




**SAFETY SWITCHES
CONTROL INSTRUMENTS
ACCESSORIES
PULLCORD TRIP INDICATION SYSTEM**



Proto 
Control

Introduction

Protocontrol name is established in Indian industries as a leading supplier of safety switches and control instruments from last two decades with its quality products and efficient pre-sale and after sale support.

Philosophy

We believe in long term relations with customer hence word 'customer' appears first in our dictionary.

New Developments

We always strive for improvement in product, technology, material & method. Hence introduced many new concepts & applications to satisfy needs of customer.

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

We are the first who exported & commissioned this product on long conveyor.

We successfully introduced Disc Type Chute Block Device for material handling plants.

Product Range

Protocontrol offers variety of safety and controlling instruments for use in material handling plants. These instruments find application in conveyor safety, speed and level monitoring.

CONVEYOR SAFETY SWITCHES AND ACCESSORIES :

- Pull Cord Switch
- Belt Sway Switch
- Heavy Duty Limit Switch
- Zero Speed Switch / Electronic Speed Switch
- Electronic Speed Switch with Extension Stand
- Pull Cord Wire
- Tying Clips
- Hooks

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
- Ultrasonic Level Transmitter
- Radar level Transmitter

SPECIALISED INSTRUMENTS

- Trip Indicator Addressable Type Pull Cord Switch System
- Cement Bag Counter
- Pulse Jet Sequencer Timer

COMPLETE TURNKEY AUTOMATION PACKAGE

- Electrical Panels -MCCs
- Logic and Automation Panels





Protocontrol is an approved vendor for major project consultants. Many project orders are executed successfully. Following are some important names.

CONSULTANTS

- Mecon Ltd
- CMPDIL Ltd.
- Desein Pvt. Ltd.
- Holtec Ltd
- Hindustan Dorr-Oliver Ltd
- Jacob H & G
- M.N.Dastur & Co.Ltd
- Fichtner Consulting Engineers (I) Pvt.Ltd
- ACC
- Avant - Garde Engineers & Consultants (P) Ltd.
- MITCON Consultancy Services Ltd
- NTPC Ltd.
- NPCIL Ltd

We executed many project orders for following customers

CEMENT

- ACC Ltd.
- Ambuja Cement
- Grasim Industries Ltd.
- Madras Cements Ltd
- Maihar Cement
- Vasavdatta Cement
- Rajashree Cement
- Ultratech Cement Ltd
- Zuari Cement
- Dalmia Cement
- Orissa Cement
- Lhaki Cement
- Chettinad Cement
- Penna Cement

STEEL

- Essar Steel Ltd
- Jindal Steel and Power Ltd
- JSW Ltd.
- Lloyds Steel Ltd
- Steel Authority Of India Ltd
- Ispat Industries Ltd.
- NMDC Ltd
- Tata Steel

POWER

- NTPC Ltd
- MAHAGENCO
- Rajasthan Rajya Vidyut Utpadan Nigam Ltd
- Chattisgarh State Electricity Board
- NPCIL Ltd.
- DVC Ltd.

FERTILISER-CHEMICAL

- IOCL Ltd.
- IFFCO
- Kribhco Ltd
- Kanoria Chemicals
- RCF Ltd.
- GSFC Ltd.
- GHCL Ltd.
- Coromandel Fertiliser

EPC CONTRACTORS-Turnkey Project Executor

- BHEL Ltd.
- Kirloskar Brothers Ltd.
- Larsen And Toubro Ltd.
- Siemens Ltd.
- Vinar Systems Pvt Ltd.
- HEC Ltd.
- Flsmidth Minerals Private Limited
- Durgapur Projects Ltd.
- Alstom Projects India Limited
- ABB Ltd.

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. Protocontrol make Safety and control products find application for stopping the conveyor at the time of an emergency.

OPERATION :

Pull cord switch also known as Rope Operated Emergency switch is used as a safety switch to stop the conveyor belt in case of an emergency by pulling the rope. 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, the switch gets operated. 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 contact opens and conveyor is stopped.

CONSTRUCTION :

Pull cord switch is housed in dust and weatherproof enclosure with IP 65 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 :

- 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 (O 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).

