General Specifications

YEW SERIES 80

Model BARD
SAFETY BARRIER

The BARD shunt-type Intrinsic Safety Barrier is used as an interface between hazardous and non-hazardous areas. It maintains intrinsic safety by limiting the currents and voltages which enter the hazardous area.

- *This safety barrier has a two-part construction: the main body of the barrier plugs into a terminal block. This facilitates installation and maintenance.*
- *Three types of BARD Safety Barriers are available: one for use with thermocouples, one for RTDs (Resistance Temperature Detectors) and one for 4 to 20 mA current loops of 2-wire transmitters and controller outputs. Double element thermocouples may also be used.*

Note: The safety barrier and other intrinsically safe instruments – such as detector, actuator etc. – may have different approval numbers.

STANDARD SPECIFICATIONS.

Intrinsic Safety Classification: approved and certified by Japanese testing authority as intrinsically-safe explosion proof equipment, code i3aG5.

BARD Intrinsic Safety Specifications

Model	BARD-200	BARD-200	BARD-300	BARD-400
For use with:	Single element thermocouple	Double element thermocouple	RTD	4 to 20 mA loop
Code for explosion grade and ignition temperature group	(JIS C0903) i3aG5 *1			
Maximum voltage that may be applied to the non-intrinsically safe terminals (Intrinsic Safety Rating) [V_M]	250 V AC/DC	250 V AC/DC	250 V AC/DC	250 V AC/DC
Open-circuit voltage*2 [Vmax]	10 V DC	10 V DC	*3	31.5 V DC
Short-circuit current*2 [Icc]	100 mA DC	100 mA DC		35 mA DC
Maximum power delivered*2 [Pmax]	0.25 W	0.25 W		1.1 W
Working voltage [Vn]	5 V DC	5 V DC	10 V DC	25 V DC
Working current [In]	–	–	–	20 mA
Maximum external inductance permitted [Lext]	2.2 mH	0.8 mH	0.45 mH	2.2 mH
Maximum external capacitance permitted [Cext]	1 μF	0.1 μF	0.1 μF	40 nF
Length of field wiring	Up to 2 km	Up to 800 m	Up to 450 m	CVV: up to 400 m CVV-S: up to 400 m CEV: up to 800 m CEV-S: up to 800 m *4

*1: i3aG5
- i: Construction (Intrinsically Safe)
- 3: Explosion class
- a: Ignition group (applicable gas atmosphere)
- G5: Gas group

*2: Between intrinsically safe terminal or between terminals and ground.

*3: No specifications for Vmax, Icc or Pmax.

*4: CVV: Vinyl-insulated, vinyl-sheathed cable.
CVV-S: CVV with shield.
CEV: Polyethylene-insulated, vinyl-sheathed cable.
CEV-S: CVV with shield.

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BARD Specifications

Model		BARD-200	BARD-200	BARD-300	BARD-400
For use with:		Single- or double-element thermocouple		RTD	4 to 20 mA loop
Internal resistance or voltage drop	Channel 1*3	235 ±15 Ω	235 ±15 Ω	130 ±3 Ω*4	Less than 4.5 V (at 20 mA DC)
	Channel 2*3	235 ±15 Ω	235 ±15 Ω	130 ±3 Ω*4	
	Channel 3*3	–	–	130 ±3 Ω*4	–
Fuse rating*3	Channel 1	100 mA DC	100 mA DC	250 mA DC	63 mA DC
	Channel 2	100 mA DC	100 mA DC	250 mA DC	500 mA DC
	Channel 3	–	–	250 mA DC	–

*3: Channel 1: Between terminals A and 1. Channel 2: Between terminals B and 2.
Channel 3: Between terminals C and 3.
If a current of 40 mA or more flows through the barrier, the fuse life may be affected.

*4: The difference between the resistance in channels 1 and 3 must be less than 60 mΩ.

Normal Operating Conditions

Ambient Temperature: 0 to 50°C.
Ambient Humidity: 5 to 90% relative humidity (non-condensing).
Grounding: Independant earth, of resistance up to 10 Ω.
Wiring: ISO M4 size (4 mm) screws.
Installation: Non-hazardous location (inside building).
Construction: Two-part construction: the main body of the barrier plugs into a terminal block.
Color: Black.
External Dimensions: 97 (H) X 31.5 (W) X 80 (D) (mm).
Weight: 350 g.

ACCESSORIES.

Earth plate with mounting hole . . . . . 1 pcs.
Tag plate . . . . . 4 pcs.

MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
BARD	. . . . .	Intrinsic Safety Barrier
Use	-2	For use with thermocouple
	-3	For use with RTD
	-4	For use with 4 to 20 mA loop of 2-wire transmitter/controller output
	00	Always 00
Style Code	*A	Style A

Some Intrinsically-Safe Instruments that can be Connected to BARD

Intrinsically safe instruments / Specifications	Thermocouple TC-[ ]*5 (single element)	Thermocouple TD-[ ]*5 (double element)	RTD RB-[ ]*5 (single element)	Transmitter UNE□□S	624□*8 4915, 6924 5502, 5503
Maximum voltage rating [Vm]	10 V DC	–*6	–*6	31.5 V DC	31.5 V DC
Maximum current rating [Im]	100 mA	–*6	–*6	35 mA DC	35 mA
Maximum power rating [Pm]	0.25 W	–*6	–*6	1.1 W	1.1 W
Input inductance [Lint]	Less than 20 μH			–*7	–*7
Input capacitance [Cint]	Less than 2 nF			–*7	–*7
Ambient temperature	Less than 55°C			Less than 60°C	
Max. temperature of part in contact with explosive atmosphere	80°C	80°C	80°C		
Max. temperature of part in contact with process fluid				80°C	
Construction of temperature sensor	Sealed or sheathed type				
Applicable safety barrier	BARD-200		BARD-300	BARD-400	

*5: [ ]; Fill in thermocouple or RTD type.
*6: For TD type thermocouple or RB type RTD, there are no specifications for Vm, Im or Pm.
*7: For UNE or 624□ etc., there are no specifications for Lint or Cint.
*8: The 624□ incorporates the 6972 as a component.

Some General Instruments that can be used with BARD

Category (for use with:)	BARD safety barrier	General instruments that can be connected to BARD*9		
		YewSeries 80, YEWPACK, etc	CENTUM	ER180
TC-□ (single element thermocouple)	BARD-200	STED EMF to Voltage Converter SALD EMF Input Alarm Unit PTED EMF to Pneum. Converter	Range Card 7RC-TC1 7RC-TC5	ER180 Temp. Recorder
TD-□ (double element thermocouple)	BARD-200 (2 sets)	STED EMF to Voltage Converter SALD EMF Input Alarm Unit PTED EMF to Pneum. Converter	Range Card 7RC-TC1 7RC-TC5	ER180 Temp. Recorder
RB-□ (single element RTD)	BARD-300	STED RTD to Voltage Converter PTED RTD to Pneum. Converter SALD RTD Input Alarm Unit	Range Card*10 7RC-RB1 7RC-RB5	ER180 Temp. Recorder*11
4 to 20 mA loop (2-wire transmitter)	BARD-400	SDBT Distributor*12	Range Card*12 7RC-MA1 7RC-MA5	
4 to 20 mA loop (controller output)	BARD-400	SLCD Indicating Controller*13 SLPC Programmable Indicating Controller SMLD Manual Station SMST Auto/Man. Station ULDU Loop Display Unit	Range Card*13 7RC-MA0	

*9: This list shows instruments and also I/O cards which can be directly connected to BARD safety barriers. Their intrinsic safety rating Vm: 250 V AC/DC.

*10: The minimum span of STED, PTED, 7RC-RB1 and 7RC-RB5 is 30°C (Pt 100 Ω).

*11: The minimum span of the ER180 temperature recorder is 50°C (Pt 100 Ω).

*12: When using distributors and the like with the BARD-400, check that the voltage supplied to them is between 25 to 28 V DC and that they contain a current limiter to limit the current to between 30 and 60 mA (recommended current: 40 mA DC). SDBT and 7RC-MA have such current limiting circuits.

*13: When using controllers, range cards and the like with the BARD-400, ensure that either their output open circuit voltage is not greater than 25 V DC, or that there is an output open circuit alarm circuit built in. Such features are built into the YewSeries 80 and YEWPACK controllers.

WIRING EXAMPLES.

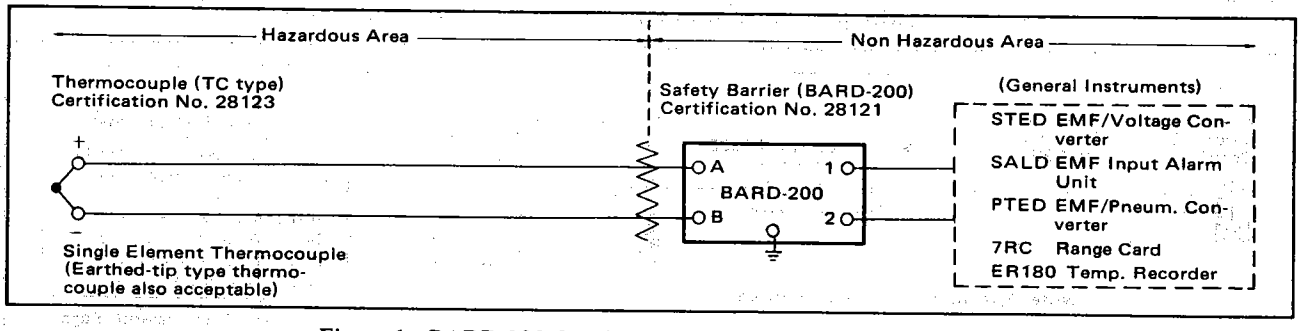

Figure 1. BARD-200 Combined with TC-type Thermocouple.

