

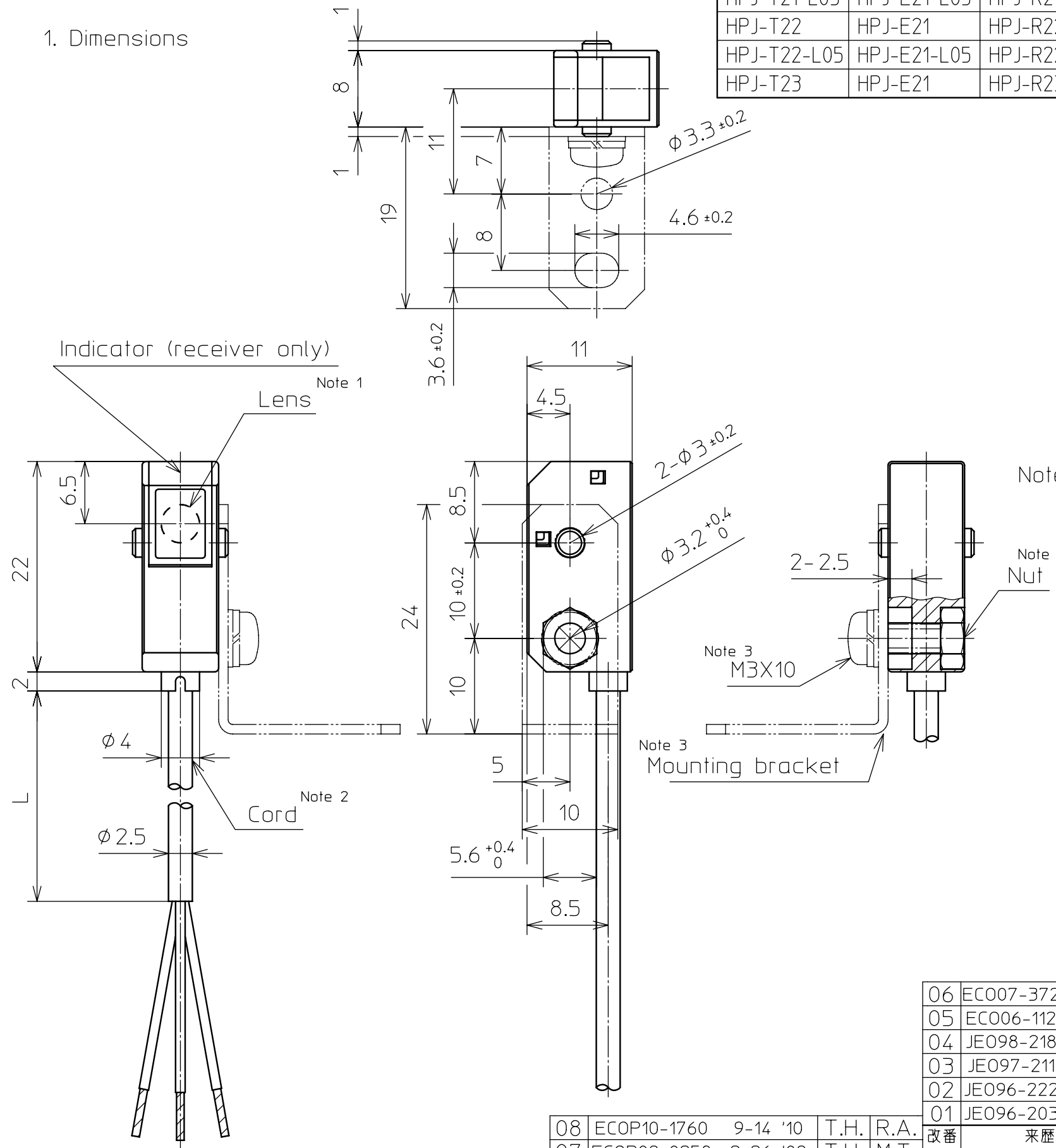
SR. No.
800-8-141-0

Yamatake Corporation

製品仕様書
SPECIFICATIONS

Through scan			Output mode	Operating mode	Cord length (L)
Set	Emitter	Receiver			
HPJ-T21	HPJ-E21	HPJ-R21	Open collector of NPN transistor	Dark on	2000 min.
HPJ-T21-L05	HPJ-E21-L05	HPJ-R21-L05	Open collector of NPN transistor	Dark on	5000 min.
HPJ-T22	HPJ-E21	HPJ-R22	Open collector of PNP transistor	Dark on	2000 min.
HPJ-T22-L05	HPJ-E21-L05	HPJ-R22-L05	Open collector of PNP transistor	Dark on	5000 min.
HPJ-T23	HPJ-E21	HPJ-R23	Open collector of NPN transistor	Light on	2000 min.

