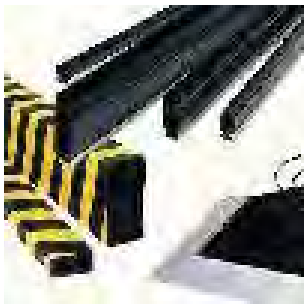
New Product Range

Jokab Safety



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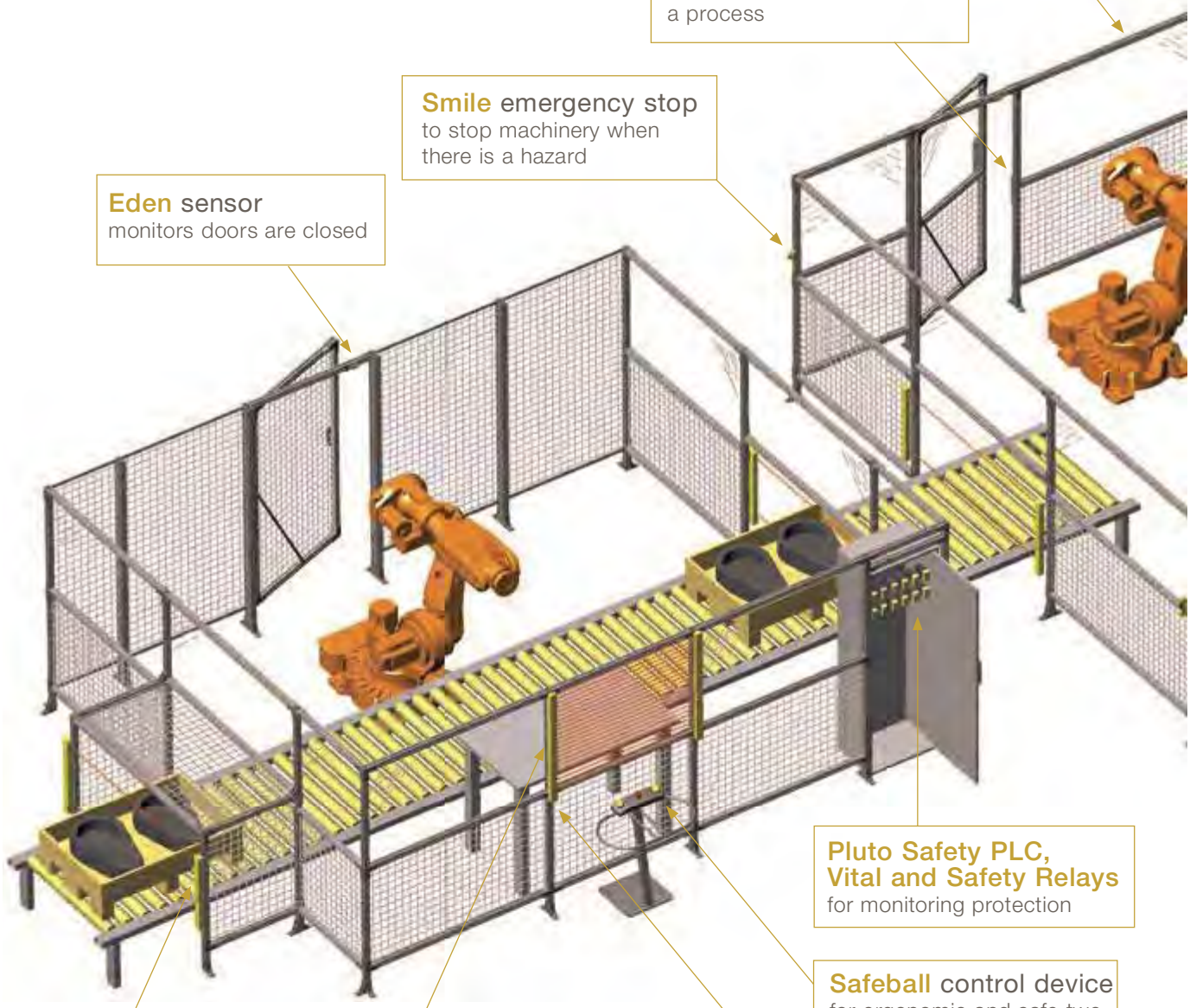
Jokab Safety

Full range of products and technical information place this part number in a search engine and download

Safety Handbook
2TLC172001C0201

Jokab Safety

Production-friendly safety systems



Quick-Guard fencing system
prevents unauthorised access and offers noise reduction

