

東横化学

TOYOKO KAGAKU CO., LTD.

Kawasaki, Kanagawa, Japan

Enable Quick Alarm of Liquid Leak at Every Industrial Field Site, even Ultra-DI Water, with Lower Cost, Easier Setting-up and Helps for Better Reliable Alert System

CE Mark Compliance



UL Recognized Products



EU-RoHS Compliance

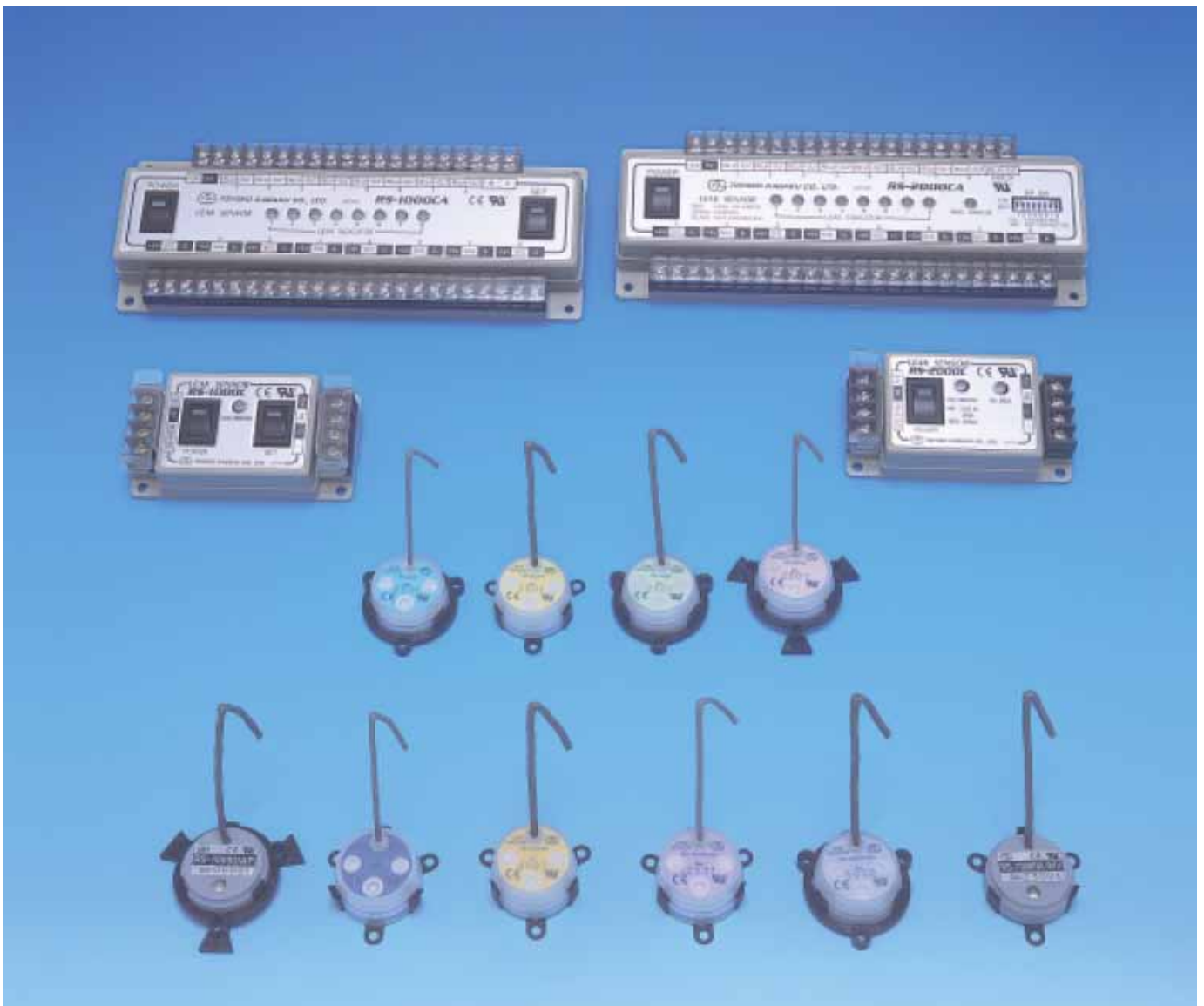


Leak Sensor

RS-1000

RS-2000

Series



Leak Sensor

RS-1000

RS-2000

Product Profiles

Detecting Liquid Leakage with photo-electronics

Easy installing, setting and resetting

No adjustment depend on the kind of liquid

RS2000 has diagnostic function for wiring failure.

RS-1000/2000 series are including plenty of sensing device groups which have been designed for detecting the liquid leakage immediately with the photo electronics technology.

Because of the conventional reliable method of photo electronic technique, the sensor product groups have specific function of leak detection for almost all existing liquids, without any complicated work of pre-adjustment for each application.

Easy setting and resetting process is another strong point of products' features, while the how-to-use of the product is very simple, very compact in size, and they are followed by the most attractive point of very low cost for all application systems.