1. Dimensions



- Note 1. Lens diameter : φ4
 2. Cord
 0.1mm² (19/0.08)
 Color: gray (receiver)
 Black (emitter)
 3. Mounting bracket, screw and nut are included.
 4. Material
 Case : PC / ABS alloy / black
 Lens : PC / clear orange
 Mounting bracket : Al t1
 5. Tightening torque
 Recommended tightening torque is less than 0.5N·m with our standard bracket set "HPJ-B02".
 Tolerable tightening torque varies depending on the material and the surface condition of brackets and the screws used.
 Please check beforehand in an actual combination.

Angular	Linear				
~	≤3	≤6	≤30	≤120	
±2.0'	±0.2	±0.3	±0.5	±0.8	

06	EC007-3729	1-9 '08	T.H.	M.T.
05	EC006-1120	12-1 '05	Y.N.	M.T.
04	JE098-2188	12-4 '98	Y.N.	T.N.
03	JE097-2116	4-10-'97	T.K.	T.N.
02	JE096-2229	9-30-'96	T.K.	T.N.
01	JE096-2038	2-21-'96	T.K.	T.N.

作成DR. T.Koike 9-5-'95	検図CHK. T.Nakao 9-5-'95	認可APPD S.Nonaka 9-5-'95	日付DATE	形番 MODEL	HPJ series
尺度SCALE 2:1				名称 NAME	Photoelectric switch
図番 NO.				AD41451E	改番REV. 08

