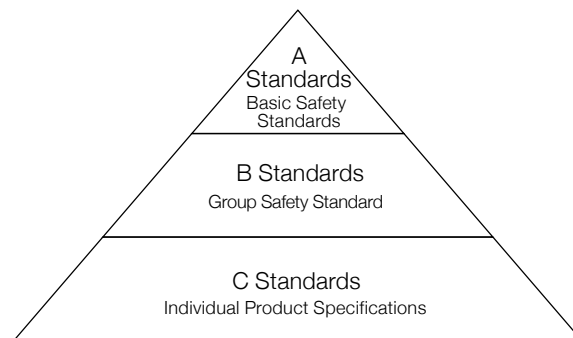
- Enterprise's responsibility
- Inherently safe design
- Introduction of safe machines

What is a hazard?

- Mechanical hazard: Crushing, pinching, piercing, cutting, impact, etc.
- Electrical hazard: Contact with a live part, insulation failure, static electricity, etc.
- Thermal hazard: Fire, explosion, radiation heat, burns, etc.
- Noise hazard: Hearing loss, ringing in the ears
- Vibration hazard: Leading to serious disorder of the hands, arms, waist and whole body
- Radiation hazard: Low frequency, high frequency, ultraviolet rays, infrared rays, X-rays, etc.
- Material and material quality hazard: Low toxicity, stimulus, dust, explosion, etc.
- Hazard generated by ignoring human engineering: Unhealthy attitude, human errors, etc.

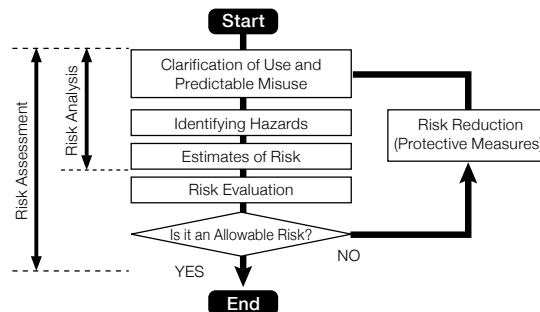
Hierarchized Structure of ISO/IEC Standards

The ISO/IEC have developed a hierarchical structure that consists of "A standards" that determine basic concepts and design technologies with safety at the top, "B standards" that summarize group safety standards in the middle, and "C standards" that determine safety standards of individual machines at the bottom. Users can ensure the safety of machines by combining these standards.



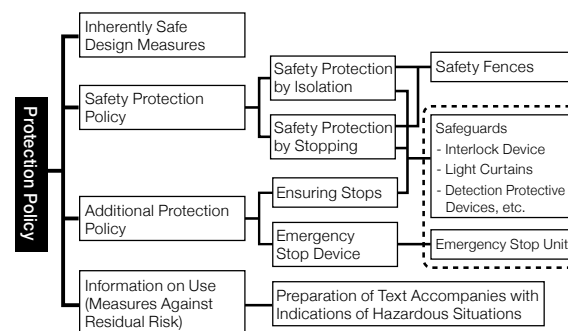
Procedure of ISO14121 Risk Assessment

When designing equipment or changing its configuration, it is necessary to correctly assess the degree of hazard and reduce the estimated risks to within the allowable range. The intended level of safety can be secured by repeating the process of identifying hazards, assessing risks, and taking risk reducing measures.



Specific Protection Policies for Risk Reduction

Risks should be reduced through three specific protection policies – a "review of intrinsic safety design" in order to reduce hazards caused by the equipment itself as much as possible, "safety protection policy" by the isolation of hazards and the stopping of machines, and "additional protection policy" such as the installation of emergency stop devices.



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- ZIP LINK

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- Precautions

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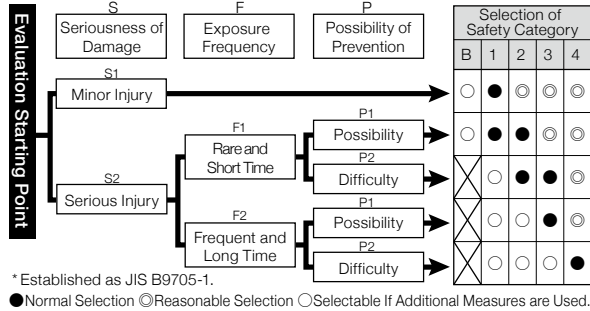
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EN954-1 Safety Category

In a machine control system, the safety maintenance capability of safety-related parts is classified into five "safety categories." It is required to consider the seriousness of failures, frequency of exposure, time to be exposed to risk, possibility of preventing risk, etc. and take measures to place machines in an appropriate safety category.

