# Safety instructions LIMITEX ATEX-IECEx

**Safety instructions**
**Rev.: 3**
**Date: 17 / 01 / 2025**

**INTRODUCTION:**

These safety instructions refer to the installation, operation and maintenance of the LIMITEX flameproof limit switches that are certified for use in areas where there is presence of potentially explosive atmospheres.

They are made by a metal case in cast iron that includes electric switches

**DESCRIPTION**

LIMITEX flameproof limit switches is an electromechanical device for low voltage control circuits
The Limitex production line includes two different models.

- Position type 001
- Rotary type 002-003

**Position type** have a system of cross metal bars that rotates when a limit position is reached by the system on which it is installed.
Metal bars are connected with a shaft to a reduction gear with cam
The rotation movement enables the cam to rotate and change the status of the electric switch (Normally open to Normally close or reverse)

**Rotary type** have a similar construction but the gearbox shaft is directly connected to the system without any bar.
The main system will give a precise number of shaft rotation during its travel to the limit positions, the number of turns enables the cam, that is connected to the reduction gear shaft , to reach the position that change the status of the installed electric switches.

**The LIMITEX flameproof limit switches is build in conformity with:**
**ATEX - IECEx CONFORMITY:**

**ATEX**

- 94/9/CE – ATEX 95, group II, category 2GD or group I M2
- EN 60079-0:2012/A11:2013
- EN 60079-1:2007
- EN 60079-31:2014

CATEGORY: 2G / 2D / 2GD / I M2
PROTECTION: Ex d / Ex tb
Gas group : IIB / IIC / I
Dust group : IIIC
TEMPERATURE CLASS FOR GAS: T6 or < 150°C for group I
SURFACE TEMPERATURE FOR DUST: T85°C
Ambient temperature -20° up to -50°C : +60 °C - protection IP66.

**IECEx**

Group I, II and III:

- IEC 60079-0:2011
- IEC 60079-1:2007-04
- IEC 60079-31:2008

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**MARKING LIMITEX ATEX**

The Limitex nameplate shows the following information :

Marking for mining gr I
CE 0051 Ex I M2 Ex d I Mb $T_{amb.}$ : -20°C up to -50°C : +60°C.
Marking for gas
CE 0051 Ex II 2 G Ex d II $P_1$ T6 Gb $T_{amb.}$ : -20°C up to -50°C : +60°C.
Marking for dust
CE 0051 Ex II 2 D Ex tb IIIC T85 Db IP66 $T_{amb.}$ : -20°C up to -50°C : +60°C.
Marking for gas and dust
CE 0051 Ex II 2 GD Ex d II $P_1$ T6 Gb Ex tb IIIC T85 Db IP66 $T_{amb.}$ : -20°C up to -50°C : +60°C
0051 = number of the notified surveillance ATEX organism (IMQ)

The position Pn provides the constructive variants :
P1 it indicates the gas group:

- P1 = B : Gas group IIB.
- P1 = C : Gas group IIC.

Gas group I
Dust group IIIC (21)
IP 66 = protection degree

-20°C up to - 50°C ÷ + 60°C = ambient temperature

T.cavo : 80°C = temperature of the cable

**MARKING LIMITEX IECEx**

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Marking for mining gr I

Ex d I Mb $T_{amb.}$ : -20°C up to -50°C ÷ +60°C
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P1 indicates the gas group:

- P1 = B : gas group IIB.
- P1 = C : gas group IIC.

Gas group I
Dust group IIIC (21)
IP 66 = *degree of protection*
-20°C up to - 50°C ÷ +60°C = *ambient temperature*

**ELECTRICAL DETAILS**

Limitex are equipped with internal switches or other electric devices with a power consumption lower than 2W

**GROUND CONNECTION**

There are two ground connections on the LIMITEX , the first is placed inside the terminal box and the other one is placed on the metal case.
Both connections must be wired to ground with appropriate cables.

