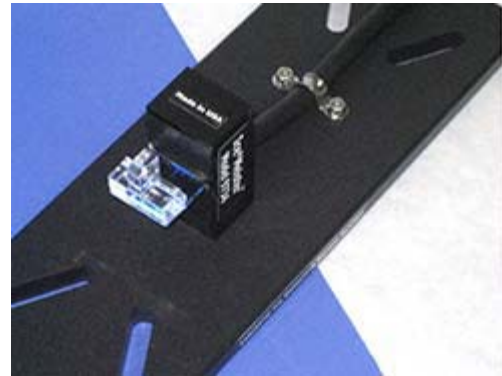


Model 9734-SYSTEM 冻雨传感器-结冰探测器



美国 New Avionics 公司的 Model 9734-SYSTEM 冻雨传感器-结冰探测器具有尺寸小,重量轻的特点。Model 9732 冻雨传感器-结冰探测器是最灵敏的结冰探测器,最低探测到 0.254mm 厚度。

冻雨是冬季具有高影响、大范围成灾的灾害性天气,电网受其影响严重。冻雨观测是地面气象业务观测中非常重要的一部分。特别是在冻雨灾害性天气的监测预警中,对冻雨发生时间的准确性和发生程度的监测是关键。“冻雨传感器”立足落实中国气象中长期发展气象观测设备的战略规划要求,结合实际业务需要,利用机光学原理探测冻雨的发生,利用光学的吸收强度变化来判断是否结冰,采用管路结构设计为传感器适应恶劣环境提供了保证。Model 9734-SYSTEM 冻雨传感器-结冰探测器有助于推进气象观测设备的自动化进程,推动下一代气象探测技术的更新,对于提升我国冻雨自动化监测水平具有深远意义。

Model 9732-SYSTEM 冻雨传感器满足 SAE AS 5498 ¶ 5.2.1.1.1

Model 9734-SYSTEM 冻雨传感器-结冰探测器应用

- 电网
- 农作物
- 道路交通
- 气象

Model 9734-SYSTEM 冻雨传感器-结冰探测器技术参数

工作温度: -40~+50C

供电电压: 6VDC~24VDC

功耗: 2.4W(@24VDC)

输出:

ICE ALERT=白线

MORE ICE = 绿线

SATURATION =黑线

FALSE < 0.5 volt

TRUE > 3.0 volts

外形尺寸:

外壳高度: 40.6 mm

外壳宽度: 33.0 mm

外壳长度: 66.3 mm

探头直径: 6.65 mm

探头长度: 71.1 mm

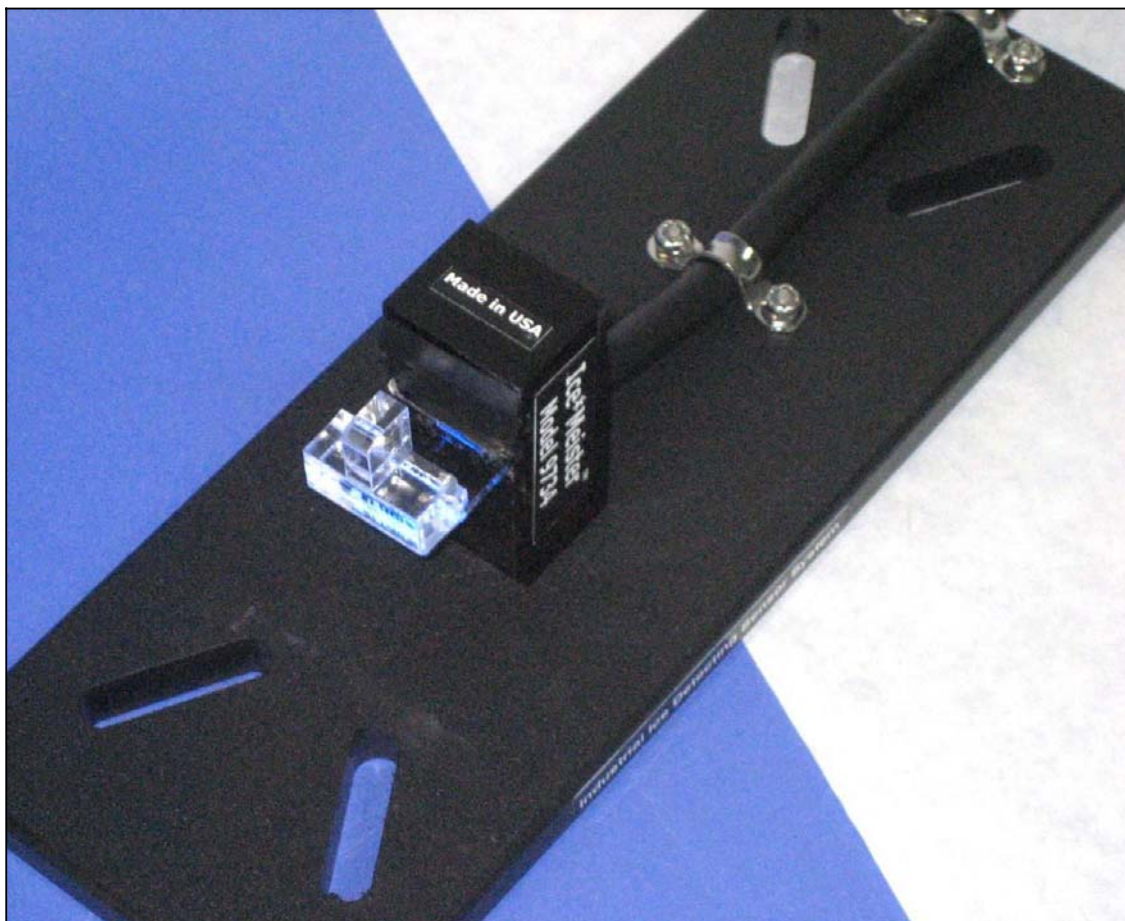
重量: 小于 180g(不包括线缆)