For another excellent feature of RS-2000 series, it provides the safety feature known as "fail-safe" concept, or "diagnostic function"; such as detecting and alarming the failure of wire cut, short circuit, power failure caused by the electrical problems, and by the physical problem such as wrong positioned sensor unit, etc. too.

We are very much pleased to provide our reliable and excellent product which can help your safety designing system and your feeling ease all the time long while you are at home and relax.

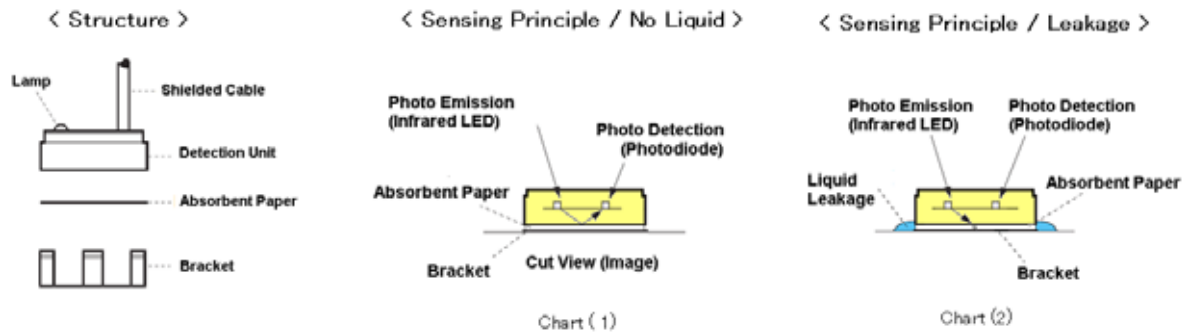
RS-1000 SERIES, Combination Type, Standard

BASIC STRUCTURE AND DETECTION PRINCIPLES

The detection unit consists of an infrared LED, photodiode, absorbent paper and a bracket (The no-paper use type does not use an absorbent paper).

At the Normal Status, the infrared light is reflected off the surface of the white absorbent paper back to the photodiode Chart (1). When a leak occurs, the absorbent paper absorbs the leaking liquid getting its color to be transparent, as it becomes wet, namely the paper passes the light through it to the other side of the paper.

As a result, the reflecting light energy of infrared light shrinks less than that is reflected when the paper color is white before wet. The photodiode converts the both of light energy by electric potential energy to deliver into the circuit. Then the sensor can process such change of electric potential by the liquid detection status for making the alert.(2).



