

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 and weighing.

CONVEYOR SAFETY SWITCHES AND ACCESSORIES :

- Belt Sway Switch
- Pull Cord Switch
- Heavy Duty Limit Switch
- Material Flow Switch
- Belt Loading Monitor
- Damaged Belt Detector / Belt Wair Monitor
- Anti collision switch for cranes
- De-Interlocking Switches
- Pull Cord Wire
- Tying Clips
- Zero Speed Switch / Electronic Speed Switch
- Electronic Speed Switch with Extension Stand

COMPLETE TURNKEY AUTOMATION PACKAGE

- Electrical Panels -MCCs
- Variable Frequency Drives and panels
- Logic and Automation Panels

SPECIALISED INSTRUMENTS

- Trip Indicator for Pull Cord Switch
- Cement Bag Counter

WEIGHING SOLUTIONS

- Load Cells
- Crane Weighing Systems
- Torque Measuring Systems
- Special Duty Weighing Application
- Batching and Custom-built Industrial Weighing Systems
- Belt Weigher & Weigh Feeder Systems

CONTROL INSTRUMENTS

- Material Level Switch Tilt Switch
- Chute-Block Detector
- Boot Level Indicator
- Vibrating Fork Type Level Switch
- Paddle Type Level Switch
- Ultrasonic Level Transmitter
- Radar level Transmitter

SAFETY SWITCHES - ELECTROMECHANICAL AND ELECTRONIC TYPE

In today's modern material handling plants, number 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 emergency. Other control instruments include position, speed, level, and weight management solutions.

FEATURES:

- Heavy duty enclosure for dusty industrial use
- Special tubular silicon gasket
- Cast Iron / DMC / cast iron enclosure
- Retaining type stainless steel screws
- Heavy duty contacts: 16 Amp rating
- 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
- Switches available in flameproof enclosure
- Rationalized design and construction allows interchangeability of parts.

STANDARD SPECIFICATIONS :

Enclosure: Weatherproof, field mounting Type, IP 65 Cast Al / Cast Iron, epoxy painted, colour light gray

DMC (FRP) enclosure for use in corrosive environment.

Special flame proof enclosure for use in hazardous area, Group IIa, IIb IIc

Output Contacts: 1 NO + 1 NC / 2 NO + 2 NC

Contact Rating for standard models: 16 Amp resistive at 440 VAC

Contact Rating for models with reed switch contact: 30 VA, 24 V DC / 230 V

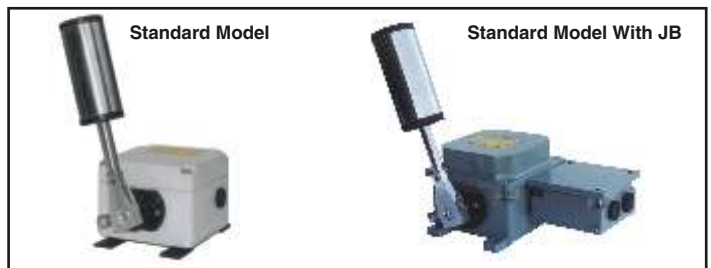
AC, 1 Amp. (Please specify your control voltage)

Reset : Pull Cord Switch: Snap action, Manual Reset Type
Belt Sway Switch: Normal action, Auto Reset Type

OPTIONAL ACCESSORIES :

- Separate junction Box for termination of cables
- Indicating lamp: Long life red LED indicating lamp for indication of operated pull cord switch
- Mechanical flag indicator for pull cord switch
- Separate reset lever for Pull Cord Switch
- Communication card (For Trip Indicator)
- Hermetically sealed reed contacts for use in extreme dusty and corrosive conditions
- Pull Cord wire, Tying clips, Hooks etc.

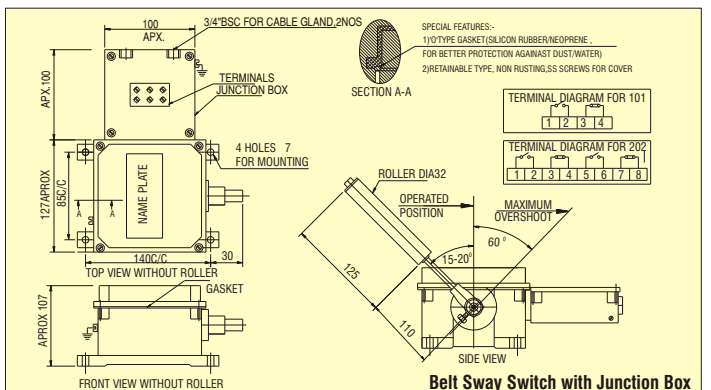
BELT-SWAY SWITCH SERIES: BS



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 etc.

