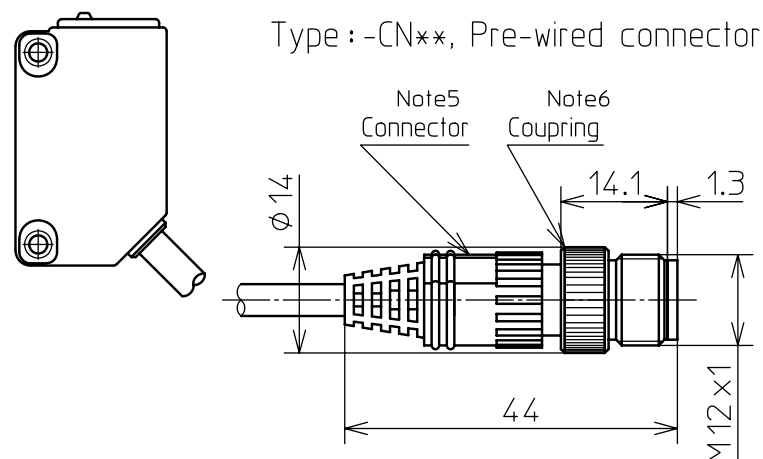
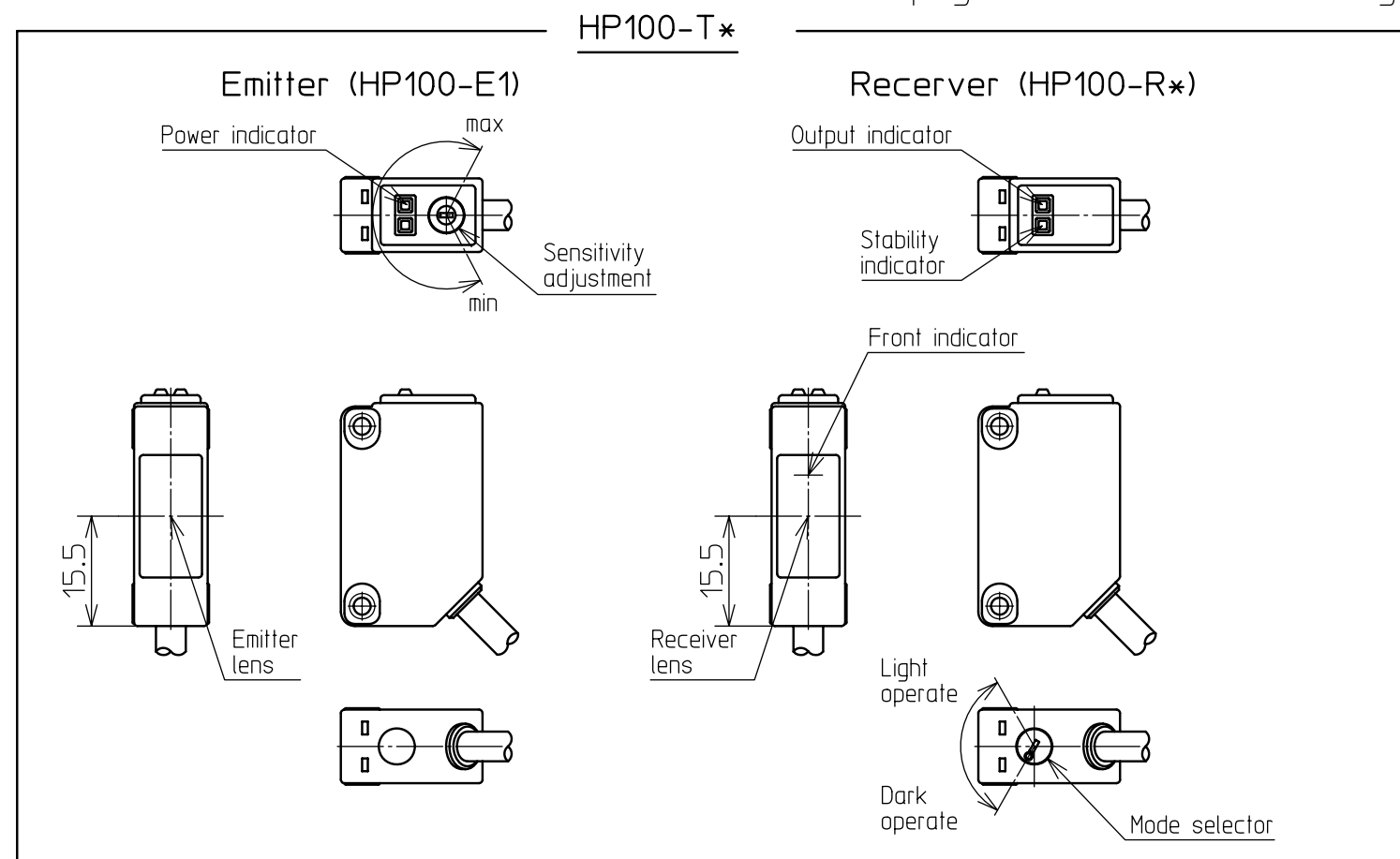
