## LG Safety Switches with Solenoid \& Separate Actuator

## Key Features

- Actuator holding force F1max: 2800 N
- 30 contact blocks with 4 contacts
- Metal housing, three conduit entries M20
- Protection degree IP67
- Versions with key release and emergency release button
- 4 stainless steel actuators
- Orientable head and devices, not detachable
- Signalling LED
- Operation with energised or de-energised solenoid

Options \& Ordering Codes

Note: The feasibility of a code number does not mean the effective availability of a product


# LG Safety Switches with Solenoid \＆ Separate Actuator 

## Specifications

| For safety applications up to： | SIL 3 acc．to EN 62061 |
| :---: | :---: |
|  | PL e acc．to EN ISO 13849－1 |
| Interlock with mechanical lock，coded： | type 2 acc．to EN ISO 14119 |
| Coding level： | Low acc．to EN ISO 14119 |
| Safety parameters： |  |
| $\mathrm{B}_{10 \mathrm{~d}}$ ： | 5，000，000 for NC contacts |
| Service life： | 20 years |
| Ambient temperature： | $-25^{\circ} \mathrm{C} \ldots+60^{\circ} \mathrm{C}$ |
| Max．actuation frequency： | 600 operating cycles ${ }^{1}$／hour |
| Mechanical endurance： | 1 million operating cycles ${ }^{1}$ |
| Max．actuation speed： | $0.5 \mathrm{~m} / \mathrm{s}$ |
| Min．actuation speed： | $1 \mathrm{~mm} / \mathrm{s}$ |
| Maximum force before breakage $\mathrm{F}_{\text {max }}$ ： | 2800 N acc．to EN ISO 14119 |
| Max．holding force $\mathrm{F}_{27}$ ： | 2150 N acc．to EN ISO 14119 |
| Maximum play of locked actuator： | 4.5 mm |
| Released actuator extraction force： | 30 N |

## Solenoid

## Housing

Metal head and housing，baked powder coating．
Three threaded conduit entries：

Protection degree：

M20x1．5（standard）

IP67 acc．to EN 60529 with cable gland having equal or higher protection degree

Cable cross section（flexible copper wire）
Cable cross section（flexible copper strands）

| Contact blocks： | $\min .1 \times 0.34 \mathrm{~mm}^{2}(1 \times$ AWG 22） |
| :--- | :--- |
|  | $\max 2 \times 1.5 \mathrm{~mm}^{2}(2 \times$ AWG 16 $)$ |

Positive contact opening in conformity with standards

IEC 60947－5－1，EN 60947－5－1．

## Utilization Category

|  | Alternating current：AC15 $(50 \div 60 \mathrm{~Hz})$ |  |  |  | Direct Current：DC13 |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Ue（V） | 120 | 250 | 400 | $\begin{aligned} & \text { Ue (V) } \\ & \text { le (A) } \end{aligned}$ | $\begin{aligned} & 24 \\ & 3 \end{aligned}$ | $\begin{aligned} & 125 \\ & 0.7 \end{aligned}$ | $\begin{aligned} & 250 \\ & 0.4 \end{aligned}$ |
|  | le（A） | 6 | 5 | 3 |  |  |  |  |
|  | Alternating current：AC15（ $50 \div 60 \mathrm{~Hz}$ ） |  |  |  | Direct Current：DC13 |  |  |  |
|  | Ue（V） | 120 | 250 | 400 | Ue（V） | 24 | 125 | 250 |
|  | le（A） | 6 | 5 | 3 | le（A） | 3 | 0.7 | 0.4 |
| Nむ』 | Alternating current：AC15 $(50 \div 60 \mathrm{~Hz})$ |  |  |  | Direct Current：DC13 |  |  |  |
|  | $\begin{aligned} & \text { Ue (V) } \\ & \text { le (A) } \end{aligned}$ | $\begin{aligned} & 24 \\ & 1.5 \end{aligned}$ |  |  | $\begin{aligned} & \text { Ue (V) } \\ & \text { le (A) } \end{aligned}$ | $\begin{aligned} & 24 \\ & 1.5 \end{aligned}$ |  |  |

ミ景
（A） 1.5
le（A） 1.5

## Electrical Data

| 흘333 | Thermal current（lth）： | 10 A |
| :---: | :---: | :---: |
|  | Rated insulation voltage（Ui）： | 400 Vac 300 Vdc |
|  | Rated impulse withstand voltage（ $\mathrm{U}_{\text {imp }}$ ）： | 6 kV |
|  | Conditional short circuit current： | 1000 A acc．to EN 60947－5－1 |
|  | Protection against short circuits： | type gG fuse 10 A 500 V |
|  | Pollution degree： | 3 |
|  | Thermal current（lth）： | 8 A |
|  | Rated insulation voltage（Ui）： | 250 Vac 300 Vdc |
|  | Protection against short circuits： | type gG fuse 8 A 500 V |
|  | Pollution degree： | 3 |
|  | Thermal current（lth）： | 1.5 A |
|  | Rated insulation voltage（Ui）： | 30 Vac 36 Vdc |
|  | Protection against short circuits： | type gG fuse 1．5 A |
|  | Pollution degree： | 3 |


| Duty cycle： | $100 \%$ ED |
| :--- | :--- |
| Solenoid protection 12 V ： | type gG fuse 1 A |
| Solenoid protection 24 V ： | type gG fuse 0.5 A |
| Solenoid protection 120 V ： | fuse 315 mA, delayed |
| Solenoid protection 230 V ： | fuse 315 mA, delayed |
| Solenoid consumption： | 9 VA |

## In Conformity With Standards

IEC 60947－5－1，EN 60947－5－1，EN 60947－1，IEC 60204－1，EN 60204－1，EN ISO 14119， EN ISO 12100，IEC 60529，EN 60529，EN 61000－6－2，EN 61000－6－3，BG－GS－ET－15， UL 508，CSA 22.2 N .14.

## In Conformity With Requirements Requested By

Low Voltage Directive 2006／95／EC，Machinery Directive 2006／42／EC and EMC Directive 2004／108／EC －

# LG Safety Switches with Solenoid \& Separate Actuator 



These switches are used on machines where the hazardous conditions remain for a while, even after the machines have been switched off, for example because of mechanical inertia of pulleys, saw disks, parts under pressure or with high temperatures. They can also be used when it is necessary to control machine guards allowing the opening of protections only under specific conditions. The versions with solenoid actuated NC contacts are considered interlocks with locking in accordance with ISO 14119, and the product is marked on the side with the symbol shown.


## Holding force of the locked actuator



The strong interlocking system guarantees a maximum actuator holding force of F1max $=$ 2800 N .

