



# Overseas Standards Compliance Manual

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(CE/UL)  
Third Edition

***IAI Corporation***





## Please Read Before Use

Thank you for purchasing our product.

In this manual, describes how our products comply with the standards of the countries outside Japan and the detailed information regarding the compliances.

For some of our products, the entire system including the connections to the peripheral devices requires to be equipped with counteractions and certificated if it is to be complied with the law. Check the local law.

Please read this manual as well as the Instruction Manual before start using the product if it is necessary to comply with an overseas standard.

Also, our products are designed assuming they would be installed in a system inside a factory by an educated and trained person.

In case of using the product for other purposes, please contact us.

In the CD/DVD enclosed with the product includes not only the content of this manual, but also the Instruction Manuals for IAI products. Print out the necessary parts of the corresponding manuals or just read on the PC monitor screen.

After reading through this manual, keep this Instruction Manual at hand so that the operator of this product can read it whenever necessary.

### [Important]

- This is the original manual explaining the compliance of IAI products with the overseas standards.
- The contents written in this manual may change without notice on the update of the products, overseas standards and so on.
- If you have any question or comment regarding the content of this manual, please contact the IAI sales office near you.
- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.



## Actions That IAI is Taking for Safety Compliances

### 1. Regarding EC Directives

The models of the IAI products that currently comply with CE Marking in standard are RCP2/RCP3, RCA/RCA2, all the actuators included in the standard models of IS(P)A/IS(P)B, NS Series, PCON/ACON/SCON, PSEL/ASEL/SSEL, ROBONET and all the controllers included in the standard models of XSEL-P/Q. Please feel free to ask us also for the other models because some may comply with the requirement.

IAI actuators and controllers (described as IAI components from now on) would not behave as a machine without connecting to machinery that you may have even if it could operate by itself. Therefore, whether or not the IAI components comply with "Machine Directive 2006/42/EC" depends on how the IAI components are installed to your machinery, thus it is not possible to judge whether the component complies with the requirements by its own.

As a requirement to have your machinery complied with EN60204-1 that widely specifies the electrical requirements for the industrial equipment, it is necessary that IAI components comply with "Low Voltage Directive 2006/95/EC" and "EMC Directive 2004/108/EC".

The IAI components can be sorted into two groups; those operate with just the 24V DC power supply and those with 200V AC. It is considerable that they both comply with Low Voltage Directive as long as the installation environment is provided in the appropriate condition, and assuming that the 24V DC power source complied with Low Voltage Directive is used for the former group, and assuming the way to use the product is following the instructions in the instruction manual for the latter group.

The statements above currently provide the CE Mark for EMC Directive (for 24V DC) and the EC Compliance Declaration for EMC Directive and Low Voltage Directive (for 200V) of IAI components.

Also, IAI products are classified as Class A ITE, which is assumed to be used in a factory environment.

### 2. Regarding UL

There is no product of IAI which is certified by the type approval of UL Standards except for some models in ROBO Cylinder. For more details, please contact the person in charge for your organization.

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**IAI** \_\_\_\_\_

## Overseas Standards Compliance List

IAI products available with overseas standards are as shown below:

Product Genre	Series Name	Type/Model		200V Type	CE Marking Compliance	UL Standards Compliance
ROBO Cylinder Actuator	ERC2	Slider	SA6C/SA7C		○	
		Rod (with no guide)	RA6C/RA7C		○	
		Rod (with guide)	RGS6C/RGS7C/RGD6C/RGD7C		○	
	RCP3	Slider	SA2AC/SA2BC/SA3C/SA4C/SA5C/SA6C SA2AR/SA2BR/SA3R/SA4R/SA5R/SA6R		○	
		Table	TA3C/TA4C/TA5C/TA6C/TA7C TA3R/TA4R/TA5R/TA6R/TA7R		○	
		Rod	RA2AC/RA2BC/ RA2AR/RA2BR		○	
	RCL	Slider	SA1L/SA2L/SA3L/SA4L/SA5L/SA6L SM4L/SM5L/SM6L			
		Rod	RA1L/RA2L/RA3L			
	RCP2	Slider	SA5C/SA6C/SA7C/SS7C/SS8C SA5R/SA6R/SA7R/SS7R/SS8R		○	
		Slider High-Speed Type	HS8C/HS8R		○	
		Rod (with no guide)	RA2C/RA3C/RA4C/RA6C/RA8C RA3R/RA4R/RA6R/RA8R SRA4R		○	
		Rod (with guide)	RGS4C/RGS6C RGD3C/RGD4C/RGD6C SRGS4R/SRGD4R		○	
		Belt	BA6/BA7/BA6U/BA7U		○	
		Gripper	GRSS/GRLS/ GRS/GRM/GRST GRHM/GRHB GR3LS/GR3LM/GR3SS/GR3SM		○	
		Rotary	RTBS/RTBSL/RTCS/RTCSL/RTB/RTBL RTC/RTCL/RTBB/RTBBL/RTCB/RTCBL		○	
		High Thrust	RA10C		○	
		Clean (RCP2CR)	Slider SA5C/SA6C/SA7C/SS7C/SS8C/HS8C		○	
			Gripper GRSS/GRLS		○	
		Water-Proof (RCP2W Slider)	SA16C		○	
		Dustproof/Splash Proof (RCP2W Rod)	RA4C/RA6C/RA10C		○	
		Dustproof/Splash Proof (RCP2W Gripper)	GRSS/GRLS		○	
	RCA2	Slider	SA3C/SA4C/SA5C/SA6C/SA2AC SA3R/SA4R/SA5R/SA6R/SA2AR		○	
		Table	TC3N/TC4N/TW3N/TW4N/TF3N/TF4N TA4C/TA5C/TA6C/TA7C TA4R/TA5R/TA6R/TA7R		○	
		Rod (with no guide)	RN3N/RN4N/RP3N/RP4N/RA2AC/RA2AR		○	
		Rod (with guide)	GS3N/GS4N/GD3N/GD4N/SD3N/SD4N		○	
	RCA	Slider	SA4C/SA5C/SA6C SA4D/SA5D/SA6D/SS4D/SS5D/SS6D SA4R/SA5R/SA6R		○	
		Rod (with no guide)	RA3C/RA4C/RA3D/RA4D RA3R/RA4R/SRA4R		○	
		Rod (with guide)	RGS3C/RGS4C/RGS3D/RGS4D RGD3C/RGD4C/RGD3D/RGD4D RGD3R/RGD4R/SRGS4R/SRGD4R		○	
		Arm	A4R/A5R/A6R		○	
		Clean (RCACR Slider)	SA4C/SA5C/SA6C/SA5D/SA6D		○	
		Dustproof/Splash Proof (RCAW Rod)	RA3C/RA3D/RA3R/RA4C/RA4D/RA4R		○	
	RCS2	Slider	SA4C/SA5C/SA6C/SA7C/SS7C/SS8C SA4D/SA5D/SA6D SA4R/SA5R/SA6R/SA7R/SS7R/SS8R	○		
		Rod (with no guide)	RA4C/RA5C/RA4D/SRA7BD RA4R/RA5R	○		
		Rod (with guide)	RGS4C/RGS5C/RGS4D/SRGS7BD RGD4C/RGD5C/RGD4D/SRGD7BD RGD4R	○		
		Extra-High Thrust	RA13R	○		
		Flat	F5D	○		
		Arm	A4R/A5R/A6R	○		
		Gripper	GR8	○		
		Rotary	RT6/RT6R/RT7R/RTC	○		
		Clean (RCS2CR Slider)	SA4C/SA5C/SA6C/SA7C/SS7C/SS8C SA5D/SA6D	○		
		Dustproof/Splash Proof (RCS2W Rod)	RA4C/RA4D/RA4R	○		
	RCS3 RCS3P	Slider	SA8/SS8	○		
		Clean (Slider)	SA8/SS8	○		

Product Genre	Series Name	Type/Model		200V Type	CE Marking Compliance	UL Standards Compliance
Single Axis	ISA/ISPA	Standard (Small/Medium/Large/Extra-Large)	S/M/L	○	○	
	ISB/ISPB	Standard (Small/Medium/Large)	S/M/L	○	○	
	ISWA	Splash Proof (Small/Medium/Large)	S/M/L	○	○	
	ISDA/ISPDA	Simple Dustproof (Small/Medium/Large)	S/M/L	○	○	
	ISDB/ISPDB	Simple Dustproof (Small/Medium/Large)	S/M/L	○	○	
	ISDACR ISPDA CR	Clean (Small/Medium/Large/Extra-Large)	S/M/L	○	○	
	ISDBCR ISPDB CR	Clean (Small/Medium/Large)	S/M/L	○	○	
	ISDACR (ESD)	Anti-Electrostatic Type	S/M/L	○	○	
	NS	Nut Rotary	S/M/L	○		
	IF	Belt-Drive	S/M	○		
	FS	Belt-Drive	N/W/L/H	○		
		Guide Module	N/W/L	○		
	RS	Rotary	30/60	○		
Vertical/Rotation Integrated Type	ZR	—	S/M	○		
Multi Axes Robot	IK	IA Kit (2-axis/3-axis)	IK2/IK3	○		
	ICSA/ICSPA	Multi Axes Robot (2-axis/3-axis/4-axis/6-axis)	ICSA2/3/4, ICSPA2/3/4, ICSPA6	○		
SCARA	IX	Standard (NNN)	120/150/180	○		
		Standard (NNN High-Speed Type)	250/350/500/600/700/800	○	○	
		Clean (NNC)	120/150/180	○		
		Clean (NNC High-Speed Type)	250/350/500/600/700/800	○	○	
		High-speed (NSN High-Speed Type)	500/600	○	○	
		Splash proof (NNW High-Speed Type)	250/350/500/600/700/800	○	○	
		Wall-mount (TNN/UNN High-Speed Type)	300/350	○	○	
		Ceiling-mount (HNN/INN High-Speed Type)	500/600/700/800	○	○	
Linear	LSA	Small/Medium/Large	H/N/W	○		
		Shaft	S	○		
		Flat	L	○		
	LSAS	Spurious Absolute	N10/N15	○		
Table Top	TT	Gate Type/Cantilever Type	A2/A3/C2/C3		○	
Other	TX	Extra-Small Type	20/28/35			
Controller for ROBO Cylinder	PMEC	3-Point Positioning Controller for RCP3/RCP2		C	○ (Note1)	
	AMEC	3-Point Positioning Controller for RCA2/RCA/RCL		C		
	PSEP	3-Point Positioning Controller for RCP3/RCP2		C/CW	○	○
	ASEP	3-Point Positioning Controller for RCA2/RCA/RCL		C/CW	○	○
	DSEP	Position Controller for RCD		C/CW	○	
	PCON	Positioning Controller for RCP3/RCP2		C/CG/CY/PL/PO/SE	○	○
		Positioning Controller for High Thrust RCP2		CF	○	○
	ACON	Positioning Controller for RCA2/RCA/RCL		C/CG/CY/PL/PO/SE	○	○
	SCON	Positioning Controller for RCS		C	○	
	PSEL	Programming Controller for RCP3/RCP2		C	○	
	ASEL	Programming Controller for RCA2/RCA/RCL		C	○	
	SSEL	Programming Controller for RCS2		C	○	
	ROBONET	Gateway R Unit		RGW-DV/RGW-CC/RGW-RR/RGW-SIO	○	○
		Controller Unit		RPCON /RACON	○	○
		Simple Absolute R Unit		RABU	○	○
		Extension Unit		REXT	○	○
	Gateway R Unit	—		RCM-GW-DV/CC/PR	○	
	RCP2	Positioning Controller for RCP2		C/CG/CF	○	
Controllers for Single-Axis, Multi Axes Robot and SCARA Robots	XSEL	Programming Controller for Multi Axes Robot Type	Small	J		
			General-Purpose	K		
			Large Capacity	P	○	
			Large Capacity (Global)	Q	○	
			With Circuit Protector	KE	○	
			Global	KT/KET	○	
		Programming Controller for SCARA Type	Small	JX		
			General-Purpose	KX		
			Large Capacity	PX	○	
			Large Capacity (Global)	QX	○	
			Global	KETX		
Simple Absolute Unit	PCON	For PCON		PCON-ABU	○	
	ACON	For ACON		ACON-ABU	○	
24V DC Power Supply	PS-24	For ROBO Cylinder		PS-241/242		

Note1 Only the 200V type controller complies with CE Marking in PMEC.



## 1. CE Marking

Display of CE Mark is compulsory for the specified products sold in the areas of European Union (EU). The products with CE mark displayed on them are guaranteed for free sales and trade within the EU market.

The CE Marking declares that a product meets the compulsory safety requirements given in EU (EC) Directives, and the manufacturer is to display it on his product on his sole responsibility.

The compulsory safety requirements specify the directives such as "EMC Directive", "Low Voltage Directive" and "Machinery Directive", which were adopted in the New Approach Directives in 1985. These directives specify the necessary requirements, and also the appropriate standards to realize the satisfaction of the requirements at the same time.

The application status of IAI products is as shown in Overseas Standards Compliance List. Please note that there are some products that require an appropriate action to be taken such like connecting to peripheral devices to comply with the standard.

### (1) EMC Directive

The whole system including IAI controller, control equipment and electrical components is subject to the compliance with EMC Directive.

Our products are complied with the standards related to EMC Directive under the condition that the controller, actuator and other peripherals are determined and fixed.

### (2) Low Voltage Directive

ISA/ISPA, ISB/ISPB, ISDA/ISPDA, ISPB/ISPDB, ISDACR/ISPDACR, ISDBCR/ISPDBCR, ISWA/ISPWA, IX and TT Series actuators are designed to comply with the Low Voltage Directive under a combination with the controller. (TT Series is integrated with controller) 24V related ROBO CYLINDER does not comply with this directive.

### (3) Machinery Directive

IX and TT Series actuators comply with the Machinery Directive. Other IAI products do not comply with the Machinery Directive. (as of Feb. 01, 2011).

## 1.1 Compliance Standards

\* Refer to the CE declaration note of each model for the compliant standards.