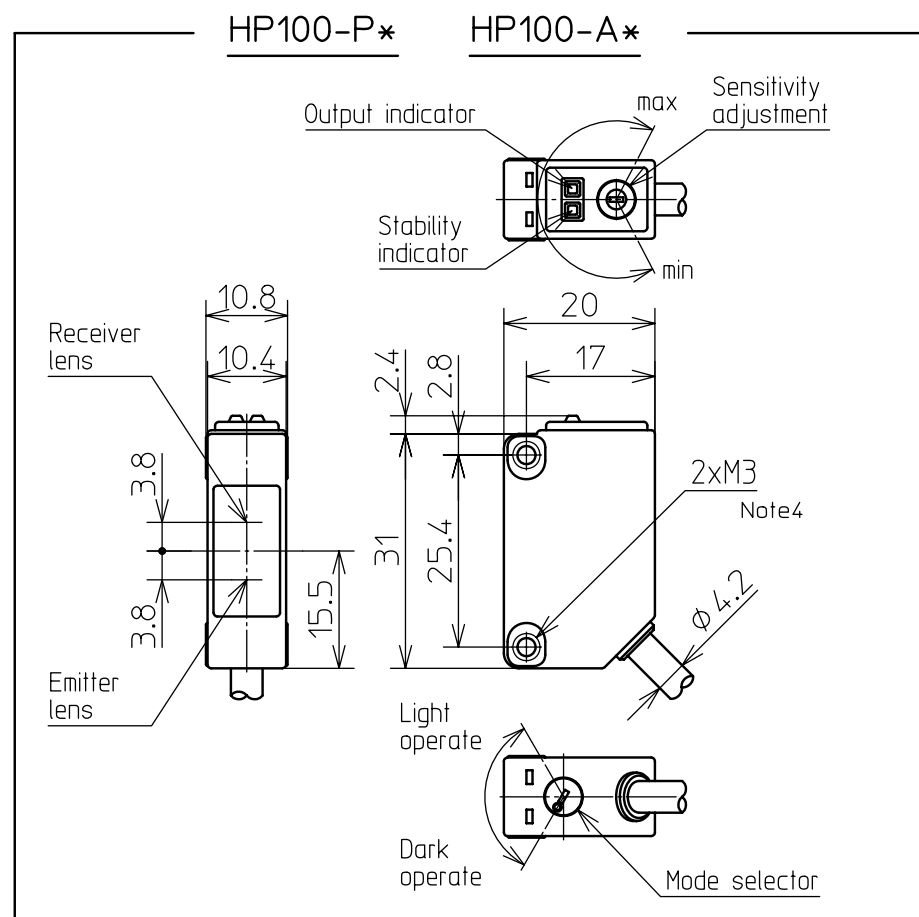