08	ECOP10-1760	9-14 '10	T.H.	R.A.
07	ECOP09-0258	2-26 '09	T.H.	M.T.

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2. Specifications

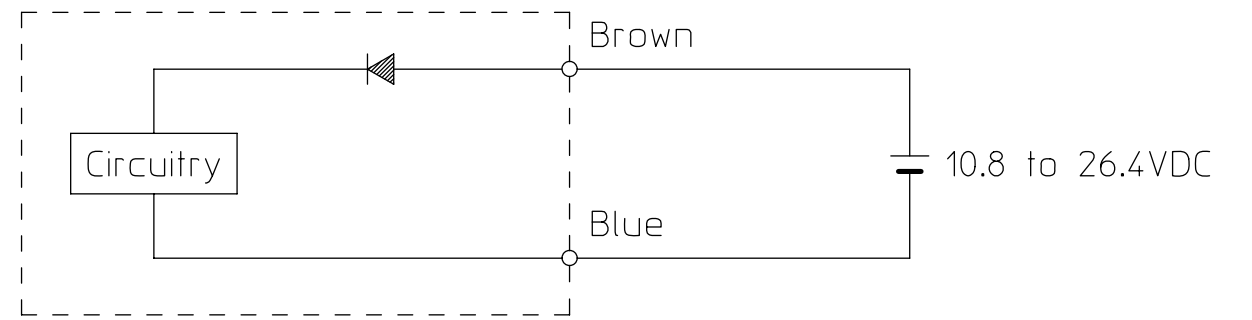
	Specification		
Catalog listing	Set : HPJ-T21(-L05) Emitter : HPJ-E21(-L05) Receiver: HPJ-R21(-L05)	Set : HPJ-T22(-L05) Emitter : HPJ-E21(-L05) Receiver: HPJ-R22(-L05)	Set : HPJ-T23 Emitter : HPJ-E21 Receiver: HPJ-R23
Scanning type	Through scan		
Supply voltage	10.8 to 26.4VDC(ripple 10%max.)		
Current consumption	40mA max.(emitter:20mA max., receiver:20mA max.)		
Scanning distance	1.5m		
Target	Opaque materials more than 4mm dia.		
Operating angle	3 to 30°		
Output mode	Open collector of NPN transistor	Open collector of PNP transistor	Open collector of NPN transistor
Operating mode	Dark on		Light on
Output	Load current : 80mA max.(resistive load) Saturation voltage : 1V max.(at 80mA load current) Output withstand voltage : 26.4V		
Response time	1ms max.		
False pulse(after power on)	1ms max.		
Light source	Infrared LED		
Indicator	Red 'on' with output on		
Ambient light	Incandescent light : 3000lx max. Sunlight : 10000lx max.		
Operating temperature	-20 to +50℃(without condensation)		
Operating humidity	35 to 85%RH(without condensation)		
Storage temperature	-40 to +70℃(without condensation)		
Storage humidity	35 to 85%RH(without condensation)		
Insulation resistance	20MΩ min.(at 500VDC)		
Dielectric strength	1000VAC 50/60Hz 1 minute (between live parts and enclosure)		
Vibration	10 to 55Hz 1.5mm double amplitude 2 hours in each direction of X,Y,Z		
Shock	500m/s ² 3 times in each direction of X,Y,Z		
Sealing	IP40 (IEC standard)		
Mass	Approx. 20g(only sensor with cord 2m)		
Protection	Reverse polarity protection		
EMC: EMC Directive (2004/108/EC), Applied harmonized standard: EN60947-5-2:2007			
EMS (Electromagnetic susceptibility)			
Electro discharge	Contact:Level1 (2kV), Air:Level1 (2kV) (EN61000-4-2:2009) Note1		
Radiated RF electromagnetic fields	Level3 (10V/m : 80MHz to 1GHz) Level2 (3V/m : 1.4GHz to 2GHz) (EN61000-4-3:2006+A1:2008+A2:2010)		
Electrical fast transients	DC power ports:Level3 (2kV / 5kHz), Signal ports:Level4 (2kV / 5kHz) (EN61000-4-4:2004)		
Conducted disturbances induced by RF fields	Level3 (10V : 150kHz to 80MHz) (EN61000-4-6:2009)		
EMI (Electromagnetic interference)			
Emission	Group1 ClassA (EN55011:2007+A2:2007)		

Note 1 ESD immunity level does not satisfy the requirements of harmonized standard.
Please take adequate measures such as wrist band when HPJ Series is touched.

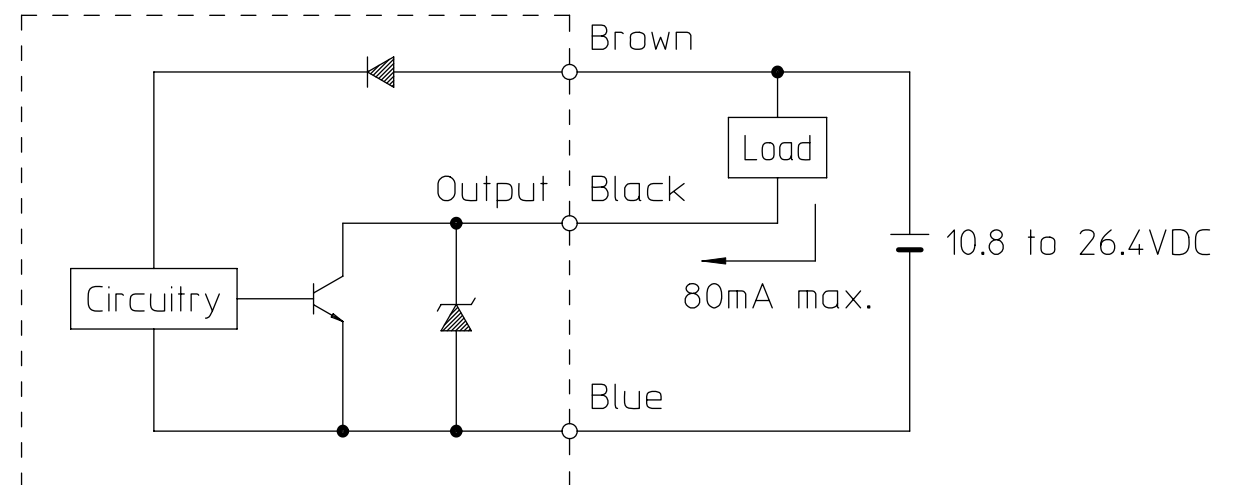
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3. Connection

