

Introduction

R/sir,

We are pleased to introduce ourselves as manufacturer for the electronics protections with automatic operation devices and marketing under the registered brand name 'SECO'.

Our unit is registered in small scale industries.

We are pleased to enclosed our current price list of our products with technical literature in brief for our ready reference and record.

We shall be pleased to supply the products on following terms:

Terms:

1. The prices are net ex-factory, exclusive of packing, freight and transits insurance charges. Excise, C.S.T./VAT and any levy will be extra as applicable.
2. All claims for loss, damage or shortage in transits, will be filled by the purchasers direct with the carriers.
3. Payment 30% advance and balance against delivery.
4. The delivery within 2 to 6 weeks from the receipt of your commercially and technically clear order. In case of any delay due to reason beyond our control, we shall not be able to accept any penalty or L.D. clause.
5. Prices are subject to change without notice.
6. Jurisdiction will be at Jodhpur (Raj.) only.

Thanking you,

Your faithfully

For : Surya Electronics and Controls.

Proprietor.

Technical literature
DIGITAL WATER/LIQUID LEVEL INDICATOR DEVICE

Seco's Digital water level indicator device developed on latest technology against the oldest way of measuring the water level by M.S. level Gauge. For overhead tank, it is very difficulty to Judge the accurate level of water by M.S. level gauge. But with latest technology, we have developed digital water level indicator device which will show accurat3e display direct in digit (figure in Meter/CMS.) of water level of Over Head Tank/Under Ground Tank with comfortable sitting because it can install in switch room, pump house or where suitable to watch. This device is well suitable for any type of liquid.

Operation of the device through a compact electronics circuitry, which ensure reliable display in digit of water level in tank. The circuit will be housed in high impact polystyrene moulded box with nylon moulded connections strips. The level system is a resistance transdurecer, which unaffected by corrosion and other contents available in liquid/water. The product have controlled by Micro Switch (have not sensor base). The whole unit is Electronically Controlled and the upper level and lower level alarm indications made by highly sensitive micro switches. The upper and lower level is pre-adjusted as per required and alarm is actuated at these levels.

Technical Specifications

- | | |
|----------------------------|---|
| 1. Display | Direct display in digits. |
| 2. Supply systems | 230 Volts AC+- 10%, 50Hz. |
| 3. Suitable for | up to 10 Meters, Over Head/.Underground Tank (Water capacity) |
| 4. Alarm for upper & lower | Pre-adjustable as per requirements. |
| 5. Temperature Range | -5 degree C to 50 degree C |
| 6. Humidity | Up to 95% R.H. |
| 7. Reset Push Switch | For silent the alarm |
| 8. Mode of operations | On/Off |

Optional : Upper and lower level cut-off is available on request at extra cost, which cut-off motor circuit at upper and lower level as per adjusted.

Technical Literature
Electronic automatic phase sequence corrector

Seco's electronics automatic phase sequence corrector, developed on latest IC based technology.

Features :

1. When phase sequence disturb, it will correct automatically.
2. It will prevent accident due to reverse rotation of motor shaft.
3. Also protect the motor from single phasing, low voltage and high voltage.
4. Tme delay provides for healthy supply and protection of system due to transits.
5. It will protect against unbalancing voltage in two phase out of three phase supply.
6. Complete electronic circuit based on IC based technology to ensure reliability.
7. Easy to connect with supply system.

Description :

The unit will be electronic circuitry for the reliable operation at 415JV +- 15% 50 Hz +- 5% with electronics relay's transformers, suitable rating pvc moulded connector with proper wiring of rated current copper conductor cable with copper lugs.

The entire unit will be fitted in M.S.C.R.C. sheet box with proper powder coating paints.

Technical Specification:

Principal of operation	Negative sequence voltage sensing.
Systems voltage and frequency	415 v+- 15%, 50Hz +-5%
Low and High voltage cut off	350 V & 480 V (can be alter as per required)
Single phasing unbalancing	Within 3 to 5 Seconds.
Low & high voltage protections	
Switch on-off time delay	60 seconds approx to ensure the healthy supply and suppression of transients.
Current Rating	available up to 800 amp.
Temperature Range	-5 degree to 50 degree C
Humidity	up to 95% R.H.
H.V test	2 KV AC (RMS) 1 min. between live parts and body.

Technical literature
Electronic fully automatic star delta starter/D.O.L. starter

SECO's introducing Electronic fully automatic star delta starter/D.O.L. starter having the following features.

