



CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1358444 (LR 35144)

Master Contract: 166730

Project: 1726703

Date Issued: 2006/01/09

Issued to: **Idec Izumi Corporation**
7-31 Nishimiyahara 1-chome
Yodogawa-Ku, Osaka 532-8550
Japan
Attention: Mr. Kuo Maeda

The products listed below are eligible to bear the CSA Mark shown



Issued by: Gabriel Lippa, CET

Authorized by: Nick Alfano, Operations
Manager

PRODUCTS

CLASS 3211 07 - INDUSTRIAL CONTROL EQUIPMENT - Miscellaneous Apparatus

Relays, Series RU2S and RU2V with suffixes, open type with dust cover, 2pdt, rated 10A, resistive, 250V ac/30V dc.; Coil rated 6 through 220V dc or 6 through 240V ac. 50/60 Hz.

Relays, Series RU4S and RU4V with suffixes, open type with dust cover, 4pdt, 6A, 250V ac/30V dc (same polarity), 1/10Hp, 250V ac (same polarity); Coil rated 6 through 220V dc or 6 through 240V ac. 50/60 Hz.

Relays, series RU42 (twin-contact type), with suffixes, open type with dust cover 4pdt, contacts rated 3A resistive, 30V dc; 3A general-use, 250V ac; coil rated 6 thru 220V dc or 6 thru 240V ac, 50/60Hz.

Notes:



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1. Open type devices are Certified as components for use only in other Certified equipment where the suitability of the combination is to be determined by the CSA International.

2. Series RU4S and RU4V: the contact terminals for each pole must be wired in same polarity.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 14 - Industrial Control Equipment



GSA INTERNATIONAL

Supplement to Certificate of Compliance

Certificate: 1358444

Master Contract: 166730

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
1726703	2006/01/09	Relays to cover addition of 3A, 250 Vac gen.purpose rating
1694551	2005/09/19	Relays to cover addition of 3A, 250 Vac gen.purpose rating
1450130	2003/09/18	To cover the following additions: 1. momentary lever and mechanical indicator type suffix M. 2. Addition of twin contact type suffix 42. 3. Alternate base material type TM-4125 by Sumitomo Bakelite Co.

History

1358444 Sept. 25 /02 Original Certification.

MASTER CONTRACT: 166730 (LR 35144)

REPORT: 1358444

PROJECT: 1726703

Edition 1: September 25, 2002; Project 1358444 - Toronto
Issued by J. Lam, C.E.T.

Edition 2: September 18, 2003; Project 1450130 - Toronto
Issued by G. Lippa, CET

Report Pages Reissued
Illustrations Added: Ills 7 and 8
Figures Added: Fig. 3

Edition 3: September 19, 2005; Project 1694551 - Toronto
Issued by J. Lam, C.E.T.

Report Pages Reissued.

Edition 4: January 9, 2006; Project 1726703 - Toronto
Issued by J. Lam, C.E.T.

Report Pages Reissued
Illustrations Added: Ill. 9

Contents: Certificate of Compliance - Page 1
Supplement to Certificate of Compliance - Page 1
Description and Tests - Pages 1 to 26
Figures - 1 to 3
Illustrations - 1 to 9

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PRODUCTS

CLASS 3211 07 - INDUSTRIAL CONTROL EQUIPMENT - Miscellaneous Apparatus

Relays, Series RU2S and RU2V with suffixes, open type with dust cover, 2pdt, rated 10A, resistive, 250V ac/30V dc.; Coil rated 6 through 220V dc or 6 through 240V ac. 50/60 Hz.

Relays, Series RU4S and RU4V with suffixes, open type with dust cover, 4pdt, 6A, 250V ac/30V dc (same polarity), 1/10Hp, 250V ac (same polarity); Coil rated 6 through 220V dc or 6 through 240V ac. 50/60 Hz.

Relays, series RU42 (twin-contact type), with suffixes, open type with dust cover 4pdt, contacts rated 3A resistive, 30V dc; 3A general-use, 250V ac; coil rated 6 thru 220V dc or 6 thru 240V ac, 50/60Hz.

Notes

1. Open type devices are Certified as components for use only in other Certified equipment where the suitability of the combination is to be determined by the CSA International.
2. Series RU4S and RU4V: the contact terminals for each pole must be wired in same polarity.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 0-M91 - General Requirements - Canadian Electrical Code, Part II
CAN/CSA-C22.2 No. 14-95 - Industrial Control Equipment

MARKINGS

The submitter's name or tradename "IZUMI" or File No "LR 21451" (located adjacent to the CSA Monogram), catalogue designation, complete electrical rating and the CSA Monogram ink-printed on or an adhesive type non-metallic label in a permanent legible manner on each complete unit. Refer to III. 7 for details.

Note: For Series RU4S and RU4V, 4-pole relays, the "SAME POLARITY" wording is also marked adjacent to the rating.

ALTERATIONS

Markings are as described under Markings above.

FACTORY TESTS

If Applicable

The equipment at the conclusion of manufacture, before shipment, shall withstand for one min, without breakdown, the application of 1000V ac plus twice the max rated voltage between live parts and exposed non-current-carrying metal parts. The factory test may be made at existing room temperature. As an alternative, a potential 20 percent higher may be applied for one sec.

Warning: The factory test(s) specified may present a hazard of injury to personnel and/or property and should only be performed by persons knowledgeable of such hazards and under conditions designed to minimize the possibility of injury.

DESCRIPTION

Electrical Spacings: Comply with the electrical spacing requirements of table 6, Group B of C22.2, No. 14.

NOMENCLATURE

A. Series RU2 /RU4

<u>RU</u>	<u>2</u>	<u>3-</u>	<u>T</u>	<u>D</u>	<u>E-</u>	<u>D6</u>
1	2	3	4	5	6	7

1. Series: RU Type Relay

2. Contact Configuration

- 2 - 2 pole single contact
- 4 - 4 pole single contact
- 42 - 4 pole twin contact

3. Terminal type

- S - Soldering and plug-in type
- V - Printed wiring board type

4. Structure

- Blank - Enclosure with latching lever and mechanical indicator
- N - Enclosure without latching lever and mechanical indicator
- T - Top flange enclosure
- C - Enclosure without latching lever and with mechanical indicator.
- M - Enclosure with momentary lever and mechanical indicator.

5. Additional Functions

- Blank: With indicator light (non polarity)
- L: With indicator light (normal polarity, No 13 minus, No. 14 plus)
- L1: With indicator light (reversed polarity, No. 13 plus, No. 14 minus)
- FD: Without indicator light & with a diode against surge voltage of DC coil (normal polarity)
- FD1: Without indicator light & with a diode against surge voltage of DC coil (reversed polarity)
- D: With indicator light & with a diode against surge voltage of DC coil (normal polarity)
- D1: With indicator light & with a diode against surge voltage of DC coil (reversed polarity)
- F: Without indicator light
- R: With indicator light & with capacitor and resistor.
- FR: Without indicator light & with capacitor and resistor.

6. Color of Enclosure

E - Colorless, transparent
Blank - Yellow, transparent

7. Operating Coil Voltage

DC coil: 6 to 220V dc (6, 9, 12, 24, 48, 100, 125, 220V dc), (D6, D9, D12, D24, D48, D110, D125, D220)
AC coil: 6 to 240V ac, 50/60 Hz (6, 12, 24, 48, 50, 100-110, 110-120, 200-220, 220-240V ac), (A6, A12, A24, A48, A50, A100, A110, A200, A220).

Construction Details

Fig 1 - Cat No RU2S-D220

General: Represents entire RU2S and RU2V series relays.. Also see Ills. 1 and 2.

