Technical bulletin

2C80
Current Check Relay

Features

- 10:1 PU setting ranges
  Select from two options:
  5 - 50% or 20 - 200% of nominal input current
- 1A or 5A nominal CT's
- Fast O/C pick up time <20ms
- Fast O/C reset time <15ms
- <5% transient over-reach
- Zero DC auxiliary burden until external initiate signal applied
- 3 x Single phase initiate inputs
- 2 N/O output contacts per phase with selectable time delay / instantaneous configuration possible
- Magnetic flag trip indication with local & remote reset
- External timer initiate output or internal timer initiate input
- Very low AC burden
- 0-510ms delay in 2ms steps & 0-2,040ms delay in 8ms steps
- Range of auxiliary supplies
- Size 4M draw out case

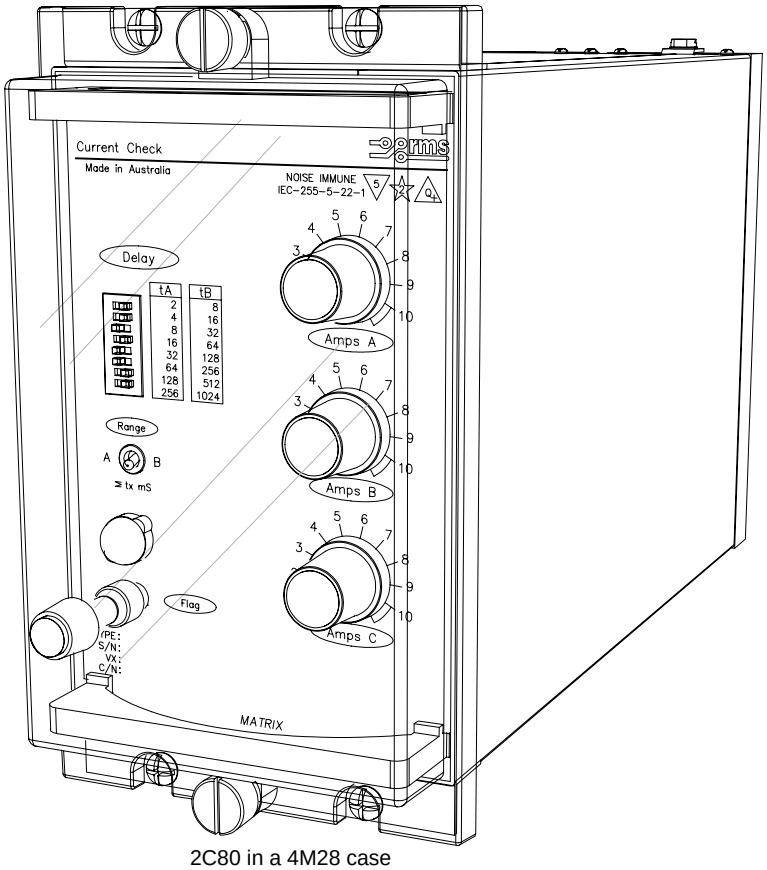
Application

The 2C80 Series relays are adjustable AC current sensing relays for application in breaker fail protection schemes. The 2C80 is particularly suitable for breaker fail schemes where single/three pole breaker tripping is possible, since control of the current detector is provided on a per phase basis.

The 2C80 current check relay detects the circuit breaker failure to trip & to ensure discrimination has a fast reset time & minimum overshoot time.

Each current level detector initiates a time delay, set by the user, which delays operation of the output contacts.

Definite time overcurrent relays offer advantages over inverse time protection in power systems which have a wide variation in source impedance. Faults can be cleared in relatively short times irrespective of the magnitude of the fault current, & coordination of several relays in a system can be obtained at all times regardless of fault current variation.



2C80 in a 4M28 case

Operation

Made in Australia

Each pole of the 2C80 is phase segregated & operates independently via its current level detector. Inputs from the line current transformers are connected to the primary of an internal interposing current transformer. The 2C80 is enabled by application of the DC auxiliary supply on either a per phase basis or via the three phase tripping input.

