Metal enclosure and open type
Features

- UL Listed, CSA Certified, CE. Meets or exceeds most local, national and international standards.
- Standard ( 40 mm ) or Wide (56 mm ) die-cast aluminum housing. Offers increased wiring space, additional cable
entry options and corrosion resistant housing
- Standard ( 40 mm ) offerings can accomodate both U.S. 29.4 [1.16] $\times 59.5$ [2.34] and DIN 30 [1.18] × 60 [2.36] mounting dimensions
- Nine field interchangeable operating heads (12 variations). Interchangeable on both the standard ( 40 mm ) and wide ( 56 mm ) styles. Reduces inventory and inventory costs
- Field replaceable, electrically isolated, double bridge
contacts. Provides electrical flexibility and ease of maintenance
- Direct opening action (positive opening) of the NC contact
- NEMA A600, Q600 contact ratings


## Application

The function of position switches (limit switches) is to produce electrical signals corresponding to the positions of moving machinery.
The units are suitable for use in virtually any climate.
Specifications
IEC 60 947-5-1.

The 3SE2 100 and 3SE2 120 position switches correspond to Swiss regulations (SUVA). The following actuator types have been approved:

- Plunger
- Overtravel plunger
- Roller plunger
- Roller lever
- Angular roller lever
- Roller crank

In addition the open-type 3SE3 position switches and the 3SE3 switch inserts are also permitted.
-. B
-. C
-D
-. E
-. F

- GW
e. 3SE3
ne 3SE3
permit-


## Safety position switches

The 3SE. position switches with metal enclosures and snap-action contacts as well as devices with slow-action contacts can be used as safety position switches in control systems conforming to EN 60 204-1, or IEC 60 204-1.

## Construction

3SE position switches are available in die-cast standard (40 mm ) or wide ( 50 mm ) aluminum enclosures or as open-type units.
The 3SE2 120/3SE3 170 position switches with standard enclosure, overtravel plunger, roller plunger, rod and roller crank actuators, conform to EN 50041.
These specifications define the most important mounting dimensions, operating points, enclosure types and actuator types.
Position switches have one or three cable entries. The cable entry has a $1 / 2^{\prime \prime}$-NPT (3SE3) or M20 x 1.5 (3SE2) threaded metal wire opening. (see also Accessories, Page 13/97)

## Actuators

All actuators can be retro-fitted or exchanged for another version. They can also be repositioned every $90^{\circ}$ so that the switches can be operated from any of the four sides.

- The position switches with roller lever are approached perpendicular to the plunger axis and position switches with angular roller lever are approached in parallel with the plunger axis.
- The roller crank actuators, ad-justable-length roller crank actuators and rod actuators can be operated from both sides and be positioned from $10^{\circ}$ to $10^{\circ}$ on the actuating spindle. The rollers of the actuators are made from wear resistant plastic.
- The wobble spring can be approached from any direction.
- The forked lever actuator has two defined switching positions. The actuating element causes changeover from one position to the other. This actuator is suitable for two-channel operation.

The open-type 3SE. position switches are available exclusively with a plunger actuator. Important:
The 3SE. position switches with metal enclosure are not permitted to be used as stops.

## Contacts

The position switches (limit switches) are available with snap-action contacts, slow-action contacts or slow-action make-before-break contacts.

The 3SE. position switches with a metal enclosure are available with 2,3 or 4 contacts.
The movable normally closed and normally open switch contacts are electrically isolated from each other and are suitable for switching voltages of different potentials.

## Contact reliability

The movable switch contacts are double moving contacts.
This increases the contact reliability even when the switch has to be operated with low voltages and currents, e. g. DC $5 \mathrm{~V} / 1 \mathrm{~mA}$.
The switching point of the snap action contacts is independent of the switching speed.
The contact chamber is covered to prevent ingress of foreign bodies.

## Principle of operation

Positive opening $\rightarrow$
The opening contacts of the switch are forced open mechanically, positively-driven and reliably by the plunger (positiveopening).

In order to ensure this positive opening, the position switch must be actuated in such a way that the nominal travel (Pages 13/100 to 13/112) and angle for the positive opening are substantially exceeded.

Position switches that display this symbol are suitable for use in safety applications.

## 3SE International Limit Switches

## Position Switches

3SE2 100 to 3SE3 170 / 3SE2 303 / 3SE2 404
Metal enclosure and open type, 40 and 56 mm width

## Technical data

©, (1) and TI ratings (with metal enclosure)

- rated voltage
AC 600 V
10 A
Heavy Duty, A 600/Q 600
Heavy Duty, A 300/Q 30
- switching capacity

