

**DCS Input/Output Relay Card Series**

**I/O RELAY CARD**  
(high load current type)

MODEL **38D2**

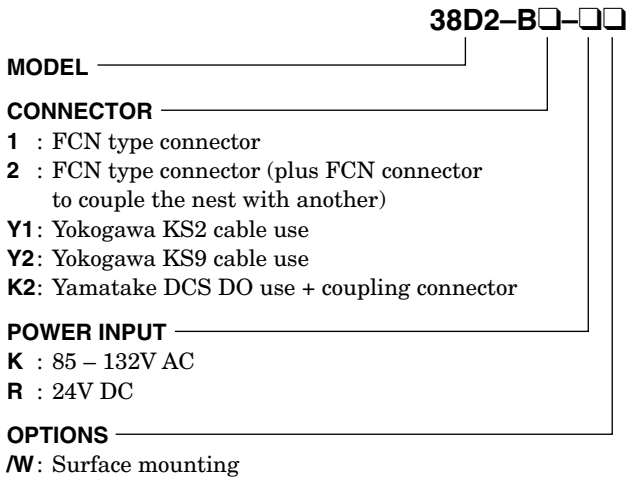
**DESCRIPTIONS**

The 38D series I/O Relay Cards easily and quickly standardize and facilitate installation of the DCS relay board.

- 16 points per rack
- Independent relay card
- Test switch and LED help debugging and monitoring
- Fuse provided to each channel
- Standard rack receives either input cards or output cards
- Input relay card is standard with a relay contact input and a re-transmitted output (5A).
- Output relay card is standard with a voltage output for driving electromagnetic valve and a relay contact (5A).

**• Standard Rack (nest)**

**MODEL & SUFFIX CODE SELECTION**



**ORDERING INFORMATION**

Specify code number. (e.g. 38D2-B1-K)

**RELATED PRODUCTS**

- Special cable (model: FCN)
- Connector terminal block (model: CNT)

**GENERAL SPECIFICATIONS**

**Construction:** Metal plates assembly; angle bracket mounting; JIS or EIA standard rack

**Capacity:** 16 positions

**Connection**

**Power, alarm, voltage output:** M3.5 screw terminals (nickel-plated brass; torque 0.8 N·m)

**Alarm output:** Dry contact output provided when a fuse on the relay cards is blown.

**INSTALLATION**

**Power input**

**AC:** Operational voltage range 85 – 132V  
47 – 66 Hz, max. 15VA

**DC:** Operational voltage range 24V DC ±10%,  
ripple 10% p-p max.

**Voltage output:** Max. 125V (100V AC/24V DC)  
Max. 8A for the total of relay cards

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90% RH (non-condensing)

**Mounting:** JIS/EIA standard rack or surface

**Dimensions:** W480×H99×D170 mm (18.90”×3.90”×6.69”)

**Weight**

**AC powered:** 2.2 kg (4.9 lbs)

**DC powered:** 2.0 kg (4.8 lbs)

**PERFORMANCE**

**Insulation resistance**

**38D2-B1, B2, BY1, BY2:** ≥100MΩ with 500V DC

(I/O connector to power to alarm output to voltage output to FG)

**38D2-BK2:** ≥100MΩ with 500V DC

(I/O connector or power to alarm output to voltage output to FG)

**Dielectric strength**

**38D2-B1, B2, BY1, BY2:** 500V AC @1 minute

(I/O connector to power to alarm output)

1500V AC @1 minute (I/O connector or power or alarm output to voltage output)

500V AC @1 minute\* (I/O connector or power or alarm output to FG)

2000V AC @1 minute (voltage output to FG)

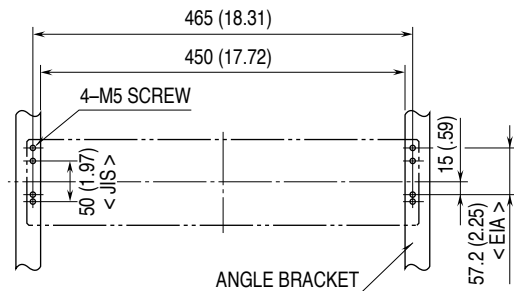
**38D2-BK2:** 500V AC @1 minute\* (I/O connector or power to alarm output to FG)

