

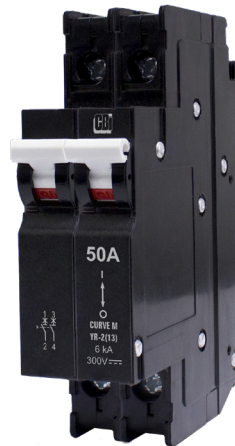
YR-Frame - Circuit Breakers for Railways



1 Pole
DIN mount



1 Pole
DIN mount



2 Pole
DIN mount



2 Pole
DIN mount

Product Category

- **UNPOLARISED PRODUCT**
- 80 Vdc (1P & 2P), 150 Vdc (1P & 2P)
(Reverse feedable)
- **POLARISED PRODUCT**
- 220 Vdc (1P & 2P), 300 Vdc (1P & 2P)
(Not reverse feedable)

*Verify approvals

Common features

- High energy DC circuit breaker
- Ultra compact - 13 mm wide module
- Hydraulic-magnetic technology
- Can be switched on immediately after tripping
- **YRD** - DIN mount, **45 mm** front escutcheon (**Grey**)
- **YRM** - DIN mount, **57 mm** front escutcheon (**Black**)
- ON and OFF indication
- Suitable for electrical isolation
- 100% rating capability, independent of ambient temperature
- RoHS compliant
- Box type main terminals

YR circuit breakers are designed in line with the following:

- | | |
|------------------|--------------------|
| • EN 45545-2 HL3 | • IEC EN60077 |
| • EN 50155 | • IEC EN61373 |
| • NF F 16-101 | • IEC EN60068-2 |
| • NF F 16-102 | • ASTM E Standards |
| • IEC EN45545 | |

Applications

- Railway Signalling
- Rolling Stock
- DC circuit protection
- Battery protection & switching

Auxiliary Switch and Trip Alarm Features

- Auxiliary switch
- AC and DC voltages
- IEC 60947-5-1 (6 A 250 Vac, 0.5 A 110 Vdc)
- GB 14048.5
- Factory fitted
- Attached to right hand side of circuit breaker
- Compact 6.5 mm width

Optional Accessories

- Handle lock (QFAP001)
- Surface mounting clips (2096001)
- Busbar (2121381)



Hydraulic-Magnetic Circuit Breakers 100% rated, unaffected by ambient temperature

YR-FRAME-DAT
REV. F
JUNE 2023
2304008

Data Sheet
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YR-Frame - Circuit Breakers for Railways

Technical Data

Product Type	Circuit Breaker YR			
Approvals	IEC 60947-2, GB 14048.2, CE, UKCA, TB/T 3497			
Product Category	UNPOLARISED		POLARISED	
Number of Poles	1 Pole	2 Pole	1 pole	2 Pole
Operating Voltages & Interrupting Capacity	80 Vdc @ 10 kA 150 Vdc @ 6 kA	80 Vdc @ 10 kA 150 Vdc @ 6 kA	220 Vdc @ 6 kA 300 Vdc @ 6 kA	220 Vdc @ 6 kA 300 Vdc @ 6 kA
Minimum Current Rating	0.5 A	0.5 A	0.5 A	0.5 A
Maximum Current Rating	32 A (80 Vdc) 50 A (150 Vdc)	32 A (80 Vdc) 50 A (150 Vdc)	50 A	50 A

Product Type	Circuit Breaker YR	
Approvals	UL 489A	
Product Category	POLARISED	
Number of Poles	1 Pole	2 Pole
Operating Voltages & Interrupting Capacity	300 Vdc @ 10 kA	300 Vdc @ 10 kA
Minimum Current Rating	0.5 A	0.5 A
Maximum Current Rating	50 A	50 A

Verify approvals for specific ratings in accordance with the relevant test certificates.

Product Type	Circuit Breaker YR
Ambient Operating Temperature	-40 °C to +85 °C
Mounting Options	Dual (DIN & mini rail) mount
Time Delay Curves	Various
Endurance	10000 operations; 1500 with current, 8500 without current (IEC 60947-2 Clause 7.2.4.2)*
Dielectric Strength	1000 - 2000 Vac for one minute (IEC 60947-2 Clause 8.3.3.3)*
Rated Impulse Withstand Voltage	4 kV (IEC 60947-2 Clause 8.3.3.2)*
Weight	110 g per pole
Altitude	Certification tests conducted at altitude ≈ 2000 metres. Will operate at higher altitudes.
Shock	20 G (IEC 60068-2-27) IEC 61373 Cat 1B
Vibration	3 G (IEC 60068-2-64) (sinusoidal wave) IEC 61373 Cat 1B
Flammability	I3 - Ignition does not persist at 850 °C after glow wire is withdrawn with an oxygen index of ≥ 28
Toxicity	F1 - Smoke index of ≤ 20 which determines the fume class
Pollution Degree	PD2 - Normally only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

* Refer to the standard for details

Circuit Breaker	Wire Size (IEC)	Wire Gauge (UL)	Torque (IEC)	Torque (UL)	Comments
Main Terminals	2.5 mm ² to 16 mm ²	18 – 6 AWG	3.5 N.m	30 lbf.in	Pz #2 Combi head

YR-Frame - Circuit Breakers for Railways

Long Code

Example Code: YRM- - -1 -(13)-M-50A- 150 - - - -

Group	1	2	3	4	5	6	7	8	9	10
Requirement	YRM frame	Auxiliary	Number of poles	Module width	Time delay curve	Current rating	Polarity marking, voltage & construction	Shunt trip	Termination	Customer Specific
Long Code	YRM	-	1	(13)	M	50A	150	-	-	-