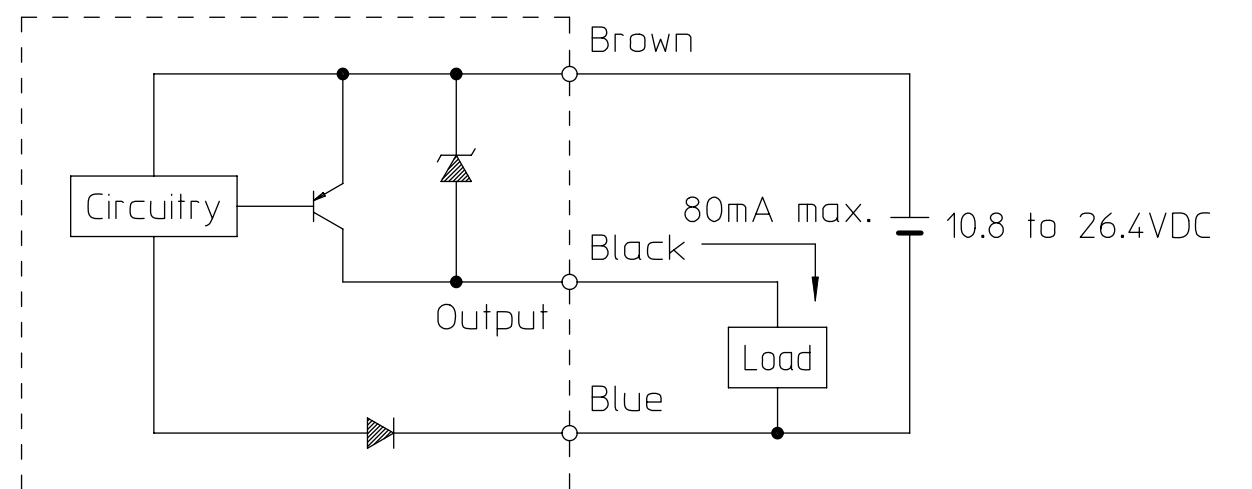
Emitter (HPJ-E21(-L05))



Receiver (HPJ-R21(-L05),-R23)



Receiver (HPJ-R22(-L05))



06	~	~	~	作成DR. K.TSUTSUI 8-23-'95	⊗	尺度SCALE	記入のない公差TOL. UNLESS NOTED
05	~	~	~	検図CHK. T.NAKAO 9-5-'95	形番 MODEL	HPJ series	
04	~	~	~	認可APPD. S.NONAKA 9-5-'95	名称 NAME	Photoelectric switch	
03	~	~	~	日付DATE	図番 NO.	AD41451E	改番REV. 08
02	~	~	~	担当 BY	検閱 APPD.		2
01	~	~	~	来歴 RECORD	日付 DATE		
改番 REV.							

SR. No.

Yamatake Corporation

製品仕様書 SPECIFICATIONS

Product revision change record

	Date	Catalog listing	Product Rev. No.	Content of change
1	12-1 '05	All	01	RoHS compliance
2	1-9 '08	All	02	Cord gauge change

Product revision

The 2-digit product revision number is shown after the country of origin on the case.

Example: Made in Japan 01

Catalog listing	Product Rev. No.
HPJ-E21(-L05)	02
HPJ-R21(-L05)	02
HPJ-R22(-L05)	02
HPJ-R23	02

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06	～	～	～
05	～	～	～
改番 REV.	来歴 RECORD	: 日付 DATE	担当 検閲 BY APPD.

作成DR. Y.Naozaki 12-1 '05		尺度 SCALE ～	記入のない公差 TOL. UNLESS NOTED ～
検図CHK. M.Tanaka 12-1 '05	形番 MODEL	HPJ series	
認可APPD. H.Matsuno 12-1 '05	名称 NAME	Photoelectric switch	
日付 DATE	図番 NO.	AD41451E	改番REV. 3/08

SP.NO.

