

SAFETY SWITCHES
CONTROL INSTRUMENTS
ACCESSORIES
PULLCORD TRIP INDICATION SYSTEM
LEVEL SENSING PRODUCTS
VIBRATION SENSORS
JUNCTION BOXES & PUSH BUTTON STATIONS

PROTOCONTROL IS NOW SMARTsaa

SMARTsaa

Proto Control

Introduction

Protocontrol brand which is established in Indian industries as a leading supplier of safety switches and control instruments from last two decades is now under flagship of SMARTsaa.
SMARTsaa offers products of Protocontrol, improved with new generation technology, advanced features, improved quality supported with efficient presale and after sale support.





Philosophy

We believe in long term relations with customer hence word 'customer' appears first in our dictionary. We believe continuous improvement in product and technology considering demands from the customers.





New Developments

We always strive for improvement in product, technology, material & method. Hence introduced many new concepts & applications to satisfy needs of customer.
We introduce Safety Pull Cord Switches having rope break detection feature for use on material handling conveyors.

We are the first in India to offer Addressable Type Pull Cord Switch Technology -Trip Indicator. This concept is now adopted by all major conveyor manufacturers in India.

We successfully introduced Disc Type Chute Block Device for material handling plants.
Our ESP Hopper Condition Monitoring Sensor is designed to resolve issue of ash level detection in ESP hoppers by non-contact way.





CONVEYOR SAFETY SWITCHES AND ACCESSORIES:

- Pull Cord Switch: Slack Rope Type
- Safety Pull Cord Switch: Tensioned Rope Type with Rope break detection
- Belt Sway Switch
- Touch Switch – Belt Sway Detector
- Heavy Duty Limit Switch
- Zero Speed Switch / Electronic Speed Switch
- Flameproof Pull Cord –Belt Sway and Zero Speed Switches
- Pull Cord Wire
- Tying Clips, Hooks, Cable Glands & Mounting Brackets





CONTROL INSTRUMENTS

- Damaged Belt Detector / Belt Weir Monitor
- Material Flow Switch
- Belt Loading Monitor
- De-Interlocking Switches
- Anti-collision switch for cranes
- Chute-Block Detector
- Boot Level Indicator
- Material Level Switch Tilt Switch
- Vibrating Fork Type Level Switch
- Paddle Type Level Switch
- Radar level Transmitter
- Wind Velocity Monitor: Anemometer
- Reverse Rotation Monitor





SPECIALISED INSTRUMENTS

- Belt Watch System
- Trip Indicator Addressable Type Pull Cord Switch System
- Cement Bag Counter- Jumbo Display Counter
- Pulse Jet Sequencer Timer
- Wireless Vibration & Temperature sensor
- Portable ESP Hopper Condition Monitor
- Coal Ash Sensor for ESP Hopper





CREDENTIALS

SMARTsaa / PROTOCONTROL is an approved vendor for major project consultants. Many project orders are executed successfully. Following are few important names.

CONSULTANTS

- NTPC Ltd
- Mecon Ltd
- CMPDIL Ltd.
- Holtec Ltd
- M.N.Dastur & Co.Ltd
- Fichtner Consulting Engineers (I) Pvt.Ltd
- ACC
- Avant - Garde Engineers & Consultants (P) Ltd.
- NPCIL Ltd
- Tata Consultancy Services

We executed many project orders for following customers

CEMENT

- ACC Ltd.
- Ambuja Cement
- Madras Cements Ltd
- Ultratech Cement Ltd
- Zuari Cement
- Dalmia Cement
- Orissa Cement
- Chettinad Cement
- India Cement
- Shree Cement
- J K Cement

STEEL

- AMNS Steel
- Rungtha Steel
- Essar Steel Ltd
- JSW Ltd.
- Lloyds Steel Ltd
- SAIL: Bhilai, Bokaro, Durgapur, Raurkela
- NMDC Ltd
- Tata Steel

POWER

- NTPC Ltd
- Adani Power
- IL&FS Power
- Lalitpur Power / Bajaj Energy
- NSPCL
- Prayagraj Power
- Tata Power
- MAHAGENCO
- Jindal Steel and Power Ltd
- Rajasthan Rajya Vidyut Utpadan Nigam Ltd
- Chattisgarh State Electricity Board
- NPCIL Ltd.
- DVC Ltd.

FERTILISER CHEMICAL

- IOCL Ltd.
- IFFCO
- Kribhco Ltd
- RCF Ltd.
- GSFC Ltd.
- GHCL Ltd.
- Coromondel Fertiliser
- DCW Ltd
- Yara Fertiliser

EPC CONTRACTORS Turnkey Project Executor

- BHEL Ltd.
- Thyssenkrupp Industries
- Kirloskar Brothers Ltd.
- Larsen And Toubro Ltd.
- Siemens Ltd.
- Vinar Systems Pvt Ltd.
- Durgapur Projects Ltd.
- ABB Ltd.
- S K Samanta & Co.
- Metso Autotech
- Sandvik Asea Ltd
- Mecgale Pneumatics
- Promac Engineering
- Wilo Mather And Platt

PULL CORD SWITCH : SERIES PC

In today's modern material handling plants multiple numbers of conveyors are used to transfer material from one location to other. SMARTsaa Protocontrol make Pull Cord Switches are used to stop the conveyor at the time of an emergency.

OPERATION:

These are conventional Slack Rope Type Pull Cord Switches. The rope is held with the help of hook and tied along the length of conveyor. The switch operates when rope is pulled. Pull Cord Switch is mounted on the walkway side of the conveyor belt, preferably at about every 30 meters. When the rope is pulled from any side, Switch gets operated. The switch is manual reset type, means unless and until the handle is reset manually to normal position, the switch remains in operated condition. NC contacts of all pull cord switches are wired in series and further connected to PLC. When any switch along the belt operates, the loop opens and conveyor is stopped.

CONSTRUCTION:

Pull cord switch is housed in dust and weatherproof Cast Al / Cast Iron / SMC enclosure with IP 66 grade of protection. Sturdy and heavy-duty Cam-Switch with robust contacts is used to give longer service life. Operating handle fitted with spring steel rings at both ends for fixing the rope. The design of the rings gives maximum flexibility in operating condition. Enclosure is epoxy painted to give high corrosion resistance. The switch is designed with manual reset type of mechanism.

FEATURES:

- Snap action / Toggle Mechanism
- Both side Operation. The switch operates when rope is pulled from either side.
- Manual reset Type the switch resets only when reset by operator.
- Heavy duty enclosure for dusty industrial use
- Special tubular silicon gasket
- Standard Cast Al./DMC/Cast Iron or Flameproof enclosure
- Retaining type stainless steel screws
- Heavy duty contacts
- Special rubber seal (0 ring) on shaft for better protection against ingress of dust & dirt
- Performance tested at reputed third party lab for 20,000 operations
- Models with indicating lamp, junction box & flag indication (refer under optional accessories).
- Can be used with Addressable Pull Cord Indication System / Belt Watch System

STANDARD SPECIFICATIONS:

- Operation: Snap action, Manual Reset Type
- Enclosure: Weatherproof, field mounting Type, IP 66 Cast Al/Cast Iron, epoxy painted, colour light grey (standard). Other colour are available as per requirement
- Output Contacts: 1 NO + 1 NC / 2 NO + 2 NC / 2 NC / 4 NC
- Contact Rating for standard models: 16 Amp resistive at 440 VAC
- SMC / DMC (FRP) / PVC enclosure for use in corrosive environment.
- Special flame proof enclosure for use in hazardous area, Group IIa, IIb, IIc, Zone 21 / Zone 22



STANDARD MODEL



PC WITH TERMINAL STRIP



WITH JUNCTION BOX



WITH INDICATING LAMP



PC JB WITH MECHANICAL FLAG



WITH JB & INDICATING LAMP

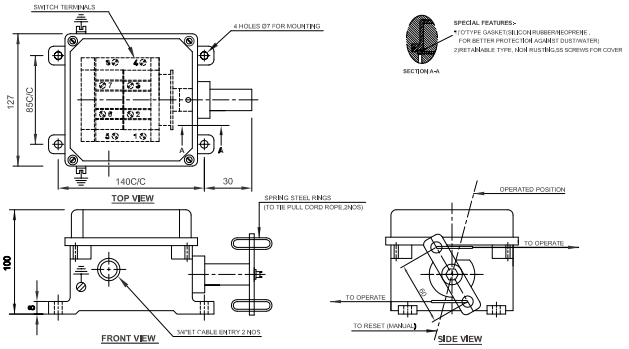


FLAMEPROOF MODEL

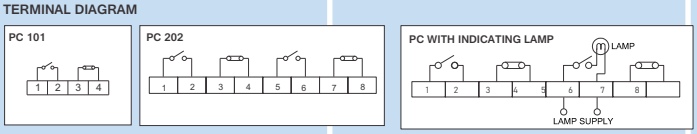


WITH RESET BUTTON

PULL CORD SWITCH : PC202 C



TERMINAL DIAGRAM



OPTIONAL FEATURES:

- Separate junction Box for termination of cables
- Indicating lamp: Long life red LED indicating lamp for indication of operated pull cord switch. Please specify lamp voltage.
  Note: For driving Indicating lamp, 1 NO switch contacts will be used. Ensure to lay additional cable for driving indicating lamp
- Mechanical flag indicator for pull cord switch
- Separate reset knob for Pull Cord Switch
- Addressable Type Pull Cord Switches: SMARTsaa Protocontrol offer complete solution for monitoring of entire plant switches at a centralized location. Please send us conveyor details (No. of switches per conveyor, conveyor layout etc.). For more details refer Page 13 for Trip Indicator.