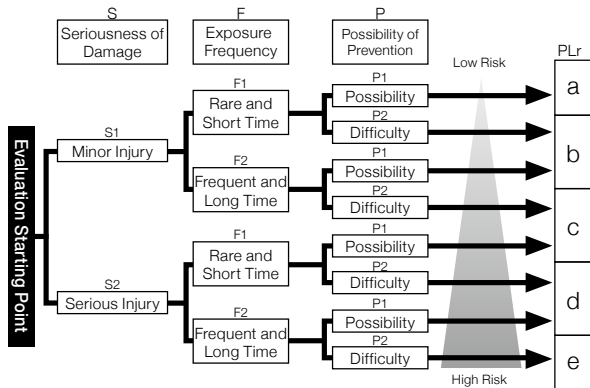


IEC61508 Safety Integrity Levels

Among "functional safety" to be secured using computers and software, regulations that define the requirements of functional safety such as reliability against deterioration and life of component parts, and self-diagnosis functions for failures are of "safety integrity level (SIL)." The necessary level (SIL1 to 4) is decided according to the frequency of functional safety requirements (low demand / high demand or continuous).

ISO13849-1 Performance Levels

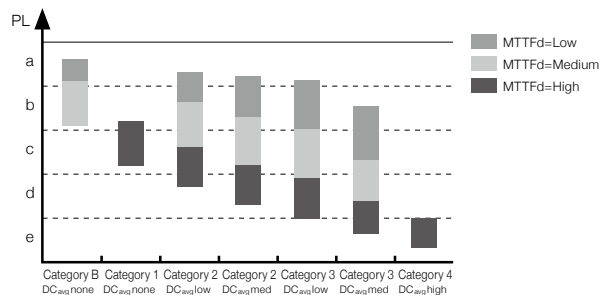
Standards that are higher than the safety category are called "performance levels." Since they incorporate stochastic elements such as the aged deterioration of parts and further equalize the assessment procedures of the required level (PLr), the five levels of assessment are easily understood and reliable.



In contrast to those mentioned above, four parameters are required to assess the performance level (PL) of a safety system.

- Category: Category (B,1,2,3,4)
- MTTFd: Mean Time To Dangerous Failur (High, Medium, Low)
- DCavg: Average Diagnostic Coverage (High, Medium, Low, None)
- CCF: Common Cause Failure (Not lower than 65 points, below 65 points)

When these complex elements are determined, the performance level (PL) of a safety system can be judged using the graph below.



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Safety PLCs

- The KOSTAC Safety AZ-C1 is a safe PLC that meets international safety standards aimed at achieving "zero hazard" via risk assessment.
- The AZ-C1 contains safety relays and safety controllers, and accurately performs supervisory control and monitoring of several devices, while contributing to the simplification of systems.
- As the flexible, low-cost and easy-to-understand "standard of the new age," the AZ-C1 extensively covers from single devices to miniature complex equipment.



Features

Acquired advanced safety certification

The AZ-C1 can be used for applications that meet EN954-1 (category 4), IEC61508 (SIL 3), and ISO13849-1: 2006 (Performance Level e). Users can easily and surely create a safe environment that conforms to international standards.

Highly reliable operation based on good self-diagnosis functions

The CPU module and input/output module are equipped with self-monitoring functions. These functions constantly monitor for undervoltage and overvoltage, grasp connection and operation status using test pulses, and run crosschecks of switching using channel monitors.

Unrestricted system expansion via an abundant array of expansion modules

Many extension modules such as safety control modules and general control modules are available. Their unrestricted mixing and matching makes various system architectures possible, thus meeting a wide range of requirements from easy program-less control to complicated program control.



Compact design, most suitable for small systems

The compact design of each module allows it to be placed even in the palm of your hand. Even if many modules are connected, the control panel only requires minimal space. Maintenance is easy as any module can be attached and removed without moving other modules in the case of replacement following the occurrence of failure.

One-touch installation, one-push wiring

Each module can be attached to the DIN rail, which is widely used as a control panel, with one touch. The use of removable terminal blocks makes wiring operations when replacing devices greatly efficient and reduces the risk of malfunctions by wiring errors. You will not need to be troubled with a flood of wiring anymore.



Displaying status and errors on the CPU

The surface of the CPU module is equipped with LEDs for status monitoring, 4-digit 7-segment LEDs, 4 series of push-button switches, etc. With support that guarantees quick response, you can grasp important statuses and error messages without connecting to external monitors and computers.