| - for 3SE. ...-8. | Heavy Duty, A 300/Q 30 |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Rated insulation voltage $U_{i}$ | 500 V |  |  |  |  |  |
| Pollution degree | Class 3 |  |  |  |  |  |
| Short circuit protection ${ }^{1}$ ), DIAZED-fuse links | Utilization category gL/gG 6 A , quick response characteristic 10 A |  |  |  |  |  |
| Rated operational voltage $U_{\text {e }}$ | AC 500 V , over 300 V only for equal potential (3SE21.0-and 35E3170-8..00) AC 500 V , over AC 380 V only for equal potential |  |  |  |  |  |
| Conventional free-air thermal current $I_{\text {th }}$ | 10 A |  |  |  |  |  |
| Rated operational current $I_{\mathrm{e}}{ }^{4}$ ) | AC 40 to 60 Hz |  |  | DC |  |  |
|  |  | $I_{\mathrm{e}} / \mathrm{AC}-12$ | $I_{\text {e }} /$ AC-15 | $U_{\text {e }}$ | $I_{\mathrm{e}} / \mathrm{DC}-12$ | $I_{\mathrm{e}} / \mathrm{DC}-13$ |
|  | V | A | A | V | A | A |
|  | 24 | 10 | 10 | 24 | 10 | 10 |
|  | 125 | 10 | 10 | 48 | 6 | 4 |
|  | 230 | 10 | 6 | 110 | 4 | 1 |
|  | 400 | 10 | 4 | 220 | 1 | $0.4{ }^{2}$ ) |
|  | 500 | 10 | 3 | 440 | 0.5 | $0.2^{3}$ ) |
| Mechanical endurance | $30 \times 10^{6}$ operating cycles ( $15 \times 10^{6}$ for 3SE3 2.0-8.) |  |  |  |  |  |
| Electrical endurance | $10 \times 10^{6}$ operating cycles with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors |  |  |  |  |  |
| - for AC-15 duty | $0.5 \times 10^{6}$ operating cycles when interrupting $I_{\mathrm{e}} / \mathrm{AC}-15$ at 230 V |  |  |  |  |  |
| - for DC-13 duty | With DC the contact endurance depends not only on the breaking current but also on the voltage, the circuit inductance and the speed of switching. No generally valid information can be given. |  |  |  |  |  |
| Operating frequency | $6 \times 10^{3}$ operating cycles per hour with 3RH11, 3RT10 16, 3RT10 17, 3RT10 24 to 3RT10 26 (3TH4, 3TF40 to 3TF43) contactors |  |  |  |  |  |
| Operating accuracy | 0.05 mm for repeated switching, measured at the plunger of the switch block. |  |  |  |  |  |
| Operating point | With snap-action contacts independent of contact wear constant throughout the life of the switch |  |  |  |  |  |
| Ambient temperature | -30 to $+85^{\circ} \mathrm{C}\left(-22\right.$ to $\left.+185^{\circ} \mathrm{F}\right)$ |  |  |  |  |  |
| Degree of protection DIN VDE 0470 and IEC 60529 |  |  |  |  |  |  |
| - with metal enclosure | IP 67 |  |  |  |  |  |
| - open-type | IP 20 (terminals), IP 40 (switching chamber) |  |  |  |  |  |
| - electrical plug and socket connection | IP 65 |  |  |  |  |  |
| Enclosure cable entry | $1 \times 1 / 2$ "-NPT (3SE3); $1 \times \mathrm{M} 20 \times 1.5$ (3SE212) or $3 \times \mathrm{M} 20 \times 1.5$ (3SE2100, 2303, 2404) |  |  |  |  |  |
| Conductor cross-sections |  |  |  |  |  |  |
| - solid | $2 \times 2.5 \mathrm{~mm}^{2}(2 \times 14$ AWG $)$ |  |  |  |  |  |
| - finely stranded with end sleeve | $2 \times 1.5 \mathrm{~mm}^{2}(2 \times 16$ AWG $)$ |  |  |  |  |  |
| Installation angle | Any |  |  |  |  |  |
| Enclosure material | Metal (GD - AlSi 12) |  |  |  |  |  |
| Protective conductor terminal | M 3.5 inside enclosure |  |  |  |  |  |

1) Without any welding acc. to DIN VDE 0660 Part 200.
2) 3SE21.0 - and 3SE3170-8..00: 0.10 A
3) Refer to Section 19, General Information for NEMA Control and Circuit Ratings.

Selection and ordering data
2 contacts • Moving double break contacts • IP 67 degree of protection • EN 50041


For operation, operating speed and travel, see Pages 13/100 to 13/105.

[^0]3SE International Limit Switches
Position Switches
3SE2 100 to 3SE3 170
Metal enclosure, 40 and 56 mm width
Selection and ordering data
2 contacts • Moving double break contacts • IP 67 degree of protection • EN 50041


For operation, operating speed and travel, see Pages 13/100 to 13/105. and DIN VDE 0660 Part 200.

1) The actuator heads can be subsequently exchanged (see Page 13/95).
2) For conduit thread adaptors see page $13 / 97$

Selection and ordering data
2 contacts • Moving double break contacts • IP 67 degree of protection • EN 50041

