SAVE FOR FUTURE

**C.R.I. FLUID SYSTEMS**
Pumping trust. Worldwide.

# C.R.I. CONTROL PANELS

## *CONTROL OF THE FUTURE*


An ISO 9001, ISO 14001 & OHSAS 18001 Company

CE*
For components only.

**C.R.I. FLUID SYSTEMS**

Pumping trust. Worldwide.

## THE BEGINNING

**of C.R.I., way back in 1961, was a resolute attempt to produce a few irrigation equipments using the limited facilities of an in-house foundry. Eventually the founder's dream was coming true as the small production unit he started kept growing rapidly. Now, after more than five eventful decades, it is an enormous, widely reputed organization, which produces more than 2300 varieties of perfectly engineered pumps and motors and sells its products in numerous countries spread across 6 continents.**

## C.R.I. IS ONE AMONG

**the few pioneers in the world to produce 100% stainless steel submersible pumps. Having achieved a record production capacity of over 2 million pumps per annum, today C.R.I. is rubbing its shoulders with the best brands in the world, with advanced technology and safety standards as its hallmarks.**

## THE INFRASTRUCTURE

**of C.R.I. is pretty comprehensive with state-of-the-art machineries and high potential in-house R&D recognised by the ministry of science and technology, Govt. of India - all within its own covered area of 300,000 square metres. The production environment is accredited with ISO 9001, ISO 14001 & OHSAS 18001 certifications and the products are CE, UR/UL, IEC, TSE & ISI certified. The R&D team always stays in tune with the changing scenario and seldom fails in coming up with**

## NEEDLESS TO SAY,

**behind this legendary growth lies the untiring, innovative, enthusiastic and dedicated team work. and, of course, a flawlessly maintained value system too. The name C.R.I. itself encapsulates the company's ethos: " Commitment, Reliability,**

C.R.I. FLUID SYSTEMS

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## Vision, Mission and Values

To be the industry leader providing best - in - class fluid management solutions to individual and institutional customers and societies in our chosen markets.

We will achieve this through our dedicated efforts to enhance the welfare of all our stakeholders and by living by our values of **commitment, reliability** and **innovation.**

# CONTENTS

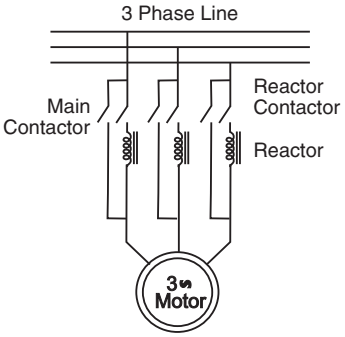
# Impedance Panel

This starter is similar to Start- Delta Starter but a set of Series Reactors are connected in series with the motor winding while starting. So this method is often called as Series Reactor Starter. Once the motor comes to its running mode these reactors are disconnected and the motor runs like DOL method. The starting current is controlled by the Impedance produced by reactors connected in series.

### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 kW to 530 kW |
| **Version** | Three Phase, 50/60 Hz, A.C. |
| **Nominal Voltage** | 380V - 415V |
| **Degree of Protection** | IP 52 / IP 55 (Optional) |
| **Panel Box** | MS Powder Coated |
| **Componants** | Schneider / L&T / GIC / Minelec / Reputed Make |

### Schematic Diagram




### Protection

- Over Voltage
- Under Voltage
- Over Load
- Short Circuit
- No Load
- Dry running
- Phase Failure
- Phase reversal (Optional)
- PT sensor (Optional)
- Level sensors
- local / remote operation & customized features against requirement

### Advantages

- Simple /Rugged Construction
- Reduced Starting Current
- Good Current / Torque property
- Only one set of cable is required from starter to motor
- Manual / Auto Operation
- IEC Standard
- Optional Control Circuit Voltages

### Components

I Reactors I Contactor I Pump Protective Relay (PPR) I CT Coil I Timer I On/Off Switch I MCB / Load Breaking Switch I Ammeter I Voltmeter I Run-Hour meter (Optional) I Selector Switch I Indicator Lamps I Powder Coated MS Box with Lock & Key