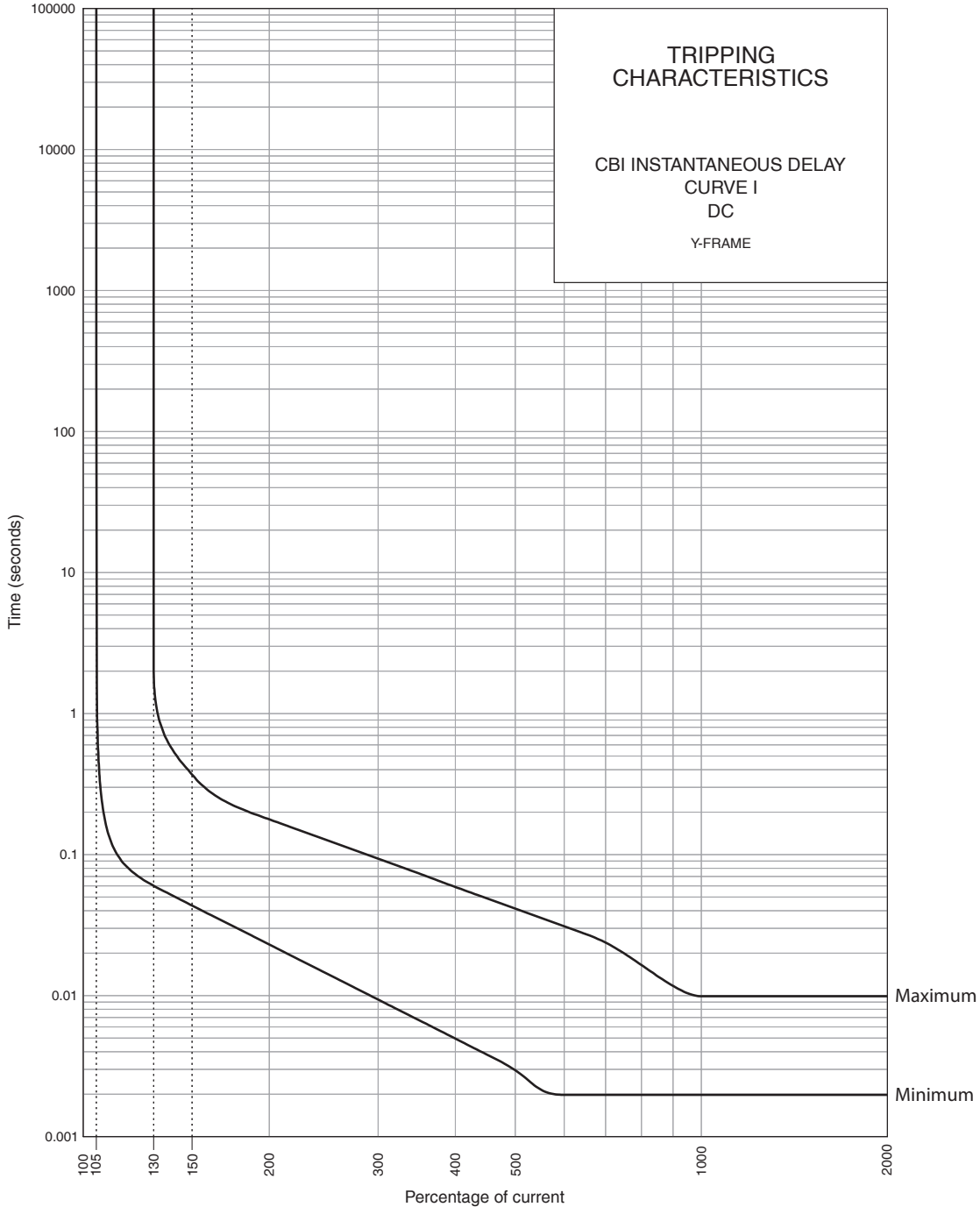
Ordering Information

Group	Code	Description	Comments
Group 1: Frame Type	YRD	YR - Frame (13 mm circuit breaker DIN mounting 45 mm front escutcheon)	Grey shell
	YRM	YR - Frame (13 mm circuit breaker DIN mounting 57 mm front escutcheon)	Black shell
Group 2: Auxiliary	-	Not applicable	
	A	Auxiliary switch	
	T	Trip alarm	
	AT	Auxiliary switch & Trip alarm	
Group 3: Number of poles	1	One pole	
	2	Two pole	
Group 4: Module Width	(13)	13 mm module	
Group 5: Time Delay	I	Instantaneous delay	
	S	Short delay	
	M	Medium delay	
	L	Long delay	
Group 6: Current Rating		0.5, 1, 2, 3, 5, 6, 10, 15, 16, 20, 25, 30, 32, 35, 40, 45, 50 A	80 Vdc, 10 kA upto 32 A
Group 7: Polarity Marking, Voltage & Construction	080	80 Vdc Unpolarised	
	150	150 Vdc Unpolarised	
	BT3	300 Vdc Polarised	
	B02	220 Vdc Polarised	
Group 8: Shunt Trip	-	Not applicable	if shunt trip is not required
	C	12 Vdc Shunt trip (Box terminal)	Recommended pulse tolerance 100 ms - 60 s Note: Shunt trip option carries no approvals - available as a special order only
	D	24 Vdc Shunt trip (Box terminal)	
	E	48 Vdc Shunt trip (Box terminal)	
	G	110 Vdc or 110 Vac Shunt trip (Box terminal)	
	H	220 / 240 Vac Shunt trip (Box terminal)	
Group 9: Termination	-	No Busbar supplied – if applicable the Busbar / Cable is to be provided & field fitted by the Customer	
	S	Factory fitted Busbar – incoming circuit CONNECTION @ BOTTOM	
	U	Busbar to be supplied loose in a KIT FORM & to be field fitted by the customer	
Group 10: Customer specific	-	Not applicable	