### <EMC Directive>

EMC Directive : 2004/108/EC

EN55011 : 2007/A2/2007 (Industrial, scientific and medical(ISM) radio-frequency equipment-Electromagnetic disturbance characteristics)

EN61000-6-2 : 2005 (Immunity standard for industrial environments)

EN61000-6-4 : 2006 (Industry environment emission)

EN61800-3 : 2004 (EMC requirements and test conditions)

IEC61000-4-2 : 2008 (Electrostatic discharge immunity test)

IEC61000-4-3 : 2006/A1/2008 (Radiated, radio-frequency, electromagnetic field immunity test)

IEC61000-4-4 : 2004 (Electrical fast transient/burst immunity test)

IEC61000-4-6 : 2008 (RF conducted disturbances immunity test)

IEC61000-4-8 : 2009 (Power frequency magnetic field immunity test)

### <Low Voltage Directive>

Low Voltage Directive : 2006/95/EC

EN61800-5-1 : 2007 (Safety requirements – electrical, thermal and energy)

### <Machinery Directive>

Machinery Directive : 2006/42/EC

EN ISO 12100-1 : 2003 (Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology)

EN ISO 12100-2 : 2003 (Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles)

EN ISO 14121-1 : 2007 (Principles for risk assessment)

EN ISO 13857 : 2008 (Safety distances, upper and lower limbs)

## 1.2 Environment

### 1.2.1 Use Environment

The CE compliance products of IAI can be used under the conditions shown in the table below:

Item	Actuator Standard	Controller Standard	Applicable Standard
Overvoltage Category <sup>*1</sup>	III	II	IEC 60364-4-443
Pollution Degree <sup>*2</sup>	3	2	IEC 60664-1
IP Code	IP40 (Note 1)	IP20	IEC 60529
Appliance Class <sup>*3</sup>	I	I	IEC 60335-1
Altitude	2000m or less	2000m or less	—
Ambient Temperature Range	0 to 40°C	0 to 40°C	—
Ambient humidity Range	Max85% (Not suitable in condensation)	Max85% (Not suitable in condensation)	—

**\*1 Overvoltage Category:**

It is also expressed as “Installation Category”, and identifies the performance of the voltage durability against the impulse voltage (transitional excess voltage) that a wiring system or electrical equipment connected to the AC power source can stand.

Nominal Voltage of Power Supply [V]		Necessary Impulse Voltage Durability [V]	
3-phase	Split-phase	Overvoltage Category	
		III	II
—	120-240	2500	1500
230/400	—	4000	2500
400/690	—	6000	4000

**\*2 Pollution Degree:**

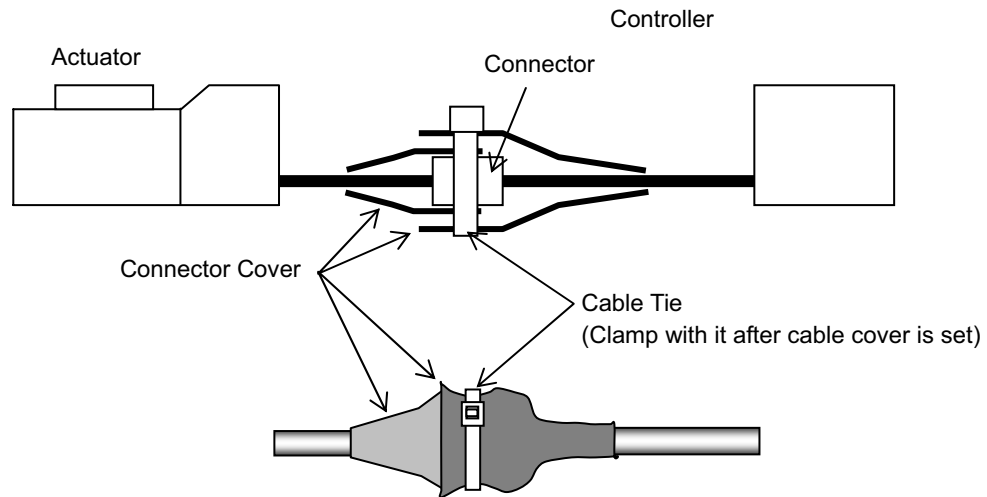
The surrounding environment may often be a cause of pollution to the insulation performance. Solid particles, dust, liquid (water) or vapor (gas) can cause short-circuit, degradation in insulation or change in resistance. There is also a case the humidity makes the machine's conductivity. Such environmental condition is categorized and specified into several degrees.

Pollution Degree 2 ... Environment that may cause non-conductive pollution or transient conductive pollution by frost.

Pollution Degree 3 ... Environment that may cause conductive pollution or cause the conductivity by condensing dry non-conductive pollution.

- \*3 Appliance Class: Categorization related to protection against electric shock  
Appliance Class I ... These are the appliances that have an additional safety measure, not relying only on the basic insulation for electrical shock protection, by connecting the ground to the electrical protection grounding conductor on the main cables of the facility so the touchable conductive part would not become a live conductor in the case the basic insulation is failed. In short, they are the electrical appliances with grounding connection required as a compulsory.

Note 1 For 200V type actuators (Low Voltage Directive compliance models) only, to satisfy IP40 of Appliance Class, it is necessary to clamp with a cable tie at each connection of motor cable and encoder cable and that of each relay cable connector, where it is covered with the connector covers overlapping to each other. Clamp the connectors again after the work when a connector is unplugged for such reason as maintenance.



## 1.2.2 Installation Environment

### a) Installation environment of the actuator

- There should be no direct sunlight.
- Any radiant heat from a large heat source such as a heat treatment furnace should not be directed at the machine main body.
- There should be no corrosive gas or flammable gas.
- It should be a normal assembling work environment where there is not too much dust.
- Oil mist or cutting liquid should not be directed at the machine.
- An impact or vibration should not be transmitted to it.
- There should be no strong electromagnetic waves, ultraviolet rays or radiation.
- Chemical resistance specification is not considered to this product.

It is generally the environment where a worker can work without any protection gear.

### b) Installation environment of the controller

- It should be installed in a control panel that possesses a structure that would not let in water, oil, carbon or dust.

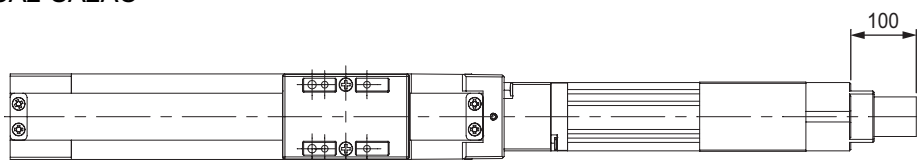
## 1.2.3 Storage Environment

Storage environment is basically the same as the use and installed environments. However, prevent an environment that would cause condensation for a long-term storage. Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package. For storage temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage period of 1 month or more, control the temperature to 50°C or less.

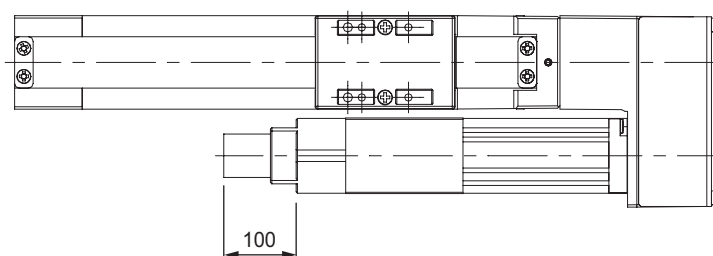
## 1.3 Space Required for Actuator Maintenance Inspection

For the models not shown in the pictures below, please contact us.

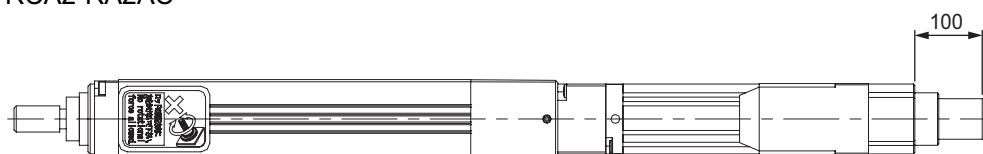
a) RCA2-SA2AC



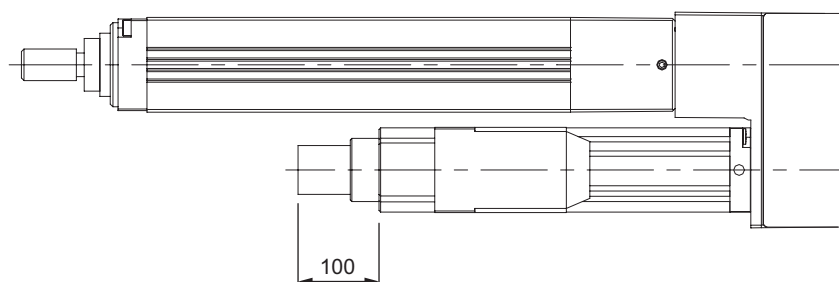
b) RCA2-SA2AR



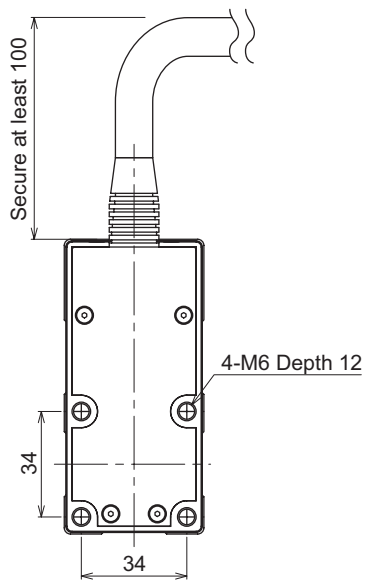
c) RCA2-RA2AC



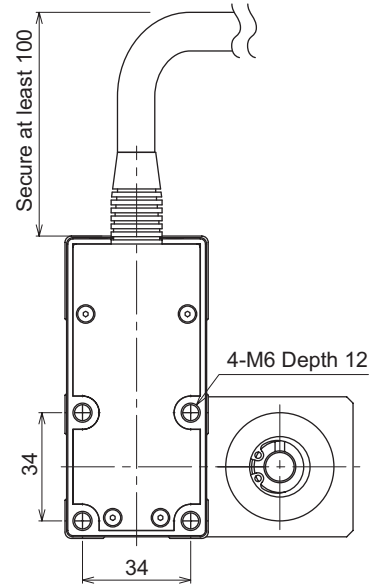
d) RCA2-RA2AR



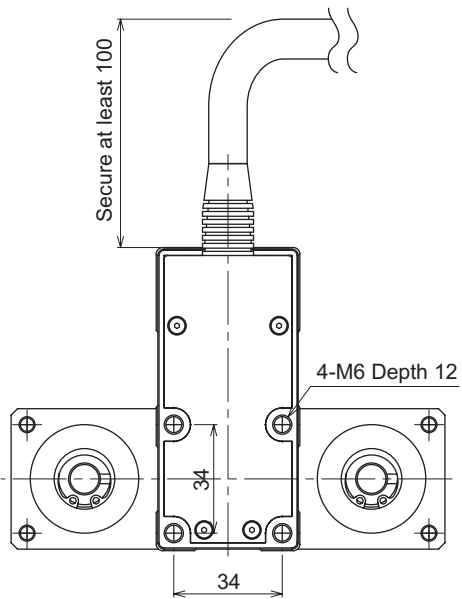
e) RCA/RCP2-SRA4R



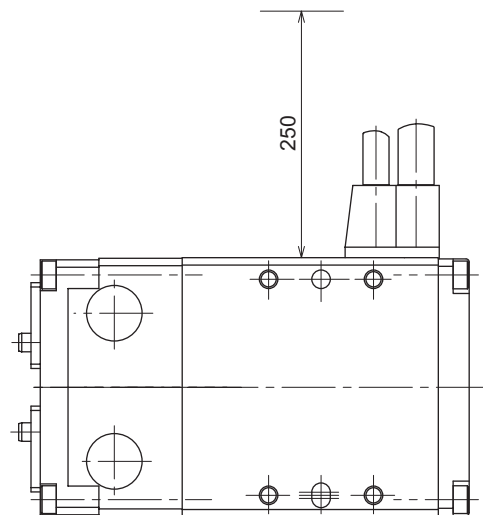
f) RCA/RCP2-SRGS4R



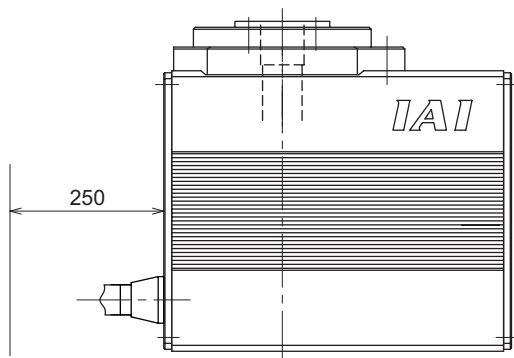
g) RCA/RCP2-SRGD4R



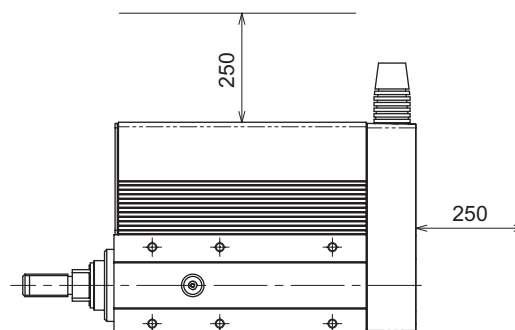
h) RCP2-GRSS  
(Same for other gripper type actuators)



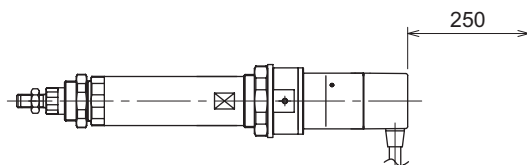
i) RCP2-RTB  
(Same for other rotary type actuators)



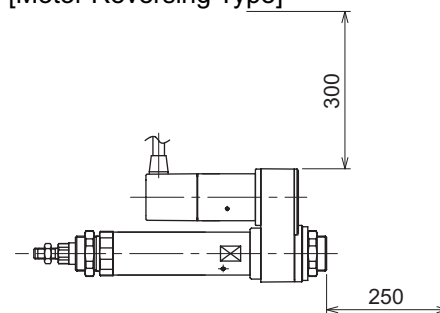
j) RCP2-SRA4R  
(Same for other short type actuators)



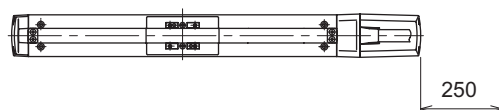
k) Rod Type (Those except for above, including ERC2)  
[Motor Straight Type]



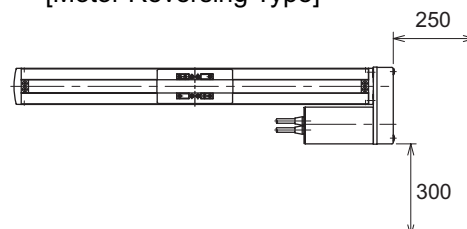
[Motor Reversing Type]



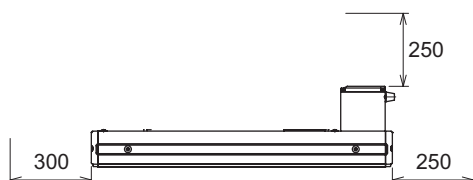
l) Slider Type (Those except for above, including ERC2)  
[Motor Straight Type]



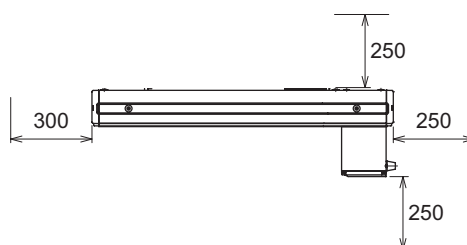
[Motor Reversing Type]



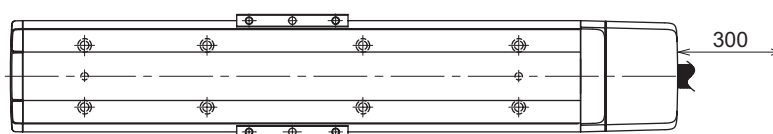
m) Slider Belt Type  
[Motor on Top]



[Motor Located on Bottom]



n) ISA-LX\* (Same for other IS Series models)



## 1.4 Power Supply

Use (both controller and actuator) under the environment that meets the overvoltage category II or III specified in IEC60364-4-443. [Refer to 1.2]

Make sure to install the circuit breaker and leakage breaker complied with the standard specified by the law to 100V AC and 200V AC controllers.

