

DCS Input/Output Relay Card Series

I/O RELAY CARD
(high load current type)

MODEL **38D2**

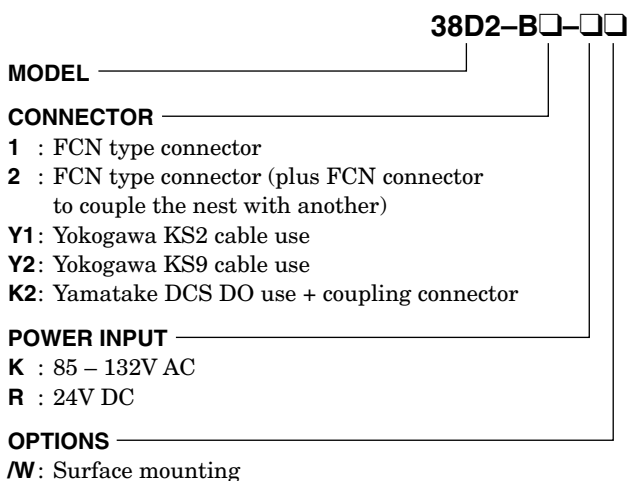
DESCRIPTIONS

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)

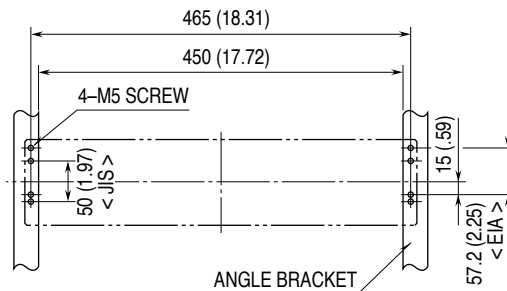
Dielectric strength

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

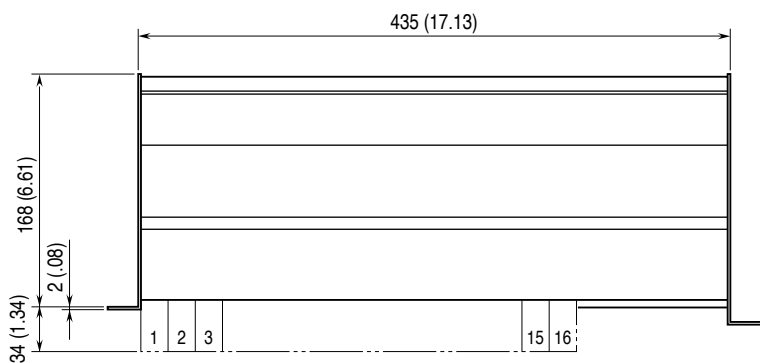
MOUNTING REQUIREMENTS mm (inch)



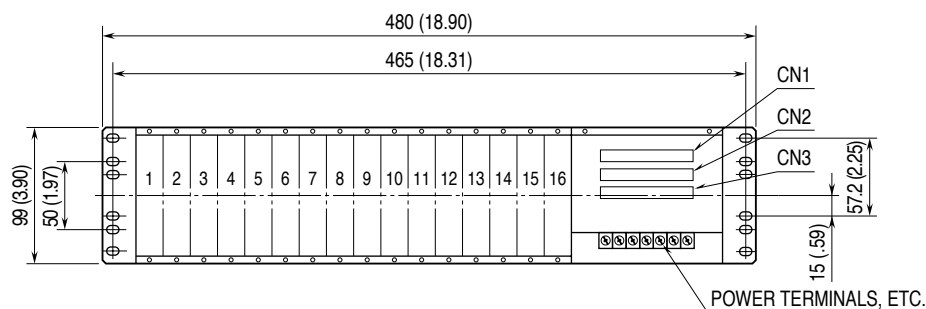
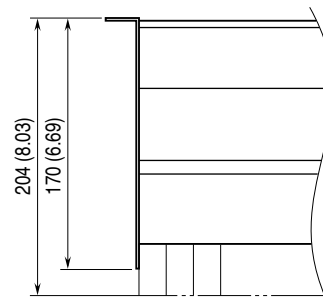
Observe appropriate wiring space under the rack.