issued January 1, 2019

New Avionics

ICE * DETECTORS™

Ice*Meister™ Model 9734-SYSTEM INDUSTRIAL ICE DETECTING SENSOR SYSTEM Technical Data Sheet



*Figure 1 Ice*Meister™ Model 9734-SYSTEM optical ice sensing detector is lightweight, easy to install and completely self-contained in one compact, robust unit. Senses H₂O in its solid and liquid phases. Indicates ICE ALERT with output relay contacts and blue indicator LED.*

黛尔特（北京）科技有限公司 电话:010-63378109 <http://www.delta-tech.cc>

GENERAL DESCRIPTION

Ice*Meister™ Model 9734-SYSTEM industrial ice detecting sensor system is a modern, optical go/no-go ice sensor for general purpose industrial applications, including wind power turbines, HVAC cooling towers, radio and TV broadcast towers, oil and gas rigs, vehicular bridges, overpasses, etc. It is completely self-contained. No external components are required.

Model 9734 consumes very little energy. Powered by a 5W solar panel system, it is suitable for use in remote locations.

9734 monitors the optical characteristics of whatever substance is on the probe. If AIR is on the probe, output indicates NO ICE. If H₂O is on the probe, output indicates ICE ALERT. Liquid water simply runs off by gravity, but ICE sticks to the optical surfaces for sensing. There are no moving parts.

Unit detects H₂O in its solid and liquid phases, including rime ice, snow, frost, clear ice, standing water. Gravity removes rain and ice melt from the optics.

This sensor has no specified accuracy, and is not intended to be used as an analog measuring instrument of any kind.

Model 9734 contains a small embedded circuit board, an optical probe, a plastic housing, and a lightweight blue cable that connects to its host system. Standard cable length is 6 feet (1.3 meters) but can be greatly extended on special order.

Model 9734 indicates the presence of ice. An optional protective cage is available to help guard against falling chunks of ice and other debris.



*Figure 2 a, b -- Ice*Meister™ Model 9734-SYSTEM senses rime ice, frost etc (left) and clear ice (right).*

SPECIFICATIONS**SENSITIVITY TO ICE ACCUMULATION:**

Better than 0.01 inch (*0.254 mm*) of rime or clear ice.

ORIENTATION:

Unit installs horizontally, with the top of its housing facing UP, and probe facing into the wind.

OPERATING / STORAGE TEMPERATURE:

- 40 deg C to + 50 deg C.

Not warranted to detect ice above 0 deg C.

ELECTRICAL INPUT:

Any clean DC voltage from 8 VDC to 30 VDC

Current draw at standard 24 VDC is < 100 mA max

red wire = + volts DC

black wire = earth ground

ELECTRICAL OUTPUT:

1 set of single pole, single throw, normally open relay contacts,
rated at 1 Amp, 50 volts non-inductive (see attached relay data sheet)

Closed when frost is present,

Opened when frost is absent.