1. Base: Plastic, Type PM-9820 or PM-9830 or TM-4125 manufactured by Sumitomo Bakelite Co., Ltd., or Type CY9610 manufactured by Matsushita Electric Works, Ltd. Overall dimensions 27.3 mm by 20.8 mm by 9.9 mm, 1.3 mm minimum thickness, flammability rated V-0, 105C RTI. Two-point snap-fit enclosure.
2. Dust Cover: Plastic, Type S-3000R manufactured by Mitsubishi Engineering-Plastics Corp., or Type LV-2250 manufactured by Teijin Chemicals Ltd., or Type MF1110 manufacture by GE Plastic Japan, rated V-2, 80°C. Measures 27.3 mm by 20.8 mm by 33.4 mm, 0.8 mm minimum thickness. Secured to base with a snap fit.
3. Coil Assembly:
Bobbin: Accepted plot plastic, Type CRN7015, manufactured by Wintech Polymer Ltd., flammability rated V-0, 140C RTI or Type 1184G-15 manufactured by Toray Industries. Or Type G2830b manufactured by Mitsubishi Rayon Co., Ltd. Overall dimensions 10.9 mm by 18.8 mm by 27.9 mm, 0.5 mm minimum thickness. Provided with split in each side of bobbin for crossover lead insulation and for insulating opposite polarity coil from frame.
Coil Wire: Random wound polyurethane copper wire.
Coil Tape: Two layers of 0.025 mm polyester tape minimum.
4. Core Assembly:
Core: Plated steel. Overall 6.6 mm by 15.5 mm by 21.4 mm
Shading Coil (AC Model only): Copper alloy. Fixed to the core of AC Models. Overall 6.5 mm by 9.9 mm by 1.9 mm.
5. Fixed Terminals: Copper alloy. 0.45 mm thick.

6. Fixed Contacts: Silver alloy, clad copper base. 3.31 mm diameter by 0.7 mm thick. Riveted to the fixed terminal extensions.
7. Movable Contact Assembly:
Movable Contact: Silver alloy, clad copper base. Normally closed contact – 2.86 mm diameter by 0.5 mm thick; Normally open contact – 3.39 mm diameter by 0.8 mm thick. Riveted to movable contact arm.
Movable Contact Arm: Copper alloy, 0.16 mm thick by 3.92 mm wide by approximately 20.9 mm long. Riveted to movable contact terminal extensions.
8. Movable Contact Terminals: Same as Item 6.
9. Card: Plastic, Type 5010N6 manufactured by Mitsubishi Engineering-Plastics Corp., or 66 Nylon, Type CM3004G-15 manufactured by Toray Industries Inc., or Type A-300 manufactured by Teijin Amoco. Facilitates simultaneous movement of movable contact arm and armature, Item 10. See Ill. 2.
10. Armature: Plated steel, 1.1 mm thick. Overall 18.2 mm by 23.4 mm by 9.2 mm.
11. Reset Spring: Stainless steel. Fits over armature, 0.12 mm thickness.
12. Common Guard: Plastic, Type 5010N6 manufactured by Mitsubishi Engineering-Plastics Corp., or Type CN7000, manufactured by Teijin Ltd., rated V-0. Overall 5.2 mm by 18.3 mm by 5.5 mm, 0.6 mm thick. Fits over movable contact arm and common stand.
13. Latching Lever: Plastic, Type S-3000R manufactured by Mitsubishi Engineering-Plastics Corp., or Type LV-2250 manufactured by Teijin Chemicals Ltd. Minimum 1.0 mm thickness.
14. Common Stand: Plastic, Type CRN7015 manufactured by Wintech Polymer Ltd., or Type 1186G-15 manufactured by Toray Industries or Type G2830b manufactured by Mitsubishi Rayon Co., Ltd. Measures overall 12.8 mm by 19.0 mm by 19.8 mm by 1.0 mm minimum thickness. Provided support and isolation to common terminals.
15. Wedge: Plastic, Type CM3006-E manufactured by Toray Industries Inc., or Type 5010N6 manufactured by Mitsubishi Engineering-Plastics Corp.
16. Common Terminals: Copper alloy, 0.48 mm thick.
17. Coil Terminals: Copper alloy, 0.48 mm thick.
18. Coil Resistor: Rated ¼ watts. Or Models with LED indicator light type only, See Ill. 1 for details.
19. Surge Diode: Rated 1A, 1000V, for models with surge protective type only, see Ill. 1 for details.
20. Indicator: Type S-3000R manufactured by Mitsubishi Engineering-Plastics corp., or Type LV-2250 manufactured by Teijin Chemicals Ltd.

Fig. 2 -Series RU4S-L-A220

General: Represents entire RU4S and RU4V series. See also Ills. 3 to 6.

1. Dust Cover: Plastic, Type S-3000R manufactured by Mitsubishi Engineering-Plastics Corp., or Type LV-2250 manufactured by Teijin Chemicals Ltd., rated V-2. Measures 27.1 mm by 20.7 mm by 33.5 mm by 0.7 mm minimum thickness. Two-point snap-fit to base.

Alternate Material: Same as above except GE Plastics Japan Ltd., Type HF-1110 minimum 0.75 mm thick, rated V-2 @ 0.9 mm thick.

2. Base: Plastic, Type PM-9820 or PM-9830 or TM-4125 manufactured by Sumitomo Bakelite Co., Ltd., or Type CY9610 manufactured by Matsushita Electric Works, td., rated V-0. Measures 27.1 mm by 20.7 mm by 9.9 mm by 1.4 mm minimum thickness, flammability rated V-0, 105C RTI. Two-point snap-fit to dust cover.

3. Coil Assembly:

Bobbin: Accepted pbt Plastic, type CRN7015 manufactured by Wintech Polymer, flammability rated V-0, 140C RTI., or Type 1184G-15 manufactured by Toray Industries Inc., or Type G2830(b) manufactured by Mitsubishi Rayon Co., Ltd, rated V-0. Measures 10.9 mm by 18.8 mm by 27.9 mm by 0.5 mm minimum thickness. Provided with split in each side of bobbin for crossover lead insulation and for insulating opposite polarity coil lead from frame.

Coil Wire: Random wound polyurethane copper wire.

Coil Tape: (Optionally provided) Two layers of 0.025 mm polyester tape minimum.

Coil Lead: Copper ally.

4. Core Assembly:

Core: Plated steel. Overall 6.7 mm by 15.2 mm by 21.6 mm.

Shading Coil (AC Models only): Copper ally. Fixed to the core of AC Models. Overall 6.5 mm by 9.9 mm by 1.9 mm.

5. Fixed Terminals: Two type provided.

Printed Wiring Board Type (RU4V Models): Copper ally, 15.88 mm long by 2.1 mm minimum width at contact, 0.7 mm wide at pin.

Soldering and Plug-In Type (RU4S Models): Copper alloy, 18.0 mm long by uniform 2.5 mm wide.

6. Fixed Contacts: Silver alloy, clad copper base with gold alloy plating or overlaid, See Ill's 3 and 4 for details.

Composition - Silver alloy (Ag-90%, Ni - 10%) or Ag - 100%.
7. Movable Contact Assembly:

Movable Contacts: Silver alloy, clad copper base with gold flashing. The composition is the same as Item 6. N.C. contacts - 2.18 mm by 1.96 mm by 0.75 mm thick. N.O. contacts - 1.85 mm by 1.86 mm by 0.75 mm thick.

Movable Contact Arm: Copper alloy, 20.8 mm long by 0.16 mm thick by 2.02 mm minimum width.
8. Card: Plastic, Type 5010N6 manufactured by Mitsubishi Engineering-plastics Corp., or Type CM3004G-15 manufactured by Toray Industries Inc., or Type A-300 manufactured by Teijin Amoco, rated V-0. Measured by 14.5 mm by 18.5 mm . Facilitates simultaneous movement of movable contact arm and armature, Item 9.
9. Armature: Plated steel, 1.1 mm thick. Overall dimensions 18.2 mm by 23.4 mm by 9.2 mm.
10. Hinge Reset Spring: Stainless steel. Fits over armature.
11. Common Guard: Plastic, Type 5010N6 manufactured by Mitsubishi Engineering Plastics Corp., or Type CN7000 manufactured by Teijin Ltd., rated V-0. Overall 5.6 mm by 18.8 mm by 5.0 mm. Fits over movable contact arm and common stand.
12. Latching Lever/Mechanical indicator: Plastic, Type S-3000R manufactured by Mitsubishi Engineering-Plastics Corp., or Type LV-2250 manufactured by Teijin Chemicals Ltd., rated V-2. 1.0 mm minimum thickness. The shape of the latching lever may vary.
13. Common Stand: Type CRN7015 manufactured by Teijin Ltd., or Type 1184G-15 manufactured by Toray Industries, or Type G2830(b) manufactured by Mitsubishi Rayon Co., Ltd., rated V-0. Measures overall 12.8 mm by 19.0 mm by 19.8 mm by 1.0 mm minimum thickness. Provides support and isolation to common terminals.