For 24V controller, 200V external supply brake and I/O power supply, use 24V DC power supply that complies with CE Marking which is safety insulated (SELV<sup>\*1</sup>).

For the wirings of actuator and controller, refer to each instruction manual.

**\*1 Safety Extra-Low Voltage : SELV**

The circuit should be non-grounded and be separated with the double insulation or more than equivalent insulation which would not generate a voltage exceeding 42.4V at peak or 60V DC in the normal condition or single failure condition. Although, a transient voltage up to 71V at peak or 120V DC is to be accepted at a failure. For the secondary circuit of the Class I equipment, the potential difference of the safety ground of a part that a user may be able to touch has to be protected with a structure to avoid a dangerous voltage and the potential difference from the voltage between lines or grounding should be 42.4V at peak, 60V DC or less. (IEC 60950)

## 1.5 Grounding

To prevent an electric shock, make sure to have the ground terminal of the AC power supply cable of the controller and the protective grounding (grounding plate) of the control panel grounded with a twisted cable with the wire diameter 0.5mm<sup>2</sup> (AWG20 or equivalent) or more.

## 1.6 Construction of Peripheral Devices and Applicable Units

For some of IAI products to meet the requirements in each directive, it is necessary to follow this manual and install the protection devices such as a circuit breaker and leakage breaker, and noise filters and clamp filters for EMC counteraction. Instruction for each controller is provided below. Please follow the appropriate ones.

Please conduct wirings between these applications with a twisted cable with the wire diameter 0.5mm<sup>2</sup> (AWG20 or equivalent) or more.

Use in a way other than indicated may cause a dissatisfaction in meeting the directive requirements (which disables CE declaration). Please contact us in such a case.

Since IAI products are to be installed to variety of systems, the tests are conducted under a certain condition of the installation distance, wirings, etc. and the units are complied with the standards related to EMC Directive under that condition.

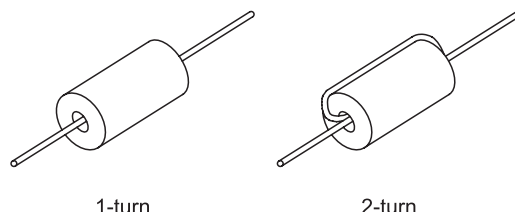
However, regarding the EMC performance, it is not possible for us to confirm or ensure the compliance in the condition of customer's use because the condition will differ due to the construction of devices including the host controller (such as PLC), network<sup>(Note)</sup> construction, control panel structure, wiring condition and the positions of the devices. Therefore, we would like you to have a responsibility for preparation for CE compliance of the whole equipment.

(Note) Each fieldbus such as DeviceNet, CC-Link, PROFIBUS, Ethernet, CompoNet that IAI controllers can be applied



In the manual, there is no instruction given when a single cable is required only to go straight through in the clamp filter (1T = 1 turn). Have the cable go into the filter twice if the indication is (2T).

(Number of Turns) = (Number of single cable to go around the outer face of clamp filter) + 1

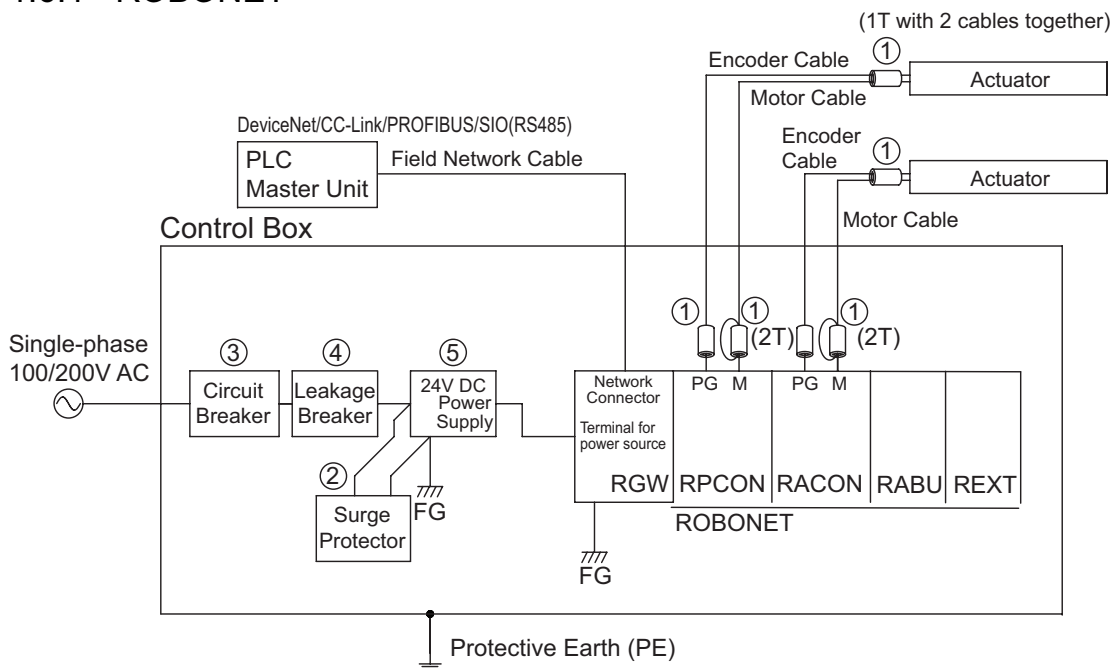


## Actuator Combined with each Controller

Indicated Location (Section No.)	Controller	Combined Actuator
1.6.1	ROBONET	RCA/RCACR/RCAW/RCA2 RCP2/RCP2CR/RCP2W/RCP3
1.6.2	PMEC (200V AC type)	RCP2/RCP2CR/RCP2W/RCP3
1.6.3	ACON/ASEP	RCA/RCACR/RCAW/RCA2
	PCON/PSEP/RCP2	RCP2/RCP2CR/RCP2W/RCP3
	DSEP	RCD
1.6.4	ASEL	RCA/RCACR/RCAW/RCA2
	PSEL	RCP2/RCP2CR/RCP2W/RCP3
1.6.5	SCON	ISA/ISDA/ISDACR/ISWA
1.6.6	SSEL	ISPA/ISPDA/ISPDACR/ISPPWA
1.6.7	XSEL-P	ISB/ISDB/ISDBCR
1.6.8	XSEL-Q	ISPB/ISPDB/ISPDBCR
The following attention (4)	XSEL-KE/KT/KET	
1.6.9	XSEL-PX	IX
1.6.10	XSEL-QX	
1.6.11	TT	TT (Integrated actuator and controller)
1.6.12	ERC2	ERC2 (Integrated actuator and controller)

### ⚠ Note :

- Do not have the motor/encoder cable and I/O cable connected to the controller with their lengths exceeding the following values.
  - Controllers with power voltage 100/200V : 30m
  - Controllers with power voltage 24V except for ERC2 : 20m
  - ERC2 : 10m
- For those controllers getting the brake power supplied from an external device, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.
- For the cable to connect the safety relay unit and the system I/O used in XSEL-Q or QX type controller, use a shielded 9-paired (or more) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the safety relay unit side.  
However, there is no specific restriction if it is XSEL-P type and connected directly to the emergency stop switch (with 2 cable cores).
- In the case of XSEL-KE/KT/KET, install the noise filter (2) "refer to 1.7.6" to the controller proximity (within 0.2m), and input the AC power supply. Besides, wire following the instruction manual of XSEL-KT/KET.



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	3×Number of Axes	
②	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	
③	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
④	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑤	24V DC Power Supply (1)	ZWS150PF	TDK-Lambda Corporation	1	100V/200V AC Input in common

Even though the diagram shown above is that for 2-axis actuator, the same treatment is required also for other cases no matter how many axes.

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Also, put the motor cable and encoder cable together into one clamp filter on the actuator side. Have 2 turns on the controller side for the motor cable.

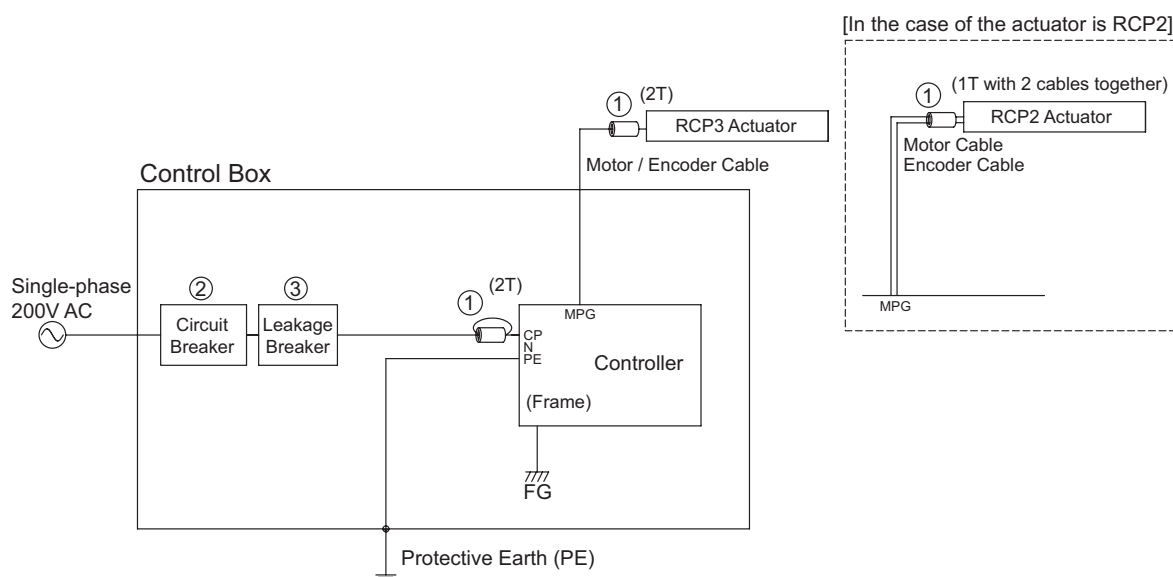
The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment following [ROBONET Instruction Manual].

## 1.6.2 PMEC (200V AC Power Supply Type)



### [Components for EMC Counteraction, Protection Equipment to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Clamp Filter (2)	E04SR401938	SEIWA ELECTRIC MFG. CO., LTD.	1	
②	Circuit Breaker (2)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	
③	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

If the actuator is RCP3, the wires for motor and encoder are integrated in one cable, thus put that cable into the clamp filter in this case.

If the actuator is RCP2, it has separate motor cable and encoder cable. In this case, put two cables together into one clamp filter.

For the 200V AC power cable, have 2 turns on the PMEC end at the point closer than or equal to 120mm.

The circuit breaker and the leakage breaker are the delegated samples.

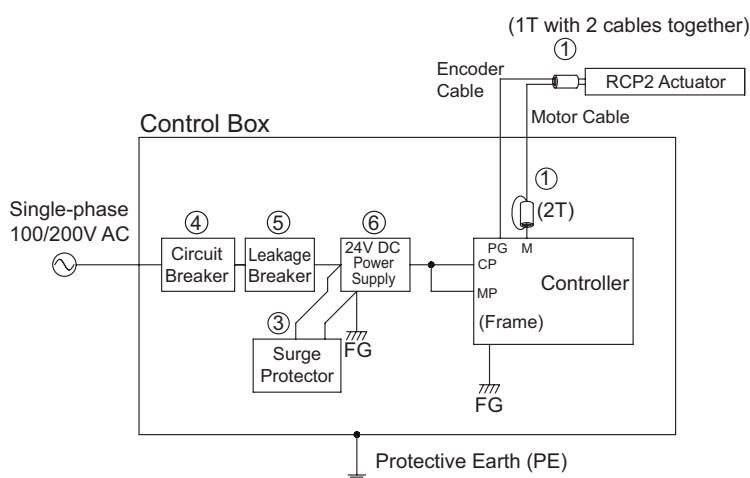
When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

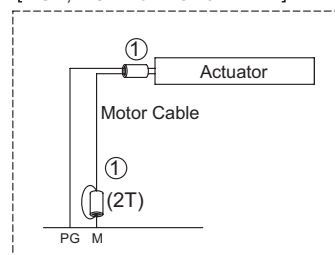
In the actual use, the setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment following [PMEC/AMEC MEC Controller Instruction Manual].

