

# Coded non-contact safety switches

## Operation:

All ABB Jokab Safety Coded Non-Contact Safety Switches are designed to conform to IEC 947-5-3 and be used as directed by ISO12100, ISO14121 and EN 60204-1.

They have coded magnetic sensing which provides a wide sensing distance and provides a high tolerance to misalignment after sensing. They can be fitted behind stainless steel fittings and can operate from 4 directions even in extreme environments of temperature and moisture.

When used in combination with most Dual Channel Safety Monitoring Relays they can be used to provide up to PLe / Category 4 to ISO 13849-1.

They offer a choice of high specification plastic or Stainless Steel 316

## Features:

Dual channel electronic safety output 2NC (1NO auxiliary optional)

Visual LED indication of switch status

Enclosure Protected to IP67 or IP69K - wash down suitable

Conformance to IEC 947-5-3 PDF-S

No moving parts to give high reliability and long life

Wide sensing distance 14mm

## Plastic versions:

The Plastic Sense range has been developed for non-contact guard door interlocking in the applications of general factory automation packaging and some food processing industries.

Supplied with Screw Cap covers to prevent contamination from food deposits.



**Sense 1**

Miniature industry standard design. 22mm fixing centres, available with Left or Right cable exit.



**Sense 3**

Universal 22mm fixing centres.



**Sense 5**

Industry standard wide fitting. Front face actuation for large guards.



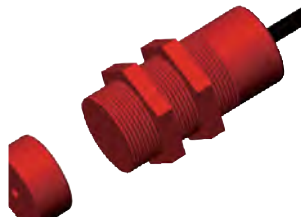
**Sense 7**

European industry standard fitting. End cable exit.



**Sense 9**

Compact slim fitting housing - suitable for fitting to applications where space is limited.



**Sense 11**

M30 threaded body - easy to mount

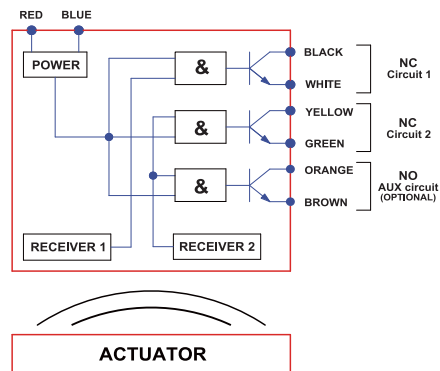
## Application:



ABB Jokab Safety Coded Non-Contact switches are designed to interlock hinge, sliding or removal guard doors. They are specifically advantageous when:

- poor guard alignment exists
- anti tamper sensing is required
- high hygiene requirements exist, e.g. food industry hose down
- long life is required (no moving or touching parts)
- LED status indication is desirable

## Principle:



# Coded non-contact safety switches



## Stainless Steel 316 versions:

The Stainless Steel 316 Sense range has been developed for non-contact guard door interlocking in the applications of food processing, pharmaceutical, packaging and chemical industries.

### Stainless Steel 316

Can be high pressure hosed at high temperature - IP69K

Designed in accordance with EHEDG guidelines for hygienic design (EHEDG European Hygienic Engineering & Design Group)

Suitable for CIP and SIP cleaning

Wide 14mm sensing high tolerance to misalignment

The housing designs, surface finish and styling means they can be used in almost any environments subject to high levels of cleaning following contamination from foreign particles.

They are offered with various types of mounting styles to cover different levels of food contact (as described by the EHEDG Design Group).

- Direct contact zone - The switch mounting is designed according to EHEDG hygienic guidelines and also fulfils the requirements of the splash zone
- Splash zone - The switch must be easy to clean and withstand the CIP and SIP cleaning processes found in the food industry (tested IP69K).

Mirror polished finish – Ra4

Can be high pressure hosed at high temperature - IP69K

Designed in accordance with EHEDG guidelines for hygienic design (EHEDG European Hygienic Engineering & Design Group)

Suitable for CIP and SIP cleaning

Can be mounted on steel structures



**Sense 3Z**

Universal 22mm fixing centres - suitable for food splash zones.



**Sense 3Z (Food)**

Universal 22mm fixing centres. Rear fixing - M4 tapped holes at rear of housing. Suitable for food contact zones.



**Sense 5Z**

Industry standard wide fitting - suitable for food splash zones. Front face actuation.



**Sense 7Z**

European industry standard fitting - suitable for food splash zones.



**Sense 9Z**

Compact slim fitting housing - suitable for food splash zones. Can be fitted to applications where space is restricted.



**Sense 9Z (Food)**

Compact slim fitting housing. Rear fixing - M4 tapped holes at rear of housing. Suitable for food contact zones.



**Sense 11Z**

M30 thread - suitable for some food contact zones.

# Sense 1 Coded non-contact safety switches

## Coded Magnetic Actuation

## Switching Tolerance up to 10mm



Compact yet robust fitting suitable for all small guard applications.

LED indication.

Hygienic screw covers ensure suitability for Food Processing washdown.

Cost effective interlock solution.

Wide sensing at 10mm.