1500V AC @1 minute (I/O connector or power or alarm output to voltage output)

2000V AC @1 minute (voltage output to FG)

\*1000V AC for 24V DC power input

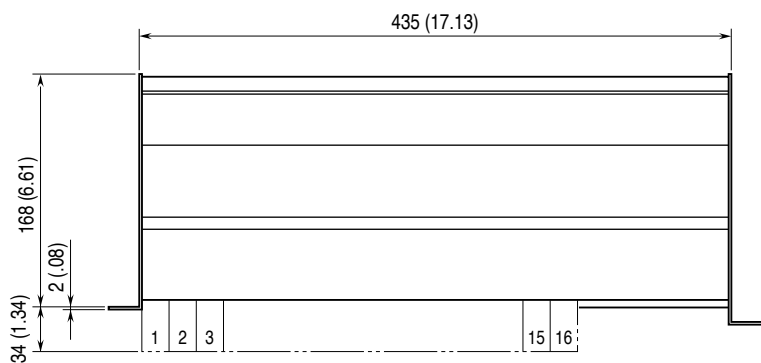
**MOUNTING REQUIREMENTS mm (inch)**



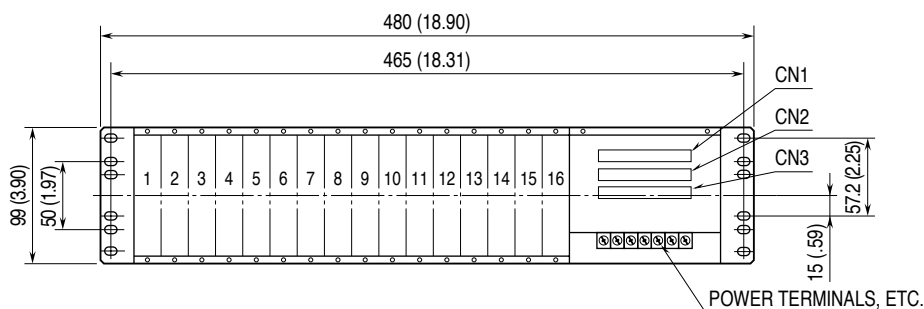
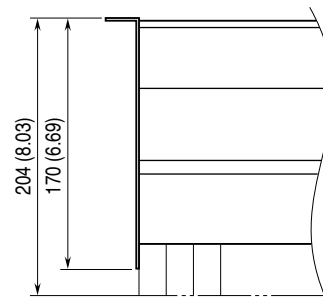
Observe appropriate wiring space under the rack.

**EXTERNAL DIMENSIONS unit: mm (inch)**

■ **RACK MOUNTING**



■ **SURFACE MOUNTING**

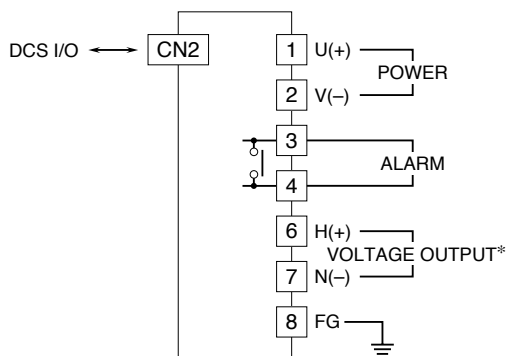


MODEL CODE		38D2				
		-B1	-B2	-BY1	-BY2	-BK2
CONNECTOR	Yokogawa KS2 (16 chs.)			X		
	Yokogawa KS9 (32 chs.)				X	
	Yamatake J-RSK					X
CN2	FCN (16/32 chs.)	X	X			
CN3	FCN (coupling nests)		X		X	X

Couple the 38D-B1 with the 38D-B2 or BY2 in order to handle 32-point I/O.

**CONNECTION DIAGRAM & CONNECTOR PIN ASSIGNMENT**

■ **38D2-B1 (FCN connector)**



\*Used only in combination with Output Relay Card (model: 38D2-5).