MODEL REFERENCE

Detection Units	Combination Type		Standalone Type	Combination Type Fail-Safe Concept
	Standard			
For General Liquid.....	RS-1000D	.....	RS-1000DA-24V	..... RS-2000D
*(Paperless Sensor).....	RS-1000PN	.....	RS-1000DAP	..... RS-2000DP
For General Liquid.....	RS-1000P	.....	RS-1000PA-24V	..... RS-2000P
*(Paperless Sensor)	RS-1000PP	.....	RS-1000PAP	..... RS-2000PP
For Corrosive Acid, etc.....	RS-1000F	.....	RS-1000FA-24V	..... RS-2000F
*(Paperless Sensor)	RS-1000FP	.....	RS-1000FAP	..... RS-2000FP
	Combine Use		Independent Use	Combine Use
Control Units				
Input/Output port: 1.....	RS-1000C	.....	N/A	..... RS-2000C
Input/Output port: 8.....	RS-1000CA	.....	N/A	..... RS-2000CA
<p>**Paperless Sensor" can be used without absorbent paper. These models are prepared for certain application, which is not convenient to maintain the paper replacing. Still, the absorbent paper is good for detecting the liquid very quick by a fine bit of a drip of the liquid. You can choice either sensor configuration from the above listed products to fit with your conditions and application.</p>				
Brackets	Absorbent Paper			
Stainless steel bracket.....	Clean Paper P/N-6411(-R)			
PVC Bracket with 3mm diameter screw holes	P/N-6418			
PVC Bracket with 4mm diameter screw holes	P/N-6419			
Exclusive use with RS-1000PN	P/N-6414			
SST bracket for Paperless sensor (except RS-1000PN).....	P/N-6416			
PVC Bracket for Paperless sensor (except RS-1000PN).....	P/N-6420B			

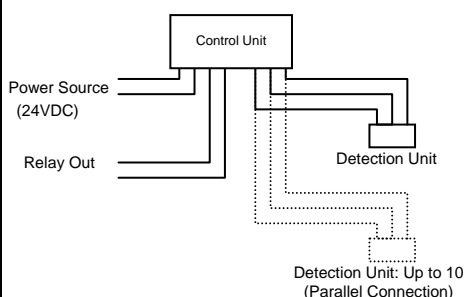
RS-1000 SERIES, Combination Type, Standard

SYSTEM CONFIGURATION

The RS-1000 series leak sensor has the combination type of models they are consisted with the Control Unit and the Detection Unit. The Control Unit of RS-1000 series has two different models by the number of input/output.

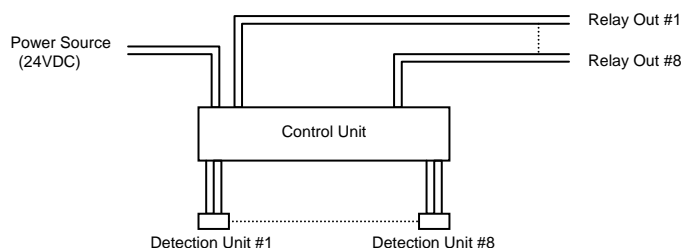
RS-1000C

A maximum of 10 Detection Units can be connected to one input terminal at a time in a Control Unit. One output is provided by a relay contact, single pole.



RS-1000CA

A maximum of 8 Detection Units can be connected to 8 independent input terminals individually. 8 independent outputs are provided, and each is allotted to an individual input.



SPECIFICATIONS

Control Unit

	RS-1000C	RS-1000CA
Input Voltage	24VDC \pm 10%	
Power Consumption	150mA below	200mA below
Light of Leak Indicator (Red)	On: Leakage Alarm Off: Normal Status	
Relay Contact Output *	Normally open x 1 pole	Normally Open x 8 poles, independent
Ambient Temperature	-10 ~ 60 deg C (14 ~ 140 deg F)	
Capacity of Relay Contact (Max)	24VDC, 1A (resistance load)	
Case Material	ABS Resin	
Weight	90g	300g

*NC contact is available for RS-1000C and RS-1000CA, when the ordering designation code is followed by -NC after the above model number. e.g. RS-1000C-NC, RS-1000CA-NC.)