**⚠ Note: 100V AC power supply type PMEC does not comply with the CE mark.**

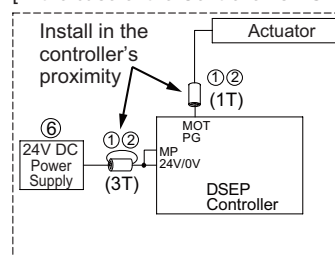
## 1.6.3 ACON, PCON, ASEP, PSEP, DSEP and RCP2



[In the case of the actuator is]  
RCA, RCA2 or RCP3



[In the case of the Controller is DSEP]



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	2	
②	Clamp Filter (2)	E04SR401938	SEIWA ELECTRIC MFG. CO.,LTD.	2	Substitution of ① (DSEP Only)
③	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	For the actuators other than RCP2
	Surge Protector (2)	R•A•V-781BWZ-4	OKAYA Electric Industries Co., Ltd.	1	For the actuator is RCP2
④	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑤	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑥	24V DC Power Supply (1)	ZWS150PF	TDK-Lambda Corporation	1	100V/200V AC Input in common

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

If the actuator is RCA, RCA2 or RCP3, the wires for motor and encoder are integrated in one cable, thus put that cable into the clamp filter in this case.

If the actuator is RCP2, it has separate motor cable and encoder cable. In this case, put two cables together into one clamp filter.

In any case, have two turns on the controller side. For a case the actuator is RCP2, it is not necessary to have a clamp filter on the encoder cable.

In the case of the controller is DSEP, install the clamp filter to the power cable with three turns.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

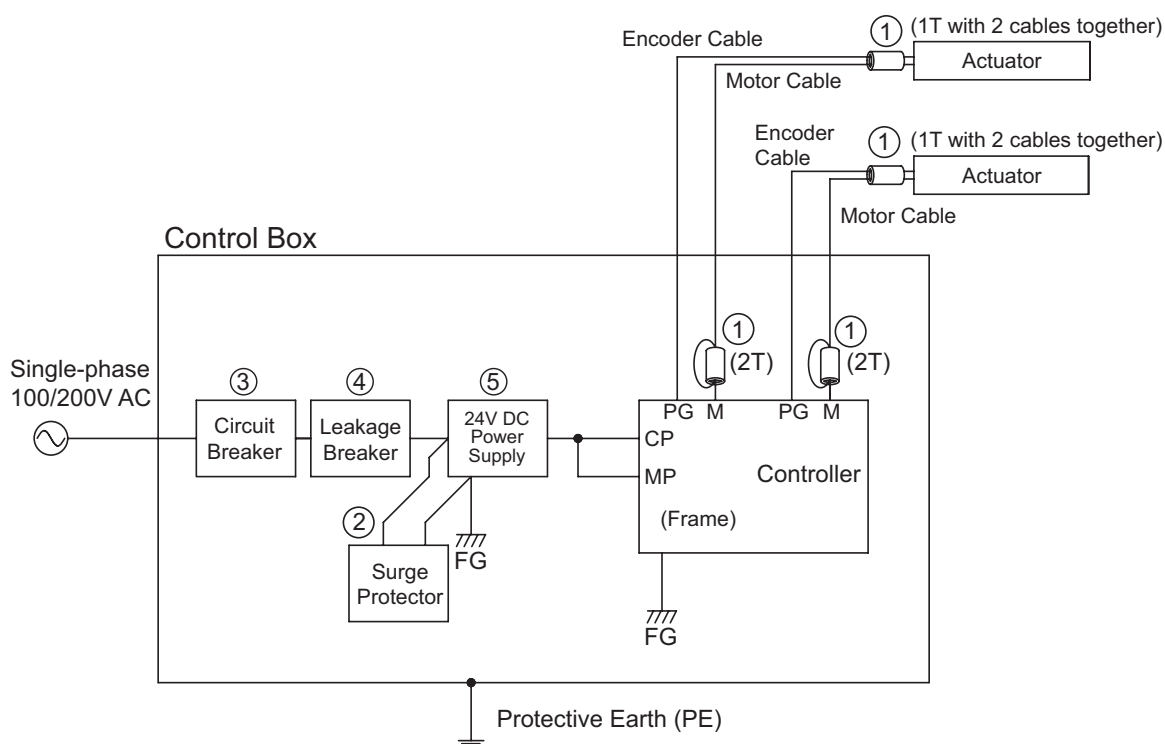
Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator.

Choose the appropriate equipment following the instruction manual of each model.

## 1.6.4 ASEL/PSEL



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	2×Number of Axes	
②	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	
③	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
④	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑤	24V DC Power Supply (1)	ZWS150PF	TDK-Lambda Corporation	1	100V/200V AC Input in common

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Also, put the motor cable and encoder cable together going through (only passing through) in one clamp filter on the actuator end. Have 2 turns on the controller side for the motor cable. It is not necessary to have a clamp filter on the encoder cable.

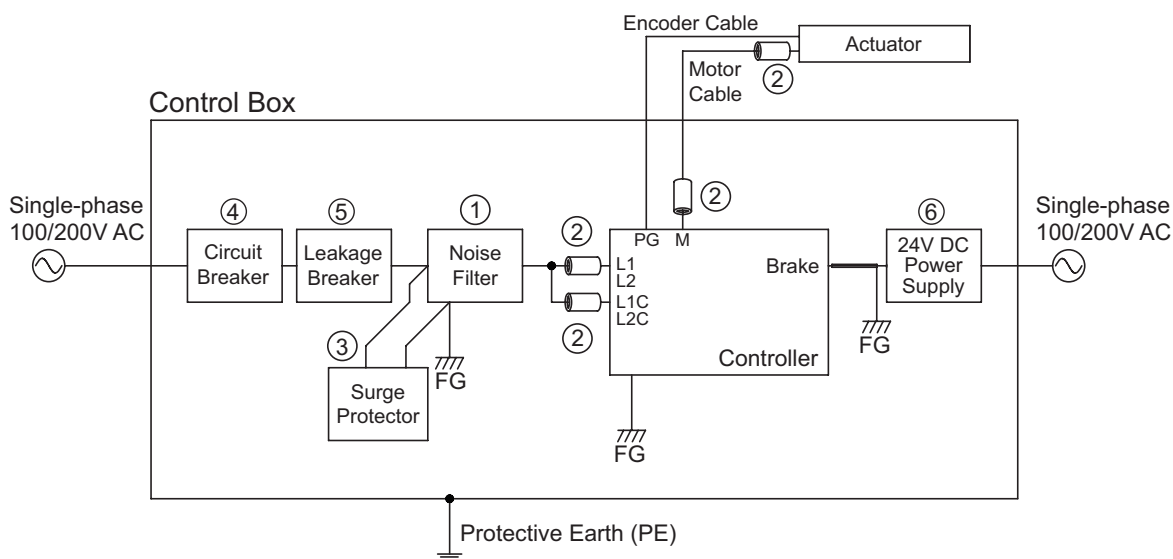
The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment following the instruction manual of each model.

## 1.6.5 SCON



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (3)	MC1210	DENSEI-LAMBDA	1	
②	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	4	
③	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	
④	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑤	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑥	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have only the motor cable go through in a clamp filter on both the actuator and the controller ends.

For the power cable, separate into motor power lines (L1 and L2) and control power lines (L1C and L2C) and put each bundle through the cable clamps.

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

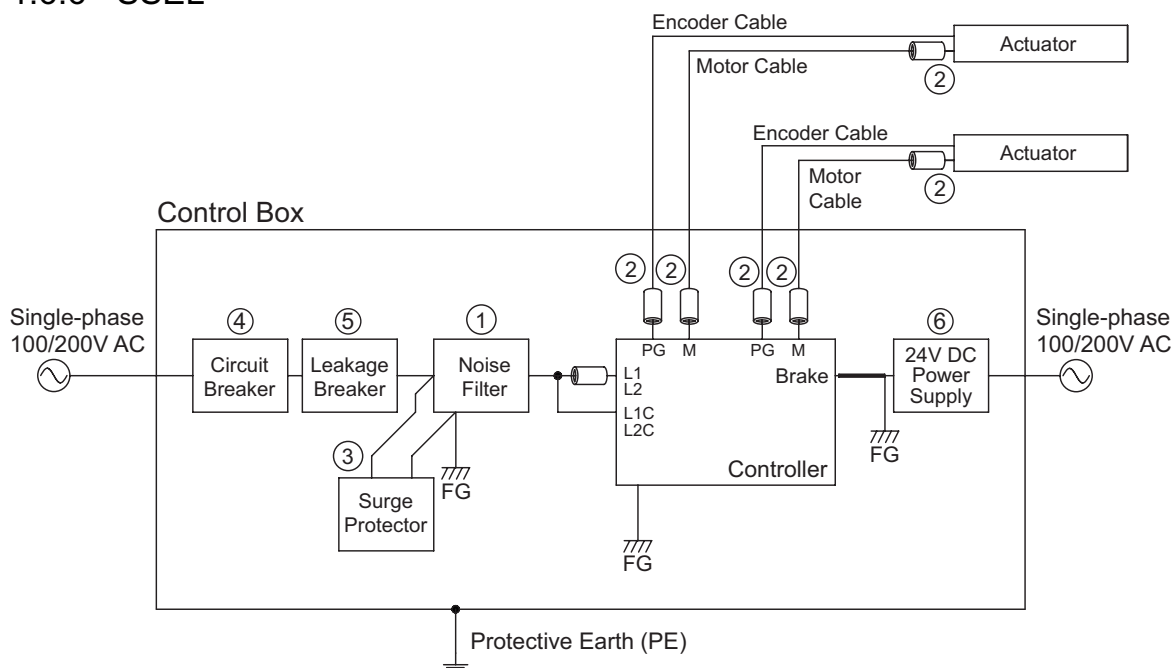
The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment following [SCON-C/CG Controller Instruction Manual].

## 1.6.6 SSEL



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (3)	MC1220	DENSEI-LAMBDA	1	For 100V power supply type
		MC1210	DENSEI-LAMBDA	1	For 200V power supply type
②	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	3×Number of Axes	
③	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	
④	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑤	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑥	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have the motor cable go through in a clamp filter on both the actuator and the controller ends.

Have only the controller end for the encoder cable to go through in a clamp filter.

For the power cable, separate into motor power lines (L1 and L2) and control power lines (L1C and L2C) and put only the bundle of motor power lines through the cable clamps.

A clamp filter is not needed on the control power lines (L1C and L2C).

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

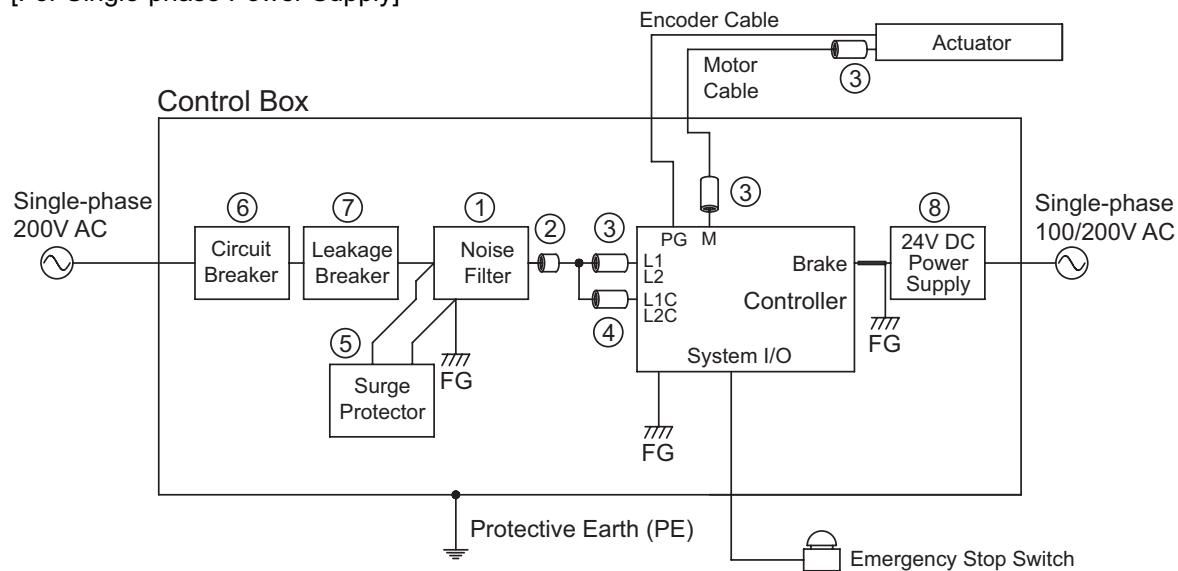
Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

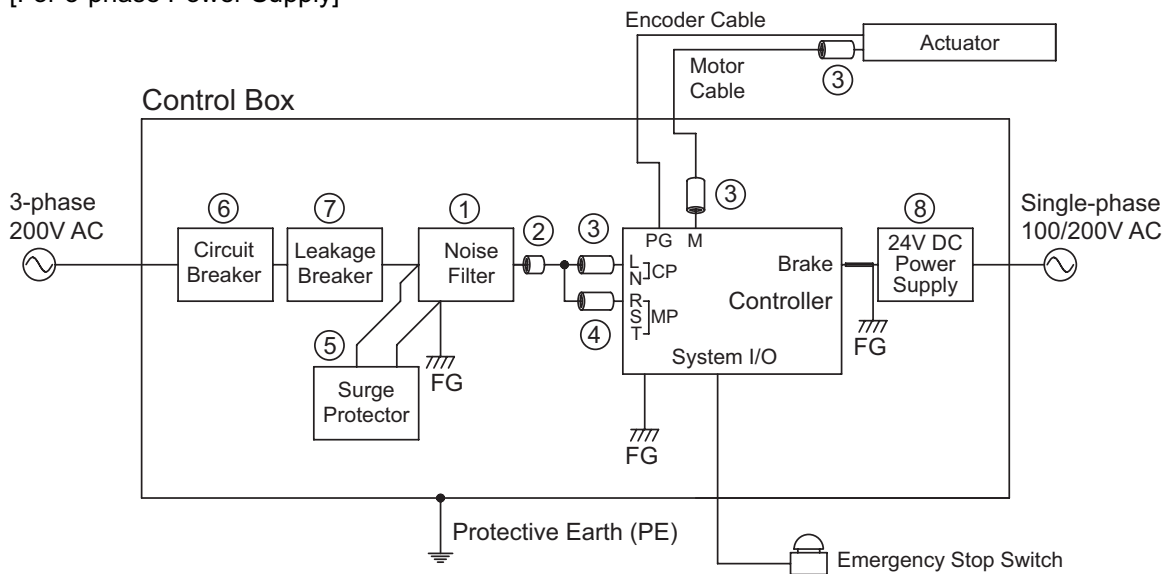
In the actual use, the setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment following [SSEL Controller Instruction Manual].

