Single Phasing Preventers (SPP)

Introduction

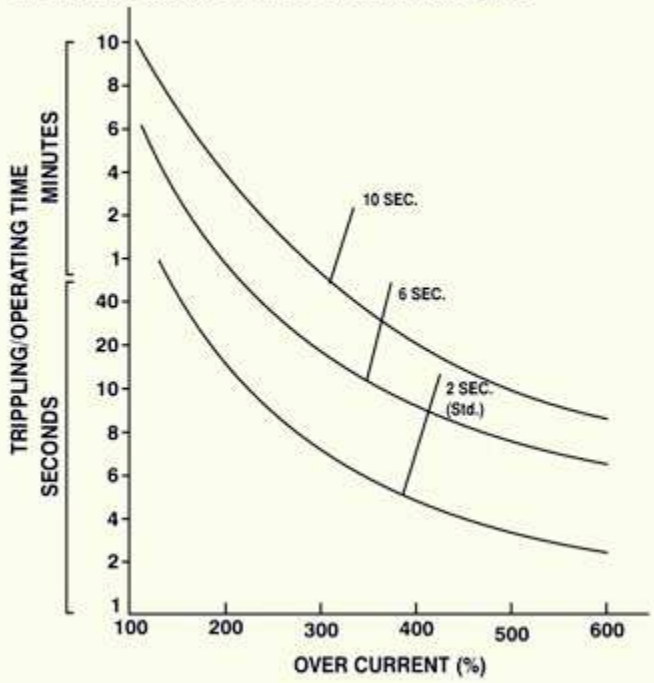
90% of total burn out of the motors are mainly due to overloading caused by unbalanced voltage conditions or phase failure. This fault remains undetected by conventional bimetallic overload relays and need a negative sequence component of voltage or current sensing single phasing preventer. They trip the motor starter if it goes beyond the set level of voltage or current.

GELCO current and voltage sensing SPP offers protection up to motor terminals and does not allow motor to start under unfavorable supply conditions. The negative sequence current sensing is the best principle for single phasing protection.

Technical Details

Single Phasing:	If any one phase is removed, the unit will trip the motor
Voltage sensing SPP:	It gives protection at sensing points only. It senses negative sequence component of voltage and protects the motor against phase failure, unbalanced supply and reverse phase sequence of voltage.
Current sensing SPP:	It gives protection up to motor terminals. It senses negative sequence component of current and protects motor against phase failure, reverse phase sequence and unbalanced supply of the current (> 50% of rated maximum current)
Reverse phasing:	When phase sequence is reversed, motor rotates in reverse direction. This condition is not desirable to run the motor, so the unit will trip the motor.
Unbalanced supply current and voltage:	Unit gives protection against unbalance voltage or current. If voltage unbalance is higher then 45+/- 5V, unit trips. If current in any tow phase differs by 50% (10 A) of rated maximum current (20 A in case of 8-20 A unit) it trips motor.
Low/High voltage cut-off:	It senses supply voltage and protects the motor against too high or too low voltage conditions.
Overload:	It senses average current going to motor and protects motor against overload (over current). Overload setting is to be set at 120% of the full load current.
Dry run:	When motor operates without load (i.e. water pump without water), the condition is considered as dry-run. Prodless dry-run setting is to be set depending upon no-load current of the motor else it may cause the miss-tripping of the motor.

OVERLOAD CHARACTERISTIC FOR ALL MODELS



CT (Current Transformer) SELECTION CHART

Sr. No.	Rated Current (Amp)	CT Rating	H.P. Rating	No. of Turns	Current Scale Multiplying Factor
1	1 to 2.5	CT 20	Up to 1	8	1/8
2	2 to 5	CT 20	Up to 3	4	1/4
3	4 to 10	CT 20	Up to 5	2	1/2
4	8 to 20	CT 20	Up to 12.5	1	1
5	16 to 40	CT 40	Up to 25	1	2
6	32 to 80	CT 80	Up to 50	1	4
7	40 to 100	CT 100	Up to 70	1	5
8	80 to 200	CT 200	Up to 135	1	10
9	160 to 400	CT 400	Up to 270	1	20

NOTE : 1. In case of Star Delta motors, consider phase current as rated current because CT is to be installed in the phase circuit only.
2. External CT needs to be for higher current usage.
3. Separate CT may be provided on request.