ORDERING PROFORMA:

Please refer ordering proforma on page number 9 to select required model Type number

SPECIAL MODELS FOR SPACIAL APPLICATIONS

SMARTsaa Protocontrol developed special models of pull cord switches for use for Special applications

Pull Cord Switches for Stone Picker Application: Type:

This switch is used for use for providing additional safety for the operators working in stone picker area. The switch is provides protection against falling of operator

Pull Cord Switch for use on Automobile Conveyors / Inspection Table / Assembly Line: Type POPOSR

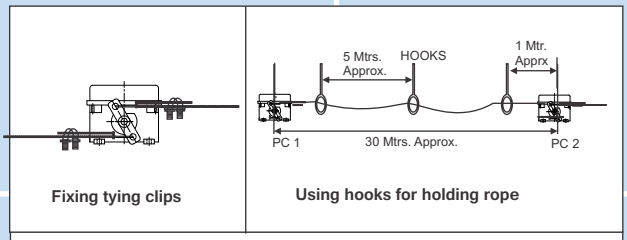
This switch is to be mounted over the head and nylon rope hangs freely. When operator wants to stop conveyor / machine he pulls the rope. The switch resets when rope is pulled once again. Design with two separate ropes for "Operate "and "Reset "is also available.

Pull Cord Switch for Small Indoor Conveyor / Wood Working Tables / Textile Machines: Type PC HR

This switch is designed for small rope length of 15 Meters. One side operated switch. The switch is provided with built in reset button. Extensively used on woodworking machines, textile machines and printing machines.

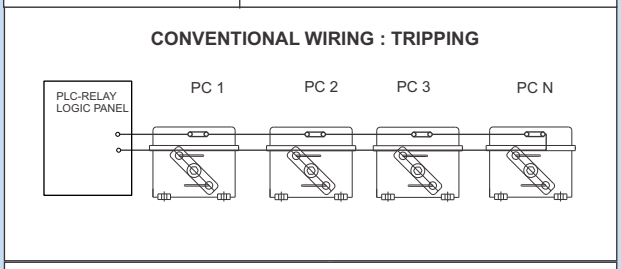
Pull Cord Switch with Reset Lever :

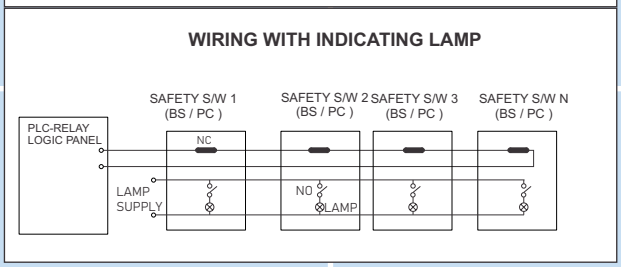
- For outdoor use.
- Provided with reset lever.
- Offers 2 C/O contact



Fixing tying clips

Using hooks for holding rope







PULL CORD SWITCHES FOR STONE PICKER APPLICATION



PO POSR
VERTICAL MOUNTING SINGLE ROPE



PC HR
SINGLE SIDE ROPE WITH RESET BUTTON



PULL CORD SWITCH WITH RESET LEVER



Plastic / Polycarbonate Enclosure

SAFETY PULL CORD SWITCH

SMARTsaa now offers new and advanced range of Safety Pull Cord Switches for use on Conveyors and critical machines.
Conventional Pull Cord Switches are slack rope type while safety Pull Cord Rope are tensioned rope type.

The switch operates when:

- Rope is Pulled
- The Rope is broken, slack, stolen or missing
- When emergency push button provided on switch is pressed



SAFETY PULL ROPE SWITCH, SINGLE SIDE OPERATION SERIES : SPC S



SAFETY PULL ROPE SWITCH, BOTH SIDE OPERATION SERIES : SPC D

Advantages :

- Single sided Pull Cord Switch is designed for rope length of 80 Meters (Usable length 50 Meters)
- Double sided Pull Cord Switch is designed for rope length of 80 Meters each side, total 160 Meters (Usable length 50 meters each side, total 100 Meters)
- Number of switches required at site gets reduced, hence reduced inventory
- Optional Additional Junction box with separate terminals for ease of wiring
- Optional LED indicator
- Robust design, totally enclosed metallic enclosure for main switch, IP67
- Switch can be used for Conveyor Guard Sensor
- The switch can be interfaced with Belt Watch System / Trip Indicator



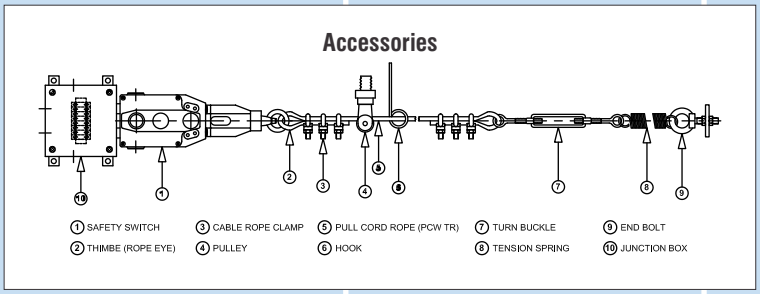
MACHINE SAFETY PULL ROPE SWITCH SERIES : SSN



MACHINE SAFETY PULL ROPE SWITCH SERIES : SSN

SPCIFICATIONS:

- Safety Pull Cord Switch with added safety feature of rope missing detection
- Rope length: Single Sided Switch: 80 Meters, Double sided switchc: Up to 80 Meters each side
- Contact arrangement: 1 NO + 1 NC, 4 NC / 2 NO, 2 NC / 1 NO,
- Contact Rating: 10 Amp resistive at 230 V AC
- Enclosure: Cast Al, Field mounting, Main switch: IP 67, Junction Box: IP 65
- Cable entry for Junction Box: ¾ inch BSP



Required Accessories:

Pull Cord Rope, Turn Buckle, Wire Rope Thimble (Rope Eye), Pulley, Stay Bolt, Spring, Hook. Quick Link, End bolt, Rope clamp



PULL CORD ROPE : PCW TR



TURN BUCKLE

Guard Sensor safety Switch

- SMARTsaa safety pull cord switch also used as guard sensor safety switch on conveyors and dangerous machines.
- Conveyor guard safety rope switch to detect removal of conveyor safety guard fixed around long conveyor. This provides 360 degree protection, increasing human safety

ORDERING PROFORMA

Please refer ordering proforma on page number 9 to select required model Type number



CABLE ROPE CLAMP



THIMBLE



HOOK



TENSION SPRING



QUICK LINK



END BOLT



PULLEY

BELT SWAY SWITCH SERIES: BS

APPLICATION:

The switch allows smooth running of the conveyor and protects it from damages by over swaying which can occur due to uneven loading of material, worn out idler roller bearings.

OPERATION:

Belt-sway switch is generally mounted on both side, preferably at about every 30 meters s and near the edge of the conveyor belt. A small clearance is allowed between contact roller and the belt edge to allow the normal running of the belt with acceptable swaying. When swaying exceeds normal limit, the belt edge pushes the contact roller, which drives the switch and operates the contacts. The switch resets automatically when the belt resumes normal running.

CONSTRUCTION:

The switch is housed in dust and weatherproof enclosure with IP 66 grade of protection. The contact roller is supported on bush / ball bearings for friction free operation. Switch mechanism is of self-reset type. The enclosure is epoxy painted to withstand harsh climate.

FEATURES:

- Normal action switch mechanism, spring return type
- The cam mechanism is with heavy duty coil spring giving long life even after prolonged over travel of roller
- Heavy duty enclosure for dusty industrial use
- Special tubular silicon gasket
- Standard Cast Al. / DMC / PVC / Cast Iron or Flameproof enclosure.
- Retaining type stainless steel screws
- Heavy duty contacts
- Special rubber seal (0 ring) on shaft for better protection against ingress of dust
- Performance tested at reputed third party lab for 20,000 operations.
- Models with indicating lamp, junction box

STANDARD SPECIFICATIONS:

- Reset: Auto / Spring Reset
- Enclosure: Weatherproof, field mounting Type, IP 66 Cast Al / Cast Iron, epoxy painted, colour light grey (standard) other colour are available as per requirement.
- Output Contacts: 1 NO + 1 NC / 2 NO + 2 NC / 2 NC / 4 NC
- Contact Rating for standard models: 16 Amp resistive at 440 VAC
- SMC / DMC (FRP)/ PVC enclosure for use in corrosive environment.
- Special flame proof encl. for use in hazardous area, Group IIa, IIb IIc, Zone 21,Zone 22

OPTIONAL FEATURES:

- Separate junction Box for termination of cables.
- Indicating lamp: Long life red LED indicating lamp for indication of operated belt sway switch. Please specify lamp voltage.
- With roller shaft and main shaft supported on pre lubricated ball bearing for extra smooth operation
- Addressable Type Belt Sway Switches: SMARTsaa Protocontrol offers complete solution for monitoring of entire plant switches at a centralized location. Please send us conveyor details (No. of switches per conveyor, conveyor layout etc.). For more details refer Page13 on: Trip Indicator.

