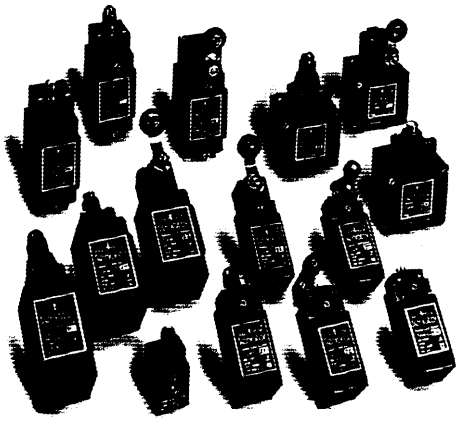
product



# Senator & Imp

**safety limit switches**

Guardmaster®

Specialists in machinery safety

The Senator safety-limit switches have been developed to provide a range of options including metal or plastic cases in various sizes, a choice of snap-acting, slow-break/make or 2 x N/C contacts and a choice of actuator heads.

The Senator range offers the option of rotating the head before installation to allow ease of mounting. Some lever switches also incorporate a 'programmable head' allowing operation of the contacts when the lever is operated centre to right, centre to left or either way.

The Imp offers the safety-switch performance of bigger units in a compact case. Designed with two mounting-hole options and a choice of actuator positions, the Imp will fit in the most confined spaces.

Guardmaster limit switches can be used for applications other than guard doors, for example on moving machine beds, crane arms, etc.

Operation of the limit switches is achieved by the sliding action of the guard or other moving objects depressing the plunger or lever. It is important that, upon actuation, the guard or other moving objects should not pass completely over the switch and allow the plunger or lever to return to its original position.

features

BIA 954067
(Imp only)

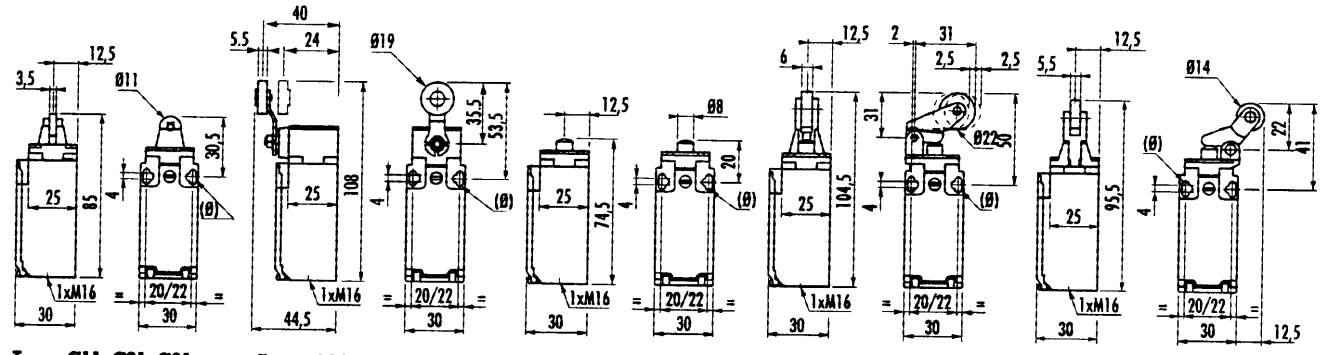
Large selection of actuator heads

Positive-operation, forced disconnection of contacts

Contacts, 1 x N/C + 1 x N/O or 2 x N/C

Conforms to EN 1088, EN 60947-5-1, EN 292, EN 60204-1

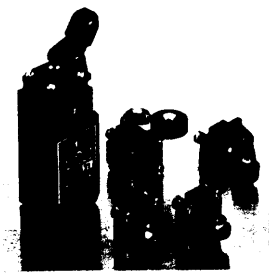
dimension drawings



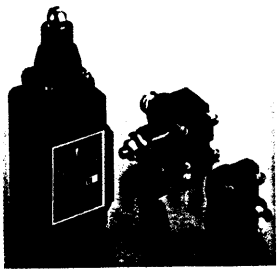

(θ) = 2 ELONGATED HOLES Ø 4,3 x 8,3 ON 22MM CENTRES, 2 HOLES Ø 4,3 ON 20MM CENTRES

(A) = CAM DISPLACEMENT/CONTACT OPERATION

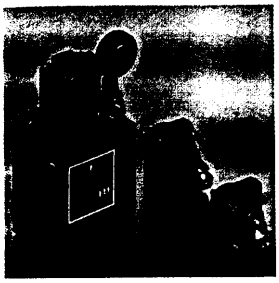
(P) = CONTACT POSITIVE OPENING POINT ⊖



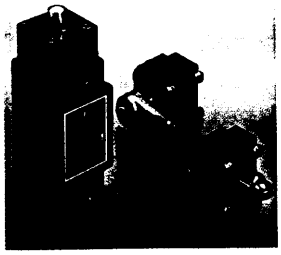
**Ci range** – options include roller, roller lever, plunger, roller plunger and cranked lever.