14. Common Terminals: Copper alloy, 0.48 mm thick.
15. Coil Terminals: Copper alloy, 0.48 mm thick.
16. LED Indicator Circuit: Consists of LED, Resistor, Diode and plastic mold frame – Type CRN7015 manufactured by Teijin Ltd., or G2830(b) manufactured by Mitsubishi Rayon Co., Ltd., rated V-0. See Ill. 5 for details.
17. Surge Diode: For models with surge protective diode.

Series RU42 4 pole twin contact style. Refer to Fig. 3 and Ill. 8

General: This model is very similar to previously investigated Type RU4, described above, except for twin-contact structure of the movable and stationary arms. Refer to Ill. 8 for dimensions, etc. Same contact material are used for the regular 4-pole versions.

Project 1726703:

Alternate Construction of RU2 and RU4 Relays

General: Same construction as previously Certified RU2 and RU4 relays, except for the configuration of base layout. Refer to Ill 9 for details.

TEST REPORT

The following tests were conducted at CSA International (Toronto) Laboratories on the submitted samples.

Relay: Cat No.: RU2S-A220 rated 10A, 250V ac, coil 240V ac
Cat No. RU4S-A220, rated 6A, 1/10Hp, 250V ac, coil 240V ac

Temperature test

Cat No.: RU2S-A220
Test Current: 10A
Wire size: No 16 AWG
Coil: 240V ac

Cat No. RU4S-A220
Test current: 6A
Wire size: No. 18 AWG
Coil: 240V ac

Test enclosure: 4 by 3 by 2-1/2

Thermocouple Location

Cat No	Deg. C	
	<u>RU2S-A220</u>	<u>RU4S-A220</u>
Coil Resistor	72.0	67.6
Coil	68.2	78.7
Terminal	73.3	66.6
Terminal	73.5	65.3
Terminal	60.6	65.9
Terminal	67.3	71.8
Base	70.4	69.0
Case top	65.0	59.9
Case side	75.7	60.1
Case side	61.4	59.0
Case side	63.7	61.1
Case side	51.7	50.9
Room ambient	23.2	22.8

Dielectric Strength Test

Immediately after the temperature test, an AC potential of 1500V ac was applied for one minute in each test:

- a. Between live parts and case (wrapped in foil)
- b. Between coil and contact terminals
- c. Between poles

Results: No dielectric breakdown.

Overload and Endurance Test

Test	Overload	Endurance	Overload	Endurance
Cat No	-----RU4S-220V ac-----			
Configuration	----Normally open----		----Normally closed----	
Sample No.	1	1	2	2
Coil	-----240V ac-----			

Test based on rating of -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	250V ac	250V ac	250V ac	250V ac
Frequency, Hz	60	60	60	60
Amps	9A	6A	9A	6A

Test circuit parameters -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	250V ac	250V ac	250Vac	250V ac
Frequency, Hz	60	60	60	60
Amps	9A	6A	9A	6A
Power Factor, range	70/80	70/80	70/80	70/80
No. of operations	59	6,000	50	6,000
On time - sec	1	1	1	1
Off time - sec	9	9	9	9

The above overload and endurance tests were considered to be accepted, since there was no indication of any electrical or mechanical failure, no undue burning or pitting of the contacts and the 30A fuse did not open.

Dielectric Strength Test

Immediately after the endurance test, an AC potential of 1500V ac was applied for one minute in each test:

- a. Between live parts and case (wrapped in foil)
- b. Between coil and contact terminals
- c. Between poles

Results: No dielectric breakdown.

Test	Overload	Endurance	Overload	Endurance
Cat No	-----RU4S-12V dc-----			
Configuration	----Normally open----		----Normally closed----	
Sample No.	3	3	4	4
Coil	-----240V ac-----			

Test based on rating of -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	30V dc	30V dc	30V dc	30V dc
Frequency, Hz	DC	DC	DC	DC
Amps	9A	6A	9A	6A

Test circuit parameters -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	30V dc	30V dc	30V dc	30V dc
Frequency, Hz	DC	DC	DC	DC
Amps	9A	6A	9A	6A
Power Factor, range	resistive	resistive	resistive	resistive
No. of operations	59	6,000	50	6,000
On time - sec	1	1	1	1
Off time - sec	9	9	9	9

The above overload and endurance tests were considered to be accepted, since there was no indication of any electrical or mechanical failure, no undue burning or pitting of the contacts and the 30A fuse did not open.

Dielectric Strength Test

Immediately after the endurance test, an AC potential of 1500V ac was applied for one minute in each test:

- a. Between live parts and case (wrapped in foil)
- b. Between coil and contact terminals
- c. Between poles

Results: No dielectric breakdown.

Test	Overload	Endurance	Overload	Endurance
Cat No	-----RU4S-220V ac-----			
Configuration	----Normally open----		---Normally closed---	
Sample No.	5	5	6	6
Coil	-----24V ac-----			

Test based on rating of -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	250V ac	250V ac	250V ac	250V ac
Frequency, Hz	60	60	60	60
Hp	1/10	1/10	1/10	1/10

Test circuit parameters -

Phase	1	1	1	1
Pole used	2	2	2	2
Voltage	250V ac	250V ac	250Vac	250V ac
Frequency, Hz	60	60	60	60
Amps	9A	3A	9A	3A
Power Factor, range	40/50	40/50	40/50	40/50
No. of operations	59	1,000	50	1,000
On time - sec	1	1/2	1	1/2
Off time - sec	9	1/2	9	1/2

The above overload and endurance tests were considered to be accepted, since there was no indication of any electrical or mechanical failure, no undue burning or pitting of the contacts and the 30A fuse did not open.

Dielectric Strength Test

Immediately after the endurance test, an AC potential of 1500V ac was applied for one minute in each test:

- Between live parts and case (wrapped in foil)
- Between coil and contact terminals
- Between poles

Results: No dielectric breakdown.

The following test results were provided by the submitter in the form of UL Inc. File E66043, Test Record No. 1, Issued 03-28-01 and Issued 07-21-00.

TEMPERATURE TEST:

Cat No.: RU2S-D-D6
 Wire size: No. 16 AWG
 Current: 10A
 Poles used: 2
 Coil Voltage: 6V dc

<u>Thermocouple Location</u>	<u>Deg. C</u>
Ambient	55.0
Coil outerwrap	78.5
Base	60.8
Cover	59.9
Movable contact/stationary contact arm	72.2
Coil, Change of resistance	88.8

DIELECTRIC STRENGTH TEST

Immediately after the temperature test, an AC potential of 1500V ac, 60Hz was applied for one minute

- Between uninsulated live parts and ground
- Between terminals of opposite polarity
- Between primary and secondary circuits

Results: No dielectric breakdown.

CROSSOVER AND DIELECTRIC STRENGTH TEST

Method: While still in heated condition from the temperature test, the coil of each device was subjected to an alternating current potential of twice the rated voltage for 7,200 electrical cycles (400Hz for 18 seconds). Indications of breakdown in the insulation system were observed.

Results

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU2S-D-D6	6V dc	12V	No breakdown
RU2S-D-D100	100V dc	200V	No breakdown
RU2S-D-D220	220V dc	440V	No breakdown

UNDER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Under Voltage</u>	<u>Results</u>
RU2S-D-D6	6V dc	4.8V dc	Acceptable
RU2S-D-D100	100V dc	80V dc	Acceptable
RU2S-D-D220	220V dc	176V dc	Acceptable

OVER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Over Voltage</u>	<u>Results</u>
RU2S-D-D6	6V dc	6.6V dc	Acceptable
RU2S-D-D100	100V dc	110V dc	Acceptable
RU2S-D-D220	220V dc	242V dc	Acceptable

REPEATED CROSSOVER LEAD DIELECTRIC TEST

The coil terminals were connected to a 6V dc, 100V dc and 220V dc source. The load terminals were connected to a 250V ac, 10A source. The thermocouples were connected to the coil of the device. The device was operated until temperatures and conditions were stabilized.