BELT MISALIGNMENT SENSOR Touch Switch Series: TS is designed to detect tracking and misalignment problems on bucket elevators and conveyors. It consists of Sensor and Control Unit. The sensor is to be mounted such that when a belt misaligns or a pulley moves over and pushes the sensor face and potential free relay contact is actuated in control unit.The relay contact is used to generate alarm and shutdown the machine. The face of the sensor is made from hardened stainless steel, so that there is virtually no wear when a belt contacts it. The sensor is not affected by dust or material build up and will still work when completely covered by material. Sensors are normally installed in pairs on opposite sides of the machine.

SPCIFICATIONS:

- Sensor Enclosure: Cast Al with Hardened steel face.
- The Sensor can be flange mounted or L Bracket Mounted Type
- Control Unit: Cast Al, IP 65
- Control Supply: 230 V AC
- O/P: 2 NO + 2 NC relay contact rated for 5 Amp



STANDARD MODEL



WITH JUNCTION BOX



WITH TERMINAL STRIP



FLAMEPROOF MODEL



WITH SPECIAL ENCLOSURE



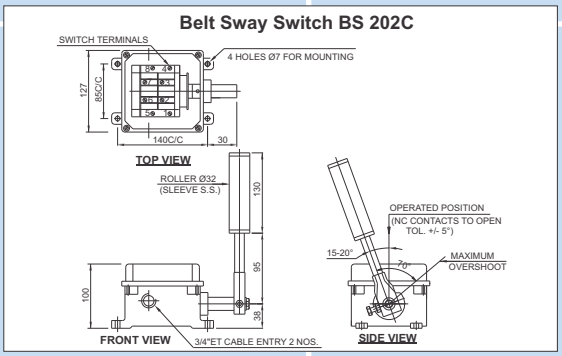
SWITCH MOUNTING ARRANGEMENT



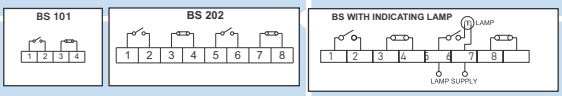
BELT MISALIGNMENT SENSOR TOUCH SWITCH

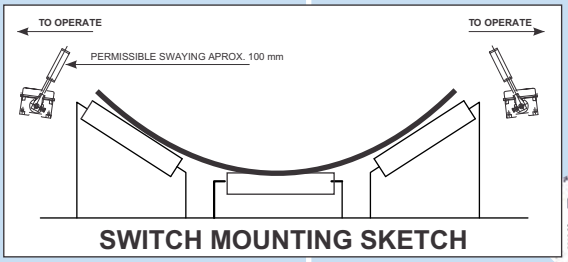


BELT MISALIGNMENT SWITCH CONTROLLER



TERMINAL DIAGRAM





HEAVY DUTY LIMIT SWITCH: SERIES: HDLS

APPLICATION:

Heavy duty limit switch are extensively used on EOT cranes, conveyors, transfer cars, elevators, steel mills and mobile / material handling Equipments for sensing of end limits and position sensing.

OPERATION:

The equipment pushes the switch roller / lever actuating the switch contacts. The heavy duty actuating mechanism is designed to absorb hits of heavy machinery without damaging the internal mechanism. Limit switches are enclosed in heavy duty weatherproof enclosure. The roller/ lever handle can be provided with special sizes and design to suit specific requirement.

CONSTRUCTION:

The switch is housed in dust and weatherproof enclosure with IP 65 grade of protection. The contact roller / lever can be provided in various shapes.



SPRING RETURN ROLLER LEVER
HDLS SR



TOGGLE ACTION LEVER
HDLS SPV2



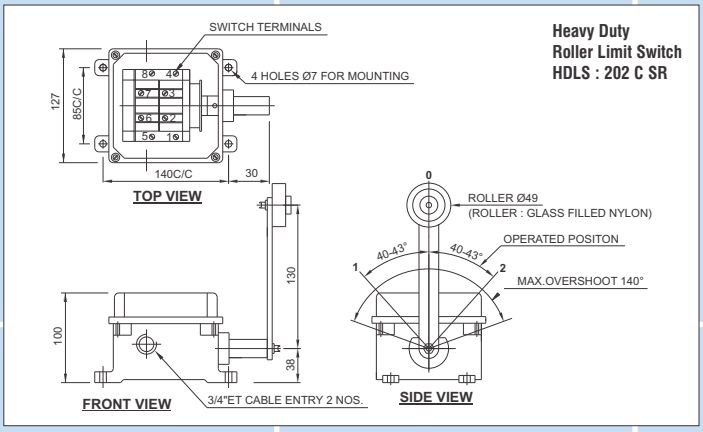
WITH JUNCTION BOX
TOGGLE ACTION V LEVER
HDLS SPV



Miniature Limit Switch

STANDARD SPECIFICATIONS:

- Enclosure : Weatherproof, field mounting Type, IP 66 Cast Al/Cast Iron, epoxy painted, colour light grey (standard) other colour are available as per requirement. DMC (FRP)/ PVC enclosure for use in corrosive environment.
- Output Contacts: 1 NO + 1 NC / 2 NO + 2 NC
- Contact Rating for standard models: 16 Amp resistive at 440 VAC
- Output Contacts: 1 NO + 1 NC / 2 NO + 2 NC
- Special flame proof enclosure for use in hazardous area, Group IIa, IIb IIc , Zone 21, Zone 22



OPERATING MECHANISM:

Two types of levers are available.
1. Spring Return roller lever
2. Toggle / Snap Action V Lever

Contact Operation :

Two types of contact operation :
1. Both Contact set operates simultaneously when roller position changes
2. Direction Dependemnt contact operation

ORDERING PROFORMA:

Please refer ordering proforma on page No.9 to select required model number

OPTIONAL COMMISSIONING SPARES FOR PULL CORD –BELT SWAY-HEAVY DUTY LIMIT SWITCH:

Following accessories are offered optionally with above switches .These accessories are specially developed for reducing installation time at field.

Pull Cord wire GI: **Type: PCW**: 6x7 GI wire construction, Strand material: GI / MS covered with PVC diameter approx. 5-6 mm specially extruded for material handling plant use.

Pull Cord Wire SS: **Type: PCW SS**: 6x7 GI wire construction, Strand material: SS, covered with PVC diameter approx. 5-6 mm specially developed for saline / sea shore area use.

Pull Cord Wire, Type : PCW TR: Specially developed for use with Safety Pull Cord Switch, High Tensile Strength : 6x7 GI wire construction, Strand material: High Tensile strength Steel, covered with bright Red PVC diameter approx. 5-6 mm.

Tying Clips: **Type: BDC**: Two tying clips are required per pull cord switch for tying pull cord cable to switch

Hook Plain: Type: HP: Pull cord rope passes through the hooks, which are placed approx. 3 Meters apart. Hooks to be welded to the structure

Hook Threaded: Type: HT: Details as above. Threaded type.

Mounting Plate /Bracket: **Type : MB** :Mounting plate made of sheet steel, 3 mm thick, powder coated for mounting switches. Suitable holes are made to mount SMARTsaa make switches.

Mounting Bracket Special: **Type MBS:** We also supply special mounting brackets for mounting our switches at places where earlier other make switches are used. Please specify type number and drawing of other make switches.

Cable Gland: Type CG: Nickel Cr plated brass Size 3/ 4 inch ET / Flame Proof / SS

Canopy Plate/Protective Plate: Type PP: SMARTsaa switches are heavy duty type, designed for outdoor use and no canopy plate is recommended. However special protective plate is offered where there is chance of excessive falling material on switch. This protective plate is to be welded to the structure at suitable height.