## Orientable Heads and Devices



The head can be easily turned to each of the four sides of the switch by unfastening the two fixing screws. The auxiliary key release device can be rotated in $90^{\circ}$ steps enabling the switch to assume 32 different configurations.

## Key Release Device with Orientable Lock



The auxiliary key release device is used to allow the maintenance or the entry into the machinery to authorized personnel only. Rotating the key, will activate the solenoid and release the actuator. The device can be rotated allowing for the installation of the safety switch inside the machinery and making the release device accessible outside the protection. In this way, the switch offers improved protection against possible tampering whilst the external side/surface of the machinery remains flat.

Key release device and emergency release button


This device performs the two above mentioned functions at the same time. Also in this case the device can be rotated and the release button can be ordered with different lengths. The activation of the button has the priority on the lock, that is with the closed lock it is still possible to press the button and release the switch. To reset the switch it is necessary to bring lock and button to their initial position.

## Wide-ranging Actuator Travel



The head of this switch has been designed to have a certain amount of movement tolerance for oscillation along the direction of insertion without causing unwanted machine shutdown caused by switch activation. This feature is available with all door interlock actuators, in order to ensure maximum device reliability.

## Contact blocks with 4 Contacts



Innovative contact block with 4 contacts, available in different contact configurations to monitor the actuator or the solenoid (patented). The unit is supplied with captive screws and self-lifting plates. Removable finger protection for eyelet terminals. Highly reliable electric contacts with four support points and double interruption

Safety Screws for Actuators


As required by ISO 14119, the actuator must be fixed immovably to the door frame. Pan head safety screws with one-way fitting are available for this purpose. With this screw type, the actuators cannot be removed or tampered with using common tools.

## Emergency release button

This device is used when the safety switch controls hazardous areas where operators may physically enter with
 all their body. The release button, oriented towards inside the machinery, allows the exit of the operator accidentally trapped also in case of possible black-out. Pushing the button, it will be actuated the same function of the auxiliary release device. To reset the switch, just return the button to its initial position. The emergency button can be rotated, is available with different lengths and it is fixed to the switch by a screw, so to allow the installation of the switch inside or outside the guards.

## Non detachable heads and devices



The head and the release device can be rotated, but cannot be detached. This reduces the risk of damage, loss of small parts, and dirt penetration of the unit.

# LG Safety Switches with Solenoid \& Separate Actuator 

## Signalling LED Type A



In the version with signalling LED type A, two green LEDs are switched-on directly by the solenoid power supply. Wiring is not necessary.

## Protection Degree IP67



These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to IEC 60529. They can therefore be used in all environments where the maximum protection of the housing is required.

## Extended Temperature Range

This range of switches is also available in a special version with an ambient operating temperature range of $-40^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$. They can be used for applications in cold stores, sterilisers and other devices with low temperature environments. Special materials that have been used to realize these versions, maintain unchanged their features also in these conditions, widening the installation possibilities.

## Extended Temperature Range



All the LG series switches are indelibly marked with a dedicated laser system that allows the marking to be also suitable for extreme environments. This system that does not use labels, prevents the loss of plate data and the marking is more resistant over time.

## Signalling LED Type B



In the version with signalling LED type B, two LED connection wires are available, one green and one red. Through suitable connections to the contact block, it is possible to see the different states of the switch from the exterior.


## Signalling LED Type B



The switch is equipped with three cable entries in different directions. This allows its application in series connections or in narrow places.

## Signalling LED Type B



Versions with working principle $D$ are supplied with a sealable auxiliary release device used by technicians during the installation or to access the machine in case of black-out. The auxiliary release device acts on the switch exactly as if the solenoid was energised, actuating therefore also the corresponding electrical contacts. Can only be actuated with a couple of tools, this ensures adequate resistance to tampering. If required it can be sealed by means of the hole provided.

## Access Monitoring

These switches alone cannot protect operators or maintenance personal when they have entered the hazardous area, because, a voluntary closing of the gate with fitted protection switch behind them could allow the machine to restart. To make sure this can't happen, a padlock able device of the type AC-KB2 can be used to lock the actuator entry into the switch. Alternatively, the gate can be fitted with an IMO entry handle of the type AC-AP-P11B-200P.

## Holding Force of the Unlocked Actuator

All the LG series switches are indelibly marked with a


# LG Safety Switches with Solenoid \& Separate Actuator 

Working Principle

The working principle of these safety switches allows three different working states:
state A: with inserted and locked actuatorwith inserted actuator, not lockedwith extracted actuator

All or some of these states may be controlled through NO contacts or positive opening NC contacts of the internal contact block. In detail, contact blocks that have electric contacts marked with the symbol of the solenoid ( $\exists \nabla$ ) are switched in the transition between the state $A$ and state $B$, while the electric contacts marked with the symbol of the actuator ( $\sigma$ ) are switched between state B and state C:

It is also possible to choose between two working principles for the actuator locking:

- Working principle D: Actuator locked with de-energised solenoid. Actuator release is obtained by power supply to the solenoid (see example of working cycle steps).
- Working principle E: Actuator locked with energised solenoid. The release of the actuator is obtained by power-off to the solenoid. It is advisable to use this versionunder special conditions because a blackout will allow the immediate opening of the protection.

Example of Working Cycle Steps with LG MSAS1DOA-F21 (Switch with Working Principle D)