| 40 mm wide | 56 mm wide ${ }^{2}$ ） | Actuator design to EN 50041 | Enclosure width | 3SE．position switches with 2 snap－action contacts Identification number 11 acc．to EN 50 013， switch block 3SE3 000－1A ${ }^{2}$ ） |  | 3SE3 position switches <br> with 2 snap－action contacts <br> Identification number 02 acc．to EN 50013 switch block 3SE3 000－8AV00 ${ }^{2}$ ） |  | Weight approx． |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Order No． | List Price \＄ | Order No． | List <br> Price \＄ |  |
|  | Actuator ${ }^{1}$ ） |  | mm |  | 1 unit |  | 1 unit | kg |
| NsC00096 | Plunger | － | 40 | $\rightarrow$ 3SED 1－0－1B | 50.00 | $\rightarrow$ 3SED 1ロ0－8BV00 | 50.00 | 0.190 |
|  | （3SX3100） |  | 56 | $\rightarrow$ 3SE2 100－1B | 50.00 | $\rightarrow$ 3SE2 100－8BV00 | 50.00 | 0.225 |
|  | Overtravel plunger(3SX3106) | B | 40 | $\rightarrow$ 3SED 1ロ0－1C | 67.00 | $\rightarrow$ 3SED 1－0－8CV00 | 67.00 | 0.230 |
|  |  |  | 56 | $\rightarrow$ 3SE2 100－1C | 67.00 | $\rightarrow$ 3SE2 100－8CV00 | 67.00 | 0.260 |
|  | Roller plunger （3SX3107） | C |  | $\rightarrow$ 3SED 1－0－1D | 74.00 | $\rightarrow$ 3SED 1ロ0－8DV00 | 74.00 | 0.255 |
|  |  |  | 56 | $\rightarrow$ 3SE2 100－1D | 74.00 | $\rightarrow$ 3SE2 100－8DV00 | 74.00 | 0.279 |
|  | Roller lever | － | 40 | $\rightarrow$ 3SED 1－0－1E | 63.00 | $\rightarrow$ 3SED 1■0－8EV00 | 63.00 | 0.210 |
|  | Actuator made of molded plastic （3SX3102） |  | 56 | $\rightarrow$ 3SE2 100－1E | 63.00 | $\rightarrow$ 3SE2 100－8EV00 | 63.00 | 0.239 |
|  | Angular roller lever | － | 40 | $\rightarrow$ 3SED 1－0－1F | 60.00 | $\rightarrow$ 3SED 1■0－8FV00 | 60.00 | 0.225 |
|  | Actuator made of molded plastic <br> （3SX3104） |  | 56 | $\rightarrow$ 3SE2 100－1F | 60.00 | $\rightarrow$ 3SE2 100－8FV00 | 60.00 | 0.242 |
|  | Roller crank |  |  |  |  |  |  |  |
|  | －finely adjustable from $10^{\circ}$ to $10^{\circ}$ | A | 40 | $\rightarrow$ 3SED 1ロ0－1GW | 71.00 | $\rightarrow$ 3SED 1ロ0－8GW00 | 71.00 | 0.305 |
|  | (3SX3211 + 3SX3212) |  | 56 | $\rightarrow$ 3SE2 100－1GW | 71.00 | $\rightarrow$ 3SE2 100－8GW00 | 71.00 | 0.331 |
| (o) | －adjustable length， finely adjustable from $10^{\circ}$ to $10^{\circ}$$(3 S \times 3211+3 S \times 3213)$ | － | 40 | 3SED 1－0－1UW | 87.00 | 3SED 1口0－8UW00 | 87.00 | 0.315 |
|  |  |  | 56 | 3SE2 100－1UW | 87.00 | 3SE2 100－8UW00 | 87.00 | 0.336 |
|  |  |  |  |  |  |  |  |  |
|  | Rod actuator | D |  |  |  |  |  |  |
|  | finely adjustable from $10^{\circ}$ to $10^{\circ}$ |  |  |  |  |  |  |  |
|  | －Molded plastic rod |  | 40 | 3SEロ 1ロ0－1WW | 82.00 | 3SEロ 1ロ0－8WW00 | 82.00 | 0.315 |
|  | （3SX3211＋3SX3215） |  | 56 | 3SE2 100－1WW | 82.00 | 3SE2 100－8WW00 | 82.00 | 0.346 |
|  | －Aluminum rod |  | 40 | 3SED 1－0－1VW | 83.00 | 3SED 1口0－8VW00 | 83.00 | 0.320 |
|  | （3SX3211＋3S×3214） |  | 56 | 3SE2 100－1VW | 83.00 | 3SE2 100－8VW00 | 83.00 | 0.355 |
|  | Wobble spring （3SX3126） | － | 40 | 3SED 1■0－1R | 81.00 | 3SED 1－0－8RV00 | 81.00 | 0.230 |
|  |  |  | 56 | 3SE2 100－1R | 81.00 | 3SE2 100－8RV00 | 81.00 | 0.270 |
|  | Fork lever，latching(3SX3127 + 3SX3115) | － | 40 | 3SED 1－0－1T | 117.00 | － |  | 0.340 |
|  |  |  | 56 | 3SE2 100－1T | 117.00 |  |  | 0.360 |
|  | Switch body |  |  |  |  |  |  |  |
|  | with switch block without actuator |  | 40 | 3SED 1ロ0－1A | 44.00 | 3SED 1－0－8AV00 | 44.00 | 0.175 |
|  |  |  | 56 | 3SE2 100－1A | 44.00 | 3SE3 100－8AV00 | 44.00 | 0.203 |
| Order No．suffix <br> －with metric connecting thread M $20 \times 1.5$ <br> I．E．3SE®1园0 <br> －with $1 / 2^{\prime \prime}$－NPT connecting thread IE 3SER170 |  |  |  |  |  |  |  |  |
|  |  |  |  | 2.2 3.7 |  | 2.2 3.7 |  |  |

For operation，operating speed and travel，see Pages 13／100 to 13／105．

Positive opening acc．to IEC 60 947－5－1，Appendix K， and DIN VDE 0660 Part 200.

1）The actuator heads can be subsequently exchanged（see Page 13／95）．
2）For conduit thread adaptors see page 13／97

# 3SE International Limit Switches <br> Position Switches 

3SE2120 Specials
Metal enclosure, 40 mm width

## Selection and ordering data

2 contacts • Moving double break contacts • IP 67 degree of protection EN 50041 • with 4-pole or 5 -pole male receptacle