Green and white wires = relay contacts

VISUAL OUTPUT:

Probe turns **BLUE** to indicate ice is present and relay contacts are closed.

CONNECTING CABLE:

0.1 inch (*2.54 mm*) diameter lightweight Teflon four-conductor shielded cable,
wire ends stripped and tinned

Red, black wires: Power in

Green, white wires: Relay contacts out

Length: 6 feet (*1.3 meters*) standard

DIMENSIONS:**Sensor head:**

Height: 2.5 inches (*63.5 mm*)

Width: 1.25 inches (*31.8 mm*)

Depth: 1.0 inch (*25.4 mm*)

Probe extension from housing: 1.0 inch (*25.4 mm*)

Mounting plate:

Length: 11 inches (*280 mm*)

Width: 4.0 inches (*102 mm*)

Thickness: 0.5 inch (*12.7 mm*)

WEIGHT:

4 ounces (*113 g*)

exclusive of mounting hardware

CONNECTING CABLE

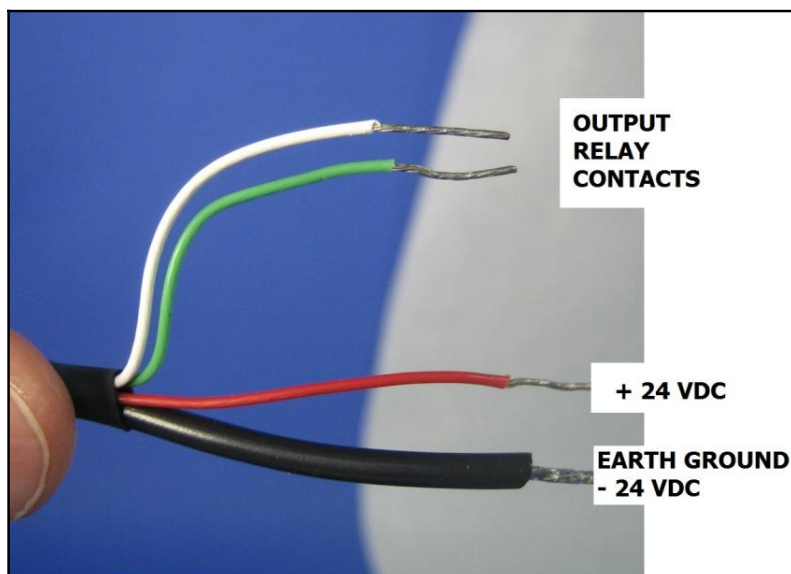


Figure 3 -- Lightweight blue cable features rugged Teflon outer jacket, internal aluminum shield with ground wire, and four stranded, tinned copper wires.

RoHS Compliant		UL C UL	
PLENUM CABLE			
DESCRIPTION			
4 Conductors AWG 24/7x32 TC			
Overall Foil Shield FEP / FEP Blue CL2P CMP			
PHYSICAL PROPERTIES			
Conductors		Insulation	
# Conductors	AWG	Material	Wall
4	24/7x32	Tinned Copper	FEP
			Finished OD
			.030"
Outer Shield Material		Drain Wire	
Layer 1 Type	Material	Coverage	Fold Technique
Overall Foil Shield	Alum / Mylar	100%	24/7x32
			Tinned Copper
Outer Jacket Material		Cabling	
Jacket Material	Color	Wall	Overall O.D.
FEP	Blue	.010"	.111" Nom.
			2" Lays on Cable with Clear Mylar
MECHANICAL PROPERTIES			
Operating Temp.	Total Weight	Bend Radius	
Rated -40C to 200C	12.9 lbs./ft.	10 X OD	
ELECTRICAL PROPERTIES			
Max. Operating Voltage			
UL Rated 300V Power Ltd.			
INDUSTRY APPROVALS AND COMPLIANCE			
Standards & Environmental Programs			
Roach / RoHS Compliant	YES		
Suitability	Indoor, Direct Burial, Wet Location		
Resistance	Oil, Gas, Sunlight, Abrasion, Acid		
Applications	Communications, Audio, Control, Instrumentation		
Flame Test	NEMA 2B2 / FT6		
NEC / (N.I.) Specification	CL2P / CMP		
CEC / C (N.I.) Specification	CMP		
MISCELLANEOUS			
Markings: TYPE CL2P - TYPE CMP 24 AWG (8), CU(U) FEP/FEP E130566 ROHS			
Color Code: Black / Red / White / Green /			

Figure 4 -- Specifications for connecting cable.