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Model Number List

Name	Model Number	Remarks	Input (Points)			Output (Points)		
			Safety Control		General Control	Safety Control		General Control
			Floating	Non-floating	DC	Transistor	Relay	Transistor
CPU Module	AZ-C1-CPU (MON)	Can be extended only for safety input/output.	4	4	—	6	—	—
	AZ-C1-CPUOP (MON)	Loaded with battery						
SUB MON Module	AZ-C1-SUBMON	For partial stop (Program-less time)	4	4	—	6	—	—
Safety Input/Output Module	AZ-C1-S-STP (E)		4	2	—	4	—	—
	AZ-C1-S-STP (LC)		—	6	—	4	—	—
	AZ-C1-S-STP (E/LC)		2	4	—	4	—	—
Safety Input module	AZ-C1-S-IN (E)		16	—	—	—	—	—
	AZ-C1-S-IN (LC)		—	16	—	—	—	—
Safety Output Module	AZ-C1-S-OUT		—	—	—	16	—	—
	AZ-C1-RELAY		—	—	—	—	2×2	—
General Input Module	AZ-C1-NS-IN		—	—	16	—	—	—
General Output Module	AZ-C1-NS-OUT (COM+)		—	—	—	—	—	16
Power Supply Module	AZ-C1-POWER							
	AZ-C1-BOOSTER	Required for 10 modules (CPU included).						
Between Modules Based	AZ-C1-BASE	For maintenance						
Programming Tool	AZC-Director							
User's Manual	AZ-C1-USER-J-M							

KOSTAC Safety AZ-C1

Features

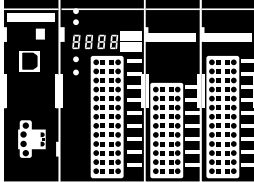
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Program-less Mode

The use of a built-in authorization circuit in the CPU supports functional performance required by the system. Just by appropriately combining the modules, safety systems that conform to international standards can be created easily, simply, and compactly.

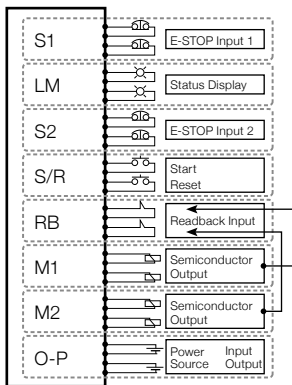


No need for programming operations from a computer

The CPU of the AZ-C1 is equipped with a stationary circuit suitable for creating a safety system. It needs no operation programming design by computer. It is not necessary to newly acquire safety certification of applications. Safety systems can be easily created simply by selecting modules in accordance with the required system configuration.

Relay units for eliminating wiring troubles

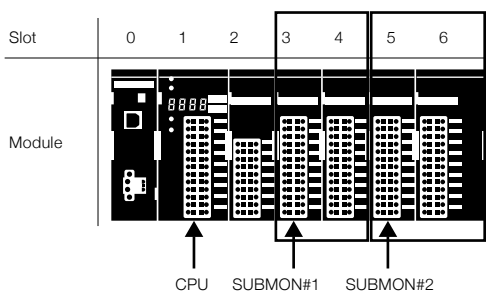
Several relay units are installed, and one unit can perform the same operations as a system with complicatedly wired connection cables, thus reducing the burden of maintenance checks.



A combination of modules for creating a partial shut-down circuit

If the AZ-C1 is connected to an "AZ-C1 SUBMON," a partial shut-down circuit can be installed in the system. It ensures safety without reducing the operation efficiency of the system more than required.

《Example of the installation of two AZ-C1 SUBMON units that control only specific slots, under the CPU that controls all slots》



[Entire shutdown]

Group controlled by the CPU (Slot 0 to slot 6)

[Partial shutdown]

Group controlled by SUBMON#1 (Slot 3 to slot 4)

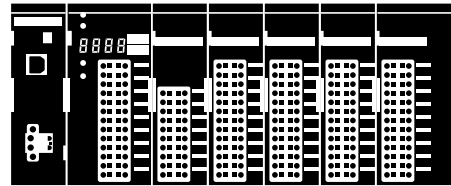
Group controlled by SUBMON#2 (Slot 5 to slot 6)

Ensures security without individual authorization in the system

The built-in circuit of the AZ-C1 is certified for safety. With the addition of various safe modules, a safety system can be created and the trouble of independently verifying the safety of the entire system and acquisition costs can be largely reduced.

Programming Mode

Ladders and function blocks can be programmed with the use of dedicated programming software. The best safety system can be created with the smallest module configuration, contributing to compactification and cost reduction of the control panel. The AZ-C1 can quickly and flexibly respond to system changes.



Software "AZC-director" allows free design

A combination of modules lets users freely run control programs and realize the system architecture that is most suitable for the scale of devices and work content. It is the best way to ensure safety while remarkably enhancing productivity by thoroughly eliminating wasted motions.