STANDARD SPECIFICATIONS :

- Reset : Snap action, Manual Reset Type
- Enclosure : Weatherproof, field mounting Type, IP 65 Cast Al./Cast Iron, epoxy painted, colour light gray (standard) other colour are available as per requirement
- Output Contacts : 1 NO + 1 NC / 2 NO + 2 NC / 4 NC
- Contact Rating for standard models : 16 Amp resistive at 440 VAC
- DMC (FRP) enclosure for use in corrosive environment.
- Special flame proof enclosure for use in hazardous area, Group IIa, IIb, IIc



Standard Model



PC with Terminal Strip



With Junction Box



With Indicating Lamp



PC JB With Mechanical Flag



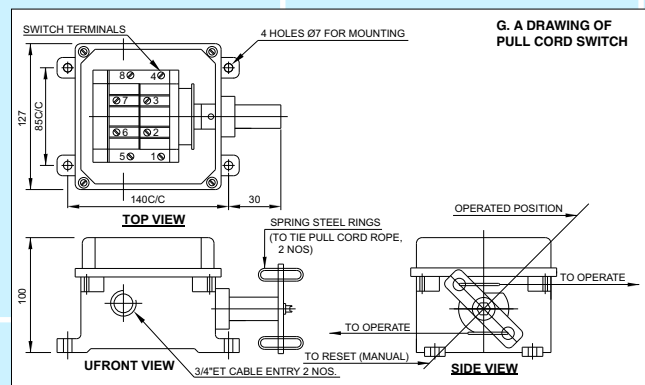
With JB & Indicating Lamp



Flameproof Model

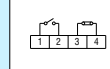


With Reset Lever

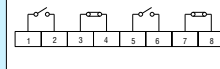


TERMINAL DIAGRAM

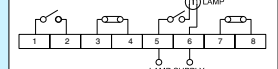
PC 101



PC 202



PC WITH INDICATING LAMP



OPTIONAL PRODUCT ACCESSORIES :

- 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.
- Mechanical flag indicator for pull cord switch
- Separate reset lever for Pull Cord Switch
- Separate reset lever for Pull Cord Switch
- Addressable Type Pull Cord Switches: 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 our catalogue on : Trip Indicator.
- Hermetically sealed reed contacts for use in extreme dusty and corrosive conditions : Contact Rating for models with reed switch contact : 30 VA, 24 V DC / 2 3 0 VAC, 1Amp.(Specify control voltage)



Wire



Tying Clips



Hooks



Mounting Bracket

OPTIONAL COMMISSIONING SPARES

Following accessories are offered optionally with Pull cord switches. These accessories are specially developed in reducing installation time of switches.

- Pull Cord wire: 6x7 GI wire construction, covered with PVC diameter approx 5-6 mm specially extruded for material handling plant use.
- Tying clips : Two tying clips are required per switch for tying pull cord cable to switch.
- Hook : Pull cord cable passes through the hooks, which are placed approx 3 Meters apart.
- Mounting Bracket : Mounting bracket made of sheet steel, powder coated with corrosion resistance paint for mounting pull cord switch. Suitable holes are made to mount pull cord switch at site.
- Cable Gland: Nickel Cr plated brass cable gland, Size 3/4 inch ET



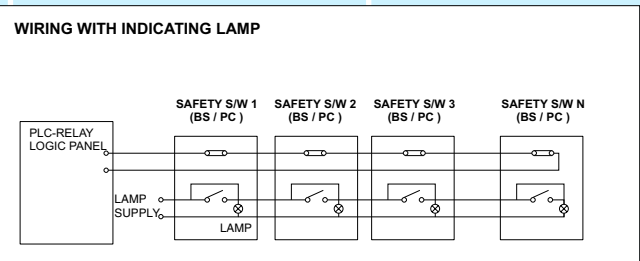
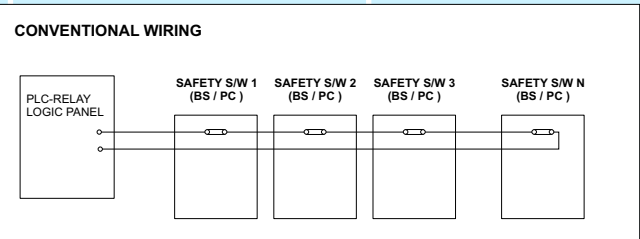
Cable Glands



Rope Tying Arrangement

ORDERING PROFORMA :

Please refer ordering proforma on page number 7 to select required model Type number



PULL Cord Switches for special use :

Protocontrol developed special models of pull cord switches for use on applications like automobile conveyors.