Magne magnetic lock
to keep doors closed during a process

Smile emergency stop
to stop machinery when there is a hazard

Eden sensor
monitors doors are closed

Pluto Safety PLC, Vital and Safety Relays
for monitoring protection

Safeball control device
for ergonomic and safe two handed control

Focus light beam
to provide protection when entering an area

Focus light curtain
with finger detection

Smart stopping timer
to assist in determining protection locations

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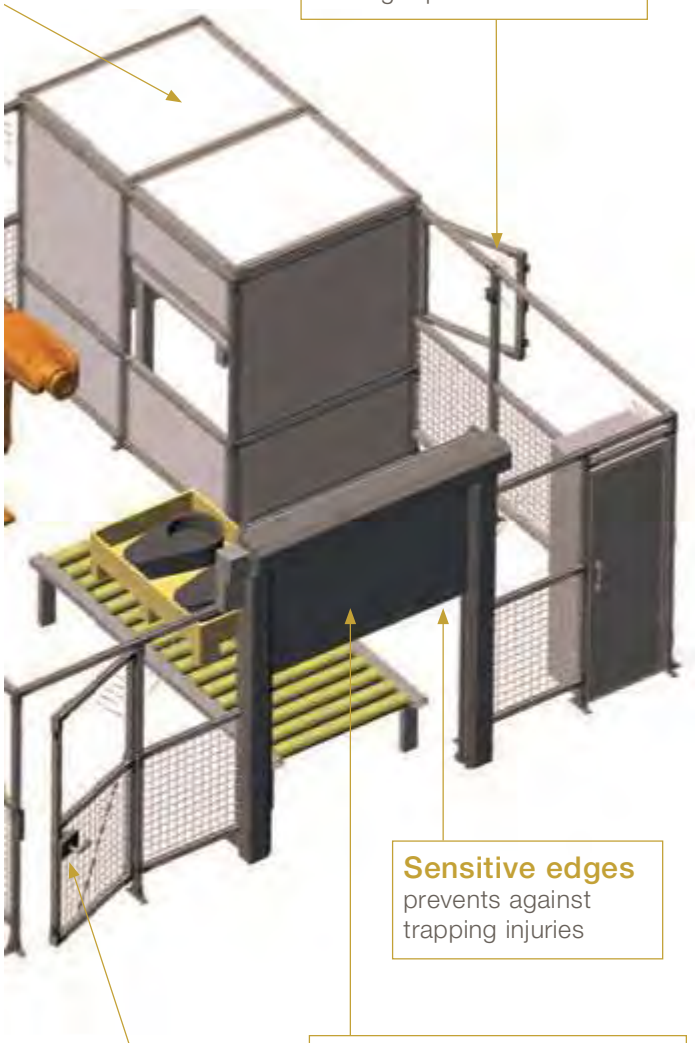
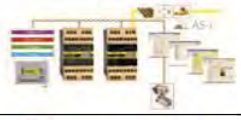


Product Groups

Training & Advice
Practical application of standards and regulations, along with CE-labelling.



Pluto Safety PLC
A unique All-Master safety PLC for dynamic and static safety circuits.

Vital Safety System
Dynamic safety circuit for several sensors in accordance with the highest safety category.

Tina Adapter Units
Transformation of static signals to dynamic safety signals, etc.

Safety Relays
The market's most fleixible safety relays for different protection purposes and categories.

Stopping Time & Machinery Diagnosis
Used for stopping time measurement, annual maintenance and for trouble shooting machinery.

Light Curtain/Light Beam/Scanner
Complete range of light beams, light curtains and scanners.

Sensors/Switches/Locks
Dynamic non-contact sensors, key switches and solenoid switches.

Control Devices
Ergonomic three-position control units, two-handed control units and foot pedals.

Emergency Stop Devices
Emergency stop devices for dynamic and static safety circuits.

Contact Strips/Bumpers/Safety Mats
Sensitive edges, bumpers and safety mats.

Fencing Systems/SafeCAD/Roller Doors
A stable and fl exible fencing system that is easy to install.