# Control Panels - 3 Phase

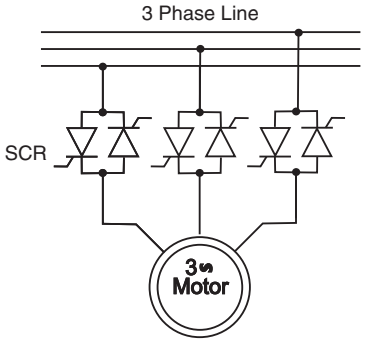
## Soft Starters

Soft starter is an advanced method of starting electrical motors by application of electronic devices like micro processor, SCR / Thyristor etc., and provides numerous advantageous over other types of starters. In this panel voltage reduction and other vital features like controlled acceleration of motor are achieved by triggering SCRs at the desired firing angle by microprocessor. Once triggered the SCR allows current in one direction and turns off at zero current.

### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 kW to 530 kW |
| **Version** | Three Phase, 50/60 Hz, A.C. |
| **Nominal Voltage** | 380V - 415V |
| **Degree of Protection** | IP 52 / IP 55 (Optional) |
| **Panel Box** | MS Powder Coated |
| **Componants** | Schneider / L&T / GIC / Minelec / Reputed Make |

### Schematic Diagram




### Protection

- Over Voltage
- Under Voltage
- Over Load
- Short Circuit
- No Load
- Dry running
- Phase Failure
- Phase reversal (Optional)
- PT sensor (Optional)
- Level sensors
- local / remote operation & customized features against requirement

### Advantages

- Reduced stresses and wear on the mechanics of the system
- Reduced starting currents
- Reduced peak inrush starting currents.
- Ramp profiling to better match type of load such as variable torque loads
- Reduced heating in motor at low speeds
- Minimize voltage dips on the supply
- Lowered Peak demand charges
- Eliminate belt slippage on fans
- Smooth acceleration of motor / load
- No instability due to changing power factor
- No instability due to slot ripple in 3 wire and 6 wire operation
- Better control of deceleration through closed loop torque control system.

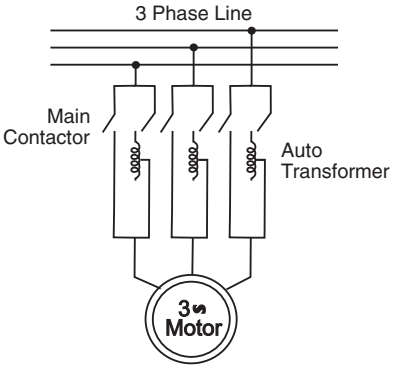
# Auto Transformer Starter

An Auto-Transformer starter is another type of conventional method of starting AC motors with the aid of Auto-Transformer. In this method the starting current is reduced by applying reduced voltage by means of Auto-Transformer for a while and once the motor comes to normal running condition the full voltage is applied across the motor winding.

### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 kW to 530 kW |
| **Version** | Three Phase, 50/60 Hz, A.C. |
| **Nominal Voltage** | 380V - 415V |
| **Degree of Protection** | IP 52 / IP 55 (Optional) |
| **Panel Box** | MS Powder Coated |
| **Componants** | Schneider / L&T / GIC / Minelec / Reputed Make |

### Schematic Diagram




### Protection

- Over Voltage
- Under Voltage
- Over Load
- Short Circuit
- No Load
- Dry running
- Phase Failure
- Phase reversal (Optional)
- PT sensor (Optional)
- Level sensors
- local / remote operation & customized features against requirement

### Advantages

- Can set desired starting voltage
- Simple / Rugged Construction
- Reduced Starting Current
- Good Current / Torque property
- Only one set of cable is required from starter to motor
- Manual / Auto Operation
- IEC Standard
- Optional Control Circuit Voltages

### Components

I Auto Transformer I Contactor I Pump Protective Relay (PPR) I CT Coil I Timer I On/Off Switch I MCB / Load Breaking Switch I Ammeter I Voltmeter I Run-Hour meter (Optional) I Selector Switch I Indicator Lamps I Powder Coated MS Box with Lock & Key

