BTicino SpA
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www.imeitaly.com

Type “B” MRCD differential relay

Code: **RDBMRCD24 – RDBMRCD230**

Model: Delta

Contents Pages

1. USE

The DIN device (230Vac or 24Vdc), coupled to the separate dedicated toroid (TDB...), measures the direct earth leakage currents as a type B waveform according to EN / IEC 60947-2 Annex M.
When associated with Bticino switches (see table), these devices ensure their activation within the limits of the standard.
The most common application fields are:
Frequency converters, medical devices such as X ray or CT scan machines, lift power supply lines, lab testing equipment, site production equipment, photovoltaic system inverters, fork lift truck battery charging stations, mechanical workshops, metalworking machines.

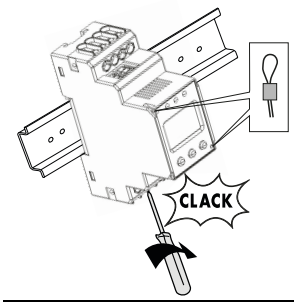
2. RANGE

Code Articolo	Model
RDBMRCD230	Type “B” differential relay 100...250Vac/dc
RDBMRCD24	Type “B” differential relay B 24...60Vac/ 24...78Vdc
Codes TDB	**Models**
TDB35	Toroid Ø 35mm
TDB60	Toroid Ø 60mm
TDB120	Toroid Ø 120mm
TDB210	Toroid Ø 210mm

3. INSTALLATION

Fixing and lead plating:

On EN/IEC 60715 symmetrical rail or DIN 35 rail.

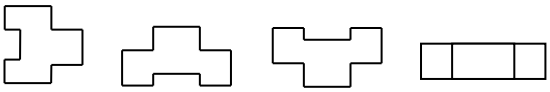


Necessary tools:

For fastening the device on the DIN rail: 5.5 mm flat screwdriver (from 4 to 6 mm)

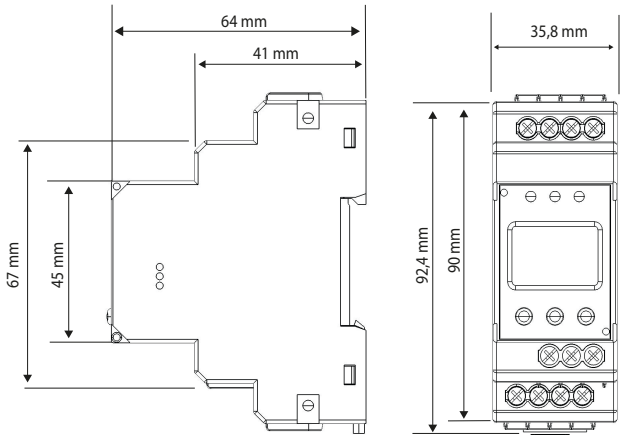
Operating position:

Vertical, Horizontal, Upside down, On the side



4. DIMENSIONS

Housing: 2 DIN43880 modules



5. COMMISSIONNING - CONNECTION

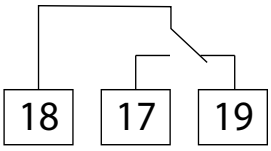
(The setup range of IΔn on the toroid must be consistent with the release threshold programmed in MRCD)