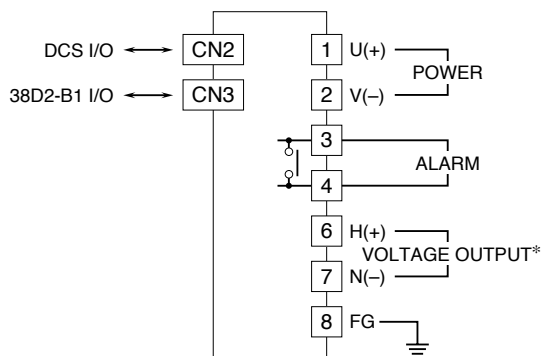
• **Connector Pin Assignment**

I/O connector CN2: Fujitsu FCN364P040-AU

PIN NO.	ASSIGNMENT	PIN NO.	ASSIGNMENT
A 1	ch. 1 +	B 1	ch. 1 -
A 2	ch. 2 +	B 2	ch. 2 -
A 3	ch. 3 +	B 3	ch. 3 -
A 4	ch. 4 +	B 4	ch. 4 -
A 5	ch. 5 +	B 5	ch. 5 -
A 6	ch. 6 +	B 6	ch. 6 -
A 7	ch. 7 +	B 7	ch. 7 -
A 8	ch. 8 +	B 8	ch. 8 -
A 9	ch. 9 +	B 9	ch. 9 -
A10	ch.10 +	B10	ch.10 -
A11	ch.11 +	B11	ch.11 -
A12	ch.12 +	B12	ch.12 -
A13	ch.13 +	B13	ch.13 -
A14	ch.14 +	B14	ch.14 -
A15	ch.15 +	B15	ch.15 -
A16	ch.16 +	B16	ch.16 -

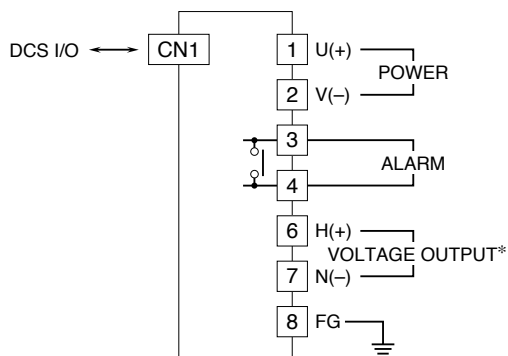
A17 – A20, B17 – B20: Unused

■ 38D2-B2 (FCN connector)



\*Used only in combination with Output Relay Card (model: 38D2-5).

■ 38D2-BY1 (KS2 cable)



\*Used only in combination with Output Relay Card (model: 38D2-5).

• Connector Pin Assignment

I/O connector CN2: Fujitsu FCN364P040-AU

I/O connector CN3: Fujitsu FCN364P040-AU

PIN NO.	ASSIGNMENT (B2)	PIN NO.	ASSIGNMENT (B1)
A 1	ch. 1 +	B 1	ch. 1 +
A 2	ch. 2 +	B 2	ch. 2 +
A 3	ch. 3 +	B 3	ch. 3 +
A 4	ch. 4 +	B 4	ch. 4 +
A 5	ch. 5 +	B 5	ch. 5 +
A 6	ch. 6 +	B 6	ch. 6 +
A 7	ch. 7 +	B 7	ch. 7 +
A 8	ch. 8 +	B 8	ch. 8 +
A 9	ch. 9 +	B 9	ch. 9 +
A10	ch.10 +	B10	ch.10 +
A11	ch.11 +	B11	ch.11 +
A12	ch.12 +	B12	ch.12 +
A13	ch.13 +	B13	ch.13 +
A14	ch.14 +	B14	ch.14 +
A15	ch.15 +	B15	ch.15 +
A16	ch.16 +	B16	ch.16 +

A17 – A20 are common negative for the 38D2-B2.

B17 – B20 are common negative for the 38D2-B1.

• I/O Location

I/O connector CN1: PS-40PE-D4T1-PN1

(ST2, ST3, ST4\* use)

38D2-BY1 Location															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ST Card I/O No.															