## 1.6.7 XSEL P Type

[For Single-phase Power Supply]



[For 3-phase Power Supply]





## [Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (1)	MC1320	DENSEI-LAMBDA	1	For 3-phase power supply type
	Noise Filter (2)	MXB-1220-33	DENSEI-LAMBDA	1	For Single-phase power supply type
②	Ring Core	ESD-R-25	NEC TOKIN	1	
③	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	1+ 2×Number of Axes	
④	Clamp Filter (3)	RFC-H13	Kitagawa Industries Co., Ltd	1	
⑤	Surge Protector (3)	R•A•V-781BXZ-4	OKAYA Electric Industries Co., Ltd.	1	For 3-phase power supply type
	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	For Single-phase power supply type
⑥	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑦	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑧	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have the motor cable go through in a clamp filter on both the actuator and the controller ends. It is not necessary to have a clamp filter on the encoder cable.

For the power cable, separate into motor power lines (1Ph: L1 and L2, 3Ph: R, S and T) and control power lines (1Ph: L1C and L2C, 3Ph: L and N) and put each bundle through the cable clamps.

Put the motor and control power lines together and put it through a ring core.

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

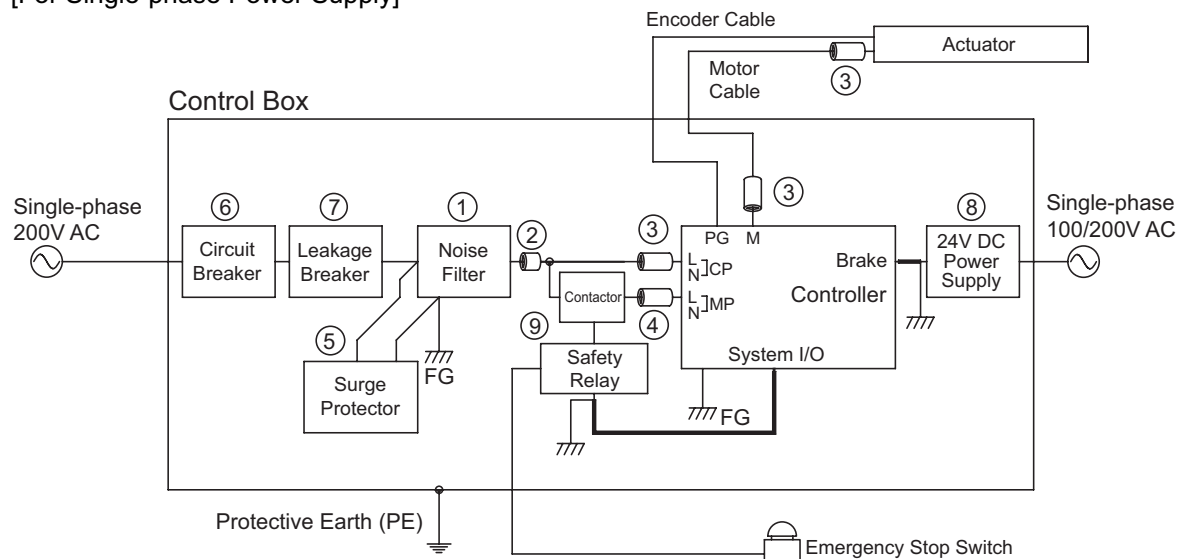
Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator.

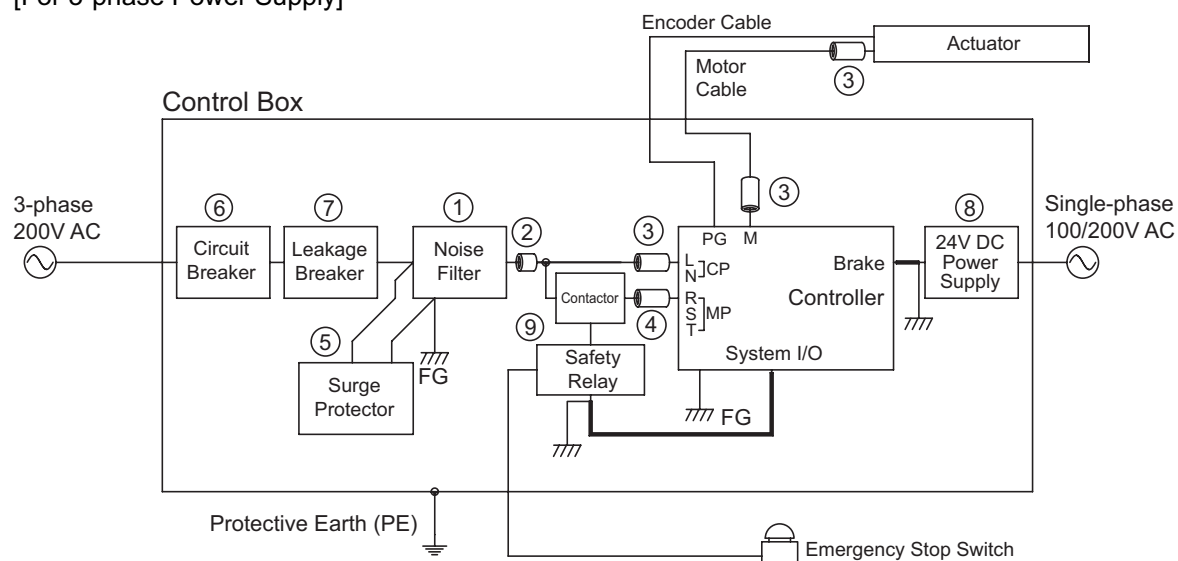
Choose the appropriate equipment following [X-SEL Controller P/Q Type Instruction Manual].

## 1.6.8 XSEL Q Type

[For Single-phase Power Supply]



[For 3-phase Power Supply]



## [Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (1)	MC1320	DENSEI-LAMBDA	1	For 3-phase power supply type
	Noise Filter (2)	MXB-1220-33	DENSEI-LAMBDA	1	For Single-phase power supply type
②	Ring Core	ESD-R-25	NEC TOKIN	1	
③	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	1+ 2×Number of Axes	
④	Clamp Filter (3)	RFC-H13	Kitagawa Industries Co., Ltd	1	
⑤	Surge Protector (3)	R•A•V-781BXZ-4	OKAYA Electric Industries Co., Ltd.	1	For 3-phase power supply type
	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	For Single-phase power supply type
⑥	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑦	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑧	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common ⑨

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have the motor cable go through in a clamp filter on both the actuator and the controller ends. It is not necessary to have a clamp filter on the encoder cable.

For the power cable, separate into motor power lines (1Ph: L1 and L2, 3Ph: R, S and T) and control power lines (1Ph: L1C and L2C, 3Ph: L and N) and put each bundle through the cable clamps.

Put the motor and control power lines together and put it through a ring core.

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

For the cable to connect the safety relay unit and the system I/O, use a shielded 9-paired (or more) twisted cable with AWG16 to 24, and ground the shield on the safety relay unit side.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

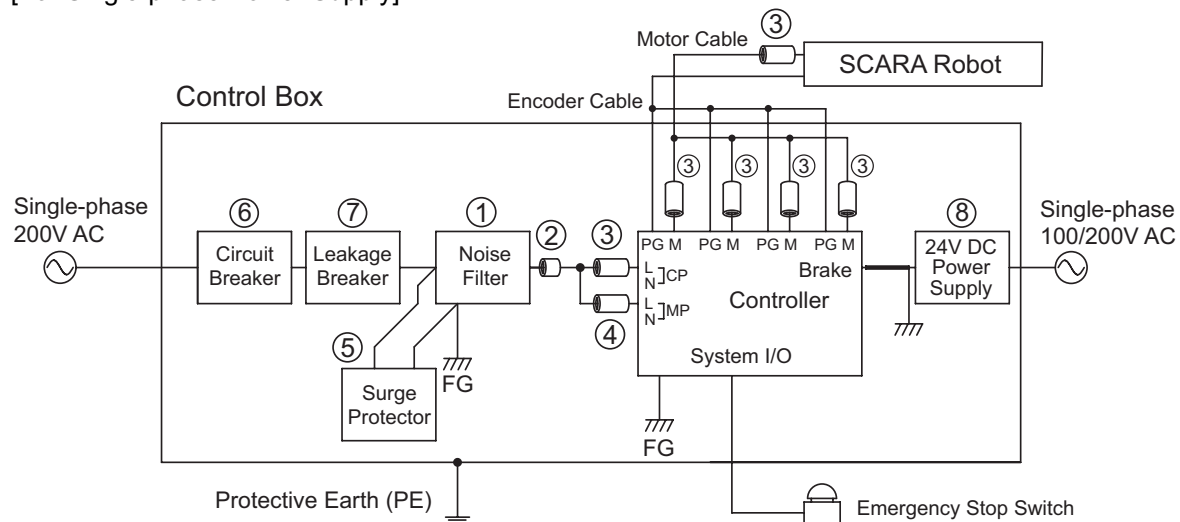
X-SEL Q Type Controller does not possess the drive cutoff circuit inside so a free construction of the safety circuit (⑨ Conductor Safety Relay) suitable for the structure of your equipment can be built outside the controller.

Construct a safety circuit following [X-SEL Controller P/Q Type Instruction Manual] before start using. The setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment.

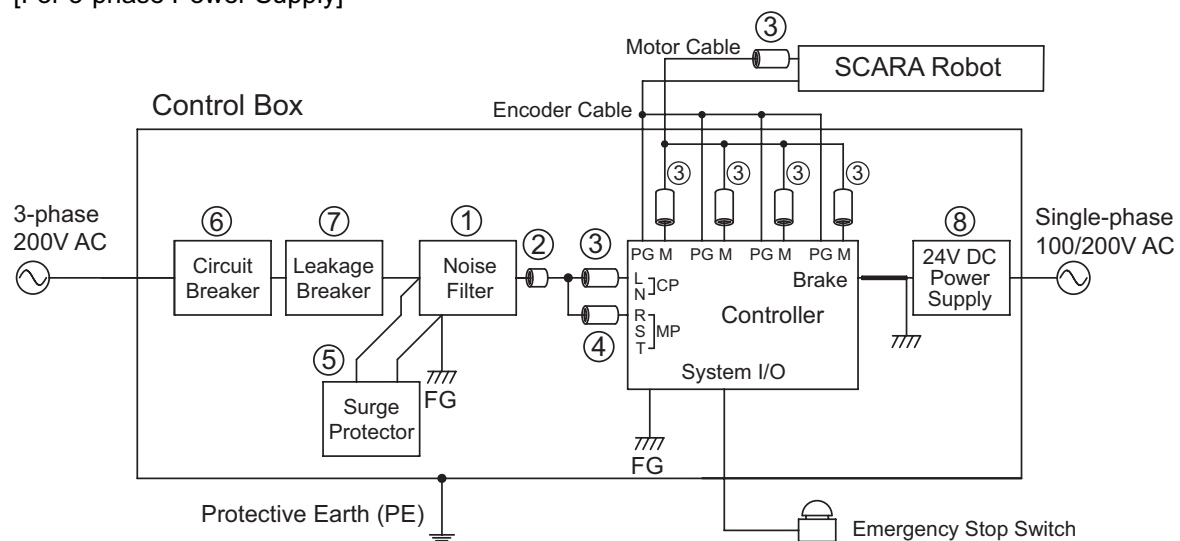
## 1.6.9 XSEL PX Type

(Note) Extra-Small IX (arm length 120/150/180) is excluded

[For Single-phase Power Supply]



[For 3-phase Power Supply]



## [Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (1)	MC1320	DENSEI-LAMBDA	1	For 3-phase power supply type
	Noise Filter (2)	MXB-1220-33	DENSEI-LAMBDA	1	For Single-phase power supply type
②	Ring Core	ESD-R-25	NEC TOKIN	1	
③	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	6	
④	Clamp Filter (3)	RFC-H13	Kitagawa Industries Co., Ltd	1	
⑤	Surge Protector (3)	R•A•V-781BXZ-4	OKAYA Electric Industries Co., Ltd.	1	For 3-phase power supply type
	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	For Single-phase power supply type
⑥	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑦	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑧	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common ⑨

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have the motor cable go through in a clamp filter on both the actuator and the controller ends. On the actuator side, the motor cable is integrated to one, thus put that cable straight into the clamp filter. It is not necessary to have a clamp filter on the encoder cable.

For the power cable, separate into motor power lines (1Ph: MP-L and N, 3Ph: MP-R, S and T) and control power lines (1Ph / 3Ph: CP-L and N) and put each bundle through the cable clamps.

Put the motor and control power lines together and put it through a ring core.

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples.

When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

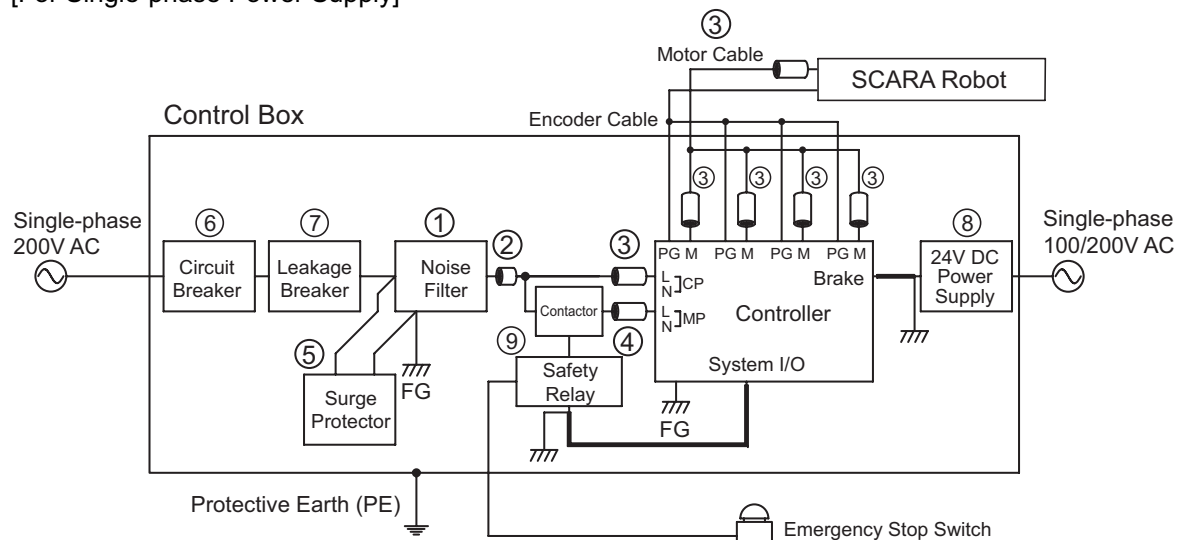
In the actual use, the setting will vary depending on the capacity of the combined actuator.