## LG Safety Switches with Solenoid \& Separate Actuator

## Selection Diagram



# LG Safety Switches with Solenoid \& Separate Actuator 

Contact Positions Related to Switch States

| Operating state |  | Working principle D locked actuator with de-energised solenoid |  |  |  |  |  |  |  |  | Working principle E <br> locked actuator with energised solenoid |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\begin{gathered} \text { state } \\ \mathrm{A}^{2} \end{gathered}$ |  |  | $\begin{gathered} \hline \text { state } \\ \text { B } \end{gathered}$ |  |  | $\begin{gathered} \text { state } \\ \text { C } \end{gathered}$ |  |  | $\begin{aligned} & \text { state } \\ & \hline \mathrm{A} \end{aligned}$ |  |  | $\begin{gathered} \text { state } \\ \text { B } \end{gathered}$ |  |  | $\begin{gathered} \text { state } \\ \text { C } \end{gathered}$ |  |  |
| Actuator |  | Inserted and locked |  |  | Inserted and released |  |  | Extracted |  |  | Inserted and locked |  |  | Inserted and released |  |  | Extracted |  |  |
| Solenoid |  | De-energised |  |  | Energised |  |  |  |  |  | Energised |  |  | De-energised |  |  | - |  |  |
|  |  |  | $\begin{array}{\|l\|l\|} \hline \text { B } & \\ \hline 9 & 0 \\ \hline \end{array}$ |  |  |  |  |  |  |  |  |  |  |  |  |  | $\begin{array}{\|cc\|} \hline 80 \\ \hline 0 & 0 \\ \therefore & 0 \\ \hline \end{array}$ |  | $\rightarrow \square$ |
| LG MSM..... $2 \mathrm{NO}+1 \mathrm{NC}$ controlled by the solenoid iNO controlled by the actuator | $\begin{aligned} & \sigma \\| \Omega \\ & \# \nabla \\ & \# \nabla \\ & \# \nabla \end{aligned}$ | 13 | - | 14 | 13 | - | 14 | 13 | L | 14 | 13 | $\cdots$ | 14 | 13 | - | 14 | 13 | $\square$ | 14 |
|  |  | 21 | - | 22 | 21 | $\cdots$ | 22 | 21 | - | 22 | 21 | $\checkmark$ | 22 | 21 | - | 22 | 21 | - | 22 |
|  |  | 33 | - | 34 | 33 | ¢ | 34 | 33 | $\bigcirc$ | 34 | 33 | - | 34 | 33 | $\checkmark$ | 34 | 33 | $\checkmark$ | 34 |
|  |  | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\square$ | 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | - | 44 |
| LG MSN..... 1NO + 1NC controlled by the solenoid 2NO controlled by the actuator | $\begin{aligned} & \because \nabla \\ & \because \square \\ & \because \\| \Omega \\ & \because \\| \Omega \end{aligned}$ | 13 | - | 14 | 13 | - | 14 | 13 | - | 14 | 13 | - | 14 | 13 | - | 14 | 13 | - | 14 |
|  |  | 21 | - | 22 | 21 | - | 22 | 21 | - | 22 | 21 | $\bigcirc$ | 22 | 21 | - | 22 | 21 | - | 22 |
|  |  | 33 | - | 34 | 33 | $\cdots$ | 34 | 33 | $\checkmark$ | 34 | 33 | - | 34 | 33 | $\cdots$ | 34 | 33 | $\checkmark$ | 34 |
|  |  | 43 | - | 44 | 43 | - | 44 | 43 | - | 44 | 43 | $\cdots$ | 44 | 43 | $\cdots$ | 44 | 43 | ¢ | 44 |
| LG MSP..... NC controlled by the solenoid 3NC controlled by the actuator | 댜 <br> r <br> $\pm$ <br> 대 | . 11 | L | 12 | 11 | L | 12 | 11 | - | 12 | 11 | L | 12 | 11 | $\bigcirc$ | 12 | 11 | - | 12 |
|  |  | 21 | L | 22 | 21 | $\checkmark$ | 22 | 21 | - | 22 | 21 | L | 22 | 21 | - | 22 | 21 | - | 22 |
|  |  | 31 | $\checkmark$ | 32 | 31 | - | 32 | 31 | - | 32 | 31 | $\checkmark$ | 32 | 31 | - | 32 | 31 | - | 32 |
|  |  | 41 | $\checkmark$ | 42 | 41 | ¢ | 42 | 41 | - | 42 | 41 | $\checkmark$ | 42 | 41 | $\checkmark$ | 42 | 41 | - | 42 |
| $\begin{aligned} & \text { LG MSR•• . . . } \\ & \text { 2N0 }+2 \text { CC controlled by the } \\ & \text { solenoid } \end{aligned}$ | $\begin{aligned} & =\nabla \\ & \# \nabla \\ & \neq \nabla \\ & \# \nabla \end{aligned}$ | 11 | T | 12 | 11 | - | 12 | 11 | - | 12 | 11 | t | 12 | 11 | - | 12 | 11 | - | 12 |
|  |  | 21 | $\checkmark$ | 22 | 21 | $\cdots$ | 22 | 21 | $\cdots$ | 22 | 21 | - | 22 | 21 | $\cdots$ | 22 | 21 | $\cdots$ | 22 |
|  |  | 33 | - | 34 | 33 | - | 34 | 33 | - | 34 | 33 | $\cdots$ | 34 | 33 | - | 34 | 33 | $\square$ | 34 |