After temperatures and conditions were stabilized, the control circuit (coil) voltage was reduced to 65 % of the potential is used in the previous crossover lead dielectric test. Indications of a breakdown in the insulation system were observed.

Results: The spacings and insulation of all the coils did withstand the application of the specified potential without breakdown.

TEMPERATURE TEST:

Cat No.: RU2S-A6
Wire size: No. 16 AWG
Current: 10A
Poles used: 2
Coil Voltage: 6V ac

<u>Thermocouple Location</u>	<u>Deg. C</u>
Ambient	55.1
Coil outerwrap	81.3
Base	66.1
Cover	60.1
Movable contact/stationary contact arm	69.6
Coil, Change of resistance	85.7

DIELECTRIC STRENGTH TEST

Immediately after the temperature test, an AC potential of 1500V ac, 60Hz was applied for one minute

- a. Between uninsulated live parts and ground
- b. Between terminals of opposite polarity
- c. Between primary and secondary circuits

Results: No dielectric breakdown.

CROSSOVER AND DIELECTRIC STRENGTH TEST

Method: While still in heated condition from the temperature test, the coil of each device was subjected to an alternating current potential of twice the rated voltage for 7,200 electrical cycles (400Hz for 18 seconds). Indications of breakdown in the insulation system were observed.

Results

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU2S-6	6V ac	12Vac	No breakdown
RU2S-A100	100-120V ac	200Vac	No breakdown
RU2S-A220	220-240V dc	440Vac	No breakdown

UNDER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Under Voltage</u>	<u>Results</u>
RU2S-A6	6V ac	5.1V ac	Acceptable
RU2S-A100	100-120V ac	102V ac	Acceptable
RU2S-A220	220-240V ac	204V ac	Acceptable

OVER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Over Voltage</u>	<u>Results</u>
RU2S-A6	6V ac	6.6V ac	Acceptable
RU2S-A100	100-120V ac	132V ac	Acceptable
RU2S-A220	220-240V ac	264V ac	Acceptable

REPEATED CROSSOVER LEAD DIELECTRIC TEST

The coil terminals were connected to a 6V ac, 100V ac and 220V ac source. The load terminals were connected to a 250V ac, 10A source. The thermocouples were connected to the coil of the device. The device was operated until temperatures and conditions were stabilized.

After temperatures and conditions were stabilized, the control circuit (coil) voltage was reduced to 65% of the potential is used in the previous crossover lead dielectric test. Indications of a breakdown in the insulation system were observed.

Results: The spacings and insulation of all the coils did withstand the application of the specified potential without breakdown.

OVERLOAD AND ENDURANCE TESTS

Cat No	RU2S-D-D12							
Device Rating	10A, 250V ac				10A, 30V dc			
TEST SPECIFICATION								
Test	Overload		Endurance		Overload		Endurance	
Wire size	No. 16 AWG				No. 16 AWG			
Poles used	1		1		1		1	
Closed circuit voltage	250V ac		250V ac		30V dc		30V dc	
Current	15A		10A		15A		10A	
Percent of rated current	150		100		150		100	
Power factor	1		1		1		1	
Phase	1		1		1		1	
Operation per minute	6		6		6		6	
Number of operations	50		6,000		50		6,000	
Cycle rated, seconds	1/9		1/9		1/9		1/9	
TEST DATA	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
Open circuit voltage, V ac/dc	255.3	255.3	255	255	30.34	30.34	30.3	30.3
Closed circuit voltage, V ac/dc	250	250	250	250	30	30	30	30
Current	15A	15A	10A	10A	15A	15A	10A	10A
Wattage	3738	3735	2519	2519	403.1	403.1	268.3	268.3
Power factor	1	1	1	1	1	1	1	1
Shunt resistance, Ω	-	-	-	-				
Number of cycles	50	50	6,000	6,000	50	50	6,000	6,000
Pitting or Burning	No	No	No	No				
DIELECTRIC STRENGTH								
Potential. From live parts to:			1500V ac				707V ac	
-Opposite polarity			No breakdown				No breakdown	
- Enclosure			No breakdown				No breakdown	
- Dead metal parts			No breakdown				No breakdown	

TEMPERATURE TEST

Cat No.: RU4S-ML-6VAC
 Wire size: No. 18 AWG
 Current: 6A
 Coil Voltage: 6V ac
 Poles used: 4

<u>Thermocouple Location</u>	<u>Deg. C</u>
Ambient	23.3
Coil outer wrap	55.1
Line terminal	35.9
Enclosure, behind coil	39.3
Enclosure, top of coil	47.4

DIELECTRIC STRENGTH TEST

Immediately after the temperature test, an AC potential of 1500V ac at 60Hz was applied for one minute in each test.

- a. Between uninsulated live parts and ground
- b. Between primary and secondary circuits

Results: No dielectric breakdown.

CROSSOVER AND DIELECTRIC STRENGTH TEST

Method: While still in heated condition from the temperature test, the coil of each device was subjected to an alternating current potential of twice the rated voltage for 7,200 electrical cycles (400Hz for 18 seconds). Indications of breakdown in the insulation system were observed.

Results

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU4S-ML-6VAC	6V ac	12Vac	No breakdown
RU4S-ML-100-110VAC	100-120V ac	200Vac	No breakdown
RU4S-ML-220-240VAC	220-240V ac	440Vac	No breakdown

UNDER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Under Voltage</u>	<u>Results</u>
RU4S-ML-6VAC (1A)	6V ac	5.1V ac	Acceptable
RU4S-ML-100-110VAC (2A)	100-120V ac	102V ac	Acceptable
RU4S-ML-220-240VAC (3A)	220-240V ac	204V ac	Acceptable

OVER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Over Voltage</u>	<u>Results</u>
1A	6V ac	6.6V ac	Acceptable
2A	100-120V ac	132V ac	Acceptable
3A	220-240V ac	264V ac	Acceptable

REPEATED CROSSOVER LEAD DIELECTRIC TEST

The coil terminals were connected to a 6V ac, 100V ac and 220V ac source. The load terminals were connected to a 250V ac, 10A source. The thermocouples were connected to the coil of the device. The device was operated until temperatures and conditions were stabilized.

After temperatures and conditions were stabilized, the control circuit (coil) voltage was reduced to 65% of the potential is used in the previous crossover lead dielectric test. Indications of a breakdown in the insulation system were observed.

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU4S-ML-6VAC	6V ac	7.8Vac	No breakdown
RU4S-ML-100-110VAC	100-120V ac	156Vac	No breakdown
RU4S-ML-220240VAC	220-240V ac	312Vac	No breakdown

Results: The spacings and insulation of all the coils did withstand the application of the specified potential without breakdown.

TEMPERATURE TEST

Cat No.: RU4S-MLD-6VDC
Wire size: No. 18 AWG
Current: 6A
Coil Voltage: 6V dc
Poles used: 4

<u>Thermocouple Location</u>	<u>Deg. C</u>
Ambient	25.4
Coil outer wrap	62.4
Line terminal	41.7
Enclosure, behind coil	55.3
Enclosure, top of coil	49.5

DIELECTRIC STRENGTH TEST

Immediately after the temperature test, an AC potential of 1500V ac at 60Hz was applied for one minute in each test.

- a. Between uninsulated live parts and ground
- b. Between primary and secondary circuits

Results: No dielectric breakdown.

CROSSOVER AND DIELECTRIC STRENGTH TEST

Method: While still in heated condition from the temperature test, the coil of each device was subjected to an alternating current potential of twice the rated voltage for 7,200 electrical cycles (400Hz for 18 seconds). Indications of breakdown in the insulation system were observed.

