



**Continental Disc[®]
Corporation**

3160 WEST HEARTLAND DRIVE LIBERTY, MISSOURI 64068-3385
PHONE: (816) 792-1500 FAX: (816) 792-2277 / 5447

MTB-700 OPERATOR'S MANUAL FOR THE 24 VDC TWO / FOUR CHANNEL CONTINENTAL B.D.I. ALARM MONITOR WITH INTRINSICALLY SAFE BARRIERS

BARRIER APPROVALS:

IECEX BAS05.0063 [Ex ia]IIC -20°C ≤ Ta ≤ +60°C Um=253V

[EEEx ia] IIC
(EN50020)



II(1)GD BAS01ATEX7147
-20°C ≤ Ta ≤ +60°C

Um=250V
Max. amb. 60°C
10.5V, 800Ω 14mA



II 3G Doc. No. MTL08ATEX5511X
Ex nA IIC T4
Terms. 7,8,9 and 10,11,12
UI = 30V Ii = 132mA



INTRINSICALLY SAFE FIELD CONNECTIONS FOR CLASS I,II,III;
DIV 1, GROUPS, A,B,C,D,E,F,G: ALSO NON-INCENDIVE FOR CLASS I :
DIV 2, GROUPS, A,B,C,D; ENTITY ACCORD WITH MTL SCI-675



2000 152423-1000852X
IS Field Connections for Class I Zone 0 and
Class I Groups A,B,C,D; Class II Groups E,F,G;
Class III. When connected per MTL Dwg SCI-677
ExnC [ia] IIC T6 Tamb = 60°C
Input Rated 35Vdc max, 60mA max. Um = 60V
Relay Contact Rated 35Vdc, 0.5A max. Um = 250V