Making maintenance easy and quick if abnormalities or failures occur

The security functions that ensure safety realize reliable operation. If an abnormality or failure occurs, individual modules can be easily replaced, and programs can be safely and quickly corrected, which makes for flexible maintenance and less risk.

One CPU unit makes the coexistence of safety control and general control possible.

A system that performs both safety control and general control can be controlled by one CPU unit. Because each control can be edited as a separate ladder program, both gang control and independent control are smooth. The data of both programs can be also shared.

Flexibly dealing with changes in work content and scale expansion

The AZ-C1 can flexibly deal with the environment where work content changes every day as seen with production floors doing limited production of diversified products. Operations are easily changed over by simply transferring a program created in advance via USB. The AZ-C1 can accurately meet the requirements for complicated programs caused by an increased number of devices.

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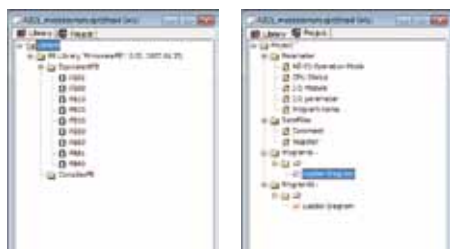
Dedicated Programming Tool

Dedicated Programming Tool "AZC-Director"

Koyo Electronics' software has the advantage of good performance and a high degree of completion. The dedicated programming software "AZC-Director" is a sophisticated tool that can be used in Windows computers. It allows free design of ladders and function blocks, whereby helping users to deploy ideal safety systems.

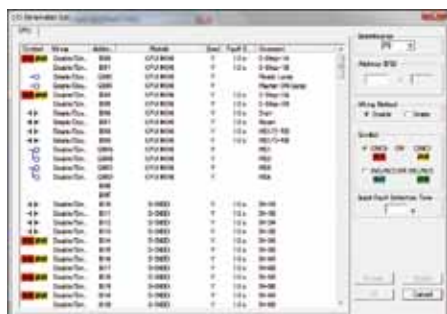
Easy-to-see, easy-to-understand ladder programming

AZC-Director enables you to select intended operations from iconized instructions and design ladder programs with just a mouse. The contents of the ladder are displayed on the screen in an easy-to-see manner, and you can surely build and debug complex programs.



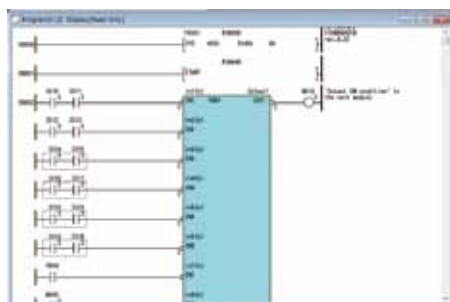
Creating safety function blocks

AZC-Director allows you to create safety function blocks on your own. You can easily design lean programs that are the most suitable for work content and flexibly adapt to complicated changes in specifications. Moreover, created function blocks can be classified and stored in folders. It is also easy to convert to other safety systems and optimize existing system by partially editing programs.



Confirming if a program is a safety circuit or general circuit at a glance

The display can be switched between a safety circuit and a general circuit (non-safety circuit) on the programming screen. You can check the operating state of each circuit from the marks on the screen, and flexibly edit programs and easily find careless mistakes.



Safety considerations for system designers







AZC-Director allows you to set various parameters concerning individual input/output status and safety functions on an easy-to-see visual screen. You can set passwords and PIN codes for project editing operations and transfers to the main body to prevent persons except the system designer from making changes.

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General Specifications

Items		Specifications				
Supply Voltage		24 V DC±10%				
Allowable Supply Voltage		21.6 to 26.4 V DC				
Power Consumption		Up to 48 W				
Use Ambient Temperature		0 to 55°C				
Use Ambient Humidity		30 to 85% RH (No condensation)				
Surrounding Atmosphere in Place of Use		No corrosive gases				
Installation Site		Metal control box Protection class: IP54				
Pollution Degree		2 or less DIN EN 50178 (VDE 0160)				
Proof Test Interval		20 years				
Vibration Resistance		IEC 60068-2-6	Frequency	Acceleration	Amplitude	Number of Sweeps
			10 to 57 Hz	—	0.35 mm	20
			57 to 150 Hz	49 m/s ²	—	(1 octave per minute)
Impact Resistance		IEC 60068-2-27 147 m/s ² ±X,Y,Z 3 times in each direction				
Noise Resistance	ESD	IEC 61000-4-2 Aerial discharge: ±8 kV Contact discharge: ±6 kV				
	RFI	IEC 61000-4-3 Indoor: 80 to 2,000 MHz (10 V/m 80%)				
	FTB	IEC 61000-4-4 Signal line : ±1 kV DC power source line: ±1 kV Functional ground line: ±1 kV				
	Surge	IEC 61000-4-5 To ground: ±1 kV				
Instantaneous Power Failure		The instantaneous power failure allowed time is not longer than 10 ms and the instantaneous power failure interval is not shorter than 1 s.				