Pull Cord Switch for automobile conveyor 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, Single side rope with reset button PC HR :

One side operated switch for small machines. The switch is provided with built in reset button.



PO POSR
Vertical Mounting Single Rope



PC HR
Single Side Rope With
Reset Button

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 etc.

OPERATION:

Belt-sway switch is generally mounted on both side, preferably at about every 30 meters 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 65 grade of protection. The contact roller is supported on bush / ball bearings for friction free operation. Roller mechanism is of self reset type. The enclosure is epoxy painted to withstand harsh climate.

FEATURES :

- 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 (O 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

STANDARD SPECIFICATIONS:

- Reset : Auto / Spring Reset Type
- Enclosure: Weatherproof, field mounting Type, IP 65 Cast Al / Cast Iron, epoxy painted, colour light gray (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
- DMC (FRP) enclosure for use in corrosive environment.
- Special flame proof enclosure for use in hazardous area, Group IIa, IIb IIc

OPTIONAL ACCESSORIES:

- 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.
- Addressable Type Belt Sway Switches : 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 our catalogue on : Trip Indicator.
- Hermetically sealed reed contacts for use in extreme dusty and corrosive conditions : Contact Rating for models with reed switch contact : 30 VA, 24 V DC / 230 V AC, 1 Amp. (Please specify your control voltage)



Standard Model



With Terminal Strip



With Junction Box



Flameproof Model



Switch with Mounting Bracket

OPTIONAL COMMISSIONING SPARES

Following accessories are offered optionally with Pull cord switches. These accessories are specially developed in reducing installation time of switches.

- Mounting Bracket
- Cable Gland
- Spare Roller Assembly



Mounting Bracket



Cable Glands



Switch Mounting Arrangement

ORDERING PROFORMA :

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

Gr.1. : Series :

- Pull Cord Switch, Manual reset type
- Belt Sway Switch (Self reset type)
- Heavy Duty Limit Switch: Spring Return Type
- Heavy Duty Limit Switch: Toggle (Stay Put) Type
- Damaged Belt Detector

PC
BS
HDLS SR
HDL SPV
DBD

Gr.2: Number of Contacts :

- 1 NO + 1 NC
- 2 NO + 2 NC
- 2 NC
- 4 NC
- 1 NO + 1 NC, Reed Sw. Contact 24 VDC, 30 VA
- 2 NO + 2 NC, Reed Sw. Contact, 24 VDC, 30 VA

101
202
002
004
101 RD
202 RD

Gr.3 : Enclosure :

- Cast Al, Improved Protection, IP 65
- Corrosion resistance, DMC enclosure, IP 65
- Flame proof enclosure IP 65
- Cast Iron, IP 65

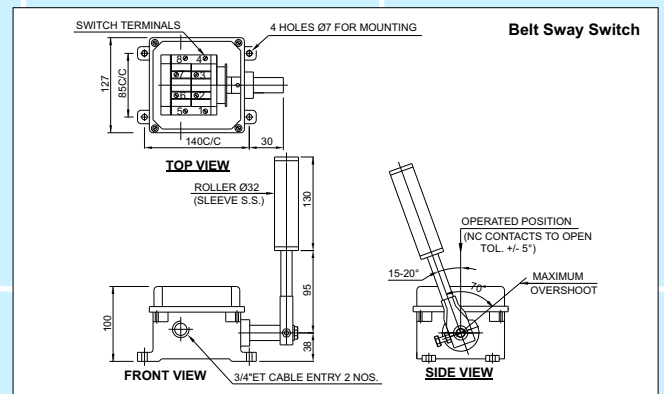
C
D
F
CI

Gr.4: Accessories : (Add suffix If required)