# Control Panels - 3 Phase

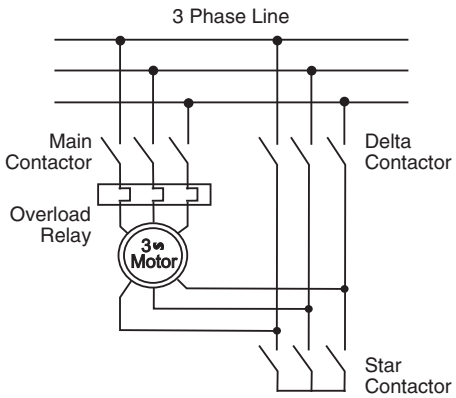
## Star-Delta Starter

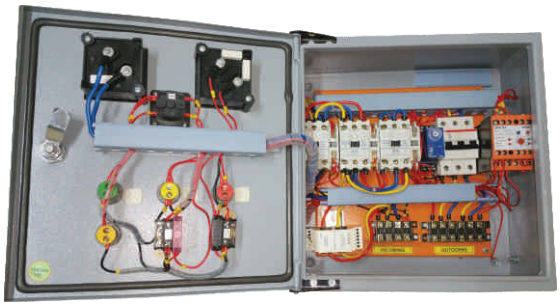
Start-Delta starters are the most common starters used widely to start AC motors. In these starters the starting current is controlled by applying reduced voltage, which is achieved by connecting motor winding in “Star” mode. Theoretically the current is reduced by a factor of $1/\sqrt{3}$ times and once the motor attains it’s normal running stage, full voltage is applied to the motor by changing the connection to “Delta” mode and remains in the same stage till the motor is stopped.

### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 kW to 350 kW |
| **Version** | Three Phase, 50/60 Hz, A.C. |
| **Nominal Voltage** | 380V - 415V |
| **Degree of Protection** | IP 52 / IP 55 & 65 (Optional) |
| **Panel Box** | MS Powder Coated / S.S (Optional) |
| **Componants** | Schneider / L&T / ABB / Siemens / Reputed Make |

### Schematic Diagram



### Protection

- Over Voltage
- Under Voltage
- Over Load
- Short Circuit
- No Load
- Dry running
- Phase Failure
- Phase reversal (Optional)
- PT sensor (Optional)
- Level sensors
- local / remote operation & customized features against requirement

### Advantages

- The operation of the star-delta method is simple and rugged
- It is relatively cheap compared to other reduced voltage methods.
- Good Torque/Current Performance.
- It draws 2 times starting current of the full load ampere of the motor connected
- Manual / Auto Operation
- IEC Standard
- Optional Control Circuit Voltages

### Components

I Contactor I Pump Protective Relay (PPR) I CT Coil I Timer I On/Off Switch I MCB / Load Breaking Switch I Ammeter I Voltmeter I Run-Hour meter (Optional) I Selector Switch I Indicator Lamps I Powder Coated MS Box with Lock & Key

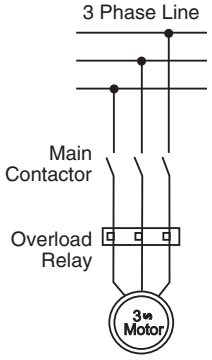
# Direct - Online Starter

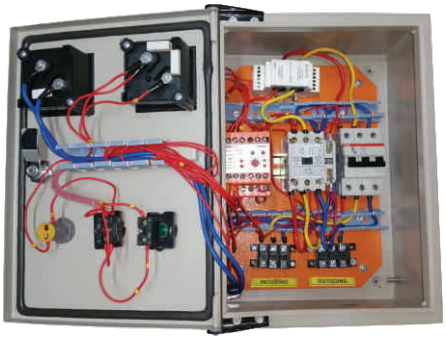
Direct - Online Starters are the simplest form of motor starter for starting induction motor and these starters basically consist of MCB / Circuit Breaker, Contactor and an overload relay for protection, electromagnetic contactor which can be opened by the thermal overload relay under fault conditions. Typically, the contactor will be controlled by separate start and stop buttons, and an auxiliary contact on the contactor is used, across the start button, as a hold in contact. i.e. the contactor is electrically latched / closed while the motor is operating.

### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 kW to 93 kW |
| **Version** | Three Phase, 50/60 Hz, A.C. |
| **Nominal Voltage** | 380V - 415V |
| **Degree of Protection** | IP 52 / IP 55 & 65 (Optional) |
| **Panel Box** | MS Powder Coated / S.S (Optional) |
| **Componants** | Schneider / L&T / ABB / Siemens / Reputed Make |

### Schematic Diagram



### Protection

- Over Voltage
- Under Voltage
- Over Load
- Short Circuit
- No Load
- Dry running
- Phase Failure
- Phase reversal (Optional)
- PT sensor (Optional)
- Level sensors
- local / remote operation & customized features against requirement

### Advantages

- Most Economical and Cheapest Starter
- Simple to establish, operate and maintain
- Simple Control Circuitry
- Easy to understand and trouble-shoot.
- It provides 100% torque at the time of starting.
- Only one set of cable is required from starter to motor.
- Manual / Auto Operation
- IEC Standard
- Optional Control Circuit Voltages

### Components

I Contactor I Pump Protective Relay (PPR) I CT Coil I Timer I On/Off Switch I MCB / Load Breaking Switch I Ammeter I Voltmeter I Run-Hour meter (Optional) I Selector Switch I Indicator Lamps I Powder Coated MS Box with Lock & Key.

# Control Panels - 1 Phase

C.R.I. Control boxes are made of hi-tech components and designed to perfection with various features to give ultimate protection to the prime movers such as Submersible motors, Centrifugal pumps etc. (All the C.R.I. single-phase submersible motors are supplied with suitable control boxes, which is mandatory). Different types of single-phase and three-phase control boxes are available which can be selected according to the control measures and features required.

## TYPES & SPECIFICATIONS

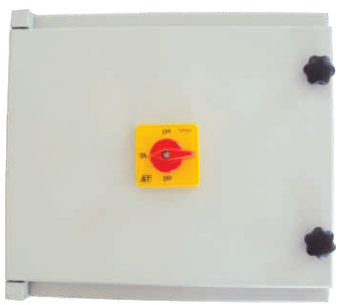
### SMART - 1 PHASE

| | |
|---|---|
| **Power Range** | 0.37 kW to 2.2 kW |
| **Version** | Single phase, 50/60 Hz, A.C. |
| **Type** | Capacitor start & run (CSR) |
| **Degree of Protection** | IP 52 |
| **Components** | Run Capacitor, Over load Protector, PVC Connector, on/off switch, Housed in a plastic enclosure. |

### SMART PLUS - 1 PHASE

| | |
|---|---|
| **Power Range** | 0.37 kW to 2.2 kW |
| **Version** | Single phase, 50/60 Hz, A.C. |
| **Type** | Capacitor start & Capacitor run (CSCR) |
| **Degree of Protection** | IP 52 |
| **Components** | Start Capacitor, Over load Protector, PVC Connector, Run Capacitor, QD Relay, Powder Coated MS Box. No on/off switch will be provided so the control has to be made externally. |

### STANDARD - 1 PHASE



| | |
|---|---|
| **Power Range** | 0.37 kW to 2.2 kW |
| **Version** | Single Phase, 50/60 Hz, A.C. |
| **Type** | Capacitor start & Capacitor run (CSCR) |
| **Degree of Protection** | IP 55 |
| **Components** | Start Capacitor, Run Capacitor, QD Relay PVC Connector, On / Off Rotary Switch MCB, Powder Coated MS Box. |

C.R.I. Elcon Control Boxes are reliable control devices to protect your pumps against overloading, unbalanced voltages, Dry run, Phase reversal & Phase failures. The inbuilt micro controller gives complete protection to both single & three phase pumps. These control boxes are also available with float option to control the water level in storage tank.

