Heavy industry
Materials handling industry
Pull-wire emergency-stop switches
One-side and two-side operating principle

Type: T3Z 068
- Pull-wire and wire-breakage monitoring
- Two side operating principle 2 x 50 m
- Cast iron housing, galvanised with 2K paint resistant to oil, grease, salt and acids in thinned down concentration
- Silver contacts, max. 3 x NC positive break, 3 x NO
- Gold plated contacts optional
- Low actuation forces max. 50 N, 30 N in direction of wire
- Indicator lamp optional

Type: ZQ 900
- Wire pull and breakage detection with front integrated Emergency-Stop button
- Selectable single side, max. 75 m wire length
- Robust galvanized cast iron casing with 2K painted, plastic cover
- Visible position indicator
- Optional indicator lamp for one of the 3 x M20 cable entries
- Max. 4 contacts e.g. 2 NC/2 NO or 4 NC
- NC with silver contacted automatic opener
- Gold plated contacts optional
- Front release push button for releasing after pull-wire or wire-break actuation

Note:
Pull-wire switch conforming to standards ISO 13850, IEC 60947-5-1, IEC 60947-5-5
2-wire bus option available upon request! Temperature range from −40 °C … +85 °C
IEC EX options II 2/3D Ex tD A21 IP65, IP66, IP67 T90°C
Belt alignment switches
For heavy applications

Type: T/M 250

- Extremely robust cast-iron housing, galvanized, 2K paint resistant to oil, grease, salt and acids in thinned down concentration
- Max. 4 contacts, e.g. 2 NC, 2 NO
- Silver contacts, optional with gold contacts
- Choice between snap- or slow action
- Different roller lengths and switching points for the pre- and main shutdown
- Temperature range standard −30 °C ... +90 °C optional −40 °C ... +200 °C also possible
- Protection class IP67

Type: T/M 441

- Extremely robust cast-iron housing, galvanized, 2K paint resistant to oil, grease, salt and acids in thinned down concentration
- 1 NO contact + 1 NC contact
- Choice between snap action or slow switching contacts
- Different roller lengths
- Temperature range standard −30 °C ... +90 °C optional −40 °C ... +200 °C also possible
- Special versions available for sea water resistance or harsh environmental conditions
- Protection class IP65

Note:
2-wire bus option upon request
IEC EX option II 2/3D Ex tD A21 IP65, IP66, IP67 T90°C available
We offer our customers complete safety solutions from a single source, consisting of pull-wire emergency stop switches, safety relay building blocks or 2-wire network solutions up to distance of 12 km.

Our pull-wire emergency stop switches guarantee a reliable emergency stop function with wire breakage monitoring on conveyor plants over a distance of 75 m on one side and 2 x 50 m on both sides. All pull-wire emergency stop switches are insensitive to external influences such as torsion, vibrations and temperature variations. If the pull-wire switch is actuated, it safely mechanically latches in the emergency stop position and can only be released by actuation of the release device.

Belt alignment switches monitor the straight running of conveyor plants. If the conveyor belt moves off-centre from the drive and pulleys, the switching devices are triggered. With staggered switching a pre-warning for example is initiated with 15° deviation and the conveyor belt is switched off for example at 25°. Individual staggered switching are available upon request. In addition to multiple versions of belt alignment switches, we offer a comprehensive programme of rollers for our belt alignment switch with different lengths, diameters and materials.

 optionally operated by key selectors. Our safety monitoring modules make sure that the monitoring of the Emergency-Stop equipment is safe right up to a performance level of PL e, this is due to the integrated monitoring of the safety circuits against wire-breakage or shorts to ground or a cross-wire short. The maximum distance for the SRB relay is 2.5 km and is dependent on the cable cross section used for the safety equipment. For systems that are more that 2.5 km we recommend a 2-wire network solution that allows a safe Emergency Stop function up to a distance of 12 km. For further details please contact us directly, we are happy to assist you with your planning.

Emergency stop shutdown on conveyor belts

Belt alignment monitoring

Application examples

Conveying plants

Application 1

Emergency stop shutdown on conveyor belts

Application 2

Belt alignment monitoring

With staggered conveyor systems the transparency of the system can be increased considerably by using a 2-wire bus connection because the switch condition of all belt alignment switches can be individually shown with all the other warning messages in a collective indication system. This helps with any troubleshooting and drastically reduces any downtime. The overall installation effort and expenditure is considerably reduced.
Dust, varying temperatures and an often "rough" handling: command devices installed on transport and conveyor plants must be able to permanently withstand harsh conditions. Our robust command devices and indicator lights, joystick switches and surface-mounted enclosures have been especially developed for such applications and provide for a safe switching.