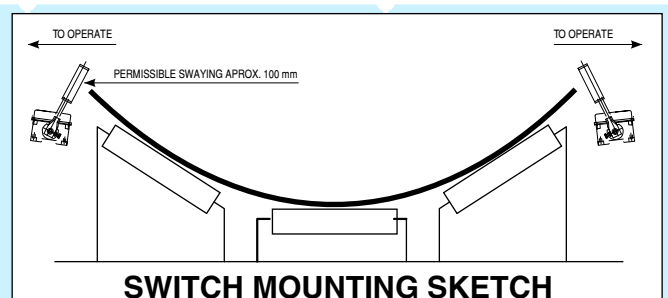
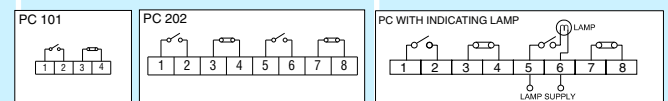
- Separate Junction Box
- Indicating Lamp AC Supply
- Indicating Lamp 24V DC Supply
- Mechanical Flag Indication (Gr. 1 should be PC)
- Special, Separate reset Lever (G1.1 should be PC)
- Switch without separate JB but with terminal strip
- Cable Gland, single compression Type
- Cable Gland, double compression Type

JB
ILA
ILD
MF
RL
TS
CG
CGD

Typical ordering code **PC 202 C JB IL**



TERMINAL DIAGRAM



ELECTRONIC SPEED SWITCH / SPEED MONITOR / ZERO SPEED SWITCH SERIES : ESM

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 preset 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, Inductive Type
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 65, Cast Al / Din Rail IP 30 / Corrosion proof DMC (FRP) / Cast Al Flame Proof (Refer Gr.2 of ordering proforma)

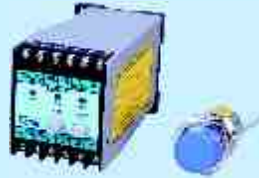
Output : 2 C/O relay contact, Rating 5 Amp resistive at 230 V AC (For other combination of contacts refer Gr. 7 or ordering proforma). With LED indication for Supply ON, Sensor ON and Relay ON Initial Time Delay : Initial time delay facility to allow the rotating mechanism to achieve the desired speed is provided. Standard delay is 0-30 sec. This delay is available in Under Speed / Zero speed Monitors

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



ESM 5, FIELD MOUNTING DIGITAL DISPLAY



ESM 1F, FLAME PROOF MODEL



Mounting Plate



FLAG ASSEMBLY

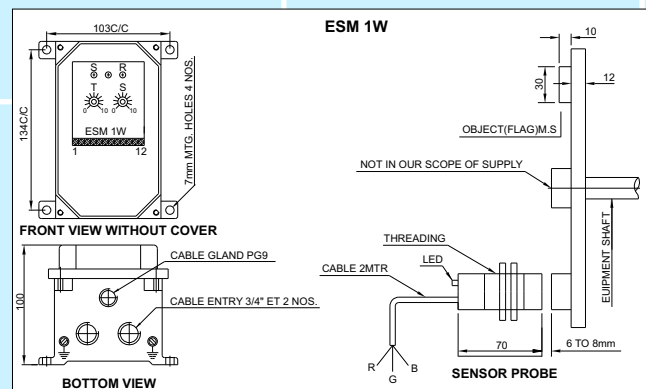
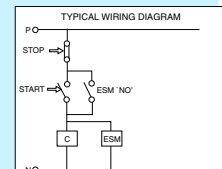


MOUNTING BRACKET FOR SENSOR PROBE



JUNCTION BOX

TERMINAL DIAGRAM	
SUPPLY	SENSOR
0 11 10 8 7 6 5 4 3 2 1	NOT IN CONTROL
1 2 3 4 5 6 7 8 9 10 11 12	RELAY



Series ESM is available in- following versions.

UNDER SPEED ZERO SPEED SWITCH SERIES: 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. It also has a special optional facility to multiply speed range x10 & x100. (Refer ord. proforma Gr.3 option 9)

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 1W xx T: Weatherproof, field mounting IP 65 enclosure, Thumb-wheel setting
- Speed switch type ESM 1 F: Flame-proof enclosure for use in hazardous area with intrinsically safe sensor and control circuit

MICRO CONTROLLER BASED, SPEED INDICATOR MONITOR - TACHOMETER 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 available at site, speed monitor will get automatically calibrated for these flags

- 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 analog 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 (cutout 92 x 92) or dust proof, field mounting or flame proof enclosure.

SPEED SWITCH WITH EXTENSION STAND :

Speed Switch with extension stand is designed for direct coupling of speed switch with conveyor belt. The speed switch is to be installed below the belt at the return side of the conveyor such that the roller makes firm contact with the belt. Special heavy- duty spring assembly is designed to take care of the bumpy belt. When belt stops the relay contact changes over. Inform linear speed of the conveyor while ordering.