Results

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU4S-MLD-6VDC	6V dc	12Vac	No breakdown
RU4S-MLD-100VDC	100V dc	200Vac	No breakdown
RU4S-MLD-220VDC	220V dc	440Vac	No breakdown

UNDER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Under Voltage</u>	<u>Results</u>
RU4S-MLD-6VDC (1B)	6V dc	4.8V dc	Acceptable
RU4S-MLD-100VDC (2B)	100V dc	80V dc	Acceptable
RU4S-MLD-220VDC (3A)	220V dc	176V dc	Acceptable

OVER VOLTAGE TEST

<u>Model number</u>	<u>Rated Voltage</u>	<u>Over Voltage</u>	<u>Results</u>
1B	6V dc	6.6V dc	Acceptable
2B	100V dc	110V dc	Acceptable
3B	220V dc	242V dc	Acceptable

REPEATED CROSSOVER LEAD DIELECTRIC TEST

The coil terminals were connected to a 6V ac, 100V ac and 220V ac source. The load terminals were connected to a 250V ac, 10A source. The thermocouples were connected to the coil of the device. The device was operated until temperatures and conditions were stabilized.

After temperatures and conditions were stabilized, the control circuit (coil) voltage was reduced to 65 % of the potential is used in the previous crossover lead dielectric test. Indications of a breakdown in the insulation system were observed.

<u>Model Number</u>	<u>Rated Voltage</u>	<u>Test Potential</u>	<u>Results</u>
RU4S-MLD-6VDC	6V dc	7.8Vdc	No breakdown
RU4S-MLD-100VDC	100V dc	130Vdc	No breakdown
RU4S-MLD-220VDC	220V dc	288Vdc	No breakdown

Results: The spacings and insulation of all the coils did withstand the application of the specified potential without breakdown.

OVERLOAD AND ENDURANCE TESTS

Cat No	RU4S-MLD-12VDC							
Device Rating	6A, 250V ac				6A, 30V dc			
TEST SPECIFICATION								
Test	Overload		Endurance		Overload		Endurance	
Wire size	No. 18 AWG				No. 18 AWG			
Poles used	1		1		1		1	
Closed circuit voltage	250V ac		250V ac		30V dc		30V dc	
Current	9A		6A		9A		6A	
Percent of rated current	150		100		150		100	
Power factor	70/80		70/80		1		1	
Phase	1		1		1		1	
Operation per minute	6		6		6		6	
Number of operations	50		6,000		50		6,000	
Cycle rated, seconds	1/9		1/9		1/9		1/9	
TEST DATA	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.
Open circuit voltage, V ac/dc	254.5	254.5	253	253	-	-	-	-
Closed circuit voltage, V ac/dc	249.9	249.9	251.6	251.6	30.3	30.3	30.3	30.3
Current	9A	9A	6A	6A	9.1A	9.1A	6A	6A
Wattage	1724	1724	1152	1152	267	267	183	183
Power factor	0.75	0.75	0.75	0.75	1	1	1	1
Shunt resistance, Ω	1615	1615	2420	2420				
Number of cycles	50	50	6,000	6,000	50	50	6,000	6,000
Pitting or Burning	No	No	No	No				
DIELECTRIC STRENGTH								
Potential. From live parts to:			1500V ac				500V ac	
-Opposite polarity			No breakdown				No breakdown	
- Enclosure			No breakdown				No breakdown	
- Dead metal parts			No breakdown				No breakdown	

OVERLOAD AND ENDURANCE TESTS

Cat No	RU4S-MLD-12VDC			
Device Rating	1/10Hp, 250V ac			
TEST SPECIFICATION				
Test	Overload		Endurance	
Wire size	No. 24 AWG			
Poles used	1		1	
Closed circuit voltage	250V ac		250V ac	
Current	9A		3A	
Percent of rated current	600		200	
Power factor	40/50		40/50	
Phase	1		1	
Operation per minute	6		60	
Number of operations	50		1,000	
Cycle rated, seconds	1/9		1/2 / 1/2	
TEST DATA	N.O.	N.C.	N.O.	N.C.
Open circuit voltage, V ac/dc	255.0	255.0	250	250
Closed circuit voltage, V ac/dc	250	250	249.9	249.9
Current	8.9A	8.9A	3A	3A
Wattage	1034	1034	344.9	344.9
Power factor	0.45	0.45	0.45	0.45
Shunt resistance, Ω	4975	4975	14745	14745
Number of cycles	50	50	1,000	1,000
Pitting or Burning	No	No	No	No
DIELECTRIC STRENGTH				
Potential. From live parts to:			1500V ac	
-Opposite polarity			No breakdown	
- Enclosure			No breakdown	
- Dead metal parts			No breakdown	

Project 1450130: Covers the following additions:

1. Momentary lever and mechanical indicator type Suffix M.
2. Addition of twin contact type, suffix 42 RU42, with contact rating of 3A res, 30V dc/250V ac.
3. Alternate base material Type TM-4125 by Sumitomo Bakelite Co., flammability rated V-0.

For Items 1 and 3, no tests were deemed necessary. For Item 2, a test program was conducted on representative samples at CSA Toronto Lab with satisfactory results as follows:

Submitter: Idec Izumi
File No.: 166730-1450130

Cat No: RU with suffix 42
Rating: 3A (resistive), 30V dc/250V ac

TEMPERATURE TEST

Cat No.: RU42-A220
Current: 3A
Wire size: No. 20 AWG
Coil: 240V ac
Test Enclosure: 1-1/4 by 2 by 3 inches

Thermocouple Location	Max Temperature, °C
Terminal	30.5
Terminal	31.3
Terminal	31.3
Terminal	31.7
Terminal	32.3
Terminal	32.1
Terminal	31.2
Terminal	30.5
Base	50.1
Case top	53.5
Case side	52.3
Case side	49.6
Case side	37.1
Case side	49.6
Coil (Rise-of resistance)	75.45
-Cold R	19.61kΩ
-Hot R	23.62kΩ
Ambient	22.0

DIELECTRIC STRENGTH TEST

Immediately after the temperature test, an AC potential of 1500V ac was applied for one minute in each test

- a. Between live parts and case (wrapped in foil)
- b. Between coil and contact terminals
- c. Between poles

Results: No dielectric breakdown.

OVERLOAD AND ENDURANCE TESTS, Cl 6.5 and 6.6 of Std. 14-95

Test	Overload	Endurance	Overload	Endurance
Cat No	RU42-A220			
Sample No	1	1	2	2
Configuration	Normally open			
Wire Size, AWG	20	20	20	20
Coil Voltage	240V ac			
Test based on rating of-				
Phase	1	1	DC	DC
Poles tested	2	2	2	2
Voltage	250V ac	250V ac	30V dc	30V dc
Frequency, Hz	60	60	DC	DC
Current	4.5A	3.0A	4.5A	3.0A
HP, LRA/FLA	-	-	-	-
Tested ambient	-	-	-	-
Test circuit parameters -				
Phase	1	1	DC	DC
Poles tested	2	2	2	2
Voltage	250V ac	250V ac	30V dc	30V dc
Frequency, Hz	60	60	DC	DC
Current	4.6A	3.2A	4.6A	3.1A
Power factor, range	resistive	resistive	resistive	resistive
Tested ambient	-	-	-	-
No. of operations	50	6,000	50	6,000
On time - second	1	1	1	1
Off time - second	9	9	9	9
Method	Magnetically			

The above overload and endurance tests were considered to be acceptable, since there was no indication of any electrical or mechanical failure, no undue pitting or burning of the contacts, and the 30A fuse did not open.

DIELECTRIC STRENGTH TEST, Cl 6.8 of Std. 14-95:

Immediately after the endurance test, an AC potential of 1500V ac was applied for one minute in each test:

- a. Between live parts and case (wrapped in foil)
- b. Between coil and contact terminals
- c. Between poles

Results: No dielectric breakdown.

Project 1694551: Covers 3A, general-use, 250V ac rating. The following tests were conducted at CSA International (Toronto) Laboratories on the submitted samples with acceptable results.

