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REPORT

on

[Industrial Control Equipment] Proximity Switches

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## DESCRIPTION

## PRODUCT COVERED:

USL, CNL - Industrial Control Equipment - Proximity Switches, Magnetic Sensors "SS Series":

## Model:

Series SS: models SS1C225-U, SS2C203-U, SS4D225-U, SS3D203-U, SS4N225-U, SS3N203-U, SS4M225-U, SS3M203-U, SS4N225P-U, SS3N203P-U, SS4M225P-U, SS3M203P-U

## GENERAL:

The devices covered by this report are magnetic sensor switches, which change its status with the magnetic field. The sensor can be REED switch or static (GMR magneto resistive chip). The devices can be available equipped with sensor cable or quick connect.

These devices are enclosed type rated Type 1, constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dirt.

## ELECTRICAL RATINGS

Series	models		Input Voltage	Input Current	Power	
SS	SS1C225-U	SS2C203-U	3-30 Vac/Vdc	0.2 A	6 W	
	SS4D225-U	SS3D203-U	Class 2			
	SS4N225-U	SS3N203-U	6-30 Vdc			
	SS4M225-U	SS3M203-U				
	SS4N225P-U	SS3N203P-U				Class 2
	SS4M225P-U	SS3M203P-U				

## ENVIRONMENTAL RATINGS:

Maximum Ambient Temperature: 60°C

These devices are enclosed type rated Type 1.

## NOMENCLATURE BREAKDOWN AND MODEL DIFFERENCES:

Model No.:    SS    1    C    2    25    P    -U    -  
                   I    II    III    IV    V    VI    VII    VIII    IX

I	-	Series	SS	:	Series
II	-	Connection	1	:	2 wires cable ("pig-tailed")
			2	:	2 wires M8 snap connector
			3	:	3 wires M8 snap connector
			4	:	3 wires cable ("pig-tailed")
III	-	Circuit type	C	:	2 wires REED
			D	:	3 wires REED
			M	:	Magneto-resistive NPN
			N	:	Magneto-resistive PNP
IV	-	Power supply	2	:	<b>*3÷30 V ac/dc for Circuit type C and D, 6÷30 V ac/dc for Circuit type M and N</b>
*					
V	-	Standard cable length	*00-25	:	<b>up to 2.5 m</b>
VI	-	Sensitivity	-	:	Standard version
			MS	:	Medium Sensitivity
			HS	:	High Sensitivity
VII	-	Protection	-	:	standard version
			P	:	"Short circuit" protection
VIII	-	Version	A-Z	:	Version
IX	-	Personalization	-	:	Gimatic
			0÷99999	:	Customer personalization

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ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

- USL - Indicates investigated to United States Standard for Industrial Control Equipment, UL508 (Seventeenth Edition)
- CNL - Indicates investigated to Canadian National Standard for Industrial Control Equipment, C22.2 No.14-13 (Twelfth Edition)

Note: USL = United States Standards - Listed  
CNL = Canadian National Standards - Listed.

These devices were evaluated for compliance with the requirements in the United States Standard for Industrial Control Equipment, UL508 (Seventeenth Edition) and the Canadian National Standard for Industrial Control Equipment, C22.2 N°.14-13.

## CONSTRUCTION DETAILS:

General - The details of construction are covered in the following photographs and accompanying descriptive pages and illustrations.

1. Corrosion Protection - All parts are made of corrosion resistant materials or painted and galvanized plated as corrosion protection.
2. Tolerances - All indicated dimensions are nominal, unless specified otherwise.
3. Mechanical Assembly - Unless otherwise stated, all enclosure parts and component mounting assemblies are mechanically secured.
4. Printed Wiring Boards - Unless otherwise specified, all printed wiring boards are R/C Wiring, Printed (ZPMV2/ZPMV8), and having an operating temperature of at least 105°C suitable for direct support of live parts.
5. Spacings

Spacings are not specified being connected to a Class 2 transformer or power supply with Class 2 characteristics.

## MARKINGS:

See Section General for more details.

The following marking are required and shall be visible when the enclosure cover is removed or the door is open, when other devices are mounted nearby as intended and when devices are installed side by side. The marking shall not be obscured by attachments such as a disconnect switch operating handle:

- a. Listed company name or File number (E362037).
- b. Electrical ratings.
- c. "Class 2", next to the voltage rating of the device.
- d. The catalogue number or equivalent.