For options not listed, please contact CBI for assistance

YR-Frame - Circuit Breakers for Railways

Time Delay Curve

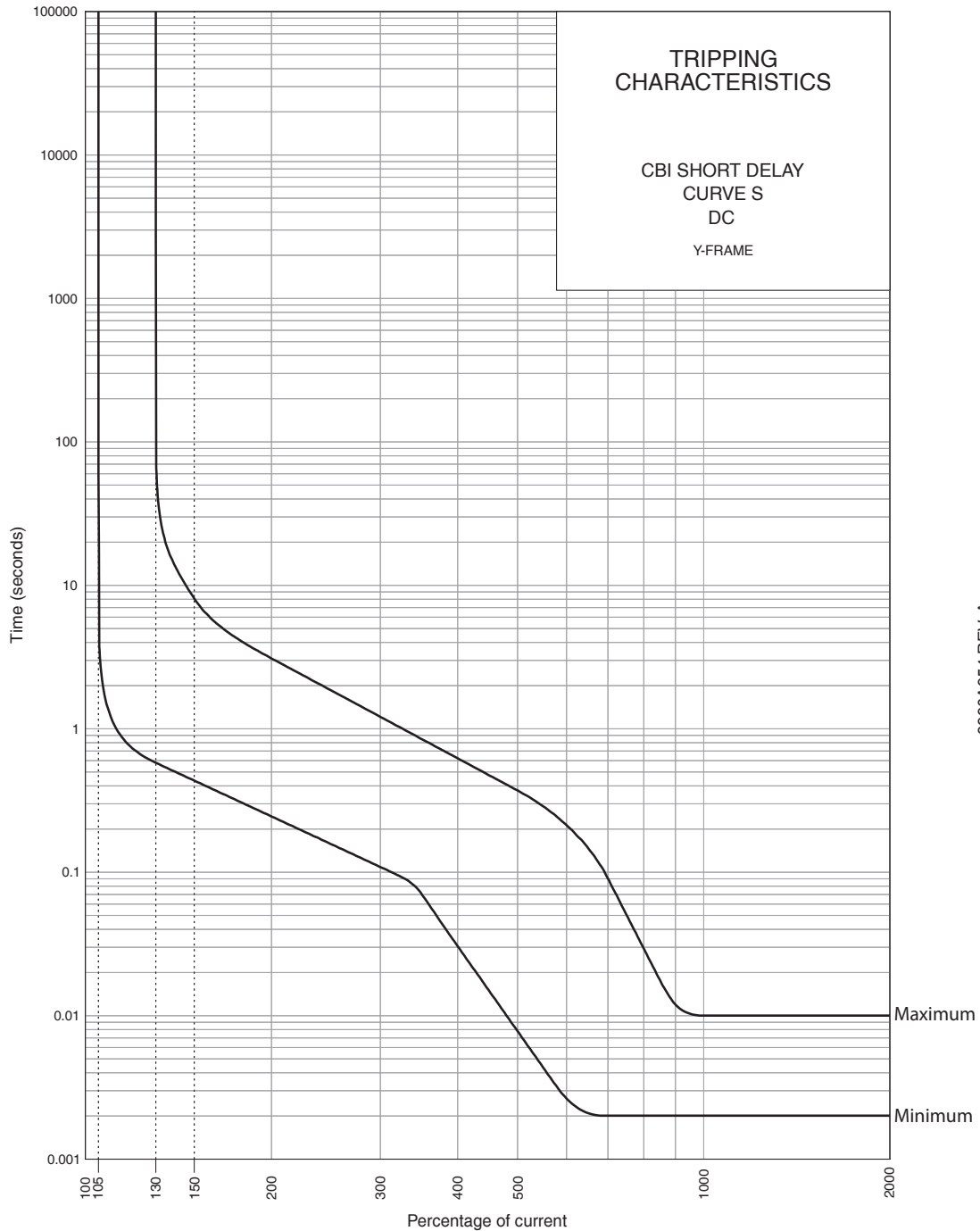


3990A961 REV. A

PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	0.06	0.04	0.02	0.009	0.005	0.003	0.002	0.002	0.002	0.002	0.002	0.002
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	2	0.4	0.2	0.09	0.1	0.04	0.03	0.02	0.016	0.012	0.01	0.01

YR-Frame - Circuit Breakers for Railways

Time Delay Curve

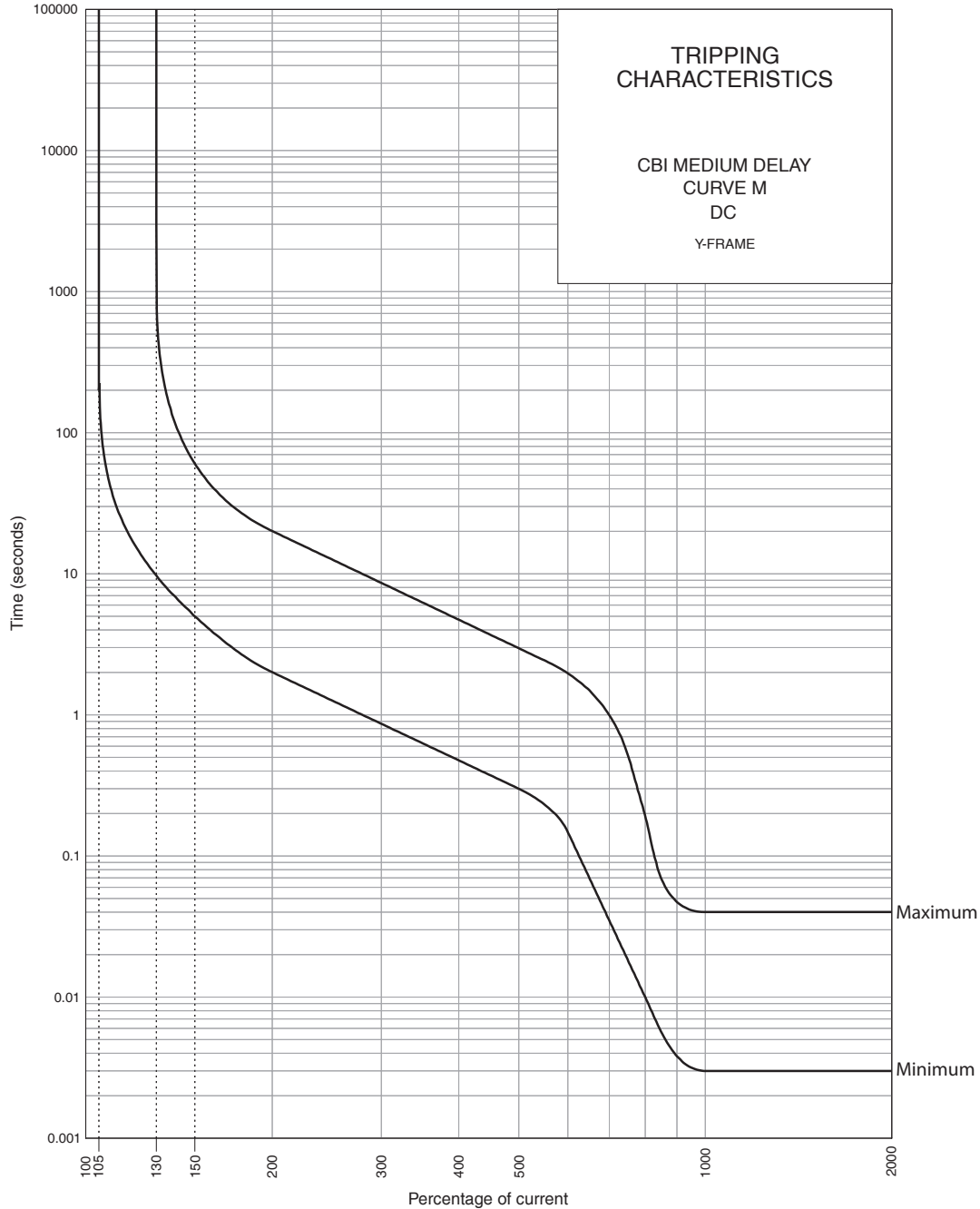


3990A954 REV. A

PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	0.58	0.44	0.2	0.1	0.03	0.01	0.003	0.002	0.002	0.002	0.002	0.002
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	3000	8.1	3.1	1.21	0.6	0.4	0.2	0.1	0.03	0.012	0.01	0.01