ORDERING PROFORMA : Electronic speed switch : ESM

Gr.1: Application

- Electronic Speed Switch for Under Speed Monitoring
- Electronic Speed Switch with Digital Display
- Electronic speed switch for over speed monitoring
- Electronic Speed Indicator (No control O/P)

1
2
4
5

Gr.2: Enclosure For Control Unit

- Din Rail Mounting (35 mm) , Safe area use,(Group 1 Should not be 5)
- Din Rail Mounting (35 mm) Intrinsically safe circuit (Group 1 Should not be 5)
- Field Mounting, Cast Al, IP 65
- Field Mounting, DMC
- Front Panel Mounting, IP 30 (Group 1 must be 2, 5)
- Flame Proof, Field Mounting IP 65 (Sensor Group must be N)
- Field mounting cast iron enlarge size

R
N
W
P
D
F
I

Gr.3: Contact Actuation Speed Range :

- Only Indicator, 1-9999 RPM, (2 Flags) (Gr.1 selection must be 5)
- 1-10 RPM (8 flags)
- 5-50 RPM (4 Flags)
- 10 - 100 RPM (4 Flags)
- 100 -1000 RPM (4 Flags)
- 50 -500 RPM (4 Flags)
- 500 -5000 RPM (2 Flags)
- 1000-10000 RPM (2 Flags)
- Other (Please specify)
- 5-5000 RPM by speed range selector

0
1
2
3
4
5
6
7
8
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
- M50 Sensing range 15-17 mm nominal, 12-15 mm operational
- M70 Sensing range 25-30 mm nominal, 20-25 mm operational
- Intrinsically Safe, For Use in hazardous area,
- M30 Sensing range 10-12 mm (Group 2 should not be B)
- Intrinsically safe, other than M30
- Square Type, Plastic Sensing range 50 mm nominal, 40 mm operational
- Special Cast Al heavy duty enclosure for sensor probe (for M 30 & M 50 sensor)
- Other (Please Specify)
- Magnetic pickup

S
E
H
N
NO
B
D
O
M

Gr.5: Time Delay

- Initial Time Delay (3-30 sec)
- Nuisance Time Delay Initial Time Delay
- Other (please specify)

1
2
3

Gr.6: Control Supply Voltage

- 230 VAC 50 Hz.
- 110 VAC 50 Hz.
- 24 VDC
- Other (Please Specify)

S
T
U
V

Gr.7: Out Put Contact

- 2 C/O 5 Amp
- 2 C/O 10 Amp
- 2 NO+2 NC 5 Amp
- 2 NO+2 NC 10 Amp
- Other (Please Specify)

1
2
3
4
5

Gr.8: Setting

- Potentiometric
- Thumbwheel
- Key pad (Gr. 1 selection must be 2)
- Only indicator (Gr.1 selection must be 5)

P
T
K
O

Gr.9: Optional Facility:(Add suffix If required)

- ReTransmission O/P, 4-20mA
- Extra Junction Box for sensor

1
JB

TYPICAL ORDERING CODE :

ESM 1 W 3 S 1 S 1 P JB

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

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.
- Binary O/P: Optional
- 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

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. For additional safety, Protocontrol offers Adaptor Units for hard wire tripping, eliminating high voltage wires going to the switch compartment. This provides additional safety against effect of cable capacitance and damage due to wiring of high voltage wires to communication 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.

To offer you stand alone Trip Indicator please inform us :

1. No of Pull Cord switches / Belt Sway connected to one Trip Indicator
2. No of groups connected to one Trip Indicator (We recommend grouping of one conveyor to one trip indicator)
3. Length of conveyor
4. Location of Trip Indicator
5. Type of O/P required from Trip Indicator : MODBUS , Binary , Analogue
8. Whether hard wire tripping is insisted or Trip Contact from Trip Indicator is to be used for tripping.