Detection Unit

	RS-1000D	RS-1000F	RS-1000P	RS-1000PN	RS-1000FP	RS-1000PP	
Supply Voltage	5VDC \pm 5%						
Power Consumption	20mA below						
Indication LED (Red/ Green)	Red: Leakage Alarm, Green: Normal Status						
Ambient Temperature	-10 ~ 60 deg C (14 ~ 140 deg F)						
Connection with Control Unit	All Detection Unit must be used with RS-1000C or RS-1000CA Control Unit.						
Material	Case	PVC	PFA	PP	PVC	PFA	PP
	Cable	HT-PVC	FEP	HT-PVC	HT-PVC	FEP	HT-PVC
	LED Lamp	Epoxy (exposed)	Epoxy (embedded)		Epoxy (exposed)	Epoxy (embedded)	
Water Protect	Silicon Stuffed	Sealed, Silicon Stuffed		Silicon Stuffed	Sealed, Silicon Stuffed		
Weight	40g	55g		40g	55g		
Absorbent Paper	Required				Not Required		
Selectable Bracket	P/N-6417, P/N-6418, P/N-6419			P/N-6414	P/N-6416, P/N-6420B		

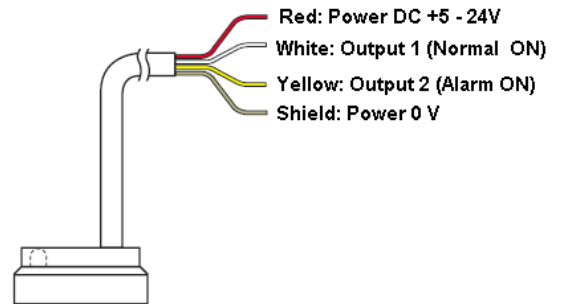
*RS-1000P Detector can be supplied with the teflon cable in stead of PVC cable per request. The Model is RS-1000P-FC-6417 provided with the Bracket P/N-6417. All the features of the sensor are quite the same as RS-1000P with PVC cable.

*Please refer the next page for specification of the Bracket and the Absorbent Paper.

RS-1000 SERIES, Standalone Detection Unit

WIRING INSTRUCTION

- Generally 3-core shielded cable is supplied with the Body.
Connect the correct power source to Red line and Shield.
- Avoid wrong wiring for the polarity of DC power. Red line for PLUS polarity, and Shield for MINUS.
 - Keep the load current not exceeding 50mA. Unless, the output circuit of Sensor may be damaged.
 - When you apply an inductive load, add a diode into output connection in parallel configuration in order to limit the back electromotive voltage for protecting the circuit.



SPECIFICATIONS

		RS-1000DA -24V	RS-1000FA -24V	RS-1000PA -24V	RS-1000DAP	RS-1000FAP	RS-1000PAP
Supply Voltage		5VDC(-5%) to 24VDC(+5%)					
Power Consumption		20mA below					
Indication of LED		Red: Leakage Green: Normal					
Output		NPN Transistor Open Collector 50mA, 2 opposite signals					
Ambient Temp		-10 ~ 60 deg C (14 ~ 140 deg F)					
Material	Case	PVC	PFA	PP	PVC	PFA	PP
	Cable	HT-PVC	FEP	HT-PVC	HT-PVC	FEP	HT-PVC
	Lamp	Epoxy (exposed)	Epoxy (embedded)		Epoxy (exposed)	Epoxy (embedded)	
Water Protect		Silicon Stuffed	Sealed, Silicon Stuffed		Silicon Stuffed	Sealed, Silicon Stuffed	
Weight		45g	55g		45g	55g	
Absorbent Paper		Required			Not Required		
Selectable Bracket		P/N-6417, P/N-6418, P/N-6419			P/N-6416, P/N-6420B		

ACCESSORIES

Bracket

	P/N-6417	P/N-6418	P/N-6419	P/N-6414	P/N-6416	P/N-6420B
Material	SUS301	PVC	PVC	SUS301	SUS301	PVC
Remarks	Nickel Plated	3mm Diameter Screw Holes	4mm Diameter Screw Holes	RS-1000PN Use only	For Paperless sensors, except RS-1000PN	

Absorbent Paper

		P/N-6411(-R)
Material	Clean Paper	
Remarks	Content: 100 pieces in a pack. Supplied for a spare stock. (10 pieces are supplied with each detection unit.)	