YR-Frame - Circuit Breakers for Railways

Time Delay Curve

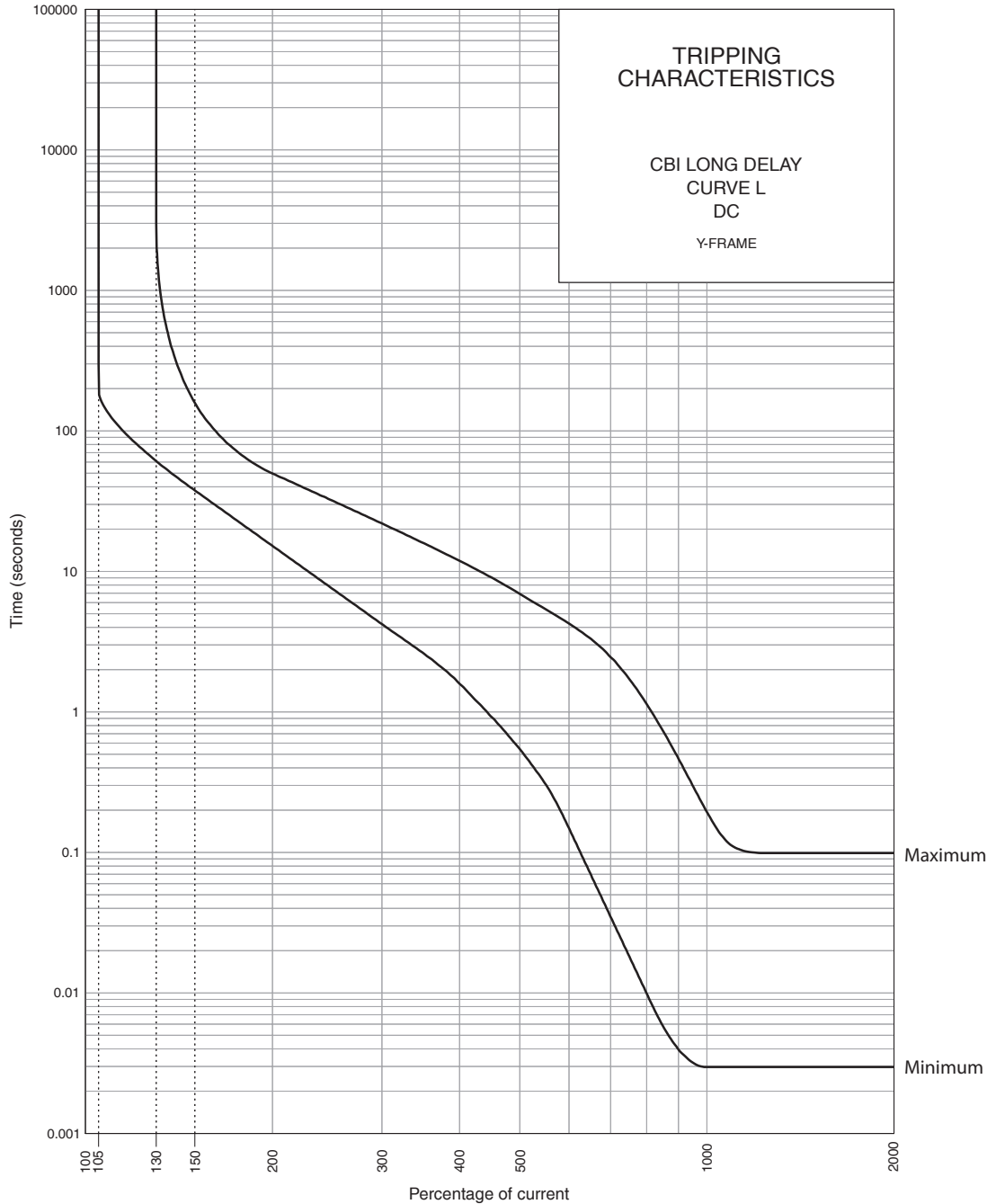


3990A883 REV. B

PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	9.7	4.99	2.0	0.9	0.48	0.3	0.15	0.03	0.01	0.004	0.003	0.003
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	3000	60.0	20.0	8.62	4.7	3.0	1.97	0.99	0.19	0.05	0.04	0.04