EXTERNAL DIMENSIONS unit: mm (inch)

■ **RACK MOUNTING**



■ **SURFACE MOUNTING**

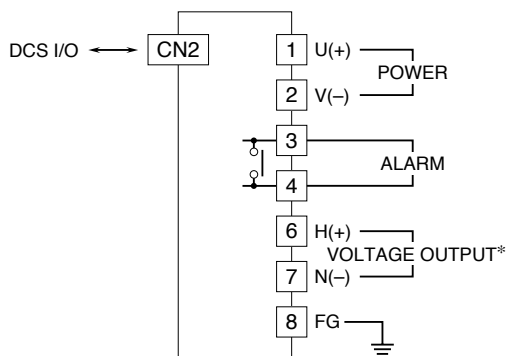


MODEL CODE		38D2				
		-B1	-B2	-BY1	-BY2	-BK2
CONNECTOR	Yokogawa KS2 (16 chs.)			X		
	Yokogawa KS9 (32 chs.)				X	
	Yamatake J-RSK					X
CN2	FCN (16/32 chs.)	X	X			
CN3	FCN (coupling nests)		X		X	X

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)**



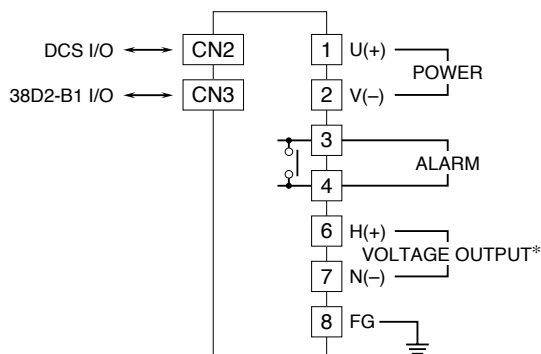
*Used only in combination with Output Relay Card (model: 38D2-5).

• **Connector Pin Assignment**

I/O connector CN2: OTAX N364P040AU
(Fujitsu FCN-364P040-AU...discontinued)

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).

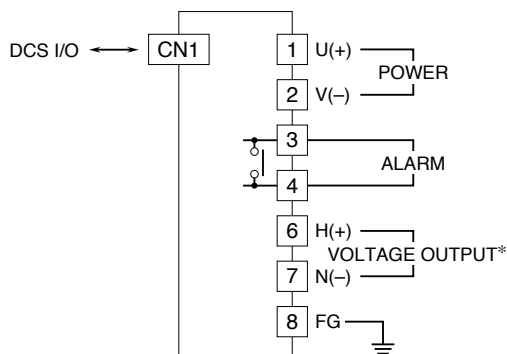
• Connector Pin Assignment

I/O connector CN2: OTAX N364P040AU
(Fujitsu FCN-364P040-AU...discontinued)
I/O connector CN3: OTAX N364P040AU
(Fujitsu FCN-364P040-AU...discontinued)

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.

■ 38D2-BY1 (KS2 cable)



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

• 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.															

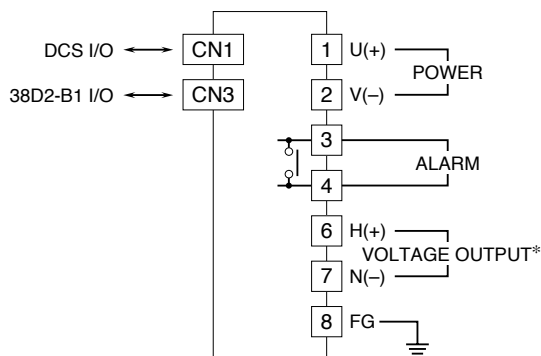
*ST2, ST3 and ST4 (for Yokogawa KS2 cable) are the contact I/O cards used for Yokogawa DCS.

- 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: OTAX N364P040AU (Fujitsu FCN364P040-AU...discontinued) (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.

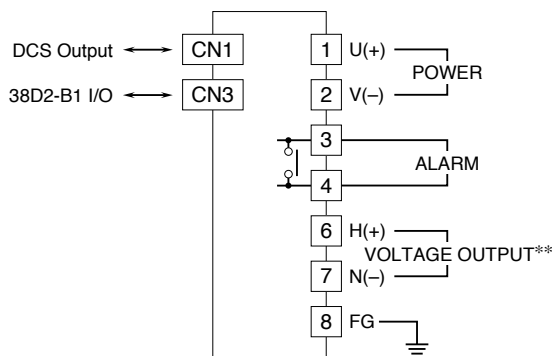
ST5: 32-point contact inputs / 32-point contact outputs
 ST6: 32-point contact inputs × 2 (64 points)
 ST7: 32-point contact outputs × 2 (64 points)

• 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: OTAX N364P040AU (Fujitsu FCN364P040-AU...discontinued) (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: 5×10^7 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)

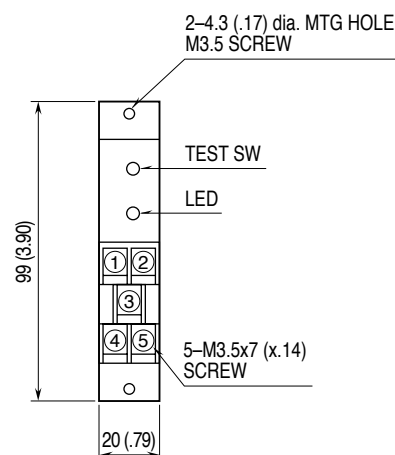
Dielectric strength: 500V AC @1 minute

(input or power to output)