The internal time delay element is initiated when either the current exceeds the user selectable setting or when the internal timer initiate input is energized. The output contact(s) corresponding to the phase initiate input is operated after the user selectable time delay.

If desired the 2C80 can be specified without the time delay element & the external timer initiate output used to operate an external time delay element.

The standard output contact configuration is 2 N/O contacts per phase. It is also possible to configure 1 N/O contact for each phase to operate instantaneously while the others conform to the pre-set time delay. This is achieved through customer configurable internal jumper links.

It should be noted that the 2C80 relay has been designed specifically to provide a zero DC auxiliary burden. The relay is not suitable for use in applications where the DC auxiliary is continuously applied or where the output contacts are to be energized continuously. For these applications the RMS 2C63 which incorporates a switchmode power supply should be employed.

Breakers can fail to clear a fault for several reasons:

- The trip circuit can be open due to a broken wire, blown fuse or open trip coil
- The interrupting mechanism can stick, leaving a single phase of a three phase circuit connected
- The interrupter can flash-over due to loss of dielectric strength through contamination or damage
- The operating mechanism can fail to operate

The purpose of the CB fail relay is to detect this condition & initiate contingency or backup procedures.

Operating Logic

INTERNAL TIMER INITIATION
Where the integral timer is specified it may be initiated in two ways:
- When the current exceeds the user selectable setting
- When the internal timer initiate input is energized

The input voltage required to initiate the internal timer is always the same as the nominated auxiliary supply.

EXTERNAL TIMER INITIATION
Where the integral timer is not specified an external timer initiate output is provided. The nominated auxiliary supply voltage is output to these terminals when the current exceeds the user selectable setting.

TIME DELAY RANGES

Low range:	0 - 510ms	in 2ms steps
High range:	0 – 2,040ms	in 8ms steps
Accuracy:	± 2% or ±1ms whichever is greater	

The total operating time is a combination of the typical minimum operate time of 10ms plus the selected time delay setting.

MIXED INSTANTANEOUS / TIME DELAYED OUTPUTS
Internal jumpers are accessible to configure 1 N/O contact per phase to operate instantaneously while the other N/O contact conforms to the pre-set time delay. Refer to the wiring diagram for details. Factory default is time delayed on all outputs & phases.

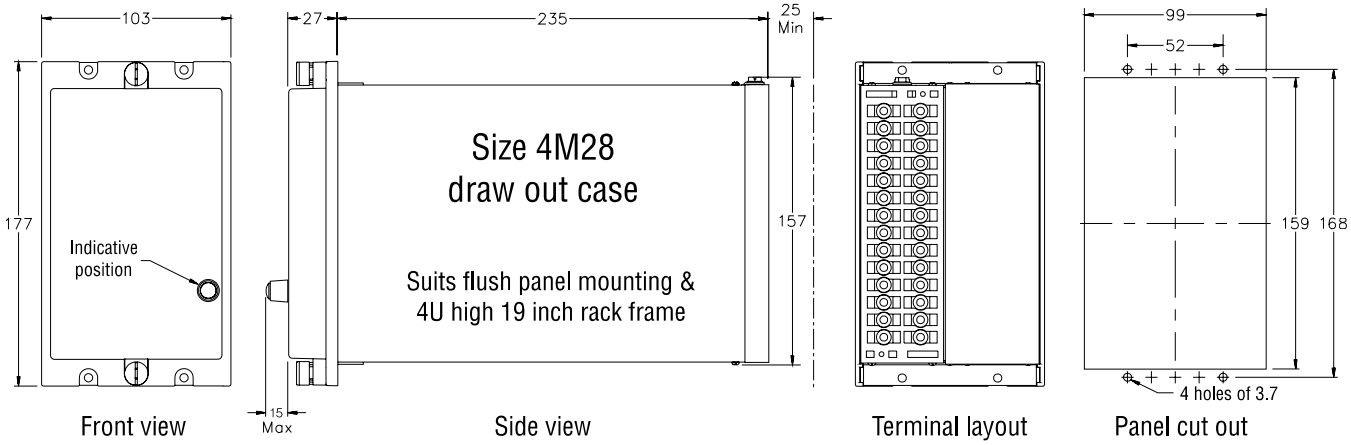
OUTPUT CONTACTS
2 N/O per phase
Other configurations available upon request.