The range of "R" switches is optionally available in metal version with high protective collar against inadvertent contact. The oil-resistant large switch surfaces can also be operated reliably whilst wearing gloves.

The emergency stop switches are equipped with positive-locking and safe latching, optionally with increased protection against inadvertent unlocking. The message buttons and indicator lights feature bright LED’s for a maximum signal effect at very low maintenance costs.

On belt transfer stations or in silo installations, the level of bulk goods such as granulates, powder or seeds often needs to be monitored. For this application, Schmersal has developed a level switch for heavy-duty applications on the basis of the 441 type position switch. The flexible reinforced fibreglass shift gate ensures that the switch is actuated throughout 360° when deflected by less than 20° or when the pressure comes from below. It comes with protection class IP65 and is suitable for ambient temperatures of −30 °C … +90 °C.
Level and slack wire switch
For heavy applications

**Type: MAF/S 441**
Level switch for hopper and container

- Robust cast-iron housing, galvanized, 2K paint resistant to oil, grease, salt and acids in thinned down concentration
- 1 NO contact / 1 NC contact
- Silver contact, gold contacts upon request
- Fiberglass actuator with return spring, including 360° radius of movement in all directions
- Switch off at approx. 20° in all directions, or with pressure from below
- Temperature range -30 °C … +90 °C optional
- Protection class IP65

**Type: T/M 441 Slack-wire switch**
Monitoring of the rope tensioner on conveyor systems

- Robust cast-iron housing, galvanized, 2K paint resistant to oil, grease, salt and acids in thinned down concentration
- 1 NO contact / 1 NC contact
- Choice between snap- or slow action
- Galvanized cast iron, actuation lever with V2A castor
- Temperature range -30 °C … +90 °C
- Protection class IP65

**Note:**
2-wire bus option upon request
IEC EX Option II 2D Ex ID A21 IP65, IP66, IP67 T90°C available
Safety solutions
Safety-monitoring modules

Safety monitoring module type SRB 301
Clocked impulse output,
max. system resistance 40 Ω
Max. cable length with 1.5 mm² 1,500 m,
Max. cable length with 2.5 mm² 2,500 m,

Characteristics of the safety relay module, safe monitoring of:
1  Ground fault
2  Cross fault
3  Line break

SRB 301 with 2-channel control and
3 safety contacts

Wide variety
IECEx Safety-monitoring modules
with encapsulated relay outputs
for dusty environments
# Ordering details and variants

## Pull-wire emergency-stop switches

### Options T3Z 068-\(\text{-YR}\) ①②③④...

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Pull-wire switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>① 1 NO - 1 NC</td>
<td>11</td>
<td>22 / 33</td>
<td>T3Z 068-11YR</td>
<td>nx NO contact / nx NC contact</td>
<td>EX-T3Z 068-11YR</td>
</tr>
<tr>
<td>AS-i SaW interface</td>
<td>AS</td>
<td>Network</td>
<td>T3Z 068-ST-AS</td>
<td>AS = Connector M12, 5 pole</td>
<td>not available</td>
</tr>
<tr>
<td>Reset by pull ring</td>
<td>−</td>
<td>T3Z 068-nnYR</td>
<td>Standard</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>Release by key</td>
<td>S</td>
<td>T3Z 068-nnYRS</td>
<td>n x NC/NO + Key release (option)</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>③ without indicator lamp</td>
<td>−</td>
<td>T3Z 068-nnYR</td>
<td>Standard</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>④ with indicator lamp</td>
<td>G</td>
<td>T3Z 068-nnYRG</td>
<td>n x NC/NO + indicator lamp</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Pull-wire switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. -40°C +90°C</td>
<td>1172</td>
<td>T3Z 068-nnYR-1172</td>
<td>n×NC/NO,ext.temp.range -40°C to +90°C</td>
<td>Standard -20°C to +60°C</td>
<td></td>
</tr>
<tr>
<td>Gold-plated contacts</td>
<td>1637</td>
<td>T3Z 068-nnYR-1637</td>
<td>0.3µm Gold-plated contacts</td>
<td>EX-T3Z 068-nnYR-1637</td>
<td></td>
</tr>
<tr>
<td>External parts in V4A</td>
<td>2867</td>
<td>T3Z 068-nnYR-2867</td>
<td>Screws, pins, lever etc. in V4A</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

Order example: T3Z 068 33YR S G 1172 = 3 x NO contact, 3 x NC contact, key release, indicator lamp, ext. temp. range -40°C to +90°C