Yamatake Corporation

製品仕様書 SPECIFICATIONS

Terms and Conditions

We would like to express our appreciation for your purchase and use of Yamatake products. You are required to acknowledge and agree upon the following terms and conditions for your purchase of Yamatake products (field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1 Warranty period and warranty scope

1.1 Warranty period

Yamatake products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Yamatake product has any failure attributable to Yamatake during the aforementioned warranty period, Yamatake shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place.

Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

- (1) Failure caused by your improper use of Yamatake product
(noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
- (2) Failure caused for other reasons than Yamatake product;
- (3) Failure caused by any modification or repair made by any person other than Yamatake or Yamatake's subcontractors;
- (4) Failure caused by your use of Yamatake product in a manner not conforming to the intended usage of that product;
- (5) Failure that the state-of-the-art at the time of Yamatake's shipment did not allow Yamatake to predict; or
- (6) Failure that arose from any reason not attributable to Yamatake, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Yamatake shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Yamatake products.

2 Ascertainment of suitability

You are required to ascertain the suitability of Yamatake product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

- (1) Regulations and standards or laws that your Equipment is to comply with.
- (2) Examples of application described in any documents provided by Yamatake are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.
- (3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use

Although Yamatake is constantly making efforts to improve the quality and reliability of Yamatake products, there exists a possibility that parts and machinery may break down.

You are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, safety design, or the like so that the said Equipment may satisfy the level of the reliability and safety required in your use, whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth.

3 Precautions and restrictions on application

Yamatake products other than those explicitly specified as applicable (e.g. Yamatake Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).

Any Yamatake products shall not be used for/with medical equipment.

In addition,

you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use Yamatake product for any purposes specified in (1) through (6) below.

Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design and other designs of protection/safety circuit on your own responsibility to ensure the reliability and safety, whereby preventing problems caused by failure or nonconformity.

- (1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
- (2) For use of specific purposes, such as:
 - * Nuclear energy/radiation related facilities
[For use outside nuclear energy controlled areas]
[For use of Yamatake Limit Switch For Nuclear Energy]
 - * Machinery or equipment for space/sea bottom
 - * Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]
 - * Antidisaster/crime-prevention equipment
 - * Burning appliances
 - * Electrothermal equipment
 - * Amusement facilities

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SP.NO.		Yamatake Corporation		製品仕様書 SPECIFICATIONS		
				<p>(3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability</p> <p>(4) Facilities that are to comply with regulations of governmental/public agencies or specific industries</p> <p>(5) Machinery or equipment that may affect human lives, human bodies or properties</p> <p>(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety</p>		
		<p>4 Precautions against long-term use</p> <p>Use of Yamatake products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.</p> <p>Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Yamatake products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.</p>				
		<p>5 Recommendation for renewal</p> <p>Mechanical components, such as relays and switches, used for Yamatake products will reach the end of their life due to wear by repetitious open/close operations.</p> <p>In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.</p> <p>Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Yamatake products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.</p> <p>Field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts.</p> <p>For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.</p>				
		<p>6 Other precautions</p> <p>Prior to your use of Yamatake products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Yamatake products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.</p>				
		<p>7 Changes to specifications</p> <p>Please note that the descriptions contained in any documents provided by Yamatake are subject to change without notice for improvement or for any other reason.</p> <p>For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.</p>				
		<p>8 Discontinuance of the supply of products/parts</p> <p>Please note that the production of any Yamatake product may be discontinued without notice.</p> <p>For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts.</p> <p>For field instruments, we may not be able to undertake parts replacement for similar reasons.</p>				
		<p>9 Scope of services</p> <p>Prices of Yamatake products do not include any charges for services such as engineer dispatch service. Accordingly, a separate fee will be charged in any of the following cases:</p> <p>(1) Installation, adjustment, guidance, and attendance at a test run</p> <p>(2) Maintenance, inspection, adjustment, and repair</p> <p>(3) Technical guidance and technical education</p> <p>(4) Special test or special inspection of a product under the conditions specified by you</p> <p>Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.</p>				
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