# ELCON - Single Phase

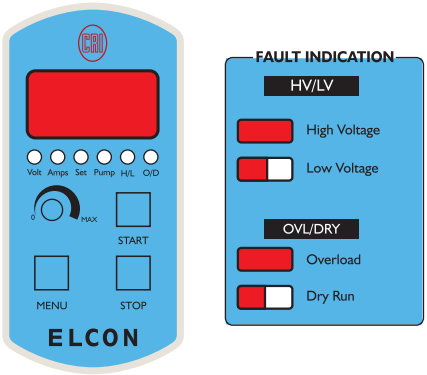
### Technical Specifications

| | |
|---|---|
| **Power Range** | 0.37 to 1.1 kW (CSCR type)<br>0.37 to 2.2 kW (CSR type) |
| **Operating Voltage** | 130 - 300V, Single Phase |
| **Frequency** | 50Hz & 60Hz |
| **Protection** | IP 53 |
| **Voltage sensing** | Isolated linear sensing |
| **Current sensing** | Current transformer |
| **Max. Current Rating** | 30Amps |


## PROGRAM LIMITS

Overload current : 0-30A
Dry run current : 0-30A
High cut-off voltage : 180-300V
Low cut-off voltage : 180-300V
Overload cut-off time : 3-100sec.
Dry run cut-off time : 3-200sec.
High/Low Volt cut-off time : 3-100sec.
Auto stop timer : 0-99min.

## DISPLAY PANEL & INDICATIONS




## FEATURES

- Digital Volt & Ammeter
- Electronic Overload Relay
- Electronic Dry run Prevention
- High / Low Voltage Protection
- User Friendly LED Indications
- Auto stop timer
- Pump failure data log
- Float switch provision to control water level (Optional)

## CONNECTION DETAILS

**POWER INPUT**

L – Phase
N – Neutral

**MOTOR CONNECTION**

Blue – Main winding
Brown – Auxiliary winding
Black – Neutral

## LED INDICATION

Volt : Voltage Display mode
Amps : Current Display mode (Reads zero when pump OFF)
Set : Indicates ELCON in Parameter view / edit mode
Pump : Glows when Pump ON
H/L : Glows when High Volt & Blinks if Low volt
O/D : Glows if overload & Blinks if dry run

# ELCON - Three Phase

### Technical Specifications

| | |
|---|---|
| Power range | 0.37 to 7.5 kW |
| Operating Voltage | 200 - 600V, Three Phase |
| Frequency | 50Hz & 60Hz |
| Connection | D.O.L. |
| Protection | IP 53 |
| Voltage sensing | Isolated linear sensing |
| Current sensing | Current transformer |
| Max. Current Rating | 30Amps |

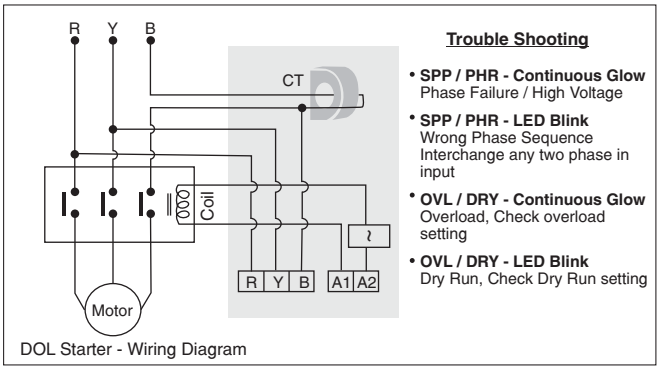

## PROGRAM LIMITS

| | |
|---|---|
| Overload current | : 0-20A |
| Dry run current | : 0-20A |
| High cut-off voltage | : 470V |
| Low cut-off voltage | : 260V |
| Overload cut-off time | : 15sec. |
| Dry run cut-off time | : 10sec. |
| High/Low Volt cut-off time | : 10sec. |
| Auto start | : 45sec. |
| Dry run Auto re-start | : 60min. |

## FEATURES

- Integrated three phase motor starter / controller
- Inbuilt overload & dry run protection
- Wide operating voltage range
- Single phase prevention
- Phase reversal cut-off
- High / Low voltage cut-off
- Unbalance voltage cut-off @70V
- Overload & dry run cut-off
- Phase failure cut-off
- Auto start & Dry run auto restart
- Auto / Manual switching
- Float switch provision to control water level (Optional)