The following markings, or similar, are provided on instructional manual shipped with the device. In addition the device shall be marked with a reference to the information such as a diagram number or document number in a way that it is visible when the device is mounted singularly. The wiring diagram may be also securely attached to the equipment.

- a. Wiring terminals shall be marked to indicate the proper connection for the power supply.
- b. Maximum Ambient temperature 60°C.

\*These "Proximity Switches" in the "Connector Version (male threads type M8)" may be provided with the "mating-Connectors-part with Cable attached". If not, this part has to be available through the "Sales catalog".

## LABELING

Any marking that is required shall be permanent, legible and visible. This marking shall be molded, die-stamped, stencil-printed, silk-screened, laser-etch printed, engraved into material or directly and indelibly ink-stamped, if acceptable for surface applied to.

The marking stamped or etched on a metal-plate shall be permanently secured by rivets or screws.

The marking indelibly stamped lettering on a pressure-sensitive label secured by adhesive:

The Marking and Labeling shall be any R/C Marking and Labeling Systems (PGDQ2) or R/C Printing Materials (PGJI2), rated "for an max operating ambient of 60°C. Unless specified otherwise within this Report, the printing material shall also be suitable for 0°C operating ambient. Material shall be suitable for application to a "Nylon - Polyamide". The combination of the ink (ribbon) and the label material shall be used per the manufacturer's UL specifications. The printing of the label shall be done using compatible printing equipment or "any thermal-transfer-ribbons printers".

## FIGURES

FIG. No.	Description
1	SS SERIES - REED CIRCUIT - EXTERNAL VIEW
2	SS SERIES - MAGNETO-RESISTIVE CIRCUIT - EXTERNAL VIEW
3	SS SERIES - INTERNAL VIEW
<b>4</b>	<b>SS SERIES - MAGNETO-RESISTIVE CIRCUIT INTERNAL VIEW</b>

## ILLUSTRATIONS

ILL. No.	Description
1	Switch Enclosure - mechanical dimensions
2	Cable Gland - mechanical dimensions
3	Fixing Screw/ Nut - mechanical dimensions
<b>4A</b>	<b>Male M8 Power Supply Connector 2 poles - mechanical dimensions</b>
<b>4B</b>	<b>Male M8 Power Supply Connector 3 poles - mechanical dimensions</b>
5	Power Supply Cord - specification
6	PRINTED WIRING BOARD - 2 wires REED - component layout
7	PRINTED WIRING BOARD - 3 wires REED - component layout
8	PRINTED WIRING BOARD - Magneto-resistive NPN - component layout
9	PRINTED WIRING BOARD - Magneto-resistive PNP - component layout
10	PRINTED WIRING BOARD - Magneto-resistive NPN with Short Circuit Protection - component layout
11	PRINTED WIRING BOARD - Magneto-resistive PNP with Short Circuit Protection - component layout

## SS SERIES - REED CIRCUIT - EXTERNAL VIEW

FIG. 1

General - These figures show an overall external view of the switch Mod. No. SS4D225-G.

This figure is also representative of all SS series which is constructed as described in the previous pages.

- \*1. **Switch Enclosure - R/C Plastics (QMFZ2/QMFZ8), manufactured by E I DUPONT DE NEMOURS & CO INC (E41938), Polyethylene Terephthalate (PET) glass reinforced, flame retardant, "Rynite", Type FR530 or FR530L, rated V-0, RTIel=155°C @ 0.35mm, min 0.4 mm thick. Only in Natural color and Black color. Refer to Ill. 1 for details on mechanical dimensions.**

Alternative - Any R/C Plastics (QMFZ2/QMFZ8), minimum rated RTIel=65°C at min 0.4 mm thick.

2. Cable Gland - Made of the same material as Switch Enclosure (FIG. 1, item 1). Refer to Ills. No. 2 for details on mechanical dimensions.
3. Fixing Screw/ Nut - Steel, M2 screw. One provided and fitted into Switch Enclosure (FIG. 1, item 1). Refer to Ills. No. 3 for details on mechanical dimensions.
- \*4. **Supply Wiring** - R/C Appliance Wiring Material (AVLV2/ AVLV8), manufactured by TEKIMA Srl (E314444), Style **21238, 2/3** conductor, **max** temp. 80°C, **600Vac, 26 AWG**", ext-dia 2.7 mm. See Ills. No. 5 for details on cable.  
This cable may end with "M8 Connector (Item 5) or "pig-tailed".
5. Male M8 Power Supply Connector (only for M8 Snap Connection Type) - Refer to Ill. No. 4 **and 4A** for details on mechanical dimensions

\*6. Female M8 Power Supply Connector (Optional) - This connector part shall be provided with Cable as in "**Supply Wiring (Item 4)**". Refer to Ill. **No. 4B and 4C** for details on mechanical dimensions

Eng. Note: This part "optional Female M8 Connector" has to be provided with the "mating-part". Otherwise this part has to be available through the "Sales catalog" (See "Marking section").