Features:

1. Fully Automatic IC controlled electro mechanical star delta starter suitable for three phase, 415 V 50 Hz induction motor.
2. Adjustable electronic timer for star to delta change over.
3. Adjustable electronic overload tripping circuit.
4. Accurate protection from overloading, single phasing, reverse phasing, unbalancing, low voltage, high voltage up to motor terminals.
5. Starting time delay of one-minute approx to ensure the healthy supply and suppression of transients.
6. Housed in a suitable dust proof, moisture proof and powder coated sheet metal fabricated box with locking arrangements.

Technical specifications

System Voltage and Frequency	415+- 15% (355 V to 475 V) 50 Hz +- 5%
Timer (Adjustable)	3 to 30 seconds.
Overload Tripping	3 to 5 seconds.
Single phasing, reverse phasing unbalancing, low and high voltage tripping	3 to 5 seconds.
Switch on time delay	60 seconds approx to ensure the healthy supply and suppression of transients
Temperature Range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KVA AC(RMS) 1 min, between the live parts and body
Mode of operations	Auto/manual
Indicator lamps	Power on, delay, overload.

Technical literature
Electronic automatic motor control panels

Features:

1. Control panels for three phase induction motor contains:
2. A fully automatic IC controlled electromechanical star-delta starter of suitable rating.
3. Adjustable electronic timer for star to delta changeover.
4. Adjustable electronic overload tripping circuit.
5. Automatic phase sequence corrector device.
6. Protection from single phasing, unbalancing, low & high voltage and overloading.
7. 96x96mm square volt meter and ammeter with selector switch.
8. M.C.B. (TP) as per motor rating.
9. Indicating lamps.
10. A suitable dust proof, moisture proof and powder coated sheet metal. Fabricated box with locking arrangements.

Technical specifications

System Voltage and frequency	415V 15% (335V to 475V) or as per required.
Timer (Adjustable)	3 to 30 seconds for star to delta
Over loading tripping	Over load tripping with in 3 to 5 sec. Adjustable as per motor rating.
Single Phasing unbalancing	Within 3 to 5 sec.
Low and high voltage tripping	
Reverse Phase Corrector	Automatically correct within 10 sec. When reverse phase sequence is occurs.
Volt Meter	0 to 500 Volts Size – 96x96mm square.
Ammeter	C.T. Operated (as per motor rating) Size- 96x96mm square.
C.T.'s	As per motor rating.
Selector switch	5A/415V for volt and Ammeter.
Temperature Range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS) 1 min. between live parts and body.
Mode of Operations	Automatic/Manual.

Technical Literature
Electronic timer for panels

Features:

1. An adjustable electronic timer suitable for star-delta change over for panel, AMF panel, control panel etc.
2. Reliable over electromechanical timer.
3. Protects the line and other devices from sudden loading.
4. Housed in suitable dust proof, shock proof, moisture proof, ABS plastic moulded box with nylon moulded connections strips.

Technical specifications

System Voltage and Frequency	230 V+- 10%, 50Hz +- 5% 415 V+- 15%, 50Hz +- 5%
Contact rating	1 Amp. At 415 V AC or 6 Amp at 230 V AC.
Time delay range	01 to 10 sec, 01 to 60 sec, 01 to 120 sec. 03 to 30 sec, 06 to 60 second or as required.
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS), 50 Hz for 1 minute Between live parts and body.
Indicator lamp	Power on, Delay

Technical Literature
Automatic Motor Protector
(Negative sequence voltage sensing)

The product developed on latest IC based technology.

Seco automatic motor protector is a solid state designed using closed tolerance components for adequate protection to the motor. The factors adversely affecting the operation of three phase induction motors are highlighted in brief.

Single Phasing:

Single phasing is an extreme case of unbalancing which is caused by loss of one phase in a three phase system blowing off the supply fuse breaking in conductor or poor contact in contactors are the common cause of single phasing. If single phasing occurs while the motor is running, it keeps on rotating as single-phase induction motor and draws heavy current which energizes the overload relay of the starters. However, if the motor is lightly loaded, the motor current may not exceed full load value and over load relay may not operate. Further more, when the overload relay is not operated, the coil of motor starter remains energized through the lines when fault is on the line side. Thus the single phasing is the main cause of burning out of the motor.

Unbalanced supply:

Unbalance voltage give rise to negative sequence voltage. Motor draws negative sequence current over and above the positive seq. current, negative sequence current is of double the line frequency core losses and rotor copper losses due to skin effect are increased at higher frequency. Thus undetected heating, due to increased losses, may damage the rotor and also stator windings due to convection of heat.