\*ST2, ST3 and ST4 (for Yokogawa KS2 cable) are the contact I/O cards used for Yokogawa DCS.

ST2: 16-point contact inputs / 16-point contact outputs

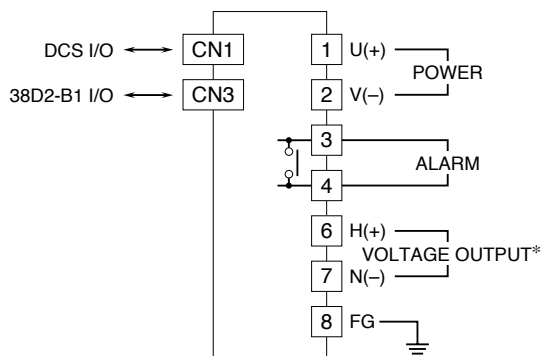
ST3: 16-point contact inputs × 2 (32 points)

ST4: 16-point contact outputs × 2 (32 points)

• Connector Pin Assignment

PIN NO.	ASSIGNMENT	PIN NO.	ASSIGNMENT
40	ch. 1 +	39	ch. 1 -
38	ch. 2 +	37	ch. 2 -
36	ch. 3 +	35	ch. 3 -
34	ch. 4 +	33	ch. 4 -
32	ch. 5 +	31	ch. 5 -
30	ch. 6 +	29	ch. 6 -
28	ch. 7 +	27	ch. 7 -
26	ch. 8 +	25	ch. 8 -
24	ch. 9 +	23	ch. 9 -
22	ch.10 +	21	ch.10 -
20	ch.11 +	19	ch.11 -
18	ch.12 +	17	ch.12 -
16	ch.13 +	15	ch.13 -
14	ch.14 +	13	ch.14 -
12	ch.15 +	11	ch.15 -
10	ch.16 +	9	ch.16 -

■ 38D2-BY2 (KS9 cable)



\*Used only in combination with Output Relay Card (model: 38D2-5).

• I/O Location

I/O connector CN1: PS-50PE-D4T1-PN1  
(ST5, ST6, ST7\* use)

I/O connector CN3: Fujitsu FCN364P040-AU  
(used to couple with the 38D2-B1)

38D2-BY2 Location															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ST Card I/O No.															
38D2-B1 Location															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
ST Card I/O No.															

\*ST5, ST6 and ST7 (for Yokogawa KS9 cable) are the contact I/O cards used for Yokogawa DCS.

- ST5: 32-point contact inputs / 32-point contact outputs
- ST6: 32-point contact inputs × 2 (64 points)
- ST7: 32-point contact outputs × 2 (64 points)

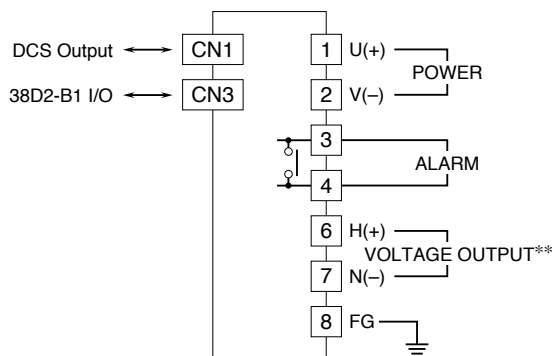
• Connector Pin Assignment

PIN NO.	ASSIGNMENT (BY2)	PIN NO.	ASSIGNMENT (B1)
46	ch. 1 +	26	ch.17 +
45	ch. 2 +	25	ch.18 +
44	ch. 3 +	24	ch.19 +
43	ch. 4 +	23	ch.20 +
42	ch. 5 +	22	ch.21 +
41	ch. 6 +	21	ch.22 +
40	ch. 7 +	20	ch.23 +
39	ch. 8 +	19	ch.24 +
38	ch. 9 +	18	ch.25 +
37	ch.10 +	17	ch.26 +
36	ch.11 +	16	ch.27 +
35	ch.12 +	15	ch.28 +
34	ch.13 +	14	ch.29 +
33	ch.14 +	13	ch.30 +
32	ch.15 +	12	ch.31 +
31	ch.16 +	11	ch.32 +

47 – 50 are common negative for the 38D2-BY2.