|  |  | 43 | - | 44 | 43 | $\checkmark$ | 44 | 43 | - | 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | L | 44 |
| LG MSS..... <br> 1NC controlled by the solenoid $2 \mathrm{NO}+1 \mathrm{NC}$ controlled by the actuator | $\begin{aligned} & \because \square \\ & \because \\| \Omega \\ & \sigma \\| \Omega \\ & \sigma \\| \Omega \end{aligned}$ | 11 | T | 12 | 11 | - | 12 | 11 | - | 12 | 11 | L | 12 | 11 | - | 12 | 11 | - | 12 |
|  |  | 21 | - | 22 | 21 | - | 22 | 21 | - | 22 | 21 | L | 22 | 21 | $\bigcirc$ | 22 | 21 | - | 22 |
|  |  | 33 | - | 34 | 33 | - | 34 | 33 | T | 34 | 33 | - | 34 | 33 | - | 34 | 33 | $\square$ | 34 |
|  |  | 43 | - | 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\cdots$ | 44 | 43 | - | 44 | 43 | - | 44 |
| LG MST...... NC controlled by the solenoid $1 \mathrm{NO}+2 \mathrm{NC}$ controlled by the actuator | $\begin{aligned} & \because \square \\ & \because \\| \Omega \\ & \cdots \\| \Omega \\ & \cdots \\| S \end{aligned}$ | 11 | $\checkmark$ | 12 | 11 | $\cdots$ | 12 | 11 | $\cdots$ | 12 | 11 | T | 12 | 11 | $\cdots$ | 12 | 11 | $\cdots$ | 12 |
|  |  | 21 | t | 22 | 21 | T | 22 | 21 | - | 22 | 21 | T | 22 | 21 | $\checkmark$ | 22 | 21 | - | 22 |
|  |  | 31 | $\checkmark$ | 32 | 31 | ¢ | 32 | 31 | $\cdots$ | 32 | 31 | - | 32 | 31 | $\checkmark$ | 32 | 31 | $\cdots$ | 32 |
|  |  | 43 | - | 44 | 43 | $\cdots$ | 44 | 43 | - | 44 | 43 | - | 44 | 43 | - | 44 | 43 | $\checkmark$ | 44 |
| L MSU..... <br> 4NC controlled by the actuator | r-fos <br> ㄷ.\\|토 <br> 태이 <br> - $\quad$ \\| | 11 | ¢ | 12 | 11 | $\bigcirc$ | 12 | 11 | - | 12 | 11 | $\pm$ | 12 | 11 | $\checkmark$ | 12 | 11 | - | 12 |
|  |  | 21 | $\square$ | 22 | 21 | L | 22 | 21 | - | 22 | 21 | L | 22 | 21 | $\checkmark$ | 22 | 21 | - | 22 |
|  |  | 31 | L | 32 | 31 | L | 32 | 31 | - | 32 | 31 | $\checkmark$ | 32 | 31 | $\checkmark$ | 32 | 31 | - | 32 |
|  |  | 41 | T | 42 | 41 | $\bigcirc$ | 42 | 41 | - | 42 | 41 | $\checkmark$ | 42 | 41 | $\checkmark$ | 42 | 41 | - | 42 |
| LG MSV••... <br> 2NC controlled by the solenoid 2NO controlled by the actuator | $\begin{aligned} & \because \square \\ & \# \square \\ & \because \\| \\ & \because \\| \& \end{aligned}$ | 11 | $\square$ | 12 | 11 | - | 12 | 11 | $\cdots$ | 12 | 11 | - | 12 | 11 | - | 12 | 11 | - | 12 |
|  |  | 21 | T | 22 | 21 | - | 22 | 21 | - | 22 | 21 | - | 22 | 21 | - | 22 | 21 | - | 22 |
|  |  | 33 | $\cdots$ | 34 | 33 | $\cdots$ | 34 | 33 | L | 34 | 33 | $\cdots$ | 34 | 33 | $\cdots$ | 34 | 33 | - | 34 |
|  |  | 43 | - | 44 | 43 | - | 44 | 43 | L | 44 | 43 | - | 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 |
| LG MSX..... <br> 1NO controlled by the solenoid 3NC controlled by the actuato | $\begin{aligned} & \because \square \\ & \because \\| \varepsilon \\ & \because \\| \& \\ & \cdots \\| \varepsilon \end{aligned}$ | 13 | $\cdots$ | 14 | 13 | $\checkmark$ | 14 | 13 | $\checkmark$ | 14 | 13 | - | 14 | 13 | $\checkmark$ | 14 | 13 | $\checkmark$ | 14 |
|  |  | 21 | L | 22 | 21 | L | 22 | 21 | - | 22 | 21 | $\checkmark$ | 22 | 21 | $\boxed{L}$ | 22 | 21 | $\cdots$ | 22 |
|  |  | 31 | $\checkmark$ | 32 | 31 | ¢ | 32 | 31 | - | 32 | 31 | $\checkmark$ | 32 | 31 | $\checkmark$ | 32 | 31 | $\cdots$ | 32 |
|  |  | 41 | - | 42 | 41 | $\checkmark$ | 42 | 41 | - | 42 | 41 | $\checkmark$ | 42 | 41 | $\checkmark$ | 42 | 41 | - | 42 |
| LG MSY..... 1NO controlled by the solenoid $1 \mathrm{NO}+2 \mathrm{NC}$ controlled by the actuator | 재 <br> 대우 <br> 매오 <br> $\#$ | 11 | - | 12 | 11 | L | 12 | 11 | $\cdots$ | 12 | 11 | L | 12 | 11 | $\checkmark$ | 12 | 11 | - | 12 |
|  |  | 21 | - | 22 | 21 | L | 22 | 21 | - | 22 | 21 | t | 22 | 21 | $\bigcirc$ | 22 | 21 | $\cdots$ | 22 |
|  |  | 33 | $\cdots$ | 34 | 33 | - | 34 | 33 | L | 34 | 33 | $\cdots$ | 34 | 33 | - | 34 | 33 | $\checkmark$ | 34 |
|  |  | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | - | 44 |