PULL CORD ROPE : PCW



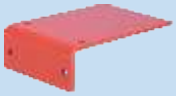
TYING CLIPS : BDC



HOOKS : HP HT



CABLE GLANDS :CG



MOUNTING PLATE : MP



CANOPY- PROTECTIVE PLATE : PP

Model Selection for Pull Cord, Belt Sway and Heavy Duty Limit Switch, Damaged Belt Detector :

Gr.1. Series:	
Pull Cord Switch, Manual reset	**PC**
Safety Pull Cord Switch, Single Sided, With Rope Break Detection, Rope span: 80 Mtrs	**SPCS**
Safety Pull Cord Switch, Double Sided, With Rope Break Detection, Rope span: 160 Mtrs	**SPCD**
Belt Sway Switch (Self reset type)	**BS**
Belt Sway Switch with two sets of contacts (1 NO+ 1NC for alarm and 1 NO +1 NC forTrip)	**BS2C**
Heavy Duty Limit Switch: Spring Return Type	**HDLS SR**
Heavy Duty Limit Switch with direction dependent contact (1NO+1NC for each direction)(Gr 2 must be 202)	**HDLS SR 2C**
Heavy Duty Limit Switch: Toggle (Stay Put) Type V Lever	**HDL SPV**
Damaged Belt Detector, Rope Type	**DBD R**
Gr.2: Number of Contacts:	
1 NO + 1 NC	**101**
2 NO + 2 NC	**202**
2 NO + 4 NC (Gr 1 should be SPCD)	**402**
2 NC	**002**
4 NC	**004**
2 C/O (Gr 1 should be DBD R)	**020**
Gr.3: Enclosure:	
Cast Al, Improved Protection, IP 66	**C**
Cast Al, Improved Protection, IP 66, Round Enclosure, (Gr 2 should be 020)	**R**
Cast AL, IP 67 for main switch enclosure (Gr. 1 should be SPCS or SPCD)	**S**
Corrosion resistance, SMC/ DMC/Plastic enclosure, IP 66, (Gr 1 should not be SPCD and SPCS)	**D: DMC P: PLASTIC**
Flame proof enclosure IP 65, suitable for Gas Gr IIa,IIb and Iic	**F**
Flame proof enclosure IP 65, suitable for Gas Gr IIa,IIb and Iic Zone 21, Zone 22 ,(Gr 1 should not be SPCD and SPCS)	**F2**
Cast Iron, IP 65 (Gr 1 should not be SPCD and SPCS)	**CI**

Gr.4: Accessories: (Add suffix If required)	
No accessories	**No adder**
Separate Junction Box, IP 65, Gr 2 should not be CI	**JB**
Accessories package for SPCS	**S1**
Accessories package for SPCD	**S2**
Indicating Lamp, 230 V AC Supply	**ILA1**
Indicating Lamp, 110 V AC Supply	**ILA2**
Indicating Lamp 24V DC Supply	**ILD**
Indicating Lamp, Universal supply 24 -230 V AC DC	**ILU**
Mechanical Flag Indication (Gr. 1 should be PC)	**MF**
With separate reset button (Gr.1 should be PC) (Gr 3 should not be F, F2)	**RB**
With Separate reset lever (Gr.2 should be 020, Group 3 should be R)	**RL**
Switch without separate JB but with terminal strip	**TS**
Cable Gland, single compression Type	**CGS**
Cable Gland, double compression Type	**CG**
Cable Gland, Double compression, Brass, Flameproof Type	**CGF**
Cable Gland, double compression Type, SS	**CGSS**
With Local Emergency Push Button (Gr.1 should be SPCS or SPCD)	**PB**
Additional Canopy / Protective plate	**PP**
Mounting Plate for PC/BS and HDLS, MS, 3 mm, Powder coated	**MP**
Height Adjustable Mounting Bracket for BS, MS, Powder Coated	**MB**
Tag Plate	**TP**
Tag Plate SS	**TPS**
Mounting hardware, Bolts M 6 x 25, 4 No	**H**
Gr. 5: Special:	
Special Colour (Other than our standard Light Grey, IS 631)	**S**
Special additional certifications if required, please specify	**C**
Roller position for BS, roller at center	**D**
Cable Entry other than ¾ inch, please specify	**O**

Typical ordering code | PC202 | C | JB | ILA | CG |

Now a day in material handling plants under / over speed monitor is one of the essential control and safety device.

APPLICATION:

Electronic Speed Monitor is used to monitor speed of conveyors, crushers, rolling mills, agitators, mixers, stirrers, screw conveyors, and other industrial machinery. This device actuates relay contacts at pre-set speed. Using these contacts desired control action such as zero speed protection / under speed protection / over speed protection can be achieved.

OPERATION:

The basic principle of speed monitor is comparison of pulses received from sensor with standard pulses. The unit consists of two parts: "SENSOR PROBE" and CONTROL UNIT. The sensor is to be installed with its sensing face in close proximity of rotating object. On this object, flags are to be fixed. The sensor produces strong electromagnetic waves, which get disturbed by the flags, giving rise to corresponding pulses. These pulses are fed to the control unit where they are compared with standard pulses to sense the speed.

ADVANTAGES:

- It senses speed by non-contact way. No moving parts. No wear and tears of rollers or misalignment of couplings.
- Easy speed setting.
- Built in initial by-pass time delay arrangement.
- Speed setting possible from 1 RPM to 5000 RPM in optional ranges.
- Totally enclosed sensor, works in presence of dust, dirt water, oil & chemicals.
- Direction sensing and speed monitoring of various locations from single point is possible
- Intrinsically Safe Sensors and speed switches with Flameproof Enclosures are available for use in Hazardous area

SPECIFICATIONS:

Sensor Probe:
Totally enclosed, IP 67, Inductive Type suitable for use in harsh, dusty and oily environment. Do not get effected by immersion under dust wand water
Enclosure: Tubular, Ni-Cr plated Brass enclosure, M 30 size with two check nuts (Refer group 4 of ordering proforma for other options)
Control Unit:
Enclosure: Field mounting IP 66, Cast Al / Din Rail IP 30 / Corrosion proof SMC / DMC /FRP / Cast Al Flame Proof (Refer Gr.2 of ordering proforma
Output: 2 NO+ 2 NC / 2 C/O relay contact, Rating 5 Amp resistive at 230 V AC) (For other combination of contacts refer Gr. 7 or ordering proforma).
With LED indication for Supply ON, Sensor ON and Relay ON
Initial Time Delay: Initial time delay facility to allow the rotating mechanism to achieve the desired speed is provided. Standard delay is 0-30 sec. This delay is available in Under Speed / Zero speed Monitors

Special Models:

- With Digital Display for set speed and continuous indication of equipment speed
- With 4-20 mA O/P
- With RS 485 MODBUS O/P
- Reverse Rotation Monitor for CW Pumps
- Digital Tachometer

OPTIONAL COMMISSIONING SPARES

- Junction box for sensor probe
- Flag Assembly
- Mounting Bracket for Sensor Probe
- Mounting Plate for control unit
- Cable Gland



ESM 1W, FIELD MOUNTING ENCLOSURE



ESM 1R
DIN RAIL ENCLOSURE



FLAMEPROOF ENCLOSURE



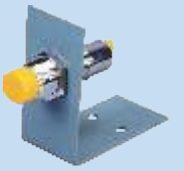
DIGITAL TECHOMETER



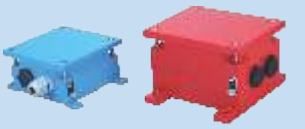
POLYCARBONATE ENLOSURE



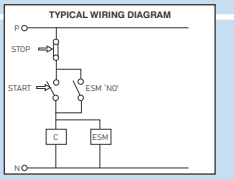
FLAG ASSEMBLY

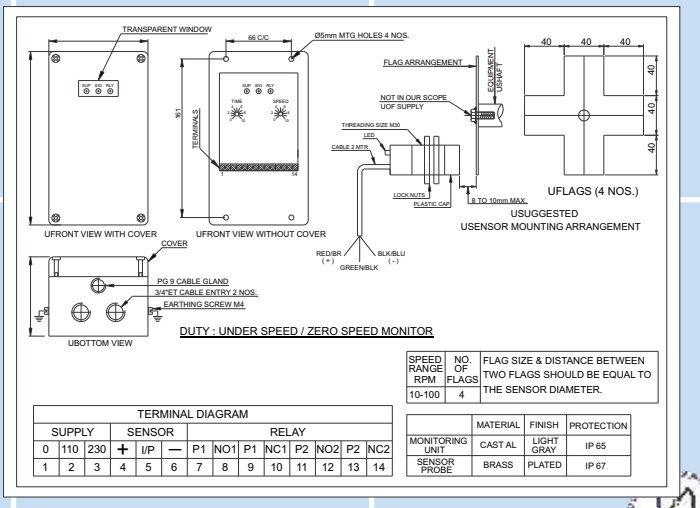


MOUNTING BRACKET
FOR SENSOR PROBE : MS



JUNCTION BOX : JB





SPEED RANGE RPM	NO. OF FLAGS	FLAG SIZE & DISTANCE BETWEEN TWO FLAGS SHOULD BE EQUAL TO THE SENSOR DIAMETER.
10-100	4	

TERMINAL DIAGRAM

SUPPLY			SENSOR			RELAY						
0	110	230	+	I/P	—	P1	NO1	P1	NC1	P2	NO2	P2	NC2
1	2	3	4	5	6	7	8	9	10	11	12	13	14

	MATERIAL	FINISH	PROTECTION
MONITORING UNIT	CAST AL	LIGHT GRAY	IP 65
SENSOR PROBE	BRASS	PLATED	IP 67

Series ESM is available in- following versions.
ESM 1: Specially developed for conveyor application. Detects conveyor belt breakage, overload, bearing damage and provide relay contacts for interlocking. The sensor is to be mounted in front of tail end pulley. Fix required number of objects (flags) on the pulley and these objects are sensed by sensor. This model is provided with potentiometric setting.

- Suitable speed range is to be selected from six optional speed ranges 1-10, 10-100.5-50, 50-500,100-1000 and 500- 5000 RPM.
- With supply ON', Relay ON' and 'SENSOR LED Indication.
- NO contact is to be used in interlocking circuits. With built in initial bypass time delay circuit to allow the conveyor to achieve normal speed at the time of starting
- Special optional facility to multiply speed range x10 & x100. (Refer ord. proforma Gr.3 option 9).One common model can be used for all conveyors.