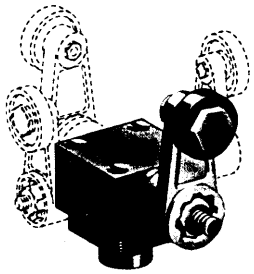
**CP range** – options include roller, roller lever, plunger.

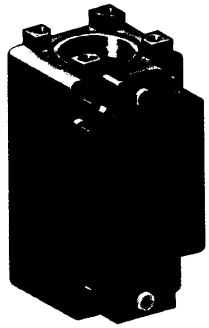


**CX range** – options include roller, roller lever, plunger.

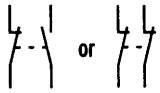


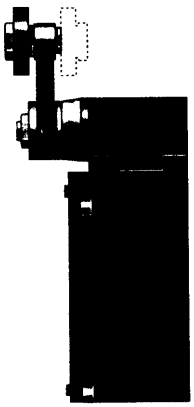
**CM range** – options include roller, roller lever, plunger.





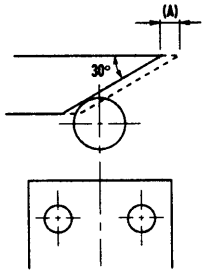
Senator contact arrangements



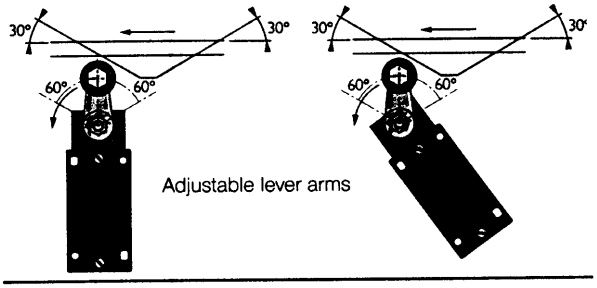



All Senators have the option of rotating the head 360° in 90° increments to give simple installation. Roller-lever operated Senators also have the option to mount the roller to the front or back of the lever.

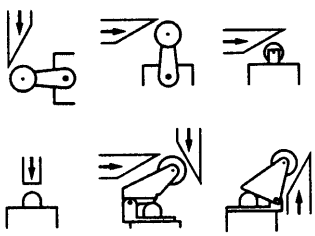
## Cam displacement

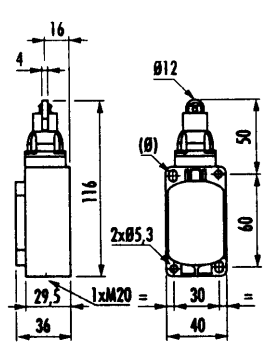



The actuating cam should be profiled at 30° for optimum operation. (Note: plunger-type switches operate from a flat profile.)

