

# SAMWHA Protection Relays: Quick Reference Chart

	Over Current	Under Current	Phase Loss	Phase Balance	Phase Reverse	Locked Rotor	Earth Fault	Time	Reset	Phases Sensed	Supply Voltage	Range	Notes
EOCR SS	■		■					Definite	Manual Remote	2	24 AC/DC 110,240,415 AC	0.5-60A 60..600A with ext. CT	Shearpin protection
EUCR 2C		■						Definite	Manual Remote	2	110,240,415 AC	0.5-60A 60..600A with ext. CT	Detect loss of prime, cavitation, belt break
EUCR 3C		■	■					Definite	Manual Remote	3	110,240,415 AC	0.5-60A 60..600A with ext. CT	as above plus intelligent motor run sensing
EOCR SP1	■		■			■		Inverse	Manual Remote	3	110,240,415 AC	1,10,20A	Mounts directly under contactor
EOCR DS1	■		■			■		Inverse	Manual Remote	3	110,240,415 AC	0.5-30A 60..600A with ext. CT	Compact electronic replacement for thermal overload
EOCR DS3	■		■		■	■		Definite	Manual Remote	3	24 AC/DC 110,240 AC	5.0-60A	as above but with definite time trip
ECR 3DD	■	■	■	■	■	■		Definite	Manual Remote	3	24,110,240 AC/DC	0.5-60A 60..600A with ext. CT	Full function motor protection
EOCR 3DM	■	■	■	■	■	■		Definite Inverse	Manual Remote Auto	3	24,110,240 AC/DC	0.5-60A 60..600A with ext. CT	Built in LED ammeter, load alert, hours run counter
EOCR FDM	■	■	■	■	■	■		Definite Inverse	Manual Remote Auto	3	24,110,240 AC/DC	0.5-60A 60..600A with ext. CT	as above plus remote display & bargraph
EGR							■	Definite	Manual Remote	3	110/240 AC	0.05-2.5A use special ZCT	Earth Fault Protection with Zero Phase current detection (ie 3 phases thru CT)
EVR			■		■			Definite	Auto	3	415 AC	340 – 500VAC	Over and Under voltage (mains failure) protection with auto reset and trip memory

All relays are suitable for 50/60Hz, LED trip & fault indication, Contact rating 3A 250Vac Resistive minimum, Independent NC & NO contacts, Overload curves comply with IEC947-4, C-Tick Approved.

## Explanation of Features and their usage

- Over Current: The most common method of electrically protecting a motor and load from long term overheating or short term overload conditions. See below.
- Definite Time: Trips after the current has exceeded the set point for a definite time. Low cost and reliable protection. Less tolerant to minor overloading than Inverse time protection.
- Inverse Time: The time to trip is inversely proportional to the square of the current. ie the higher the current, the quicker the trip. This is the traditional thermal overload behaviour.
- Shear Pin: Fast acting overcurrent trip that mimics a mechanical shear pin, yet is not affected by starting torque. Used to prevent overload damage to machine and transmission components.
- Under Current: Relay will trip when the current drops below the setpoint for longer than the trip delay. Detects loss of load, belt break, cavitation & loss of prime.
- Start Delay: Used to ignore the high motor starting currents that would otherwise trip definite time or shear pin Overcurrent relays.
- Trip Delay: Adjusts the duration of fault condition needed to trip the relay.
- Test Function: Allows confirmation of correct relay operation when in the standby mode (ie no current detected) useful for commissioning and fault finding in associated control circuitry.
- Reset: Relay trip conditions may be Manually reset using their built-in reset button or Remotely reset by interrupting the control supply, Auto reset is self-clearing after a delay.
- Earth Fault: Detects when an excessive current flows to earth by monitoring the vector sum of the 3 phase currents thru a single CT. Common on machines in pumping or other damp conditions.
- Metering CT: Provides accurate feedback of motor current up to 125% of rated value. Used for definite time under or over current (shearpin) protection.
- Protection CT: Provides accurate feedback of motor current up to 600% of rated value. Used for thermal overload (i2t) protection.
- N type: N type relays are fail safe, ie contacts change state if supply is lost or trip occurs, When powered up, the relay is energised to indicate a healthy condition.
- R type: R type relay is energised for trip condition. Used where common reset line required for multiple device. Must be regularly tested for reliable operation.