EFL-IS – I.S. EFLO & FC PROTECTION RELAY

IECEx TRA 15.0011X, Compliant with AS/NZS 2081:2011, Sections 7 & 9

Application

The Ampcontrol EFL-IS relay is IECEx Ex ia certified and is compliant to AS/NZS 2081:2011 sections 7 & 9. It has been designed for installation on mining outlets supplying hazardous area equipment that require earth fault lockout and frozen contact protection. The EFL-IS is capable of being installed on a wide range of system voltages from 110V up to 1.1kV. In addition to EFLO and FC protection, the EFL-IS also offers a selectable undervoltage protection function.

Features

- AS/NZS 2081:2011* compliant
- IECEx Ex ia I Ma certification (U_m 132V_{rms} withdrawn)
- Earth Fault Lock-out (EFLO) protection
- Frozen Contact (FC) protection
- Selectable Undervoltage (UV) protection
- Selectable Back EMF Timer
- Compatible with a wide range of system voltages

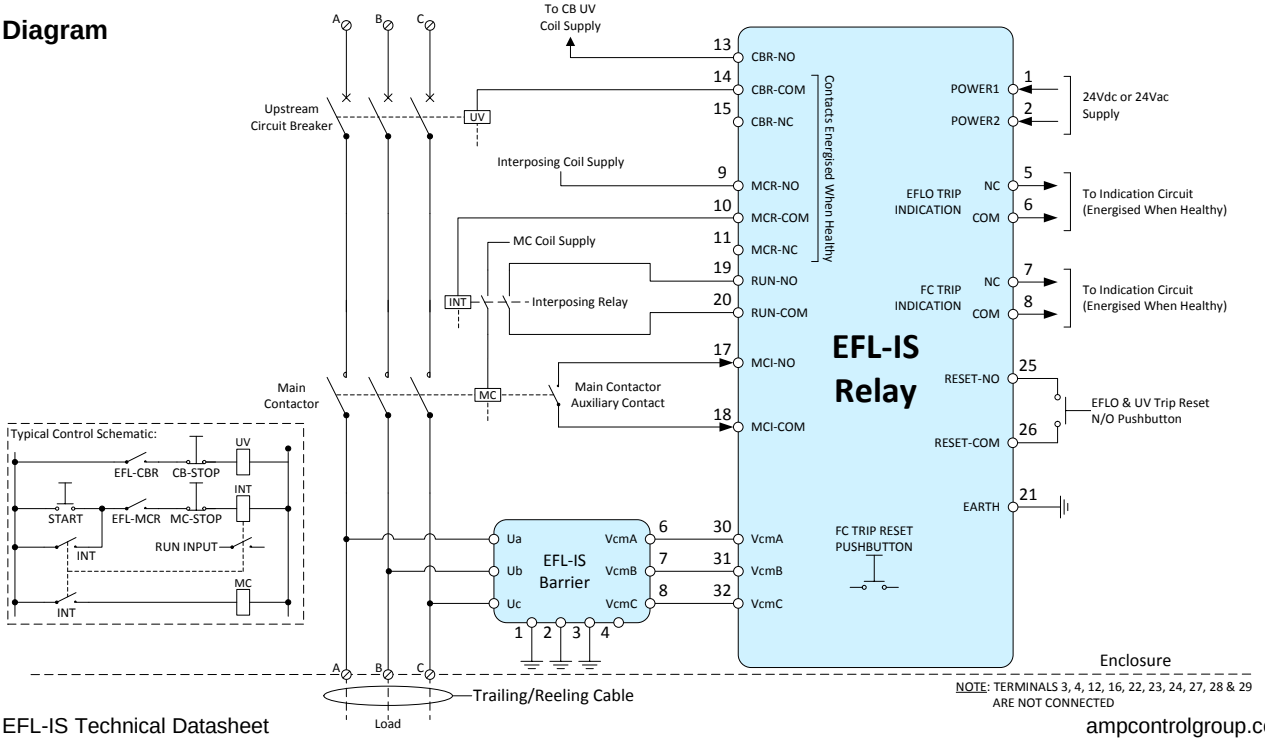
Description

While the outlet's main contactor is open, the EFL-IS relay will use an intrinsically safe signal to continually monitor the resistance of the outlet's phase conductors to earth. If this resistance falls below an acceptable level the EFL-IS relay will initiate an EFLO trip, preventing the outlet from being started.

The EFL-IS relay will also monitor the state of the outlet's main contactor. If voltage appears on the line when the contactor is open, a Frozen Contact electrical trip will occur. This FC output relay is intended to be used to open the upstream circuit breaker. If the main contactor is either open when it should be closed or closed when it should be open a Frozen Contact logical trip will occur, initiating an upstream circuit breaker trip. A Back EMF timer is also provided to inhibit the frozen contact electrical trip function for a short period after the main contactor is open.

The EFL-IS relay also has an undervoltage protection function which, if activated, will open the main contactor if the outlet voltage falls below 50% of the selected system voltage.