Cat No.: RU2S-C-DC24
 Rating: 3A, 250V ac

OVERLOAD AND ENDURANCE TEST

Test	Overload	Endurance	Overload	Endurance
Cat No	RU2S-C-DC24			
Configuration	Normally Open		Normally Closed	
Wire size, No.	18	18	18	18
Test based on rating of-				
Phase	1	1	1	1
Poles tested	2	2	2	2
Voltage	250V ac	250V ac	250v ac	250V ac
Frequency, Hz	60	60	60	60
Ampere	4.5A	3A	4.5A	3A
Test circuit parameters -				
Phase	1	1	1	1
Poles tested	2	2	2	2
Voltage	250V ac	250V ac	250v ac	250V ac
Frequency, Hz	60	60	60	60
Ampere	4.55A	3.2A	4.55A	3.2A
Power factory, range	70/80	70/80	70/80	70/80
No. Of Operation	50	6,000	50	6,000
Time on - second	1	1	1	1
Time off - seconds	9	9	9	9
Method Of Operation	Magnetically			

The above overload and endurance tests are considered to be acceptable, since there was no indication of any electrical or mechanical failure, no undue pitting or burning of the contacts and the 30A fuse did not open

DIELECTRIC STRENGTH TEST

Immediately after the endurance test, an AC potential of 1500V ac was applied for one minute in each test

- a) Between live parts and case (Wrapped in foil)
- b) Between contact and coil terminals
- c) Between poles

Results: No dielectric breakdown

Project 1726703: Covers alternate configuration of base layout for Cat Nos. RU2 and RU4 relays. Due to the similarity to the previously Certified relays with same catalogue designations, no further tests were considered necessary.

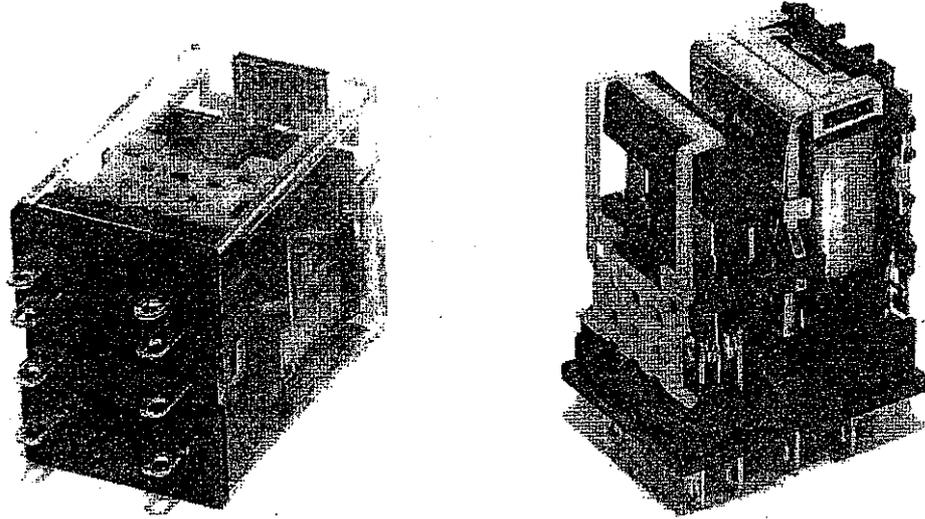


Fig. 1
(LR 35144)
166730-1358444

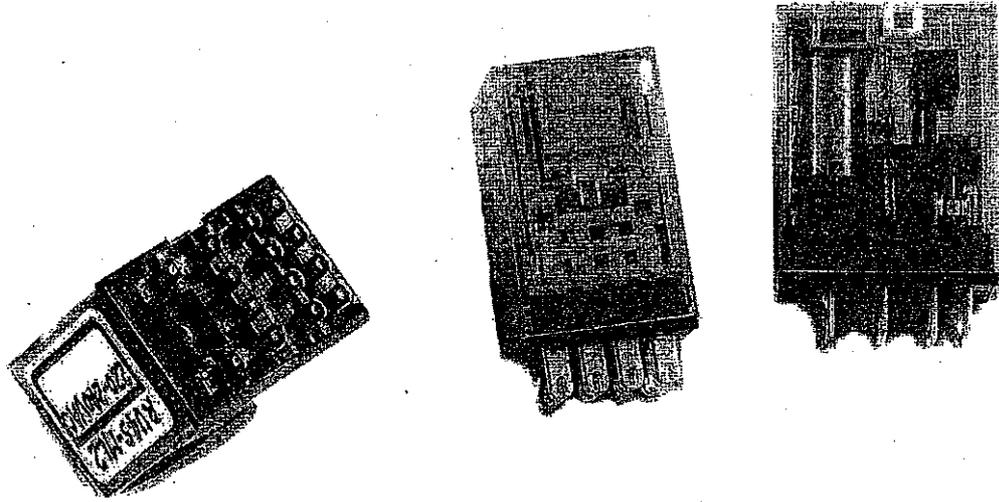
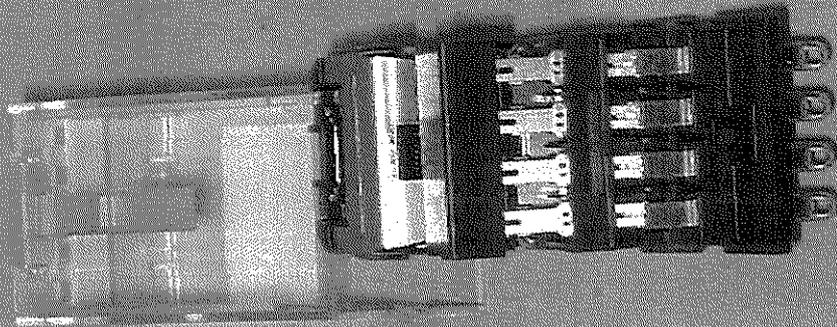
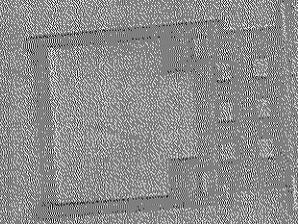
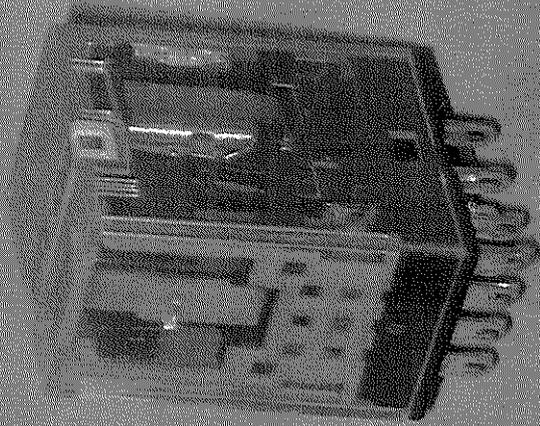


Fig. 2
(LR 35144)
166730-1358444

166730-1358444
proj. - 1450130

FIG. 3



With indicator light & a diode against surge voltage of DC coil
 (AC type : without a diode against surge voltage of DC coil)
 (with non polarity LED)

Type number

· DC type

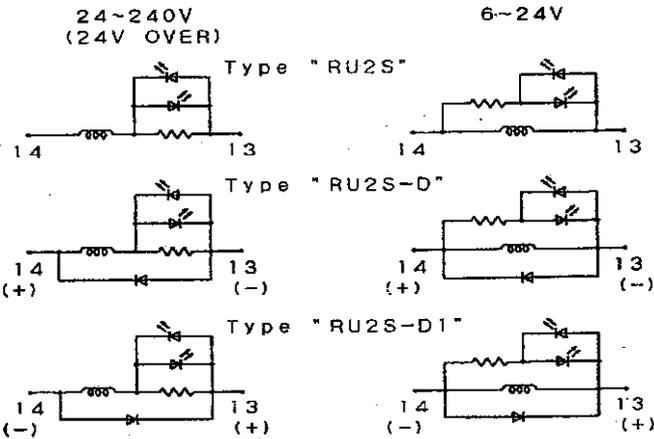
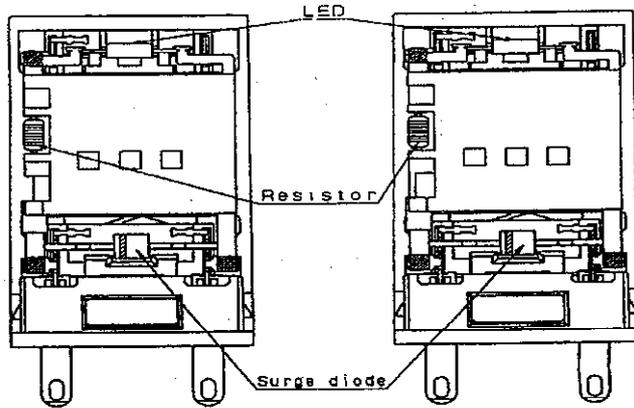
ex. RU2S-D*** (non surge diode)

