


SP. No.	Azbil Corporation					製品仕様書 SPECIFICATIONS																	
	<p>CATALOG LISTING</p> <p>SL 1 - P 1 2 C</p> <div style="display: flex; align-items: center; margin-top: 10px;"> <div style="flex: 1; border-left: 1px solid black; border-right: 1px solid black; height: 100px; position: relative;"> <div style="position: absolute; top: 10px; left: 10px;">1</div> <div style="position: absolute; bottom: 10px; left: 10px;">2</div> </div> <div style="flex: 2; margin-left: 10px;"> <p>→ SHORT ROLLER LEVER</p> <p>→ Resistant against cutting fluid</p> <ul style="list-style-type: none"> Spring of Internal switch is corrosion-resistant spetial alloy Special resin seal (Only FLUORINE RUBBER tipe of 2) <p>*Refer to 5.LIFE</p> </div> </div>																						
<div style="margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> CONTACT MATERIAL </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CODE</th> <th>CONTACT MATERIAL</th> </tr> <tr> <td>~</td> <td>SILVER</td> </tr> <tr> <td>K</td> <td>GOLD PLATED</td> </tr> </table>											CODE	CONTACT MATERIAL	~	SILVER	K	GOLD PLATED							
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<div style="margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> ENVIRONMENTAL RESISTANCE </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CODE</th> <th>SEALING MATERIAL TO BE EXPOSED TO OUTSIDE</th> </tr> <tr> <td>~</td> <td>NBR</td> </tr> <tr> <td>V</td> <td>FLUORINE RUBBER</td> </tr> </table>											CODE	SEALING MATERIAL TO BE EXPOSED TO OUTSIDE	~	NBR	V	FLUORINE RUBBER							
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<p>Catalog listing and electrical ratings covered by this drawing are as in the below table.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">CATALOG LISTING</th> <th colspan="2">ELECTRICAL RATINGS</th> </tr> </thead> <tbody> <tr> <td rowspan="2">SL 1 - P C SL 1 - P V C</td> <td>EN (JIS/IEC)</td> <td>AC-15 3A-250V AC-12 3A-250V DC-12 2A-48V </td> </tr> <tr> <td>UL/CSA</td> <td>3A-250V ac General Use load 3A-30V dc </td> </tr> <tr> <td rowspan="2">SL 1 - P K C SL 1 - P K V C</td> <td>EN (JIS/IEC)</td> <td>AC-12 0.1A-125V DC-12 0.1A-48V </td> </tr> <tr> <td>UL/CSA</td> <td>0.1A-125V ac General Use load 0.1A-30V dc </td> </tr> </tbody> </table>											CATALOG LISTING	ELECTRICAL RATINGS		SL 1 - P C SL 1 - P V C	EN (JIS/IEC)	AC-15 3A-250V AC-12 3A-250V DC-12 2A-48V 	UL/CSA	3A-250V ac General Use load 3A-30V dc 	SL 1 - P K C SL 1 - P K V C	EN (JIS/IEC)	AC-12 0.1A-125V DC-12 0.1A-48V 	UL/CSA	0.1A-125V ac General Use load 0.1A-30V dc
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7 02						作成DR. M.SATO 7.22.'13		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~														
6 02						照査CHK. SUDO 7.22.'13	形 番 MODEL	SL1-P**C															
5 02	03	ECOP15-1706	9,14,'15	M.SATO	TOMITA	認可APPD SUDO 7.22,'13	名 称 NAME	MINIATURE LIMIT SWITCH															
4 02	02	ECOP15-0157	2, 2,'15	M.SATO	TOMITA	日付DATE 7.22,'13	図 番 NO.	AD17539E		改番REV. 03													
3 03	01	ECOP14-0446	2,10,'14	M.SATO	TOMITA																		
2 03	00	ECOP13-1247	7,22,'13	M.SATO	SUDO																		
頁 PAGE	改番 REV.	改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY	照査 CHK.																	


