EARTH LEAKAGE PROTECTION

el3

EARTH LEAKAGE RELAY

NEXT-GENERATION EARTH LEAKAGE PROTECTION FOR VVVF DRIVES AND FIXED-SPEED CIRCUITS

The el3 Earth Leakage Relay delivers next-generation protection for VVVF drives and fixed-speed circuits.

Designed and engineered in Australia, the el3 uses advanced microprocessor technology to provide precise, reliable earth-leakage monitoring in demanding mining and industrial environments.

The el3 is compliant with AS2081:2011 and is fully compatible with Flyshtec ELT3 (1000T) toroids.



FIG. 1 — EL3 RELAY, FRONT VIEW

EARTH LEAKAGE RANGE **30 mA – 20 A**	TRIP DELAY **50 ms – 20 s**
OUTPUT CONTACTS **2 × C/O, 5 A**	SUPPLY OPTIONS **24 – 48 / 110 – 240 V**

AS2081:2011 COMPLIANT | ISO 9001 MANUFACTURED | AUSTRALIAN DESIGNED & SUPPORTED

KEY FEATURES

01 16-bit microprocessor core for precise, stable measurement

02 Frequency range 50 – 60 Hz (VSD mode off) or 5 – 100 Hz (VSD mode on)

03 Failsafe / non-failsafe operation, switch selectable

04 Latch / no-latch operation, switch selectable

05 EL toroid open-circuit monitoring

06 Adjustable trip current and trip delay time

07 Local or external latch reset

08 Separate control contacts and analogue output — 4 – 20 mA or 2 – 10 V

KEY BENEFITS

HIGH ELECTRICAL IMMUNITY

Stable operation on VVVF-driven and electrically noisy circuits.

ADVANCED FAULT DETECTION

Microprocessor measurement with toroid open-circuit supervision.

FAST INSTALLATION & SETUP

Front panel DIP configuration, trip level and time dials, and a test function.

TOROID COMPATIBILITY

Suits limited and unlimited neutral systems with the Flyshtec ELT3 (1000T) toroid.

APPLICATIONS

VSD	MMS	EC	P&F	S/P	C/F
VVVF & VSD circuits	Mining motor starters	Electrical cabinets	Pumps & fans	Surface & process equipment	Conveyor & feeder systems