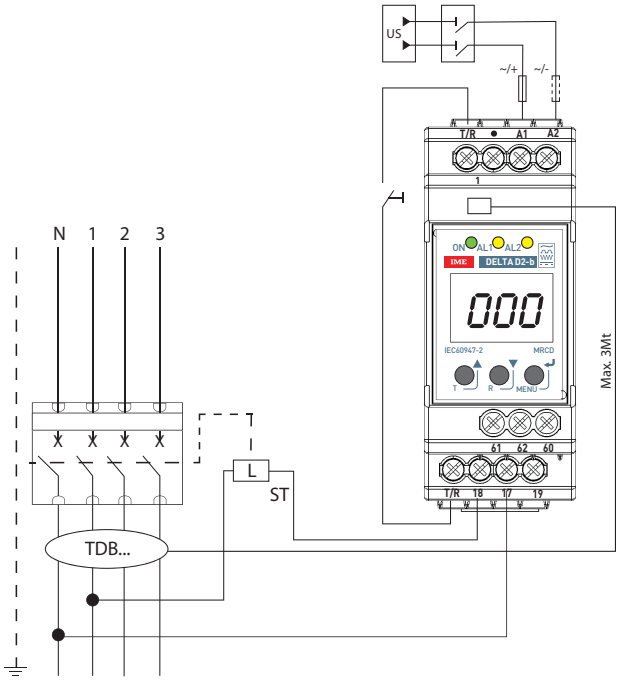
Positive safety

Normally closed contact with powered instrument

N.C. automatic opening in case of lack of supply voltage

(Us when separated from the line to be protected)

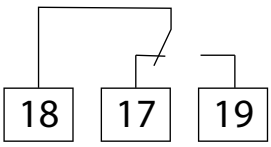


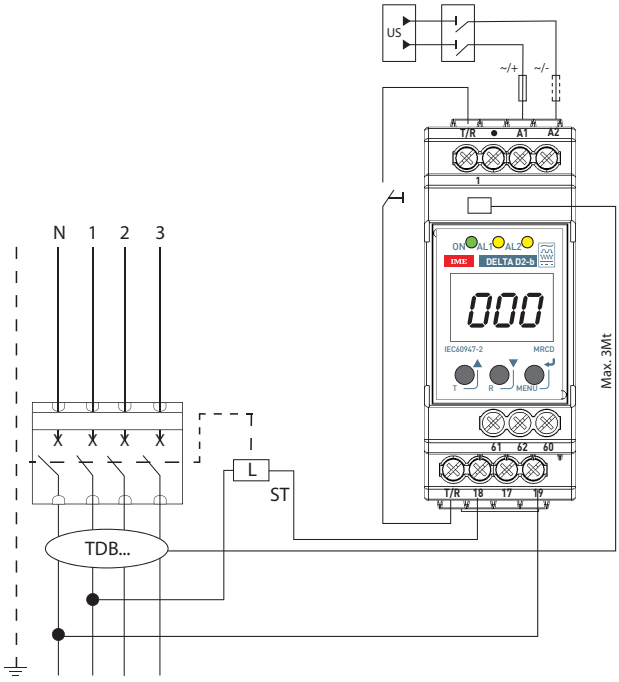


Negative safety (from 20W34)

Normally open contact

N.O. no automatic opening in case of lack of supply voltage (Us)





5. COMMISSIONNING - CONNECTION

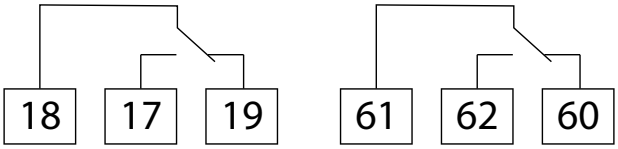
(The setup range of IΔn on the toroid must be consistent with the release threshold programmed in MRCD)

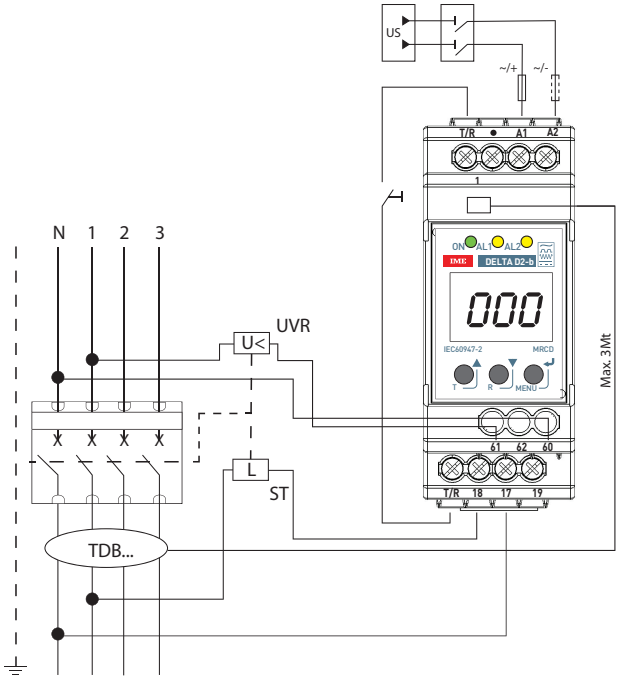
Advanced configuration with additional coil (UVR) for the consent to the closure of the switch, programming the threshold: (IΔ1 = 100% of IΔ2)