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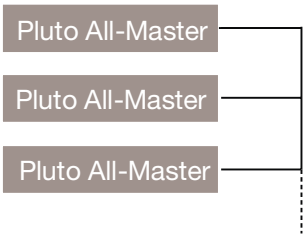
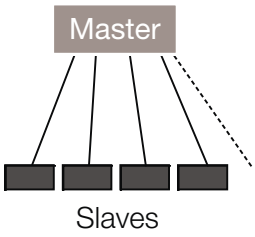
Pluto safety PLC‘s

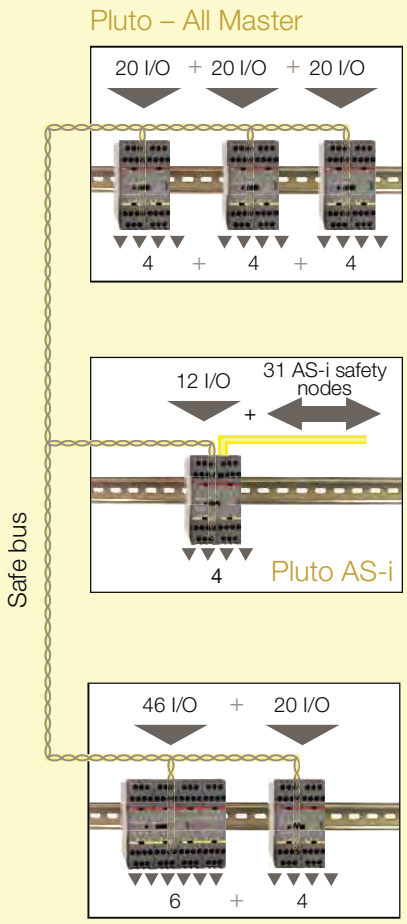
for simplifying design and changes to safety systems

Our solution with All-Master



Traditional safety PLC





Pluto is an ”All-Master” safety PLC concept, that simplifies the design of safety systems and achieves the highest safety level PL e according to EN ISO 13849-1 and SIL 3 according to EN 62061 and EN 61508. The key difference between Pluto and conventional safety PLC´s is that there is no "Master-Slave" relationship between the control units connected to the safety bus. Each Pluto is a 'Master' unit and can see the other Plutos' inputs and outputs, and can thereby make decisions about its own safety environment.

This concept enables simple communication, programming and changes to the safety system. With the use of a 'Gateway' device, a Pluto can communicate with other bus systems and thereby form part of a larger network. Gateway units are available for several different bus systems, such as Profibus, CanOpen, DeviceNet, Profinet, Ethernet/IP and Modbus TCP. With a Pluto AS-i, both safety slaves and standard slaves can be handled.
Pluto offers an economic solution for both single machines and for major machine systems.

Pluto safety PLC‘s
to supervise safety devices


Light beams


Light grids/curtains


3-position devices


Sensors/ switches


Two-hand controls


Emergency stops


Strips

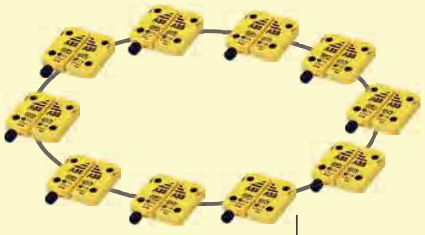

Mats

Most safety devices on the market can be connected directly to Pluto units. By using dynamic signals with sensors from ABB Jokab Safety only one input is needed to achieve the highest level of safety, compared to two inputs for other manufacturers' PLCs. It is also possible to connect up to 10 sensors in series to a single input on Pluto and still achieve the highest level of safety.

For example non-contact Eden sensors, Spot light beams and Tina emergency stop buttons can all be connected in series to a single Pluto input. Even mechanical switches can be connected to the 'dynamic' safety circuit using ABB Jokab Safety's various Tina adapters. Pluto also has IO connections that can be used as both inputs and outputs.

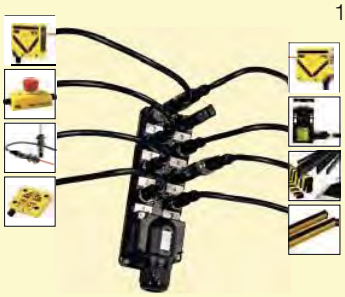
to save on inputs!

Dynamic signals
1–10 doors with one Eden per door
PL e



One input

Dynamic signals
1-10 sensors
PL e



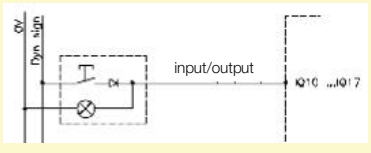
One input

Pluto
has inputs for static and dynamic sensors. Several sensors can be connected to one dynamic input in accordance with PL e.