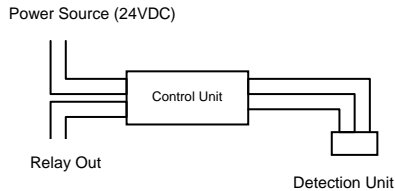
RS-2000 SERIES, Combination Type, Detectable Failure

SYSTEM CONFIGURATION

The RS-2000 series leak sensor consists of the Control Unit and the Detection Unit that has RS-2000 designation.

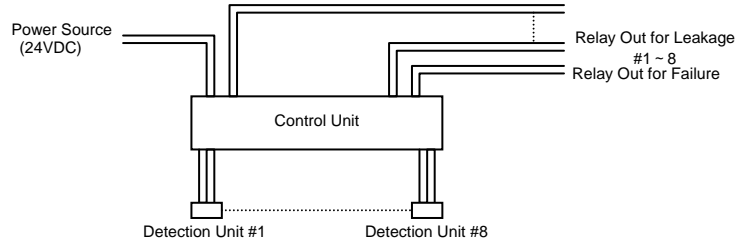
RS-2000C

A Control Unit operates one Detection Unit. It has a relay contact that works when Leakage has occurred.



RS-2000CA

A Control Unit allows connecting up to 8 Detection Units to each individual terminal separately. It has 8 relay outputs corresponding to each Detection Unit and another relay output that alarms on Failure.



NOTE: The RS-2000 series control unit does not allow connecting 2 or more Detection Units to one terminal by parallel connection.

SPECIFICATIONS

Control Unit

		RS-2000C	RS-2000CA
Input Voltage		24VDC \pm 10%	
Power Consumption		100mA below	200mA below
Leak Indicator	LED for Leakage	Red: Leakage, Failure	Green: Normal Off: Power Outage
	LED for Failure	Red: Failure	Off: Normal
Discriminative Detection		Yes	
Ambient Temp.		-10 ~ 60 deg C (14 ~ 140 deg F)	
Number of Input for Detection Unit		1	8
Max Detection Unit per Input		1	
Relay Contact Outputs	Numbers	1	9 (8 for Leakage 1 for Failure)
	Capacity	24VDC 1A (resistance load)	
	Status	Normal: Close	Leakage/Failure Alarm: Open Power Outage: Open
Case Material		ABS Polymer	
Weight		100g	330g

Detection Unit

		RS-2000D	RS-2000F	RS-2000P	RS-2000DP	RS-2000FP	RS-2000PP	
Supply Voltage		5VDC \pm 5%						
Power Consumption		20mA below						
Indication of LED		Red: Leakage Green: Normal Off: Failure						
Connection with Control Unit		All Detection Unit must be used with RS-2000C or RS-2000CA Control Unit.						
Ambient Temp.		-10 ~ 60 deg C (14 ~ 140 deg F)						
Material	Case	PVC	PFA	PP	PVC	PFA	PP	
	Cable	HT-PVC	FEP	HT-PVC	HT-PVC	FEP	HT-PVC	
	LED Lamp	Epoxy (exposed)	Epoxy (embedded)		Epoxy (exposed)	Epoxy (embedded)		
Water Protect		Silicon Stuffed	Sealed, Silicon Stuffed		Silicon Stuffed	Sealed, Silicon Stuffed		
Weight		40g	55g		40g	55g		
Absorbent Paper		Required				Not Required		
Selectable Bracket		P/N-6417, P/N-6418, P/N-6419				P/N-6416, P/N-6420B		

Please refer the next page for more details for the condition of the LED and Relay Contacts.