TERMINAL LAYOUT & FRONT PANEL

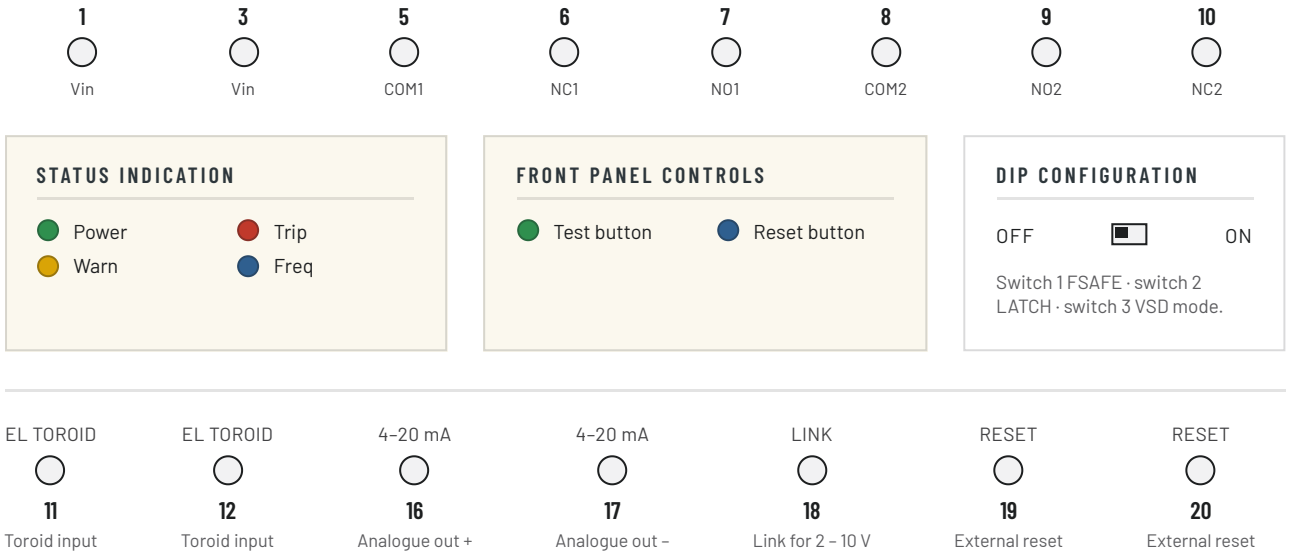


FIG. 2 — EL3 TERMINAL DESIGNATIONS AND FRONT-PANEL INDICATION

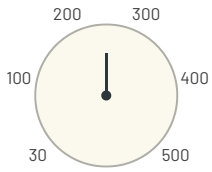
INDICATION

Power	Supply present — flashes on open-circuit toroid
Trip	Earth leakage trip, output relays operated
Warn	Leakage approaching the set trip level
Freq	VSD mode active, 5 – 100 Hz frequency response
Test	Front panel test of the protection function
Reset	Latch reset, front panel or external (terminals 19 – 20)

CONTROL SETTINGS

TRIP LEVEL

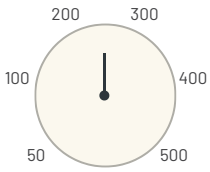
30 – 500 mA on this variant



Milliamps

TRIP TIME

50 – 500 ms on this variant



Milliseconds

Failsafe / latch	Failsafe and latch on fault selected on the front panel DIP switches
VSD mode	Off — 50 to 60 Hz response; on — 5 to 100 Hz response
Analogue output	4 – 20 mA, or 2 – 10 V with terminal 18 linked

INSTALLATION NOTES

01 Earth leakage sensing requires an Flyshtec ELT3 (1000T) toroid; the toroid is not supplied with the relay.

02 Toroid connections to be made in screened cable, earthed at one end only.

03 All connections must comply with the requirements of AS2081.

04 All contacts are shown in the de-energised (relay healthy) condition.

05 Wider current and time ranges are available — contact Flyshtec for the range required.

TERMINAL FUNCTIONS

NO.	TERMINAL	FUNCTION
1	**Vin**	AC/DC supply
3	**Vin**	AC/DC supply
5	**COM1**	Common, relay 1
6	**NC1**	Normally closed, relay 1
7	**NO1**	Normally open, relay 1
8	**COM2**	Common, relay 2
9	**NO2**	Normally open, relay 2
10	**NC2**	Normally closed, relay 2
11	**EL toroid**	Earth leakage toroid input
12	**EL toroid**	Earth leakage toroid input
16	**4 – 20 mA**	Analogue output, positive
17	**4 – 20 mA**	Analogue output, negative
18	**Link**	Link for 2 – 10 V output
19	**Reset**	External reset switch
20	**Reset**	External reset switch

DIMENSIONS & ENCLOSURE

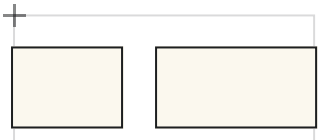


FIG. 3 — ENCLOSURE, FRONT & SIDE ELEVATION (55 MM HIGH)

Dimensions	75 mm (W) × 55 mm (H) × 110 mm (D)
Material	High-impact resistant polycarbonate
Protection	IP20
Mounting	DIN rail
Terminals	Cage screw terminals
Weight	216 g

SPECIFICATIONS

SUPPLY

MODEL	MIN	TYP	MAX	UNIT
A01312	90	110	120	V AC
A01313	20	24	50	V AC/DC

Power consumption	3 VA ± 20%
Operating temperature	0 – 60 °C
Earth leakage current	30 mA – 20 A (range as ordered)
Trip delay time	50 ms – 20 s (range as ordered)
Frequency response	50 – 60 Hz, or 5 – 100 Hz in VSD mode
Analogue output	4 – 20 mA or 2 – 10 V
Relay contacts	2 × changeover, 5 A at 250 V AC (general), 5 A at 30 V DC (resistive), 100 VA max
Toroid	Flyshtec ELT3 (1000T), open-circuit monitored

ORDERING INFORMATION

PART NO.	DESCRIPTION
A01312	el3 relay — 110 – 240 V AC
A01313	el3 relay — 24 – 48 V AC/DC

Supplied with: Relay unit, instruction sheet and wiring diagram. EL toroid ordered separately.

STANDARDS & COMPLIANCE

AS2081:2011 — Electrical equipment for mines and quarries

ISO 9001 — Designed and manufactured under a certified quality system

RoHS — Compliant

RCM E200379

FLYSHTEC

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+61 435 939 513
info@flyshtec.com.au
www.flyshtec.com.au

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0468 344 220
richard@dejongindustrialsystems.com.au
www.dejongindustrialsystems.com.au