## CONNECTION DIAGRAM - 3 Phase




DOL Starter - Wiring Diagram

# Sewage / Drainage Pump Controller

## (DOL, 220V, Single Phase, 50Hz (Sewage / Drainage Pumps)

This controller is specially designed for sewage pumping system, by adoption of level transmitter (0.5-4.5V), pump user can easily set the different liquid depth for sewage pump operation and observe the dynamic liquid depth in the sump or sewage tank.

Intelligent pump controller is an easy to use, programmable controlling & protection device for single sewage pump .

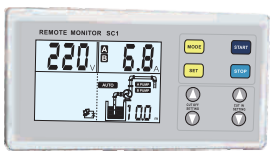
## MAIN SPECIFICATIONS

Rated Input Voltage: AC 220V/50HZ,Single Phase

Rated Output Power:0.37KW-2.2KW

## DESIGN FEATURES

- Single pump control
- Present Level transmitter with 0.5-4.5V analog signal
- Easily setting the different liquid depth for sewage pump operation and observing dynamic liquid depth in the sump or sewage tank.
- Eliminates the float switch or liquid sensor installed in the sump or sewage tank
- Auto / Manual switch
- Protect the pump against many faults
- Dynamic LCD displaying the real liquid depth
- Dynamic LCD displaying pump running information
- Pump accumulative running time displaying
- Pump last five fault record displaying
- Pump shaft anti rust
- Present remote monitor
- Present one dry contact point
- Grade of Protection IP 54
- Visual & Audio alarm for fault prompt



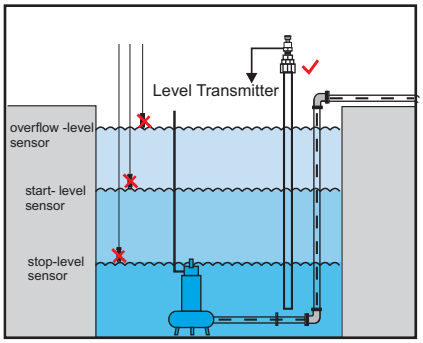
Remote Monitor

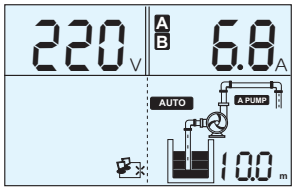
Level Transmitter

## APPLICATION

Suitable for sewage and drainage pump lifting stations.

**More convenient and secure**




Different water levels (depth) for starting the pumps can be easily set on the LCD screen:

PUMP STOP level - PUMP START level - OVER FLOW level

Through the level transmitter, pump users can easily learn the water depth in the sump/sewage tank, the unit is centimeter.

# Duplex Pump Controller

## (DOL, 220V, Single Phase, 50Hz (Sewage / Drainage Pumps)

This controller is specially designed for sewage pumping system, by adopting level transmitter (0.5-4.5V), pump user can easily set the different liquid depth for sewage pump operation and observe the dynamic liquid depth in the sump or sewage tank.

Intelligent pump controller is an easy to use, programmable controlling & protection device for duplex sewage pump .

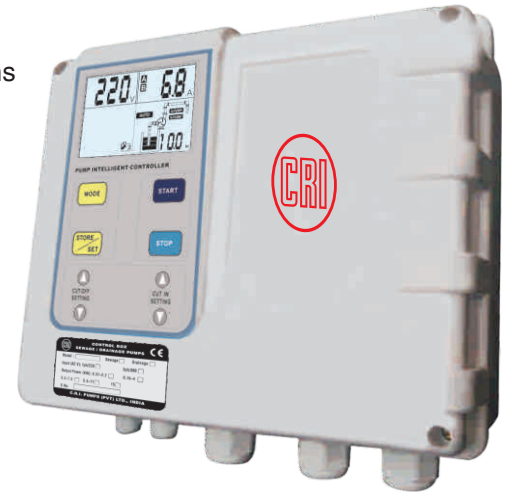
### MAIN SPECIFICATIONS

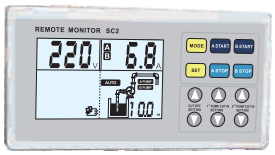
Rated Input Voltage: AC 220V/50HZ,Single Phase