High Specification polyester housing with backplate

Can be mounted unobtrusively in channels or behind doors - left or right cable exit

Up to: PLe ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

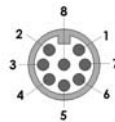
2NC 1NO circuits - High switching life - no moving parts

**Specified to 80C but designed to work up to 100C**  
**Will operate with most EN 954-1 Cat.4 Safety Relays**

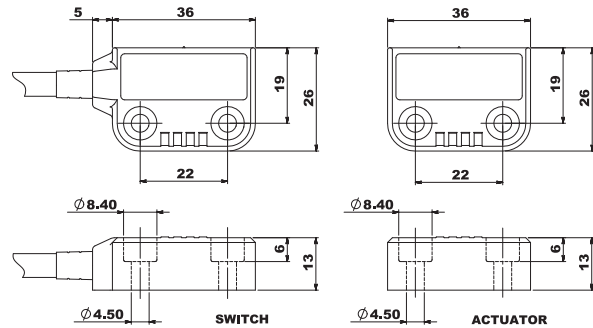


Left or Right Cable Exits

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	



Quick Connect M12 versions fitted with 250mm (10") cable



Sense 1	
2TLA050050R4108	Sense 1, 2m cable Rt. 2NC/1NO LED
2TLA050050R5108	Sense 1, 5m cable Rt. 2NC/1NO LED
2TLA050050R6108	Sense 1, 10m cable Rt. 2NC/1NO LED
2TLA050050R2108	Sense 1, QC cable Rt. 2NC/1NO LED
2TLA050050R4107	Sense 1, 2m cable Lt. 2NC/1NO LED
2TLA050050R5107	Sense 1, 5m cable Lt. 2NC/1NO LED
2TLA050050R6107	Sense 1, 10m cable Lt. 2NC/1NO LED
2TLA050050R2107	Sense 1, QC cable Lt. 2NC/1NO LED
2TLA050040R0205	Sense 1, Spare Actuator

Standards EN1088 IEC 947 5 3 EN 60204 1  
 ISO 13849-1 EN62061 EN 954-1 UL508

### Safety Classification and Reliability Data:

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load
EN 954-1	up to Category 4 with Safety Relay
ISO 13849-1	up to PLe depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTF	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 8mm Close
(Target to target)	Sar 12mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP 67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 3 Coded non-contact safety switches

**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**



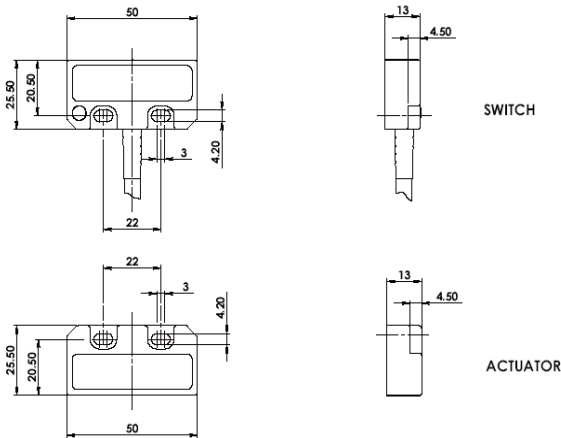
**Will operate with most Safety Relays**

**Specified to 80C but designed to work up to 100C**

Universal fitting - established 22mm fixing footprint suitable for most general applications.  
 Withstands environments where high humidity or hose down is required.  
 Durable polyester housing.  
 Wide 14mm sensing and high tolerance to misalignment.  
 Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1  
 2NC 1NO circuits - High switching life - no moving parts  
 Quick connect versions.



Quick Connect M12 versions fitted with 250mm (10") cable



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	
6	Green	Safety NC2 -ve	200mA Max. 24Vdc
7	Black	Safety NC1 +ve	
1	White	Safety NC1 -ve	200mA Max. 24Vdc
2	Red	Supply +24Vdc	
3	Blue	Supply 0Vdc	



Standards: ISO 13849-1 EN62061 EN 954-1 UL508  
 Safety Classification and Reliability Data:

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PLe depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	8 cycles per hour / 24 hours per day / 365 days
Safety Data - Annual Usage	PFHd 2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.d.c 0.2 A Max. Rating
Safety Channel 2 NC	24V.d.c 0.2 A Max. Rating
Safety Channel 3 NO	24V.d.c 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

Sense 3	
2TLA050052R4100	Sense 3, 2m cable, 2NC/1NO LED
2TLA050052R5100	Sense 3, 5m cable, 2NC/1NO LED
2TLA050052R6100	Sense 3, 10m cable, 2NC/1NO LED
2TLA050052R2100	Sense 3, QC cable, 2NC/1NO LED
2TLA050040R0206	Sense 3, Spare Actuator

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 3Z Coded non-contact safety switches

**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**



**Will operate with most Safety Relays**

**Specified to 105C, but designed to work up to 125C.**

Robust Stainless Steel 316 enclosure designed to survive the tough environments of Food and Pharmaceutical applications.

LED indication. Stainless Steel 316 Mirror polish finish (Ra4).

Survives high pressure hosing at high temperature.

High temperature specification 105C.

Wide 14mm sensing and high tolerance to misalignment.

Universal fitting - established 22mm fixing footprint suitable for most general applications.

Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

Quick connect versions.