Polarized retroreflective scan	Diffuse scan	Through scan			Output
		Set	Emitter	Receiver	
HP100-P1	HP100-A1	HP100-T1	HP100-E1	HP100-R1	Open collector of NPN transistor
HP100-P2	HP100-A2	HP100-T2	HP100-E1	HP100-R2	Open collector of PNP transistor

See page2 for details of catalog listing.

DIMENSIONS



Cord length

Catalog listing	Cord length	Wiring type
HP100-**-LP5	500min	with cord
HP100-**-L05	5,000min	
HP100-**-CN03	300min	with pre-wired connector
HP100-**-CN05	500min	
HP100-**-CN1	1,000min	

- Note 1. MATERIAL (Photoelectric switch) Case: PBT resin/Black
Cover: PMMA resin
(Connector) Body: Polyester elastomer/Gray
Pin: Brass Au plated
Coupling: Brass Ni plated
2. Cord: Oil Resist 0.2mm²
Color Gray (except through scan emitter)
Black (through scan emitter only)
3. Lens diameter: $\phi 7.3$
4. Please tighten the mounting screw at the torque less than 0.5N·m.
Using the screw that enters the product more than 7mm.
5. Please use the "PA5" series (DC type) of our VA connector.
6. Screw the coupling by hand.(0.4 TO 0.6N·m)
7. UL LISTED PRODUCT
UL FILE No.E252012
ENCLOSURE TYPE 1
RATINGS POWER SUPPLY: 12/24VDC, CLASS 2
OUTPUT: I max. 100mA
MAXIMUM AMBIENT TEMPERATURE: 60°C

≤3	≤6	≤30	≤120
±0.2	±0.3	±0.5	±0.8

記入のない公差 TOL. UNLESS NOTED
REFER ABOVE TABLE FOR TOL. UNLESS NOTED.

05	ECOP10-1118	Jul.22 '10	T.Hosoi	R.Akimoto
04	EC008-1594	Jun. 4 '08	T.Koike	M.Tanaka
03	EC007-0214	Feb. 16 '07	T.Koike	T. Nakao
02	EC006-0435	Feb. 23 '06	T.Koike	T. Nakao
01	EC005-1045	Dec. 15 '05	T. Nakao	T. Koike
改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY	検閲 APPD.

作成DR. Y.Mochizuki April.28'05	検図CHK. T.Nakao May.30'05	認可APPD. S.Suzuki May.31'05	日付DATE May.31'05	図番 NO.	尺度SCALE 1:1	形番 MODEL HP100 series	名称 NAME Photoelectric switch	改番REV. 05	1/4
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SR. No.


Yamatake Corporation

製品仕様書
SPECIFICATIONS

Catalog listing

Polarized retroreflective scan	Diffuse scan	Through scan			Cord length	Wiring type	Output	Packing
		Set	Emitter	Receiver				
HP100-P1-LP5	HP100-A1-LP5	HP100-T1-LP5	HP100-E1-LP5	HP100-R1-LP5	500min.	with cord	Open collector of NPN transistor	Packing 1 unit (In case of Through scan set, Emmitter and Receiver are included)
HP100-P1	HP100-A1	HP100-T1	HP100-E1	HP100-R1	2000min.			
HP100-P1-L05	HP100-A1-L05	HP100-T1-L05	HP100-E1-L05	HP100-R1-L05	5000min.			
HP100-P2-LP5	HP100-A2-LP5	HP100-T2-LP5	HP100-E1-LP5	HP100-R2-LP5	500min.			
HP100-P2	HP100-A2	HP100-T2	HP100-E1	HP100-R2	2000min.			
HP100-P2-L05	HP100-A2-L05	HP100-T2-L05	HP100-E1-L05	HP100-R2-L05	5000min.			
HP100-P1-CN03	HP100-A1-CN03	HP100-T1-CN03	HP100-E1-CN03	HP100-R1-CN03	300min.	with pre-wired connector	Open collector of NPN transistor	
HP100-P1-CN05	HP100-A1-CN05	HP100-T1-CN05	HP100-E1-CN05	HP100-R1-CN05	500min.			
HP100-P1-CN1	HP100-A1-CN1	HP100-T1-CN1	HP100-E1-CN1	HP100-R1-CN1	1000min.			
HP100-P2-CN03	HP100-A2-CN03	HP100-T2-CN03	HP100-E1-CN03	HP100-R2-CN03	300min.			
HP100-P2-CN05	HP100-A2-CN05	HP100-T2-CN05	HP100-E1-CN05	HP100-R2-CN05	500min.			
HP100-P2-CN1	HP100-A2-CN1	HP100-T2-CN1	HP100-E1-CN1	HP100-R2-CN1	1000min.			
HP100-P1-LP5-Q	HP100-A1-LP5-Q	HP100-T1-LP5-Q	HP100-E1-LP5-Q	HP100-R1-LP5-Q	500min.	with cord	Open collector of NPN transistor	Packing 10 units (In case of Through scan set, Emmitter and Receiver are included each 10 units)
HP100-P1-Q	HP100-A1-Q	HP100-T1-Q	HP100-E1-Q	HP100-R1-Q	2000min.			
HP100-P1-L05-Q	HP100-A1-L05-Q	-	HP100-E1-L05-Q	HP100-R1-L05-Q	5000min.			
HP100-P2-LP5-Q	HP100-A2-LP5-Q	HP100-T2-LP5-Q	HP100-E1-LP5-Q	HP100-R2-LP5-Q	500min.			
HP100-P2-Q	HP100-A2-Q	HP100-T2-Q	HP100-E1-Q	HP100-R2-Q	2000min.			
HP100-P2-L05-Q	HP100-A2-L05-Q	-	HP100-E1-L05-Q	HP100-R2-L05-Q	5000min.			
HP100-P1-CN03-Q	HP100-A1-CN03-Q	HP100-T1-CN03-Q	HP100-E1-CN03-Q	HP100-R1-CN03-Q	300min.	with pre-wired connector	Open collector of NPN transistor	
HP100-P1-CN05-Q	HP100-A1-CN05-Q	HP100-T1-CN05-Q	HP100-E1-CN05-Q	HP100-R1-CN05-Q	500min.			
HP100-P1-CN1-Q	HP100-A1-CN1-Q	HP100-T1-CN1-Q	HP100-E1-CN1-Q	HP100-R1-CN1-Q	1000min.			
HP100-P2-CN03-Q	HP100-A2-CN03-Q	HP100-T2-CN03-Q	HP100-E1-CN03-Q	HP100-R2-CN03-Q	300min.			
HP100-P2-CN05-Q	HP100-A2-CN05-Q	HP100-T2-CN05-Q	HP100-E1-CN05-Q	HP100-R2-CN05-Q	500min.			
HP100-P2-CN1-Q	HP100-A2-CN1-Q	HP100-T2-CN1-Q	HP100-E1-CN1-Q	HP100-R2-CN1-Q	1000min.			