27 – 30 are common negative for the 38D2-B1.

■ 38D2-BK2 (J-RSK cable)



\* Must be coupled with the 38D2-B1.

\*\*Used only in combination with Output Relay Card (model: 38D2-5).

• I/O Location

Output connector CN1: 57GE-40500-751 (J-RSK cable use)

Output connector CN3: Fujitsu FCN364P040-AU  
(used to couple with the 38D2-B1)

38D2-BK2 Location															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DCS Output No.															
38D2-B1 Location															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
DCS Output No.															

• Connector Pin Assignment

PIN NO.	ASSIGNMENT (BK2)	PIN NO.	ASSIGNMENT (B1)
3	ch. 1 +	11	ch.17 +
4	ch. 2 +	12	ch.18 +
5	ch. 3 +	13	ch.19 +
6	ch. 4 +	14	ch.20 +
7	ch. 5 +	15	ch.21 +
8	ch. 6 +	16	ch.22 +
9	ch. 7 +	17	ch.23 +
10	ch. 8 +	18	ch.24 +
27	ch. 9 +	19	ch.25 +
26	ch.10 +	20	ch.26 +
29	ch.11 +	21	ch.27 +
28	ch.12 +	22	ch.28 +
31	ch.13 +	23	ch.29 +
30	ch.14 +	24	ch.30 +
33	ch.15 +	25	ch.31 +
32	ch.16 +	50	ch.32 +

2, 34 – 39, 41 are common negative for the 38D2-BK2.

40, 42 – 47, 49 are common negative for the 38D2-B1.

1, 48: Power input (+)

2, 34 – 39, 41, 40, 42 – 47, 49: Power input (-)

## • Input Relay Card

### MODEL & SUFFIX CODE SELECTION

MODEL	38D2-1□
INPUT	Dry contact or open collector
OUTPUT	Relay contact
TEST SWITCH	
0	: Non-lock switch
1	: Lock switch

### ORDERING INFORMATION

Specify code number. (e.g. 38D2-11)

### RELATED PRODUCTS

- Standard Rack (model: 38D2-B)

### GENERAL SPECIFICATIONS

**Construction:** Rack mounted; terminal access via screw terminals at the front and via connector at the rear

#### Connection

**Input:** M3.5 screw terminals

**Output to DCS:** Card-edge connector

**Re-transmitted output:** M3.5 screw terminals

**Power input:** Supplied from the card-edge connector

**Screw terminal material:** Nickel-plated steel  
(torque 0.8 N·m)

**Fuse:** 0.5A incorporated

**Alarm contact:** Dry contact output at the alarm output terminals of the rack when the fuse is blown.

**Isolation:** Input or power to output

#### Test switch

**AUTO:** Output contact turns ON with input contact ON.

**OFF:** Forced output OFF

**ON:** Forced output ON

**LED indicator:** Light turns on when the relay coil is energized.

### INPUT & OUTPUT

■ **INPUT:** Dry contact or open collector  
**Contact detecting:** 24V DC @35mA

■ **RELAY/RE-TRANSMITTED OUTPUT:** SPDT  
**Rating:** 120V AC or 24V DC @5A (resistive load)  
**Maximum switching rating:** 250V AC @2A or 125V DC @0.2A (resistive load)

#### Relay life

**Mechanical:**  $5 \times 10^7$  cycles

**Electrical:**  $10^5$  cycles (30 cycles/min.)

### INSTALLATION

**Power input:** Operational voltage range 24V DC  $\pm 10\%$ , ripple 10% p-p max., approx. 35mA

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90% RH (non-condensing)