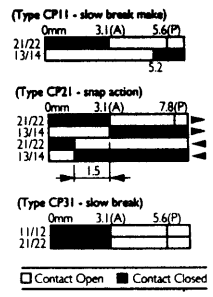


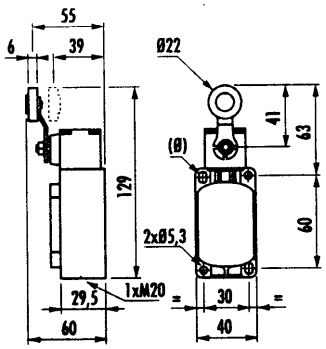

## Operating examples



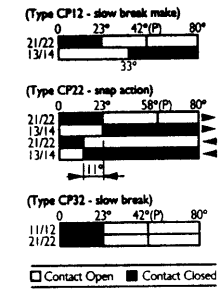


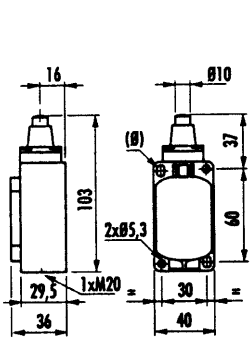

**Types CP11, CP21, CP31**



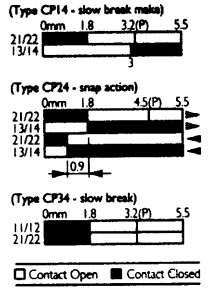



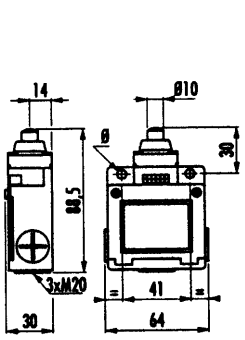

**Types CP12, CP22, CP32**



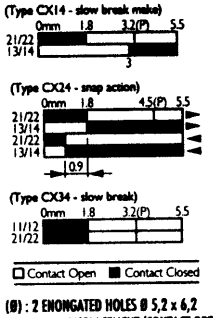



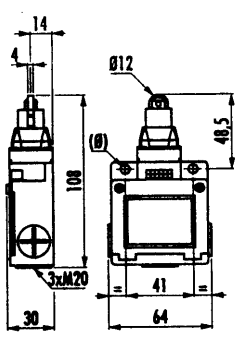

**Types CP14, CP24, CP34**



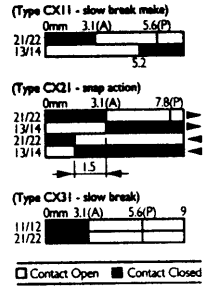




**Types CX14, CX24, CX34**



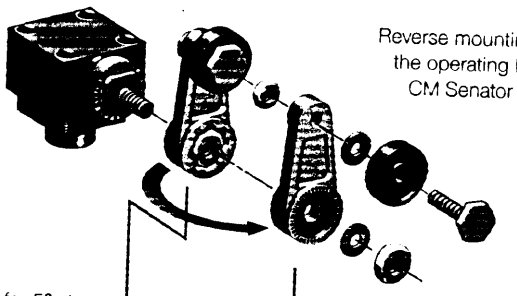




**Types CX11, CX21, CX31**




(Ø) : 2 ELONGATED HOLES Ø 5,3 x 7,3 (A) = CAM DISPLACEMENT/CONTACT OPERATION (P) = CONTACT POSITIVE OPENING POINT ⊖

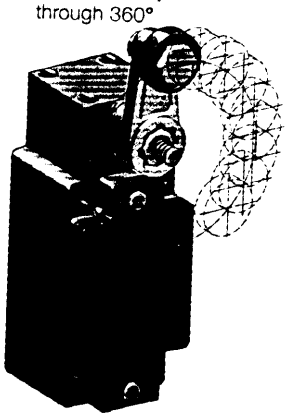
(Ø) : 2 ENONGATED HOLES Ø 5,2 x 6,2
(A) = CAM DISPLACEMENT/CONTACT OPERATION (P) = CONTACT POSITIVE OPENING POINT ⊖

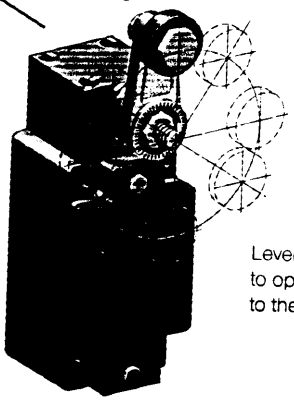


Reverse mounting of the operating lever, CM Senator only.

for 5° steps through 360°

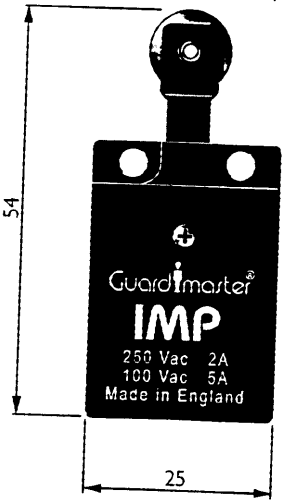
for 45° steps through 360°





Lever arms can be adjusted to operate from various angles to the switch body.