CONSTRUCTION:



The switch is housed in dust and weatherproof enclosure with IP 65 grade of protection. The contact roller is supported on poly plastic bearings (Delrin) having high relative of lubrications and the lowest coefficient of friction. This assures smooth operation of the roller over a long period of time. Roller mechanism is of self reset type. The enclosure is epoxy painted to withstand harsh climate.

OPERATION:

For normal running of the belt with acceptable swaying, the belt-sway switch is generally mounted on both sides 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.

PULL CORD SWITCH SERIES : PC

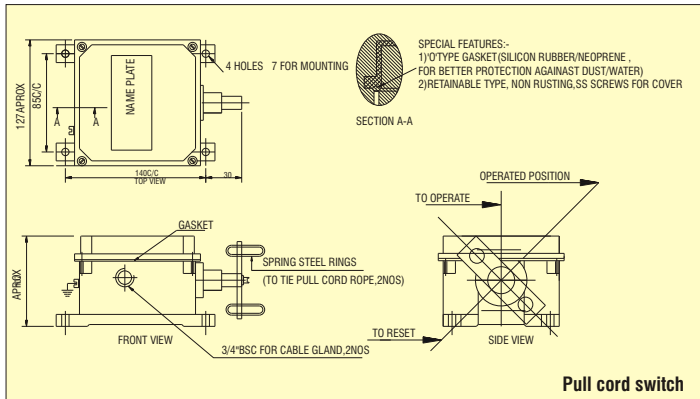


APPLICATION :

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.

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.

OPERATION:

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.

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.

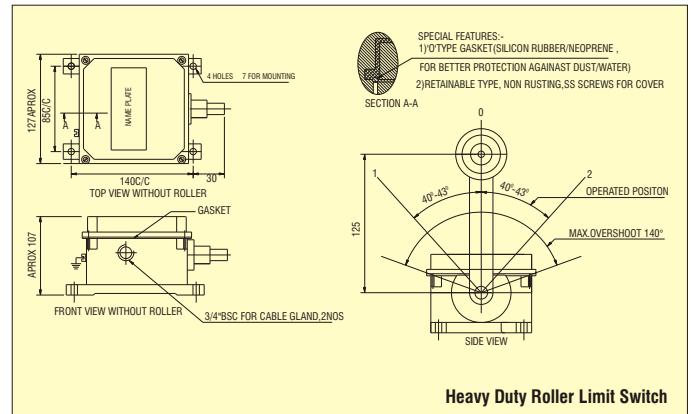
CONSTRUCTION :

Limit switches are enclosed in heavy duty weatherproof enclosure. The roller handle can be provided with different sizes and design to suit specific requirement.



STANDARD SPECIFICATIONS :

Refer details like enclosure, contacts, contact rating etc under standard specifications of belt sway switch. Roller lever with having self-return mechanism and toggle stay put mechanism are available..



DAMAGED BELT DETECTOR / BELT WAIR MONITOR: SERIES DBD

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 is mount 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

If top surface of the belt gets damaged, the same is not detected by DBD However this damaged portion will fall below the surface of the belt's return run. In order to detect this type of damage, second DBD system can be installed below the return side of belt. To cover the entire belt width, the system should be installed at a point where the conveyor belt is only slightly toughed e.g. near the head pulley or behind a feeding point. The switch operation is simple. The switch is heavy Duty designed to work in material handling industry.

SPECIFICATION OF SERIES DBD

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.

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.

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.



BLM

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 cats mounting type with start stop buttons.



DIS

ANTI COLLISION SWITCH FOR CRANES : KPS

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 infrared light principle. The modulated beam when gets reflected by approaching crane is detected and contacts are actuated.



KPS

PULL CORD WIRE and TYING CLIPS and Hooks :

Pull cord wire, Diameter Aprox. 5-6 mm, 6x7 constructions, galvanized steel wire with PVC cover. Specially extruded for material handling industry. Tying clips for tying pull cord cable to individual switch are also supplied. Hooks for holding of pull cord wire are available.



ELECTRONIC SPEED SWITCH / MONITOR / INDICATOR



ESM-1R
Din Rail Mounting
IP 30

ESM-1W
Field Mounting IP 65
Potentionmatic Setting

ESM-1WXXT
Field Mounting IP 65
Thumbwheel Setting

ESM-1F
Field Mounting IP 65
Flameproof

Now a days 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.