SP. No.	Azbil Corporation				製品仕様書 SPECIFICATIONS	
	<p>1. STANDARDS</p> <ul style="list-style-type: none"> Conform to : JIS C 8201-5-1 IEC 60947-5-1 NECA C 4508 Approved by : UL 508 (UL, File E96090) CSA C22.2 No.14 (C-UL) (UL, File E96090) EN 60947-5-1 (TUV No. : R 50006349) GB14048.5-2008 (CQC No. : 2013010305648691) About UL 508, CSA C22.2 No.14 <ul style="list-style-type: none"> Enclosure: Type1 Maximum ambient temperature: 70 ℃ About EN 60947-5-1 <ul style="list-style-type: none"> Maximum ambient temperature: 70 ℃ <p>2. STRUCTURE</p> <ul style="list-style-type: none"> Contact form : C (SPDT) Shape of contact : Rivet Type of terminal : Screw (M3 binding head screw with toothed lock washer) Degree of protection : IP67 (IEC 60529) (JIS C 0920) Protection class : Class II Environment pollution degree : Degree 3 					
頁 PAGE	改番 REV.	改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY	照査 CHK.
03	~	9,14,'15	M.SATO	TOMITA	作成DR. M.SATO 7,22,'13	
02	~	2, 2,'15	M.SATO	TOMITA	照査CHK. SUDO 7,22,'13	尺度 SCALE ~ 記入のない公差 TOL. UNLESS NOTED ~ 形 番 MODEL SL1-P**C
					認可APPD SUDO 7,22,'13	名 称 NAME MINIATURE LIMIT SWITCH
					日付DATE 7,22,'13	図 番 NO. AD17539E
						改番REV. 03 2/7

3. ELECTRICAL CHARACTERISTICS




- Rated operational voltage (U_e), Utilization category and Rated operational current (I_e)

Item	Silver contacts			Gold plated contacts	
Rated operational voltage (Ue)	AC250V	AC250V	DC48V	AC125V	DC48V
Utilization category	AC-15	AC-12	DC-12	AC-12	DC-12
Rated operational current(Ie)	3A	3A	2A	0.1A	

- Rated frequency: **45 to 65Hz and d.c.**
- Insulation Resistance
 - Between terminals of different polarities: **100 MΩ min.**
 - Between each terminal and the enclosure: **100 MΩ min.**
- Rated insulation voltage (Ui): **250V**
 - Notes 1. Dielectric test voltage between each terminal and the enclosure: **2000VAC**
(45 ~ 65Hz, for 5 seconds, leak current 1mA)
- Dielectric test voltage between the open contacts: **1000VAC** (50 / 60Hz, for 1 minute, leak current 1mA)
- Rated impulse withstand voltage (Uimp):
 - Between terminals of different polarities: **2500V**
 - Between each terminal and the enclosure: **2500V**
- Switching over voltage: **Category II**
- Contact Resistance
 - Silver Contacts:
 - 50 mΩ max. (initial)** Measured by the voltage drop method at 6 to 8 VDC **1A**.
 - Gold Plated Contacts:
 - 100 mΩ max. (initial)** Measured by the voltage drop method at 6 to 8 VDC **0.1A**.
- Minimum operational current and voltage:
 - Silver Contacts: **5mA-24VDC, 10mA-12VDC**
 - Gold Plated Contacts: **5mA-5VDC**
- Conventional free air thermal current (Ith):
 - Silver Contacts: **3A**
 - Gold Plated Contacts: **1A**
 - Notes 2. Temperature-rise limit: **65 °C max.**
- Short-circuit protective device:
 - EN,IEC: Fuse: **M10A** (IEC 60127, fuse)
 - GB:
 - Silver contacts: cartridge fuse **10A**
 - Gold plated contacts: cartridge fuse **3A**
- Conditional short-circuit current: **1000A** (Power factor 0.5 to 0.7)

作成DR. M.SATO 7.22.'13		尺度SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
照査CHK. SUDO 7.22.'13	形番 MODEL	SL1-P**C	
認可APPD SUDO 7.22.'13	名称 NAME	MINIATURE LIMIT SWITCH	
日付DATE 7.22.'13	図番 NO.	AD17539E	改番REV. 3/7 03