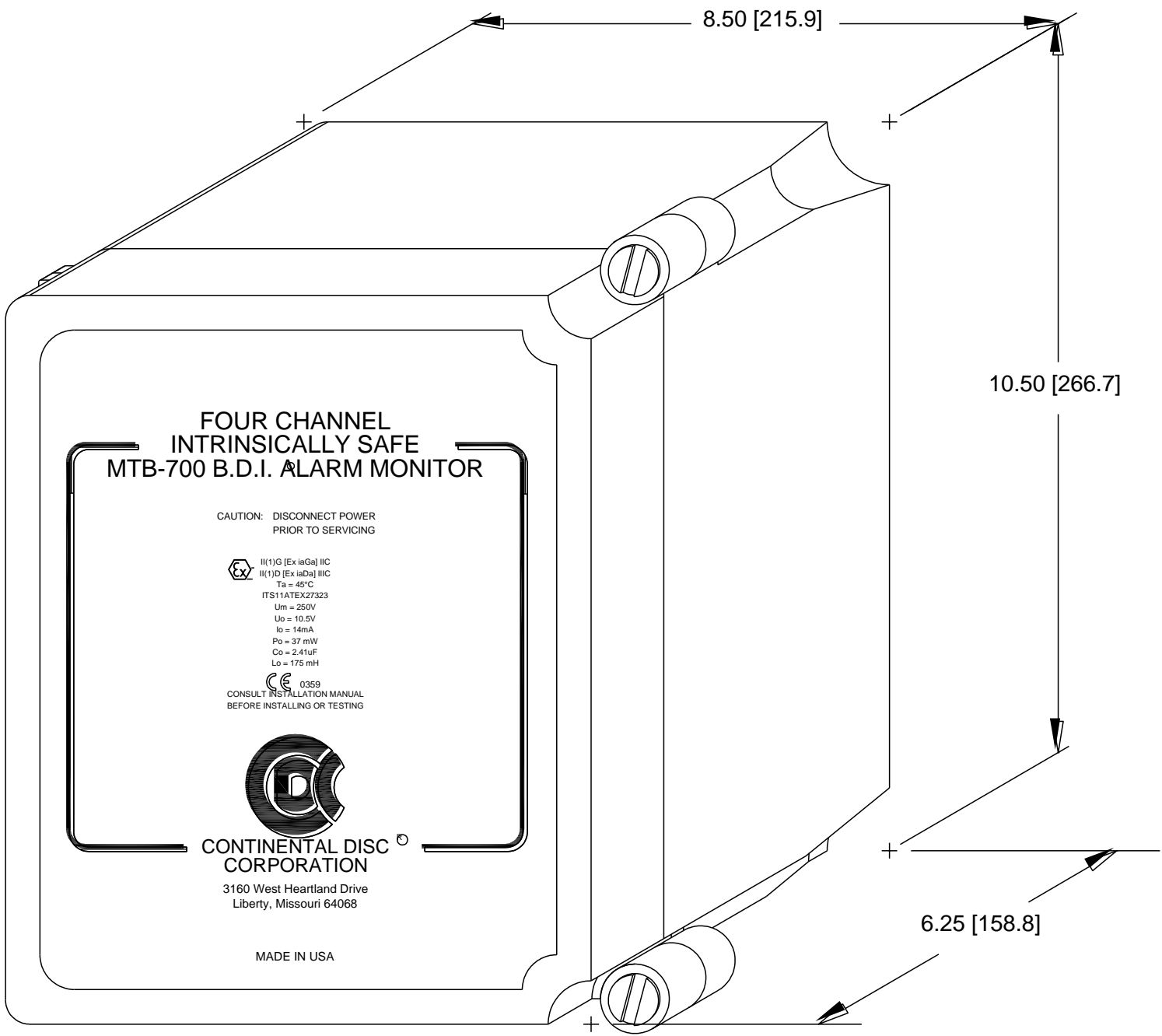
LISTED
73P6

Suitable for use in Cl. I, Div. 2
Gps. A,B,C,D Haz. Loc. With
Int. Safe connections to Cl. I, II, III,
Gps. A,B,C,D Haz. Loc. When
connected per MTL Dwg. SCI-902.
Max. amb. 60°C
Relay Contact Rated 2A,
40Vdc and 80VA.

IMPORTANT

USER SHOULD READ CAREFULLY AND UNDERSTAND
THIS MANUAL BEFORE INSTALLING, CONNECTING OR
TESTING THIS UNIT

PART NO.'s: M2S-0000-V024
M4S-0000-V024




I. GENERAL INFORMATION

The Continental Disc Four Channel Alarm Monitor can be purchased with only one MTL barrier making it a two channel monitor, or with two MTL barriers making it a four channel monitor. The two channel monitor can be upgraded to a four channel monitor by purchasing another MTL barrier (see Replacement Parts List).

The Four Channel Alarm Monitor, when used in conjunction with the patented Continental Disc B.D.I.® (Burst Disc Indicator) system, is designed to signal the operator immediately when a rupture disc has relieved an over-pressure condition from either a positive pressure or a negative (vacuum) pressure depending on the type of rupture disc installed.

The Four Channel Alarm Monitor uses MTL intrinsically safe barriers and DPDT relays for auxiliary contacts. It is designed to continuously monitor four separate field contacts and contains one Form C DPDT relay per channel. Modular construction is utilized with all circuitry.

The Four Channel Alarm Monitor circuitry is enclosed in a strong wall-mount, fiberglass enclosure which meets the requirements of Nema Types 4, 4X, 12, 13 and ATEX (Code: CE 0359 

II (1) G [Ex ia Ga] IIC / II (1) D [Ex ia Da] IIIC Ta = 45 / Certification Number: ITS11ATEX27323). This unit must be installed in a general purpose non-hazardous environment.

II. STORAGE

The Four Channel Alarm Monitor is to remain packed in the box in which it is shipped until ready for installation. This unit should be stored in a cool dry atmosphere with ambient temperatures within -40° to +122° Fahrenheit (-40° to +50° C).

III. INSTALLATION

WARNING: These installation and servicing instructions are for use by qualified personnel only. To avoid injury and electrical shock, do not perform any servicing other than that contained in this manual. The installation and wiring of this unit should be performed in accordance with the latest edition of the governing Electrical Code.