CPU Specifications

Items		Specifications			
Program System		Stored program system			
Program Control System		Cyclic computing system			
Input-Output Control System		Image register system			
Execution Time		15 ms / Scan			
Maximum System Reaction Rate	Program-less mode	Only DC output is used.	52.6 ms		
		Relay output is used.	67.6 ms		
	Programming mode	Only DC output is used.	22.6 ms		
		Relay output is used.	37.9 ms		
Program Memory		12 K WORD (Internal memory: 64 KB)			
Memory Type		CMOS-RAM, FLASH-ROM			
Backup Battery		Charge type (Lithium battery: Life is up to 5 years)			
Display		7 segments LED×4			
		Safety Control Program		General Control Program	
Basic Command		16		16	
Timer Command		4		4	
Function Command		7		54	
External I/O Points		256		256	
Internal I/O Points		1,024		1,024	
Hold Flag		768		768	
Link Flag		2,048		2,048	
Edge Detection Flag		512		512	
Data Register		512 bytes		1,024 bytes	
Current Value Register		512 bytes		2,048 bytes	
Special Register		2,048 bytes		2,048 bytes	
Comment Memory		64 K bytes		64 K bytes	

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Specifications

Power Source / Booster module

Items	Specifications	
Model Number	AZ-C1-POWER	AZ-C1-BOOSTER
Supply Voltage	24 V DC ±10%	
Output Current	1.0 A: When the maximum module is mounted	
Power Consumption	Up to 24 W	
Backplane Bus	3.3 V DC ±10%, up to 15 W	
Fuse	External fuse 1.0 A	
Weight	160 g	155 g
Accessories	—	
		Between modules based (AZ-C1-BASE)

CPU Module / SUBMON Module Input/Output Specification

Items	Specifications		
Model Number	AZ-C1-CPU (MON)	AZ-C1-CPUOP (MON)	AZ-C1-SUBMON
Operation Voltage/Current	24 V DC ±10% / 70 mA		
Fuse	Internal fuse 3.2 A		Internal fuse 3.2 A, 4.0 A
Safety Input Number	DC 8 points Floating (4) Non-floating (4)/2 points (+common) 6 points (-common)		
Input Resistance	Approx. 4.7 kΩ		
Input Voltage/Current	24 V DC, 5 mA/point		
ON/OFF Level	ON: Minimum 18 V DC /3.5 mA OFF: Up to 4.7 V DC /0.5 mA		
Detectable Minimum Pulse Duration	1.4 ms (Input filter 0.7 ms)		
Safely-detectable Minimum Pulse Duration	15 ms		
Safety Output Number	DC 6 points (Source)		
Output Voltage/Current	24 V DC, 0.5 A/point		
Program-less Mode	Input	Safety signal 2 systems (Contact point x 2), readback x 2, Start x 1, Reset x 1	
	Output	Safety output 2 systems, action indication use x 2	
Weight	230 g		200 g
Terminal Type	Removable 36P terminal block		
Accessories	Between modules based (AZ-C1-BASE)		

Safety Control Module for Input/Output Specifications







Items	Specifications		
Model Number	AZ-C1-S-STP (E)	AZ-C1-S-STP (LC)	AZ-C1-S-STP (E/LC)
Operation Voltage/Current	24 V DC ±10% /68 mA		
Fuse	Internal fuse 3.2 A, 4.0 A		Internal fuse 3.2 A
Safety Input Number	DC 6 points		
	Floating (4) Non-floating (2)	Non-floating (6)	Floating (2) Non-floating (4)
	2 points (+common), 4 points (-common)	6 points (-common)	1 point (+common), 5 points (-common)
Input Resistance	Approx. 4.7 kΩ		
Input Voltage/Current	24 V DC, 0.5 A/point		
ON/OFF Level	ON: Minimum 18 V DC /3.5 mA OFF: Up to 4.7 V DC /0.5 mA		
Detectable Minimum Pulse Duration	1.4 ms (Input filter 0.7 ms)		
Safely-detectable Minimum Pulse Duration	15 ms		
Safety Output Number	DC 4 points (Source)		
Output Voltage/Current	24 V DC, 5 mA/point		
Program-less Mode	Input	Safety signal 2 systems (Contact point x 2) Readback x 2	Safety signal 2 systems (Light curtain x 2)
	Output	Safety output 2 systems	
Weight	185 g		
Terminal Type	Removable 28P terminal block		
Accessories	Between modules based (AZ-C1-BASE)		