## SS SERIES - MAGNETO-RESISTIVE CIRCUIT - EXTERNAL VIEW

FIG. 2

General - These figures show an overall external view of the switch Mod. No. SS4N225-G.

This figure is also representative of all SS series which is constructed as described in the previous pages.

1. Switch Enclosure - R/C Plastics (QMFZ2/QMFZ8), manufactured by E I DUPONT DE NEMOURS & CO INC (E41938), Polyethylene Terephthalate (PET) glass reinforced, flame retardant, "Rynite", Type FR530 **or FR530L**, rated V-0, RTIel=155°C @ 0.35mm, min 0.4 mm thick. Only in Natural color and Black color.

## Alternate materials

Any R/C Plastics (QMFZ2/QMFZ8), minimum rated RTIel=95°C at min 0.4mm thick, having minimum Flame Class.

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2. Cable Gland - Made of the same material as Switch Enclosure (FIG. 1, item 1). Refer to Ills. No. 2 for details on mechanical dimensions.
3. Fixing Screw/ Nut - Steel, M2 screw. One provided and fitted into Switch Enclosure (FIG. 1, item 1). Refer to Ills. No. 3 for details on mechanical dimensions.
- \*4. **Supply Wiring** - R/C Appliance Wiring Material (AVLV2/ AVLV8), manufactured by TEKIMA Srl (E314444), Style **21358, 2/3** conductor, **max temp. 80°C, 600Vac, 26 AWG**", ext-dia 2.7 mm. See Ills. No. 5 for details on cable. This cable may end with "M8 Connector (Item 5) or "pig-tailed".
5. Male M8 Power Supply Connector (only for M8 Snap Connection Type) - Refer to Ill. No. 4 **and 4B** for details on mechanical dimensions
- \*6. Female M8 Power Supply Connector (Optional) - This connector part shall be provided with Cable as in "**Supply Wiring (Item 4). Refer to Ill. No. 4B and 4C for details on mechanical dimensions**

Eng. Note: This part "optional Female M8 Connector" has to be provided with the "mating-part". Otherwise this part has to be available through the "Sales catalog" (See "Marking section").

7. **Connector (Optiona) - R/C (ECBT2/8) Component Connectors for Use in Data Signal, Control AND Power Applications, manufactured by Colombo Sergio & Figli srl, Cat No MODS.**

Eng. Note: This part has to be provided with the "mating-part". Otherwise this part has to be available through the "Sales catalog" (See "Marking section").

SS SERIES - INTERNAL VIEW

FIG. 3

General - These figures show an overall internal view of the switch Mod. No. SS4C225-U. This figure is also representative of all SS series, which is constructed as described in the previous pages.

1. Epoxy Potting Resin - Manufactured by ALTANA - Camattini Spa, Epoxy-Resin (EP) Type EC70 with Hardener K21 / K70, rated GTI-90°C.

Alternate - any Epoxy Potting Resin, min rated 90°C.

2. Printed Wiring Board - R/C Printing Wiring Boards (ZPMV2/8), manufactured by LOPAR Srl (E233842), rated V-0, 105°C, suitable for "Direct Support". Refer to the following table for details on component layout.

Circuit type	Personalization	Board Name	Ill.
C - 2 wires REED	-	A.057	6
D - 3 wires REED	-	A.058	7
M - Magneto-resistive NPN	-	A.060	8
N - Magneto-resistive PNP	-	A.059	9
M - Magneto-resistive NPN	P - Short Circuit Protection	A.062	10
N - Magneto-resistive PNP	P - Short Circuit Protection	A.061	11

Alternative - Any R/C PWB (ZPMV2), rated V-2, whose solder time and temperatures are not exceeded, minimum operating temperature is 105°C and suitable for Direct Support.