### Options ZQ900-\(\text{-YR}\) ①②

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Pull-wire switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>① 2 NO / 2 NC</td>
<td>22</td>
<td>11/02/13/04</td>
<td>ZQ 900-22</td>
<td>nx NO contact / nx NC contact</td>
<td>EX-ZQ 900-22-3D</td>
</tr>
<tr>
<td>AS-i SaW interface</td>
<td>AS</td>
<td>Network</td>
<td>ZQ 900 ST-AS</td>
<td>AS = connector M12, 5 pole output down</td>
<td>not available</td>
</tr>
<tr>
<td>② Emergency-Stop button</td>
<td>N</td>
<td>ZQ 900-nnN</td>
<td>n x S/O + Emergency-Stop button front side</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Pull-wire switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast iron lever</td>
<td>243</td>
<td>n. 250-nnZ-243</td>
<td>Lever L 129 mm Castor ø 25 mm L 50 mm</td>
<td>EX-n. 250-nnZ-243</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>966</td>
<td>n. 250-nnZ-966</td>
<td>Lever L 142 mm Castor ø 32 mm L 65 mm</td>
<td>EX-n. 250-nnZ-966</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>1224</td>
<td>n. 250-nnZ-1224</td>
<td>Lever L 177 mm Castor ø 32 mm L 100 mm</td>
<td>EX-n. 250-nnZ-1224</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>2087</td>
<td>n. 250-nnZ-2087</td>
<td>Lever L 227 mm Castor ø 32 mm L 150 mm</td>
<td>EX-n. 250-nnZ-2087</td>
<td></td>
</tr>
<tr>
<td>④ Temp. -40°C +90°C</td>
<td>1172</td>
<td>n. 250-nnZ-1172</td>
<td>Ext. temp. range -40°C to +90°C</td>
<td>Standard -20°C to +60°C</td>
<td></td>
</tr>
<tr>
<td>Temperature tolerant</td>
<td>T</td>
<td>n. 250-nnZ-T</td>
<td>Ext. temp. resistance -40°C to +200°C</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>Gold-plated contacts</td>
<td>1276-2</td>
<td>n. 250-nnZ-1276-2</td>
<td>0.3 mm Gold-plated contacts</td>
<td>EX-n. 250-nnZ-1276-2</td>
<td></td>
</tr>
<tr>
<td>Toothed shaft</td>
<td>2825-2</td>
<td>n. 250-nnZ-2825-2</td>
<td>Toothed shaft output 10° toothing</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

Order example: ZQ900-13 N = 1 x NO contact, 3 x NC contact, with emergency-stop button on the front

## Belt alignment switches

### Options T.250-\(\text{-Z}\) ①②③④⑤

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Belt alignment switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Snap action</td>
<td>M.</td>
<td>M. 250-nnZ</td>
<td>Snap action contact type</td>
<td>EX-M. 250-nn</td>
<td></td>
</tr>
<tr>
<td>Slow action</td>
<td>T.</td>
<td>T. 250-nnZ</td>
<td>Slow action contact design</td>
<td>EX-T. 250-nn</td>
<td></td>
</tr>
<tr>
<td>② 1 NO - 1 NC</td>
<td>11</td>
<td>22</td>
<td>n. 250-11Z</td>
<td>nx NO contact / nx NC contact</td>
<td>EX-n. 250-11</td>
</tr>
<tr>
<td>Staggered contacts</td>
<td>H</td>
<td>n. 250-nnZ-H</td>
<td>Staggered contacts exp. 1N01NC=10G./=25G.</td>
<td>EX-n. 250-nnH</td>
<td></td>
</tr>
<tr>
<td>⑤ Cast iron lever</td>
<td>243</td>
<td>n. 250-nnZ-243</td>
<td>Lever L 129 mm Castor ø 25 mm L 50 mm</td>
<td>EX-n. 250-nnZ-243</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>966</td>
<td>n. 250-nnZ-966</td>
<td>Lever L 142 mm Castor ø 32 mm L 65 mm</td>
<td>EX-n. 250-nnZ-966</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>1224</td>
<td>n. 250-nnZ-1224</td>
<td>Lever L 177 mm Castor ø 32 mm L 100 mm</td>
<td>EX-n. 250-nnZ-1224</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>2087</td>
<td>n. 250-nnZ-2087</td>
<td>Lever L 227 mm Castor ø 32 mm L 150 mm</td>
<td>EX-n. 250-nnZ-2087</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Belt alignment switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature tolerant</td>
<td>T</td>
<td>n. 250-nnZ-T</td>
<td>Ext. temp. range -40°C to +90°C</td>
<td>EX-n. 250-nnZ-25G.</td>
<td></td>
</tr>
<tr>
<td>Gold-plated contacts</td>
<td>1276-2</td>
<td>n. 250-nnZ-1276-2</td>
<td>0.3 mm Gold-plated contacts</td>
<td>EX-n. 250-nnZ-1276-2</td>
<td></td>
</tr>
<tr>
<td>Toothed shaft</td>
<td>2825-2</td>
<td>n. 250-nnZ-2825-2</td>
<td>Toothed shaft output 10° toothing</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