SALIENT FEATURES: ESM 1W / ESM 1 F:

- Most compact and easy to use
- Easy speed setting by potentiometer
- Built in Initial bypass time delay to bypass speed switch at the time of starting the conveyor
- Robust, totally enclosed, IP 67, Inductive type speed sensor
- Field Mounting Die Cast Al enclosure for controller, IP 66 Potential free relay contacts for interlocking

MODELS AVAILABLE IN SERIES ESM 1:
Speed Switch type ESM 1R: Din Rail mounting, IP 30 Panel mounting enclosure, Potentiometric setting
Speed Switch type ESM 1W: Weatherproof, field mounting, IP 65 enclosure, Potentiometric setting
Speed switch type ESM 1 F : Flame-proof enclosure for use in hazardous area with intrinsically safe sensor and control circuit
Speed Switch type ESM 2W With Digital Display for set speed and continuous indication of equipment speed
Speed Indicator Tachometer ESM 4

- With 4-20 mA O/P
- With RS 485 MODBUS O/P

Reverse Rotation Monitor for CW Pumps

ADDITIONAL SPECIAL MODELS

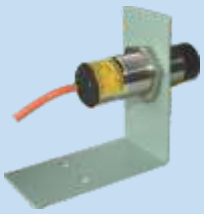
MINIATURE COMBINED SPEED SENSOR + CONTROLLER: ESM 1B2
Developed for small conveyors and rotating equipment's. Sensor as well as controller circuit is housed in sensor probe, Size M30. It actuates O/P device like relay / PLC when equipment speed drops below set value. Speed setting and initial time delay adjustment done with miniature trim pots provided at the back of sensor. O/P device like relay-PLC (DC models) or Contactor (AC models) is to be housed in panel.
Type: ESM 1B2 XX1U7P: 24 DC supply
Type: ESM 1B2 XX1S6P: 240 AC supply

MICRO CONTROLLER BASED SPEED INDICATOR SWITCH: SERIES: ESM 2

FEATURES:

- Micro Controller based circuitry packed with customer friendly features. Same speed monitor is used for indication of RPM or MPM (Linear speed)
- Selectable number of flags: Enter number of flags which are
- Relay contact O/P for Tripping
- Digital Display
- Adjustable trip delay
- Settable hysteresis
- Special models for combined under over speed monitoring duty
- Special models with 4-20mA/RS232/RS485 retransmission facility.

DIGITAL TACHOMETER: SERIES: ESM 5
It receives input from Transducer (like Proximity switch) or analogue input (from transmitter) and indicates speed in RPM, MPM or any other unit. Rotational / linear speed indication is possible. The unit is enclosed in panel mounting (cut out 92 x 92) or dust proof, field mounting or flame proof enclosure.



Combined Sensors + Controller
ESM B2



ESM 2,6,FIELD MOUNTING
DIGITAL DISPLAY



DIGITAL SPEED SWITCH IN
POLYCARBONATE HOUSING



DIGITAL TACHO METER



MICRO CONTROLLER
BASED SPEED INDICATOR

MODEL SELECTION for ELECTRONIC SPEED SWITCH	ESM
Gr.1: Application	
Electronic Speed Switch for Under Speed Monitoring	1
Electronic Speed Switch with Digital Display	2
Electronic speed switch for over speed monitoring	4
Electronic Speed Indicator (No control O/P)	5
Electronic Under + Over Speed Switch with Digital Display	6
Gr2: Enclosure for Control Unit	
Din Rail Mounting (35 mm), Safe area use, (Group 1 Should not be 2,5,6)	R
Din Rail Mounting (35 mm) Intrinsically safe circuit (Group 1 Should not be 2, 5, 6)	N
Field Mounting, Cast Al, IP 65	W
Field Mounting, Plastic / Polycarbonate / SMC / DMC	P
Front Panel Mounting, IP30 (Group 1 must be 2, 5)	D
Flame Proof, Field Mounting IP65 (Sensor Group must be N)	F
Combined Sensor + Controller in sensor probe housing (Gr 1 should be 1,Gr 4 : S,H,E, ,Gr 5 :1,Gr 7: 6,7, Gr 8: L	B2
Gr. 3: Contact Actuation Speed Range:	
Only Indicator, 1-9999 RPM, (2 Flags) (Gr.1 selection must be 5)	0
1-10 RPM (8 flags)	1
5-50 RPM (4 Flags)	2
10 - 100 RPM (4 Flags)	3
100 -1000 RPM (4 Flags)	4
50 -500 RPM (4 Flags)	5
500 -5000 RPM (2 Flags)	6
1000-10000 RPM (2 Flags)	7
Other (Please specify)	8
5-5000 RPM by speed range selector	9
Gr.4: Sensor Probe	
Tubular threaded, with two check nuts, Ni Chrome Plated Brass with 2 Mtr 3 core PVC cable	
M30 Sensing range 10-12 mm nominal, 8-10 mm operational	S
M50 Sensing range 15-17 mm nominal, 12-15 mm operationa	E
M70 Sensing range 25-30 mm nominal, 20-25 mm operationa	H
Intrinsically Safe, For Use in hazardous area, M30 Sensing range 10-12 mm (Group 2 should not be B2)	N
Intrinsically safe, other than M30,(Group 2 should not be B2)	NO
Square Type, Plastic Sensing range 50 mm nominal,40 mm operational	B
Special Cast Al heavy duty enclosure for sensor probe (for M 30 & M 50 sensor)	D
Other (Please Specify)	O
Gr. 5: Time Delay	
Initial Time Delay (3-30 sec)	1
Nuisance Time Delay with Initial Time Delay	2
Other (please specify)	3

Gr.6: Control Supply Voltage	
110 / 230 VAC 50 Hz. (Gr 1 should be 1)	S
230 V AC,50 Hz	T
110 VAC 50 Hz.	V
24 VDC	U
Other (Please Specify)	O
Gr.7: Out Put Contact	
2 NO+ 2 NC, 5 Amp (Not available when Gr 2 is R, N, F)	1
2 C/O 5 Amp	2
2 C/ O 10 Amp	3
2 NO+2 NC, 10 Amp	4
Other (Please Specify)	5
Gr.8: Setting	
Potentiometric	P
Key pad (Gr. 1 selection must be 2)	K
Gr.9: Optional Facility: Add suffix If required	
Retransmission O/P, 4-20mA	1
MODBUS RS 485 (Gr 1 should be 2, 6)	2
Gr.10 Optional Accessories, Add suffix if required	
Extra Junction Box for sensor	JB
Flag Assembly	F
Mounting Bracket for sensor	MS
Mounting Plate for Control Unit	MP
Cable Gland for Control Unit, Double Compression Type, ¾ inch, BSP, Brass, 2 Nos.	CG
Gr 11: Special, Add suffix	
Special Colour for control unit	S

Typical ordering code: ESM 1 W 3 S 1 S 1 P JB

BELT WATCH SYSTEM / ADDRESSABLE PULL CORD INDICATION / TRIP INDICATOR SYSTEM

Unique, proven product for large material handling plants where multiple numbers of switches are connected in series. Trip Indicator is developed to give exact indication of operated switch in control room



Trip Indicator

ADVANTAGES:

- Most advanced method of locating operated Switch with Instant indication, & tripping
- Time required to search for operated switch is eliminated.
- Communication through two core cable only, less cable cost and cable laying cost
- Interchangeable Communicating card
- RS 232 / RS-485 MODBUS O/P, PLC interface for fault logging.
- Miniature size of communication cards Fail safe circuit
- Specially suitable for high length conveyors
- Scrolling Display of multiple operated switch
- Roll call Feature: Indicates missing of communication card.
- General Field problems like: Cable open. Cable short are indicated on Trip Indicator
- Redundant O/P: Optional
- Trip Indicator: Effective working even if switches are filled with water



Belt Watch Panel for Single Conveyor



Trip Indicator Plant Management Panel

PRINCIPLE OF OPERATION:

A small communication card is to be wired inside the conventional safety switch. The trip indicator is to be installed in suitable location like control room. When any switch is operated, the location number of operated switch is displayed on the Trip Indicator. The trip indicator is also provided with relay output which can be interlocked with existing relay logic circuit.