# LG Safety Switches with Solenoid \＆ <br> Separate Actuator 

## Contact Positions Related To Switch States

| Operating state |  | Working principle D locked actuator with de－energised solenoid |  |  |  |  |  |  |  | Working principle E <br> locked actuator with energised solenoid |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | $\begin{gathered} \text { state } \\ \text { A } \end{gathered}$ |  | $\begin{gathered} \text { state } \\ \mathbf{B} \\ \hline \end{gathered}$ |  |  | $\begin{aligned} & \text { state } \\ & \text { C } \end{aligned}$ |  | $\begin{gathered} \text { state } \\ \mathrm{A} \end{gathered}$ |  |  | $\begin{gathered} \text { state } \\ \text { B } \end{gathered}$ |  |  | state |  |  |
| Actuator |  | Inserted and locked |  | Inserted and released |  |  |  | Extracted |  | Inserted and locked |  |  | Inserted and released |  |  | Extracted |  |  |
| Solenoid |  | De－energised |  | Energised |  |  |  |  |  | Energised |  |  | De－energised |  |  | － |  |  |
|  |  |  | $\begin{array}{\|l\|} \hline \text { © } 8 \\ \hline \odot \quad 0 \\ \hline \end{array}$ |  | $\left.\begin{array}{\|c\|c\|} \hline \left.\begin{array}{\|c\|} \hline 8 \\ \hline 0 \\ \hline \\ \hline \end{array} \right\rvert\, \\ \hline \end{array} \right\rvert\,$ |  | $\begin{array}{\|c\|c\|} \hline 8 & \longrightarrow 0 \\ \hline 0 & 0 \\ \therefore & \rightarrow \end{array}$ |  |  | $\left.\begin{array}{\|c\|} \hline \text { 各 } \\ \hline 0 \\ \hline \\ \hline \end{array} \right\rvert\,$ |  |  |  |  |  |  |  |  |
| LG MSM．．．．．． $2 \mathrm{NO}+1 \mathrm{NC}$ controlled by the solenoid 1NO controlled by the actuator | －$\square_{6} 13$ |  | － 14 | 13 | － | 14 | 13 | $\boxed{\square}$ | 14 | 13 | － | 14 | 13 | － | 14 | 13 | $\boxed{L}$ | 14 |
|  | $\square \boxtimes$ | 21 | t 22 | 21 | － | 22 | 21 | $\cdots$ | 22 | 21 | $\tau$ | 22 | 21 | － | 22 | 21 | － | 22 |
|  | $\square \square$ | 33 | － 34 | 33 | $\checkmark$ | 34 | 33 | $\square$ | 34 | 33 | － | 34 | 33 | － | 34 | 33 | $\bigcirc$ | 34 |
|  | $\square \square$ | 43 | － 44 | 43 | L | 44 | 43 | T | 44 | 43 | － | 44 | 43 | $\square$ | 44 | 43 | $\square$ | 44 |
|  | $\pm \triangle$ | 13 | － 14 | 13 | － | 14 | 13 | $\checkmark$ | 14 | 13 | $\cdots$ | 14 | 13 | － | 14 | 13 | － | 14 |
| LG MSN．．．．．． 1NO＋1NC controlled by the | $\pm$ | 21 | $\bigcirc 22$ | 21 | － | 22 | 21 | － | 22 | 21 | $\checkmark$ | 22 | 21 | － | 22 | 21 | － | 22 |
|  | $\cdots$ | 33 | － 34 | 33 | － | 34 | 33 | $\checkmark$ | 34 | 33 | － | 34 | 33 | $\cdots$ | 34 | 33 | $\bigcirc$ | 34 |
| 2NO controlied by the actuator | $\cdots$ | 43 | － 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 |
|  | $\square \\|^{\circ}$ | ． 11 | － 12 | 11 | $\bigcirc$ | 12 | 11 | － | 12 | 11 | $\checkmark$ | 12 | 11 | $\checkmark$ | 12 | 11 | － | 12 |
| LG MSP．．．．．． | $\cdots$ |  | － 22 | 21 | L | 22 | 21 | $\sim$ | 22 | 21 | L | 22 | 21 | $\checkmark$ | 22 | 21 | － | 22 |
| 1NC controneled by the actuator | $\pm$ | 31 | － 32 | 31 | － | 32 | 31 | $\cdots$ | 32 | 31 | $\boxed{L}$ | 32 | 31 | $\cdots$ | 32 | 31 | $\cdots$ | 32 |
|  | $\cdots$ | 41 | － 42 | 41 | － | 42 | 41 | － | 42 | 41 | L | 42 | 41 | － | 42 | 41 | $\cdots$ | 42 |
|  |  | 11 | － 12 | 11 | $\cdots$ | 12 | 11 | $\cdots$ | 12 | 11 | L | 12 | 11 | $\cdots$ | 12 | 11 | $\bigcirc$ | 12 |
| LG MSR．．．．． | $\pm \square$ | 21 | － 22 | 21 | $\cdots$ | 22 | 21 | $\cdots$ | 22 | 21 | － | 22 | 21 | $\cdots$ | 22 | 21 | － | 22 |
| $2 \mathrm{NO}+2 \mathrm{NC}$ controlled by the solenoid | $\pm$ | 33 | － 34 | 33 | $\checkmark$ | 34 | 33 | $\checkmark$ | 34 | 33 | － | 34 | 33 | $\checkmark$ | 34 | 33 | $\checkmark$ | 34 |
|  | $\pm$ | 43 | － 44 | 43 | $\checkmark$ | 44 | 43 | $\checkmark$ | 44 | 43 | － | 44 | 43 | $\checkmark$ | 44 | 43 | $\checkmark$ | 44 |
|  | $\square$ | 11 | － 12 | 11 | － | 12 | 11 | － | 12 | 11 | $\checkmark$ | 12 | 11 | － | 12 | 11 | － | 12 |
| 1NC controlled by the solenoid | ¢\｜a |  | － 22 | 21 | $\bigcirc$ | 22 | 21 | － | 22 | 21 | L | 22 | 21 | $\checkmark$ | 22 | 21 | － | 22 |
| $\begin{aligned} & 2 \mathrm{NO}+1 \mathrm{NC} \text { controlled by the } \\ & \text { actuator } \end{aligned}$ | 厄析 |  | － 34 | 33 | $\cdots$ | 34 | 33 | L | 34 | 33 | － | 34 | 33 | － | 34 | 33 | ¢ | 34 |
|  | ¢0］ | 43 | － 44 | 43 | $\cdots$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\cdots$ | 44 | 43 | $\cdots$ | 44 | 43 | － | 44 |
|  |  | 11 | － 12 | 11 | － | 12 | 11 | － | 12 | 11 | － | 12 | 11 | － | 12 | 11 | － | 12 |
| LG MST••••• NC controlled by the solenoid | $\cdots$ |  | － 22 | 21 | L | 22 | 21 | － | 22 | 21 | $\square$ | 22 | 21 | － | 22 | 21 | － | 22 |
| 1NO +2 NC controlled by the | $\cdots$ |  | － 32 | 31 | － | 32 | 31 | － | 32 | 31 | － | 32 | 31 | － | 32 | 31 | － | 32 |
|  | $\square$ | 43 | － 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 | 43 | $\checkmark$ | 44 |
|  | ㄷ．0오 |  | － 12 | 11 | $\checkmark$ | 12 | 11 | － | 12 | 11 | $\bigcirc$ | 12 | 11 | $\checkmark$ | 12 | 11 | － | 12 |
| LG MSU．．．． | $\cdots$ |  | － 22 | 21 | $\boxed{L}$ | 22 | 21 | － | 22 | 21 | $\boxed{L}$ | 22 | 21 | $\boxed{L}$ | 22 | 21 | － | 22 |
| 4 NC controlled by the actuator | $\cdots$ |  | － 32 | 31 | － | 32 | 31 | $\cdots$ | 32 | 31 | L | 32 | 31 | － | 32 | 31 | $\cdots$ | 32 |
|  | $\cdots$ | 41 | － 42 | 41 | L | 42 | 41 | － | 42 | 41 | － | 42 | 41 | － | 42 | 41 | $\cdots$ | 42 |
|  | $\pm$ | 11 | － 12 | 11 | － | 12 | 11 | － | 12 | 11 | L | 12 | 11 | － | 12 | 11 | － | 12 |
| LG MSV．．．．． |  |  | － 22 | 21 | $\cdots$ | 22 | 21 | － | 22 | 21 | $\boxed{L}$ | 22 | 21 | － | 22 | 21 | － | 22 |
| 2NC controled by the Solenoid | $\cdots$ |  | － 34 | 33 | $\cdots$ | 34 | 33 | L | 34 | 33 | － | 34 | 33 | － | 34 | 33 | $\bigcirc$ | 34 |
|  | $\sigma$ | 43 | － 44 | 43 | $\cdots$ | 44 | 43 | L | 44 | 43 | － | 44 | 43 | － | 44 | 43 | － | 44 |
|  |  | 13 | － 14 | 13 | $\square$ | 14 | 13 | $\boxed{L}$ | 14 | 13 | － | 14 | 13 | L | 14 | 13 | $\square$ | 14 |
|  | $\approx \\|$ |  | － 22 | 21 | － | 22 | 21 | － | 22 | 21 | $\checkmark$ | 22 | 21 | － | 22 | 21 | － | 22 |
| 1NO controlled by the solenoid 3NC controlled by the actuator | $\cdots$ |  | － 32 | 31 | $\checkmark$ | 32 | 31 | $\cdots$ | 32 | 31 | － | 32 | 31 | － | 32 | 31 | $\cdots$ | 32 |
|  | $\because$ | 41 | － 42 | 41 | － | 42 | 41 | $\cdots$ | 42 | 41 | － | 42 | 41 | － | 42 | 41 | $\cdots$ | 42 |
|  | $\cdots$ |  | － 12 | 11 | $\checkmark$ | 12 | 11 | $\sim$ | 12 | 11 | L | 12 | 11 | $\checkmark$ | 12 | 11 | $\cdots$ | 12 |
| 1NO controlled by the solenoid |  |  | － 22 | 21 | L | 22 | 21 | $\cdots$ | 22 | 21 | － | 22 | 21 | － | 22 | 21 | － | 22 |
| $\begin{aligned} & 1 \mathrm{NO}+2 \mathrm{NC} \text { controlled by the } \\ & \text { actuator } \end{aligned}$ | $\cdots$ |  | － 34 | 33 | $\cdots$ | 34 | 33 | $\bigcirc$ | 34 | 33 | $\cdots$ | 34 | 33 | $\cdots$ | 34 | 33 | $\checkmark$ | 34 |
|  | $\pm$ |  | － 44 | 43 | $\checkmark$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\sim$ | 44 | 43 | $\checkmark$ | 44 | 43 | $\checkmark$ | 44 |