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Safety Input/Output Module Specifications

Items		Specifications	
Model Number	AZ-C1-S-IN (E)		AZ-C1-S-IN (LC)
Operation Voltage/Current	24 V DC ±10%/62 mA		
Fuse	Internal fuse 3.2 A		
Safety Input Number	DC 16 points		
	Floating (16)		Non-floating (16)
	8 points (+common), 8 points (-common)		16 points (-common)
Input Resistance	Approx. 4.7 kΩ		
Input Voltage/Current	24 V DC, 5 mA/point		
ON/OFF Level	ON: Minimum 18 V DC/3.5 mA OFF: Up to 4.7 V DC/0.5 mA		
Detectable Minimum Pulse Duration	1.4 ms (Input filter 0.7 ms)		
Safely-detectable Minimum Pulse Duration	15 ms		
Program-less Mode	Input	Safety signal 2 systems (Contact point x 8)	Safety signal 2 systems (Light curtain x 8)
	Output	Readback x 2	
Weight	190 g		
Terminal Type	Removable 36P terminal block		
Accessories	Between modules based (AZ-C1-BASE)		

Safety Output Module Specifications

Items		Specifications	
Model Number	AZ-C1-S-OUT		AZ-C1-RELAY
Operation Voltage/Current	24 V DC ±10%/74 mA		24 V DC ±10%/107 mA
Safety Output Number	DC 16 points (Source)		2 x 2 Relay output
Output Voltage/Current	24 V DC, 0.3 A/point		Up to 4 A resistance load / point External fuse : Up to 4A
Program-less Mode	Output	Safety output 8 systems	Safety output 2 systems
Weight	250 g		
Terminal Type	Removable 36P terminal block		Removable 8P terminal block
Accessories	Between modules based (AZ-C1-BASE)		

General Control Module Input/Output Specification

Items		Specifications	
Model Number	AZ-C1-NS-IN		AZ-C1-NS-OUT (COM+)
Operation Voltage/Current	24 V DC ±10%/25 mA		24 V DC ±10%/48 mA
Fuse	—		Internal fuse 3.2 A
Number of Input Points	DC16 points (-common)		—
Input Resistance	Approx. 4.7 kΩ		—
Input Voltage/Current	24 V DC, 5 mA/point		—
ON/OFF level	ON: Minimum 18 V DC/3.5 mA OFF: Up to 4.7 V DC/0.5 mA		—
Detectable Minimum Pulse Duration	1.4 ms (Input filter 0.7 ms)		—
Number of Outputs Points	—		DC 16 points (Source)
Output Voltage/Current	—		24 V DC, 0.3 A/point
Weight	170 g		175 g
Terminal Type	Removable 24P terminal block		
Accessories	Between modules based (AZ-C1-BASE)		

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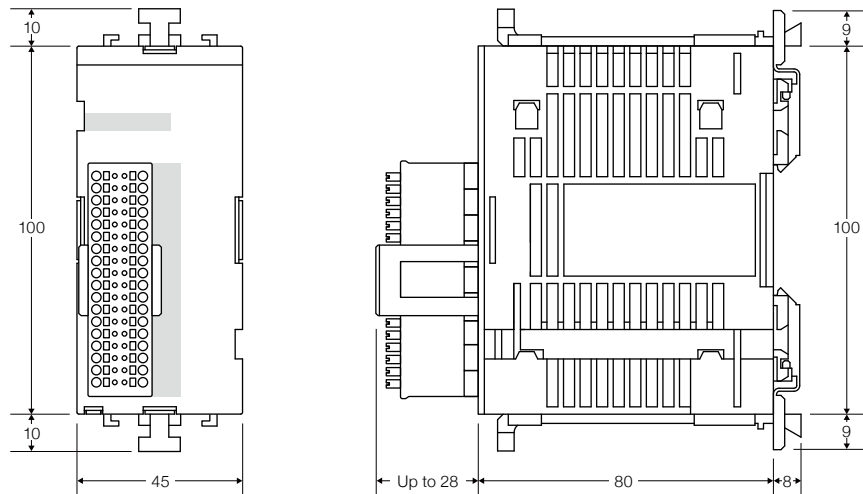
KOSTAC Safety AZ-C1

Dimensions

Dimensions (Unit: mm)

CPU module: AZ-C1-CPU (MON), AZ-C1-CPU0P (MON)