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

作成DR. T.Koike Feb.23 '06		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
検図CHK. T.Nakao Feb.24 '06	形番 MODEL	HP100 series	
認可APPD. S.Suzuki Feb.28 '06	名称 NAME	Photoelectric switch	
日付 DATE	図番 NO.	AD42920E	改番 REV. 2/05

SP. No.

Yamatake Corporation

製品仕様書
SPECIFICATIONS

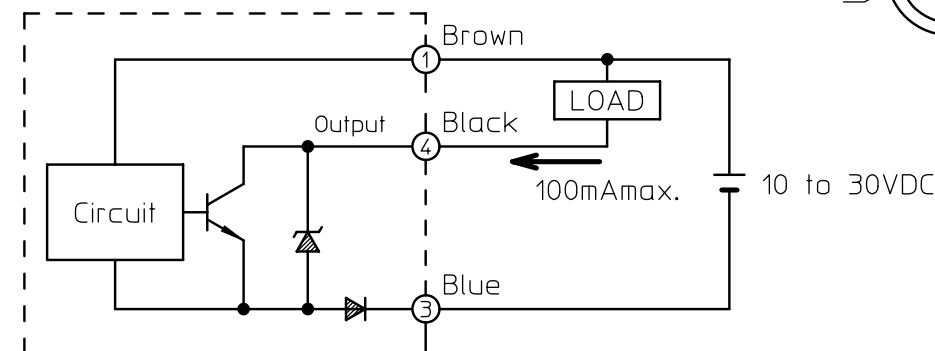
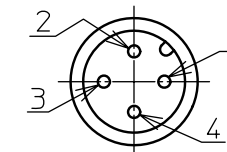
SPECIFICATIONS