YR-Frame - Circuit Breakers for Railways

Time Delay Curve

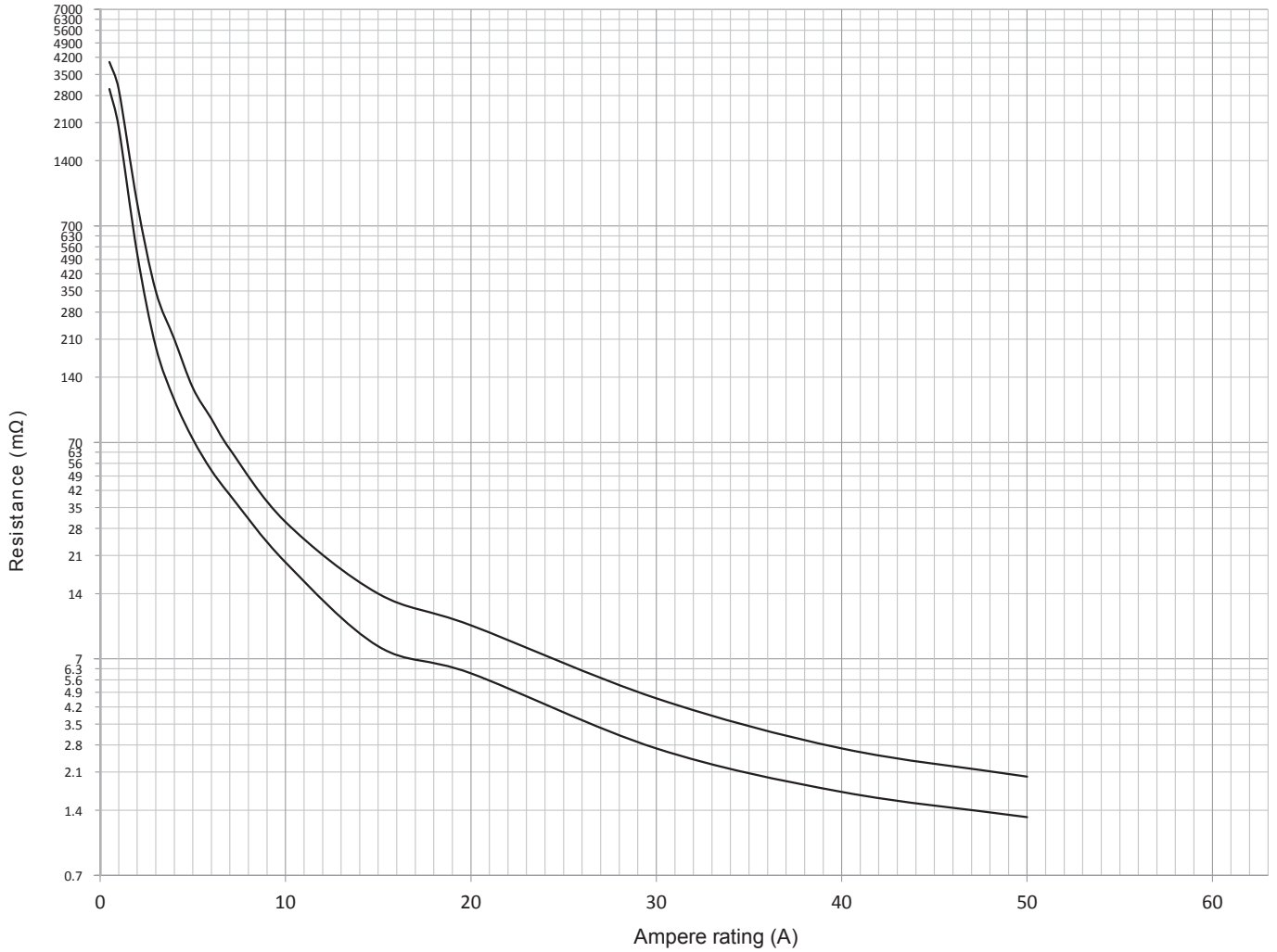


3990A953 REV. A

PERCENTAGE OF RATED CURRENT	105%	130%	150%	200%	300%	400%	500%	600%	700%	800%	900%	1000%	1200%
MINIMUM TRIP TIME IN SECONDS	NO TRIP	60.9	37.7	15.2	4.2	1.6	0.54	0.15	0.03	0.01	0.004	0.003	0.003
MAXIMUM TRIP TIME IN SECONDS	NO TRIP	3000	158.3	49.8	21.98	11.9	6.9	4.3	2.5	1.1	0.5	0.2	0.1

YR-Frame - Circuit Breakers for Railways

Resistance Curve



3990B0290 REV. A

Amp RATING	0.5	1	2	3	4	5	6	7	10	15	20	30	40	50
MINIMUM (mΩ)	3000	2000	520	190	110	72	52	40	19.5	8	6	2.7	1.7	1.3
MAXIMUM (mΩ)	4000	3000	890	350	220	100	95	80	30	14	10	4.6	2.7	2.0

YR-Frame - Circuit Breakers for Railways

Unpolarised / Reverse Feedable

DIN mounting 45 mm escutcheon			DIN mounting 57 mm escutcheon	
AMP	BOM No.	Long Code	BOM No.	Long Code
One pole (13 mm width) 80 Vdc				
0.5 A	YRD1M0A5080	YRD-1(13)-M-0.5 A-080	YRM1M0A5080	YRM-1(13)-M-0.5A-080
1 A	YRD1M001080	YRD-1(13)-M-1A-080	YRM1M001080	YRM-1(13)-M-1A-080
2 A	YRD1M002080	YRD-1(13)-M-2A-080	YRM1M002080	YRM-1(13)-M-2A-080
3 A	YRD1M003080	YRD-1(13)-M-3A-080	YRM1M003080	YRM-1(13)-M-3A-080
5 A	YRD1M005080	YRD-1(13)-M-5A-080	YRM1M005080	YRM-1(13)-M-5A-080
6 A	YRD1M006080	YRD-1(13)-M-6A-080	YRM1M006080	YRM-1(13)-M-6A-080
10 A	YRD1M010080	YRD-1(13)-M-10A-080	YRM1M010080	YRM-1(13)-M-10A-080
15 A	YRD1M015080	YRD-1(13)-M-15A-080	YRM1M015080	YRM-1(13)-M-15A-080
16 A	YRD1M016080	YRD-1(13)-M-16A-080	YRM1M016080	YRM-1(13)-M-16A-080
20 A	YRD1M020080	YRD-1(13)-M-20A-080	YRM1M020080	YRM-1(13)-M-20A-080
25 A	YRD1M025080	YRD-1(13)-M-25A-080	YRM1M025080	YRM-1(13)-M-25A-080
30 A	YRD1M03080	YRD-1(13)-M-30A-080	YRM1M030080	YRM-1(13)-M-30A-080
32 A	YRD1M032080	YRD-1(13)-M-32A-080	YRM1M032080	YRM-1(13)-M-32A-080
Two pole (13 mm width) 80 Vdc				
0.5 A	YRD2M0A5080	YRD-2(13)-M-0.5A-080	YRM2M0A5080	YRM-2(13)-M-0.5A -080
1 A	YRD2M001080	YRD-2(13)-M-1A-080	YRM2M001080	YRM-2(13)-M-1A-080
2 A	YRD2M002080	YRD-2(13)-M-2A-080	YRM2M002080	YRM-2(13)-M-2A-080
3 A	YRD2M003080	YRD-2(13)-M-3A-080	YRM2M003080	YRM-2(13)-M-3A-080
5 A	YRD2M005080	YRD-2(13)-M-5A-080	YRM2M005080	YRM-2(13)-M-5A-080
6 A	YRD2M006080	YRD-2(13)-M-6A-080	YRM2M006080	YRM-2(13)-M-6A-080
10 A	YRD2M010080	YRD-2(13)-M-10A-080	YRM2M010080	YRM-2(13)-M-10A-080
15 A	YRD2M015080	YRD-2(13)-M-15A-080	YRM2M015080	YRM-2(13)-M-15A-080
16 A	YRD2M016080	YRD-2(13)-M-16A-080	YRM2M016080	YRM-2(13)-M-16A-080
20 A	YRD2M020080	YRD-2(13)-M-20A-080	YRM2M020080	YRM-2(13)-M-20A-080
25 A	YRD2M025080	YRD-2(13)-M-25A-080	YRM2M025080	YRM-2(13)-M-25A-080
30 A	YRD2M030080	YRD-2(13)-M-30A-080	YRM2M030080	YRM-2(13)-M-30A-080
32 A	YRD2M032080	YRD-2(13)-M-32A-080	YRM2M032080	YRM-2(13)-M-32A-080