Suitable for CIP SIP cleaning - Food Splash zones EHEDG guidelines

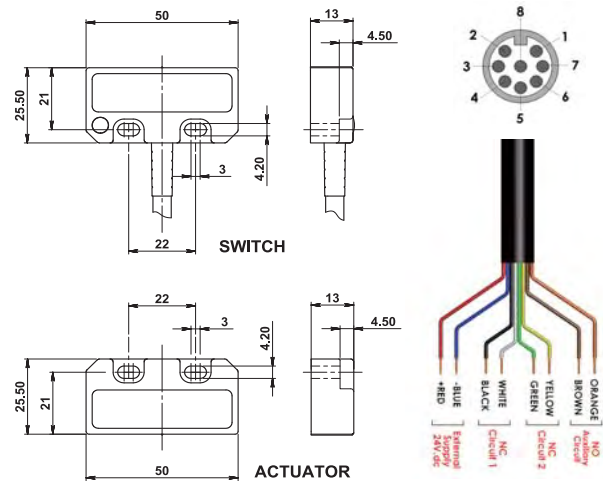
**Stainless Steel Housing**

Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)



Quick Connect M12 versions fitted with 250mm (10") cable

Standards	EN1088 IEC 947-5-3 EN 60204-1 ISO 13849-1 EN62061 EN 954-1 UL508
Safety Classification and Reliability Data:	
Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PLe depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1	NC 24V.dc 0.2 A Max. Rating
Safety Channel 2	NC 24V.dc 0.2 A Max. Rating
Safety Channel 3	NO 24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Delectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any



For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

Sense 3Z Standard	
2TLA050052R4120	Sense 3Z, SS 2m cable, 2NC/1NO LED
2TLA050052R5120	Sense 3Z, SS 5m cable, 2NC/1NO LED
2TLA050052R6120	Sense 3Z, SS 10m cable, 2NC/1NO LED
2TLA050052R2120	Sense 3Z, SS QC cable, 2NC/1NO LED
2TLA050040R0207	Sense 3Z, SS Spare Actuator

# Sense 3Z Coded non-contact safety switches

**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**



**Stainless Steel 316 housing**

**IP69K**

**Specified to 105C, but designed to work up to 125C.**

Specifically designed for Food Processing applications - Stainless Steel 316 Mirror polished finish (Ra4).

Suitable for CIP and SIP cleaning - mounting holes are at the rear - no food traps

Universal housing - 22mm fixing hole centre - 50mm wide body

Rear fixing 2 x M4 tapped holes

Can be high pressure hosed at high temperature - IP69K

Wide 14mm sensing high tolerance to misalignment.

LED indication

Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

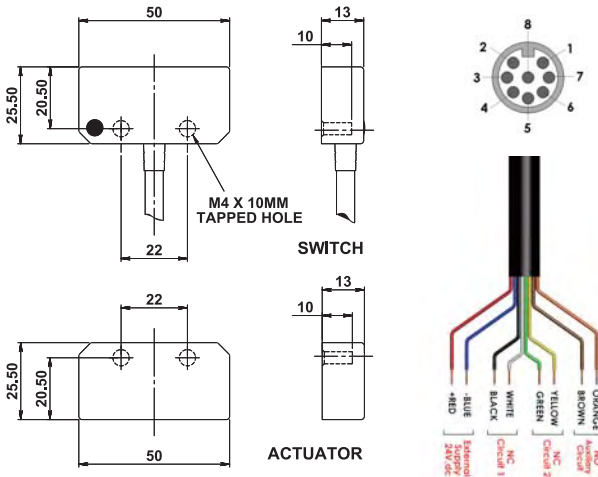
No Food Trap Housing - Rear Mounting Holes



Quick Connect M12 versions fitted with 250mm (10") cable

**Stainless Steel Housing**

Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

Safety Classification and Reliability Data:

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay up to PLe depending upon system architecture up to SIL3 depending upon system architecture
Safety Data - Annual Usage PFHd	8 cycles per hour / 24 hours per day / 365 days 2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life) MTTFd	47 years 470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V. ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance: (Target to target)	Sao 10mm Close Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

## Sense 3Z Food Industry

2TLA050052R4150	Sense 3Z, SS 2m cable, 2NC/1NO LED
2TLA050052R5150	Sense 3Z, SS 5m cable, 2NC/1NO LED
2TLA050052R6150	Sense 3Z, SS 10m cable, 2NC/1NO LED
2TLA050052R2150	Sense 3Z, SS QC cable, 2NC/1NO LED
2TLA050040R0208	Sense 3Z, SS Spare Actuator

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 5 Coded non-contact safety switches

**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**



## Will operate with most Safety Relays

Slim fitting suitable for all industry applications.

Wide 14mm sensing high tolerance to misalignment.

LED indication - no moving parts - survives shock and vibration

Up to: PLe ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

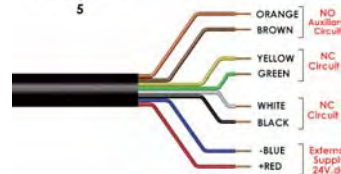
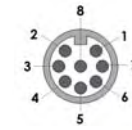
Quick connect versions.