RS-2000 SERIES, Combination Type, Detectable Failure

THE ADDITIONAL FEATURES ON RS-2000 SERIES

RS-2000 has unique features that can detect any failure listed below.

- 1) Improper wiring between Control Unit and Detection Unit
- 2) Power outage of Control Unit
- 3) Broken wiring connected with Control Unit (7 different wiring should be connected with Control Unit.)
- 4) Power outage of Detection Unit
- 5) Decline of the IR LED inside the Detection Unit

RS-2000 series detects above failure and alarms by relay out when any failure has occurred. RS-2000 has second LED that indicates "Failure" to alarm failure status as above other than leakage alarm. In order that, RS-2000CA has second Relay Contact that works only when failure (except leakage) has occurred. In case of RS-2000CA, it is available to design the system that distinguishes between leakage and failure automatically.

Please note that RS-2000CA has a Dip Switch that disables detecting circuit to prevent un-required alarm when the number of using Detection Units is below 8. Please refer the Operation Manual for the details of the Dip Switch.

DESCRIPTIONS of the STATUS of LED & RELAY CONTACTS

RS-2000CA

				LED on	LED on Control Unit		Relay Out	
				Detection Unit	for Leakage	for Failure	for Leakage	for Failure
Normal Condition				Green	Green	Off	Close	Close
Leak Condition				Red	Red	Off	Open	Close
Dip switch Off				N/C	Off	Off	Open	Close
Improper Wiring of Detection Unit				Depending on situation	Red	Red	Open	Open
Broken Wiring on Power Line				Off	Off	Off	Open	Open
Broken Wiring of Relay Out				Green	Green	Off	See NOTE below.	
Broken Wiring of Detection Unit								
Broken Wiring	+5V			Off	Red	Red	Open	Open
		SIG		Green	Red	Red	Open	Open
			GND	Off	Red	Red	Open	Open
	+5V	SIG		Off	Red	Red	Open	Open
		SIG	GND	Off	Red	Red	Open	Open
	+5V	SIG	GND	Off	Red	Red	Open	Open
Short Circuit on Detection Unit								
Short Circuit	+5V	SIG		Green	Red	Red	Open	Open
		SIG	GND	Green	Red	Red	Open	Open
	+5V		GND	Off	Red	Red	Open	Open
	+5V	SIG	GND	Off	Red	Red	Open	Open
Power Outage of Control Unit				Off	Off	Off	Open	Open
Power Outage of Detection Unit				Off	Red	Red	Open	Open
Decline of the IR LED				Red	Red	Off	Open	Close

RS-2000C

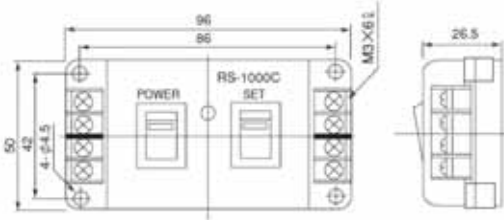
				LED on	LED on Control Unit		Relay Out	
				Detection Unit	for Leakage	for Failure	for Leakage	
Normal Condition				Green	Green	Off	Close	
Leak Condition				Red	Red	Off	Open	
Improper Wiring of Detection Unit				Depending on situation	Red	Red	Open	
Breaking Wiring on Power Line				Off	Off	Off	Open	
Breaking Wiring of Relay Out				Green	Green	Off	See NOTE below.	
Breaking Wiring of Detection Unit								
Break Wiring	+5V			Off	Red	Red	Open	
		SIG		Green	Red	Red	Open	
			GND	Off	Red	Red	Open	
	+5V	SIG		Off	Red	Red	Open	
		SIG	GND	Off	Red	Red	Open	
	+5V	SIG	GND	Off	Red	Red	Open	
Short Circuit on Detection Unit								
Short Circuit	+5V	SIG		Green	Red	Red	Open	
		SIG	GND	Green	Red	Red	Open	
	+5V		GND	Off	Red	Red	Open	
	+5V	SIG	GND	Off	Red	Red	Open	
Power Outage of Control Unit				Off	Off	Off	Open	
Power Outage of Detection Unit				Off	Red	Red	Open	
Decline of the IR LED				Red	Red	Off	Open	

NOTE: When the wiring for relay out gets broken, it will be noticed by cutoff of the loop for the relay out, though relay does not work. However, when there is short circuit on the wiring for relay out, it is impossible to be noticed by this sensor system.