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	<div style="border: 1px solid black; padding: 5px;"> <p>4. MECHANICAL CHARACTERISTICS</p> <ul style="list-style-type: none"> • Actuator strength : Withstands 5 times as high as O.F. in the operating direction for 1 minute. • Terminal strength : Withstands 0.6N・m tightening torque applied for 1 minute. • Shock : At 300m/s², contact misoperation shall be 1ms max. in the free position and in the total travel position. • Vibration : With a vibration of peak-to-peak amplitude of 1.5mm and frequency of 10 to 55Hz for 2 continuous hours, contact misoperation shall be 1ms max. in the free position and in the total travel position. • Allowable operating speed : 0.02 mm/s to 0.5 m/s At the lowest speed, contact instability shall be 0.1s max. At the highest speed, the actuator shall not be damaged. • Mechanical operating frequency : <table border="1" style="margin: 5px 0; border-collapse: collapse;"> <tr> <th style="width: 30%;">CAT. LIST.</th> <th>Operating frequency</th> </tr> <tr> <td>SL1-P*C</td> <td>120 cycles/minute max.</td> </tr> <tr> <td>SL1-P*VC</td> <td>60 cycles/minute max.</td> </tr> </table> </div>										CAT. LIST.	Operating frequency	SL1-P*C	120 cycles/minute max.	SL1-P*VC	60 cycles/minute max.																
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<div style="border: 1px solid black; padding: 5px;"> <p>5. LIFE (Under the standard test condition)</p> <ul style="list-style-type: none"> • Mechanical Life: At overtravel of 70 to 100% of the specified value with 30° cam angle. <table border="1" style="margin: 5px 0; border-collapse: collapse;"> <tr> <th style="width: 30%;">CAT. LIST.</th> <th>Operation cycle</th> </tr> <tr> <td>SL1-P*C</td> <td>20000k cycles min.</td> </tr> <tr> <td>SL1-P*VC</td> <td>2000k cycles min.</td> </tr> </table> <ul style="list-style-type: none"> • Electrical Life: <table border="1" style="margin: 5px 0; border-collapse: collapse;"> <tr> <th rowspan="2" style="width: 20%;">Contact material</th> <th rowspan="2" style="width: 20%;">Condition</th> <th colspan="2">Operation cycle</th> </tr> <tr> <th>SL1-P*C</th> <th>SL1-P*VC</th> </tr> <tr> <td rowspan="2" style="text-align: center;">Silver</td> <td>5A-250VAC 2A-48VDC 5A-30VDC</td> <td style="text-align: center;">300k cycles min.</td> <td style="text-align: center;">300k cycles min.</td> </tr> <tr> <td>1A-125 VAC</td> <td style="text-align: center;">2000kcycles min.</td> <td style="text-align: center;">2000k cycles min.</td> </tr> <tr> <td style="text-align: center;">Gold plated</td> <td>0.1A-125 VAC 0.1A- 48 VDC</td> <td style="text-align: center;">5000kcycles min.</td> <td style="text-align: center;">2000k cycles min.</td> </tr> </table> <p style="margin-left: 40px;">At operating frequency of 20 cycles a minute and at resistive load</p> <ul style="list-style-type: none"> • Mechanical life in Oil dropping test (reference specification) : 2000 k cycles min. <p>Test condition</p> <p>Cutting fluid : Yushiroken EC50T-3 (Yushiro Chemical Industry Co., Ltd.) Synthetic 770TG (Yushiro Chemical Industry Co., Ltd.) Emulcut DC-60 (Kyodo Yushi CO., LTD.)</p> <p>Operating frequency : 60 cycles/minute</p> </div>										CAT. LIST.	Operation cycle	SL1-P*C	20000k cycles min.	SL1-P*VC	2000k cycles min.	Contact material	Condition	Operation cycle		SL1-P*C	SL1-P*VC	Silver	5A-250VAC 2A-48VDC 5A-30VDC	300k cycles min.	300k cycles min.	1A-125 VAC	2000kcycles min.	2000k cycles min.	Gold plated	0.1A-125 VAC 0.1A- 48 VDC	5000kcycles min.	2000k cycles min.
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7. STANDARD TEST CONDITIONS <p>・Temperature : +20 ℃</p> <p>・Humidity : 65 %RH</p>																						
8. RECOMMENDED TIGHTENING TORQUE <p>For mounting the switch on a panel : 1.3 to 1.7 N・m (M4)</p> <p>For mounting the terminal on the switch: 0.4 to 0.6 N・m (M3 binding head screw with toothed lock washer)</p>																						
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02	～	2, 2,'15	M.SATO	TOMITA																		

PRECAUTIONS

(1) MOUNTING

- Tighten each portion of limit switch at reasonable torque specified in this specification.
Over-tightening may damage the screw or other parts.
- Dog must be free from the force to push the switch actuator under free position.
- Do not use silicone adhesives or silicone-contained grease.
It may cause electrical contact conduction failure.