| 40 mm wide | Actuator ${ }^{1}$ ) | Actuator design to EN 50041 | Enclosure width <br> mm | 3SE3 position switches <br> with 2 snap-action contacts <br> 6 mm stroke <br> Identification number 11 acc. to EN 50013. switch block 3SE3 000-1A) |  | Weight approx. <br> kg |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Order No. | List Price \$ <br> 1 unit |  |
|  | Plunger <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle |  | 40 | $\begin{aligned} & \rightarrow \quad \text { 3SE2 120-1BV00-0AC4 } \\ & \rightarrow \quad \text { 3SE2 120-1BV00-0AC5 } \end{aligned}$ | $\begin{aligned} & 67.00 \\ & 70.00 \end{aligned}$ | $\begin{aligned} & 0.200 \\ & 0.200 \end{aligned}$ |
|  | Overtravel plunger <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle | B | 40 | $\rightarrow$ 3SE2 120-1CV00-0AC4 <br> $\rightarrow$ 3SE2 120-1CV00-0AC5 | $\begin{aligned} & 84.00 \\ & 87.00 \end{aligned}$ | $\begin{aligned} & 0.200 \\ & 0.200 \end{aligned}$ |
|  | Roller plunger <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle | C | 40 | $\rightarrow$ 3SE2 120-1DV00-0AC4 <br> $\rightarrow$ 3SE2 120-1DV00-0AC5 | $\begin{aligned} & 91.00 \\ & 94.00 \end{aligned}$ | $\begin{aligned} & 0.265 \\ & 0.265 \end{aligned}$ |
|  | Roller lever <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle |  | 40 | $\rightarrow$ 3SE2 120-1EV00-0AC4 <br> $\rightarrow$ 3SE2 120-1EV00-0AC5 | $\begin{aligned} & 80.00 \\ & 83.00 \end{aligned}$ | $\begin{aligned} & 0.225 \\ & 0.200 \end{aligned}$ |
|  | Angular roller lever <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle |  | 40 | $\rightarrow$ 3SE2 120-1FV00-0AC4 <br> $\rightarrow$ 3SE2 120-1FV00-0AC5 | $\begin{aligned} & 67.00 \\ & 70.00 \end{aligned}$ | $\begin{aligned} & 0.230 \\ & 0.230 \end{aligned}$ |
|  | Roller crank <br> - finely adjustable from $10^{\circ}$ to $10^{\circ}$ <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle <br> - adjustable length, finely adjustable from $10^{\circ}$ to <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle | $\text { - } 10^{\circ}$ | 40 | $\rightarrow$ 3SE2 120-1GW00-0AC4 <br> $\rightarrow$ 3SE2 120-1GW00-0AC5 <br> 3SE2 120-1UW00-0AC4 | $\begin{aligned} & 88.00 \\ & 91.00 \\ & \\ & 104.00 \end{aligned}$ | $\begin{aligned} & 0.310 \\ & 0.310 \\ & 0.325 \end{aligned}$ |
|  | Switch body with contact block without operating head <br> - with 4-pole, M12 male receptacle <br> - with 5-pole, M12 male receptacle | - | 40 | 3SE2 120-1AV00-0AC4 3SE2 120-1AV00-0AC5 | $\begin{aligned} & 61.00 \\ & 64.00 \end{aligned}$ | $\begin{aligned} & 0.180 \\ & 0.180 \end{aligned}$ |

Wiring Diagram for M12 Connections

| $\begin{gathered} \text { M12 } \\ \text { Pin } \\ \hline \end{gathered}$ | Limit Switch,Snap-Action Contacts $2^{2}$ ) |  | Typical M12 Cable ${ }^{3}$ ) |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 4-pole Connection | 5-pole Connection | 4-wire Connection | 5-wire Connection |
| 1 | 21 | 21 | Brown | Brown |
| 2 | 22 | 22 | White | White |
| 3 | 13 | 13 | Blue | Blue |
| 4 | 14 | 14 | Black | Black |
| 5 | N/A | Ground | N/A | Green |



Positive opening acc. to IEC
60 947-5-1, Appendix K

1) The actuator heads can be subsequently exchanged (see Page 13/95).
2) 21 \& $22=$ Normally Closed; 13 \& $14=$ Normally Open.
3) Typical M12 female plug with 5 meter cable.

|  | 4 -pole <br> Right-angle <br> $3 R X 1542$ | 5 -pole <br> 3RX1631 |
| :--- | :---: | :---: |
| 3RX15 |  |  |

$\begin{array}{lcc}\text { Right-angle } & \text { 3RX1542 } & \text { 3RX1631 } \\ \text { Straight } & \text { 3RX1513 } & \text { 3RX1570 }\end{array}$

# 3SE International Limit Switches <br> Position Switches <br> 3SE2 120 Specials <br> Metal enclosure, 40 and 56 mm width 

Selection and ordering data
2 contacts • Moving double break contacts • IP 67 degree of protection • EN 50041
1 or 2 LEDs • Stainless steel roller/rod • Increased corrosion protection
$\left.\begin{array}{llllll}\text { Actuator } \\ \text { Enclosure } \\ \text { width }\end{array}\right)$

1) The actuator heads can be subsequently exchanged (see Page 13/95)
2) For conduit thread adaptors see page 13/97.
3) The switch contacts have changed from their normal state.
4) Green LED - There is power to the switch. Yellow LED - The switch contacts have changed from their normal state.
5) Two parts required. Order separately.

# 3SE International Limit Switches <br> Position Switches 

## 3SE2 100 to 3SE3 170, 3SE2 230

Selection and ordering data
Switch Bodies with replaceable contact block without operating head


Molded Plastic Housing $40 \mathrm{~mm}^{2)}$


3SE2 230

Operating heads for the 3SE2100, 3SE2120 and 3SE3170 series are interchangeable with each other and the various contact configurations. The same operating heads are also used in the 3SE2303 and 3SE2404 series. These switches are not available in parts.
Operating heads for the 3SE2230 series are interchangeable with the various contact configurations and may also require a lever (side rotary operating head).

## Switch Body with Contact Block without Operating Head



[^1]
# 3SE International Limit Switches <br> Position Switches <br> 3SE2 303 <br> Metal enclosure, 56 mm width 

Selection and ordering data
3 contacts $\cdot$ Wide enclosure • Moving double break contacts • IP 67 degree of protection • M20 $\mathbf{x} 1.5$ connecting thread


For operation, operating speed and travel, see Pages 13/106 to 13/112. and DIN VDE 0660 Part 200.

1) The actuator heads can be subsequently exchanged (see page 13/95).
2) For conduit thread adaptors see page 13/97.