OUTPUT CONTACT RATINGS

Make & carry
30A AC or DC (Limits L/R=40ms & 300V max.) for 0.2s
20A AC or DC (Limits L/R=40ms & 300V max.) for 0.5s
5A AC or DC continuously

Break (Limits 5A & 300V max.)
1,250VA AC resistive
250VA at 0.4PF AC inductive
75W DC resistive
30W DC inductive L/R = 40ms
50W DC inductive L/R = 10ms

Minimum recommended load
0.5W, 10mA or 5V minimum.



Technical Data

AUXILIARY SUPPLY
Select from the following nominal supply voltage:
32V DC, 48V DC, 110V DC, or 125V DC
Operating range: -25 to +20%
Burden at 110V DC nominal supply:
Less than 8 watts during timing.
Less than 10 watts with output relays energized.

THERMAL RATING
Sustained application of the DC auxiliary will cause the internal power supply dropping resistors to heat with possible damage to the relay resulting. This is particularly the case with 250V DC versions & where all three-phase inputs are energized. The times shown in the following thermal rating table should not be exceeded:

	Maximum Continuous DC Application Time Minutes		
DC Auxiliary Voltage	One phase energized	Two phases energized	Three phases energized
32	80	65	50
48	60	50	40
110 / 125	30	25	20

FLAG AUXILIARY SUPPLY
When a flag trip indication is specified in the Ordering Information section, the 2C80 requires a separate auxiliary for the flag set and reset to function. This auxiliary is low burden & must be continuously applied to the flag auxiliary input.

DROPOUT PICKUP RATIO
85% approximately.

OPERATING TIME OF INSTANTANEOUS ELEMENT
At 2 X Setting: Less than 20ms (Typically 15ms) on pick up.
Drop out less than 15 ms

CURRENT MEASURING ACCURACY
Repeat: ±2% of setting
Setting: ±5% of maximum setting

INSULATION WITHSTAND in accordance with IEC 255-5:
2KV RMS & 1.2/50 5KV impulse between:
- all input terminals & frame
- all output terminals & frame
- all input & output terminals
- each input group
- each output group

NOISE IMMUNITY
Withstands the high frequency interference test detailed in IEC 255-22-1.

CT INPUT BURDENS
Auxiliary supply: (at 110V DC nominal supply)
Less than 2.5 watts when dropped out.
Less than 3.5 watts with output relays energized.
Sensing circuits: VA per phase all settings.

I amps	1A CT input	5A CT input
1	1.25	0.01
5	6	0.18
10	25	0.70
20	100	2.9
25	-	4.5
30	-	6.5

CT INPUT THERMAL WITHSTAND (Per phase)

	1A CT	5A CT *
Continuous	3.5	25
4.5s	39	250
3s	75	450
2s	90	550
1s	120	800
0.5s	180	1,000

Note: * M Series case terminals & CT shorting switches are limited to 400A for 1s.