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
7. Type of O/P required from Trip Indicator : MODBUS , Binary , Analogue

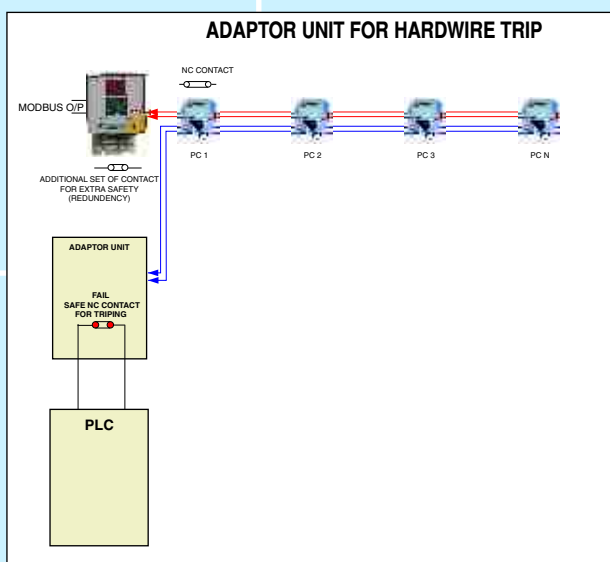
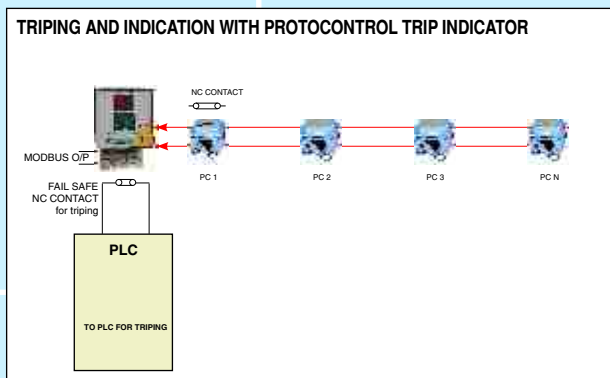
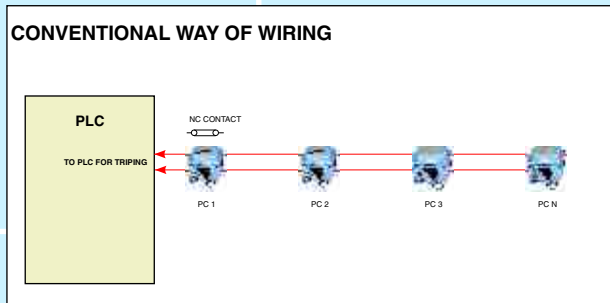
Please ask for catalog for more details



Trip Indicator



Trip Indicator Plant Management Panel



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 different 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.

STANDARD SPECIFICATIONS :

- Enclosure: Weatherproof, field mounting Type, IP 65 C a s t Al/Cast Iron, epoxy painted, colour light gray (standard) other colour are available as per requirement. DMC (FRP) 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
- Contact Rating for standard models : 16 Amp resistive at 440 VAC
- Special flame proof enclosure for use in hazardous area, Group IIa, IIb IIc

OPERATING MECHANISM

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

OPTIONAL COMMISSIONING SPARES

- Separate junction Box for termination of cables
- Cable Gland
- Mounting Bracket

ORDERING PROFORMA :

Please refer ordering proforma on page No. 7 to select required model number



Standard Model Spring Return Roller Lever



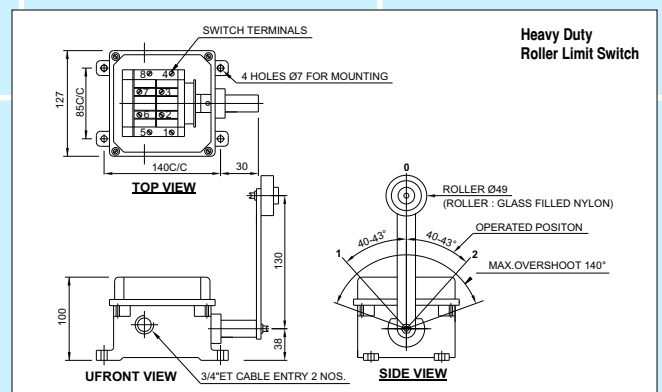
With Junction Box Toggle Action V Lever



Mounting Bracket



Cable Glands



Protocontrol developed entire new range of RF Admittance / Capacitance Level switches for variety of applications like :Chute Block Sensing , Boot level Sensing , Stock Pile Level Sensing, Level Sensing of materials in hopper & Fly Ash Level Sensing in hoppers. Following are few models.

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, dry and wet having particle size up to 30 mm

RF Admittance Rod Probe: Series RFLS R : Chute Block switches/ Boot Level Sensor / 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.