# 3SE International Limit Switches <br> Position Switches 

3SE2 404
Metal enclosure, 56 mm width

Selection and ordering data
4 contacts . Wide enclosure • Moving double-break contacts • Degree of protection IP $67 \cdot \mathrm{M} 20 \times 1.5$ connecting thread


For operation, operating speed and travel, see Pages 13/100 to 13/105.

# 3SE International Limit Switches <br> Position Switches 

3SE2 100 to 3SE3 170 ／3SE2 303 ／3SE2 404
Metal enclosure， 40 and 56 mm width

## Accessories

Actuator heads lamps
The actuator heads of the position switches can be subsequently exchanged for other variants．

|  | Actuators with mounting screws | For position switches | Order No． | List Price \＄ | Weight approx |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 3SE2 100－■口 |  |  |  |
|  |  | 3SE2 120－ם口 |  |  |  |
|  |  | 3SE2 230－■口 |  |  |  |
|  |  | 3SE2 303－■口 |  |  |  |
|  |  | 3SE2 404－■口 |  |  |  |
|  |  | 3SE3 170－ם口 |  | 1 unit | kg |
| $\mathrm{PB}_{8}$ | Plunger | －．${ }^{\text {B }}$ | 3SX3 100 | 24.00 | 0.018 |
| ${ }^{+1}$ | includes screws and gasket |  |  |  |  |
|  | Overtravel plunger | －．C | 3SX3 106 | 43.00 | 0.056 |
|  | includes screws and gasket |  |  |  |  |
|  | Roller plunger | －．D |  |  |  |
|  | includes screws and gasket |  |  |  |  |
|  | －standard roller |  | 3SX3 107 | 51.00 | 0.082 |
|  | －stainless steel roller |  | 3SX3 263 | 69.00 | 0.080 |
|  | Roller lever | －．E |  |  |  |
|  | includes screws and gasket |  |  |  |  |
|  | －standard roller |  | 3SX3 102 | 28.00 |  |
|  | －stainless steel roller |  | 3SX3 275 | 33.00 | 0.050 |
|  | Angular roller lever | －．F |  |  |  |
|  | includes screws and gasket |  |  |  |  |
|  | －standard roller |  | 3SX3 104 | 35.00 | 0.043 |
|  | －stainless steel roller |  | 3SX3 276 | 30.00 | 0.050 |
| 3SX3 126 | Wobble spring ${ }^{1)}$ <br> （includes screws and gasket） |  |  |  |  |
|  |  |  |  |  |  |
|  | －standard，spring 50 mm ， plastic rod 50 mm |  | 3SX3 126 | 59.00 | 0.049 |
|  | －length 73 mm ，spring 23.5 mm ， stainless steel rod 10 mm |  | 3SX3 282 | 66.00 | 0.020 |
|  | －length 113 mm ，spring 23.5 mm ， stainless steel rod 50 mm |  | 3SX3 285 | 66.00 | 0.020 |
|  | －length 139.5 mm ，spring 50 mm ， plastic rod 50 mm with increased corrosion protection |  | 3SX3 284 | 85.00 | 0.050 |
|  | －length 139.5 mm ，spring 50 mm ， stainless steel rod 50 mm |  | 3SX3 281 | 77.00 | 0.060 |
|  | －length 239.5 mm ，spring 150 mm ， plastic rod 50 mm |  | 3SX3 283 | 66.00 | 0.070 |
|  | －length 239.5 mm ，spring 150 mm ， stainless steel rod 50 mm |  | 3SX3 311 | 82.00 | 0.080 |

${ }^{1)}$ Not for safety circuits

3SE International Limit Switches
Position Switches
3SE2 100 to 3SE3 170 / 3SE2 303 / 3SE2 404
Metal enclosure, 40 and 56 mm width
Accessories

|  | Actuators with mounting screws | For position switches | Order No. | List Price \$ | Weight approx. |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 3SE2 100-ם口 <br> 3SE2 120- $\square$ <br> 3SE2 303- $\square$ <br> 3SE2 404- $\square$ <br> 3SE3 170- $\square$ |  | 1 unit | kg |
| $\text { 3SX3 } 211$ | Roller crank operating heads (without lever, includes screws \& gasket) |  |  |  |  |
|  | - standard momentary (spring return), left and right operation | -.GW, -.U, -.V, -.W | 3SX3 211 | 41.00 | 0.112 |
|  | - momentary (spring return), left and/or right operation | -.GW, -.U, -.V, -.W | 3SX3 307 | 48.00 | 0.085 |
|  | - fork lever, maintained | -1T | 3SX3 127 | 65.00 | 0.131 |
| $\text { 3SX3 } 212$ | Roller crank levers (operating head not included) | -. GW |  |  |  |
|  | - standard, plastic roller, 19 mm dia. |  | 3SX3 212 | 9.00 | 0.020 |
|  | - stanless steel roller, 19 mm dia. |  | 3SX3 265 | 21.75 | 0.025 |
|  | - plastic roller, 30 mm dia. |  | 3SX3 278 | 17.00 | 0.020 |
|  | - plastic roller, 50 mm dia. |  | 3SX3 301 | 16.00 | 0.020 |
|  | - rubber roller, 50 mm dia. |  | 3SX3 280 | 18.00 | 0.020 |
| $\text { 3SX3 } 213$ | Adjustable length roller crank (operating head not included) | -.UW |  |  |  |
|  | - levers with clamp |  |  |  |  |
|  | - standard, plastic roller, 19 mm dia. |  | 3SX3 213 | 24.00 | 0.024 |
|  | - stanless steel roller, 19 mm dia. |  | 3SX3 268 | 37.00 | 0.030 |
|  | - plastic roller, 30 mm dia. |  | 3SX3 302 | 30.00 | 0.025 |
|  | - rubber roller, 50 mm dia. |  | 3SX3 304 | 32.00 | 0.020 |
|  | - levers without clamp- rubber roller, 50 mm dia. |  |  |  |  |
|  |  |  | 3SY3 024 | 8.00 | 0.036 |
| $\begin{gathered} 3 S \times 3115 \\ 0 \end{gathered}$ | Fork lever <br> (operating head not included) <br> - standard, plastic rollers, 19 mm dia. <br> - stainless steel rollers, 19 mm dia. | -1T |  |  |  |
|  |  |  | 3SX3 115 | 35.00 | 0.032 |
|  |  |  | 3SX3 266 | 61.00 | 0.050 |
| 3SX3 215 | Rod actuator (operating head not included) |  |  |  |  |
|  | - with support |  |  |  |  |
|  |  | -.WW | 3SX3 215 | 20.00 | 0.031 |
|  | - aluminum rod | -.VW | 3SX3 214 | 20.00 | 0.032 |
|  | - without support- standard, plastic rod |  |  |  |  |
|  |  | -.WW | 3SX3 000 | 3.00 | 0.008 |
|  | - aluminum rod | -.VW | 3SX3 001 | 3.00 | 0.016 |