# LG Safety Switches with Solenoid \＆ Separate Actuator 

Dimensional Drawings

All measures in the drawings are in mm

## Contact type：

L＝slow action

Contact blocks

Working principle D，supplied with sealable
auxiliary release device and without actuator riary tor


Working principle D，supplied with key release and without actuator


|  |  |  |  |  | $=\square$ | ■－5 |  |  |  | － | 당 |  |  |  | $=\square$ | －0／0 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MSA | L | LGMSAS1D0A | $\square$ | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 1NO＋1NC | LGMSAS1E0A | $\downarrow$ | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | LGMSAS5D0A | $\square$ | $\Theta$ | 1NO＋1NC | $1 \mathrm{NO}+1 \mathrm{NC}$ |
| MSB | L | LGMSBS1D0A | $\downarrow$ | $\Theta$ | 2NC | 1NO＋1NC | LGMSBS1E0A | $\downarrow$ | $\Theta$ | 2NC | 1NO＋1NC | LGMSBS5D0A | $\downarrow$ | $\Theta$ | 2NC | 1NO＋1NC |
| MSC | L | LGMSCS1D0A | $\square$ | $\Theta$ | 3NC | 1NC | LGMSCS1E0A | $\square$ | $\Theta$ | 3NC | 1NC | LGMSCS5D0A | $\square$ | $\Theta$ | 3NC | 1NC |
| MSD | L | LGMSDS1D0A | $\square$ | $\Theta$ | 1NO＋1NC | 2NC | LGMSDS1E0A | 凹 | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NC | LGMSDS5D0A | い | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NC |
| MSE | L | LGMSES1DOA | $\square$ | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC | LGMSES1E0A | $\square$ | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC | LGMSES5D0A | $\square$ | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC |
| MSF | L | LGMSFS1D0A | い | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NO | LGMSFS1E0A | $\square$ | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NO | LGMSFS5D0A | 小 | $\Theta$ | 1NO＋2NC | 1NO |
| MSG | L | LGMSGS1D0A | $\checkmark$ | $\Theta$ | 2NC | 2NC | LGMSGS1E0A | $\downarrow$ | $\Theta$ | 2NC | 2NC | LGMSGS5D0A | $\checkmark$ | $\Theta$ | 2NC | 2NC |
| MSH | L | LGMSHS1D0A | 凹 | $\Theta$ | 4NC | 1 | LGMSHS1E0A | W | $\Theta$ | 4NC | 1 | LGMSHS5D0A | 小 | $\Theta$ | 4NC | 1 |
| MSI | L | LGMSIS1D0A | $\checkmark$ | $\Theta$ | 3NC | 1N0 | LGMSIS1E0A | 小 | $\Theta$ | 3NC | 1N0 | LGMSIS5D0A | 小 | $\Theta$ | 3NC | 1NO |
| MSL | L | LGMSLS1D0A | 凹 | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NC | LGMSLS1E0A | 凹 | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NC | LGMSLS5D0A | d | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NC |
| MSM | L | LGMSMS1D0A | ป | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1N0 | LGMSMS1E0A | 山 | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1N0 | LGMSMS5D0A | 山 | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NO |
| MSN | L | LGMSNS1D0A | 凹 | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NO | LGMSNS1E0A | む | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NO | LGMSNS5D0A |  | $\Theta$ | 1NO＋1NC | 2NO |
| MSP | L | LGMSPS1D0A | $山$ | $\Theta$ | 1NC | 3NC | LGMSPS1E0A | 凹 | $\Theta$ | 1NC | 3NC | LGMSPS5D0A | $\square$ | $\Theta$ | 1NC | 3NC |
| MSR | L | LGMSRS1D0A | $山$ | $\Theta$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | 1 | LGMSRS1E0A | 山 | $\Theta$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | 1 | LGMSRS5D0A | $\downarrow$ | $\Theta$ | 2NO＋2NC | ／ |
| MSS | L | LGMSSS1D0A | $\square$ | $\Theta$ | 1NC | 2NO＋1NC | LGMSSS1E0A | $\square$ | $\Theta$ | 1NC | 2NO＋1NC | LGMSSS5D0A | $\square$ | $\Theta$ | 1NC | 2NO＋1NC |
| MST | L | LGMSTS1D0A | $\square$ | $\Theta$ | 1NC | 1NO＋2NC | LGMSTS1E0A | $\downarrow$ | $\Theta$ | 1NC | $1 \mathrm{NO}+2 \mathrm{NC}$ | LGMSTS5D0A | $\checkmark$ | $\Theta$ | 1NC | 1NO＋2NC |
| MSU | L | LGMSUS1D0A |  | $\Theta$ |  | 4NC | LGMSUS1E0A |  | $\Theta$ |  | 4NC | LGMSUS5D0A |  | $\Theta$ |  | 4NC |
| MSV | L | LGMSVS1DOA | 凹 | $\Theta$ | 2NC | 2NO | LGMSVS1E0A | 凹 | $\Theta$ | 2NC | 2NO | LGMSVS5D0A | 凹 | $\Theta$ | 2NC | 2NO |
| MSX | L | LGMSXS1D0A |  | $\Theta$ | 1N0 | 3NC | LGMSXS1E0A |  | $\Theta$ | 1N0 | 3NC | LGMSXS5D0A |  | $\Theta$ | 1NO | 3NC |
| MSY | L | LGMSYS1D0A |  | $\Theta$ | 1N0 | 1NO＋2NC | LGMSYS1E0A |  | $\Theta$ | 1N0 | $1 \mathrm{NO}+2 \mathrm{NC}$ | LGMSYS5D0A |  | $\Theta$ | 1N0 | $1 \mathrm{NO}+2 \mathrm{NC}$ |
| Min．force |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  |
| Travel diagrams |  | see overleaf－group 1 |  |  |  |  | see overleaf－group 1 |  |  |  |  | see overleaf－group 1 |  |  |  |  |