AMBIENT OPERATING TEMPERATURE RANGE
-5 to 55 degrees C.
Deviation of time delay: ± 5% max. over this range

HUMIDITY
40 degrees C & 95% RH non condensing

CASE
Size 4 draw out
28 M4 screw terminals
Flush panel mount or 4U high 1/4 width 19 inch rack mount
IP51 rating

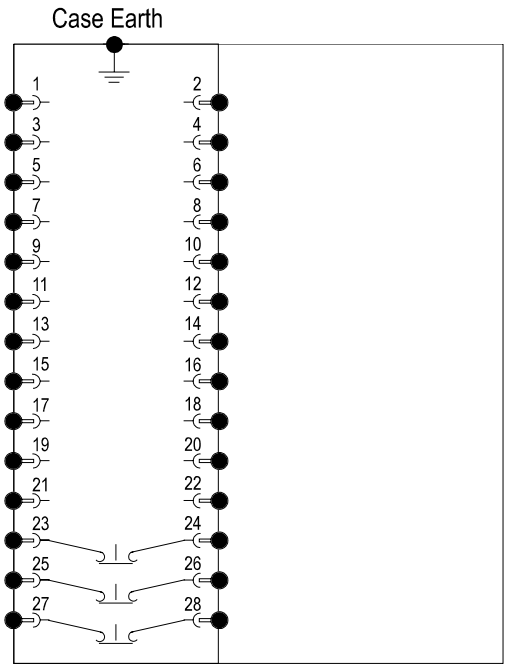
SHIPPING DETAILS
Each relay is supplied individually packed in pre formed cardboard cartons with internal moulded polystyrene former.

Weight: 3.5Kg

Size: 370(L) x 240(W) x 145(D)mm - Size 4 case

For large shipment individual cartons are packed in sturdy cardboard pallet boxes & surrounded by loose fill to absorb vibration & shock during transit.

ACCESSORIES SUPPLIED WITH EACH RELAY
1 x M4 self threading mounting screw kit P/N 290-406-151
2 x M4 terminal screw kit (28 per kit) P/N 290-407-153



4M28 Case terminations (REAR VIEW)

Ordering Information

Generate the required ordering code as follows: e.g. 2C80 CAABA

2C80 [1] [2] [3] [4] [5]

1 AUXILIARY SUPPLY (-25% to + 20%)

A	32V DC	B	48V DC
C	110V DC	D	125V DC
E	250V DC		

2 CURRENT SETTING (% of nominal)

A	5-50%	B	20-200%

3 CT RATING (Nominal)

A	1A	B	5A

4 INTEGRAL TIME DELAY

A Not required - External timer initiate output provided (All output contacts instantaneous)