**Specified to 80C.  
but designed to work up to 100C.  
Will operate with most Safety Relays**



Quick Connect M12 versions fitted with 250mm (10") cable

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

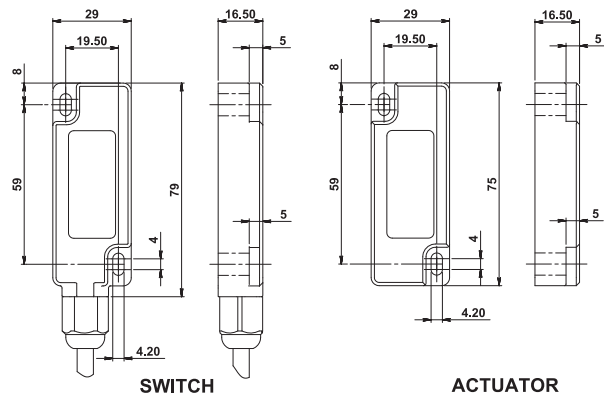


Sense 5	
2TLA050054R4100	Sense 5, 2m cable, 2NC/1NO LED
2TLA050054R5100	Sense 5, 5m cable, 2NC/1NO LED
2TLA050054R6100	Sense 5, 10m cable, 2NC/1NO LED
2TLA050054R2100	Sense 5, QC cable, 2NC/1NO LED
2TLA050040R0209	Sense 5, Spare Actuator

Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

**Safety Classification and Reliability Data:**

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay up to PLe depending upon system architecture up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP 67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any



For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 5Z Coded non-contact safety switches

**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**



**Will operate with most Safety Relays**

**Specified to 105C.  
but designed to work up to 125C.**

Specifically designed for Food Processing applications - Stainless Steel 316 Mirror polished (Ra4)

Robust 32mm wide housing - no moving parts - survives shock and vibration

Can be high pressure hosed at high temperature - IP69K

Wide 14mm sensing high tolerance to misalignment.

LED indication

Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

Suitable for CIP SIP cleaning - food Splash zones EHEDG guidelines

**Stainless Steel Housing**



Quick Connect M12 versions fitted with 250mm (10") cable

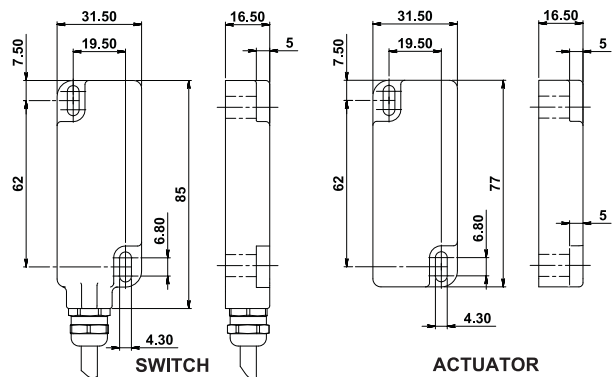
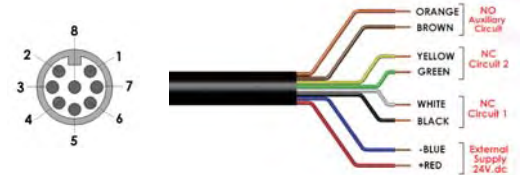
Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)

Sense 5Z	
2TLA050054R4120	Sense 5Z, SS 2m cable, 2NC/1NO LED
2TLA050054R5120	Sense 5Z, SS 5m cable, 2NC/1NO LED
2TLA050054R6120	Sense 5Z, SS 10m cable, 2NC/1NO LED
2TLA050054R2120	Sense 5Z, SS QC cable, 2NC/1NO LED
2TLA050040R0210	Sense 5Z, SS Spare Actuator

Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

**Safety Classification and Reliability Data:**

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load
EN 954-1	up to Category 4 with Safety Relay
ISO 13849-1	up to PLe depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Delectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any



For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

# Sense 7 Coded non-contact safety switches

## Coded Magnetic Actuation      Switching Tolerance up to 14mm

Popular European fitting suitable for all industry applications.  
 Can be high pressure hosed at high temperature - IP69K  
 Wide 14mm sensing - high tolerance to misalignment  
 LED indication  
 Up to: PLe ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1  
 2NC 1NO circuits - High switching life - no moving parts  
 Quick connect versions.

Sense 7	
2TLA050056R4100	Sense 7, 2m cable, 2NC/1NO LED
2TLA050056R5100	Sense 7, 5m cable, 2NC/1NO LED
2TLA050056R6100	Sense 7, 10m cable, 2NC/1NO LED
2TLA050056R2100	Sense 7, QC cable, 2NC/1NO LED
2TLA050040R0211	Sense 7, Spare Actuator

Standards	EN1088 IEC 947-5-3 EN 60204-1 ISO 13849-1 EN62061 EN 954-1 UL508
Safety Classification and Reliability Data:	
Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PLe depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	8 cycles per hour / 24 hours per day / 365 days
Safety Data - Annual Usage	
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1	NC 24V.dc 0.2 A Max. Rating
Safety Channel 2	NC 24V.dc 0.2 A Max. Rating
Safety Channel 3	NO 24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

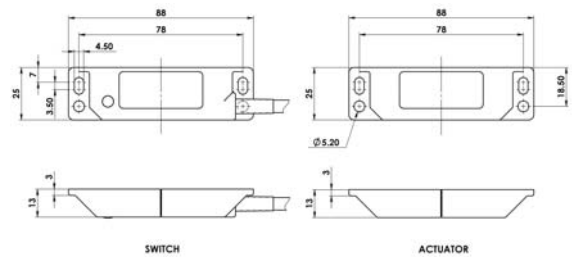
For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present