# 3SE International Limit Switches <br> Position Switches 



1) For wiring, a crimping tool is necessary, max. conductor size $1 \mathrm{~mm}^{2}$.

## 3SE International Limit Switches <br> Position Switches

3SE2 100 to 3SE3 170 / 3SE2 303 / 3SE2 404
Metal enclosure, 40 and 56 mm width

Accessories and spare parts


# 3SE International Limit Switches <br> Position Switches <br> 3SE3 020 / 3SE3 023 <br> Open type 

Selection and ordering data
2 contacts • Moving double break contacts • Degree of protection: Terminals IP 20, switching chamber IP 40
Tandem arrangement ( $2 \times 2$ contacts) is possible when 3SY3 121 adapter is used (see accessories below).


Safety function according to IEC 60 947-5-1, Appendix K.
For operation, operating speed and travel, see Page 13/112.

# 3SE International Limit Switches <br> Position Switches 

## 3SE2 100 to 3SE3 170 / 3SE2 404

Metal enclosure, 40 and 56 mm width
Operation, operating speed and travel or angle of actuators

## 2 contacts . Standard and wide enclosure

Bars, cams, stops, etc. are used as actuating devices. The shape of the actuating device must provide the given angles for the leading and trailing edges.

For operation from the side, sparingly greased steel, POM (polyoxymethylene or polyacetal) or PA (polyamide) should be used as cam and bar material.

Operating speed along plunger axis
The actuating speed in the case of position switches with slowaction contacts is not permitted
to go lower than $15 \mathrm{~mm} / \mathrm{s}$ for DC and $1 \mathrm{~mm} / \mathrm{s}$ for $A C$. Position switches with snap-action contacts should be used when the speeds are lower.

3SE2 404 position switches . 4 contacts . Wide enclosure

The data for operation, operating speed, travel and angle of operation is the same as for the
position switches with 2 switch blocks.

Two switch blocks with 2 contacts are used for position switches with 4 contacts.


# 3SE International Limit Switches <br> Position Switches 

## 3SE2 100 to 3SE3 170 / 3SE2 230 / 3SE2 404 <br> Metal enclosure, 40 and 56 mm width

Operation, operating speed and travel or angle of actuators
2 or 4 contacts . Standard and wide enclosure


## 3SE International Limit Switches <br> Position Switches

3SE2 100 to 3SE3 170 / 3SE2 230 / 3SE2 404
Metal enclosure, 40 and 56 mm width
Operation, operating speed and travel or angle of actuators
2 or 4 contacts. Standard and wide enclosure



# 3SE International Limit Switches <br> Position Switches 

3SE2 100 to 3SE3 170 / 3SE2 230 / 3SE2 404
Metal enclosure, 40 and 56 mm width
Operation, operating speed and travel or angle of actuators
2 or 4 contacts . Standard and wide enclosure


# 3SE International Limit Switches <br> Position Switches 

3SE2 100 to 3SE3 170 / 3SE2 230 / 3SE2 404
Metal enclosure, 40 and 56 mm width
Operation, operating speed and travel or angle of actuators
2 or 4 contacts . Standard and wide enclosure


1) Max. operating angle $70^{\circ}$.

# 3SE International Limit Switches <br> Position Switches 

3SE2 100 to 3SE3 170 ／3SE2 230 ／3SE2 404
Metal enclosure， 40 and 56 mm width
Operation，operating speed and travel or angle of actuators
2 or 4 contacts．Standard and wide enclosure

| Operation by a bar |  | Switch blocks <br> Terminal designation acc．to EN 50013 | Nominal travel and related terminals |  | Switch blocks | Nominal travel and related terminals |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | operating pt acc．to EN 50041 max．operating speed ref．line acc．to EN 50041 direction of operation |  |  | ref．line acc．to EN 50041 contact closed contact open operating point on return positive opening to IEC 60 947－5－1－3 |  |  |

## Rod actuator

finely adjustable from $10^{\circ}$ to $10^{\circ}$
3SE2 100－．WW，3SE．1ロ0－．WW， 3SE2 230－．W，3SE2 404－．WW 3SE2 100－．VW，3SE．1ロ0－．VW， 3SE2 230－．V，3SE2 404－．VW


A＝Operating range
$B=$ Lower edge of actuator
$v_{\text {max．}}=3 \mathrm{~m} / \mathrm{s}$
Minimum torque required
in direction of operation： 25 Ncm
In special designs，contacts can only be operated from right or left．By twisting the plunger from the right and left．

## Spring rod

3SE2 100－1R，3SE．1ロ0－1R， 3SE2 230－．R

$v_{\max }=1 \mathrm{~m} / \mathrm{s}$ ，approachable from all
sides
Minimum force required
in direction of operation： 12 N
with lateral deflection at the tip： 2.5 N