B Required - Internal timer initiate input provided

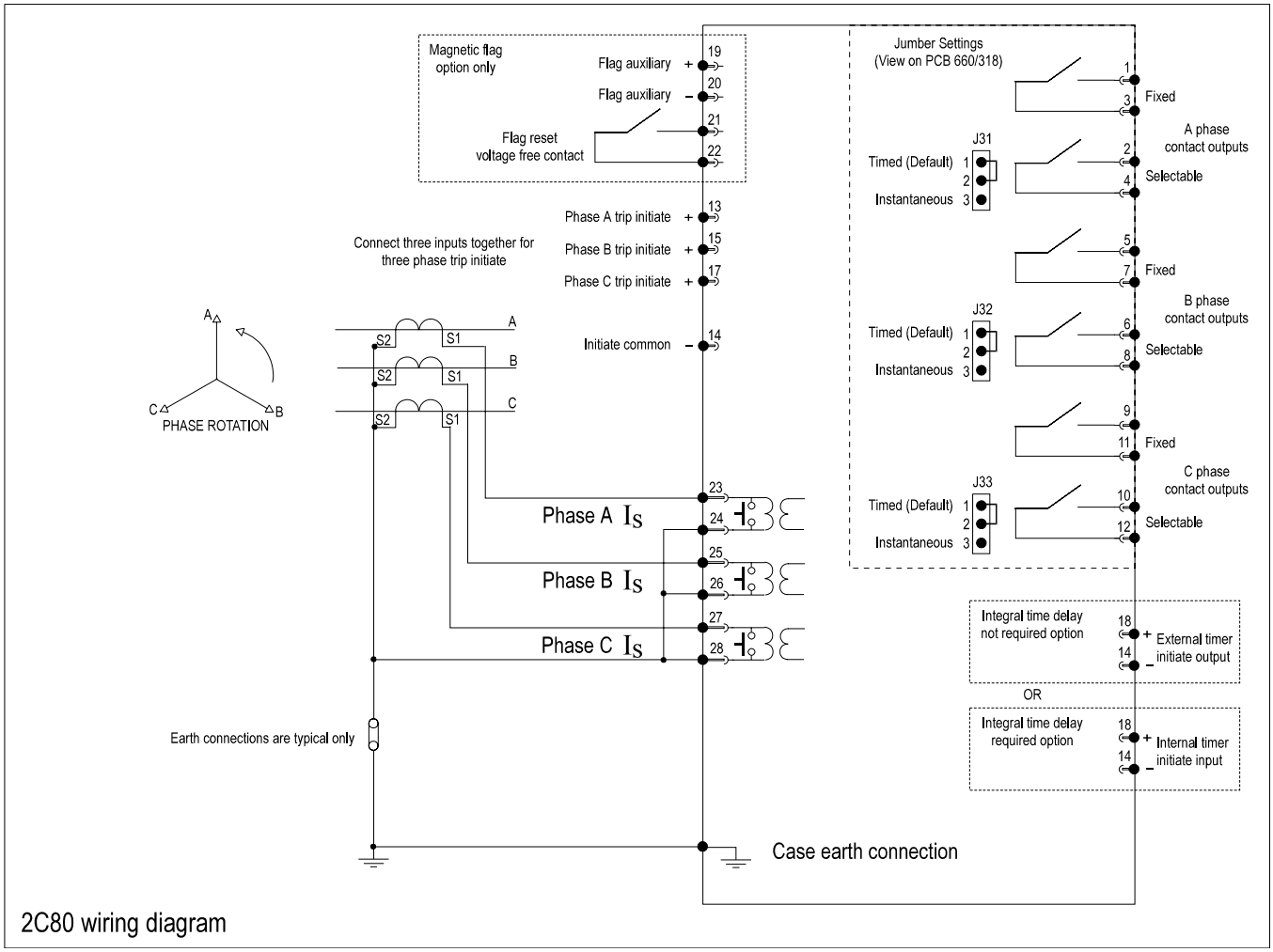
5 MAGNETIC FLAG TRIP INDICATION

A Not required

B Required - 24 to 150V DC auxiliary

C Required - 140 to 300V DC auxiliary

Other special options are available such as different time ranges, wider auxiliary voltages & output contact configurations. Refer to a sales office or the factory for details.



2C80 wiring diagram

Australian Content

Unless otherwise stated the product(s) quoted are manufactured by RMS at our production facility in Melbourne Australia. Approximately 60% of our sales volume is derived from equipment manufactured in house with a local content close to 90%. Imported components such as semi-conductors are sourced from local suppliers & preference is given for reasonable stock holding to support our build requirements.

Quality Assurance

RMS holds NCSI (NATA Certification Services International), registration number 6869 for the certification of a quality assurance system to AS/NZS ISO9001-2000. Quality plans for all products involve 100% inspection and testing carried out before despatch. Further details on specific test plans, quality policy & procedures may be found in section A4 of the RMS product catalogue.

Product Packaging

Protection relays are supplied in secure individual packing cardboard boxes with moulded styrene inserts suitable for recycling. Each product & packing box is labeled with the product part number, customer name & order details.

Design References

The products & components produced by RMS are based on many years of field experience since Relays Pty Ltd was formed in 1955. A large population of equipment is in service throughout Australia, New Zealand, South Africa & South East Asia attesting to this fact. Specific product & customer reference sites may be provided on application.

Product Warranty

All utility grade protection & auxiliary relay products, unless otherwise stated, are warranted for a period of 24 months from shipment for materials & labour on a return to factory basis. Repair of products damaged through poor application or circumstances outside the product ratings will be carried out at the customer's expense.

Standard Conditions of Sale

Unless otherwise agreed RMS Standard Terms & Conditions (QF 907) shall apply to all sales. These are available on request or from our web site.

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