(2) WIRING

- Do not perform wiring while power is connected.
It may cause operator's electrical shock or sudden machine start.
- Don't remove the terminal cover and the knurled nut.
Loose assembly may cause insulation failure due to decrease in seading performance.
As a result, the switch would not satisfy it's operation performance.

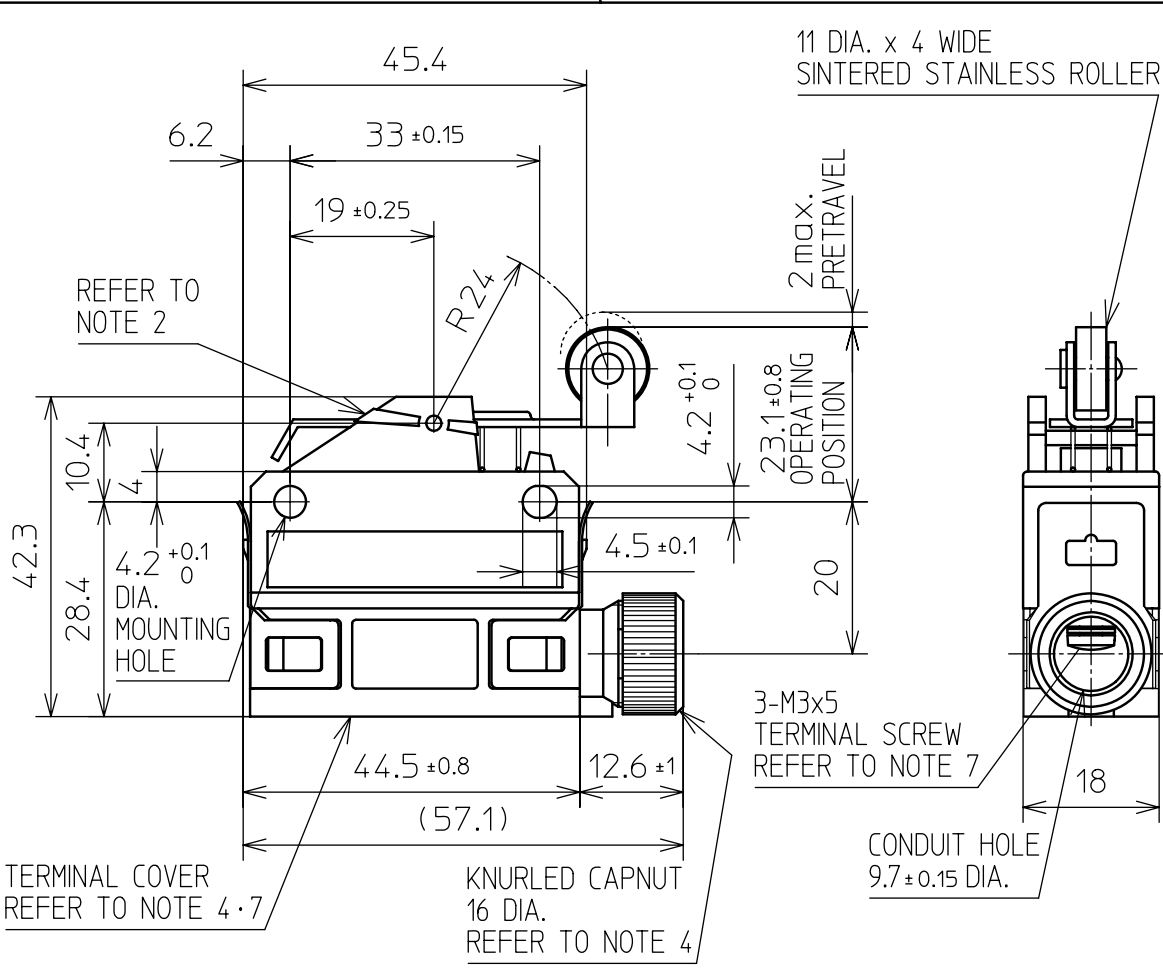
(3) ADJUSTMENT

- Do not apply excessive force (more than 5 times of operating force) to the actuator.
It may break the switch.
- Small overtravel may cause chattering of contact or contact failure by vibration or shock.