RU2S-D-D***

RU2S-D1-D***

· AC type

ex. RU2S-A*** (non surge diode)



Wiring diagram of coil terminal

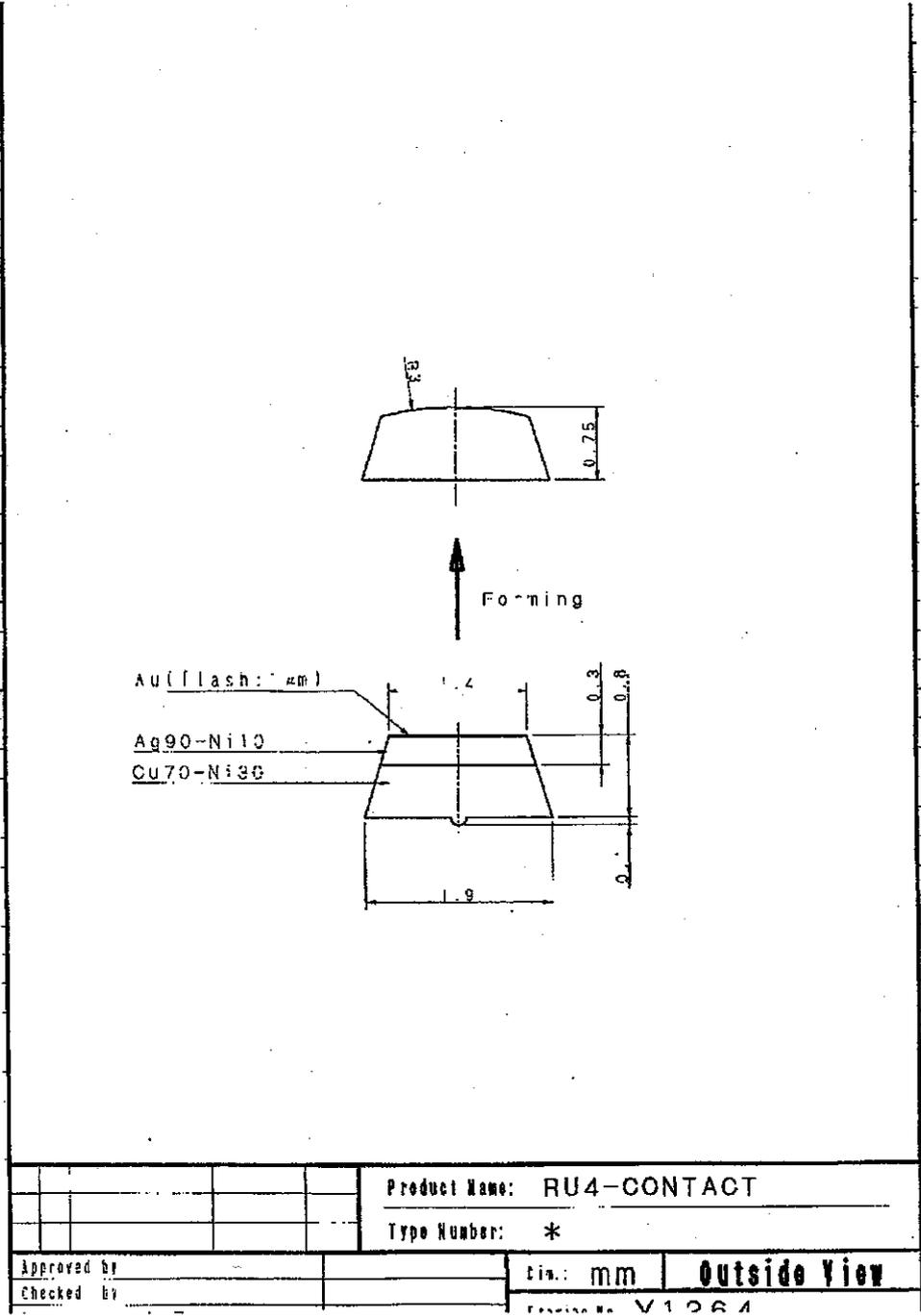
		Product Name: RU2	
		Type Number: RU2S (AC/DC)	
Approved by		Dim.: mm	Outside View
Checked by		Drawing No. *	
Drawn by	*	7.25.2000	

R RU2 (CADRA)

idcc

*

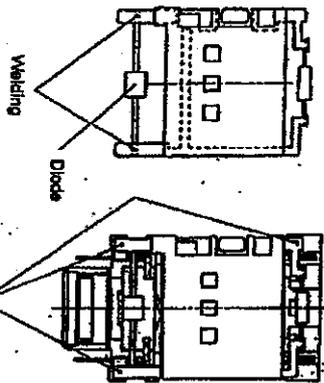
III. 1
 (LR 35144)
 166730-1358444



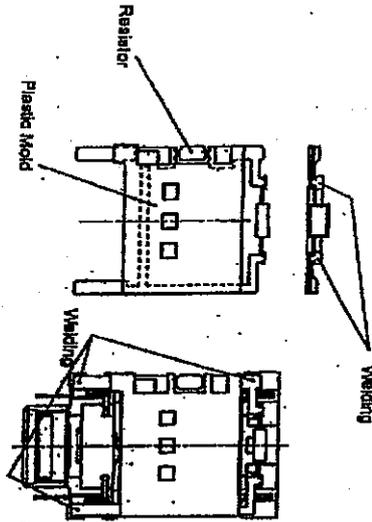
III. 3
 (LR 35144)
 166730-1358444



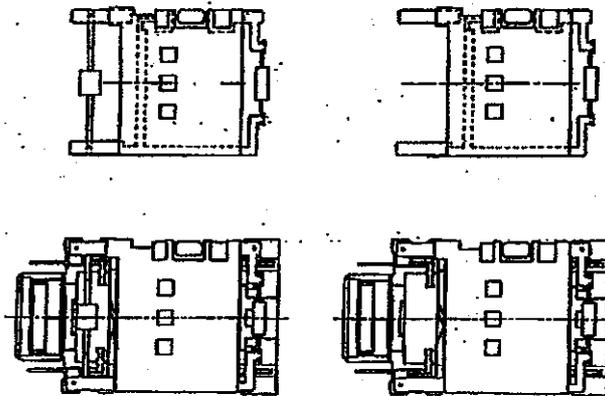
LED (Non-polarized)



LED



Low-Voltage Type (24V or less)