## SAFETY INSTRUCTIONS FOR INSTALLATION IN DANGEROUS ZONE

These safety instructions must be used in accordance with the Use and Maintenance manual
Before carrying out the commissioning job, the user must ensure that the electric system is appropriate for its dangerous zone classification (Zone 1, 2, 21, 22) and verify that group and temperature class are appropriate for the gas, vapor and dust particles that are included in the zone in which the LIMITEX will be installed.

In case of storage LIMITEX must be placed in a safe zone without dust, vibrations, corrosive gas and smoke, with stable temperature and put in its standard position. The storage temperature must be included between 5°C and 45°C with relative humidity not exceeding 60%. The storage period should not be longer than 18 months.
LIMITEX must be installed and maintained in accordance to the system rule and maintenance for areas classified as Hazardous zone 1 and Zone 2 (Gas) or Zone 21 and Zone 22 (dust); for example: IE60079-14, IEC60079—17 or other nationals norms/standards.
Please use cables suitable for operating temperature of 80°C as shown on the metal plate
In case of installation in “Mine area Group I” , the user have to take as reference that the equipment underwent shock that are corresponding to Low risk energy only.
In case of use in Combustible dust area: the client must clean the surface of the external enclosure in order to avoid the entrance of dust particles bigger than 5 mm.

Ground connections:

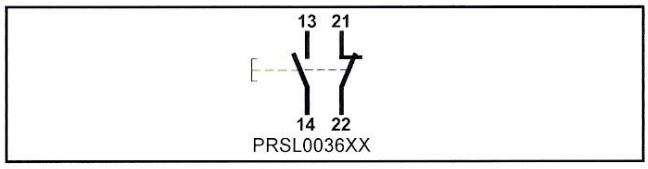
The enclosures are fitted with an internal and an external ground terminal M5, both terminals are made in stainless steel.
These terminals are fitted with lock washers in order to avoid the loosening of the wires.
The terminal that is located inside the case allows the connection of a wire with minimum section equal to the active wires one.
The terminal located outside the case allows the connection of a wire with minimum section of 4 mm ².

## STEPS FOR THE PROPER INSTALLATION OF THE LIMIT SWITCH

1 - remove the cover
2 - connect the limit switch shaft to the reduction gear shaft, check carefully the connection in order to avoid any misalignment
3 - fix the limit switch firmly in its place in order to prevent abnormal vibrations during operation; use the fixing holes placed on the base to install the equipment or the flange
4 - insert the cable into the limit switch through the cable clamp
5 - strip the cable to a suitable length in order to wire the switches
6 - Fix the wire into its clamp
7 - connect the switches according to the electric diagram that is printed on their body or follow the wiring scheme shown on the back of the instruction manual (use 6.3 mm Faston taps)
8 - adjust the operating point of the cams; for a proper adjustment, loose the central screw of the cam set, adjust the operating point of each single cam by turning its screw (the numbers on the screws refer to the cams counting from bottom to top), then tighten the central screw
9 - insert the free end of the no-drop wire
10 - Close the terminal box cover and secure the safety screw

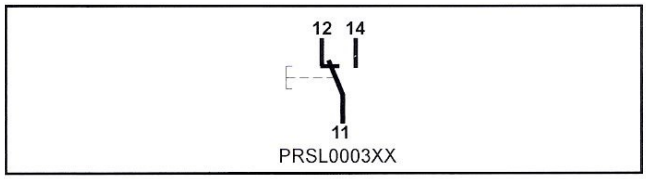
## CONNECTION DIAGRAM

CONNECTION SWITCH POSITION TYPE LIMITEX 001




the single switch fast opening with 1 NO contact + 1 NC changeover contact with two connection terminals for each contact.
All NC contacts are positive opening operation.