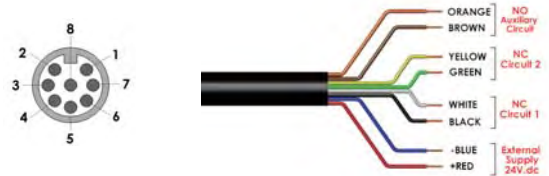
**Specified to 80C , but designed to work up to 100C**  
**Will operate with most EN 954-1 Cat.4 Safety Relays**



Quick Connect M12 versions fitted with 250mm (10") cable



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO or NC	200mA Max. 24Vdc
5	Brown	Auxiliary NO or NC	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	



# Sense 7Z Coded non-contact safety switches



## Coded Magnetic Actuation

## Switching Tolerance up to 14mm

Specifically designed for Food Processing applications - Stainless Steel 316 Mirror polished finish (Ra4).

Suitable for CIP cleaning - Food Splash zones EHEDG guidelines

Wide 14mm sensing high tolerance to misalignment.

LED indication

Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

Quick connect versions.

**Specified to 105C,  
but designed to work up to 125C.  
Will operate with most EN 954-1  
Cat.4 Safety Relays**

## Stainless Steel Housing



Quick Connect M12 versions fitted with 250mm (10") cable

Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)

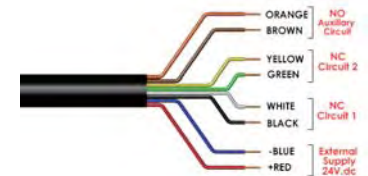
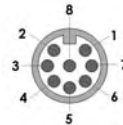
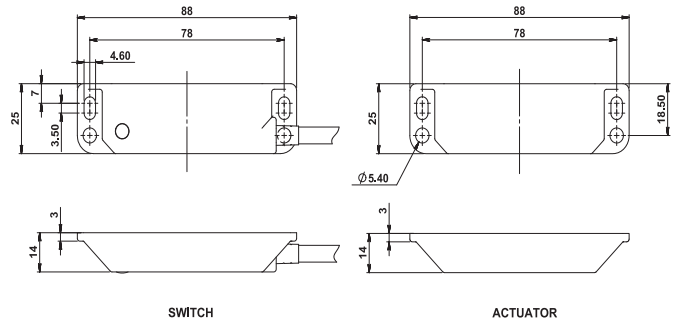
Sense 7Z	
2TLA050056R4120	Sense 7Z, SS 2m cable, 2NC/1NO LED
2TLA050056R5120	Sense 7Z, SS 5m cable, 2NC/1NO LED
2TLA050056R6120	Sense 7Z, SS 10m cable, 2NC/1NO LED
2TLA050056R2120	Sense 7Z, SS QC cable, 2NC/1NO LED
2TLA050040R0212	Sense 7Z, SS Spare Actuator

Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

### Safety Classification and Reliability Data:

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay up to PLE depending upon system architecture up to SIL3 depending upon system architecture
Safety Data - Annual Usage PFHd	8 cycles per hour / 24 hours per day / 365 days 2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life) MTTFd	47 years 470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Delectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance: (Target to target)	Sao 10mm Close Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

# Sense 9 Coded non-contact safety switches

**Coded Magnetic Actuation**      **Switching Tolerance up to 14mm**



Slim fitting suitable for all industry applications.

Easy to install within narrow frame structures.

Durable polyester housing.

Wide 14mm sensing and high tolerance to misalignment.

LED indication

Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

Quick connect versions.

**Specified to 80C, but designed to work up to 100C.**  
**Will operate with most Safety Relays**

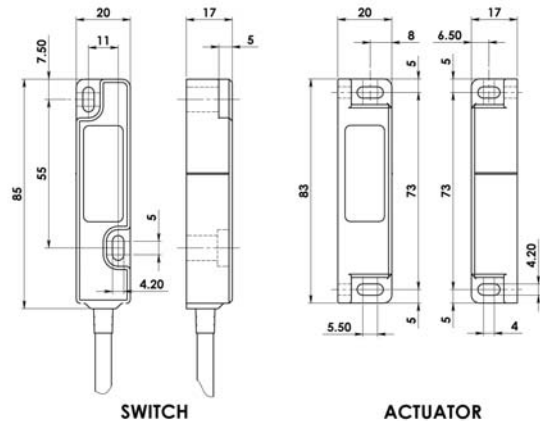
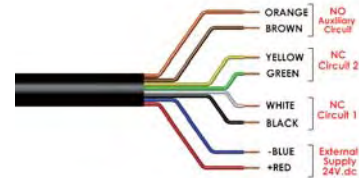
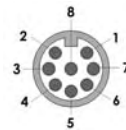


Quick Connect M12 versions fitted with 250mm (10") cable

## Sense 9

2TLA050058R4100	Sense 9, 2m cable, 2NC/1NO LED
2TLA050058R5100	Sense 9, 5m cable, 2NC/1NO LED
2TLA050058R6100	Sense 9, 10m cable, 2NC/1NO LED
2TLA050058R2100	Sense 9, QC cable, 2NC/1NO LED
2TLA050040R0213	Sense 9, Spare Actuator