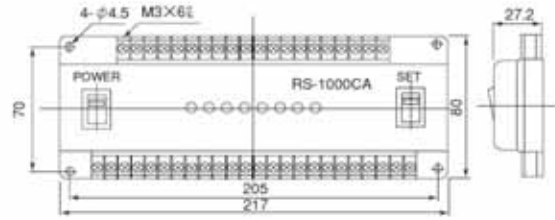
DIMENSIONS

Control Unit

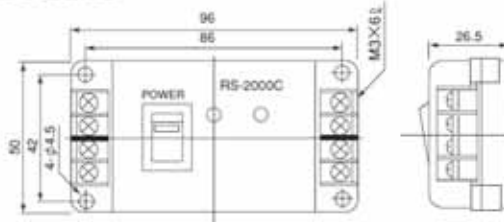
RS-1000C / RS-1000C-NC



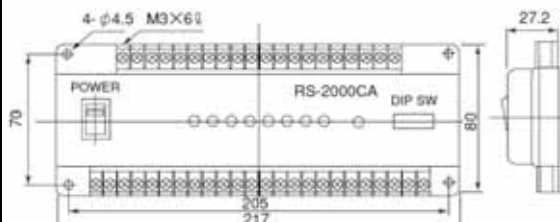
RS-1000CA / RS-1000CA-NC



RS-2000C

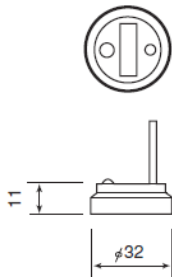


RS-2000CA

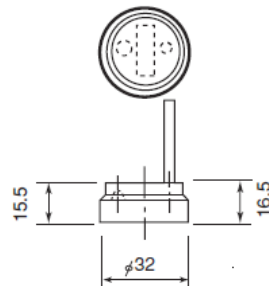


Detection Unit

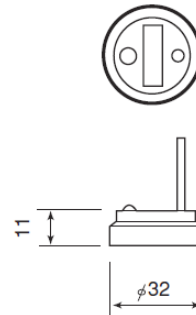
RS-1000D, RS-2000D, RS-2000DP
 -----2-Core Shield Cable (2m)
 RS-1000DA, RS-1000DAP
 -----3-Core Shield Cable (2m)



RS-1000F, RS-1000P, RS-1000FP
 RS-2000F, RS-2000P, RS-2000FP,
 RS-2000PP --- 2-Core Shield Cable (2m)
 RS-1000FA, RS-1000FAP, RS-1000PA,
 RS-1000PAP--- 3-Core Shield Cable (1.5m)

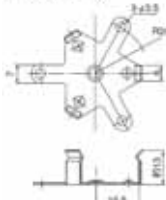


RS-1000PN ----- 2-Core Shield Cable (2m)



Bracket

P/N-6417



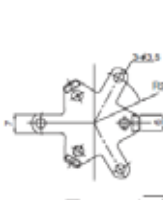
P/N-6418



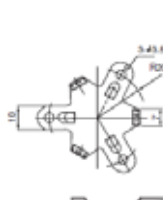
P/N-6419



P/N-6414



P/N-6416



P/N-6420B



TOYOKO KAGAKU CO., LTD.

370 Ichinotsubo, Nakahara-Ku, Kawasaki City, Kanagawa Pref. 211-8502 Japan
 TEL: +81-44-435-5860 FAX: +81-44-434-9091
 URL: <http://www.toyokokagaku.co.jp>