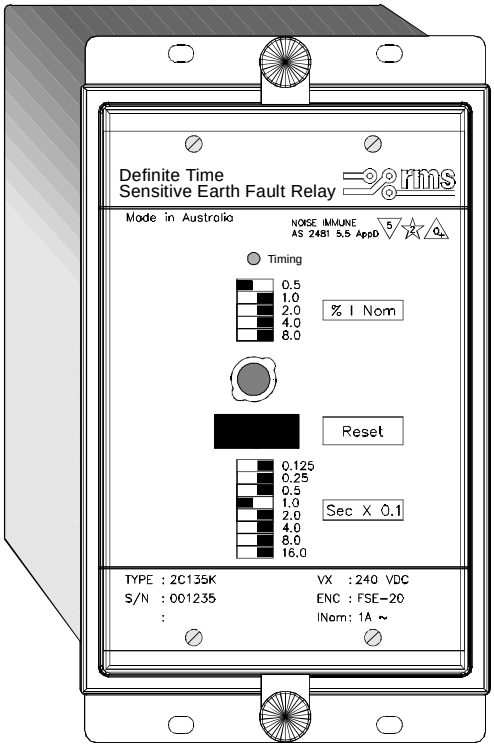
Technical bulletin

2C135

Sensitive Earth Fault Relay

Features

- High sensitivity
- 3rd harmonic & HF noise suppression
- High reset / operate ratio
- Extremely low burden
- 0-31s definite time delay
- Optional 1 or 5A CT input
- Tuned to 50 Hz
- Hand reset magnetic disc flag (Permanent memory)
- Timing LED indication
- Optional inhibit input
- Optional instantaneous output
- Range of auxiliary supplies
- Wide range of case styles
- Made in Australia



2C135 in size 4 rack mount case

Application

The main earth fault protection relays in distributions systems, power stations & large manufacturing / processing plants can fail to detect a high impedance breakdown to earth causing hazard to human life & potential damage to plant & equipment. In these & other situations demanding extra sensitive earth fault protection, the 2C135 relay using solid state techniques, can be applied to detect earth currents down to 0.5% of the CT nominal current.

The relay is tuned to reject 3rd & higher harmonic frequencies to avoid problems under quiescent conditions. An adjustable time delay is built in to provide stability during switching & other transient disturbances & to allow adequate grading with other protection systems at high fault current levels.

The relay can be connected in the residual circuit of three line current transformers, or to a neutral, or core balanced CT.

A block diagram of the relay is shown below:

Operation

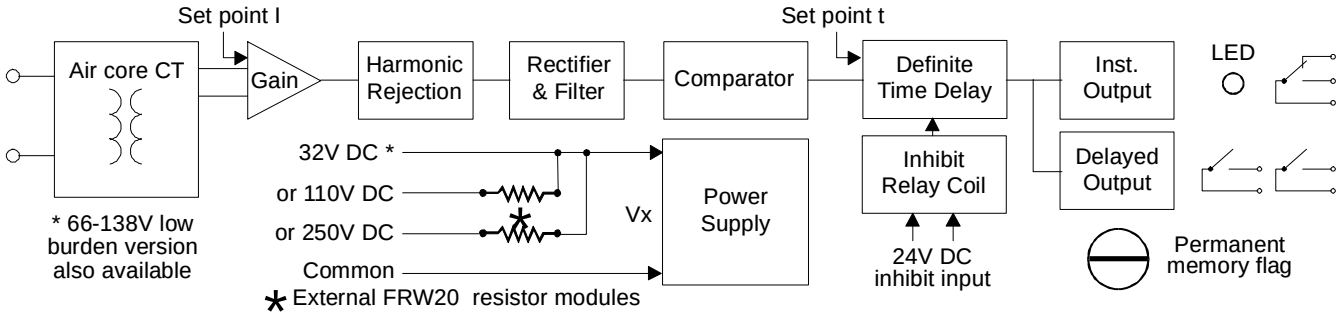
Made in Australia

The 2C135 type relay provides sensitive earth fault protection with a high degree of accuracy over a wide range of input current settings & offers the high sensitivity & harmonic suppression required for this application. Power for the electronic circuitry is derived from the auxiliary supply via a simple & effective regulator. The harmonic suppression feature combined with high frequency noise immunity minimise any possibility of malfunction.

The 2C135 also offers an adjustable time delay, to manage situations where high impedance faults develop slowly, ensuring the main protection operates on high fault currents. An instantaneous output contact may also be specified.

Current & time settings are fully adjustable using DIL switches readily accessible on the front panel of the relay & provide a high level of repeatability & accuracy. Visual indication of an output relay operation is provided by a bistable magnetic disc flag also located on the front panel.

Two alternative power supply designs are available. The 1st provides for multi voltage (30, 125 & 250V DC) inputs based on external mounted FRW20 resistor modules to drop the Vx input to 30V DC nominal. The 2nd type provides the advantage of reduced auxiliary supply burden for 125V DC operation or over the range 66 to 138V DC where the instantaneous contact is not required. The 2C135 can be built as a chassis only to retrofit into the GEC 1D case.