CAUTION: The B.D.I. Alarm Monitor **MUST** be installed as follows:

1. Mount Enclosure

Bolt the monitor unit to wall using supplied mounting bracket hardware. This unit must be installed in a non-hazardous environment.

2. Install Barriers

Open the monitor front cover by rotating the handle located on the front. Mount the MTL 5516C Barrier/s on the 35mm symmetrical "top hat" rail located at the bottom of the monitor by means of the clip mechanism located at the base of the barrier. This is achieved by hooking one clip onto the rail and then rotating the unit until the other clip engages. The blue terminal block of the barrier should face to the right. Connect the wiring plug into connector P3 for barrier 1 (Channels 1 and 2) and into connector P4 for barrier 2 (Channels 3 and 4) while observing connector polarity.

5. Mode of Operation

When powering up either on initial installation or upon restoring power from a lost power condition, the unit will power up in an alarm state, activating the horn and lamps, and will require resetting to return to the non-alarm state. After a rupture disc bursts, the horn and lamp will activate, indicating an alarm state. The monitor may be reset to non-alarm state by either of the following procedures.

- A. Silence the horn by depressing the momentary reset switch or momentarily closing the remote reset contacts. The monitor can then be returned to non-alarm state by replacing the B.D.I. Assembly.

NOTE: The momentary switch must be depressed for a minimum of one second.

- B. Alternatively the monitor may be returned to non-alarm state by replacing the B.D.I. Assembly and then resetting the monitor.

6. Connect Remote Reset and Test Switches

CAUTION: A two conductor shielded wire such as Belden #8412, #8441, or equivalent should be used for wiring these switches and should be physically separated from both AC wiring and the intrinsically safe disc signal wiring. Failure to do so could introduce false signals into the circuitry.

- A. Connect Remote Alarm Master Reset Switch

This switch must be a normally open momentary contact switch with a contact rating of at least 10 milliamperes at 12 VDC. The switch wire should enter the monitor through the upper right side of the enclosure and be connected at TB6 on terminals "Reset" and "GND".

- B. Connect Remote Master Test Switch

This switch must be a normally open momentary contact switch with a contact rating of at least 10 milliamperes at 12 VDC. The switch wire should enter the monitor through the upper right side of the enclosure and be connected at TB6 on terminals "Test" and "GND".

7. Connect Disc Signal Wiring at Safety Barrier

WARNING: Disconnect power to the monitor before wiring.

CAUTION: To properly maintain the intrinsic safety of the system and to ensure immunity of the system to external interference, approved shielded cable should be used. Individual runs should use a 2 conductor shielded cable such as Belden #8412, #8441, or equivalent. Runs from monitor to field junction box should use an 8 conductor shielded cable such as Belden #9504 or equivalent. Remove a maximum 2 cm of insulation from wires prior to connecting. All wires must be tie wrapped together prior to exiting the enclosure.

The disc signal wires should be routed into the monitor through the lower right side of the enclosure and should be connected to the appropriate MTL Barrier terminals. The terminals correspond to the disc channel numbers as follows:

<u>Channel Number</u>	<u>MTL Barrier</u>	<u>Terminal Number</u>
1	Top	4-5
2	Top	1-2
3	Bottom	4-5
4	Bottom	1-2

CAUTION: Factory Mutual Specified field wiring must be within the following limits:

Group A & B:	Series inductance	$L_a = 75$	Millihenries
	Shunt capacitance	$C_a = 5.5$	Microfarads
Group C:	Series inductance	$L_a = 270$	Millihenries
	Shunt capacitance	$C_a = 16.5$	Microfarads
Group D:	Series inductance	$L_a = 600$	Millihenries
	Shunt capacitance	$C_a = 44$	Microfarads

CAUTION: BASEEFA Specified field wiring must be within the following limits:

Group A:	Series inductance	$L_a = 552$	Millihenries
	Shunt capacitance	$C_a = 104$	Microfarads
Group B:	Series inductance	$L_a = 207$	Millihenries
	Shunt capacitance	$C_a = 39$	Microfarads
Group C:	Series inductance	$L_a = 69$	Millihenries
	Shunt capacitance	$C_a = 13$	Microfarads

NOTE: Lead polarity is not important when connecting the disc signal wiring to the monitor. Any channel not being utilized should have its two corresponding MTL barrier terminals jumpered together.