One connection

Two inputs

IO connections
Pluto has IO connections that can be used in three ways:
- input
- output
- both input and output at the same time (e.g. for a reset button with lamp indication)



Static inputs (mechanical switches)
2 for each door = PL e

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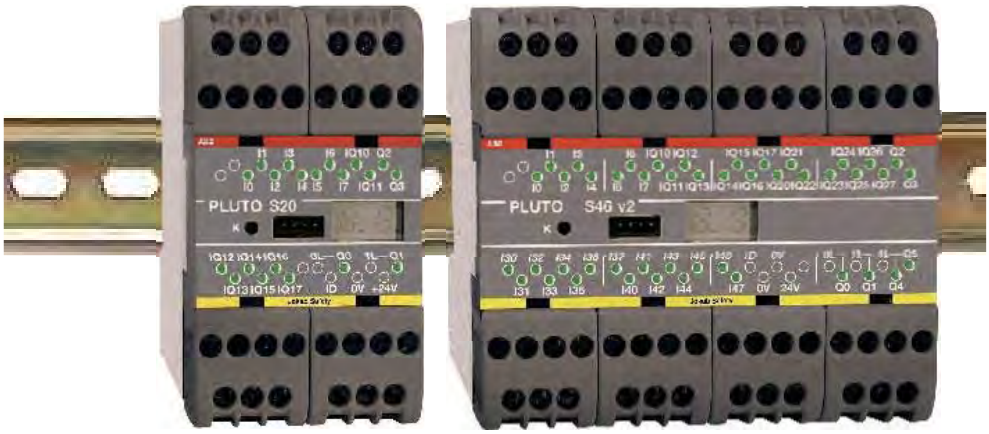
Pluto safety PLC‘s



Technical data - general

Colour:	Grey
Operating voltage:	24V DC ±15%
Electrical insulation:	Category II in accordance with IEC 61010-1
Safety level	
EN 954-1	Cat. 4
EN ISO 13849-1	PL e/cat. 4
EN 61508	SIL 3
EN 62061	SIL 3
PFH_d	
Relay output	$2{,}00\times10^{-9}$
Transistor output	$1{,}50\times10^{-9}$
Pluto safety bus	
Max number of Pluto units on the databus:	32
Databus type:	CAN
Databus speeds:	100, 125, 200, 250, 400, 500, 800, 1000 kb/s
Databus cable length:	Up to 600 m, 150 m at 400 kb/s

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Selection

Description	Part No.	Product Hierarchy 4700001 Order Code	Price
Pluto S20 20- I/O Non-Pluto safety bus	20-070-05	2TLA020070R0500	
Pluto B46-6 46- I/O with Pluto safety bus	20-070-17	2TLA020070R1700	
Pluto S46-6 46- I/O Non-Pluto safety bus	20-070-18	2TLA020070R1800	
Pluto A20 20- I/O Current monitoring	20-070-03	2TLA020070R0300	
Pluto B16 16- I/O Non-failsafe outputs	20-070-07	2TLA020070R0700	
Pluto B20 20- I/O with Pluto safety bus	20-070-06	2TLA020070R0600	
Pluto AS-i v2	20-070-11	2TLA020070R1100	
IDFIX-R identifier pre-programmed	20-070-20	2TLA020070R2000	
IDFIX-RW identifier programmable	20-070-21	2TLA020070R2100	
Pluto USB cable for programing	20-070-58	2TLA020070R5800	
GATE-P2 Pluto Gateway PROFIBUS-DP	20-070-70	2TLA020071R8000	
GATE-C2 Pluto Gateway CANopen	20-070-71	2TLA020071R8100	
GATE-D2 Pluto Gateway DeviceNet	20-070-72	2TLA020071R8200	
GATE-E2 Pluto Gateway Ethernet	20-070-73	2TLA020071R8300	

Jokab Safety

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Safety Handbook
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Vital - safety controller

Control of an entire safety system based on the dynamic safety circuit

Vital is based on a single channel safety concept where multiple safety sensors can be connected in series and monitored with a single safety controller. A dynamic signal is sent from Vital through all connected sensors, and then returned to Vital which then evaluates the received signal. As each safety sensor inverts the signal, it is possible to detect short circuits or faults in any of the sensors. Vital 2 and Vital 3 are designed for use with ABB Jokab Eden sensors, Tina components and Spot light grids or similar products. Vital 2 and 3 are both safety controllers with two safe input functions and two output groups, the only difference between the two models being in the input configuration.