Technical Data

AUXILIARY SUPPLY BURDEN (At 110V DC)
55mA typical independent of range with output relay picked up
Check with factory as burden may vary depending on type.

AC CURRENT
Sensing Range: 0.5-15.5% of 5A (25-775mA).
Dropout/Pickup Ratio: 90% nom**.**

CURRENT SETTING ACCURACY
+/-5% of setting +/-0.05% of nom.

INPUT CT THERMAL RATINGS
20X nominal for 3 seconds
2X nominal continuous

OPERATE TIME
Timer set to zero: 30ms approx. at 10X setting.

RELEASE TIME
Independent of timer setting: <30ms at 10X setting.

TIMER SETTING
Range: Instantaneous (30ms) to 31s.
Accuracy: +/-5% of setting +/- 0.5s.

OUTPUT RELAY OPERATION INDICATOR
Delayed: Hand resettable magnetic disc (permanent memory).
Inst: LED indication.

HARMONIC REJECTION
>20X setting for frequencies 100 Hz & above.

RMS 30R TYPE RELAY CONTACT RATINGS (Delay contacts)

Make & Carry Continuously
3,000 VA AC resistive with maximums of 660V & 12A
3,000 VA DC resistive with maximums of 660V & 12A

Make & Carry for 0.5 Seconds
7,500 VA AC resistive with maximums of 660V & 30A
7,500 VA DC resistive with maximums of 660V & 30A

AC Break Capacity
3,000 VA AC resistive with maximums of 660V & 12A

DC Break Capacity (Amps)

Voltage			**24V**	**48V**	**125V**	**250V**
Resistive rating		**a**	12	1.5	0.5	0.25
		b	12	12	10	5
L/R=40ms	Maximum break *	**a**	12	1	0.4	0.2
		b	30	15	5.5	3.5
	1K operations (N3 Rating)	**b**	12	12	5	2.5

a = Without magnetic blowouts b = With magnetic blowouts
* As tested by Powernet Yarraville laboratories in Victoria.

IDEC RH TYPE RELAY CONTACT RATINGS (Inst. contacts)

Make & Carry Continuously
1,700 VA AC resistive with maximums of 380V & 8A
1,700 VA DC resistive with maximums of 250V & 8A

Make & Carry for 0.5 Seconds
2,500 VA AC resistive with maximums of 380V & 12A
2,500 VA DC resistive with maximums of 250V & 12A

AC Break Capacity
1,700 VA AC resistive with maximums of 380V & 8A

DC Break Capacity (Amps)

Voltage		**24V**	**48V**	**125V**	**250V**
Resistive rating		8	1	0.4	0.2
L/R=40ms	1,000 (N3) operations	8	0.3	.01	0.05

AMBIENT OPERATING TEMPERATURE RANGE
-5 to 55 degrees C.

INSULATION WITHSTAND
In accordance with AS2481-1981 (clause 5-4), IEC 255-5:
2KV RMS between input & frame, output & frame, & output & input.
1.2/50 5KV impulse between each terminal & earth, between circuits not normally connected together & between terminals of the same circuit.

NOISE IMMUNITY
Withstands the high frequency interference test detailed in AS2481-1981 (clause 5-5 App. D), IEC 255-22-1.

2C135 Options

Check the appropriate box under each section to accurately specify the relay configuration required & return with request for quotation:

2C135 Type Number if known: **K____**

AUXILIARY SUPPLY (85-110% of nominal)
☐ Multi voltage unit 30, 125 & 250V DC * Vx= _____ V DC
☐ 125V DC
☐ 66 to 132V DC (Inst. contacts not available)
☐ Other _____
* External mounting FRW20 resistor modules supplied to suit specified Vx. Refer FRW20 data sheet for details.

CT INPUT RATING
☐ 1 Amp
☐ 5 Amp

INHIBIT INPUT
☐ Apply 24V DC voltage to inhibit operation *
☐ Not required

DELAYED OUTPUT RELAY (Direct tripping duty)
☐ 30R type 2 N/O contacts
☐ 30R type 2 C/O contacts

INSTANTANEOUS OUTPUT RELAY
☐ Idec RH type 1 C/O contact
☐ Not required

ENCLOSURE STYLE (Refer Part B Section 6 for details)
☐ Size 4E Case for rack mounting (4u high, 1/4 width)
☐ Size FSD Case for flush mounting in vertical format
☐ Size FSD Case for flush mounting in horizontal format
☐ Module only to suit GEC 1D case
☐ FSB flush mounting case

CONNECTION TERMINALS
☐ 2BA studs
☐ 2BA screws

SPECIAL CUSTOMER LABELLING (* SPECIFY ANY 2)
☐ Not Required (Standard labelling)
☐ * Type No. _____
☐ * Order No. _____
☐ * Name: _____
☐ * Other: _____

OTHER REQUIREMENTS

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