8. Final Assembly

Check all internal wiring to ensure proper connections with no unwanted possible shorts, grounds, or open circuits. Check all fuses to make sure they are still operable.

9. Energize Power to Unit

With the monitor, disc, and remote indicators installed and properly connected, close the circuit breaker to apply power. The monitor should now power up indicating an alarm condition. Reset monitor to a non-alarm state.

IV. MAINTENANCE

This monitor has been designed to operate continuously with little maintenance required. Periodic checks to make sure that units are clean and free from contaminating atmospheres, and are in good physical and electrical condition, constitute the only maintenance required.

Should the system fail to function properly, the operator should check for the following items where applicable:

- A. Does the unit have power?
- B. Are all fuses operable?
- C. Are the affected barriers and relays operating properly?
- D. Is all wiring connected properly?
- E. Is there a short or open circuit in the disc signal wiring or disc sensor?
- F. Is the disc alarm sensor strip broken?

Although this unit utilizes long life components and relays, every effort has been made to make this unit as easily serviceable as possible. Replacement components may be purchased from the following list or consult the factory for maintenance.

V. REPLACEMENT PARTS LIST

Description	Part Number
Replacement parts kit for the M4A/M2A BDI monitor	516000100
(2) Fuse, AGC 1/4 AMP	
Four Channel Mother Board	219000000
Barrier Assembly, MTL 5516C, 24 VDC	513000100
Fuse, 160mA MTL Barrier	110100400

VI. SPECIFICATIONS

Input Power:	24 VDC \pm 2 Volts
Signal Level:	7 VDC @ 22 MA MAX
Field Circuit Resistance to Operate:	Energize: \leq 200 Ω De-energize: \geq 500 Ω
	Hysteresis: 100 Ω nominal
Output Relay Contacts:	5 Amps @ 240 VAC Resistive MAX. 5 Amps @ 24 VDC Resistive MAX. 1/8 HP @ 120/240 VAC, 7 Amps maximum carry current
Operating Temperature Range:	-20° to + 45°C

ATEX EC-TYPE Examination Certificate No. ITS11ATEX27323

Intrinsically Safe Are as Follows:

IS Parameters:

$U_0 = 10.5$ V dc
 $I_0 = 14$ mA
 $P_0 = 37$ mW
 $C_i = 0$
 $L_i = 0$

Gas Group	Co μ F	Lo mH	Lo/Ro μ H/ohm
IIC	2.41	175	967
IIB	16.8	680	1333
IIA	75	1000	1333
Group III	16.8	680	1333

VII. LIMITED WARRANTY

Products manufactured by C.D.C. have a warranty against defective workmanship and material for a period of one year after date of invoice. In no event shall C.D.C.'s liability for damages with respect to any of the products furnished under this Agreement exceed the charges previously paid by the customer to C.D.C. for such products. Buyer's sole remedy for breach of this Agreement is repair or replacement of defective parts furnished by C.D.C., which have been returned to C.D.C.'s factory at purchaser's expense. It is expressly agreed between purchaser and C.D.C. that the remedy of repair and replacement is the exclusive and sole remedy of the purchaser.

VIII. DISCLAIMER OF WARRANTIES

Except as specifically provided in this Agreement, there are no warranties, expressed or implied, including, but not limited to any implied warranties of merchantability or fitness for a particular purpose.