Choose the appropriate equipment following [X-SEL Controller PX/QX Type Instruction Manual].

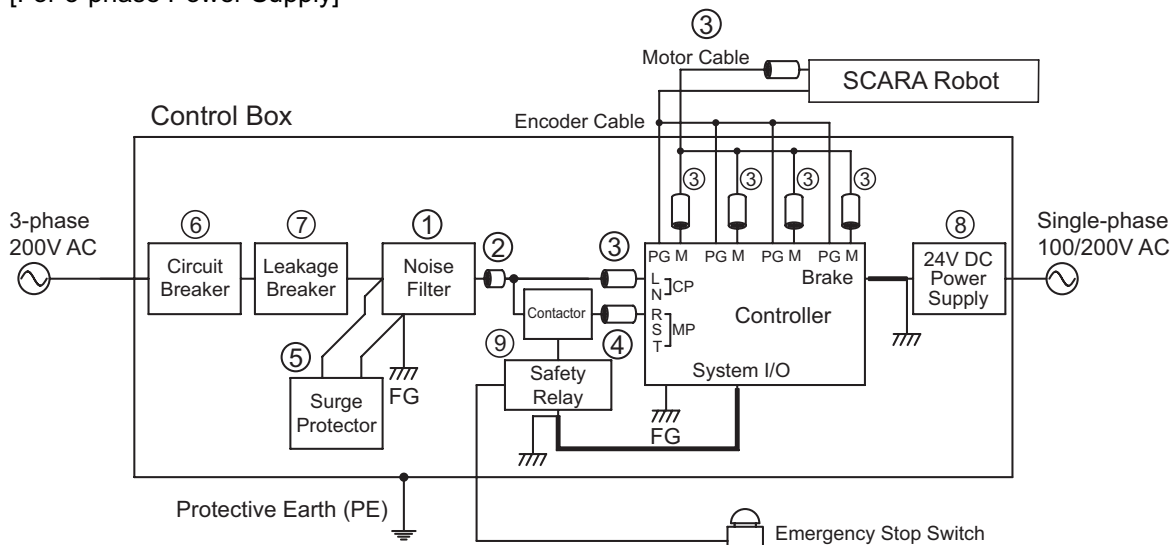
## 1.6.10 XSEL QX Type

(Note) Extra-Small IX (arm length 120/150/180) is excluded

[For Single-phase Power Supply]



[For 3-phase Power Supply]



## [Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Noise Filter (1)	MC1320	DENSEI-LAMBDA	1	For 3-phase power supply type
	Noise Filter (2)	MXB-1220-33	DENSEI-LAMBDA	1	For Single-phase power supply type
②	Ring Core	ESD-R-25	NEC TOKIN	1	
③	Clamp Filter (1)	ZCAT3035-1330	TDK CORPORATION	6	
④	Clamp Filter (3)	RFC-H13	Kitagawa Industries Co., Ltd	1	
⑤	Surge Protector (3)	R•A•V-781BXZ-4	OKAYA Electric Industries Co., Ltd.	1	For 3-phase power supply type
	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	For Single-phase power supply type
⑥	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
⑦	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
⑧	24V DC Power Supply (2)	ZWS75PF-24	TDK-Lambda Corporation	1	100V/200V AC Input in common ⑨

Mount the clamp filter as close to the cable terminal as possible, and affix with a cable tie so it would not move.

Have the motor cable go through in a clamp filter on both the actuator and the controller ends. On the actuator side, the motor cable is integrated to one, thus put that cable straight into the clamp filter. It is not necessary to have a clamp filter on the encoder cable.

For the power cable, separate into motor power lines (1Ph: MP-L and N, 3Ph: MP-R, S and T) and control power lines (1Ph / 3Ph: CP-L and N) and put each bundle through the cable clamps.

Put the motor and control power lines together and put it through a ring core.

Attach a noise filter to the point where the cable length is 300mm or less from the controller.

For the brake power supply cable, use a shielded 2-core (1-paired) twisted cable with AWG16 to 20 (1.25 to 0.5mm<sup>2</sup>), and ground the shield on the 24V DC power supply side.

For the cable to connect the safety relay unit and the system I/O, use a shielded 9-paired (or more) twisted cable with AWG16 to 24, and ground the shield on the safety relay unit side.

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

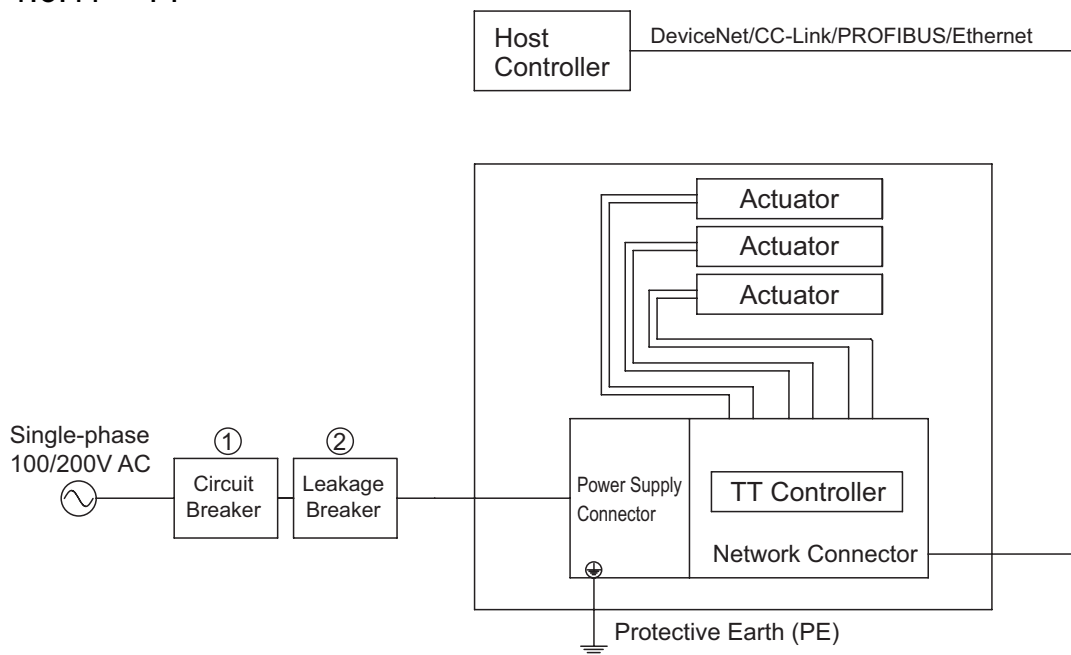
Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

X-SEL QX Type Controller does not possess the drive cutoff circuit inside so a free construction of the safety circuit (⑨ Conductor Safety Relay) suitable for the structure of your equipment can be built outside the controller.

Construct a safety circuit following [X-SEL Controller PX/QX Type Instruction Manual] before start using. The setting will vary depending on the capacity of the combined actuator. Choose the appropriate equipment.

## 1.6.11 TT



The diagram above shows that for 3-axis type. Have the same treatment also for 2-axis type.

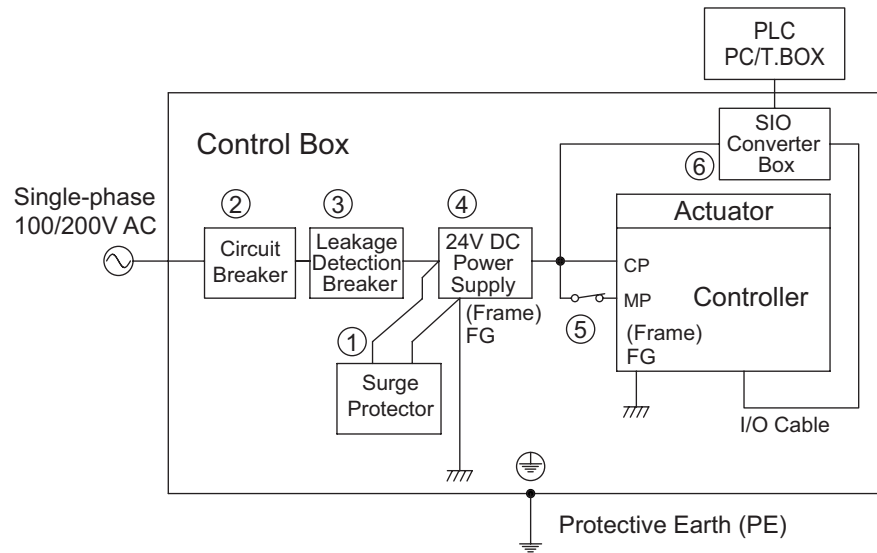
[Protection Equipment to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
②	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common

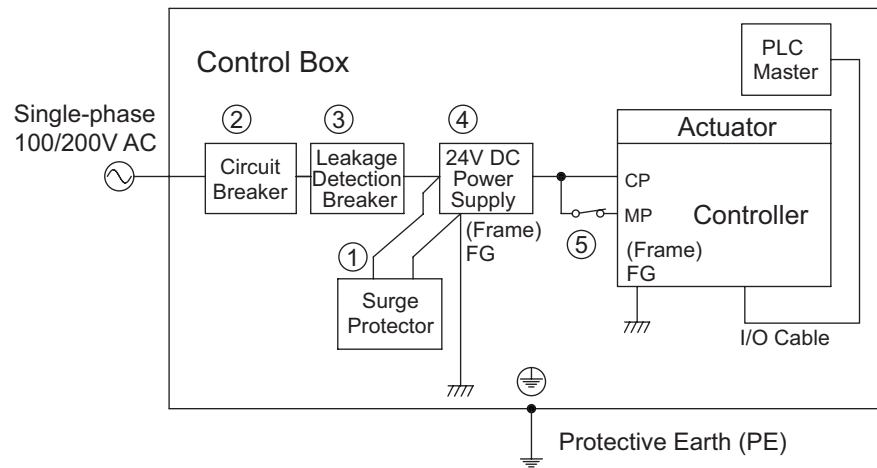


## 1.6.12 ERC2

[SIO]



[PIO]



[Components for EMC Counteraction, Protection Equipment and Power Supply to Ensure Safety]

No.	Name	Model	Supplier	Quantity	Reference
①	Surge Protector (1)	R•A•V-781BWZ-2A	OKAYA Electric Industries Co., Ltd.	1	When the actuator is RCP2
②	Circuit Breaker (1)	NF32-SV-3P-7.5A-CE	Mitsubishi Electric Corporation	1	100V/200V AC Input in common
③	Leakage Breaker (1)	NV32-SV-3P-MB AC100-240V-15mA-CE	Same as above	1	100V/200V AC Input in common
④	24V DC Power Supply (1)	ZWS150PF	TDK-Lambda Corporation	1	100V/200V AC Input in common
⑤	Relay	LY Series	OMRON	1	
		HC Relay Series	Panasonic Electric Works Co., Ltd.	(1)	
⑥	SIO Converter	RCB-TU-SIO-A(B)	IAI	1	

The circuit breaker, leakage breaker and 24V DC power supply are the delegated samples. When choosing a circuit breaker, choose one that the cutoff current would not trip with the in-rush current.

Choose a harmonic and surge-applicable type for the leakage breaker.

Choose a CE complied type that is safety-insulated one for the 24V DC power supply.

In the actual use, the setting will vary depending on the capacity of the combined actuator.

Choose the appropriate equipment following the instruction manual of each model.

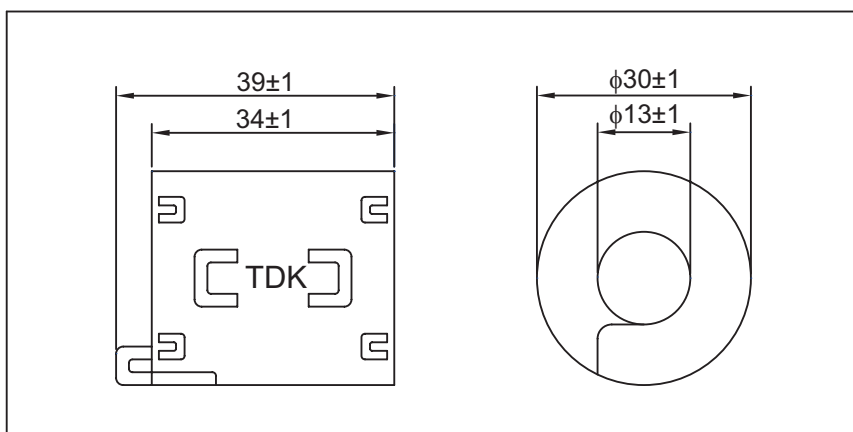
## 1.7 Components for EMC Counteraction

Introduced below are the components for EMC counteraction to be used for each model. To meet the EMC Directive, apply them to the appropriate points where the peripheral devices for each model indicate.