Note:

The “M” after the number in the BOM number i.e. YRD2M0A5080 represents the time delay tripping curves

If a different curve is required please replace the “M” with the appropriate time delay curve

YR-Frame - Circuit Breakers for Railways
Unpolarised / Reverse Feedable

DIN mounting 45 mm escutcheon			DIN mounting 57 mm escutcheon	
AMP	BOM No.	Long Code	BOM No.	Long Code
One pole (13 mm width) 150 Vdc				
0.5 A	YRD1M0A5150	YRD-1(13)-M-0.5 A-150	YRM1M0A5150	YRM-1(13)-M-0.5A-150
1 A	YRD1M001150	YRD-1(13)-M-1A-150	YRM1M001150	YRM-1(13)-M-1A-150
2 A	YRD1M002150	YRD-1(13)-M-2A-150	YRM1M002150	YRM-1(13)-M-2A-150
3 A	YRD1M003150	YRD-1(13)-M-3A-150	YRM1M003150	YRM-1(13)-M-3A-150
5 A	YRD1M005150	YRD-1(13)-M-5A-150	YRM1M005150	YRM-1(13)-M-5A-150
6 A	YRD1M006150	YRD-1(13)-M-6A-150	YRM1M006150	YRM-1(13)-M-6A-150
10 A	YRD1M010150	YRD-1(13)-M-10A-150	YRM1M010150	YRM-1(13)-M-10A-150
15 A	YRD1M015150	YRD-1(13)-M-15A-150	YRM1M015150	YRM-1(13)-M-15A-150
16 A	YRD1M016150	YRD-1(13)-M-16A-150	YRM1M016150	YRM-1(13)-M-16A-150
20 A	YRD1M020150	YRD-1(13)-M-20A-150	YRM1M020150	YRM-1(13)-M-20A-150
25 A	YRD1M025150	YRD-1(13)-M-25A-150	YRM1M025150	YRM-1(13)-M-25A-150
30 A	YRD1M030150	YRD-1(13)-M-30A-150	YRM1M030150	YRM-1(13)-M-30A-150
32 A	YRD1M032150	YRD-1(13)-M-32A-150	YRM1M032150	YRM-1(13)-M-32A-150
35 A	YRD1M035150	YRD-1(13)-M-35A-150	YRM1M035150	YRM-1(13)-M-35A-150
40 A	YRD1M040150	YRD-1(13)-M-40A-150	YRM1M040150	YRM-1(13)-M-40A-150
45 A	YRD1M045150	YRD-1(13)-M-45A-150	YRM1M045150	YRM-1(13)-M-45A-150
50 A	YRD1M050150	YRD-1(13)-M-50A-150	YRM1M050150	YRM-1(13)-M-50A-150
Two pole (13 mm width) 150 Vdc				
0.5 A	YRD2M0A5150	YRD-2(13)-M-0.5A-150	YRM2M0A5150	YRM-2(13)-M-0.5A -150
1 A	YRD2M001150	YRD-2(13)-M-1A-150	YRM2M001150	YRM-2(13)-M-1A-150
2 A	YRD2M002150	YRD-2(13)-M-2A-150	YRM2M002150	YRM-2(13)-M-2A-150
3 A	YRD2M003150	YRD-2(13)-M-3A-150	YRM2M003150	YRM-2(13)-M-3A-150
5 A	YRD2M005150	YRD-2(13)-M-5A-150	YRM2M005150	YRM-2(13)-M-5A-150
6 A	YRD2M006150	YRD-2(13)-M-6A-150	YRM2M006150	YRM-2(13)-M-6A-150
10 A	YRD2M010150	YRD-2(13)-M-10A-150	YRM2M010150	YRM-2(13)-M-10A-150
15 A	YRD2M015150	YRD-2(13)-M-15A-150	YRM2M015150	YRM-2(13)-M-15A-150
16 A	YRD2M016150	YRD-2(13)-M-16A-150	YRM2M016150	YRM-2(13)-M-16A-150
20 A	YRD2M020150	YRD-2(13)-M-20A-150	YRM2M020150	YRM-2(13)-M-20A-150
25 A	YRD2M025150	YRD-2(13)-M-25A-150	YRM2M025150	YRM-2(13)-M-25A-150
30 A	YRD2M030150	YRD-2(13)-M-30A-150	YRM2M030150	YRM-2(13)-M-30A-150
32 A	YRD2M032150	YRD-2(13)-M-32A-150	YRM2M032150	YRM-2(13)-M-32A-150
35 A	YRD2M035150	YRD-2(13)-M-35A-150	YRM2M035150	YRM-2(13)-M-35A-150
40 A	YRD2M040150	YRD-2(13)-M-40A-150	YRM2M040150	YRM-2(13)-M-40A-150
45 A	YRD2M045150	YRD-2(13)-M-45A-150	YRM2M045150	YRM-2(13)-M-45A-150
50 A	YRD2M050150	YRD-2(13)-M-50A-150	YRM2M050150	YRM-2(13)-M-50A-150

Note:

The "M" after the number in the BOM number i.e. YRD2M0A5080 represents the time delay tripping curves

If a different curve is required please replace the "M" with the appropriate time delay curve