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 & emicals.
- 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

CONSTRUCTION:

The basic principle of speed monitor is comparison of pulses received from sensor with standard pulses. The unit consists of two parts: CONTROL UNIT and "SENSOR PROBE". 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.

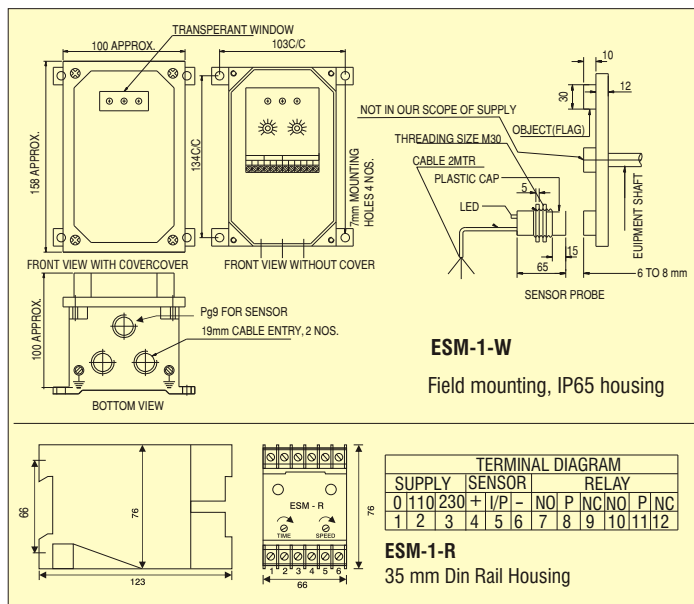
OUTPUT:

The control unit incorporates an output relay This relay will operate at preset speed giving 2 C/O contacts of 5 Amp 240 VAC resistive

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.

ENCLOSURE :



The sensor is epoxy potted and housed in metallic / plastic tube. Control unit is enclosed in cast Al / Cast iron / Corrosion proof DMC enclosure.

COMMON SPECIFICATIONS

Sensor Probe:

Totally enclosed, Inductive Type

Enclosure: 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/ 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

Series ESM is available in- following versions.

UNDER SPEED ZERO SPEED SWITCH SERIES: ESM 1

Specially developed for conveyor duty applications. 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 ordering 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) ESM 2

- Selectable number of flags. Enter number of flags which are available at site, speed monitor will get automatically calibrated for these flags
- Digital Display
- Adjustable trip delay
- Settable hysteresis special models for combined under over speed monitoring duty
- Special models with RS 232 / RS 485 retransmission facility



DIGITAL TACHOMETER SERIES : ESM 5

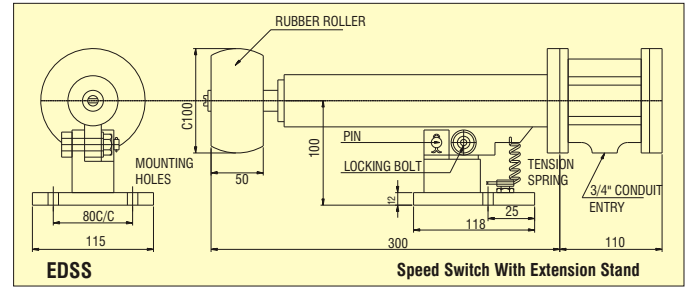
It receives input from Transducer (like Proximity switch) or analog input (from transmitter) and indicate speed in RPM, MPM or any other unit. Rotational / linear speed indication is possible. The unit is enclosed in panel mounting (cutout 92 x 92) or dust proof, field mounting or flame proof enclosure.



SPEED SWITCH WITH EXTENSION STAND Series : EDSS :

Electronic Speed Switch with Extension Stand : Series ESSES
 Electrostatic Speed Switch with Extension Stand : Series EDSSES

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.



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 / RIO Signaling/ RS 485 communication with different PROTOCOL / Using R j 45 or CAT networking with Ethernet Switches/ Gateways/ Wireless applications.

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
- Variable Frequency Drives with Panels
- Training



ORDERING PROFORMA

Ordering Proforma: For 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

Gr2 : 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 & 48 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

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
HDLT
DBD

Gr.2: Number of Contacts :

- 1 NO + 1 NC
- 2 NO + 2 NC
- 1 NO + 1 NC, Reed Sw. Contact Rating 24 V DC, 30 VA
- 2 NO + 2 NC, Reed Sw. Contact Rating 24 V DC, 30 VA

101
202
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
- 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

JB
IL
MF
RL
TS

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

TYPICAL ORDERING CODE :

ESM **1 W 3 S 1 S 1 P JB**

Specification are subject to change

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