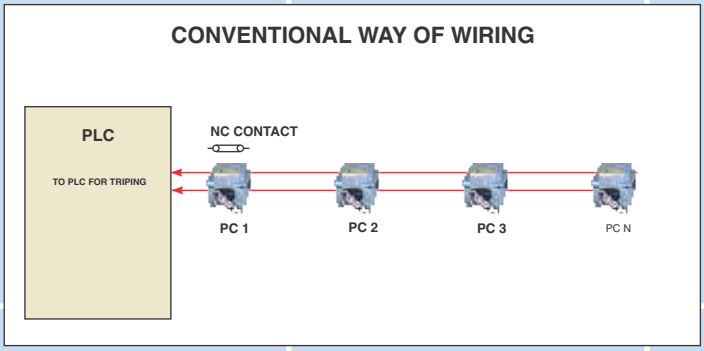
FUNCTIONAL DESCRIPTION:

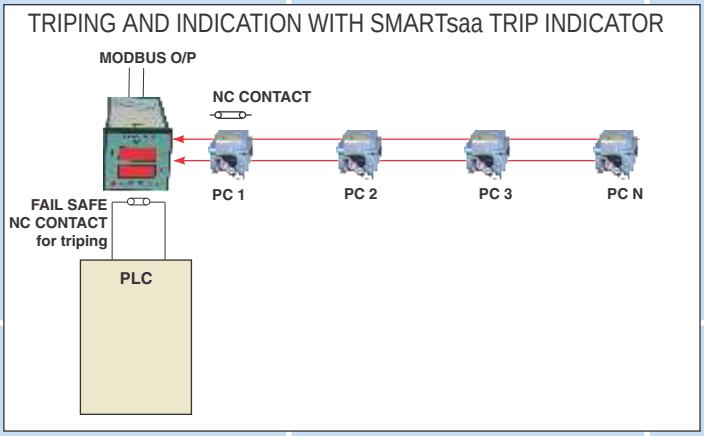
Various models are available depending on number of safety switches/ length of belt, number of conveyors, configuration of communication o/p etc. However all models will have following basic features. When any safety switch is operated, the O/P relay of trip indicator is operated, tripping conveyor instantly. Operated switch number is also displayed and communicated to PLC / DCS as per requirement. All safety features are incorporated along with special features as mentioned below.b To offer you suitable model,
please inform us :

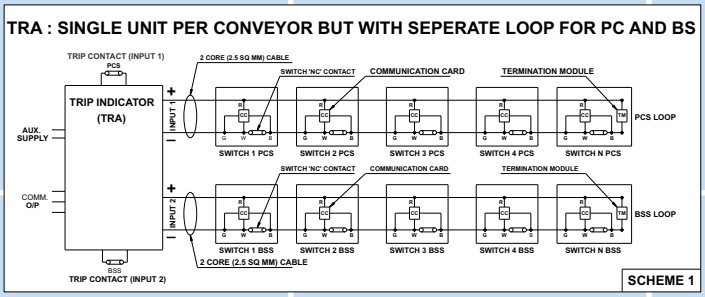
- Conveyor Number and number of switches on each conveyor
- No of loops connected to one Trip Indicator (We recommend grouping
- of one conveyor to one trip indicator)
- Total Length of conveyor
- Location of Trip Indicator
- Type of O/P required from Trip Indicator: 4-20 mA, RS 485 MODBUS

We also offer complete plant management system for pull cord switches.
To offer you most appropriate system, we require following details
1. Plant Layout informing conveyor numbers and locations
2. No of Belt Sway and Pull Cord Systems on each conveyor
3. No of groups per conveyor (like Belt Sway and Pull Cord) and number of Groups per Trip Indicator
3. Length of conveyor
4. Location of Trip Indicator
5. Location of Panels for multiple trip indicators
6. Make of DCS and communication Type
7. Type of O/P required from Trip Indicator

Please ask for catalogue for more details







CHUTE BLOCK SWITCHES / LEVEL SWITCHES FOR SOLIDS, POWDERS AND GRANULES

SMARTsaa developed entire new range of RF Admittance / Capacitance / Tilt Type / Diaphragm Type / Radar Type Level switches for variety of applications like: Chute Block Sensing, Boot level Sensing, Stock Pile Level Sensing, and Level Sensing of materials in hopper & Fly Ash Level Sensing in ESP hoppers.

We are pioneer in designing first Disc Type Chute Block Switch in India. Used for sensing level of almost all solids. Designed using state of the art concept of "Coat Guard Circuit" which eliminates problem of false tripping due to deposition of material on sensor probe.



DISC TYPE : RFLS D



ROD TYPE : RFLS R

RF ADMITTANCE DISC PROBE: SERIES RFLS D: CHUTE BLOCK SWITCH FOR HOPPERS

Suitable for sensing material jamming in a compact chute. Designed for mounting at the bottom of the hopper. As the disc probe does not come in the path of the material it does not block the passage and hence does not affect the material flow. Ideal for almost every material solid, powder & granule having particle size up to 30 mm

RF ADMITTANCE ROD PROBE: SERIES RFLS R : CHUTE BLOCK / BOOT LEVEL / LEVEL SWITCH

The probe is to be inserted in the walls of hopper at required level point. When material level rises and touches the probe the contact is actuated. Suitable for almost every material solid, powder, granule, dry and wet having particle size up to 30 mm. As the probe is to be inserted in the hopper user has to ensure proper location for minimum abrasion. Provide proper canopy for long use. Special probe for working in high abrasion area and having temp range up to 450 degree cent.



ROPE TYPE : RFLS C



TILT TYPE : TLS

RF ADMITTANCE ROPE PROBE: SERIES RFLS C: STOCK PILE LEVEL SWITCH / TOP MOUNTED LEVEL SWITCH

The probe is to be hanged from the top in the hopper. The probe length is selected such that the bottom tip of sensor reaches at required level point. When material level rises and touches the probe the contact is actuated. Suitable for almost every material solid, powder, granule having particle size up to 30 mm.

TILT SWITCH: SERIES TLS: LEVEL SWITCH FOR HOPPER

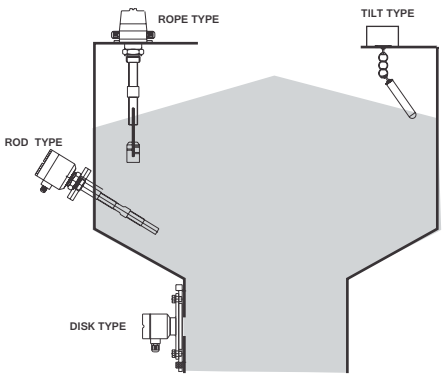
Developed for sensing level of stockpile on stacker-reclaimer or sensing level of material in hopper. The freely hanging probe when gets tilted with material, switch is actuated. Reliable level switch for heavy solids and lumps

The TILT probe is to be hanged from the top in the hopper or supported on the walls of hopper at required locations. When material level rises, makes a cone in the hopper. When the material touches the probe and the probe gets tilted, the contact is actuated. Suitable for almost every material solid, powder, granule but only for dry free flowing solids.

As the probe is to be hanged in the hopper user has to ensure that the falling material flow does not fall directly on the sensor.

The TILT probe is to be hanged from the top in the hopper or supported on the walls of hopper at required locations. When material level rises, makes a cone in the hopper. When the material touches the probe and the probe gets tilted, the contact is actuated. Suitable for almost every material solid, powder, granule but only for dry free flowing solids. As the probe is to be hanged in the hopper user has to ensure that the falling material flow does not fall directly on the sensor.

MOUNTING LOCATIONS OF CHUTE BLOCK SWITCHES



To quote proper model Chute Jam Device / Level Switch: Please inform us

1. Size of hopper, chute (Please send drawing of chute)
2. Mounting from sides / Top
3. Material to be sensed and its particle size
4. Specify, material is with moisture contains or free flowing
5. Supply voltage
6. The controller is to be located with the sensor or remote type (to overcome vibration)
7. Max temperature of material
8. Abrasion properties of material (to prove suitable coating on sensor probe)

LEVEL SWIITCHES FOR POWDER, SOLID, LIQUID AND SLURRY

In material handling industries variety of level sensors are used. Rough operating conditions in material handling plants demands for reliable and robust design of sensor and control circuit.

With experience of more than 26 years in this field, SMARTsaa offers variety of level switches for use in hoppers, silos, bucket elevators & stacker reclaimer for sensing level of cement, clinker, coal, sand, iron ore, fly ash, alumina, sinter, limestone and coke.

We offer simple level switch to complex level transmitter. Few applications are:

- Level switches and transmitters for liquid sumps and slurry
- Level Switch for powder, granules and solids
- Boot Level Detector for Bucket Elevators
- Stock pile level detection for boom conveyor
- Sensing level of crushed stone and ore in quarry
- Sensing level in clinker silo
- Level sensing of cement silo
- Level sensing of coke, coal in steel and power plants
- Level sensing for cereals, rice, husk, paddy & floor
- Sensing level of fertilisers, chemicals and raw materials
- Sensing level of fly ash in power plants
- Non-Contact level measurement of coal ash in ESP Hoppers
- Portable Hopper Condition Monitor
- Radar Level Transmitter for hoppers and silos

We offer: Level Switches and transmitters for Liquid and slurry:

- Cable Ended Level Switch
- Side Mounted and Vertically Guided Level Switches
- Conductivity Type Level Switches
- Ultrasonic and Radar level Transmitters for liquids



SIDE MOUNTED TYPE



RF ADMITTANCE TYPE



VIBRATING FORK TYPE



RFLT RF CAPACITANCE LEVEL TRANSMITTER



DIAPHRAGM TYPE



PADDLE TYPE

VIBRATING FORK TYPE LEVEL SWITCH: SERIES VFLS

For free flowing, non-sticky powders and granules. Particle size up to 10 mm.

Vibrating Rod Type Level Switch: Series VRLS For mud, slurry and powders

PADDLE TYPE LEVEL SWITCH: SERIES: PLS

Simple level switch powder and granules provided with heavy duty motor which do not burn under locked rotor condition

DIAPHRAGM TYPE LEVEL SWITCH: SERIES DLS

Reliable and low cost level switch for sensing level of dry and free flowing powder and granules. Boot level detector for bucket elevator, level switch for sensing level of food grains in hopper.