黛尔特 (北京) 科技有限公司 电话:010-63378109 <http://www.delta-tech.cc>

TESTING

STANDARD TEST CONDITIONS for testing in a laboratory		
ambient temperature	energize unit, soak at ambient temp 20-30 minutes	25 deg C (normal office temp)
ambient lighting	fluorescent illumination (from ceiling)	500 lux (normal office lighting)
	white LED illumination	no limit
	sunlight	no sunlight allowed
	incandescent lamp	no incandescent lamp allowed
mechanical	mounting plate orientation	horizontal
	sensor air-gap orientation	up
testing I	desktop test with 9-volt battery and foam dunnage chip.	convenient out-of-the-box test
testing II	desktop test with transparent tumbler of tap water.	simulates clear ice
testing III	field test with commercial component cooler cold spray.	simulates rime ice

TESTING I (out-of-the-box)

Convenient, simple, out-of-the-box desktop or field test with 9-volt battery and foam dunnage chip:

Connect 9734's red wire to the 9-volt battery's positive (+) terminal, and the black wire to the battery's negative (-) terminal.

Insert foam dunnage into 9734's air gap.

Observe blue indicator LED glows, indicating the foam has simulated FROST threshold.

Listen for relay activation *click* inside the solid 9734 housing.

Using a suitable continuity checker, confirm output relay contacts close between white and green wires.

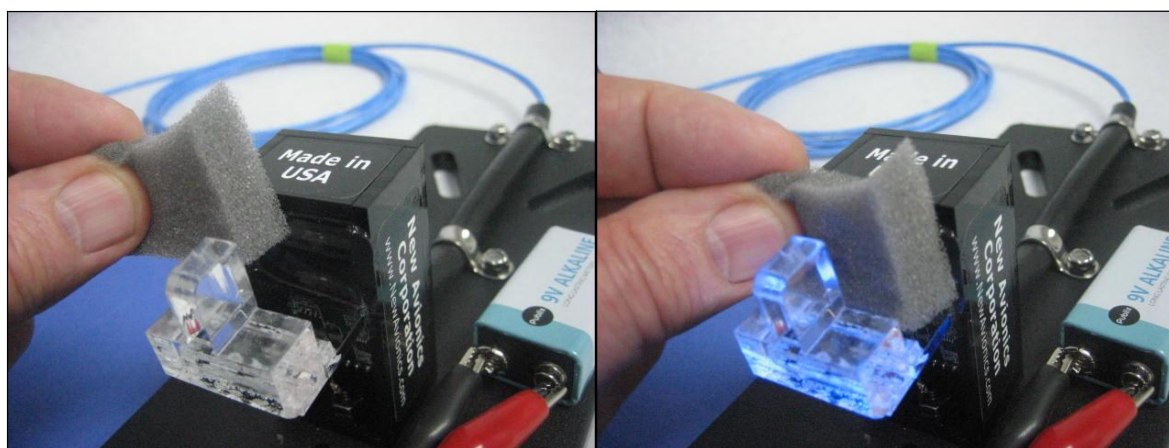


Figure 5 a , b -- Desktop test with 9-volt battery and opaque charcoal test foam.

CONVULGED FOAM SETS		SOLD IN CARTON QUANTITIES			Cut thick convulged polyurethane to the size you need.	
MODEL NO.	SHEET SIZE L x W x H	TYPE OF FOAM	SETS/ CARTON	PRICE PER SET		LBS./ CTN.
S-12789	6 x 6 x 2"		64	\$1.25	\$1.15	6
S-6435	8 x 6 x 2"		48	2.05	1.80	5
S-11751	10 x 10 x 2"		24	2.85	2.65	6
S-8394	12 x 12 x 2"		24	3.90	3.65	8
S-6436	16 x 16 x 2"	Charcoal	12	5.90	5.45	7
S-6437	24 x 24 x 2"		6	11.85	11.10	8
S-6438	24 x 36 x 2"		9	14.90	14.00	16
S-15663*	24 x 36 x 4"		4	30.70	28.60	14
S-14641	48 x 96 x 2"		1	97.00	90.00	11

* Total set height is 4"; base, 1 1/2".