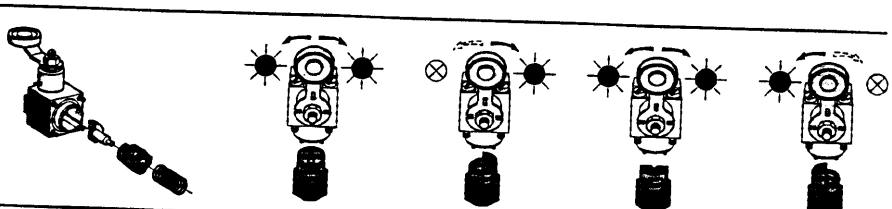
Actual size of Imp




Imp contact arrangements

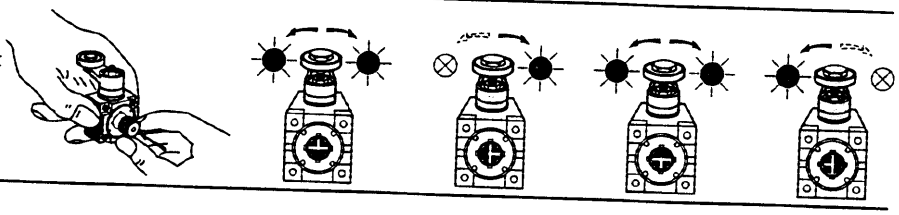
Operating configurations and how to set

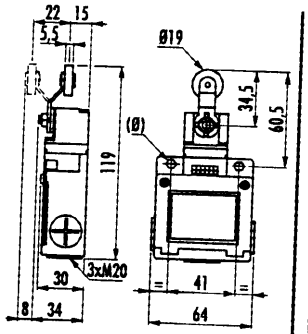
CM lever switches only.



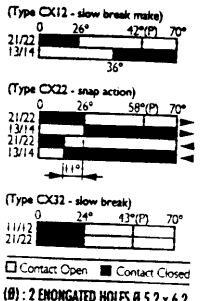
Operating configurations and how to set

CP & CX lever switches only.

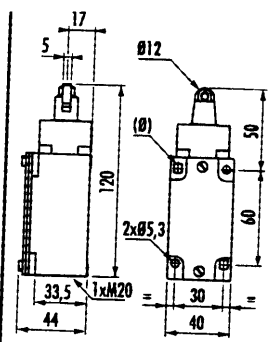




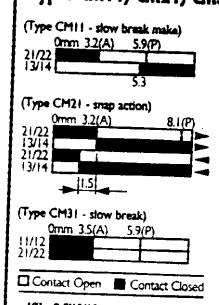

**Types CX12, CX22, CX32**



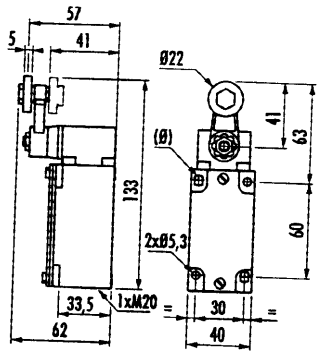

**(Ø) : 2 ENONGATED HOLES Ø 5,2 x 6,2**
**(A) = CAM DISPLACEMENT/CONTACT OPERATION**
**(P) = CONTACT POSITIVE OPENING POINT ⊖**