Legend：$\Theta$ With positive opening according to EN 60947－5－1，$\rightarrow \vec{\square}$ interlock with lock monitoring in accordance with EN ISO 14119

# LG Safety Switches with Solenoid \＆ Separate Actuator 

Dimensional Drawings

Contact type：
L＝slow action

Working principle D，supplied with key release，emer－Working principle D，supplied with emergency Working principle E，supplied with emergency gency release button，without actuator release button，without actuator release button，without actuator


Contact blocks

|  |  |  |  |  | $=\square$ | ®象 |  |  |  | $\pm$ | 땅 |  |  |  | $=\square$ | ■乐 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MSA | L | LGMSAS6D0A | － | $\Theta$ | 1NO＋1NC | 1NO＋1NC | LGMSAS7D0A | 山 | $\Theta$ | 1NO＋1NC | 1NO＋1NC | LGMSAS7E0A | 凹 | $\Theta$ | 1NO＋1NC | 1NO＋1NC |
| MSB | L | LGMSBS6D0A | 凹 | $\Theta$ | 2NC | 1NO＋1NC | LGMSBS7D0A | 山 | $\Theta$ | 2NC | 1NO＋1NC | LGMSBS7E0A | 凹 | $\Theta$ | 2NC | $1 \mathrm{NO}+1 \mathrm{NC}$ |
| MSC | L | LGMSCS6D0A | い | $\Theta$ | 3NC | 1NC | LGMSCS7D0A | い | $\Theta$ | 3NC | 1NC | LGMSCS7E0A | $\square$ | $\Theta$ | 3NC | 1NC |
| MSD | L | LGMSDS6D0A | $山$ | $\Theta$ | 1NO＋1NC | 2NC | LGMSDS7D0A | 山 | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NC | LGMSDS7E0A | 凹 | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NC |
| MSE | L | LGMSES6D0A | 山 | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC | LGMSES7D0A | い | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC | LGMSES7E0A | W | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NC |
| MSF | L | LGMSFS6D0A | 凹 | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NO | LGMSFS7D0A | い | $\Theta$ | $1 \mathrm{NO}+2 \mathrm{NC}$ | 1NO | LGMSFS7E0A | $\checkmark$ | $\Theta$ | 1NO＋2NC | 1NO |
| MSG | L | LGMSGS6D0A | 山 | $\Theta$ | 2NC | 2NC | LGMSGS7D0A | 山 | $\Theta$ | 2NC | 2NC | LGMSGS7E0A | 凹 | $\Theta$ | 2NC | 2NC |
| MSH | L | LGMSHS6D0A | 山 | $\Theta$ | 4NC | 1 | LGMSHS7D0A | い | $\Theta$ | 4NC | 1 | LGMSHS7E0A | $\checkmark$ | $\Theta$ | 4NC | 1 |
| MSI | L | LGMSIS6D0A | 山 | $\Theta$ | 3NC | 1NO | LGMSIS7D0A | 山 | $\Theta$ | 3NC | 1N0 | LGMSIS7E0A | $\square$ | $\Theta$ | 3NC | 1NO |
| MSL | L | LGMSLS6D0A | $山$ | $\Theta$ | 2NO＋1NC | 1NC | LGMSLS7D0A | い | $\Theta$ | 2NO＋1NC | 1NC | LGMSLS7E0A | $\square$ | $\Theta$ | 2NO＋1NC | 1NC |
| MSM | L | LGMSMS6D0A | 山 | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1N0 | LGMSMS7D0A | い | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NO | LGMSMS7E0A | $\square$ | $\Theta$ | $2 \mathrm{NO}+1 \mathrm{NC}$ | 1NO |
| MSN | L | LGMSNS6D0A | 山 | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NO | LGMSNS7D0A | 山 | $\Theta$ | 1NO＋1NC | 2NO | LGMSNS7E0A | $\square$ | $\Theta$ | $1 \mathrm{NO}+1 \mathrm{NC}$ | 2NO |
| MSP | L | LGMSPS6D0A | 凹 | $\Theta$ | 1NC | 3NC | LGMSPS7D0A | い | $\Theta$ | 1NC | 3NC | LGMSPS7E0A | $\checkmark$ | $\Theta$ | 1NC | 3NC |
| MSR | L | LGMSRS6D0A | い | $\Theta$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | 1 | LGMSRS7D0A | 山 | $\Theta$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | 1 | LGMSRS7E0A | $\downarrow$ | $\Theta$ | $2 \mathrm{NO}+2 \mathrm{NC}$ | 1 |
| MSS | L | LGMSSS6D0A | 凹 | $\Theta$ | 1NC | 2NO＋1NC | LGMSSS7D0A | い | $\Theta$ | 1NC | 2NO＋1NC | LGMSSS7E0A | $\square$ | $\Theta$ | 1NC | $2 \mathrm{NO}+1 \mathrm{NC}$ |
| MST | L | LGMSTS6D0A | 凹 | $\Theta$ | 1NC | 1NO＋2NC | LGMSTS7D0A | い | $\Theta$ | 1NC | 1NO＋2NC | LGMSTS7E0A | 凹 | $\Theta$ | 1NC | $1 \mathrm{NO}+2 \mathrm{NC}$ |
| MSU | L | LGMSUS6D0A |  | $\Theta$ |  | 4NC | LGMSUS7D0A |  | $\Theta$ |  | 4NC | LGMSUS7E0A |  | $\oplus$ |  | 4NC |
| MSV | L | LGMSVS6D0A | 凹 | $\Theta$ | 2NC | 2 NO | LGMSVS7D0A | い | $\Theta$ | 2NC | 2NO | LGMSVS7E0A | 凹 | $\Theta$ | 2NC | 2NO |
| MSX | L | LGMSXS6D0A |  | $\Theta$ | 1N0 | 3NC | LGMSXS7D0A |  | $\Theta$ | 1NO | 3NC | LGMSXS7E0A |  | $\Theta$ | 1NO | 3NC |
| MSY | L | LGMSYS6D0A |  | $\Theta$ | 1N0 | 1NO＋2NC | LGMSYS7D0A |  | $\Theta$ | 1N0 | 1NO＋2NC | LGMSYS7E0A |  | $\Theta$ | 1NO | $1 \mathrm{NO}+2 \mathrm{NC}$ |
| Min．force |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  | $30 \mathrm{~N}(60 \mathrm{~N} \Theta)$ |  |  |  |  |
| Travel diagrams |  | see overleaf－group 1 |  |  |  |  | see overleaf－group 1 |  |  |  |  | see overleaf－group 1 |  |  |  |  |