• Total set height is 2"; base, 3/4".

• Sets are 2 sheets of interlocking foam.

ULINE
12575 Uline Drive
Pleasant Prairie, WI 53158

THREE WAYS TO ORDER
Phone 1-800-295-5510
Fax 1-800-295-5571
Online uline.com

Figure 6-- Opaque charcoal test foam and 9-volt battery are commonly available from office supply stores.

黛尔特 (北京) 科技有限公司 电话:010-63378109 <http://www.delta-tech.cc>

TESTING II (water CLEAR ICE test)

Simple, CLEAR ICE test with a wide-mouth glass tumbler full of clean tap water.

With 9734 connected to a 9-volt battery or suitable DC power supply, submerge the probe into a tumbler of clean tap water. The tumbler must have a wide mouth, and be made of clear glass or plastic, as shown below.

Observe the blue LED illuminates, the relay *clicks* closed, and continuity tester confirms the relay contacts are closed, as Testing I, above.



Figure 7 a, b-- CLEAR ICE test with 9-volt battery and clear glass tumbler of clean tap water.



Figure 8 -- serial number is located on housing adjacent to cable entrance.

黛尔特（北京）科技有限公司 电话:010-63378109 <http://www.delta-tech.cc>

TESTING III (field test)

9734 can be tested with commercial TETRAFLUOROETHANE component cooler spray.

Be certain to use only tetrafluoroethane to avoid damaging the optical components in the air gap.



Figure 9 a, b -- Commercial component cooler spray freezes moisture out of the ambient air, simulates detectable ice.

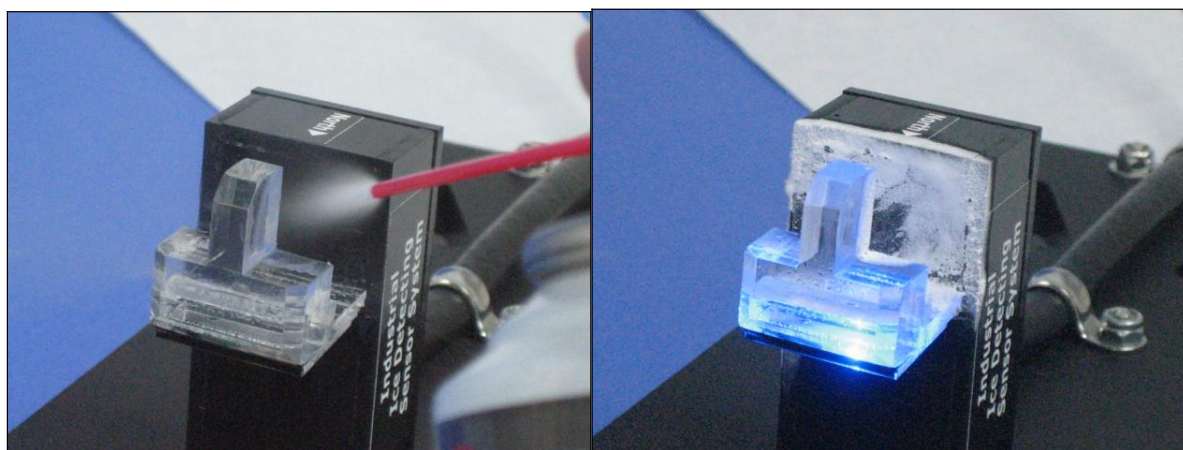


Figure 10 a, b Test 9734 for frost and rime ice with sprayed stream of compressed gas tetrafluoroethane component cooler; leaves no residue. Cold spray freezes moisture out of the ambient air, creates detectable surface frost.

DISCLAIMERS

1. Specifications and other contents are subject to change at any time without notice.
2. This document is not contractual. Nothing in it constitutes or implies a warranty or guaranty of any kind, explicit or implicit. Warranty information is given only in separate "warranty" statement.
3. Optical probe should be protected from mechanical abuse, abrasion and harsh chemicals. Damage to the probe voids the warranty.
4. No warranty is given as to the suitability of this product for any particular application.
5. Initial thermal shocking of the sensor may cause condensation to form on the optics and register as "frost".
6. This unit is not a measuring instrument, and provides no specific calibration.
7. When installed on a fixed tower, probe should face NORTH to minimize sunlight contamination.
- 8 Allow unit to soak at ambient temperature before evaluating. Test under fluorescent or energy-saving LED lighting; see STANDARD CONDITIONS.