ULTRASONIC AND RADAR LEVEL TRANSMITTERS:

Non-contact measurement specially offered for dusty and corrosive environments

Long range products up to 125 Meters Analogue 4-20 mA O/P Local Indication

Offered with communication O/P for direct interfacing with SCADA



ULTRASONIC / RADAR TYPE

ESP HOPPER CONDITION MONITOR PORTABLE UNIT: SMARTsaa CAS PT

SMARTsaa offers an innovative product first time in India, to detect level of Coal Ash in ESP Hopper by non-contact way. It uses Naturally Occurring Gamma-ray Sensor Technology & do not require any Gama Ray Source and do not require any certification formalities. Detects gamma rays emitted from coal ash from outside the hopper by non-contact way.

SALIANT FEATURES:

- Detects ash level in ESP Hopper by non-contact way in just two minutes
- Portable Model, supplied with portable power supply
- Gives ash quantity % in ESP hopper
- Indicates rat hole formation
- Indicates ash deposition on the inside walls of hopper
- Provides 4-20 mA O/P for continuous monitoring duty (if required)
- Single Sensor can be used for checking condition of multiple hoppers
- Resolves dispute between operation staff and maintenance staff by giving correct level and condition of hopper



COAL ASH CENSOR



POWER SUPPLY

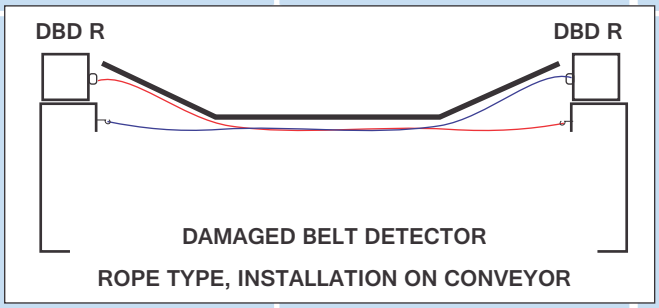


EASY SENSING

Conveyor belts are subject to wear and tear during operation. Repairs like vulcanization and splicing have to be carried out from time to time. In large conveyor plants, impending belt damages are not always noticed in advance. SMARTsaa make Damaged Belt Detector Series: DBD detects belt damages at an early stage. Parts of the belt have come off in shreds. Steel ropes stand off from the belt. Belt edges are torn. Facing of repair point have come off. Slices are defective. Sharp object protruding through the belt fabric Damaged Belt Detector is to be mounted in pairs, positioned on either side of the belt. The units are connected by two spans of special PVC coated cable. One end of the cable mounts permanently to a support bracket and the other end is connected to a spring loaded ball located in a DBD unit. The switch gets actuated when an object or broken belt surface sweeps away one or both cables pulling spring loaded ball out of socket. DBD R is to be ordered in pairs. To be installed in a span of 10-20 Meters below conveyor after discharge chute. One pair can also be used below return belt after return pulley to detect damage on top belt surface.



DAMAGED BELT DETECTOR
ROPE TYPE



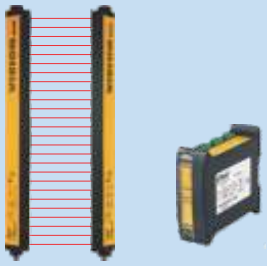
SPECIFICATION OF SERIES DBD R

Enclosure: Heavy Duty Cast Al, IP 66
Output: 2 C/O contact rated for 10 Amp resistive at 230 V AC
Supplied with tripping cable length of 5 Meter
Supplied with mounting bracket

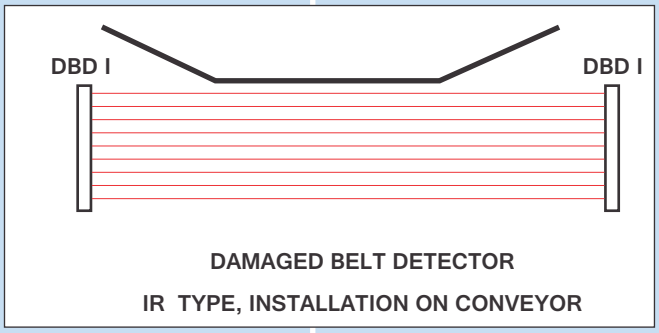
DAMAGED BELT DETECTOR / BELT WAIR MONITOR, INFRARED TYPE: Series DBDI

Many a times in normal running, some sharp objects gets locked in the chute plate. This sharp object cuts the belt surface and material start falling down the belt. To detect this damage SMARTsaa offers infrared type damaged belt detector.

Infrared type light beam curtain is fixed below the belt. In the case of belt damage, material pieces or dust starts falling down through the belt slit. When the light beams are obstructed by falling material through conveyor, same is detected and alarm is activated. Special electronic circuit for use in dusty environment is developed by SMARTsaa.



DAMAGED BELT DETECTOR
INFRARED TYPE



SPECIFICATION of Series DBD I:

Sensing Unit:

Sensing area Approx.: Length 350 mm
Sensing Gap (Belt Width): 1.5 Mtr./ 2 Mtr.
Enclosure for sensing unit: Al

Control Unit

Supply: 230 V AC
Enclosure: Field mounting, IP 65
Output: 2 C/O relay contact, Rating 5 Amp resistive at 230 VAC

REVERSE ROTATION MONITOR: Series RRM

The SMARTsaa reverse rotation monitor (RRM) is used for protection of important machinery like Boiler feed pumps, Turbine, Horizontal and vertical pumps, compressors etc. against reverse rotation.

It provides early indication of reverse rotation event. Finds applications in machines having fluid couplings wherein bearing damages can be avoided by using RRM. This unit also can be used as "Start Permissive contact "during reverse rotation in vertical or horizontal pumps. Motor or pumps cannot be restarted unless and otherwise reverse rotation / flow drops to acceptable range.



REVERSE ROTATION MONITOR
RRM

WIND SPEED INDICATOR: ANEMOMETER

It consists of sturdy speed sensor (Cup Generator) and wind velocity indicator. The wind velocity is sensed three cup rotor assembly. Sensor is fitted with cup such that when cup shaft rotates with speed, pulses are generated. The electronic unit is housed in field mounting, IP 65 housing. Anemometer provide digital display of speed as well as provide relay contact when wind speed exceeds set value. Models with retransmission O/P (4-20mA / MODBUS) are also available



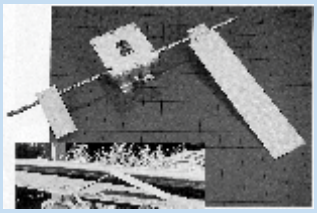
ANEMO METER

MATERIAL FLOW SWITCH: SERIES: MFS

The flow switch is designed to produce signal if the flow at any critical point is interrupted. The switch can generate alarm when the belt is running without material

OPERATION:

The switch consists of paddle and counter weight assembly and switch assembly. Material on conveyor and switch remains in operated position lifts the paddle. When flow stops the paddle is allowed to pivot and actuates the switch. The switch is adjustable type and switch actuation at predetermined points is possible.



MATERIAL FLOW SWITCH

BELT LOADING MONITOR: BLM

Belt loading monitor is a simple and robust device to detect loading of material on the belt conveyor. It consists of a roller assembly which is to be installed below the belt. Due to loading on the belt, the roller makes contact with the belt .The belt pushes the roller down and operates the limit switch contact.
The contacts are used in control circuit for interlocking purpose. The enclosure for switch is cast Al / DMC suitable for outdoor mounting.



BELT LOADING MONITOR

SPECIFICATIONS:

- Control Supply: 230 V AC, 50 Hz
- Output: 2 C/O relay contact, Rating 5 Amp resistive at 230 V AC
- Enclosure: Field mounting IP 65, Cast Al



DE INTERLOCKING SWITCH

BELT LOADING MONITOR WITH ZERO SPEED SWITCH: BLM ESM

It detect belt loading as well as generates an alarm when speed of the conveyor reduces pre-set value. Sensor probe is housed in the roller assembly. The pulses are fed to separate control unit of ESM which gives relay O/P. Features like initial bypass time delay and potentiometric speed setting are provided in control unit.

MISSING BUCKET DETECTOR FOR BUCKET ELEVATOR

- Used on bucket elevator to detect missing buckets. High Sensing Range adjustable for different bucket elevator
- Heavy Duty Model



BELT MISALIGNMENT DETECTOR



MISSING BUCKET DETECTOR FOR BUCKET ELEVATOR

BELT MISALIGNMENT DETECTOR FOR BUCKET ELEVATOR

- Used on bucket elevator to detect belt sway. Prevent damage by early detection of bucket sway beyond specified limit.
- Microcontroller Unit with added features
- No physical contact with bucket
- No wear and tear, long life.
- Switches for use in hazardous locations are also available.
- High sensing range
- No effect of dust, water and mud hence reliable operation

DE INTERLOCKING SWITCH / AUTO MANUAL CONTROL STATION:

SMARTsaa offers de-interlocking switches / auto manual stations for conveyors. The conveyor can be manual started at field by isolating it from main control like DCS. Various programs and logics are available as per customer's specifications. The enclosure is cats mounting type with start stop buttons.