Legend：$\Theta$ With positive opening according to EN 60947－5－1，$\ddagger$ interlock with lock monitoring in accordance with EN ISO 14119

## LG Safety Switches with Solenoid \& Separate Actuator

## Travel Diagrams Table

| $\begin{aligned} & \text { MSA } \\ & \text { 2NO+2NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSM } \\ & 3 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ |  |
| :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { MSB } \\ & \text { 1NO }+3 \text { NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSN } \\ & 3 \mathrm{NO}+1 \mathrm{NC} \end{aligned}$ | $\begin{aligned} & \text { • } \\ & \substack{13-14 \\ 21-22 \\ 0} \\ & \hline \end{aligned}$ |
| $\begin{aligned} & \text { MSC } \\ & \text { 4NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSP } \\ & \text { 4NC } \end{aligned}$ |  |
| $\begin{aligned} & \text { MSD } \\ & \text { 1NO }+3 N C \end{aligned}$ |  | $\begin{aligned} & \text { MSR } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ |  |
| $\begin{aligned} & \text { MSE } \\ & \text { 1NO }+3 \text { NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSS } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ |  |
| $\begin{aligned} & \text { MSF } \\ & \text { 2NO }+2 \mathrm{NC} \end{aligned}$ |  | $\begin{aligned} & \text { MST } \\ & \text { 1NO }+3 \text { NC } \end{aligned}$ |  |
| $\begin{aligned} & \text { MSG } \\ & \text { 4NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSU } \\ & 4 \mathrm{NC} \end{aligned}$ |  |
| $\begin{aligned} & \text { MSH } \\ & \text { 4NC } \end{aligned}$ | $\pm \square$ | $\begin{aligned} & \text { MSV } \\ & \text { 2NO+2NC } \end{aligned}$ |  |
| $\begin{aligned} & \text { MSI } \\ & \text { 1NO }+3 \text { NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSX } \\ & \text { 1NO }+3 \text { NC } \end{aligned}$ |  |
| $\begin{aligned} & \text { MSL } \\ & \text { 2NO+2NC } \end{aligned}$ |  | $\begin{aligned} & \text { MSY } \\ & 2 \mathrm{NO}+2 \mathrm{NC} \end{aligned}$ |  |

$\square \quad$ Contacts activated by the solenoid Positive opening travel

Stainless Steel Actuators

| Article | Description |
| :--- | :--- |
| AC-KEYF22 | Actuator with Rubber Mountings |
|  |  |


| Article | Description |
| :--- | :--- |
| AC-KEYF21 | Angled Actuator |
|  |  |

# LG Safety Switches with Solenoid \& Separate Actuator 

## Universal Actuator AC-KEYF28

IMPORTANT: These actuators must be used with items of the LG series only (e.g. LGMSAS1DOA). Low level of coding acc. to EN ISO 14119.

| Article | Description |
| :--- | :--- |
| AC-KEYF28 | Universal Actuator |



Joined and two directions adjustable actuator for doors with reduced dimensions. The actuator has two couples of fixing holes and it is possible to rotate by $90^{\circ}$ the actuator-working plan.


## Accessories for Sealing

Pliers, steel wire and lead seals used to seal the auxiliary release device (versions S1D and S7D only).

| Article | Description |
| :--- | :--- |
| AC-FSPB-200 | Pack of 200 lead seals |
| AC-FSPB-10 | Pack of 10 lead seals |
|  |  |
| Article | Description |
| AC-FSFI-400 | 400 metre wire roll |
| AC-FSFI-10 | 10 metre wire roll |
| Article | Description |
| AC-FSPZ | Pliers without logo |

## Utilization Limits

Do not use where dust and dirt may penetrate in any way into the head and deposit there, in particular where metal dust, concrete or chemicals are spread. Adhere to the EN ISO 14119 requirements regarding low level of coding for interlocks. Do not use in environments with the presence of explosive or flammable gas. In these cases, use ATEX products.

| Article |  | Description |  | Article | Description |
| :---: | :---: | :---: | :---: | :---: | :---: |
| AC-KB2 |  | Actuator entry locking device |  | AC-KLA371 | Set of Two Locking Keys |
|  |  | Padlockable device to lock the actuator entry (patented) in order to prevent the accidental closing of the door behind operators while they are inside the machine. To be used only with LG series switches (e.g. LGMSDS1DOA). Hole diameter for padlocks 9 mm . |  |  | Extra copy of the locking keys to be purchased if further keys are needed (standard supply 2 units). The keys of all switches have the same code. Other codes on request. |

# LG Safety Switches with Solenoid \& Separate Actuator 

Other Release Button Lengths

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| -BF30 | -BF40 | -BF60 | -BFAD |
| For wall thickness 15 to 30 mm | For wall thickness 30 to 40 mm | For wall thickness 40 to 60 mm | For wall thickness 60 to 500 mm |
| - Avoid torsion and bending on the <br> - To guarantee the correct device <br> - Keep clean the release button slip products could compromise the Periodically check for correct dev | lease button bar. eration, keep a distance of 10 to 25 mm ing area. The guide bushing or tube mus vice operation. operation. | etween the wall and the release button. be cleaned inside, since dirt or chemical | - Avoid torsion and bending on the release button bar. <br> - Use a bushing or a tube with $18 \pm 0,5 \mathrm{~mm}$ diameter as a guide inside the wall. <br> - The M10 threaded bar has to be inserted into the guide in order to avoid its bending. The M10 threaded bar is not supplied with the device. <br> - Do not exceed an overall length of 500 mm between the release button and the switch. <br> To guarantee the correct device operation, keep a distance of 10 to 25 mm between the wall and the release button. <br> - Keep clean the release button slipping area. The guide bushing or tube must be cleaned inside, since dirt or chemical products could compromise the device operation. <br> - Periodically check for correct device operation. |

## Release Button

| Article | Description |
| :--- | :--- |
| AC-FG-BF15 | Technopolymer release button for max. 15 mm wall thickness, supplied with screw |
| AC-FG-BF30 | Technopolymer release button for max. 30 mm wall thickness, supplied with screw |
| AC-FG-BF40 | Technopolymer release button for max. 40 mm wall thickness, supplied with screw |
| AC-FG-BF60 | Metal release button for max. 60 mm wall thickness, supplied with screw |



| Article | Description |
| :--- | :--- |
| AC-FG-BFAD | Metal release button for wall thickness from 60 to 500 mm, supplied with 2 supports <br> and 2 screws, without M10 threaded bar. |