Positive safety

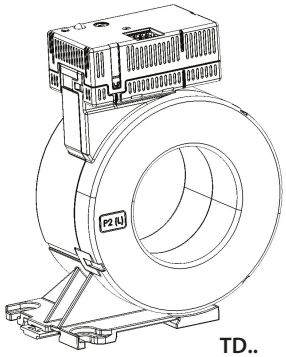
Normally closed contact with powered instrument

N.C. automatic opening in case of lack of supply voltage (Us)

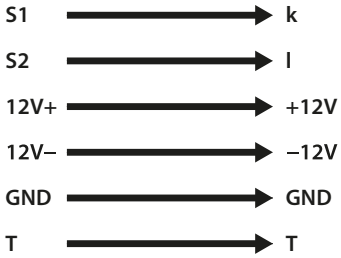


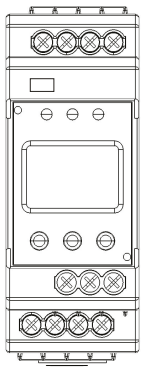


5.1 TOROID CONNECTION AND RELAY



TD..





RD..

6. OPERATING DATA

Auxiliary power supply Us (A1 – A2):

- RDBMRCD230:

Us: 100…250V AC/DC
Permitted variation: 70…300V AC/DC
Permitted frequency: 42…460Hz
Self consumption: < 6.5VA

- RDBMRCD24:

Us: 24…60V AC @ 24…78DC
Permitted variation: 16…72V AC @ 9,6…94V DC
Permitted frequency : 42…460Hz
Self consumption: < 6.5VA

Power ON inhibition time: 1,2 s

6.1 ELECTRIC DATA

Type B differential current:
- IΔn 0,03…3A

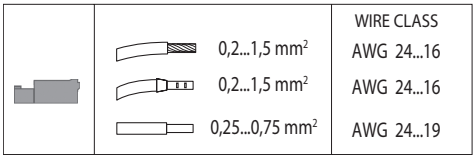
Operating frequency:
- 0…2kHz

Output relay contact capacity (EN/IEC 60947-5-1):
- 230 Vac 5A
- 24 Vdc 1A

Connectable section:
- Copper wires
- Voltage connection terminals Us (A1 -A2):

	Without bush
Rigid wire	1 x 4 mm²
Flexible wire	8/9 mm MAX 1 x 2,5 mm²

- Removable terminal board for the toroid connection:



- Release coil control relay terminal board:

	Without bush
Rigid wire	1 x 4 mm²
Flexible wire	8/9 mm MAX 1 x 2,5 mm²

Necessary tools:
- For the voltage connection terminals (A1-A2): screwdriver with 6mm blade or Pozidriv No. 2
- For the toroid connection terminal: screwdriver with 2,5 mm blade

6.2 MECHANICAL DATA

Screw terminals:
- Depth of the terminals: 6mm
- Lengths of the wire stripping: 8-9mm

Screw head:
- Voltage connection terminals (A1 - A2): COMBI PZ2
- Coil control relay terminal board (18-17-19): COMBI PZ2
- Pre-alarm relay terminal board (61-62-60): COMBI PZ2
- Remote test and reset terminal board (T/R): COMBI PZ2

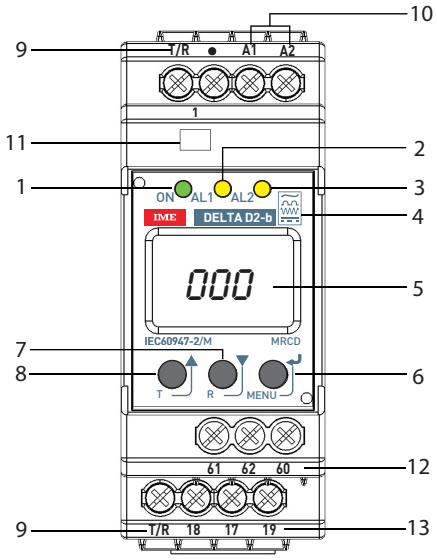
Recommended torque:
- Voltage connection terminals (A1 - A2): 0.5Nm
- Coil control relay terminal board (18-17-19): 0.5Nm
- Pre-alarm relay terminal board (61-62-60): 0.5Nm
- Remote test and reset terminal board (T/R): 0.5Nm