Catalog listing	HP100-P1	HP100-P2	HP100-T1	HP100-T2	HP100-A1	HP100-A2
Scanning type	Polarized retroreflective scan		Through scan		Diffuse scan	
Supply voltage	10 to 30VDC (ripple 10% max.)					
Current consumption	13mA max.		27mA max. Emitter:16mA max. Receiver:11mA max.		16mA max.	
Scanning distance	0.05 to 5m (Reflector:FE-RR8)		15m		1m	
Target	Opaque materials more than $\phi 80$ (Reflector:FE-RR8)		Opaque materials more than $\phi 9$		White paper (KODAK Graycard 90%) 300x300mm	
Operating angle	Sensor : 0.5 to 10° / Reflector : 20° min.		2 to 20°			
Hysteresis						20% max. of scanning distance
Operating mode	Convertible light operated / dark operated (with mode selector)					
Output mode	HP100-*1 : Open collector of NPN transistor (N-MOS FET is used for output device) HP100-*2 : Open collector of PNP transistor (P-MOS FET is used for output device)					
Output	Load current:100mA (resistive load), Output withstand voltage:30V Saturation voltage:3V max. (at 100mA load current), Short circuit protection					
Response time	500 μ s max.					
Light source	Red LED			Infrared LED		
Indicator	except HP100-E1 : Orange 'ON' with output / Green 'ON' with atable light and stable dark HP100-E1 : Orange 'ON' with power on HP100-R* : Front indicator Red 'ON' with light receiving					
Ambient light	Incandescent light : 10,000lx max. / Sunlight : 40,000lx max.					
Operating temperature	-30 to +60°C (without condensation)					
Storage temperature	-40 to +70°C (without condensation)					
Humidity	35 to 85%RH (without condensation)					
Insulation resistance	20M Ω min. (at 500VDC)					
Dielectric strength	1000VAC 50/60Hz 1minute					
Vibration	10 to 55Hz 1.5mm double amplitude 2hours in each direction of X,Y,Z					
Shock	500m/s ² 10times in each direction of X,Y,Z					
Sealing	IP67 (IEC standard)					
Weight	Approx.55g (only sensor with cable 2m)					
Protection	False pulse protection (8ms typ.), wrong wiring protection					
EMC: EMC Directive (2004/108/EC), Applied harmonized standard: IEC60947-5-2:2007						
EMS (Electromagnetic susceptibility)						
Electro discharge	Contact:Level3 (6kV), Air:Level3 (8kV) (EN61000-4-2:1995+A1:1998+A2:2001)					
Radiated RF electromagnetic fields	Level3 (10V/m : 80MHz to 1GHz) Level2 (3V/m : 1.4GHz to 2GHz) (EN61000-4-3:2006)					
Electrical fast transients	DC power ports:Level3 (2kV / 5kHz), Signal ports:Level4 (2kV / 5kHz) (EN61000-4-4:1995+A1:2001+A2:2001)					
Conducted disturbances induced by RF fields	Level3 (10V : 150kHz to 80MHz) (EN61000-4-6:1996+A1:2001)					
EMI (Electromagnetic interference)						
Emission	Group1 ClassA (CISPR11:2003+A1:2004+A2:2006)					