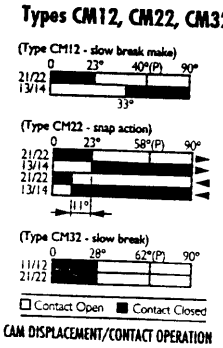

**Types CM11, CM21, CM31**



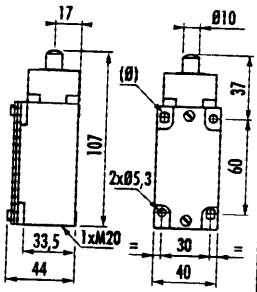

**(Ø) : 2 ENONGATED HOLES Ø 5,3 x 7,3**



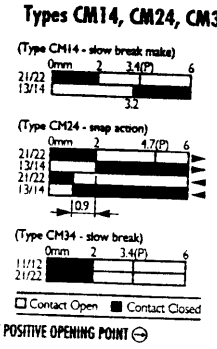

**Types CM12, CM22, CM32**



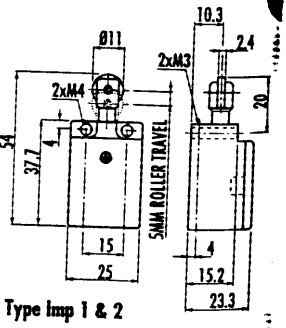

**(A) = CAM DISPLACEMENT/CONTACT OPERATION**



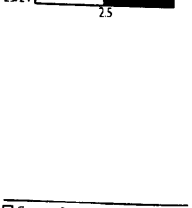

**Types CM14, CM24, CM34**




**(P) = CONTACT POSITIVE OPENING POINT ⊖**



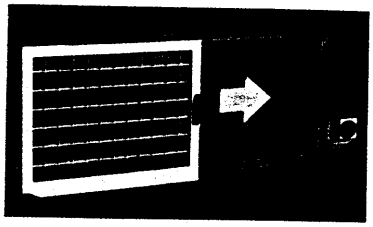

**Type Imp 1 & 2**



## technical specifications

| Senator | |
|---|---|
| Approvals | CSA |
| Conforming to standards | EN 60947-5-1, EN 1088, EN 292, EN 60204-1 |
| Safety contacts | 1 x N/C + 1 x N/O or 2 x N/C |
| Utilisation category | AC 15 - DC 13 |
| AC (Ue) | 240 V |
| (Ie) | 3 A |
| DC (Ue) (Ie) | 250 V 0.27 A |
| Thermal current (Ith) | 10 A |
| Safety contact gap | >2 x 2 mm |
| Rtd insulation voltage | (Ui) 500 V |
| Rtd impulse withstand voltage | (Uimp) 6000 V |
| Pollution degree | 3 |
| Actuator travel for positive opening | Various (see diagrams) |
| Case material | (Ci, CP) Glass-reinforced plastic, (CX, CM) Die-cast alloy |
| Actuator material | Stainless steel |
| Protection | (Ci, CP) IP65, (CX, CM) IP66 |
| Conduit entry | (CM) 1 x M20, (CX) 3 x M20, (Ci) 1 x M16 |
| Operating temperature | -25°C to +70°C |
| Fixing | (Ci) M4, (CP, CX, CM) M5 |
| Mounting | Any position |
| Mechanical life | 1 x $10^6$ |
| Colour | Red and black |
| | |
| Imp | |
| Approvals | BG, CSA |
| Conforming to standards | EN 60947-5-1, EN 1088, EN 292, EN 60204-1 |
| Safety contacts | 1 x N/C positive break |
| Utilisation category | AC 15 |
| AC (Ue) | 500 V 250 V 100 V |
| (Ie) | 1 A 2 A 5 A |
| DC | 250 V 0.5A, 24 V 2 A |
| Max. switched current/voltage/load | 500 V/500 VA |
| Thermal current (Ith) | 10 A |
| Minimum current | 5 V 5 mA DC |
| Safety contact gap | >2 x 2 mm |
| Rtd insulation voltage | (Ui) 500 V |
| Rtd impulse withstand voltage | (Uimp) 2500 V |
| Auxiliary contacts | 1 x N/O |
| Pollution degree | 3 |
| Actuator travel for positive opening | 2.5 mm |

## application example



| | |
|---|---|
| Break contact minimum force | 10 N |
| Maximum actuator travel | 5 mm |
| Maximum actuation speed | 160 mm per sec |
| Maximum actuation frequency | 2 cycle per sec |
| Case material | UL approved glass-filled polyester |
| Actuator material | Acetal |
| Protection | IP30 |
| Conduit entry | 3 x breakout |
| Operating temperature | -25°C to +80°C |
| Fixing | 2 x M3 front or 2 x M4 top |
| Mechanical life | 10 x $10^6$ |
| Electrical life | 1 x $10^6$ |
| Colour | Red |

**Note:** The safety contacts of the Guardmaster switches are described as normally closed (N/C), i.e. with the guard closed, actuator in place (where relevant) and the machine able to be started.