Safety output module: AZ-C1-S-OUT, AZ-C1-RELAY

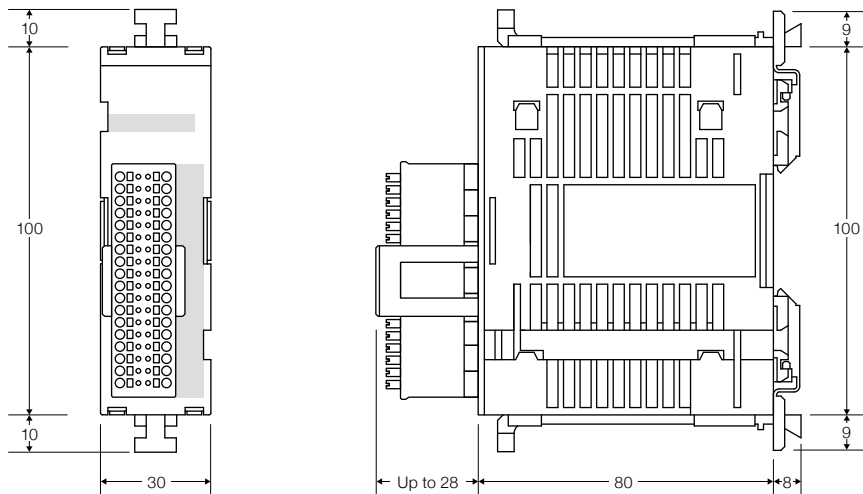


Power supply module: AZ-C1-POWER, AZ-C1-BOOSTER

Safety input module: AZ-C1-S-IN (E), AZ-C1-S-IN (LC)







Safety input/output module: AZ-C1-SUBMON, AZ-C1-S-STP (E), AZ-C1-S-STP (LC), AZ-C1-S-STP (E/LC)

General control module: AZ-C1-NS-IN, AZ-C1-NS-OUT (COM+)



- Common Subject Matter
- KOSTAC Safety AZ-C1**
- SJ
- DL05/06
- DL205
- D4
- D3
- Programmer
- DirectSOFT
- Terminator I/O
- Process Control
- ZIP LINK
- Safety
- Features
- Dedicated Programming Tool
- Specifications
- Dimensions**
- Precautions

KOSTAC Safety AZ-C1

- PLC 
- HMI 
- SENSOR 
- ENCODER 
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KOSTAC Safety AZ-C1

Precautions

Precautions in Use

Installation site

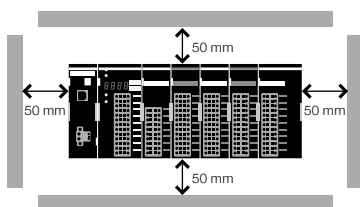
When installing the KOSTAC Safety AZ-C1, avoid the environments shown below to prevent failure and malfunction.

- (1) Places where the ambient temperature is outside the range from 0 to 55°C
- (2) Places where the ambient humidity is outside the range from 30 to 85% RH
- (3) Places where condensation occurs due to rapid temperature changes
- (4) Places that are exposed to corrosive gas and combustible gas
- (5) Places where there are large quantities of conductive powder like iron powder, oil mist, salt, and organic solvents
- (6) Places that are exposed to direct sunlight
- (7) Places where intense electric fields and ferromagnetic fields are generated
- (8) Places where vibrations and impacts are directly applied to the main body

Installation

When installing the KOSTAC Safety AZ-C1, secure enough space around it for ventilation and maintenance checks.

Space of at least 50 mm from both sides, top and bottom of the main body



Installation on DIN rails

This product can be installed using commercial DIN rails of 35 mm in width (conforms to JIS C 21812). Anchor the product using commercial fasteners for DIN rails on both ends of the main body so that the main body does not move.

Module terminal block

The terminal block of each module is a screwless terminal.

The rod terminals shown below conform to the terminal blocks.

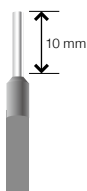
Recommended rod terminal models:

AI0.75 to 10 GY (Made by Phoenix Contact K.K.)

AI1 to 10 RD (Made by Phoenix Contact K.K.)

When making rod terminals, ensure the rod terminals conform to cables and crimp tools.

* When you use rod terminals except those made by recommended manufacturers, consider the following dimensions.