RF Admittance Rope Probe: Series RFLS C : Chute Block / Stock Pile Level switch for Top level Mounting

The probe is to be hanged from the top in the hopper. The probe length is selected such that the bottom tip 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, dry and wet having particle size up to 30 mm. 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.

Tilt Probe: Series TLS 602: Chute Block switch / Stock Pile Level Switch for Booms:

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.

- To quote proper model pf chute jam Device: Please inform us
1. Size of hopper, chute (Please send drawing of chute)
 2. Mounting Location and suitability
 3. Material to be sensed and its particle size
 4. Confirm the 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. Ensure that the sensor is protected in hopper
 8. Abrasion properties of material (to prove suitable coating on sensor probe)

Other Level Switches available. Please ask for Level Switches catalogue

- Vibrating Fork Type Level Switch
- Paddle Type Level Switch
- Ultrasonic Level Transmitter
- Radar level Transmitter



DISC TYPE : RFLS D



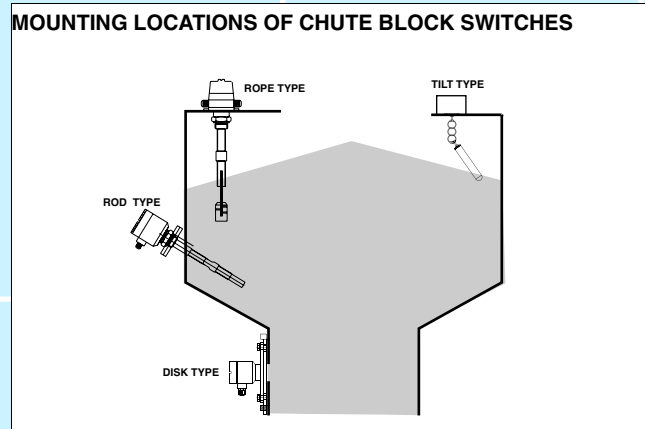
ROD TYPE : RFLS R



ROPE TYPE : RFLS C



TILT TYPE : TLS



ULTRASONIC / RADAR TYPE



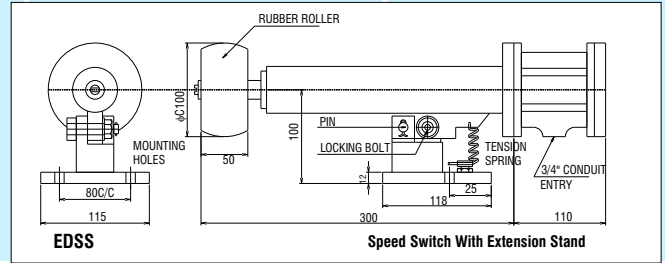
PADDLE TYPE



VIBRATING FORK TYPE

**ELECTRONIC SPEED SWITCH WITH EXTENSION STAND:
Series ESSES:**

It carries advantages of contact type speed monitoring as well as electronic control. The sensor is housed in extension stand. The controller can be Din Rail / Field Mounting or Flameproof type.



ELECTRODYNAMIC SPEED SWITCH WITH EXTENSION STAND : Series EDSSES:

It is electro dynamic type speed switch do not require Aux. power supply. Generates 1 C/O contact for forward and 1 C/O contact for reverse speed. Please specify linear speed of conveyor in M/Min.



ELECTRODYNAMIC SPEED SWITCH WITH EXTENSION STAND

DAMAGED BELT DETECTOR / BELT WAIR MONITOR ROPE TYPE: Series DBD R:

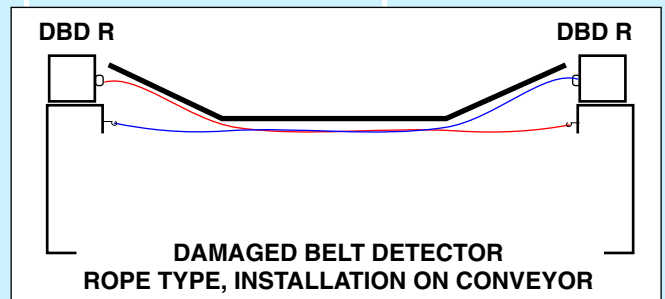
Conveyor belts are subject to wear and tear during operation. Repairs like vulcanization and splicing have to be carried out from time to time. In large conveyor plants, impending belt damages are not always noticed in advance. Protocontrol make Damaged Belt Detector Series: DBD enables the following belt damages to be detected 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 ROPE TYPE

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



DAMAGED BELT DETECTOR ROPE TYPE, INSTALLATION ON CONVEYOR

SPECIFICATION OF SERIES DBD R

Enclosure: Heavy Duty Cast Al, IP 65
Output: 2 NO + 2 NC contact rated for 10 Amp resistive at 230 V AC supplied with tripping cable length of 5 Meter.