**Mounting:** Standard Rack 38D2-B

**Dimensions:** W20×H99×D177 mm (0.79"×3.90"×6.97")

**Weight:** 100 g (0.22 lbs)

### PERFORMANCE

**Insulation resistance:**  $\geq 100M\Omega$  with 500V DC  
(input or power to output)

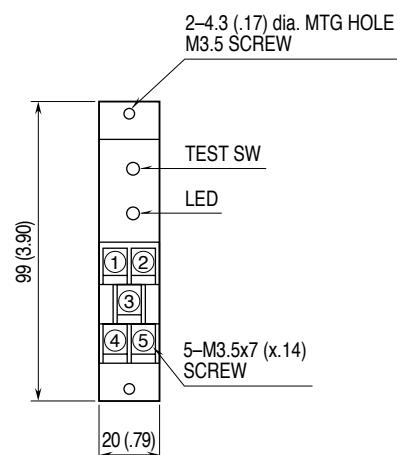
**Dielectric strength:** 500V AC @1 minute

(input or power to output)

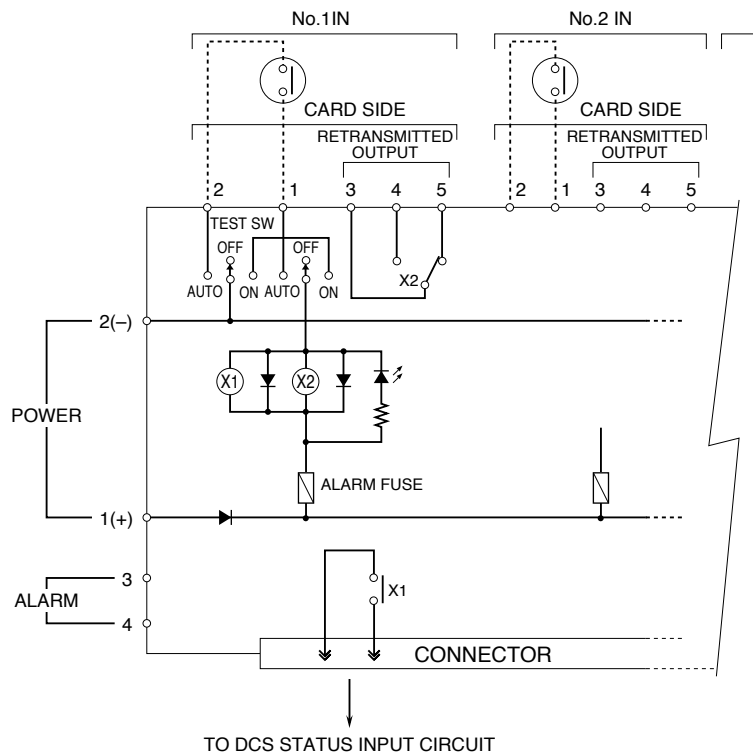
500V AC @1 minute\* (output to ground)

\*1000V AC for 24V DC power input with the 38D2-B

### FRONT VIEW unit: mm (inch)



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**



## • Output Relay Card

### MODEL & SUFFIX CODE SELECTION

MODEL	38D2-5□
INPUT	Dry contact or open collector
OUTPUT	Relay contact and voltage
TEST SWITCH	
0	: Non-lock switch
1	: Lock switch

### ORDERING INFORMATION

Specify code number. (e.g. 38D2-51)

### RELATED PRODUCTS

- Standard Rack (model: 38D2-B)