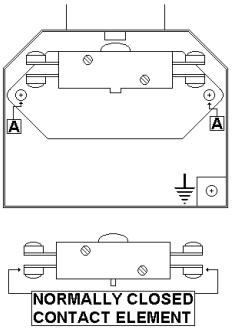
CONNECTION SWITCH ROTARY TYPE LIMITEX 002-003

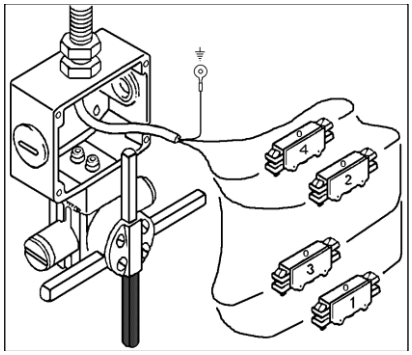



The single switch with 1 NO + 1 NC change over contacts.
All NC contacts are positive opening operation.

CONNECTION SWITCH TYPE LIMITEX POSITION 001 WITH 4 CONNECTIONS

Cross limit switch with 2 microswitches:
Unscrew screw "A" and remove the microswitches block.
Peel the wire and connect it to the terminal screws of the microswitches (no connector required).
Put back the microswitches block in proper position and fix it with screws "A".
Connect the ground terminal.
Before closing the limit switch, turn the cross lever left and right to be sure that microwitches are activated properly.
If they are not activated properly, the microswitch block may be in incorrect position.

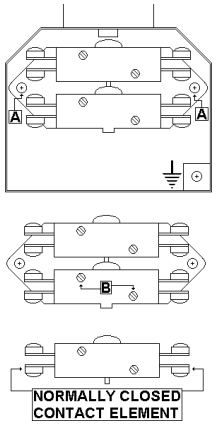


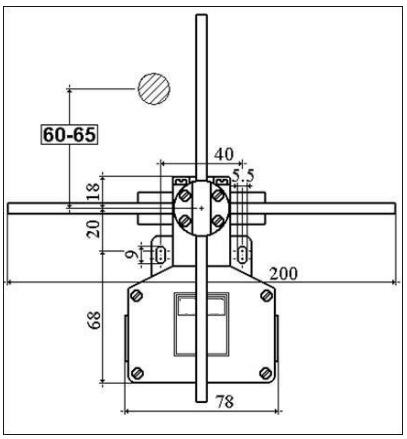




INSTRUCTIONS FOR WIRING TWO SPEEDS CROSS WISE LIMIT SWITCHES

Two speeds cross limit switch with 4 microswitches:

Unscrew "A" screws and remove the microswitch block.
Unscrew "B" screws and remove the microswitches in 2nd line (microswitches numbered 2 and 4).
Peel the wire and connect to the terminal screws of the microswitches in front position (that control the slow down function) (no connector required)..
Put back the microswitches in 2nd line (microswitches numbered 2 and 4) and fix them with screws "B".
Peel the wire and connect to the terminal screws of the microswitches in back position (that control the stop function).
Put back the microswitches block in proper position and fix it with screws "A".
Connect the ground terminal.
Before closing the limit switch, turn the cross lever left and right to be sure that all microwitches are activated properly.
If they are not activated properly, the microswitch block may be in incorrect position.
NOTE: use Diam. 1mm wires or smaller due to the small dimension of the case.




See above diagram.

In order to reach the best result, the actuator point should be placed at 60-65mm from the center of the cross (for limit switches with 200mm bars).

In case of limit switches with 300mm bars, the actuator point should be placed at 90-95mm

**SWITCHES TECHNICAL SPECIFICATIONS**

| | |
|---|---|
| Rated operational current | 3 A |
| Rated operational voltage | 250 V |
| Rated thermal current | 10 A |
| Rated insulation voltage | 300 V~ |
| Mechanical life | 1x106 operations |
| Terminal referencing | According to EN 50013 |
| Connections | 6,3 mm Faston taps |

**WARNING - MANDATORY FOR ALL CONNECTION TYPES -**
DO NOT OPEN THE METAL COVER IN PRESENCE OF EXPLOSIVE ATMOSPHERE.
AFTER EVERY OPENING OF THE METAL COVER, PLEASE ADD A LAYER OF WHITE LITHIUM GREASE ONLY.
THE MINIMUM ACCEPTABLE QUALITY OF APPLIED SCREWS MUST BE A12.9 GRADE.