## ordering details

| Type | Contacts | Cable entry | Part no. |
|---|---|---|---|
| Plastic case limit switches | | | |
| SB = Slow break contacts, SA = Snap acting contacts, | | | |
| SBM = Slow break before make contacts | | | |
| Senator (Ci-31) | 2N/C (SB) | 1xM16 | 931164831 |
| Senator (Ci-21) | 1N/C+1N/O (SA) | 1xM16 | 931162831 |
| Senator (Ci-11) | 1N/C+1N/O (SBM) | 1xM16 | 931161831 |
| Senator (Ci-32) | 2N/C (SB) | 1xM16 | 931164832 |
| Senator (Ci-22) | 1N/C+1N/O (SA) | 1xM16 | 931162832 |
| Senator (Ci-12) | 1N/C+1N/O (SBM) | 1xM16 | 931161832 |
| Senator (Ci-34) | 2N/C (SB) | 1xM16 | 931164834 |
| Senator (Ci-24) | 1N/C+1N/O (SA) | 1xM16 | 931162834 |
| Senator (Ci-14) | 1N/C+1N/O (SBM) | 1xM16 | 931161834 |
| Senator (Ci-36) | 2N/C (SB) | 1xM16 | 931164836 |
| Senator (Ci-26) | 1N/C+1N/O (SA) | 1xM16 | 931162836 |
| Senator (Ci-16) | 1N/C+1N/O (SBM) | 1xM16 | 931161836 |
| Senator (Ci-37) | 2N/C (SB) | 1xM16 | 931164837 |
| Senator (Ci-27) | 1N/C+1N/O (SA) | 1xM16 | 931162837 |
| Senator (Ci-17) | 1N/C+1N/O (SBM) | 1xM16 | 931161837 |
| Senator (CP-31) | 2N/C (SB) | 1xM20 | 921164821 |
| Senator (CP-21) | 1N/C+1N/O (SA) | 1xM20 | 921162821 |
| Senator (CP-11) | 1N/C+1N/O (SBM) | 1xM20 | 921161821 |
| Senator (CP-32) | 2N/C (SB) | 1xM20 | 921164822 |
| Senator (CP-22) | 1N/C+1N/O (SA) | 1xM20 | 921162822 |
| Senator (CP-12) | 1N/C+1N/O (SBM) | 1xM20 | 921161822 |
| Senator (CP-34) | 2N/C (SB) | 1xM20 | 921164824 |
| Senator (CP-24) | 1N/C+1N/O (SA) | 1xM20 | 921162824 |
| Senator (CP-14) | 1N/C+1N/O (SBM) | 1xM20 | 921161824 |
| Senator (CP-11-Ex) | 1N/C+1N/O | pre-wired | 922164851 |
| Senator (CP-14-Ex) | 1N/C+1N/O | pre-wired | 922164854 |
| Imp 1 (roller parallel to switch front) | 1N/C+1N/O | 3xbreakouts | 18001 |
| Imp 2 (roller parallel to switch side) | 1N/C+1N/O | 3xbreakouts | 18002 |

| Type | Contacts | Cable entry | Part no. |
|---|---|---|---|
| Metal case limit switches | | | |
| SB = Slow break contacts, SA = Snap acting contacts, | | | |
| SBM = Slow break before make contacts | | | |
| Senator (CX-31) | 2N/C (SB) | 3xM20 | 951164821 |
| Senator (CX-21) | 1N/C+1N/O (SA) | 3xM20 | 951162821 |
| Senator (CX-11) | 1N/C+1N/O (SBM) | 3xM20 | 951161821 |
| Senator (CX-32) | 2N/C (SB) | 3xM20 | 951164822 |
| Senator (CX-22) | 1N/C+1N/O (SA) | 3xM20 | 951162822 |
| Senator (CX-12) | 1N/C+1N/O (SBM) | 3xM20 | 951161822 |
| Senator (CX-34) | 2N/C (SB) | 3xM20 | 951164804 |
| Senator (CX-24) | 1N/C+1N/O (SA) | 3xM20 | 951162804 |
| Senator (CX-14) | 1N/C+1N/O (SBM) | 3xM20 | 951161804 |
| Senator (CM-31) | 2N/C (SB) | 1xM20 | 911164811 |
| Senator (CM-21) | 1N/C+1N/O (SA) | 1xM20 | 911162811 |
| Senator (CM-11) | 1N/C+1N/O (SBM) | 1xM20 | 911161811 |
| Senator (CM-32) | 2N/C (SB) | 1xM20 | 911164812 |
| Senator (CM-22) | 1N/C+1N/O (SA) | 1xM20 | 911162812 |
| Senator (CM-12) | 1N/C+1N/O (SBM) | 1xM20 | 911161812 |
| Senator (CM-34) | 2N/C (SB) | 1xM20 | 911164814 |
| Senator (CM-24) | 1N/C+1N/O (SA) | 1xM20 | 911162814 |
| Senator (CM-14) | 1N/C+1N/O (SBM) | 1xM20 | 911161814 |

**Note:** Replacement heads and actuators are available. Please contact Guardmaster for further details.

For Ex and details refer to the Ex and interlock switches section.