### 1.7.1 Clamp Filter (1)

Model : ZCAT3035-1330

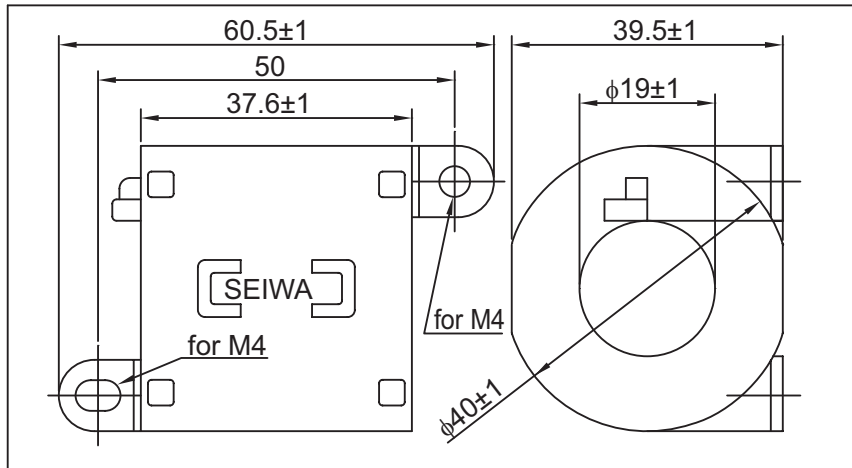
Supplier : TDK Corporation



## 1.7.2 Clamp Filter (2)

Model : E04SR401938

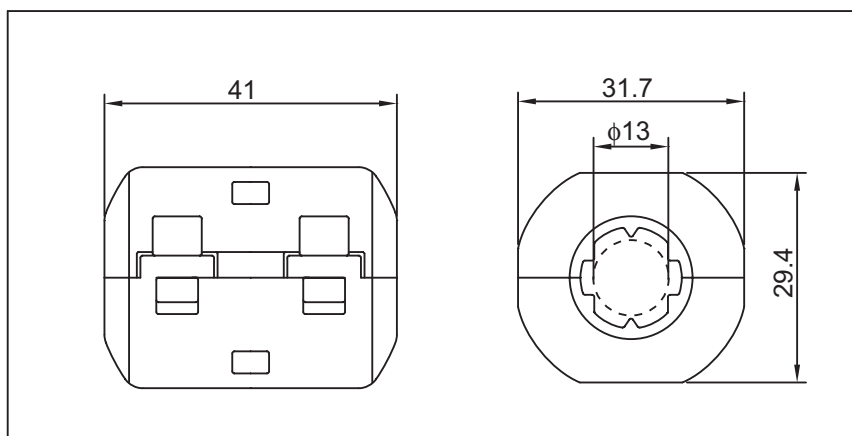
Supplier : SEIWA ELECTRIC MFG. CO.,LTD.