Rated Output Power:0.37-2.2KW/3-4KW

### DESIGN FEATURES

- Double pumps control
  main pump / standby pump automatically alternate
  main pump / standby pump automatically switch malfunctions
  standby pump participate running if required
- Present Level transmitter with 0.5-4.5V analog signal
- Easily setting the different liquid depth for sewage pump operation and observing dynamic liquid depth in the sump or sewage tank.
- Eliminates the float switch or liquid sensor installed in the sump or sewage tank
- Auto / Manual switch
- Protect the pump against many faults
- Dynamic LCD displaying the real liquid depth
- Dynamic LCD displaying pump running information
- Pump accumulative running time displaying
- Pump last five fault record displaying
- Pump shaft anti rust
- Present remote monitor
- Present one dry contact point
- Grade of Protection IP 54
- Visual & Audio alarm for fault prompt





Remote Monitor

Level Transmitter

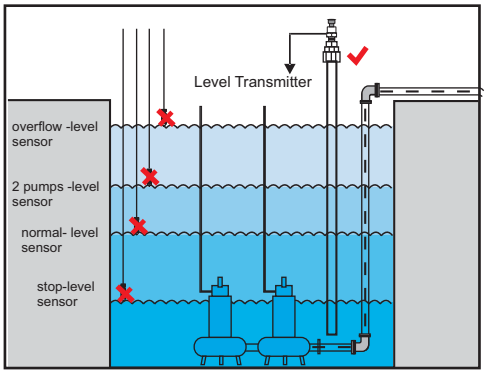
### APPLICATION

Suitable for sewage and drainage pump lifting stations.

L922-S eliminates the need for at least 5 water level sensor or 3 float switches: stop-level,normal- level for one pump, high-level for two pumps, overflow- alarm level. Thus significant cost-savings result from dramatically reduced purchasing and clearing of sensors or float switch. L922-S is also more secure because it uses level transmitter, whereas sensors or float switch often fail because of the effect of sludge.

Different water levels (depth) for starting the pumps can be entered via LCD screen directly, L932-S will start or stop the pumps running according to the different depth setting value.

More convenient and secure



# Sewage / Drainage Pump Controller

## (DOL, 380V, 3 Phase, 50Hz (Sewage / Drainage Pumps)

This controller is specially designed for sewage pumping system, by adoption of level transmitter (0.5-4.5V), pump user can easily set the different liquid depth for sewage pump operation and observe the dynamic liquid depth in the sump or sewage tank.

Intelligent pump controller is an easy to use, programmable controlling & protection device for single sewage pump.

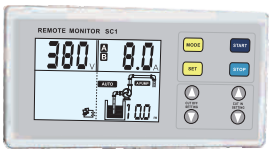
## MAIN SPECIFICATIONS

Rated Input Voltage: AC 380V/50HZ,Three Phase

Rated Output Power:0.75KW-4KW / 5.5KW-11KW / 15KW

## DESIGN FEATURES

- Single pump control
- Present Level transmitter with 0.5-4.5V analog signal
- Easily setting the different liquid depth for sewage pump operation and observing dynamic liquid depth in the sump or sewage tank.
- Eliminates the float switch or liquid sensor installed in the sump or sewage tank
- Auto / Manual switch
- Protect the pump against many faults
- Dynamic LCD displaying the real liquid depth
- Dynamic LCD displaying pump running information
- Pump accumulative running time displaying
- Pump last five fault record displaying
- Pump shaft anti rust
- Present remote monitor
- Present one dry contact point
- Grade of Protection IP 54
- Visual & Audio alarm for fault prompt