NOTES

1. Ice*Meister™ is a trademark of New Avionics Corporation, protected by US Patents.

Ice*Meister™ Model 9734-SYSTEM
INDUSTRIAL ICE DETECTING SENSOR SYSTEM
issued January 1, 2019
supersedes all previous editions

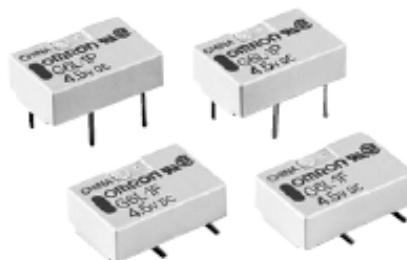
OUTPUT RELAY SPECIFICATIONS:

OMRON

Ultra-thin Low Signal Relay G6L

Extremely Thin SPST-NO Flat Relay, One of the Thinnest Relays in the World

- For high-density mounting and slim finished packaging, G6L uses 20% less mounting area and 67% less volume in comparison with the G5V-1 relay.
- Measures just 7.0 (W) x 10.6 (L) x 4.2 (H) mm for surface-mount or 3.8 (H) for through-hole.
- High dielectric strength: 1,000 VAC between coil and contacts and 750 VAC between contacts of the same polarity.
- Conforms to FCC Part 68 impulse withstand voltage rating of 1.5kV for 10 x 160 μ s.
- Conforms to UL60950 (File No. E41515) / CSA C22.2 No. 60950 (File No. LR31926).
- Use of lead completely eliminated.



Ordering Information

Contact form	Construction	Mounting type	Model
SPST-NO	Fully sealed	Through-hole terminal	G6L-1P
		Surface-mount terminal	G6L-1F

Note: 1. When ordering, add the rated coil voltage to the model number.
Example: G6L-1P 12 VDC

└── Rated coil voltage

2. When ordering tape packing, add "-TR" to the model number.
Example: G6L-1F-TR 12 VDC

└── Tape packing

Be sure since "-TR" is not part of the relay model number, it is not marked on the relay case.

Model Number Legend:

G6L □ - 1□ - □

1 2 3 4

1. Relay function

None: Non-latching

2. Contact form

1: SPST-NO

3. Terminal shape

P: PCB terminals

F: Surface-mount terminals

4. Packaging

None: Tube packaging

TR: Tape and reel packaging

Application Examples

- Peripherals of MODEM/PC
- Telephones
- Office automation machines
- Audio-visual products
- Communications equipment
- Measurement devices
- Amusement equipment
- Security equipment

OMRON

Specifications

■ Contact Ratings

Item	Resistive load
Contact mechanism	Single crossbar
Rated load	0.3 A at 125 VAC, 1 A at 24 VDC
Carry current	1 A
Max. operating voltage	125 VAC, 60 VDC
Max. operating current	1 A

■ Coil Ratings

Item	Voltage Rating				
	3 VDC	4.5 VDC	5 VDC	12 VDC	24 VDC
Rated current	60.0 mA	40.0 mA	36.0 mA	15.0 mA	9.6 mA
Coil resistance	50.0 Ω	112.5 Ω	139.0 Ω	800.0 Ω	2,504.0 Ω
Pick-up voltage	75% max. of rated voltage				
Dropout voltage	10% min. of rated voltage				
Maximum voltage	150% of rated voltage				130% of rated voltage
Power consumption	Approx. 180 mW				Approx. 230 mW

Note: 1. The rated current and coil resistance are measured at a coil temperature of 23°C with a tolerance of $\pm 10\%$.