Torque produced by negative sequence current is in opposition to that of positive sequence current. Hence the net torque produced by the motor is reduced. As a result motor draws more current to meet the load torque. More over, under unbalanced supply, there is reduction in motor efficiency and rise in noise, vibration and motor slip. If the voltage unbalance exceeds the allowable value, need arises of the means like 'Seco Automatic Motor Protector' to trip-off the starter of motor to avert such disaster. It should be clear from the discussion that the conventional starters are disable to provide enough protection.

High Voltage:

Higher voltage increases the core losses due to increase in core flux and over stresses the motor insulation. It is desirable to switch off the motor, when the applied voltage exceeds the allowable value.

Low Voltage:

The torque produced by the motor is proportional to the square of the applied voltage. Therefore, the motor torque reduces considerably at reduced supply voltage. And the motor draws large current due to increase in slip. It is desirable to switch-off the motor, if voltage falls below permissible value.

Seco automatic motor protector having an automatic 'switch-off' at dangerously low/high voltage and an automatic 'switch-on' when voltage return in healthy conditions. Pilot lamps gets 'switch-off' when single phasing, excessive unbalance, reverse phasing low/high voltage. The unit provides protection up to motor terminals.

Technical Specifications

Principle of operation	Negative sequence voltage sensing
System Voltage and Frequency	415 AC +- 15% 3 phase, 50Hz +- 5%

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Contact Rating	1 Amp. At 415 AC, 6 Amp. At 240 V AC.
Trip Time Delay	2 to 3 seconds.
Switch-on time delay	60 seconds approx to ensure the healthy supply and suppression of transients.
Output Contact	1 NO + 1 NC
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS), 50 Hz for one minute between the live parts and body
Mode of operation	Auto/SPP/Bypass
Indicator Lamps	Power On, Delay

Technical Literature
Automatic Motor Protector
(Negative Sequence Current Sensing)

The product developed on latest IC based technology.

Seco's automatic motor protector type CSP/PSP, which protects against single phasing, reverse phasing, low voltage, high voltage, over loading, unbalancing, under/over current and specially dry running without prod up to motor terminals with in built C.T's.

Single Phasing Protection:

The unit will trips within 3 to 5 seconds against single phasing caused due to loss of phase, fuse failure or loose connections.

Reverse Phasing Protections:

The unit will trip within 3 to 5 seconds, if phase sequence is reversed.

Unbalancing protections:

The balance setting is 50% of the rated current for e.g., if rated current is 30 Amp, the unit will trip when current in any two of the three phase differ by 15 ampere.

Overloading Protections:

The unit will follow inverse time current characteristics. The unit is provided with fixed inverse time characteristics, which is pre-adjusted. The trip time should be slightly higher than starting duration of motor.

Dry running protection:

The unit will trip 3 to 5 seconds when water goes below the tail. Due to prodless, it will save amount of cable, sensor valuable time.

Technical Specifications

Principle of operation	Negative sequence current sensing
System Voltage and Frequency	415 V +- 20% 3 phase, 50Hz +- 5%
Contact Rating	1 Amp. At 415 VAC, 6 Amp. At 240 VAC.
Trip Time Delay	2 to 3 seconds.
Trip Time Overload	As per inverse time current characteristics.
Switch-on time delay	60 seconds approx to ensure the healthy supply and suppression of transients.
Auxillary Supply	415/230/110 Volts as per requirement.
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS), 50 Hz for one minute between the live parts and body
Trip Setting	Under current : 50% at set overload current Unbalance : 50% of rated current. Overload : By potentiometer provided on the unit.
Mode of operation	Auto/SPP/Bypass
Reset	Auto Reset : in case of single phasing, reverse phasing, Low/high voltage and Dry running.
Indictor Lamps	Power On, Overload, Phase failure/Reverse Phase, Low Voltage, High Voltag4e and Dry Running.

Technical literature
Electronic time delay relay

Features:

1. A precociously controlled time delay relay circuit for reliable accurate operation.
2. Suitable for controlling of air conditioners, water coolers, freeze, deep freezer etc.
3. Avoid sudden load on line.
4. Avoid damage due to transients.
5. Available in required current capacity and time delay.
6. Avoid damage due to over current.