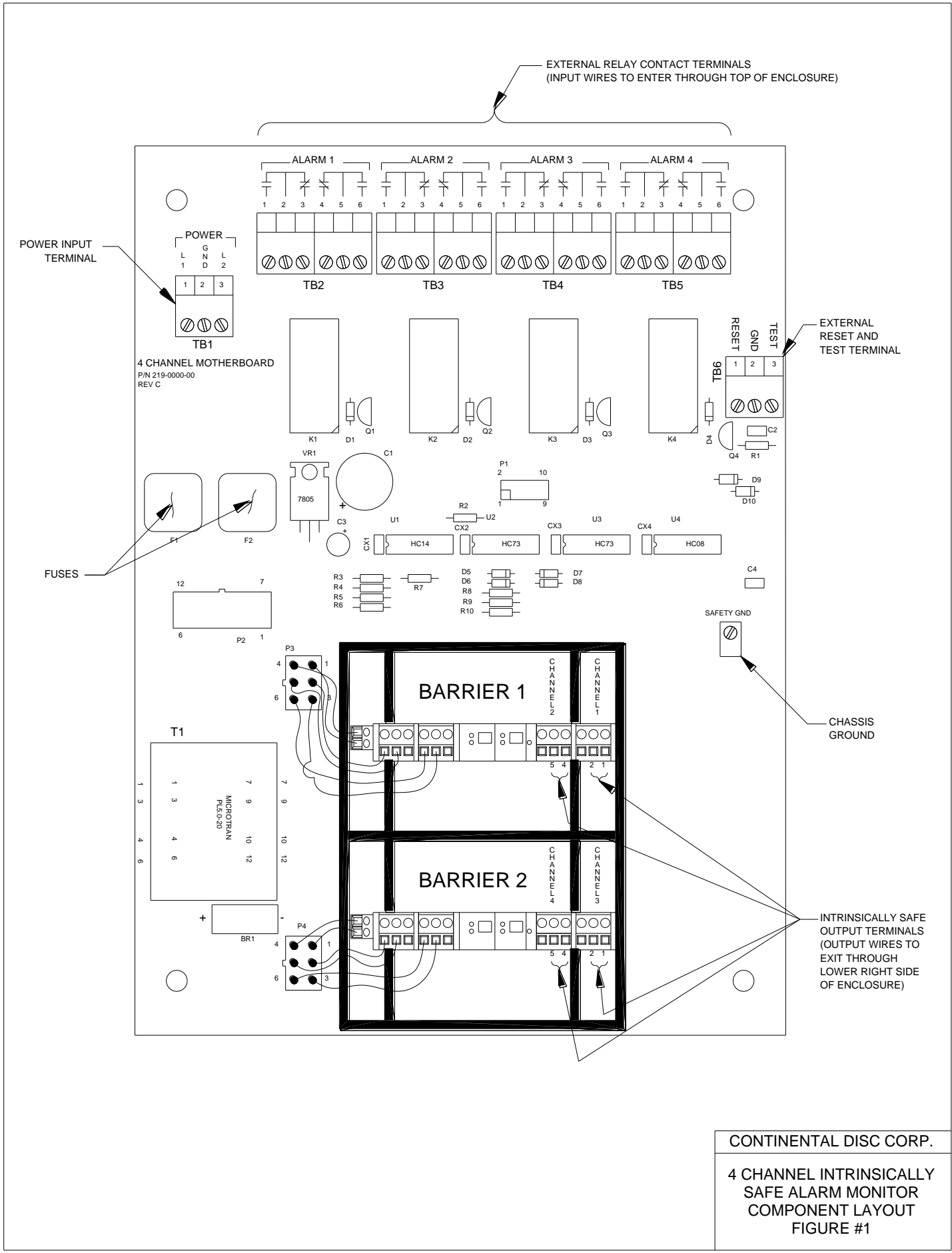
IX. DISCLAIMER OF CONSEQUENTIAL DAMAGES

In no event shall C.D.C. be liable for consequential damages, including but not limited to damages for loss of use, damages for lost profits, and damages for resulting harm to property other than the C.D.C. assemblies and their component parts.