YR-Frame - Circuit Breakers for Railways

Polarised / Not Reverse Feedable

DIN mounting 45 mm escutcheon			DIN mounting 57 mm escutcheon	
AMP	BOM No.	Long Code	BOM No.	Long Code
Two pole (26 mm width) 300 Vdc Polarised (1+1=2P) - Positive Bottom / Positive Top				
0.5 A	YRD2M0A5BT3	YRD-2(13)-M-0.5 A-BT3	YRM2M0A5BT3	YRM-2(13)-M-0.5A-BT3
1 A	YRD2M001BT3	YRD-2(13)-M-1 A-BT3	YRM2M001BT3	YRM-2(13)-M-1A-BT3
2 A	YRD2M002BT3	YRD-2(13)-M-2 A-BT3	YRM2M002BT3	YRM-2(13)-M-2A-BT3
3 A	YRD2M003BT3	YRD-2(13)-M-3 A-BT3	YRM2M003BT3	YRM-2(13)-M-3A-BT3
5 A	YRD2M005BT3	YRD-2(13)-M-5 A-BT3	YRM2M005BT3	YRM-2(13)-M-5A-BT3
6 A	YRD2M006BT3	YRD-2(13)-M-6 A-BT3	YRM2M006BT3	YRM-2(13)-M-5A-BT3
10 A	YRD2M010BT3	YRD-2(13)-M-10 A-BT3	YRM2M010BT3	YRM-2(13)-M-10A-BT3
15 A	YRD2M015BT3	YRD-2(13)-M-15 A-BT3	YRM2M015BT3	YRM-2(13)-M-15A-BT3
16 A	YRD2M016BT3	YRD-2(13)-M-16 A-BT3	YRM2M016BT3	YRM-2(13)-M-16A-BT3
20 A	YRD2M020BT3	YRD-2(13)-M-20 A-BT3	YRM2M020BT3	YRM-2(13)-M-20A-BT3
25 A	YRD2M025BT3	YRD-2(13)-M-25 A-BT3	YRM2M025BT3	YRM-2(13)-M-25A-BT3
30 A	YRD2M030BT3	YRD-2(13)-M-30 A-BT3	YRM2M030BT3	YRM-2(13)-M-30A-BT3
32 A	YRD2M032BT3	YRD-2(13)-M-32A-BT3	YRM2M032BT3	YRM-2(13)-M-32A-BT3
35 A	YRD2M035BT3	YRD-2(13)-M-35A-BT3	YRM2M032BT3	YRM-2(13)-M-35A-BT3
40 A	YRD2M040BT3	YRD-2(13)-M-40A-BT3	YRM2M040BT3	YRM-2(13)-M-40A-BT3
45 A	YRD2M045BT3	YRD-2(13)-M-45A-BT3	YRM2M045BT3	YRM-2(13)-M-45A-BT3
50 A	YRD2M050BT3	YRD-2(13)-M-50A-BT3	YRM2M050BT3	YRM-2(13)-M-50A-BT3

Note:

The “M” after the number in the BOM number i.e. YRD2M0A5080 represents the time delay tripping curves

If a different curve is required please replace the “M” with the appropriate time delay curve

YR-Frame - Circuit Breakers for Railways

Possible Connection Diagrams

Figure 1: Single Pole, Single Break (80 Vdc, 150 Vdc Unpolarised)

This circuit makes use of a single pole circuit breaker connected in series with the load.

Figure 2: Double Pole, Double Break. Isolates load 80 Vdc, 150 Vdc (Unpolarised) and 220 Vdc series, 300 Vdc (Polarised)

This circuit makes use of a double pole circuit breaker where the load is between the contacts, providing full isolation to the load.

Figure 3: Double Pole, Double Break. Isolates load 300 Vdc, 400 Vdc, 600 Vdc

This circuit makes use of a double pole circuit breaker where the load is between the contacts, providing full isolation to the load.

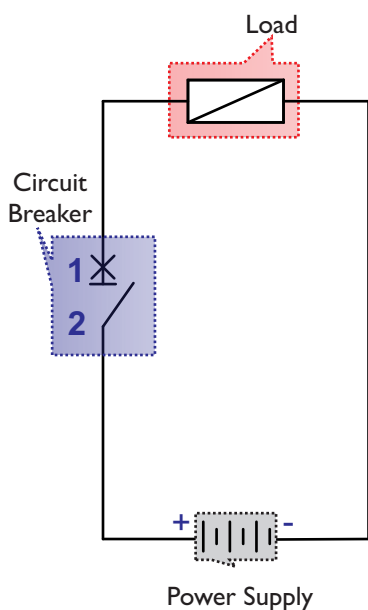


Figure 1:
Single Pole, Single Break
(80 Vdc, 150 Vdc Unpolarised)

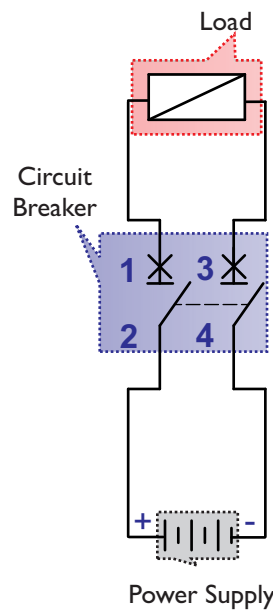


Figure 2:
Double Pole, Double Break.
Isolates Load
80 Vdc, 150 Vdc (Unpolarised)
and 220 Vdc, 300 Vdc (Polarised)

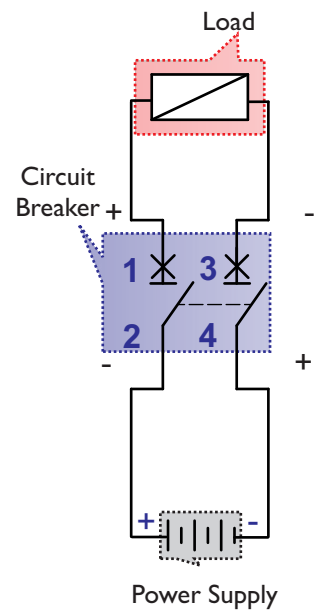


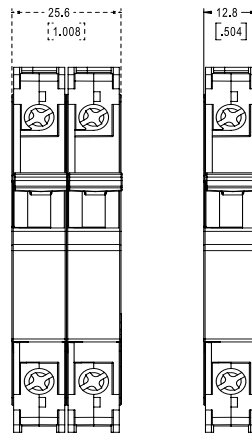
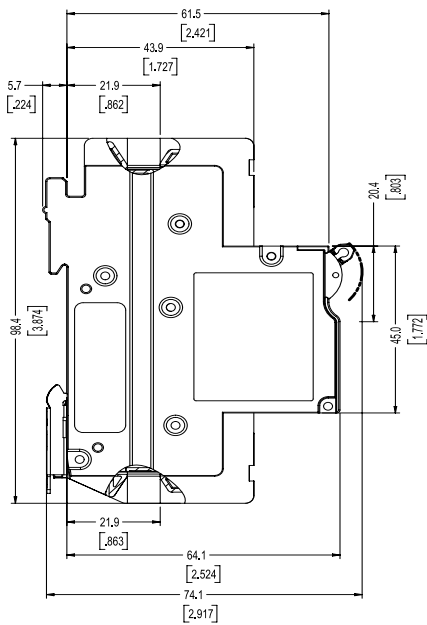
Figure 3:
Double Pole, Double Break
Isolates Load
(300 Vdc, 400 Vdc, 600 Vdc)
(300 Vdc / Pole) (Polarised)

Notes:

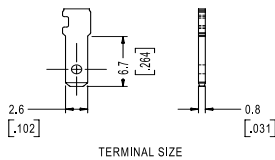
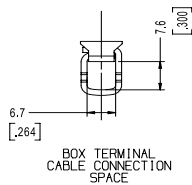
1. Unpolarised products are rated at 80 Vdc, 150 Vdc per pole, and will function at voltages below rated voltage
2. Polarised products are rated at 220 Vdc, 300 Vdc per pole
3. Other types of connections are possible
4. Verify for the specific application and ensure compliance