Technical Specifications

System Voltage and Frequency	230 V +-10% , 50Hz +- 5% 415 V +-15% , 50Hz +- 5%
Load Control	Through a suitable rating of relay.
Contact Rating	1 Amp. At 415 VAC, 6 Amp. At 240 VAC.
Time Delay	Up to 5 minute, as per required.
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS), 50 Hz for one minute between the live parts and body
Enclosure	M.S. Fabricated Box with powder coated paint/ABS Plastic Box.

Technical Literature
Automatic Power Control Switch
(The Magic)

Seco's automatic power control switch (The magic). Is it not magic?

The lights are switched on or off automatically at the sunset and sunrise. The wonder full magical feat is performed by photo sensor on latest IC based technology.

Photo sensor works wonder for large lights installations such as those at street lights. Housing colonies, railway stations, air-port, sprawling industries, advertising neon sign display stock yard and many more. At such installation, a chain of hundreds of lights is required to be controlled from an easy accessible points. Normally, the controlling switches are operated manually. More recently clock timers, through costly, are also being used. Result the lights are switched much earlier and switched off much later tan necessary, or vice-versa. It means wastage of precious power and increase in power bills.

Photo sensor is the answer to this puzzling riddle. It employs a photo sensor to controls the switch automatically, pre adjusted to a desired intensity of nature light available of sun rise or sun set times. The lights are switched on or off as the case my e. It means optimizing the light availability and saving in power and labour bill. Surely, photo sensor is designed to remain unaffected by natural disturbances. An light conditions due to seasonal/variations, clouds, thunder lighting or even artificial lights. If necessary, it can be operated manually also

Photo sensor is particularly a big power saver for large external lighting installations, where switching of lights is dependent on natural day light and where even manual control becomes physically tedious due to large distance involved.

Photo sensor essentially employs a light sensor exposed to the natural light in open space from the collected diffused ambient light, it generated an electric pulse. The electric pulse activates a light dependent resistor which cuts on or off the electric current, the cut off cut on electric current can be adjusted through a knob with the help of an in built rheostat. The device operates on 230 V AC, 50 Hz supply from the mains. There is supply indicator light too. A three way switch is provided for adjusting it for automatic, manual or switch off operations..

Technical Specifications

System Voltage and Frequency	230 V +-15% , 50Hz +- 5% 415 V +-15% , 50Hz +- 5%
Contact Rating	1 Amp. At 415 VAC, 6 Amp. At 240 VAC.
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS) 1 min between the live parts and body
Switch on level at dusk	4 to 16 lugs.
Switch off level at down	4 to 16 lugs.
Switching capacity range	10 Amp. To 63 Amp. Single phase, Two Phase. 16 Amp. To 800 Amp. Three phase
Over load rating protections	By M.C.B.
Indicator Lamps	Power On
Mode of Operation	Auto/Off/Manual
Protections	At low and high voltage as per required.
Two phase and three phase	Separated in single phase (will be off only defect phase, balance will be on)

Technical Literature

Automatic Power Control Switch

Seco introduces an automatic power control switch based on in-built digital timer. The timer can be preset as per requirement. This pre set time can be different for different days. Eight tie (on-off) can be adjusted for a particular day. The timer switch on or off the contactor to control the power of load. It may be used for controlling of street lights, pump motors, blowers, air conditioners, refrigerators, neon sign display etc.

The timer is housed in a compact dust proof ABS Box and whole unit is housed in a powder coated M.S. sheet box with locking arrangements.

Technical Specifications

Principal of Operations	Negative sequence voltage sensing.
System Voltage and Frequency	230 V +-15% , 50Hz +- 5% 415 V +-15% , 50Hz +- 5%
Contact Rating	6 Amp. At 230 VAC, 1 Amp. At 415 VAC.
Temperature range	-5 degree to 50 degree C
Humidity	Up to 95% R.H.
H.V. Test	2 KV AC (RMS) 1 min between the live parts and body
Over load protections	By M.C.B.
Amp. Range	As per requirement.
Indicator Lamps	Power On
Mode of Operation	Auto/Off/Manual
Protections	At low and high voltage as per required.
Two phase and three phase	Separated in single phase (will be off only defect phase, balance will be on)

Technical literature
Electronic automatic digital timer switch (Programmable) Type DET

Instruction Manual:

SECO make electronic digital timer switch programmable is a very reliable timing control switch suitable for pump motor starters, street light controllers and other power control switches. It is available in 6/8 ON/OFF timings which can be set as per requirement by the customers. The set timing may be for a complete week or for a group of days or for a particular day. Fifteen choices are available for day setting and it can be easily selected by the customers. It is a unique energy saving and manpower saving device.