Technical data - general data for Vital 1

TÜV Nord – Vital 1
TÜV Rheinland – Vital 2 and 3

Level of safety	
EN ISO 13849-1	PL e, category 4
EN 62061	SIL 3
IEC/EN 61508-1…7	SIL 3
EN 954-1	Category 4
PFHd	1,01×10-8
Power supply	
Vital, A1-A2	24 VDC ±15%
From Vital to sensors/units, B1-B2	24 VDC
Dynamic safety circuit	
T 1	Output signal
R 1	Input signal
Reset input X1	
Supply for reset input	+24VDC
Reset current	30 mA max. (inrush current 300 mA during contact closure)
Minimum contact closure time for reset	80 ms

Connection of S1
Even numbers of sensors (Eden + Spot T/R + Tina) require a connection between B1 and S1. S1 is not connected for odd numbers of sensors. Odd number, no connection between B1 and S1.

Number of sensors	
Max. number of Eden/Tina to Vital 1	30
Total max. cable length to Eden/Tina	1000 m
Max. number of Spot T/R to Vital	6 pairs
Total max. cable length to Spot T/R	600 m
Relay outputs	
NO	2
Max switching capacity, resistive load	6A/250 VAC/1500 VA/150W
Minimum load	10 mA/10V
Contact material	AgCdO
Mechanical life	>10^7 operations
External fuse (EN 60947-5-1)	6.3A or 4A slow

7

Selection

Type	Part No	Product Hierarchy 4700002 Order Code	Price
Vital 2	20-070-43	2TLA020070R4300	
Vital 3	20-070-44	2TLA020070R4400	

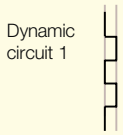
Vital - safety controller

Features

- Easy installation
- Flexible
- Cost effective
- A wide range of safety sensors can be connected into the circuit
- Several safe outputs
- Information output
- Outputs with time delay (Vital 2 and 3)
- Display for troubleshooting (Vital 2 and 3)

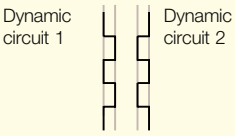
Vital 1 Safety controller

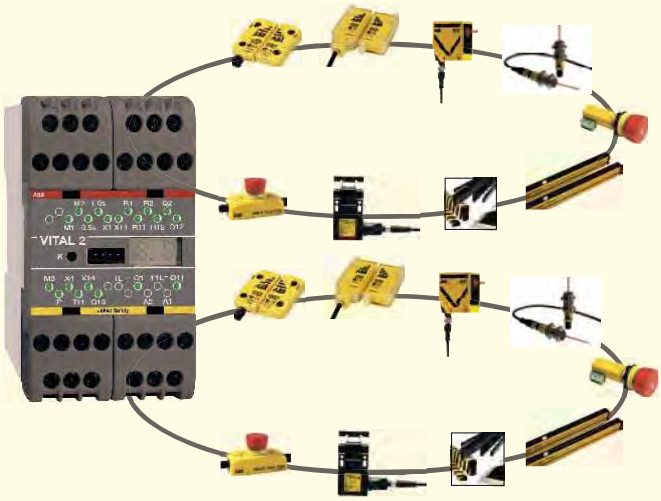
- Up to 30 sensors can be connected to the same dynamic safety circuit



Vital 2 Safety controller

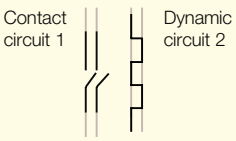
- Two safety circuits are monitored by one module
- Simple system with extensive functionality
- Up to 10 sensors can be connected to each dynamic safety circuit
- Output group 2 can be set for time delay
- Three different modes of operation

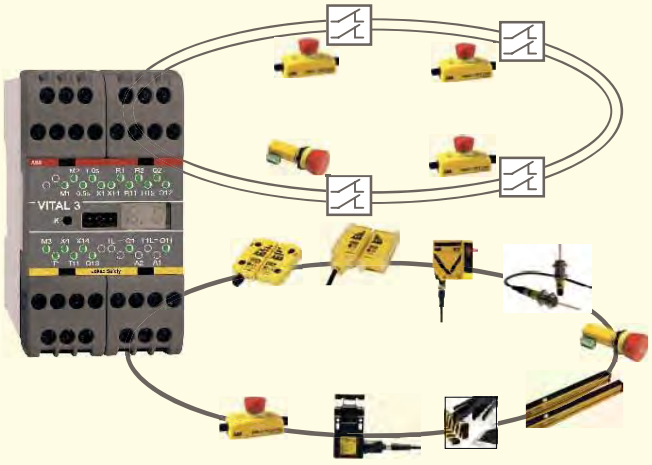




Vital 3 Safety controller

- Two safety circuits are monitored by one module
- Devices with two-channel, opening contacts can be connected to one circuit
- Simple system with extensive functionality
- Output group 2 can be set for time delay
- Three different modes of operation