Maximum torque:
- Voltage connection terminals (A1 - A2): 0.6Nm
- Coil control relay terminal board (18-17-19): 0.6Nm
- Pre-alarm relay terminal board (61-62-60): 0.6Nm
- Remote test and reset terminal board (T/R): 0.6Nm

7. GENERAL FATURES

Marking data:

MRCD indelible marking



Visual notification

1. “Green” ON LED
2. “Yellow” AL1 LED
3. “Yellow” AL2 LED
4. Symbols of "Type B Differential”
5. LCD display

Keypad made up of 3 double-function pushbuttons

6. ENTER (confirm programming data)
   MENU (> 2s access the programming mode)
7. Decrease of a programming value
   RESET (manual reset)
8. Increase of a programming value
   TEST (manual)

Input terminals

9. T/R external contact for the remote TEST/RESET functions
10. A1-A2 auxiliary voltage
11. Signal input from TDB… toroid

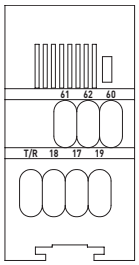
Output terminals

12. Pre-alarm relay 61-62-60 (Programmable N.C./N.O.)
13. TRIP relay 18-17-19 (Programmable N.C./N.O.)

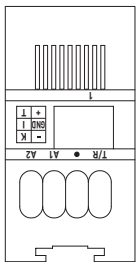
7. GENERAL FATURES *(continued)*

MRCD laser marking

Lower Side



Upper Side

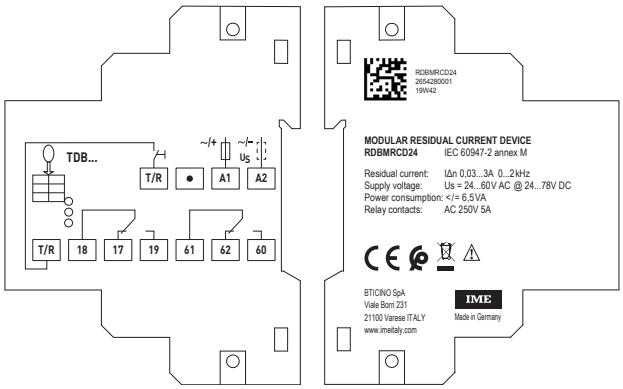


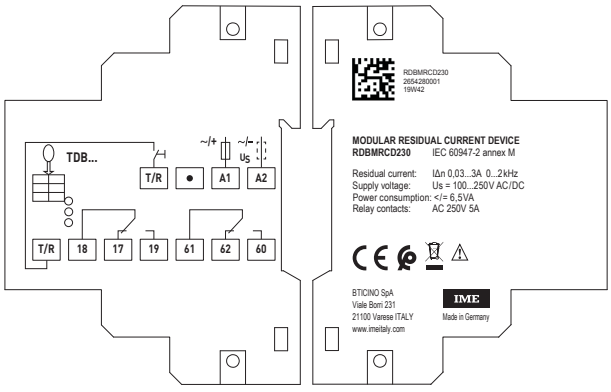
Left Side

Connection diagrams

Right Side

Traceability information





7. GENERAL FATURES *(continued)*

Display:

3-digit LCD (1000 points)
Indicated value measurement error: ±17,5%, ±2 digits

LEDs:

ON: voltage present Us
AL1: pre-alarm IΔn 1
AL2: alarm, coil release IΔn 2

Display of the automatic instantaneous values:

- IΔn instantaneous
- Release threshold set IΔn 2
- Trip delay set IΔn 2

Programmable parameters:

- Release threshold IΔn 2: 0.03…3A
- Trip delay Δt 2: 0…10s
- Pre-alarm threshold IΔn 1: value 50…100% of IΔn2
- Trip delay Δt 1: 0…10s
- Password: 0…999 (default = 0)