Button Instruction

Clock	For current time setting
Timer	For setting of 6/8 On and 6/8 Off programmed.
Day	For selection of a day or a group of day (Fifteen options are available)
Hour	For hour setting
Min	For minute setting.
P	Reset button for cancel all prior setting.
Manual	For selection of On/Auto/Off mode.

To set current time and day

1. Press clock and day buttons until current day shows on display. Release both buttons for current day setting.
2. Press clock and hour button until current hour shows on display release both buttons for current hour setting.
3. Press clock and min button until current minute shows on display release both buttons for current minute setting.

To set program

1. Press time button. On----- will appear on the display. This is 1 program that you desire to turn on the device connected with this timer.
2. Press day button. To select the program period. There are fifteen choices.
3. Press hour button to set hour.
4. Press min. button to set minute.
5. Now first on timing and day is entered in the device, again press timer button OFF----- will appear on the display. This is for off program that you desire to turn off the device connected with this timer.
6. Repeat the procedure until OFF program is set.
7. Similarly you can set 6/8 ON and 6/8 Off timing program.

Review of Program:

Press timer button to check your program for on and off timing and days. For any correction in program please follow the same procedure as given above.

Manual Button

Press manual button to select On/Auto/Off. On and Off mode turns on and off device. Auto mode is to set a device as per program entered. Now the timer will turn on and turn off according to the program.

By-Pass Switch

By-Pass Switch disconnects your device from time. Now your device is isolated from the time and its program.

Indications:

Power On indications shows that the device is connected with required supply system. Timer On indication shows that the timer is in on position.

Caution:

1. Connect the timer device with required supply voltage as mentioned on the device (110 V/220V/440V AC).
2. Press reset button before setting of program.

Technical Literature Automatic Level Controller

Seco's automatic level controller developed on latest IC based technology for controlling operation of pump set automatically. The unit operates on principle of conductivity. Sensing of levels is by means of suitable stainless steel sensor or magnetic float switch.

Salient Features:

1. Avoids overflow and dry running.
2. No man power required to operate as fully automatic.
3. Longer Life, no mechanical system.
4. No Need of daily switching ON/OFF of motor.

For underground to overhead tank:

To use unit for both tanks, all connections (OH, OL, C, UL, UH) should be used. Whenever liquid level in underground tanks fall below set level, it switches off the pump of set. Pumping will restart only when liquid level reaches to set high level or above that and only if demanded by overhead tank. Low level in underground tank to be set above foot-valve to avoid dry running of pump set. Now motor operation will be as per level in overhead tank.

For overhead tank:

To use unit for controlling in overhead tank, short points C, UL and UH. Now when ever level in overhead tank falls below set low level, unit operated pump set automatically and when liquid level reaches out high level, stops motor pump set. Motor will restart only when liquid level falls below low level.

For underground tank:

To use the unit for underground tank, keep terminals OH & OL open. Now when liquid level falls below set low level, the unit switches off the pump set and it will switch on the pump set only when level reached to high level.

Available four models:

- | | |
|---------------------|--|
| 1. Type ALC (MINNY) | Suitable for single phase up to 2 H.P. (Single tank) |
| 2. Type ALCS | Suitable for single phase up to 1 H.P. (Both tank) |
| 3. Type ALCS-1 | Suitable for single phase up to 2 H.P. (Both tank) |
| 4. Type ALCT | Suitable for three phase for F.A.S.D. and D.O.L. starters (Both tanks) |

Technical Specifications

Principal of Operations	Negative sequence voltage sensing.	
System Voltage and Frequency	ALC/ALCS/ALCS-1	230 V +-20% , 50Hz +- 5%
	ALCT	415 V +-20% , 50Hz +- 5%
Contact Rating	ALC/ALCS/ALCS-1	6 Amp. At 230 VAC
	ALCT	1 Amp. At 415 VAC
Trip Time Delay	All Models	3 to 5 Seconds
Temperature range	All Models	-5 degree to 50 degree C
Humidity	All Models	Up to 95% R.H.
H.V. Test body	All Models	2 KV AC (RMS) 1 min between the live parts and
Mode of Operation	All Models	Auto/Off/Manual
Indicator Lamps	All Models	Power On

Coading in Diagram:

OH : Overhead tank high level
UL : Underground tank low level
OL : Overhead tank low level
UH : Underground tank high level
C : Common

Use with:

- (a) Over head tank Short C,UL and UH
(b) Underground tank Keep OH and OL open.