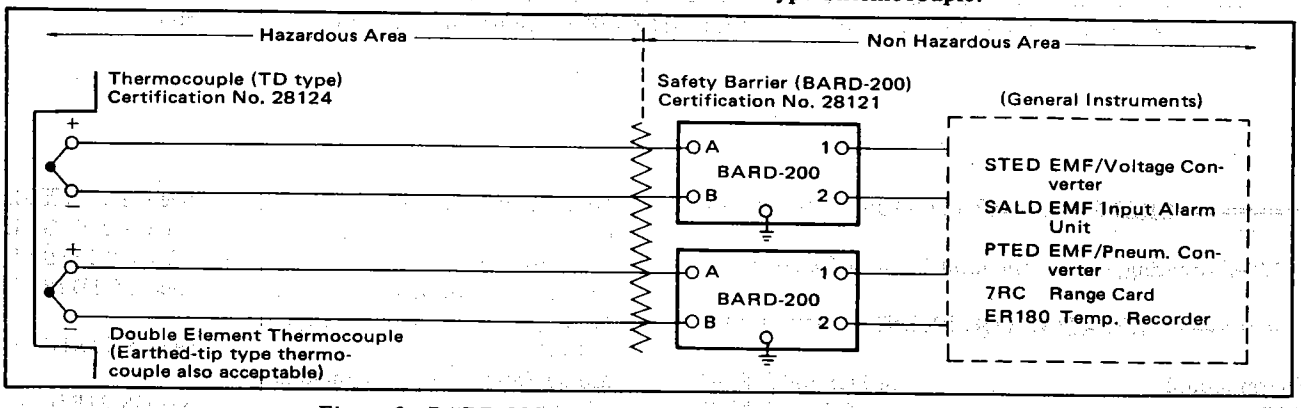

Figure 2. BARD-200 Combined with TD-type Thermocouple.

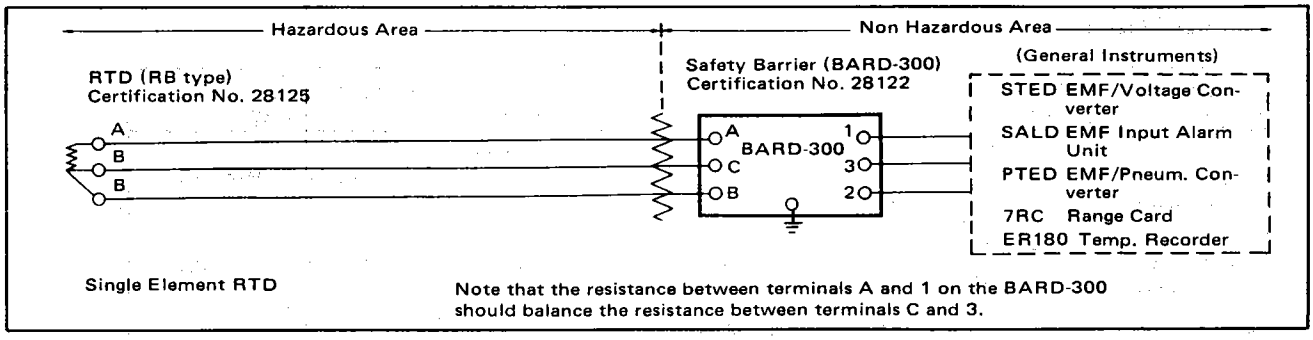

Figure 3. BARD-300 Combined with RB-type RTD.