(4) REQUEST

- Confirm the quality under the actual application condition to ensure the reliability in actual use.

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		<p>Notes</p> <ol style="list-style-type: none">1. Switch enclosure is of zinc alloy coated with black fluoroplastics. Terminal cover is plastic.2. Set so that tha roller lever can be with the range of projection of housing at overtravel.3. Seal is already assembled for a cable of 5.8 to 7.8 dia.4. Mount completely the terminal cover after wiring, to keep the sealing of terminal housing. Tighten fully the knurled capnut by hand without using a tool.5. Use a lead wire whose cross section is from 0.75 to 1.25mm² to the diameter.6. Conect lead-wires with insulated R-shape or Y-shape crimp type terminal.7. Terminal cover, terminal screws and hex nuts are furnished unassembled.																	
		<table><tr><th colspan="2">Characteristics</th></tr><tr><td>Operating force</td><td>4.0 N max.</td></tr><tr><td>Release force</td><td>0.78 N min.</td></tr><tr><td>Movement differential</td><td>0.3 max.</td></tr><tr><td>Overtravel</td><td>4 min.</td></tr></table>		Characteristics		Operating force	4.0 N max.	Release force	0.78 N min.	Movement differential	0.3 max.	Overtravel	4 min.	<table><tr><th colspan="2">Circuit diagram</th></tr><tr><td>1(COM)</td><td><div><div>— 4(NO)</div><div>└ 2(NC)</div></div></td></tr></table>		Circuit diagram		1(COM)	<div><div>— 4(NO)</div><div>└ 2(NC)</div></div>
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	Terms and Conditions					
	We would like to express our appreciation for your purchase and use of Azbil Corporation's products. You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system 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					
	Azbil Corporation's 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 Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation 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 azbil product (Noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.); (2) Failure caused for other reasons than Azbil Corporation's product; (3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors; (4) Failure caused by your use of Azbil Corporation's 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 Azbil Corporation's shipment did not allow Azbil Corporation to predict; or (6) Failure that arose from any reason not attributable to Azbil Corporation, 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 Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.					
	2 Ascertainment of suitability					
You are required to ascertain the suitability of Azbil Corporation's 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 Azbil Corporation 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 azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down. You are required to provide your Equipment with safety design such as fool-proof design, *1 and fail-safe design *2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance, *3 fault tolerance, *4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use. *1. A design that is safe even if the user makes an error. *2. A design that is safe even if the device fails. *3. Avoidance of device failure by using highly reliable components, etc. *4. The use of redundancy.						
3 Precautions and restrictions on application						
Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area). Any Azbil Corporation's products shall not be used for/with medical equipment. The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives. 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 azbil 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, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.						
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SP.NO.	Azbil Corporation				製品仕様書 SPECIFICATIONS	
	<p>(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals</p> <p>(2) For use of specific purposes, such as:</p> <ul style="list-style-type: none">* Nuclear energy/radiation related facilities [For use outside nuclear energy controlled areas] [For use of Azbil Corporation's 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* Facilities/applications associated directly with billing <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 Azbil Corporation's 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 Azbil Corporation's 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 Azbil Corporation's 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 Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.</p> <p>System products, 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. 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 Azbil Corporation's 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 Azbil Corporation's 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 azbil 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 Azbil Corporation's 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. For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.</p> <p>9 Scope of services</p> <p>Prices of Azbil Corporation's 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> <ul style="list-style-type: none">(1) Installation, adjustment, guidance, and attendance at a test run(2) Maintenance, inspection, adjustment, and repair(3) Technical guidance and technical education(4) Special test or special inspection of a product under the conditions specified by you <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> <p>AAS-511A-014-04</p>					
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