2. The operating characteristics are measured at a coil temperature of 23°C.

3. The maximum voltage is the highest voltage that can be imposed on the relay coil.

■ Characteristics

Item	Non-latching Relays	
	G6L-1P, G6L-1F	
Contact resistance (See Note 1)	100 m Ω max.	
Operate time (See Note 2)	5 ms max. (approx. 1.1 ms)	
Release time (See Note 2)	5 ms max. (approx. 0.4 ms)	
Insulation resistance (See Note 3)	1,000 M Ω min. (at 500 VDC)	
Dielectric strength	Coil and contacts	1,000 VAC, 50/60 Hz for 1 min
	Contacts of same poles	750 VAC, 50/60 Hz for 1 min
Surge withstand voltage	Coil and contacts	1,500 VAC, 10 \times 160 μ s
Vibration	Mechanical durability	10 to 55 Hz, 1.65-mm single amplitude (3.3-mm double amplitude)
	Malfunction durability	10 to 55 Hz, 1.65-mm single amplitude (3.3-mm double amplitude)
Shock	Mechanical durability	1,000 m/s ²
	Malfunction durability	100 m/s ²
Service life	Mechanical	5,000,000 operations min. (at 36,000 operations/hour)
	Electrical	100,000 operations min. (with a rated load at 1,800 operations/hour)
Failure rate (P level) (See Note 4)	1 mA at 5 VDC	
Ambient temperature	Operating: -40°C to 70°C (with no icing or condensation)	
Humidity	Operating: 5% to 85% RH	
Weight	Approx. 0.6 g	

Note: 1. The contact resistance was measured with 10 mA at 1 VDC with a fall-of-potential method.

2. Values in parentheses are actual values.

3. The insulation resistance was measured with a 500-VDC Megger Tester applied to the same parts as those used for checking the dielectric strength.

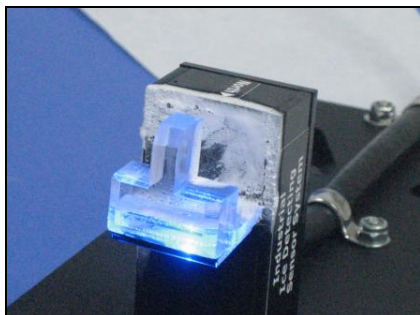
4. This value was measured at a switching frequency of 120 operations/min. This value may vary, depending on switching frequency, operating conditions, expected reliability level of the relay, etc. It is always recommended to double-check relay suitability under actual load conditions.

5. The above values are initial values.

**partial list of
CUSTOMERS**

Model 9732 aerospace ice sensors have been shipped to: Aerotronics, Aerovironment, Avionica, Avionics International Supply, Battelle Laboratories, BH Airways Bulgaria, Boeing, Cirrus, DZYNE Technologies, E.L.O. Trade Cyprus, Embention Spain, Heico, INPAER aero Brazil, Insitu, Israel Aerospace Industries, Lumax Int'l Taiwan, NOAA, Norwegian University of Science and Technology, Open Avionics LLC, SouthSide Industries Australia, SportAir USA, Technology Service Corp, Vestel Turkey, others.

Model 9734 industrial ice sensors have been shipped to: Ameren Electric Utility, Anemometry Specialists, Arkansas Highway Dept, ASDI Food Service, Astrophysikalisches Institut Germany, Boeing, Clabo Group Italy, CS Tech Japan, Clipper Windpower, Control Systems Utah, Daimler-Ford Germany, Duke Energy, Electrolux, Emerson Electric refr control, Environment Canada, EverPower wind, Gemini Observatory, General Electric, General Acoustics GmbH, Godrej & Boyce, Hudson's Bay Company, Iowa Telecom, KVUE-TV, Kold-Safe LLC, Leer Refrigerators, Lee's Refrigeration Inc, Lockheed-Martin, McKinstry Corp, Mountain Equipe Srl Italy, Oklahoma State University, One Energy Wind, Outland Energy Inc, Panasonic Japan, Panacea Solutions, Shorewood Minnesota public works dept, Southern California Edison, SRI International, Subaru Japan, University of Alaska, Univ of British Columbia, Univ of Dayton, Vestas Denmark, WBAL-TV, WFRG-FM, others.



9734 SYSTEM



9734 REFR



9732 STEEL



9732 PLASTIC

NewAvionics
CORPORATION

New Avionics Corporation
2501 East Commercial Blvd
Ft Lauderdale FL 33308 USA
954-776-1900

黛尔特（北京）科技有限公司 电话:010-63378109 <http://www.delta-tech.cc>

	NAC 9734	Lufft ARS-31	Goodrich 871
solar power consumption	3 Watts	30 Watts	15-50 Watts
weight	0.25 lbs 4 ounces 113 grams	2.0 lbs 32 ounces 900 grams	0.7 lbs 11 ounces 317.5 grams
output	2 relay contacts	RS 485 2400 baud	RS-422 9600 baud.
principle of operation	direct sensing either H2O molecules or air	internally calculates freezing road temperatures	vibrating reed changes frequency with mass of ice
installation	adjacent meteorological boom	costly embedded into roadway	adjacent meteorological boom
technology	modern	old	1985