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	



Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

### Safety Classification and Reliability Data:

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PLe depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	8 cycles per hour / 24 hours per day / 365 days
Safety Data - Annual Usage	PFHd 2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V,dc 0.2 A Max. Rating
Safety Channel 2 NC	24V,dc 0.2 A Max. Rating
Safety Channel 3 NO	24V,dc 0.2 A Max. Rating
Minimum switched current	10V, dc 1mA
Dielectric withstand	250V,ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 9Z Coded non-contact safety switches



**Coded Magnetic Actuation**

**Switching Tolerance up to 14mm**

**Will operate with most Safety Relays**

**IP69K**

**Specified to 105C.  
but designed to work up to 125C.**

Specifically designed for Food Processing applications - Stainless Steel 316 Mirror polished finish (Ra4).

Suitable for CIP cleaning

Industry standard slim 20mm wide housing - can be fitted in narrow channels

Can be high pressure hosed at high temperature - IP69K

Wide 14mm sensing high tolerance to misalignment.

LED indication

Up to: PLe ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1

2NC 1NO circuits - High switching life - no moving parts

Suitable for CIP SIP cleaning - Food Splash zones EHEDG guidelines

**Stainless Steel Housing**



Quick Connect M12 versions fitted with 250mm (10") cable

Tested IP69K (high pressure hose) with detergent at 80C. and 100psi)

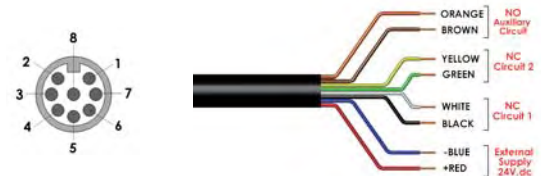
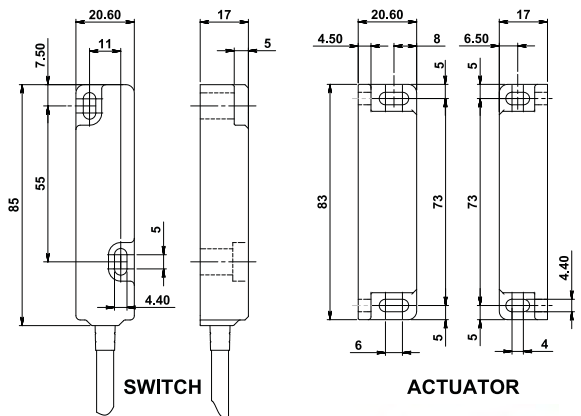
Sense 9Z Standard	
2TLA050058R4120	Sense 9Z, SS 2m cable, 2NC/1NO LED
2TLA050058R5120	Sense 9Z, SS 5m cable, 2NC/1NO LED
2TLA050058R6120	Sense 9Z, SS 10m cable, 2NC/1NO LED
2TLA050058R2120	Sense 9Z, SS QC cable, 2NC/1NO LED
2TLA050040R0214	Sense 9Z, SS Spare Actuator

Standards EN1088 IEC 947-5-3 EN 60204-1  
ISO 13849-1 EN62061 EN 954-1 UL508

**Safety Classification and Reliability Data:**

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load
EN 954-1	up to Category 4 with Safety Relay
ISO 13849-1	up to PLe depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-6</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz, 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

# Sense 9Z Coded non-contact safety switches

**Coded Magnetic Actuation      Switching Tolerance up to 14mm**



**Specified to 105C, but designed to work up to 125C.  
Will operate with most Safety Relays**

**Stainless Steel 316 housing      IP69K**

- Specifically designed for Food Processing applications - Stainless Steel 316 Mirror polished finish (Ra4).
- Suitable for CIP SIP cleaning - mounting holes are at the rear - no food traps
- Suitable for Food contact zones - EHEDG guidelines
- Slim fixing - can be fitted in narrow channels
- Can be high pressure hosed at high temperature - IP69K
- Wide 14mm sensing high tolerance to misalignment.
- LED indication
- Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1
- 2NC 1NO circuits - High switching life - no moving parts

**Stainless Steel Housing**

**No Food Trap Housing –  
Rear Mounting Holes**

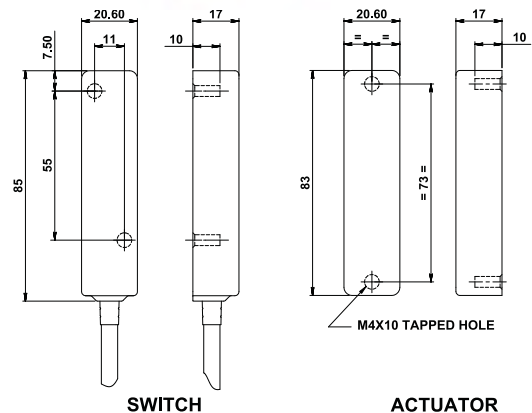


Quick Connect M12 versions fitted with 250mm (10") cable

Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)