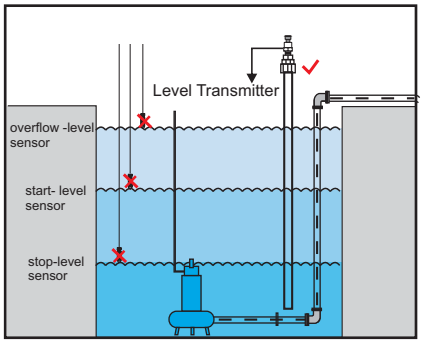

Remote Monitor

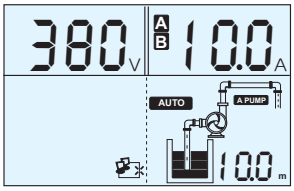
Level Transmitter

## APPLICATION

Suitable for sewage and drainage pump lifting stations.

More convenient and secure




Different water levels (depth) for starting the pumps can be easily set on the LCD screen:

PUMP STOP level - PUMP START level - OVER FLOW level

Through the level transmitter, pump users can easily learn the water depth in the sump/sewage tank, the unit is centimeter.

# Duplex Pump Controller

## (DOL, 380V, Three Phase, 50Hz (Sewage / Drainage Pumps)

This controller is specially designed for sewage pumping system, by adopting level transmitter (0.5-4.5V), pump user can easily set the different liquid depth for sewage pump operation and observe the dynamic liquid depth in the sump or sewage tank.

Intelligent pump controller is an easy to use, programmable controlling & protection device for duplex sewage pump .

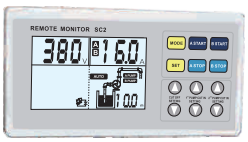
## MAIN SPECIFICATIONS

Rated Input Voltage: AC 380V/50HZ,Single Phase

Rated Output Power:0.75KW-4KW / 5.5KW-11KW / 15KW

## DESIGN FEATURES

- Double pumps control
  main pump / standby pump automatically alternate
  main pump / standby pump automatically switch malfunctions
  standby pump participate running if required
- Present Level transmitter with 0.5-4.5V analog signal
- Easily setting the different liquid depth for sewage pump operation and observing dynamic liquid depth in the sump or sewage tank.
- Eliminates the float switch or liquid sensor installed in the sump or sewage tank
- Auto / Manual switch
- Protect the pump against many faults
- Dynamic LCD displaying the real liquid depth
- Dynamic LCD displaying pump running information
- Pump accumulative running time displaying
- Pump last five fault record displaying
- Pump shaft anti rust
- Present remote monitor
- Present one dry contact point
- Grade of Protection IP 54
- Visual & Audio alarm for fault prompt



Remote Monitor

Level Transmitter

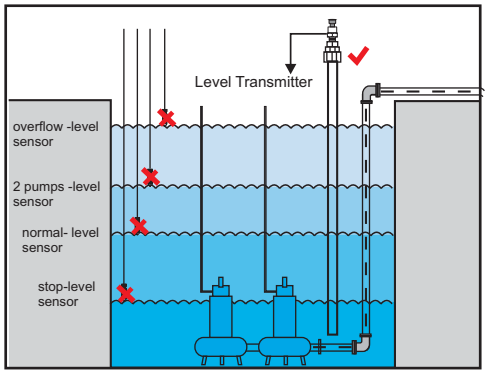
## APPLICATION

Suitable for sewage and drainage pump lifting stations.

L932-S eliminates the need for at least 5 water level sensor or 3 float switches: stop-level,normal- level for one pump, high-level for two pumps, overflow- alarm level. Thus significant cost-savings result from dramatically reduced purchasing and clearing of sensors or float switch. L932-S is also more secure because it uses level transmitter, whereas sensors or float switch often fail because of the effect of sludge.

Different water levels (depth) for starting the pumps can be entered via LCD screen directly, L932-S will start or stop the pumps running according to the different depth setting value.

More convenient and secure



# Notes :

# W I N N I N G  W A Y S

When you have a good thing going it is quite in the fitting of things that recognitions come our way. Several prestigious awards, which decorate our shelf, say it all. These rewards not only acknowledge our position as a leader in the water pump industry but also serve as reminders about what the customer expects from a winner. And we, as ever, have our ears perfectly tuned to customer expectations.

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