***NOTE** : Specifications are subject to change in view of continuous efforts towards further improvement.*

NSV/NSC/NVC

All Models protect motor against single Phasing, High/Low voltage,Reverse Phasing and Unbalanced Supply voltage condition. It can be used for any HP rated motor. Trip time delay is provided to avoid mis tripping of the motor.

Available Models

Models\Features	**Unbalance Voltage**	Low Volt	High volt	Reset	Remark
MINNY	45 V +/- 5V	-	-	Auto	Volatage Sensing SPP in small size
NSV-W	45 V +/- 5V	-	-	Auto	Volatage Sensing SPP in rigid construction
NSV-W1	Adjustable (30-70V)	Cut off : 320 V +/- 5V Cut in : 340 V +/- 5V	Cut off : 500V +/- 5V Cut in : 470 V +/- 5V	Manual	Volatage Sensing SPP with adjustable unbalance voltage
NSV-CG	45 V +/- 5V	Cut off : 320 V +/- 5V Cut in : 340 V +/- 5V	Cut off : 500V +/- 5V Cut in : 470 V +/- 5V	Auto	Volatage Sensing SPP with High/Low voltage protection
NSV-CG1	45 V +/- 5V	Adjustable (300V-380V)	Adjustable (450V-500V)	Auto	Volatage Sensing SPP with adjustable High/Low volt
SWG	45 V +/- 5V	Cut off : 320 V +/- 5V Cut in : 340 V +/- 5V	Cut off : 500V +/- 5V Cut in : 470 V +/- 5V	Auto	Volatage Sensing SPP with Wate Level Guard
NSC	-	Cut off : 320 V +/- 5V Cut in : 340 V +/- 5V	Cut off : 500V +/- 5V Cut in : 470 V +/- 5V	Manual	Current Sensing SPP 50% of rated maximum current
NVC	45 V +/- 5V	Cut off : 320 V +/- 5V Cut in : 340 V +/- 5V	Cut off : 500V +/- 5V Cut in : 470 V +/- 5V	Auto	Voltage & Current Sensing SPP 50% of rated maximum

Note :SWG:SPP with water Water Level Guard(YES and NO indication provided to check the water level on the unit).

Technical Specifications

System Voltage:	415 V +/- 20%, 3, 50 Hz
Auxilliary Supply:	415V / 215 V / 110 V +/-20%,50 Hz
Output Contact Rating:	1 C/o potential free,6A resistive at 230v or 1A at 415V at 0.5 P.F.
Trip Time Delay	
For single phasing, reverse phasing Unbalance & Low/High Voltage:	4-7 secs
Recommand Wiring:	1.0 Sq. mm
Humidity:	Up to 95%RH
Enclosure:	High impact polystyrene moulded with nylon modulded connection strip
Fail safe:	Relay is energised in healthy conditions and trips in faulty conditions
Indication	

NSV W :	HEALTHY
NSV CG/NSV-CG1:	ON,PHASE FAIL,L.V.,H.V
NSV W1:	POWER ON,SPP FAULTY
NSC:	SUPPLY,SPP TRIP
NVC:	CURRENT SPP HEALTHY, VOLTAGE SPP FAULTY, LOW VOLT, HIGH VOLT
SWG:	SPP FAULTY,LOW VOLT,HIGH VOLT,YES,NO,ON
Dimension	
Overall:	Minnary-102 X 65mm Others-140 X 100 X 95mm
Mounting:	Minary-82 X 48
	Others-129 X 74
CT Dimensions	
Inbuilt:	16 mm ID
Seperate:	31 mm ID
Weight:	Minny-250 gms (approx.) others-600 gms (approx.)