### GENERAL SPECIFICATIONS

**Construction:** Rack mounted; terminal access via screw terminals at the front and via connector at the rear

#### Connection

**Input:** Card-edge connector

**Relay & voltage output:** M3.5 screw terminals

**Power input:** Supplied from the card-edge connector

**Screw terminal material:** Nickel-plated steel  
(torque 0.8 N·m)

**Fuse:** 0.5A incorporated

**Alarm contact:** Dry contact output at the alarm output terminals of the rack when the fuse is blown.

**Isolation:** Input or power to output

#### Test switch

**AUTO:** Output contact turns ON with input contact ON.

**OFF:** Forced output OFF

**ON:** Forced output ON

**LED indicator:** Light turns on when the relay coil is energized.

**Spark quenching diode:** Close across the jumper pin on the PCB with voltage output

### INPUT & OUTPUT

■ **INPUT:** Dry contact or open collector

**Contact detecting:** 24V DC @45mA

■ **RELAY CONTACT OUTPUT:** SPDT

**Rating:** 120V AC or 24V DC @5A (resistive load)

**Maximum switching rating:** 250V AC @2A or  
125V DC @0.2A (resistive load)

#### Relay life

**Mechanical:**  $5 \times 10^7$  cycles

**Electrical:**  $10^5$  cycles (30 cycles/min.)

■ **VOLTAGE OUTPUT:** 100V AC or 24V DC  $\pm 10\%$

**Load current:** 0.5A max. (8A max. in the total of 16 cards)

### INSTALLATION

**Power input:** Operational voltage range 24V DC  $\pm 10\%$ , ripple 10% p-p max., approx. 45mA

**Operating temperature:** -5 to +55°C (23 to 131°F)

**Operating humidity:** 30 to 90% RH (non-condensing)

**Mounting:** Standard Rack 38D2-B

**Dimensions:** W20×H99×D177 mm (0.79"×3.90"×6.97")

**Weight:** 100 g (0.22 lbs)

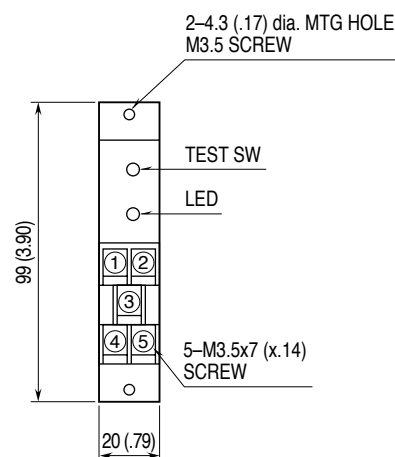
### PERFORMANCE

**Insulation resistance:**  $\geq 100M\Omega$  with 500V DC  
(input or power to output)

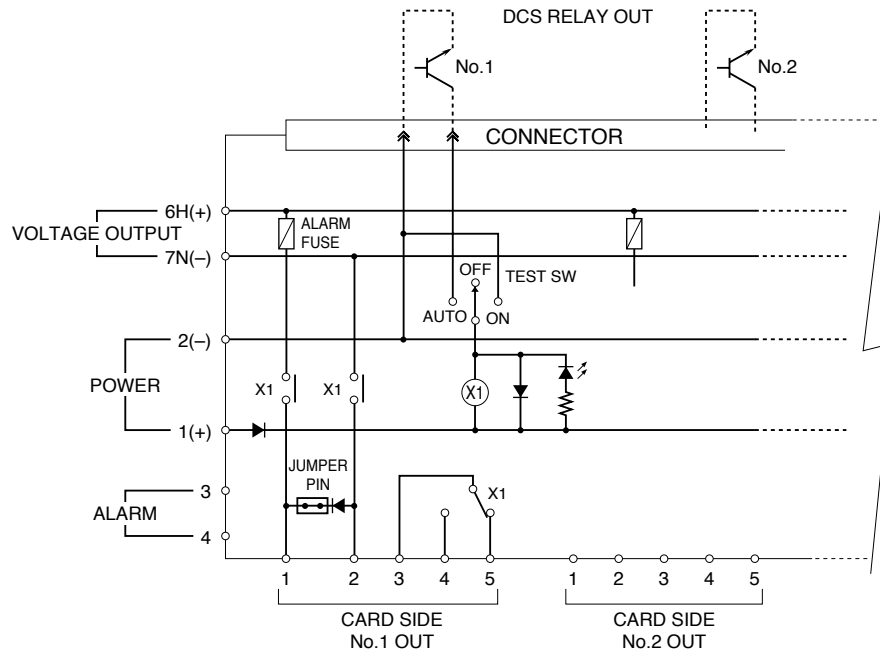
**Dielectric strength:** 1000V AC @1 minute  
(input or power to output)

2000V AC @1 minute (output to ground)

### FRONT VIEW unit: mm (inch)



**SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM**





**COMBINATION EXAMPLE**

■ WITH MULTI-POINT STATUS I/O CARDS