MRCD (without connected switch)							
SET=> Rated residual operating current (IΔn)	0,03A	0,05...3A					
SET=> Limiting non actuating time	0s	0,1s	0,25s	0,5s	1s	2,5s	5s
Non-operating time @ 2IΔn		0,1s	0,25s	0,5s	1s	2,5s	5s
Maximum break time @ 5IΔn	23ms	0,24s	0,39s	0,64s	1,14s	2,64s	5,14s

Control:

MANUAL TEST:

- It checks the efficiency of the earth leakage relay, including output relays
- Local test: front T pushbutton
- Remote test: T/R external contact closing (long press >1,5 s)

MANUAL RESET:

- Local reset: front T pushbutton
- Remote reset: T/R external contact closing (short press <1,5 s)

PERMANENT AUTOMATIC TEST:

- It checks the continuity of the earth leakage relay - toroid connection

7. GENERAL FATURES

Maximum dissipated thermal power for the thermal dimensioning of the panels: 6.5W

Operating room temperatures (MRCD and TDB):

- Min. = -25 °C Max. = +55 °C.

Room storage temperatures (MRCD and TDB):

- Min. = -25 °C Max. = +70 °C.

Protection class:

- Terminal protection index against solid bodies and liquids: IP20 (IEC/EN 60529)
- Protection index of the internal components against solid bodies and liquids: IP30 IEC/EN 60529

Housing material: >PC+ABS<

Volume and weight of packed MRCD:

Code Art.	Volume	Weight
RDBMRCD230	1 dm^3	0,22 Kg
RDBMRCD24	1 dm^3	0,22 Kg

8. CONFORMITY AND CERTIFICATIONS

Isolation RDBMRCD230

- Insulation voltage, Ui:250V
- Installation categories: III
- Level of pollution: 2

Isolation RDBMRCD24

- Insulation voltage, Ui:100V
- Installation categories: III
- Level of pollution: 2

Dielectric rigidity:

- Power supplies/ Outputs: 2.2kV

Impulse voltage Uimp :

RDBMCRD230 : 4kV
RDBMCRD24 : 2,5kV

In compliance with the standards:

- EN/IEC 60947-2 Annesso M

Respecting the environment – Conformity with the EU directives:

- Compliance with the 2100/65/EU Directive, as modified by the 2015/863 Directive (RoHS 2), on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Conformity with the REACH Regulation (1907/ 2006): at the date of publication of this document no substance in the annex XIV is found in these products.
- RAEE Directive (2012/19/EU: the sale of this product includes a contribution to the appointed environmental bodies of each European country in charge of handling, at the end of their life, the products falling within the scope of the EU Directive on Electric and Electronic Equipment Waste.

Packaging:

- Packaging designed and produced in accordance with directive 94/62/CE

Plastic materials:

- Part marking according to standards ISO 11469 and ISO 1043.

9. MEGATIKER COMPATIBILITY TABLE

MRCD Type B combinations according to EN / IEC 60947-2 Annex M for life-saving function with IAn to 30mA				
DIN Device	**RDBMRCD230**			
	RDBMRCD24			
Toroid	**TDB35**			
	TDB60			
	TDB120			
	TDB210			
Switches		Release coil ST (Standard configuration)	Release coil UVR (Advanced configuration)	SET=> Rated residual Operating current (I∆n 0,03A)
Range Bticino Megatiker	M1 160E	**M7S024; M7S230**	**M7U024; M7U230**	OK
	M1 160B			OK
	M1 160N			OK
	M2 250B			OK*
	M2 250F			OK*
	M2 250H			OK*
	M2 250B Ele			OK*
	M2 250N Ele			OK*
	M2 250H Ele			OK*
	M2 250B Ele+Measure			OK*
	M2 250F Ele+Measure			OK*
	M2 250H Ele+Measure			OK*
	M4 630F	**M7C024; M7C230**		
	M4 630N			
	M4 630L			
	M4 630F Ele			
	M4 630N Ele			
	M4 630L Ele			
	M4 630N Ele+Measure			
	M4 630L Ele+Measure			

* I∆n 30mA applicable up to In = 160A