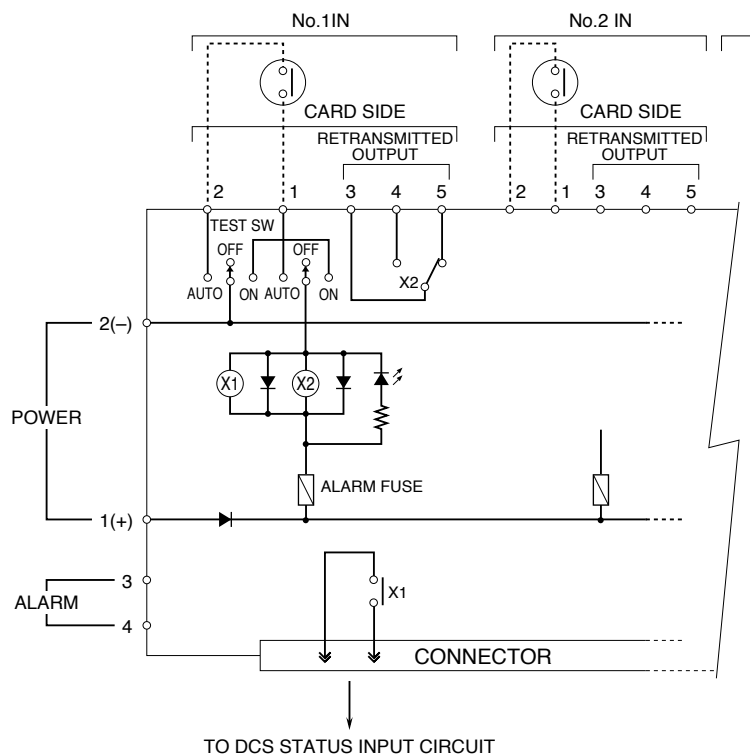
500V AC @1 minute* (output to ground)

*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: 5×10^7 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)

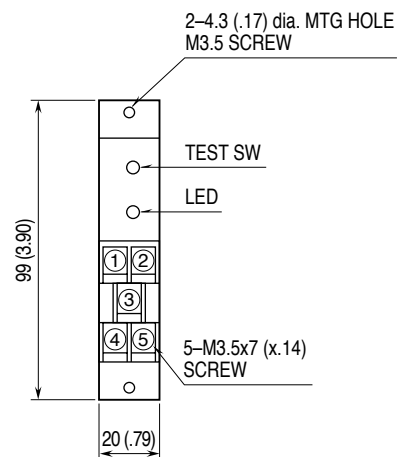
PERFORMANCE

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

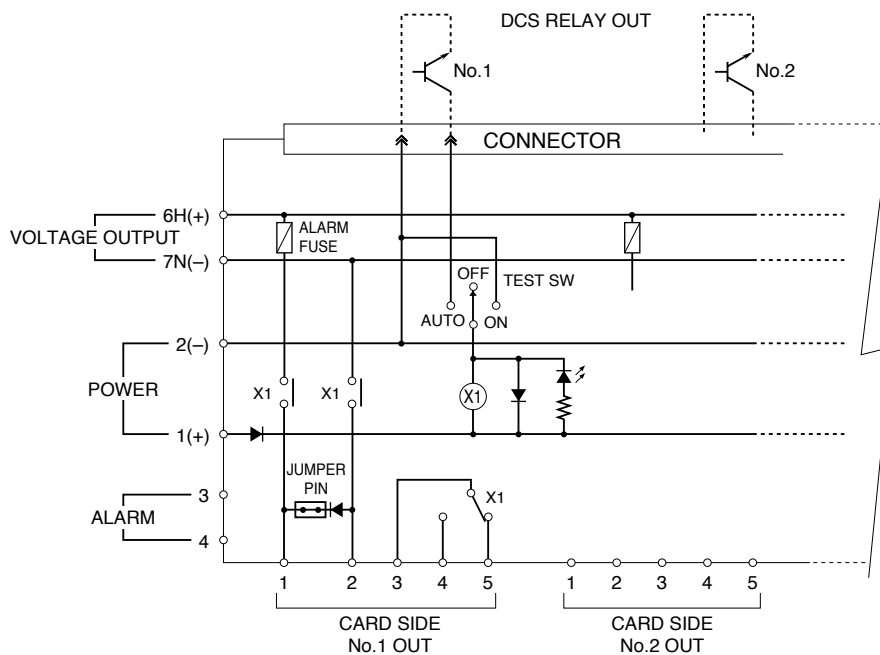
Dielectric strength: 1000V AC @1 minute
(input or power to output)

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