Diagram



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Specifications			
Supply Voltage			
Regulated Voltage	24Vdc ± 20% or, 24Vac ± 20%, 50Hz		
Power Consumption	< 5W		
System Voltage			
1.1kV Barrier (174623)	110V to 1.1kV		
Certification			
IECEx	IECEx TRA 15.0011X IEC 60079-0:2011 Edition:6.0 IEC 60079-11:2011 Edition:6.0		
EFL-IS Relay Marking	Ex ia I Ma (U_m 132V_{rms} withdrawn)		
EFL-IS Barrier Marking	[Ex ia] I Ma (U_m 832V_{rms} withdrawn)		
EFL Tripping Thresholds			
3PH Load Disconnected	Trip by 3MΩ (Refer to Section 6.2)		
3PH Load Connected	Trip by 1MΩ (Refer to Section 6.2)		
Undervoltage Protection	<50% of Voltage setting (Refer to Section 6.4)		
Relay Contacts			
Group	*Type*	*Rating*	
MCR Trip Contacts	1 x CO (NO-COM-NC)	110Vac, 6A, 300VA (AC1), 60VA (AC15) 30Vdc, 1.2A (DC1)	
CBR Trip Contacts	1 x CO (NO-COM-NC)	110Vac., 6A, 300VA (AC1), 60VA (AC15) 30Vdc, 1.2A (DC1)	
EFLO Indication Contacts	1 x NC	110Vac, 6A, 300VA (AC1), 60VA (AC15) 30Vdc, 1.2A (DC1)	
FC Indication Contacts	1 x NC	110Vac, 6A, 300VA (AC1), 60VA (AC15) 30Vdc, 1.2A (DC1)	
Mechanical & Environment			
Dimensions (HxWxD)	111 x 45 x 114mm (EFL-IS Relay) 111 x 22 x 114mm (EFL-IS Barrier)		
Terminal Max. Wire Gauge	2.5mm^2		
IP Rating	IP20		
Operating Temperature	-20°C to 60°C		
Humidity	Between 10% relative humidity and the dew point, non-condensing		
Air Flow	The EFL-IS Relay and Barrier are to be mounted in a position that allows unrestriced air flow through the upper and lower air vents.		
LED Indication			
LED	***ON***	***OFF***	***FLASHING***
Status	Internal Fault	-	OK
Trip (FC)	-	FC Healthy	FC Trip
Logical (FC)	Logical FC Trip	-	-
Elec (FC)	Electrical FC Trip	-	-
Undervoltage	UV Trip	System Healthy or UV Not Activated	-
EFLO Status	EFLO Trip	EFLO Healthy	EFLO Test Underway
Find Out More			
For more information on this product, contact Ampcontrol Customer Service on +61 1300 267 373 or *customerservice@ampcontrolgroup.com* or visit the Ampcontrol website: www.ampcontrolgroup.com			

Ordering	
Part Number	**Description**
174624	RELAY EFL IS
174623	BARRIER EFL EXT 1.1KV IS
141479	P/SUPPLY 24V 1A DIN MOUNT

Certification	
Certification details	
IECEx	IECEx TRA 15.0011X
Applicant	Ampcontrol CSM Pty Ltd 7 Billbrooke Close. Cameron Park, NSW 2285 Australia
EFL-IS Relay Marking	Ex ia I Ma (U_m 132V_{rms} withdrawn)
EFL-IS Barrier Marking	[Ex ia] I Ma (U_m 832V_{rms} withdrawn)
Ambient Temperature	-20˚C to + 60˚C
Standards	
IEC 60079-0:2011 Edition:6.0	Explosive atmospheres – Part 0: General requirements
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"
EFL Barrier	
The barrier has a combination of low voltage (Um=132V) and high voltage, the fly leads have a combined Um=832V and Uo=26.7V.	
EFL Relay	
The apparatus is powered from AC mains and powered by a nominal 132VAC.	
Conditions of Certification pertaining to Issue 0 of this Certificate	
1. The EFL equipment is to be installed in a non-hazardous (safe) area. The ambient temperature range is -20˚C to + 60˚C. 2. The EFL is to be housed in a suitable enclosure that provides a degree of protection of not less than IP54. 3. The earth terminals of the EFL Barrier must be connected to a mains earth system via three (3) earth conductors making a combined 4mm². These provide ongoing electrical safety and maintain the intrinsic safety and certification. 4. The electrical parameters in the below table shall be taken into account during installation.	

EFL Relay Entity Parameters

Function	Terminals	Um	Uo	Io	Po	Co	Lo
110V Incoming Power	All Connections	132V	-	-	-	-	-

EFL Barrier Entity Parameters

Function	Terminals	Um	Uo	Io	Po	Co	Lo
High Voltage Leads	Ua, Ub, & Uc	832V	26.7V	176uA	1.2mW	4.25uF	10H
Low Voltage Terminals	5,6,7	132V	-	-	-	-	-

Typical IS System Diagram	
Drawing Number	EFLE005 (See following page)