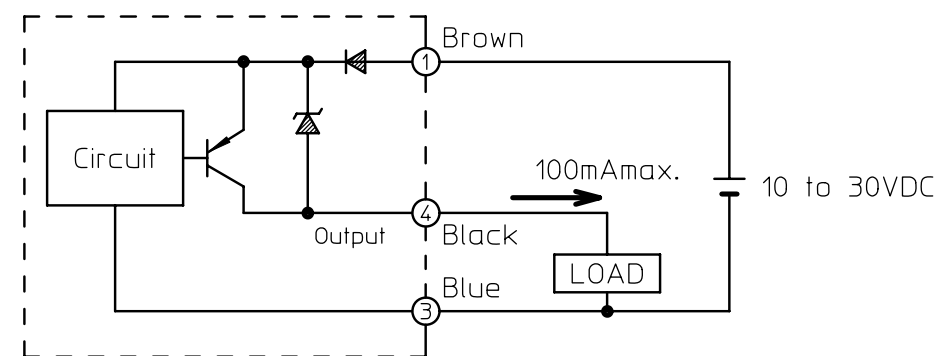
WIRING

NPN Type : Polarized retroreflective scan
Through scan receiver
Diffuse scan

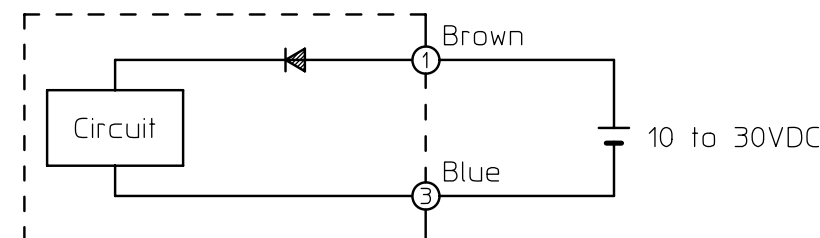
pre-wired connector
pin layout



PNP Type : Polarized retroreflective scan
Through scan receiver
Diffuse scan



Through scan emitter



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作成DR. Y.Mochizuki April,28'05	検図CHK. T.Nakao May,30'05	認可APPD. S.Suzuki May,31'05	日付DATE May,31'05	尺度SCALE ~	記入のない公差TOL. UNLESS NOTED ~
形番 MODEL	HP100 series				
名称 NAME	Photoelectric switch				
図番 NO.	AD42920E	改番REV. 05	3		

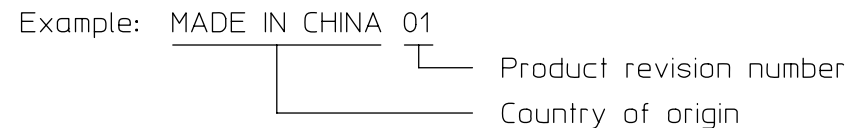
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Product revision change record

	Date	Catalog listing	Product rev. No.	Content of change
1	11.22.'05	All	01	Add UL and EMC specifications. Change current consumption.
2	2.16.'07	HP100-A*	02	Modification of optical characteristics. No specification is changed.
3	6.4.'08	HP100-P* HP100-A* HP100-R*	02 03 02	The shape of mode selector

Product revision

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



As for through scan, product revision number is applied on each emitter(HP100-E*) and receiver(HP100-R*).
Revision number is not applied on set listings(ex. HP100-T*)

Catalog listing	Product rev. No.
HP100-P1 (-Q)	02
HP100-P1-L * (-Q)	02
HP100-P1-CN * (-Q)	02
HP100-P2 (-Q)	02
HP100-P2-L * (-Q)	02
HP100-P2-CN * (-Q)	02
HP100-A1 (-Q)	03
HP100-A1-L * (-Q)	03
HP100-A1-CN * (-Q)	03
HP100-A2 (-Q)	03
HP100-A2-L * (-Q)	03
HP100-A2-CN * (-Q)	03
HP100-E1 (-Q)	01
HP100-E1-L * (-Q)	01
HP100-E1-CN * (-Q)	01
HP100-R1 (-Q)	02
HP100-R1-L * (-Q)	02
HP100-R1-CN * (-Q)	02
HP100-R2 (-Q)	02
HP100-R2-L * (-Q)	02
HP100-R2-CN * (-Q)	02

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03	~	~	~	~
02	~	~	~	~
01	~	~	~	~
改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY	検閲 APPD.

作成DR. T.Nakao Dec.15 '05		尺度SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
検図CHK. T.Koike Dec.16 '05	形番 MODEL	HP100 series	
認可APPD S.Suzuki Dec.19 '05	名称 NAME	Photoelectric switch	
日付DATE	図番 NO.	AD42920E	改番REV. 05 / 4

SP. NO.	Yamatake Corporation		製品仕様書 SPECIFICATIONS			
	Terms and Conditions					
	<p>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.</p>					
	<p>1 Warranty period and warranty scope</p>					
	<p>1.1 Warranty period</p> <p>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.</p>					
	<p>1.2 Warranty scope</p> <p>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.</p> <p>Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:</p> <ol style="list-style-type: none"> (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. <p>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.</p>					
	<p>2 Ascertainment of suitability</p> <p>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:</p> <ol style="list-style-type: none"> (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 <p>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.</p> <p>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.</p>					
	<p>3 Precautions and restrictions on application</p> <p>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).</p> <p>Any Yamatake products shall not be used for/with medical equipment.</p> <p>In addition,</p> <p>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.</p> <p>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.</p> <ol style="list-style-type: none"> (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: <ul style="list-style-type: none"> * 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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	REV.		RECORD	DATE	BY	APPD.

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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