Slow－action contacts
$1 \mathrm{NC}+1 \mathrm{NO}$

## －

3SE3 000－0A
3SE3 010－0A Ident．No． 11
$1 \mathrm{NO}+1 \mathrm{NC}$
With make－before－ break


3SE3 000－3A
3SE3 010－3A
Ident．No． 11
Snap－action contacts


3SE3 000－1A
3SE3 010－1A，
Ident．No． 11
in direction of rotation
in direction of rotation

2 NC


2 NO


3SE3 000－7A
Ident．No． 20

2 NC


3SE3 000－1AV00，
3SE3 010－1AV00，
Ident．No． 02

Snap－action contacts
1 NC＋ 1 NO


3SE3 000－1A
3SE3 010－1A，
Ident．No． 11

Deflection of spring rod


2 NC


3SE3 000－1AV00，
3SE3 010－1AV00， Ident．No． 02

[^2]3SE International Limit Switches
Position Switches

## 3SE2 303

Metal enclosure, 56 mm width
Operation, operating speed and travel or angle of actuators
3 contacts . Wide enclosure

| Operation by a bar |  |
| :--- | :--- |
| $\odot$ | operating pt acc. to EN 50041 |
| $V_{\max }$ | max. operating speed |
| O-line | reference line acc. to EN 50041 |
| H | travel difference |
| $\rightarrow$ | direction of operation |


$v_{\max .}=1.5 \mathrm{~m} / \mathrm{s}$


| Switch blocks | Nominal travel <br> and related terminals | Minimum force <br> required in |
| :--- | :--- | :--- |
| Terminal designation acc. | O-line reference line acc. to EN 50041 | direction of |
| to EN 50 013 | $S$ | travel acc. to EN 50 041 |$\quad$| operation |
| :--- |

Slow-action contacts

## $1 \mathrm{NO}+2 \mathrm{NC}$


$\xrightarrow{S=10 \pm 1}$


2 NO + 1 NC


Ident. No. 21


16 N
$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break


Ident. No. 12


18 N
$2 \mathrm{NO}+1 \mathrm{NC}$ make-before-break


Operation, operating speed and travel or angle of actuators

## 3 contacts . Wide enclosure

| Operation by a bar |  | Switch blocks <br> Terminal designation acc. to EN 50013 | Nominal travel and related terminals |  | Minimum force required in direction of operation |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \odot \\ & V_{\max } \\ & 0 \text {-line } \\ & \mathrm{H} \\ & \rightarrow \end{aligned}$ | operating pt acc. to EN 50041 max. operating speed reference line acc. to EN 50041 travel difference direction of operation |  | O-line S $\square$ $\star \star$ | reference line acc. to EN 50041 travel acc. to EN 50041 <br> contact closed <br> contact open <br> operating point on return <br> positive opening to <br> IEC 60 947-5-1-3 |  |

3SE2 303-.C

$v_{\text {max. }}=1.5 \mathrm{~m} / \mathrm{s}$

$v_{\max .}=0.5 \mathrm{~m} / \mathrm{s}$
$1 \mathrm{NO}+2 \mathrm{NC}$

$\stackrel{\mathrm{S}=10 \pm 1,5}{10 \sim 1}$


## $\mathrm{S}=10 \pm 1,5$ $1 \rightarrow l$


$1 \mathrm{NO}+2 \mathrm{NC}$ make-before-break

$37 N$
$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break


3SE International Limit Switches
Position Switches

## 3SE2 303

Metal enclosure, 56 mm width
Operation, operating speed and travel or angle of actuators
3 contacts . Wide enclosure

| Operation by a bar |  |
| :--- | :--- |
| O | operating pt acc. to EN 50041 |
| $V_{\max }$ | max. operating speed |
| 0 -line | reference line acc. to EN 50041 |
| $H$ | travel difference |
| $\rightarrow$ | direction of operation |


| Switch blocks | Nominal travel <br> and related terminals | Minimum force <br> required in <br> direction of |
| :--- | :--- | :--- |
| Terminal designation acc. | 0-line | reference line acc. to EN 50 041 |
| to EN 50013 | $S$ | travel acc. to EN 50 041 |$\quad$ operation

## Roller plunger

3SE2 303-.D
$1 \mathrm{NO}+2 \mathrm{NC}$


35 N

$v_{\max .}=1.5 \mathrm{~m} / \mathrm{s}$

$v_{\max .}=1 \mathrm{~m} / \mathrm{s}$

## $2 \mathrm{NO}+1 \mathrm{NC}$


$\underset{\substack{\mathrm{S} \\ 1 \\ \mid-15 \pm 2,5}}{ }$

$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break


37 N
$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break



# 3SE International Limit Switches <br> Position Switches 

3SE2 303
Metal enclosure, 56 mm width
Operation, operating speed and travel or angle of actuators
3 contacts . Wide enclosure

| Operation by a bar |  | Switch blocks | Nomin and re | travel ted terminals | Minimum force required in direction of operation |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\bigcirc$ | operating pt acc. to EN 50041 | Terminal designation acc. to EN 50013 | o-line S$\square$ | reference line acc. to EN 50041 travel acc. to EN 50041 <br> contact closed contact open positive opening to IEC 60 947-5-1-3 |  |
| $\alpha$ | approach angle |  |  |  |  |
| $\beta$ | trailing angle |  |  |  |  |
| $\gamma$ | approach angle |  |  |  |  |
| $V_{\text {max }}$ | max. operating speed |  |  |  |  |
| O-line | reference line acc. to EN 50041 |  |  |  |  |
|  | travel difference |  |  |  |  |