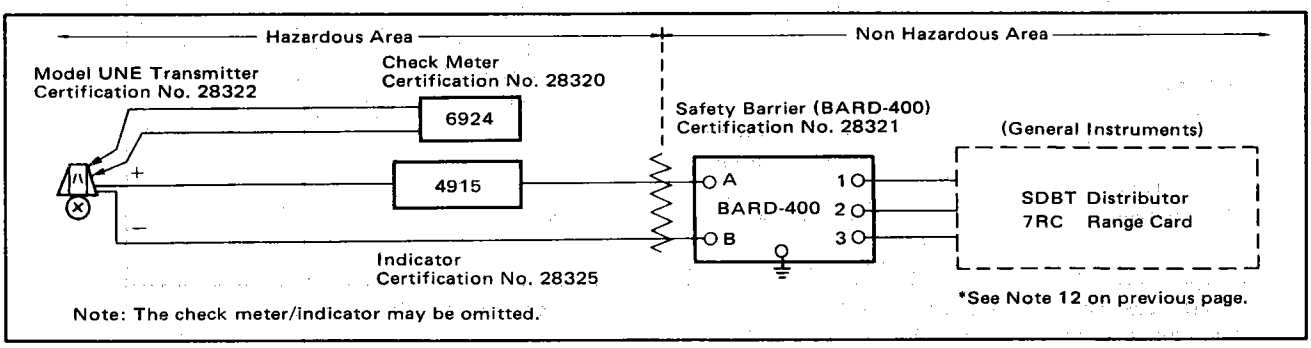

Figure 4. BARD-400 Combined with Model UNE Transmitter.

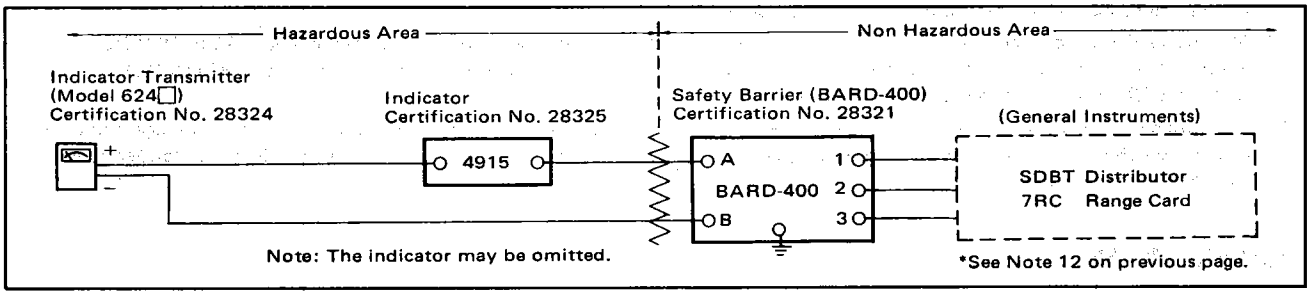

Figure 5. BARD-400 Combined with Model 624□ Indicator Transmitter.

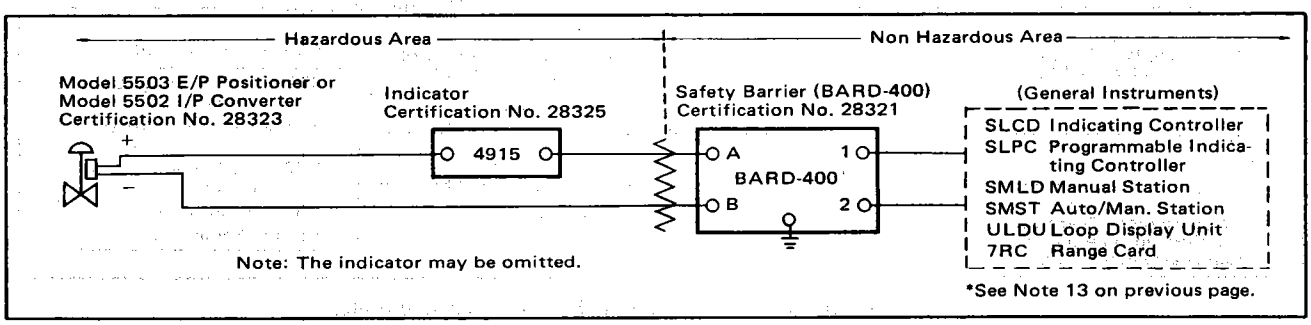

Figure 6. BARD-400 Combined with Model 5503 E/P Positioner or Model 5502 I/P Converter.

========= ORDERING INSTRUCTIONS =========

When ordering, specify the model and suffix codes.

========== RELATED EQUIPMENT ==========

Thermocouple . . . . . See GS 6B□□□-E
RTD . . . . . See GS 6B□□□-E
Model UNE Transmitter . . . . . .See GS 1C3□□-E
Check Meter . . . . . .See GS 22C1B1-E
Indicator . . . . . .See GS 1S1B2-E
Indicator Transmitter . . . . . See GS 1D2B1-E
Model 5502 Current to Pneumatic
(I/P) Converter . . . . . See GS 21B1D1-E
Model 5503 Current to Pneumatic
(E/P) Positioner . . . . . .See GS 21B1C1-E

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