DAMAGED BELT DETECTOR / BELT WAIR MONITOR INFRARED TYPE: Series DBD I

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 Protocontrol 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 Protocontrol.



DAMAGED BELT DETECTOR INFRARED TYPE

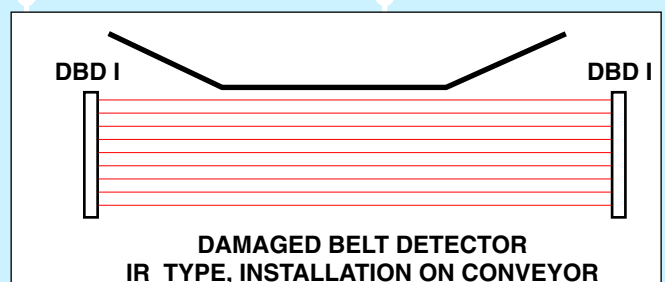
SPECIFICATION of Series DBD I :

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/ Din Rail Panel mounting IP30
Output : 2 C/O relay contact, Rating 5 Amp resistive at 230 VAC



DAMAGED BELT DETECTOR IR TYPE, INSTALLATION ON CONVEYOR

**MATERIAL FLOW SWITCH FOR CONVEYOR :
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: Series : 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.

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



BELT LOADING MONITOR

DE INTERLOCKING SWITCH / AUTO-MANUAL CONTROL STATION

Protocontrol offer 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 cast mounting type with start stop buttons.



DE INTERLOCKING SWITCH

ANTI COLLISION SWITCH FOR CRANES

This product finds applications on cranes having long travels like in stock yard. When two cranes are moving on same rail extra protection is required to be provided when they 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 is detected and contacts are actuated.



ANTI COLLISION SWITCH



ANTI COLLISION SWITCH

CEMENT BAG COUNTER :

Protocontrol 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 1. Limit Switch 2. Inductive Proximity Switch 3. 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 or with wireless interface facility.

Please ask for detailed catalogue of the product.

PULSE JET SEQUENCER TIMER:

Protocontrol 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.

TURNKEY AUTOMATION PACKAGES FOR CONVEYORS AND MATERIAL HANDLING PLANTS

Protocontrol offers complete automation packages for material handling plants and process industries. With more than 22 years of experience in manufacturing of sensors & field instruments for material handling plants, Protocontrol is now geared up with execution of total turn key automation packages. We have team of project engineers & full set up for execution of total turn key project supported with full techno-commercial documentation / Design. Our expert engineering team can design, fabricate, wire electrical & instrumentation panels as per international standards.

We offer in house as well as at site programming on variety of PLC & SCADA as per site requirement & applications. We commit our self as self dependent project executers with our own support for devices like Trip Indicators & other field devices on conveyors. We also Work specially on long / multiple conveyor applications wherein Ethernet/Distributed PLC / R IO Signaling / RS 485 communication with different PROTOCOL / Using RJ 45 or CAT networking with Ethernet Switches/ Gateways/ Wireless applications.



CEMENT BAG COUNTER



JET PULSE SEQUENCER TIMER



CONTROL PANEL

We offer package including:

- Selection and finalizing specification of Field Devices
- Cable lying, wiring, Installation and commissioning of field devices and panels
- Supply of PCC, MCC, PLC, Electric Control Panels & Motor Control Panels
- Selection of automation platform
- Programming and working on PLC, HMI/ MMI, SCADA applications
- Industrial Ethernet and Communication Devices
- Machine Tool Automation with PLC, CNC & Drives Training

OUR OTHER PRODUCTS



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

Protocontrol manufactures more than 2600 types of proximity switches. These products are used for position, speed, and level sensing applications. We have specialized sensors 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 analog output



TEMPERATURE SCANNER

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



SIGNAL CONDITIONING : TRANSMITTERS & INTERFACING DEVICES: POWER TRANSDUCERS

Protocontrol offers field sensors. We also bridge the gap between field sensors and control room by offering a 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 Protocontrol 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