Applicable cable: AWG18
 Cross-section of cable: 0.75 to 1 mm²
 Length of rod terminal: 10 mm

Safety Precautions

- This product cannot be installed outside the control panel. Use this product by installing it in an enclosure of IP54 or higher standard.
- The power supply must meet at least one of the following requirements.
 Safety main transformer:
 EN 61588/VDE 0570 Part 2 to 6 "Special requirements of safety transformers for general application (IEC 61588-2-6: 1997)"
 Switch mode power supply:
 EN 60950-1 "Information equipment - Safety - Part 1" and EN 50178 "Electronic equipment for power source". Moreover, the power supply must be applicable to SELV circuits defined by EN 60950-1.
- Do not disassemble, repair, and remodel this product. Doing so may damage the intrinsic safety functions and is dangerous.
- A "safety manager" must confirm that software design, installation, and maintenance of this product are correctly performed. The "safety manager" refers to a person who has the authority and responsibility to ensure the safety at each stage of design, installation, operation, maintenance, and disposal of mechanical equipment. Protective measures are required so that persons other than the "safety manager" do not change the programs, wiring or settings.
- Regarding devices concerning safety functions to be connected to this product, use those that meet safety standards according to the safety level and category determined in risk assessments. Moreover, the conformance of safety level and category of the entire system needs to be assessed by an authorized third party accreditation organization.
- Do not use modules for general control for safety input or safety output. Doing so may damage the safety of the system if a failure occurs in this product or associated equipment, and is dangerous.

KOSTAC Safety AZ-C1

Precautions

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Warranty Conditions: Points to be Checked When Ordering This Product

When estimating or ordering our control products, the warranty conditions shall be as follows unless there are special instructions or considerations in the estimate, contract document, catalog, or specifications.

Warranty period

The warranty period of the delivered product shall be one (1) year from the date that it is delivered to the designated place.

Warranty scope

If a failure occurs due to our responsibility during the warranty period mentioned above, we shall be responsible for replacing or repairing the failed parts of the device. However, in any of the following conditions, it shall be excluded from the scope of warranty.

- (1) If customers improperly handled or used the product
- (2) If the failure was caused by reasons other than the delivered product
- (3) If the product was remodeled or repaired by companies other than Koyo Electronics Industries
- (4) If the failure was caused by reasons not attributable to Koyo Electronics Industries, such as natural disasters
- (5) If the failure was caused by reasons that could not be scientifically or technologically predicted at the time when the device of Koyo Electronics Industries was designed

The warranty shall cover the delivered product itself. Koyo Electronics Industries shall be exempted from compensation for damage caused by the failure of the delivered product.

Scope of responsibility

Koyo Electronics Industries accepts no liability whatsoever for direct or indirect damages or secondary damages resulting from the use of our products.

Koyo Electronics Industries accepts no liability whatsoever for damages resulting from programs created using our products or their results.

Conditions for applications

- (1) When using our products, customers are requested to check their conformance to pertinent standards, laws and regulations by themselves.
Customers are also requested to check their conformance to their machines, devices, and systems by themselves.
If customers use our products without checking conformance, Koyo Electronics Industries accepts no liability for the conformance of products.
- (2) Our products have acquired certification under international standards concerning the protection against mechanical hazards, but this does not guarantee that the products will not incur failures or problems.

- (3) It is prohibited to use our products for applications that pose grave danger to human life or property including the applications mentioned below.
Koyo Electronics Industries accepts no liability for damages resulting from the use of our products in such applications.
 - ◇ Thermal, hydraulic, and nuclear power plants
 - ◇ Train and railway systems
 - ◇ Aircrafts and air traffic control
 - ◇ Other transportation systems
 - ◇ Medical machines
 - ◇ Entertainment machines
 - ◇ Incineration and fuel systems
 - ◇ Gas, water, and electricity supply systems
 - ◇ Around-the-clock continuous operation systems
 - ◇ Facilities that handle nuclear, hazardous, or chemical materials
 - ◇ Mining and drilling
 - ◇ Applications that pose high risks to human life, health or property
- (4) If customers use our products for applications that pose a risk to human life or property, they are requested to sufficiently consider calling attention to dangers and redundant design across the entire system, secure safety and reduce hazards at the source. In such case, customers are requested to confirm that our products are appropriately used and installed for intended applications in the design phase.
Moreover, customers are requested to clearly notify users of predictable precautions and prohibited matter sin use so that our products do not incur failures because of incorrect use or improper handling by third parties

Change in specifications

The specifications of products described in this catalog are subject to change due to improvement or other circumstances. Regarding actual specifications when you purchase the product, consult with our sales persons.

Scope of services

The prices of delivered products do not include service costs such as dispatching engineers. Therefore, separate expenses will be charged in the following cases.

- (1) Guidance on installation and adjustment, and witnessing of test-runs
- (2) Maintenance checks, adjustments, and repairs
- (3) Technical guidance and technical education

The product is packaged according to our packaging specifications. The warranty provided with this product assumes that it is traded and used in Japan. Regarding trade and use of this product outside Japan, consult our sales persons.