Order example: T.250-22Z 1224 1172 = slow action switch, 2 x NO - 2 x NC, lever 1224, exp. temp. range -40°C to +90°C

### Options T.441-\(\text{-Y}\) ①②③④⑤

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Option</th>
<th>Order code</th>
<th>Pull-wire switches with</th>
<th>Order of the EX option</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Snap action</td>
<td>M.</td>
<td>M. 441-nnY</td>
<td>Snap action contact type</td>
<td>EX-M. 441-nn</td>
<td></td>
</tr>
<tr>
<td>Slow action</td>
<td>T.</td>
<td>T. 441-nnY</td>
<td>Slow action contact design</td>
<td>EX-T. 441-nn</td>
<td></td>
</tr>
<tr>
<td>② Cast iron lever</td>
<td>243</td>
<td>n. 441-nnY-243</td>
<td>Lever L 129 mm Castor ø 25 mm L 50 mm</td>
<td>EX-n. 441-nnY-243</td>
<td></td>
</tr>
<tr>
<td>Cast iron lever</td>
<td>966</td>
<td>n. 441-nnY-966</td>
<td>Lever L 142 mm Castor ø 32 mm L 65 mm</td>
<td>EX-n. 441-nnY-966</td>
<td></td>
</tr>
<tr>
<td>③ Temp. -40°C +90°C</td>
<td>1172</td>
<td>n. 441-nnY-1172</td>
<td>Ext. temp. range -40°C to +90°C</td>
<td>Standard -20°C to +60°C</td>
<td></td>
</tr>
<tr>
<td>Temperature tolerant</td>
<td>T</td>
<td>n. 441-nnZ-T</td>
<td>Ext. temp. range -40°C to +200°C</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>Gold-plated contacts</td>
<td>1276-2</td>
<td>n. 441-nnY-1276-2</td>
<td>0.3 mm Gold-plated contacts</td>
<td>EX-n. 441-nnY-1276-2</td>
<td></td>
</tr>
<tr>
<td>Actuator attachment</td>
<td>1090</td>
<td>n. 441-nnY-1090</td>
<td>Seawater resistant brass alloy</td>
<td>not available</td>
<td></td>
</tr>
</tbody>
</table>

Order example: T.441-11Y 966 1172 = slow action switch, 1 x NO - 1 x NC, lever 966, ext. temp. range -40°C to +90°C
With its own affiliates in around 20 countries and capable sales and service partners in 30 more countries, the Schmersal Group has operations worldwide.

We started quite early with the internationalisation of sales, consultancy and production. This is also one of the reasons that we are a favoured global partner for machinery and plant construction and also an approved partner for many medium sized engineering companies with local presence. Wherever there are machines that work with Schmersal safety switches, the nearest branch or representative is not far away.
The Schmersal Group

In the demanding field of machine safety, the owner-managed Schmersal Group is one of the international market leaders. The company, which was founded in 1945, has a workforce of about 2000 people and seven manufacturing sites on three continents along with its own companies and sales partners in more than 60 nations.

Customers of the Schmersal Group include global players from the area of mechanical engineering and plant manufacturing as well as operators of machinery. They profit from the company’s extensive expertise as a provider of systems and solutions for machine safety. Furthermore, Schmersal specialises in various areas including foodstuff production, the packaging industry, machine tool industry, lift switchgear, heavy industry and the automotive industry.

A major contribution to the systems and solutions offered by the Schmersal Group is made by tec.nicum with its comprehensive range of services: certified Functional Safety Engineers advise machinery manufacturers and machinery operators in all aspects relating to machinery and occupational safety – and do so with product and manufacturer neutrality. Furthermore, they plan and realise complex solutions for safety around the world in close collaboration with the clients.

Safety Products
- Safety switches and sensors, solenoid interlocks
- Safety controllers and safety relay modules, safety bus systems
- Optoelectronic and tactile safety devices
- Automation technology: position switches, proximity switches

Safety Systems
- Complete solutions for safeguarding hazard areas
- Individual parametrisation and programming of safety controllers
- Tailor-made safety technology – be it for individual machines or a complex production line
- Industry-specific safety solutions

Safety Services
- tec.nicum academy – Seminars and training
- tec.nicum consulting – Consultancy services
- tec.nicum engineering – Design and technical planning
- tec.nicum integration – Execution and installation

www.schmersal.com