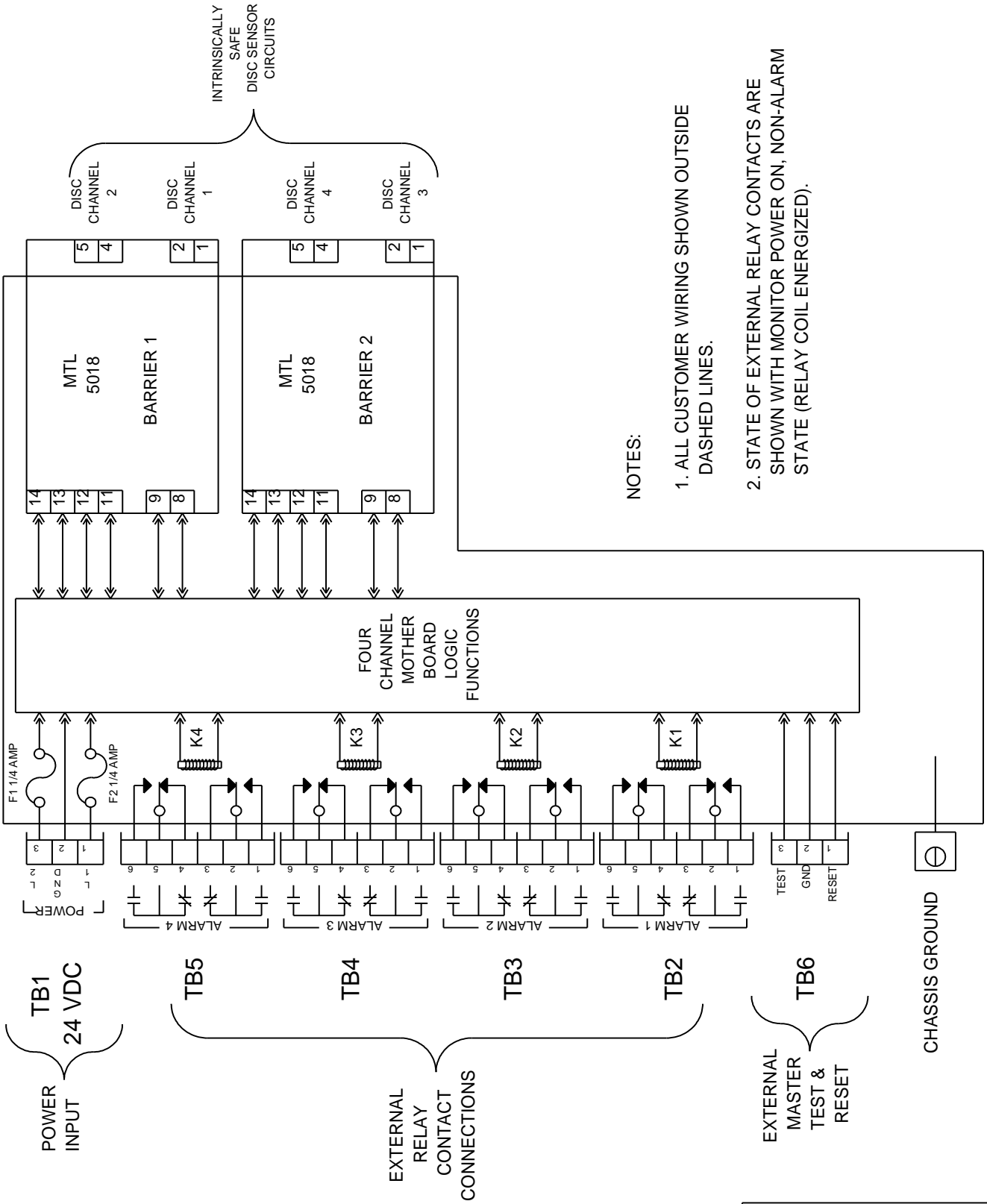
Customer acknowledges and understands that the provisions of these additional terms and conditions, including this paragraph concerning disclaimer of consequential damages and limitation or remedy, apply fully to the purchase of the products.

X. WARRANTY EXCLUSIONS

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. It is void if the serial number is altered, defaced, or removed.