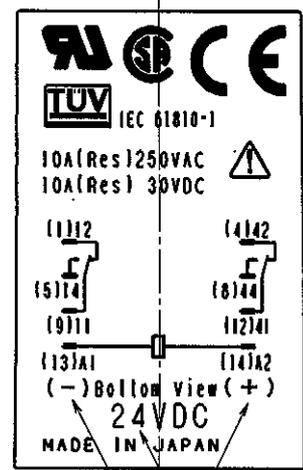
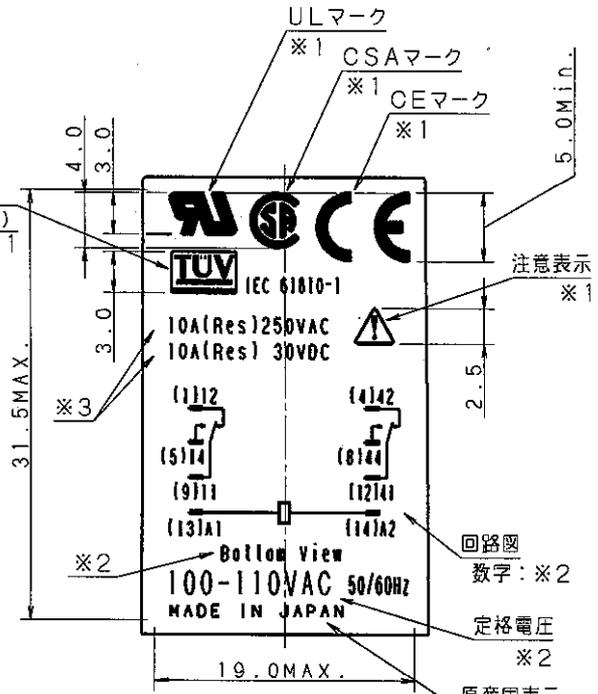
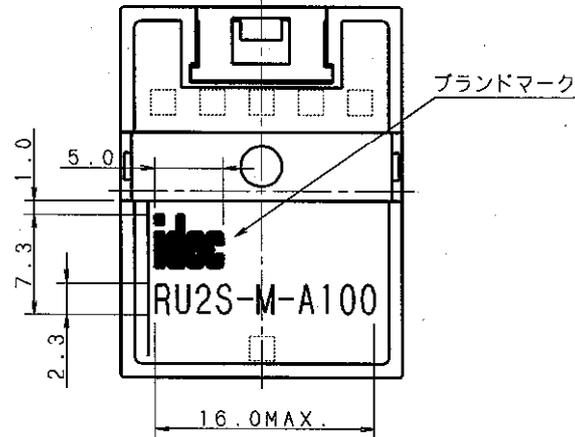
High-Voltage Type (more than 24V)

III. 6
(LR 35144)
166730-1358444

加工工程
1. ケース印刷 (天面)
2. ケース印刷 (側面)

166730-135844
proj. -1450130
211.7

注1 印刷ノ色ハ天面ハ青色(DIC・N890、第6版)トシ、側面ハ白(指定ナシ)トスル。印刷時ハ印刷ノ面、方向ヲ間違エナイコト。
注2 図中ノ※数字ハ文字ノ書体ヲ指示スルタメモノデアリ、書体ハ以下ノ通り。
※1: 指定ロゴマーク (清刷又ハ支給データニヨル)
※2: Frutiger Bold
※3: Frutiger Black
注3 極性表示ハダイオード付タイプニノミ印刷シ、ソノ他ノタイプニハ印刷シナイコト。又、ダイオード付ハ下記ノ形番種別ニヨリ極性ガ異ナルノデ注意ノコト。



極性表示 ※2 定格電圧 ※2
ダイオード付タイプ

角 度	± 30'
高さ又は片より	± 0.1
ねじの牙繰	JIS 2級

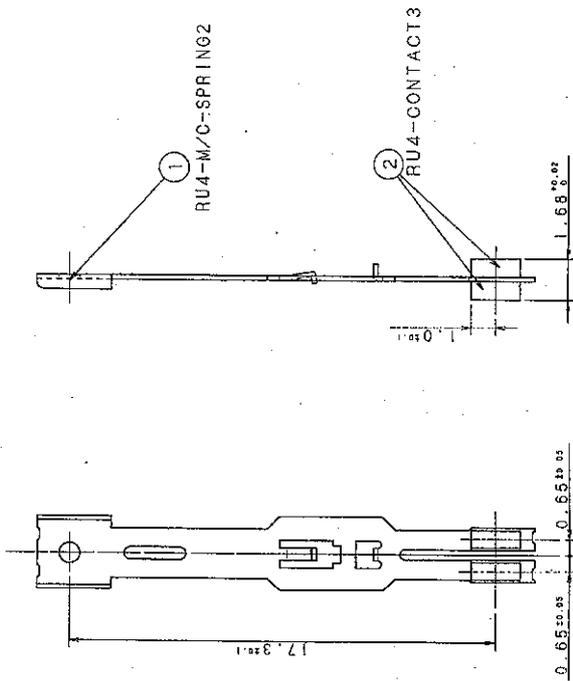
4ピン	16ピン	63ピン	250ピン
± 0.1	± 0.2	± 0.3	± 0.8
公差			

△	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
△	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
△	数 変更No. 及び摘要			年・月・日	担当者	*	*	*	*	*	*	*	*	*	*	*	*	*	*
承	製	製	製	製	製	1	RU4-CASE2	Y1364-1004	1	*	*	*	*	*	*	*	*	*	*
研	研	研	研	研	研	1	RU4-CASE2	Y1364-1004	1	*	*	*	*	*	*	*	*	*	*
山	山	山	山	山	山	1	RU4-CASE2	Y1364-1004	1	*	*	*	*	*	*	*	*	*	*
第3角法	単位	mm	尺	2	1	個	1	質量	*										

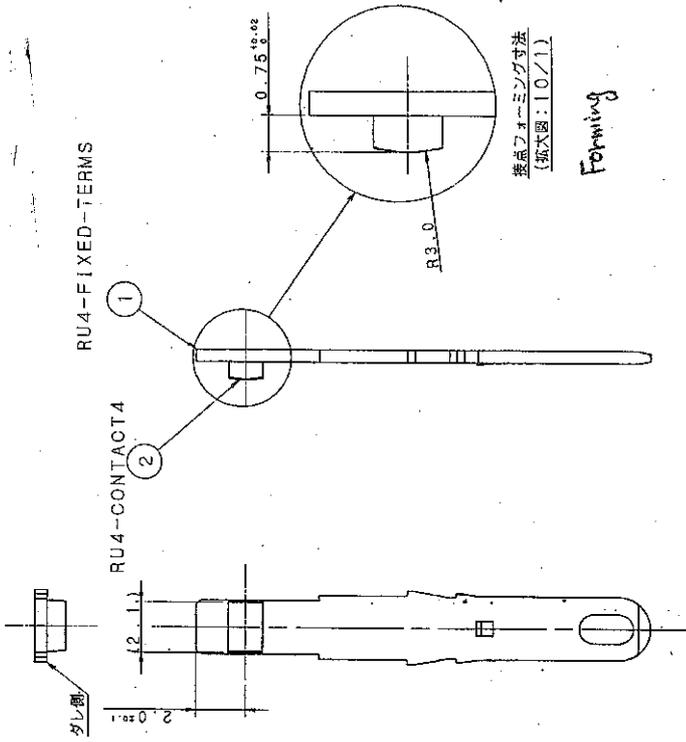
製品名	RU2	名	RU2-M-CASE2	図	Y1365-5001
		称	-MARKING		

RU形ツイン接点再DR会議資料

RU4-X-M/C-SPRING-KIT

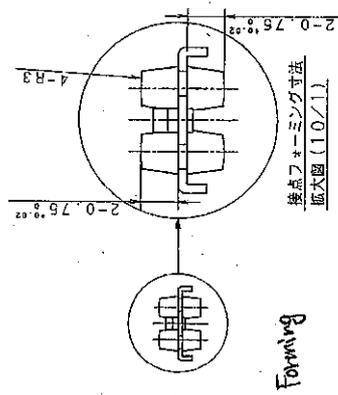


RU4S-X-FIXED-TERMS-KIT



Stationary Contact Arms

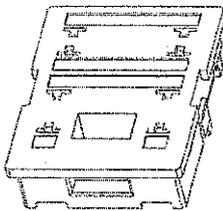
166730-1358444
proj. -1450130
J11.8



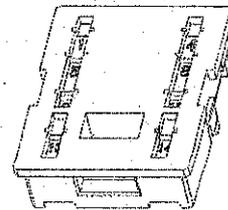
Movable Contact Arm

RU2 series relay

Current

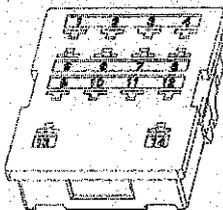


Alternate

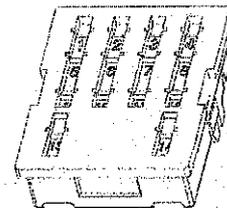


RU4 series relay

Current



Alternate



III. 9
(LR 35144)
166730-1358444