## 1.7.3 Clamp Filter (3)

Model : RFC-H13

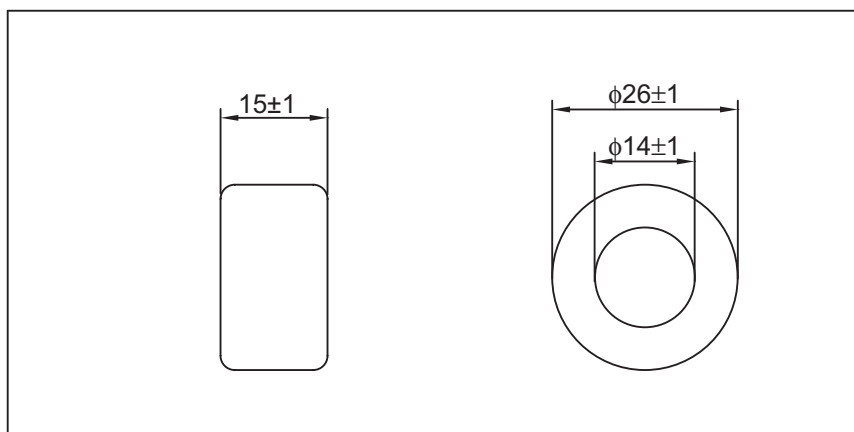
Supplier : Kitagawa Industries Co., Ltd



## 1.7.4 Ring Core

Model : ESD-R-25

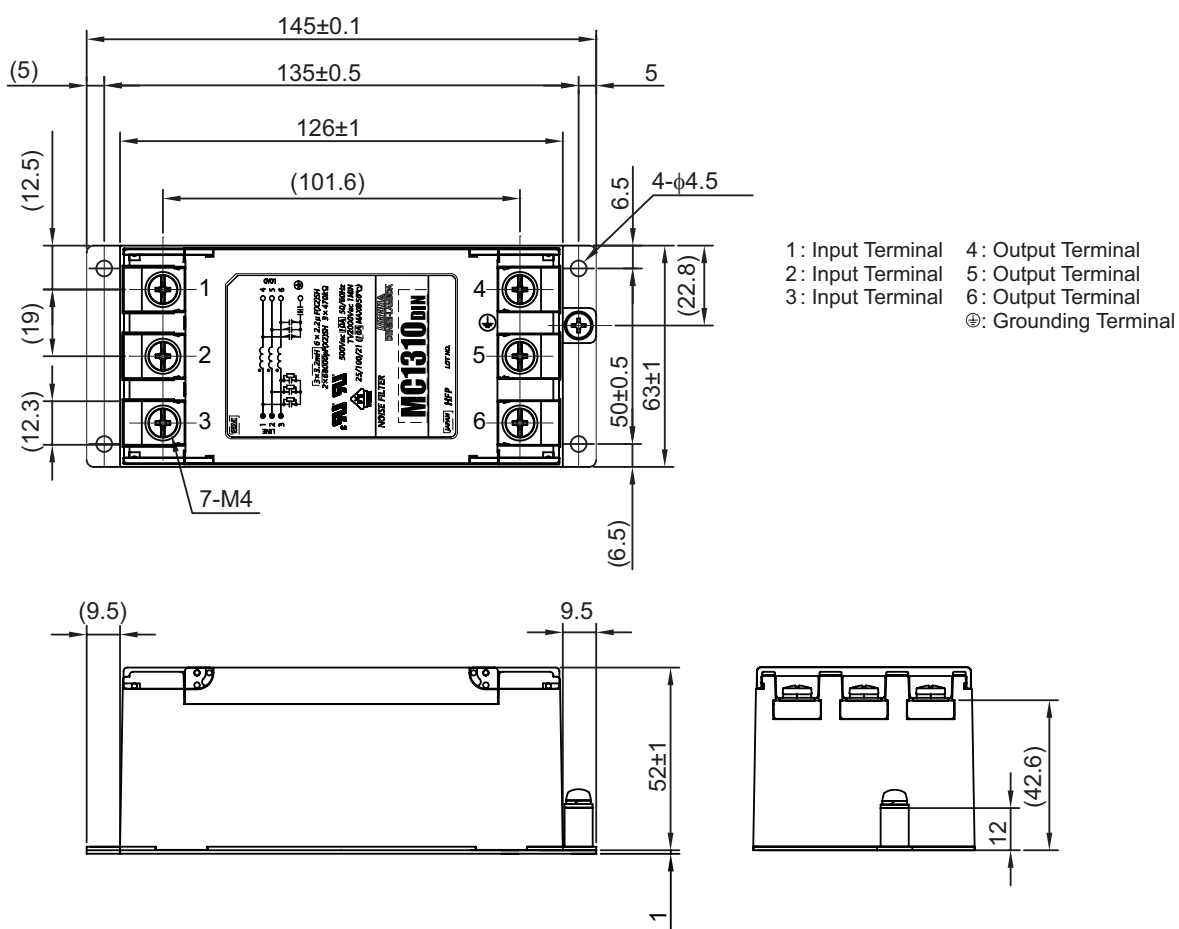
Supplier : NEC TOKIN Corporation



## 1.7.5 Noise Filter (1)

Model : MC1320

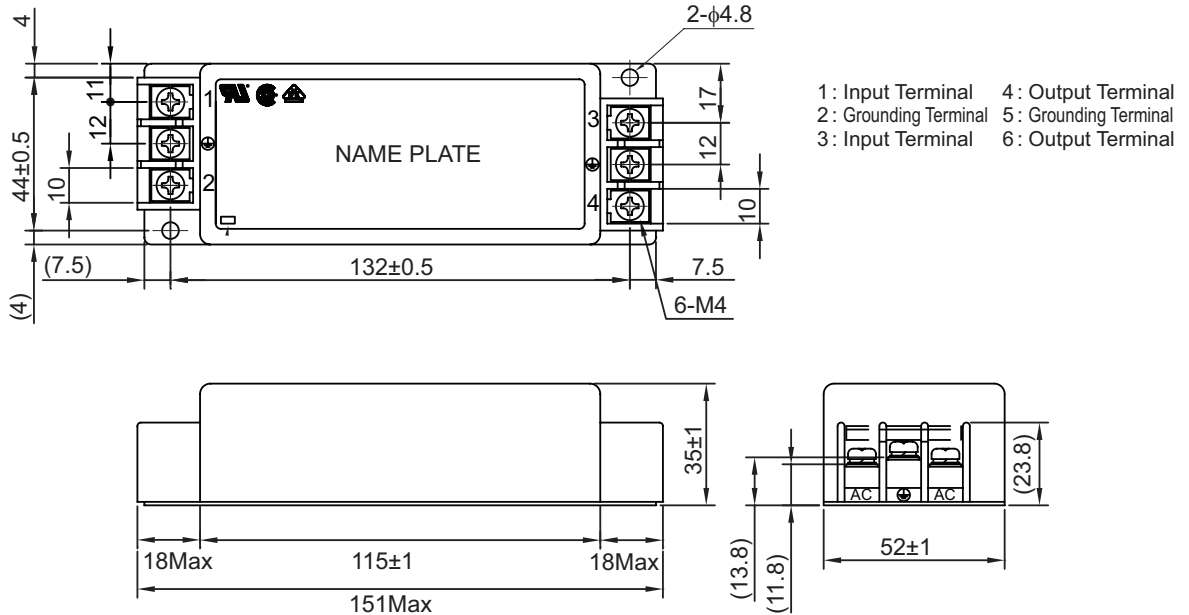
Supplier : TDK-Lambda Corporation



## 1.7.6 Noise Filter (2)

Model : MXB1220-33

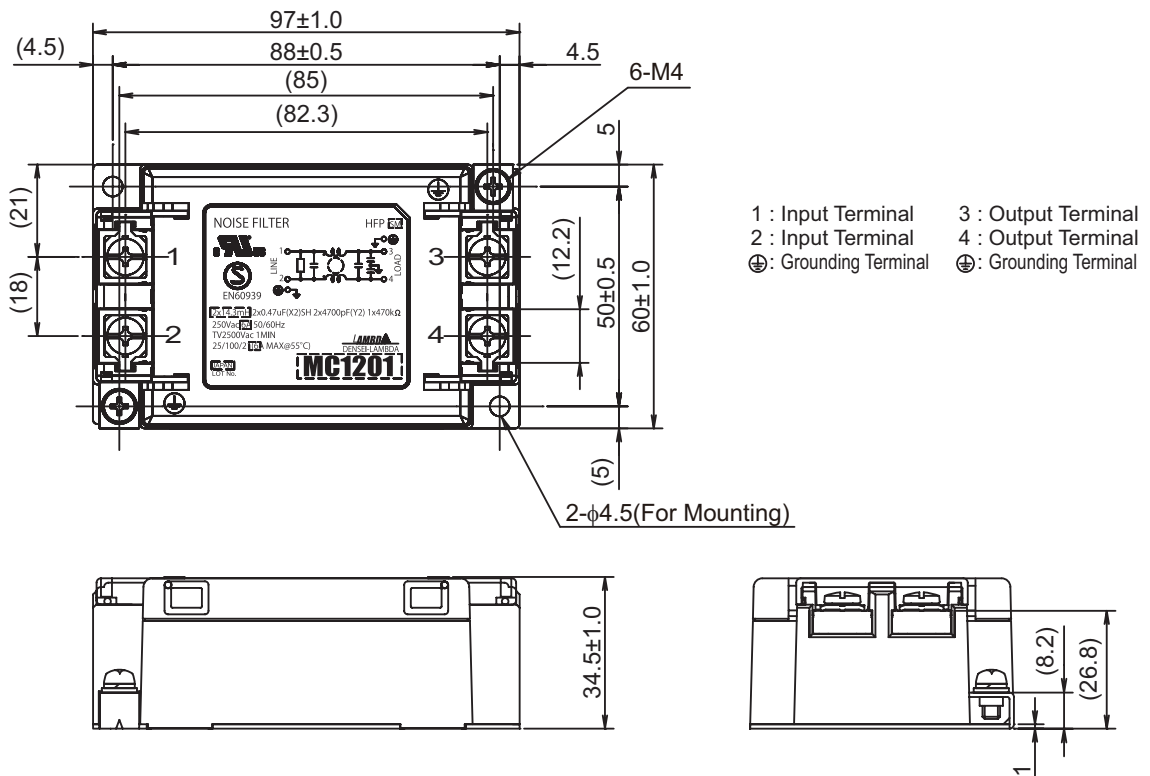
Supplier : TDK-Lambda Corporation



## 1.7.7 Noise Filter (3)

Model : MC1220  
MN1210

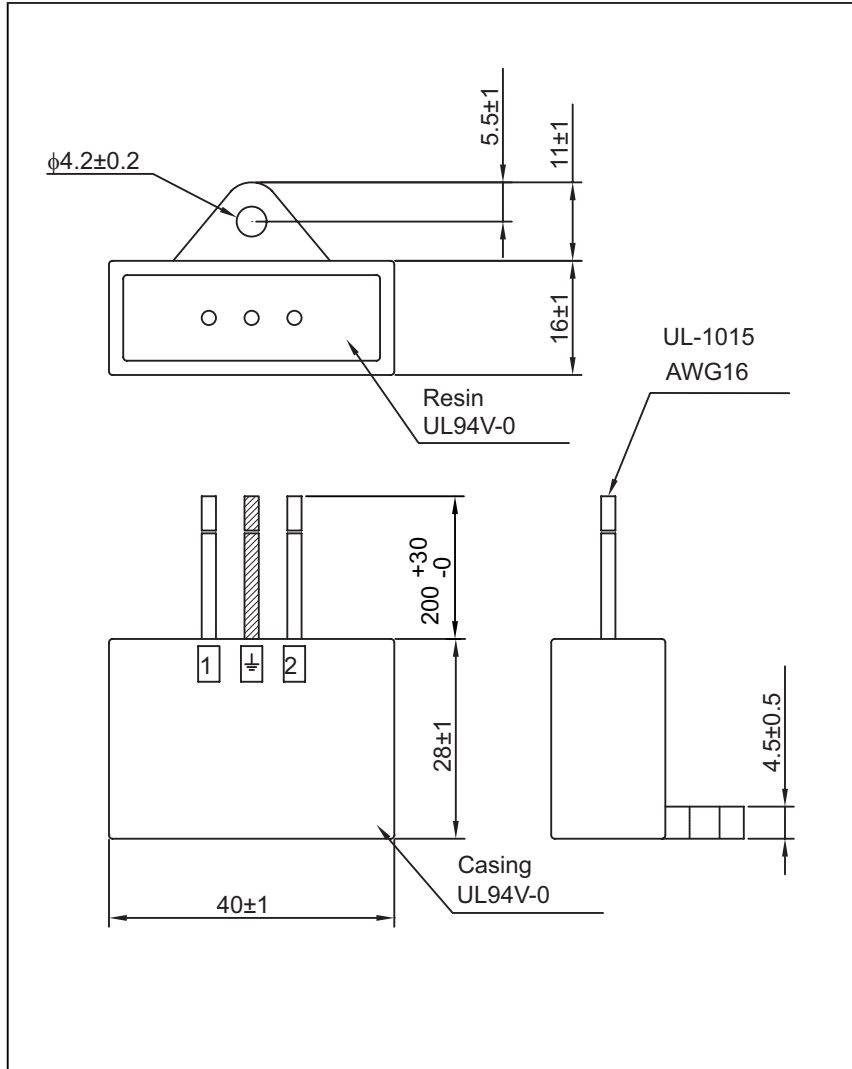
Supplier : TDK-Lambda Corporation



## 1.7.8 Surge Protector (1)

Model : R•A•V-781BWZ-2A

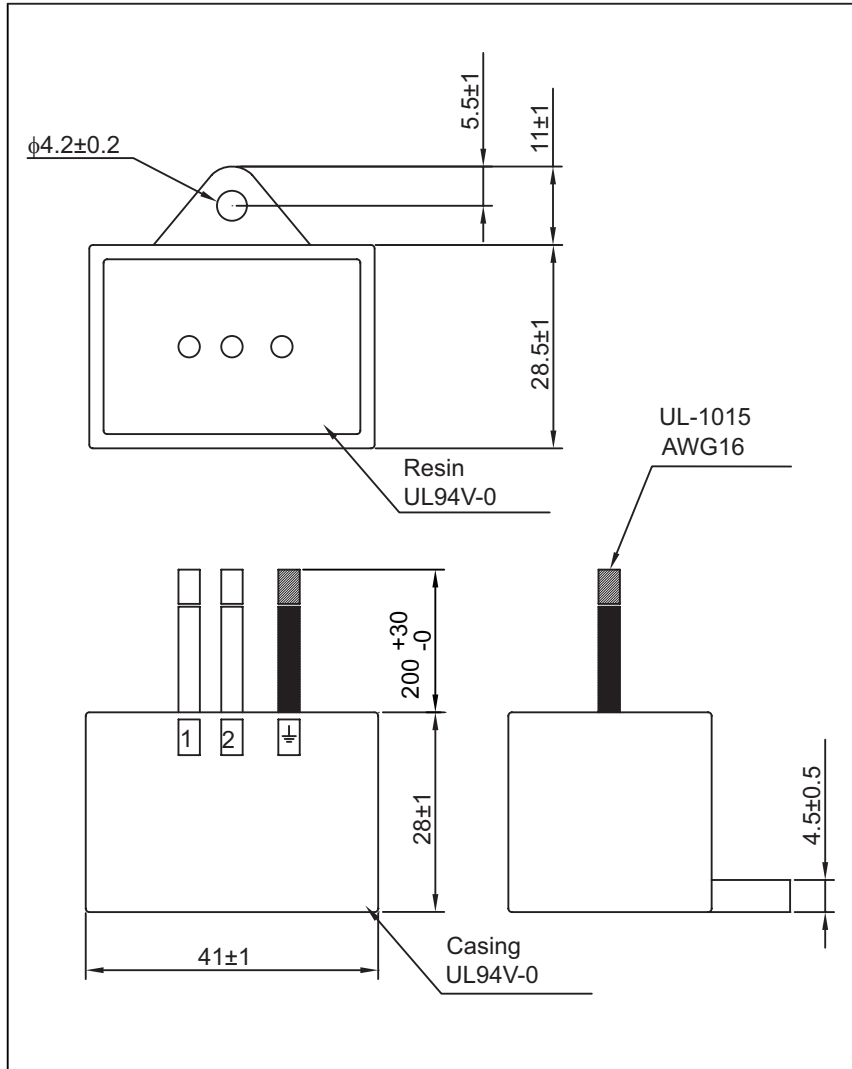
Supplier : OKAYA Electric Industries Co., Ltd.



## 1.7.9 Surge Protector (2)

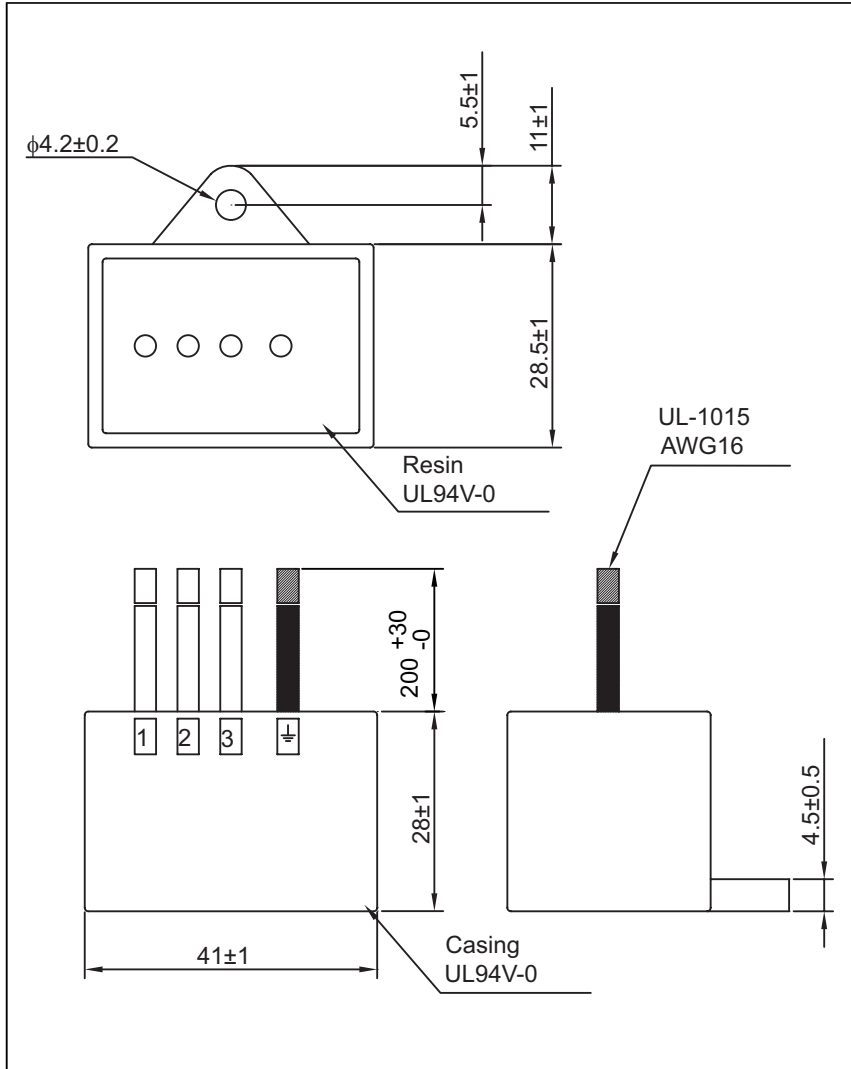
Model : R•A•V-781BWZ-4

Supplier : OKAYA Electric Industries Co., Ltd.



## 1.7.10 Surge Protector (3)

Model : R•A•V-781BXZ-4 (3-phase) Supplier : OKAYA Electric Industries Co., Ltd.





## 1.8 Protection Equipment to Ensure Safety

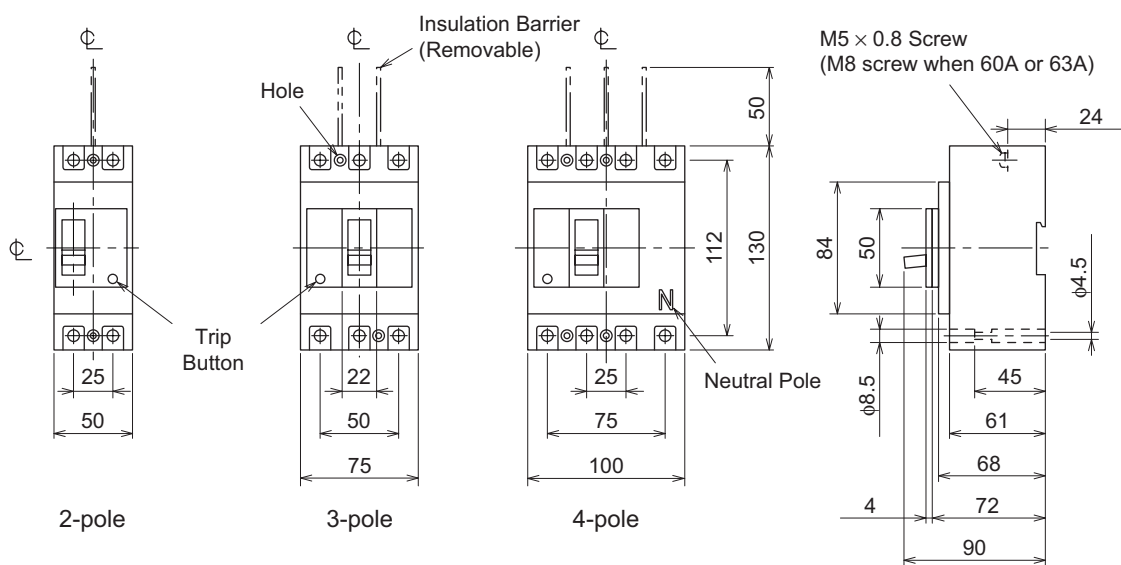
It is the safety equipment used to each model to ensure the safety.

If the input is 100V/200V AC single phase, 2-pole type is also available. (In the circuit sample in Section 1.6, 3P (3-pole) type is shown.)

### 1.8.1 No Fuse Breaker (Circuit Breaker)

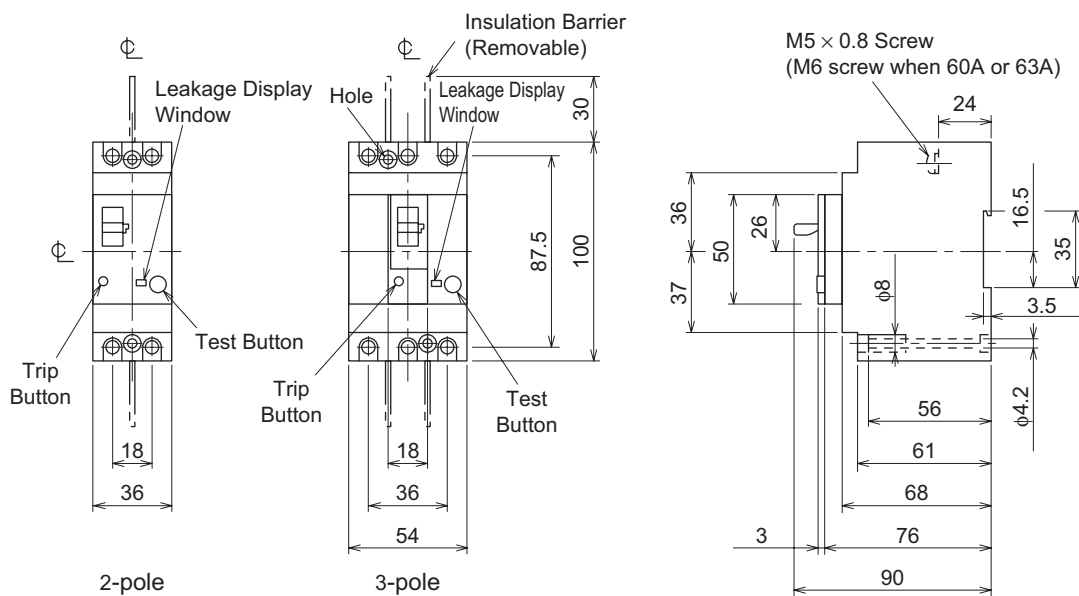
Model : NF32-SV-3P-7.5A 3P : 3-pole

Supplier : Mitsubishi Electric Corporation



## 1.8.2 Earth Leakage Breaker

Model : NV32-SV(F)-3P-MB-AC100-200V-15mA-CE 3P : 3-pole  
 Supplier : Mitsubishi Electric Corporation



## 2. UL Standards

Underwriters Laboratories Inc. (UL) is a not-for-profit organization founded by the National Fire Protection Association in the U.S. in 1894, to have research, test and inspection to protect people's lives and properties from a fire, disaster, theft and other considerable accidents.

UL Standards is the product safety standards related to functionality and safety of products, and the products that passed the evaluation test are allowed to be released to the market with the UL certification mark attached on.

The UL mark shown on a product proves that UL has tested and evaluated on the product, and has certified it meets the conformity to the requirements provided by UL.

In the recognized component directory called "Yellow Book", the registrants, names of materials, ratings and displayed marks for the recognized components subject to components and materials are listed with file numbers.

Please note that using a product registered in the Yellow Book as a part of the final product would not make the final product certified as a UL product.

In IAI products, some of them are certified by the UL standards as shown in the list in the top pages of this manual. Contact us for more detailed information.

## Change History

Revision Date	Description of Revision
2011.05	New Release
2011.10	<p>Second edition</p> <p>Cover : "Original" added</p> <p>Please Read Before Use : Product intended function added</p> <p>Section 1.1 : compliable standards revised</p> <p>Section 1 and others : ISB Series added to descriptions</p> <p>Section 1.2 : Environment separated into 1. Use Environment, 2. Installation Environment and 3. Storage Environment</p> <p>Section 1.3 : Description of required space added to maintenance inspection</p> <p>Section 1.6 : 1)Table showing actuator to be combined with controller added 2)Wire diameter added to ground wiring 3)Change from D type grounding to protective grounding (protective earth) 4)Note added regarding the use of complied circuit breaker and leakage breaker for protection equipment and safety insulated ones for 24V power supply 5)ERC2 wiring added</p> <p>Corresponding model added</p>
2011.12	<p>Third edition</p> <p>Actions That IAI is Taking for Safety Compliances added</p>





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