Slow-action contacts perpendicular to plunger axis
$1 \mathrm{NO}+2 \mathrm{NC}$

$2 \mathrm{NO}+1 \mathrm{NC}$

$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break


15 N

17 N
make-before-break

$: v_{\max }=1 \mathrm{~m} / \mathrm{s}$ at $\alpha_{\max }=30^{\circ}$
$v_{\max .}=2.5 \mathrm{~m} / \mathrm{s}$ at $\gamma_{\max }=45^{\circ}$
$\beta_{\max }=45^{\circ}$
For operation along plunger axis: $v_{\max }=1.5 \mathrm{~m} / \mathrm{s}$

## Angular roller lever

3SE2 303-.F


For operation along plunger axis:
$v_{\max .}=1 \mathrm{~m} / \mathrm{s}$ at $\alpha_{\max }=30^{\circ}$
$v_{\max }=2.5 \mathrm{~m} / \mathrm{s}$ at $\gamma_{\max }=45^{\circ}$
$v_{\max }=2.5 \mathrm{~m} / \mathrm{s}$ at $\beta_{\max }=45^{\circ}$

Sow-action contacts
$1 \mathrm{NO}+2 \mathrm{NC}$
along plunger axis


Ident. No. 12
$2 \mathrm{NO}+1 \mathrm{NC}$


Ident. No. 21
$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break


Ident. No. 12
$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break


Ident. No. 21


## 3SE International Limit Switches

Position Switches

## 3SE2 303

Metal enclosure, 56 mm width
Operation, operating speed and travel or angle of actuators

## 3 contacts . Wide enclosure

| Operation by a bar |  |
| :--- | :--- |
| $\odot$ | operating pt acc. to EN 50041 |
| $V_{\max }$ | max. operating speed |
| O-line | reference line acc. to EN 50041 |
| H | travel difference |
| $\rightarrow$ | direction of operation |


| Switch blocks | Nominal travel <br> and related terminals | Minimum force <br> required in <br> direction of |
| :--- | :--- | :--- |
| Terminal designation acc. | 0-linereference line acc. to EN 50 041 <br> to EN 50 013 | Sotation |
|  | $\square$ | travel acc. to EN 50 041 |
|  | $\square$ | contact closed <br> contact open <br> positive opening to <br> IEC $60947-5-1-3$ |

## Roller crank

finely adjustable from $10^{\circ}$ to $10^{\circ}$

## 3SE2 303-.GW-Z

A31

$v_{\text {max. }}=3 \mathrm{~m} / \mathrm{s}$
In special designs contacts can only be operated from right or left. By twisting the plunger from the right and left.

Slow-action contacts

## $1 \mathrm{NO}+2 \mathrm{NC}$


perpendicular to plunger axis



## $2 \mathrm{NO}+1 \mathrm{NC}$



$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break

$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break


1) Max. operating angle $70^{\circ}$.

Max. deflection for adjustment purposes $90^{\circ}$.

# 3SE International Limit Switches <br> Position Switches <br> 3SE2 303 <br> Metal enclosure, 56 mm width 

Operation, operating speed and travel or angle of actuators
3 contacts . Wide enclosure

$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break


1) Max. operating angle $70^{\circ}$.

# 3SE International Limit Switches <br> Position Switches 

3SE2 303 / 3SE3 02.
Metal enclosure, 56 mm width
Operation, operating speed and travel or angle of actuators

## 3 contacts . Wide enclosure

| Operation by a bar |
| :--- | :--- |
| $\odot$ operating pt acc. to EN 50041 <br> $V_{\max }$ max. operating speed <br> O-line reference line acc. to EN 50041 <br> $\rightarrow$ direction of operation |


| Switch blocks | Nominal travel <br> and related terminals | Minimum force <br> required in |
| :--- | :--- | :--- |
| Terminal designation acc. | 0-linereference line acc. to EN 50 041 |  |
| to EN 50 013 | S | travel acc. to EN 50 041 |$\quad$| rotation of |
| :--- |



Slow-action contacts Deflection in direction of rotation


## $2 \mathrm{NO}+1 \mathrm{NC}$


$1 \mathrm{NO}+2 \mathrm{NC}$
make-before-break
A $=$ Operating range
$B=$ Lower edge of actuator
$v_{\max .}=3 \mathrm{~m} / \mathrm{s}$


In special designs contacts can only be operated Ident. No. 12
from right or left. By twisting the plunger from the right and left.
$2 \mathrm{NO}+1 \mathrm{NC}$
make-before-break


Ident. No. 21

1) Max. operating angle $70^{\circ}$. Max. deflection for adjustment purposes $90^{\circ}$.

3SE3 020 and 3SE3 023 open-type position switches
2 and 3 contacts • Moving double break contacts • Degree of protection: Terminals IP 20, switching chamber IP 40


## Dimension drawings

3SE2 1.0, 3SE3 1.0

3SE. $1 \square 0$
narrow enclosure, 2 contacts,
with plunger


3SE2 100
wide enclosure, 2 contacts,
with plunger


Actuators for 3SE2 1.0, 3SE3 1.0 position switches



3SX3 212 roller crank for
3SX3 211 actuator heads


Rod actuator, adjustable length, Form D



Fork lever


Wobble spring


3SE International Limit Switches
Position Switches
3SE2 303 / 3SE2 404
Metal enclosure, 56 mm width
Dimension drawings

3SE2 303
wide enclosure, 3 contacts


3SE2 404
wide enclosure, 4 contacts


Open-type


3SE3 023-.A



[^0]:    1) The actuator heads can be subsequently exchanged (see Page 13/95).
    2) For conduit thread adaptors see page 13/97
[^1]:    ${ }^{1}$ ) Shown with operating head. See catalog page 13/95 and 13/96 for operating heads and levers.
    ${ }^{2}$ ) Shown with operating head. See catalog page 13/83 for operating heads and levers.

[^2]:    1）Max．operating angle $70^{\circ}$ ．