YR-Frame - Circuit Breakers for Railways

Outline Dimensions: DIN Mount 45 mm (YRD) Front Escutcheon (Grey)

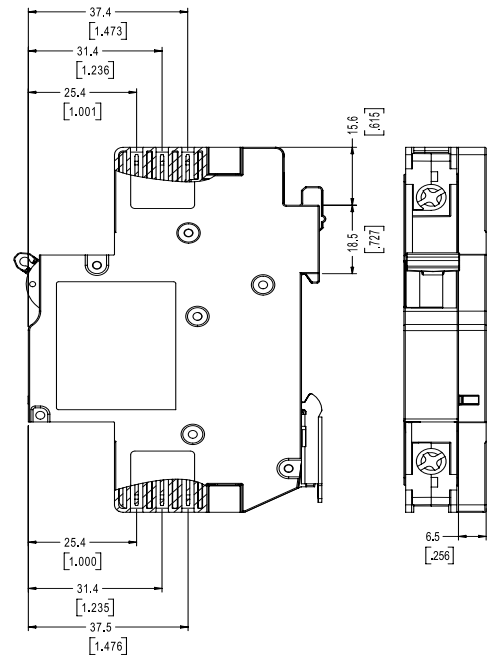


TOLERANCE ± 0.4 UNLESS OTHERWISE SPECIFIED
(DIMENSIONS IN BRACKETS ARE IN INCH)



TERMINAL CONNECTIONS:
NORMALLY OPEN (NO) : 18-15
NORMALLY CLOSED (NC) : 16-15

TERMINAL ARRANGEMENT FOR
BREAKER IN OFF POSITION

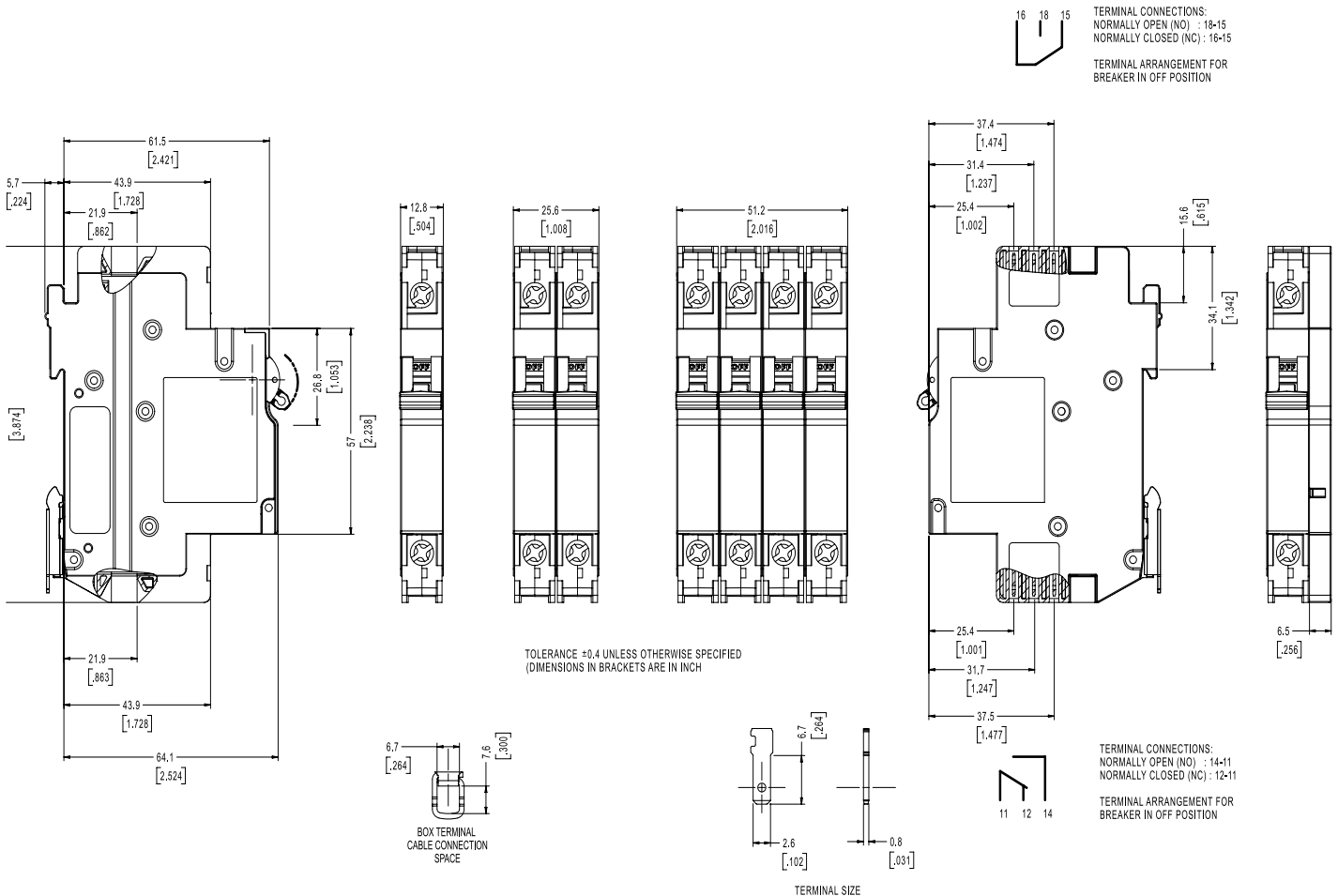


TERMINAL CONNECTIONS:
NORMALLY OPEN (NO) : 14-11
NORMALLY CLOSED (NC) : 12-11

TERMINAL ARRANGEMENT FOR
BREAKER IN OFF POSITION

YR-Frame - Circuit Breakers for Railways

Outline Dimensions: DIN Mount 57 mm (YRM) front Escutcheon (Black)



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EUROPEAN HEADQUARTER

Emcomp International AB
Tomtagatan 17
702 32, Örebro, Sweden
Tel: +46 (0)581 62 15 50
Fax: +46 (0)581 62 15 60
Email: info@emcomp.se
Website: www.emcomp.se

GERMANY OFFICE

Emcomp International AB
Gewerbepark 23
85250 Altomünster Germany
Tel: +49 8254 994 334 10
Fax: +49 8254 994 334 19
Email: info@emcomp.se
Website: www.emcomp.de