Sense 9Z Food Industry	
2TLA050058R4150	Sense 9Z, SS 2m cable, 2NC/1NO LED
2TLA050058R5150	Sense 9Z, SS 5m cable, 2NC/1NO LED
2TLA050058R6150	Sense 9Z, SS 10m cable, 2NC/1NO LED
2TLA050058R2150	Sense 9Z, SS QC cable, 2NC/1NO LED

Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	



Standards	EN1088 IEC 947-5-3 EN 60204-1 ISO 13849-1 EN62061 EN 954-1 UL508
Safety Classification and Reliability Data:	
Mechanical Reliability B10d	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PLE depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	8 cycles per hour / 24 hours per day / 365 days
Safety Data - Annual Usage PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life) MTTFd	47 years / 470 years
Safety Channel 1 NC	Voltage free : 250V.ac 1.0 A Max. Rating
Safety Channel 2 NC	Voltage free : 250V.ac 1.0 A Max. Rating
Safety Channel 3 NO	Voltage free : 24V.dc 0.2 A Max. Rating
Fuse	Internal 1.0 A (F) External 0.8A (F) (User)
Contact release time	<2ms
Initial contact resistance	<500 milliohm
Minimum switched current	10V, dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance: (Target to target)	Sao 10mm Close Sar 22mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 11 Coded non-contact safety switches

## Coded Magnetic Actuation

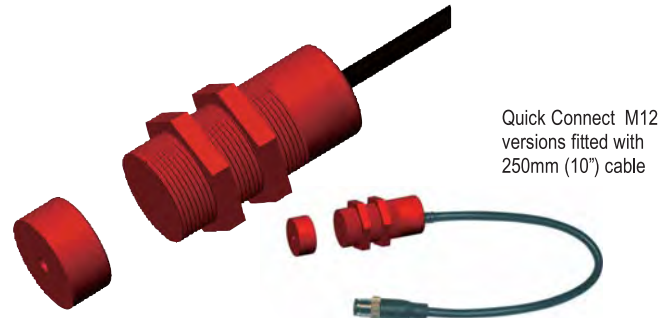
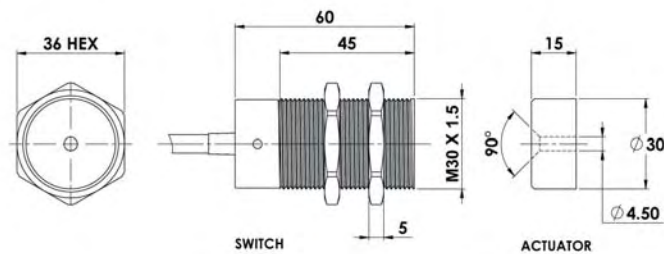
Switching Tolerance up to 10mm



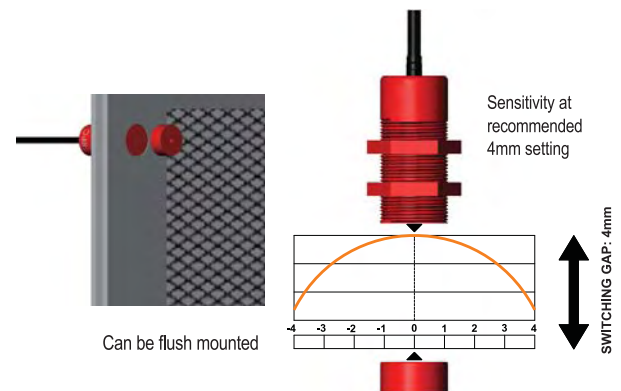
- Cylindrical fitting suitable for all industry applications.
- Easy to install - M30 threaded body - easy to set
- Wide 10mm sensing
- Robust, suitable for harsh environments
- Can be flush mounted
- LED indication
- Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1
- 2NC 1NO circuits - High switching life - no moving parts
- Quick connect versions.

**Specified to 80C, but designed to work up to 100C.**  
**Will operate with most Safety Relays**

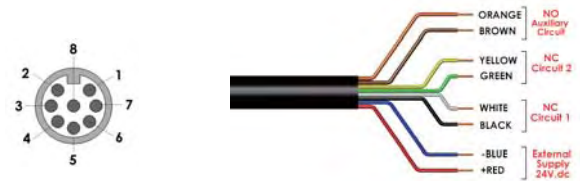
Sense 11	
2TLA050060R4100	Sense 11, 2m cable, 2NC/1NO LED
2TLA050060R5100	Sense 11, 5m cable, 2NC/1NO LED
2TLA050060R6100	Sense 11, 10m cable, 2NC/1NO LED
2TLA050060R2100	Sense 11, QC cable, 2NC/1NO LED
2TLA050040R0215	Sense 11, Spare Actuator



Quick Connect M12 versions fitted with 250mm (10") cable



Standards	EN1088 IEC 947-5-3 EN 60204-1 ISO 13849-1 EN62061 EN 954-1 UL508
Safety Classification and Reliability Data:	
Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load up to Category 4 with Safety Relay
EN 954-1	up to PL e depending upon system architecture
ISO 13849-1	up to SIL3 depending upon system architecture
EN 62061	
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Dielectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance: (Target to target)	Sao 8mm Close Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	UL approved polyester
Temperature Range	-25 +80C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Position	Any