CONTINENTAL DISC CORP.
 4 CHANNEL INTRINSICALLY SAFE ALARM MONITOR COMPONENT LAYOUT FIGURE #1



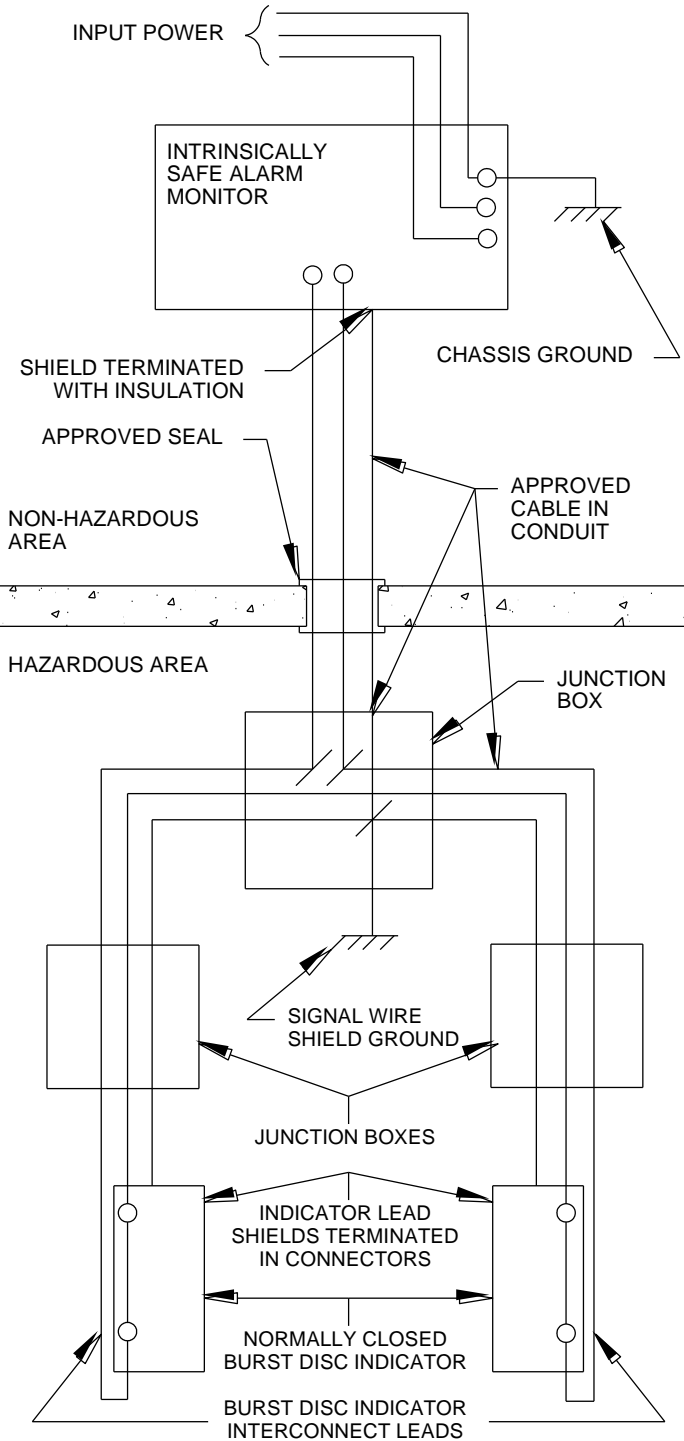
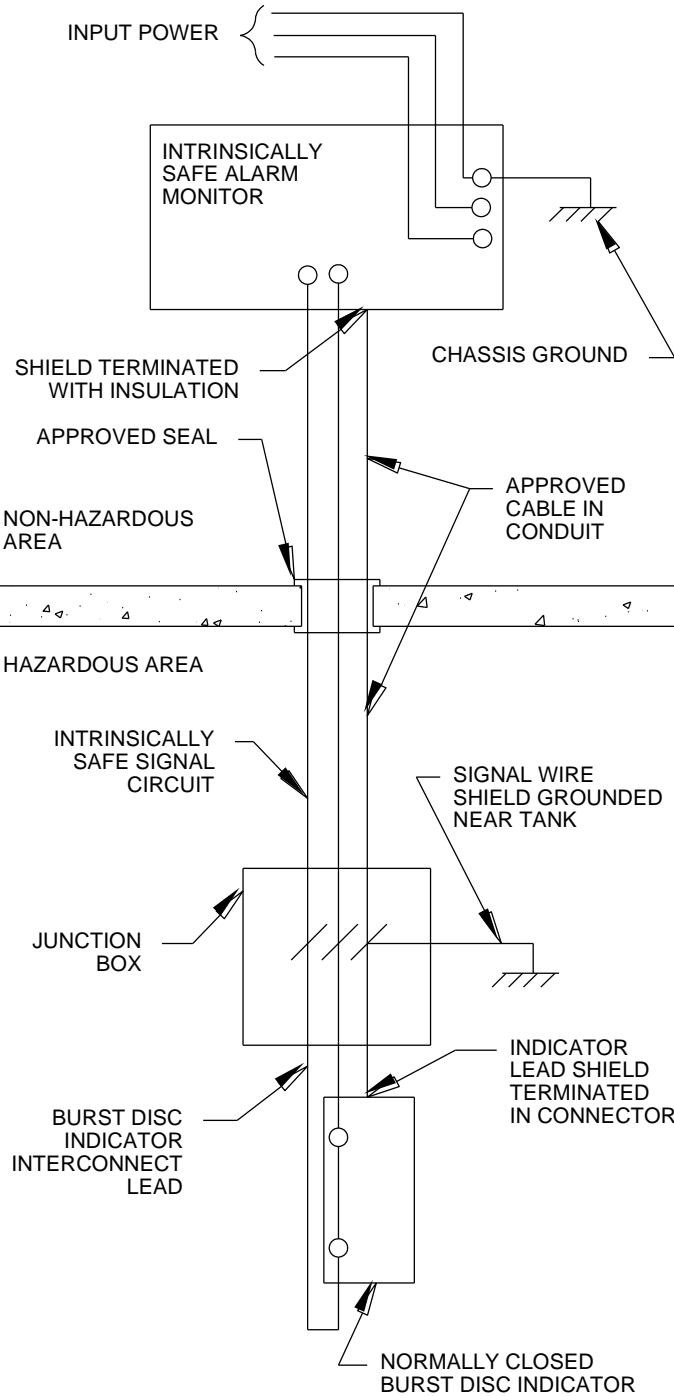
NOTES:

1. ALL CUSTOMER WIRING SHOWN OUTSIDE DASHED LINES.
2. STATE OF EXTERNAL RELAY CONTACTS ARE SHOWN WITH MONITOR POWER ON, NON-ALARM STATE (RELAY COIL ENERGIZED).

CONTINENTAL DISC CORP.
 4 CHANNEL CONTINENTAL
 B.D.I. ALARM MONITOR
 24 VDC CIRCUIT
 SCHEMATIC FIGURE #2

SINGLE B.D.I. PER CHANNEL

MULTIPLE B.D.I. PER CHANNEL



NOTES:

1. FACTORY MUTUAL FIELD WIRING MUST BE WITHIN THE FOLLOWING LIMITS:
 - GROUP A & B: SERIES INDUCTANCE $L_a = 75$ MILLIHENRIES
 - SHUNT CAPACITANCE $C_a = 5.5$ MICROFARADS
 - GROUP C & D: SERIES INDUCTANCE $L_a = 270$ MILLIHENRIES
 - SHUNT CAPACITANCE $C_a = 16.5$ MICROFARADS
2. BASEEFA SPECIFIED FIELD WIRING MUST BE WITHIN THE FOLLOWING LIMITS:
 - GROUP A & B: SERIES INDUCTANCE $L_a = 207$ MILLIHENRIES
 - SHUNT CAPACITANCE $C_a = 39$ MICROFARADS
 - GROUP C & D: SERIES INDUCTANCE $L_a = 69$ MILLIHENRIES
 - SHUNT CAPACITANCE $C_a = 13$ MICROFARADS

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**B.D.I. ALARM MONITOR
INTRINSIC SAFETY
WIRING DIAGRAM
FIGURE #3**