***INSTALLATION***

WARNING: Every work on LIMITEX must be carried out when the system in which it installed result stopped and disconnected from the power supply (including all its auxiliary parts). Adequate precautions must be taken to avoid excess or peak voltages. The cables must not be crushed or exposed to mechanical load.
Use cables with a sufficient section to bear the maximum current, avoiding overheating and/or drops in voltage. Connect the cables to the terminals following the instructions shown on the diagrams. Check that terminal nuts are firmly tightened.
Electric connections to the terminals must be fixed in order to guarantee a safe distance between every live uncovered parts. The contact area must be cleaned and protected against corrosion.

**Ground connection:**

Two ground connections are provided, one inside the terminal box and the other on the LIMITEX case. Both of them must be connected to the plant grounding with at least one conductor with an adequate diameter.

**Box closure**

It is mandatory to replace the insulation grease layer when reassembling the metal cover. The terminal box cover must be firmly tighten to ensure a correct sealing.

**STARTING OF *OPERATIONS***

IN ORDER TO CHOOSE THE CORRECT LIMITEX VERSION, CHECK THE DANGER CHARACTERISTIC OF THE ZONE IN WHICH THE LIMITEX WILL BE INSTALLED AND THE ACTUAL SAFETY LAWS.

Verify that the LIMITEX is suited for use in the working conditions defined with the purchase order.
Before starting operations with LIMITEX it is important to check that:
-installation has been carried out properly
-the bearings are not damaged after installation works
- Design data corresponds to the ones shown on the nameplate and technical documentation

**NON AUTHORIZED MODIFY ON LIMITEX ARE NOT ALLOWED; IN CASE OF MODIFICATION WARRANTY AND CONSTRUCTOR RESPONSIBILITY ARE NO LONGER VALID.**

If a repair work is required on parts that could affect the protection against explosion, the LIMITEX construction features must be maintained identical (for example: dimensions of joints, bearings standards, etc.) and if part is replaced, the repair work must be done with original components only.
The maintenance operations and check frequency depends about the ambient and working conditions.

Please follow these maintenance instructions:

a) Often clean the LIMITEX external surface and remove dust layers
around the terminal box cover.
b) Check that nominal max. current consumption is respected.
c) In case of damage, please contact an authorized assistance workshop only

# *EC Declaration of conformity*

*The Manufacturer*: COEL Motori srl - Via Campania 40 20090 – Fizzonasco di Pieve Emanuele – MI ITALY
*declares under own sole responsibility that the product:*

**LIMITEX-SWITCHES**

Certified: **INERIS 13 ATEX 0020X**

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CE 0051 Ex II 2 GD Ex d II $P_1$ T6 Gb Ex tb IIIC T85 Db IP66 $T_{amb.}$ : -20°C up to -50°C : +60
0051 = number organism notified surveillance ATEX (IMQ)

The position Pn they preview constructive varying :
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IP 66 = protection degree

-20°C up to - 50°C ÷ + 60°C = ambient temperature

T.cavo : 80°C = temperature of the cable

Limitex is in conformity to 94/9/CE – ATEX 95, group II, category 2GD or group I M2, in accordance with the norm

EN 60079-0:2012+A11:2013 / EN 60079-1:2007 / EN 60079-31:2014.

Certified: **IECEx INE 13.0051X**

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**(The LIMITEX product is not affected by the main technical changes of the standard EN IEC 60079-0:2018).**

The LIMITEX are built in accordance following rules for group I, II and III, in accordance with applicable:
IEC 60079-0:2011, IEC 60079-1:2007-04, IEC 60079-31:2008.

DATE : 17/01/2025 *Managing director : MORENO MOZZATI*

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