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present

# Sense 11Z Coded non-contact safety switches

**Coded Magnetic Actuation**      **Switching Tolerance up to 10mm**



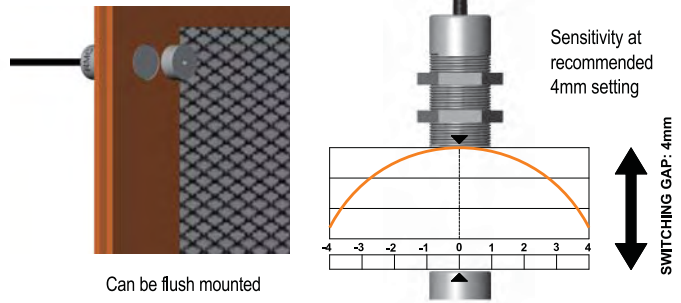
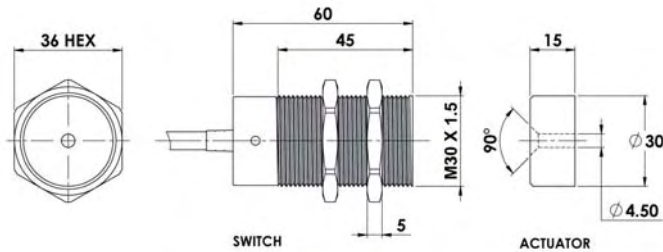
- Cylindrical fitting suitable for all industry applications.
- Easy to install - M30 threaded body - easy to set
- Wide 10mm sensing - low hysteresis - no moving parts
- Suitable to be harsh environments of Food processing and packaging
- Can be flush mounted - solid stainless steel 316 housing
- LED indication Stainless Steel 316
- Up to: Ple ISO 13849-1 SIL 3 EN 62061 Cat 4 EN 954-1
- 2NC 1NO circuits
- Quick connect versions.

**Specified to 105C, but designed to work up to 125C.**  
**Will operate with most Safety Relays**

## Stainless Steel Housing



Tested IP69K (high pressure hosing with detergent at 80C. and 100psi)



Can be flush mounted

Sensitivity at recommended 4mm setting

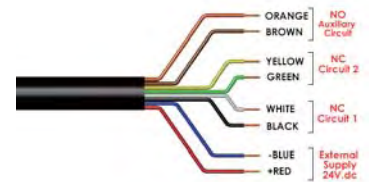
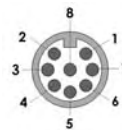
SWITCHING GAP: 4mm

Sense 11Z	
2TLA050060R4120	Sense 11Z, SS 2m cable, 2NC/1NO LED
2TLA050060R5120	Sense 11Z, SS 5m cable, 2NC/1NO LED
2TLA050060R6120	Sense 11Z, SS 10m cable, 2NC/1NO LED
2TLA050060R2120	Sense 11Z, SS QC cable, 2NC/1NO LED
2TLA050040R0216	Sense 11Z, SS Spare Actuator

Standards EN1088 IEC 947-5-3 EN 60204-1  
 ISO 13849-1 EN62061 EN 954-1 UL508

**Safety Classification and Reliability Data:**

Switching Reliability	3.3 x 10 <sup>6</sup> operations at 100mA load
EN 954-1	up to Category 4 with Safety Relay
ISO 13849-1	up to PLE depending upon system architecture
EN 62061	up to SIL3 depending upon system architecture
Safety Data - Annual Usage	8 cycles per hour / 24 hours per day / 365 days
PFHd	2.52 x 10 <sup>-8</sup>
Proof Test Interval (Life)	47 years
MTTFd	470 years
Safety Channel 1 NC	24V.dc 0.2 A Max. Rating
Safety Channel 2 NC	24V.dc 0.2 A Max. Rating
Safety Channel 3 NO	24V.dc 0.2 A Max. Rating
Minimum switched current	10V. dc 1mA
Delectric withstand	250V.ac
Insulation Resistance	100 Mohms
Recommended setting gap	5mm
Switching Distance:	Sao 10mm Close
(Target to target)	Sar 20mm Open
Tolerance to misalignment	5mm in any direction from 5mm setting gap
Switching frequency	1.0 Hz maximum
Approach speed	200mm/m. to 1000mm/s.
Body Material	Stainless Steel 316 Mirror polished finish (Ra4)
Temperature Range	-25 +105C.
Enclosure Protection	IP69K IP67
Shock Resistance	IEC 68-2-27 11ms 30g
Vibration Resistance	IEC 68-2-6 10-55 Hz. 1mm
Cable Type	PVC 6 or 8 core 6mm O.D.
Mounting Bolts	2 x M4 Tightening torque 1.0 Nm
Mounting Position	Any



Quick Connect (QC) M12 8 way Male Plug (Pin view from switch)	Flying Lead Colours	Circuit (Actuator Present)	Output Types Solid State
8	Orange	Auxiliary NO	200mA Max. 24Vdc
5	Brown	Auxiliary NO	
4	Yellow	Safety NC2 +ve	200mA Max. 24Vdc
6	Green	Safety NC2 -ve	
7	Black	Safety NC1 +ve	200mA Max. 24Vdc
1	White	Safety NC1 -ve	
2	Red	Supply +24Vdc	Supply 24Vdc +/- 10%
3	Blue	Supply 0Vdc	

For all ABB Jokab Safety switches the NC circuits are closed when the guard is closed and the actuator present