ANTI COLLISION SWITCH

ANTI COLLISION SWITCH FOR CRANES

This product finds applications on cranes having long travel like in stock yard. When two cranes are moving on same rail extra protection is required to be provided when crane approach each other and enter in danger zone. Anti-Collision switch prevents accidents of cranes. Works on principle of infrared light. The modulated beam when gets reflected by approaching crane. Signal is detected and contacts are actuated.



CRANE COLLUSION PREVENTION SWITCH

CEMENT BAG COUNTER / JUMBO DISPLY COUNTER / BATCH COUNTER / PRODUCTION COUNTER

SMARTsaa offer Cement Bag Counting system for online measurement of cement bags on conveyors.
It consists of:

- Sensor
- Bag Display System (Counter)
- Setting Terminal
  Selection of sensor and sensor location plays vital role in performance of the system. Various types of sensors are developed considering diverse applications. The sensor can be
- Limit Switch
- Inductive Proximity Switch
- Photoelectric Sensor.

Large size bright display for target and for actual production. Display height of 2 inch / 4 inch making it visible from distance. Setting terminal can be hanging type

Please ask for detailed catalogue of the product.



BATCH COUNTER



CEMENT BAG COUNTER



KEYPAD UNIT FOR COUNTER



PRODUCTION COUNTER

PULSE JET SEQUENCER TIMER:

SMARTsaa offers different models of Pulse Jet Controller /Sequential Timer for Bag filters & the applications that requires sequential switching of output devices like solenoids, relays etc.
The system has the application in ESP, Bag House in Chemical, Fertilizers, Food, Glass, Minerals & Metallurgical, Steel & Other Industrial Processes requiring Bag Filters & those requiring sequential operation of output devices for desired timing pulses.

OPERATING PRINCIPLE:
It sequences the operation of various solenoids in the bag house. The sequential operation of the timer controls the ON & OFF time of the solenoid valve which in turn allows the compressed air injection for cleaning purpose. The required ON time, OFF time are adjustable by potentiometer (in case of Solid State Circuit or can be programmed by keypad in case of Microcontroller Based Circuit).
The system is also responsible for giving the feedback signals like timer on, purge O/P, local, remote, enable & DP (potential free) outputs to the DCS system for further control operations. The Microcontroller Based Circuit also supports many optional features.

Please ask for detailed catalogue of the product.



JET PULSE
SEQUENCER TIMER



CONTROL PANEL

VIBRATION SENSORS – WIRELESS VIBRATION – TEMPERATURE SENSOR-VIBRATION GUAGE
UNMANNED INSPECTION SOLUTIONS FOR ELECTRIC MOTORS
VIBRATION DIGNOSIS INSTRUMENTS

It is installed on various rotating motors and provides three axis RMS Vibration and velocity and acceleration, the FFT of velocity and acceleration raw data and single point temperature monitoring. Customer can read all data on their mobile phone and can also upload to the remote management platform to perform functions storage, trend comparison, diagnostic analysis and report Output.



WIRELESS VIBRATION AND TEMP.SENSOR



VIBRATION GUAGE

SALIANT FEATURES

- Stick and play
- No Power Cord Required
- No wired network required
- Mobile App supports data export to remote database for AI Computing
- Exclusively provide variety of high tech data display like RMS, FFT, Raw
- Data,, Health Index, Temperature
- Health Index: Provides advice on proactive maintenance
- Provides predictable maintenance schedule



IOT GATEWAY

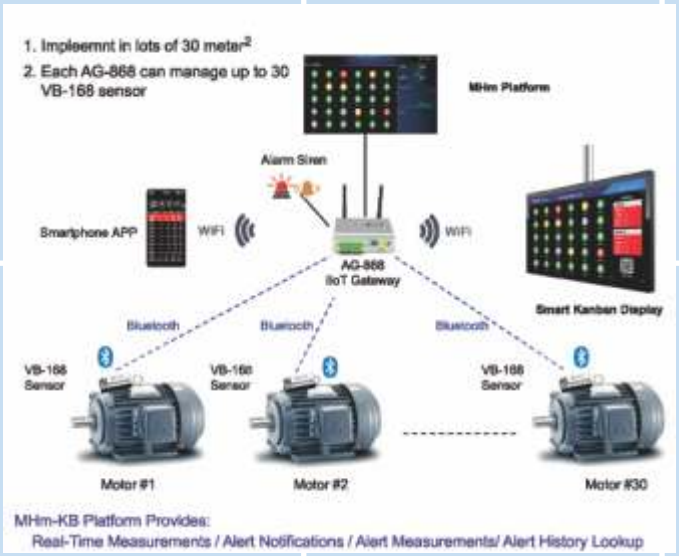


TEMPERATURE SENSOR

In factories, there are many types of motors, and most of the motors are generally small and medium-sized. The health of these motor is very critical. Periodical inspections are been practiced to measure vibration and temperature to ensure motors health as vibration and temperature are key vital signs. Manual inspections however are time consuming and difficult to implement with required accuracy. Our unmanned inspection solution automate the collection of the vibration, temperature measurement of electrical motors (rotating machines). Out solution is easy to install and operate.

UNMANNED INSPECTION SOLUTION FOR ELECTRIC MOTORS (ROTATING MACHINES)

Our "Unmanned Inspection Solution" can be implemented in lots of 30 meter2 AG-868 IoT gateway is usually positioned at the centre of the lot. VB-168 Bluetooth vibration-temperature sensors are effortlessly sticked to each motors within this lot. Installation can be done easily in a few hours if not less. Implementation can be expanded to cover the entire factory by repeating this installation process to cover hundreds, thousands of motors. Each AG-868 works with up to 30 VB-168 sensors. Increase the number of AG-868 to scale up to cover the whole



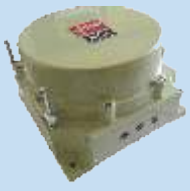
UNMANNED INSPECTION SOLUTION FOR MOTORS

ENCLOSURES AND JUNCTION BOXES.

- Junction Boxes
- Local Control Station
- Push Button Station
- Pendant Control Station

Various enclosures to suit every requirement, specify:

- Enclosure Size
- MOC
- Number of terminals
- Switchgear
- Cable entries



FLAMEPROOF ENCLOSURES



LOCAL CONTROL STATION

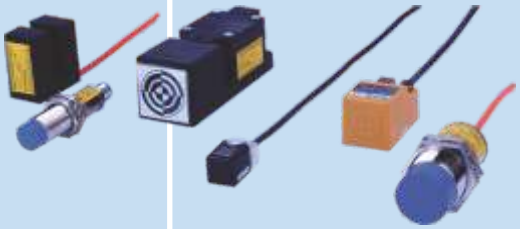


ENCLOSURE JUNCTION BOXES



PUSH BUTTON STATION

PROXIMITY SWITCH: INDUCTIVE - CAPACITIVE - MAGNETIC - PHOTOELECTRIC-ULTRASONIC



SMARTsaa manufactures more than 2600 types of proximity switches. These products are used for position, speed and level sensing applications.

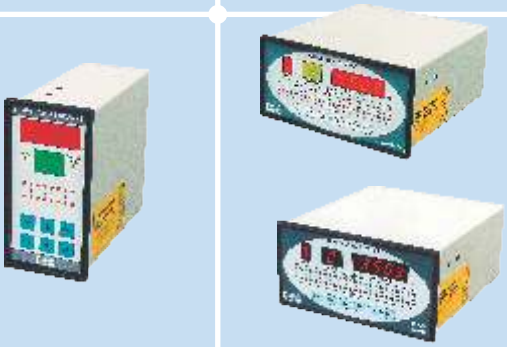
We have specialized sensor to suit every application.
Latest addition in our range is:

- Inductive Proximity Switch with extra-long sensing range: 50 mm
- Capacitive Proximity Switch for powder sensing like Cement
- Proximity switch for use in hazardous area application: Namur Type
- Magnetic Proximity Switch: For high sensing range
- Ultrasonic Proximity Sensor for analogue output



TEMPERATURE SCANNER

- Winding Bearing Temperature Scanner
- WTI for Dry Cast Resin Transformers
- Process Scanners
- Temperature Scanners with retransmission outputs
- Software or communication, SCADA /Ethernet and wireless communication



SIGNAL CONDITIONING: TRANSMITTERS & INTERFACING DEVICES: POWER TRANSDUCERS

SMARTsaa offers field sensors. We also bridge gap between field sensors and control room by offering variety of signal conditioning modules. These modules provide effective isolation, improve signal communication and hence improve plant performance. Fill the gap between sensors to control room by

- SMARTsaa make signal conditioning modules.
- Head Mounted Temp. Transmitter
- Signal Transmitter / Signal Isolator
- Signal Converters
- Loop Powered field mounted isolated Temp. Tx.
- Pressure Transmitter
- Voltage / current transducer
- Watt / Var / Watt & Var Transducer
- Watt-Hr / Var-Hr Transducer
- Power Factor / Phase Angle Transmitter
- Mains Frequency Transducer
- Process Transmitters



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SMARTsaa
Proto Control