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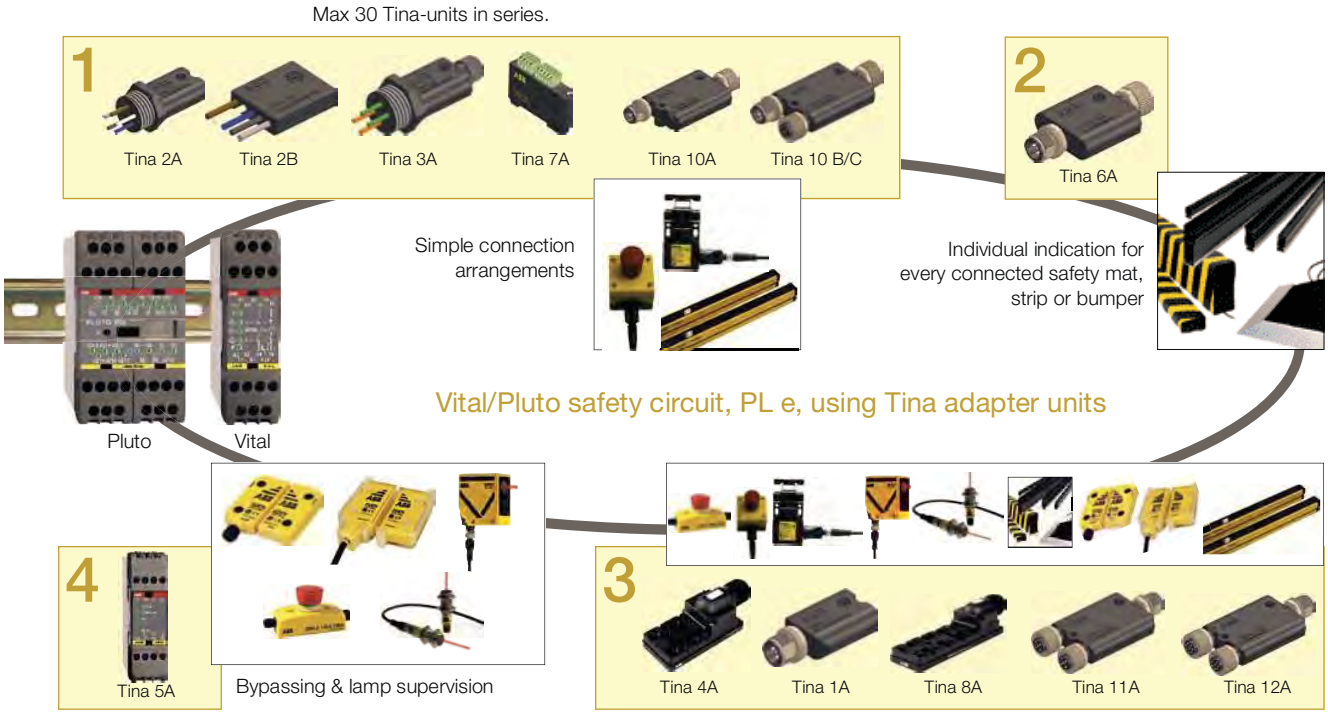
Tina - adapter units

Application - adaption of many different types of safety devices to the dynamic system



Why you should choose Tina?

- Safety circuit,PL e, EN ISO 13849-1
- Individual status indication of every connected unit in the safety circuit
- Supervision of lamp indicating bypassing of safety device
- Quick release M12 connector

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Tina - adapter units

Tina is available in several verions

Tina is available in several versions depending on the type of safety component that is connected to the Vital or Pluto circuit. Also available is a bypassing unit, three connector blocks with 2, 4 or 8 M12 connectors, and a blind plug for un-used connections. As an accessory there is a Y-connector for series or parallel connection and even for connection of light beams with separate transmitter and receiver. Tina units are also included in emergency stop models Smile Tina and Tina Inca. This is to adapt ABB Jokab Safety's products to dynamic safety circuits.

All Tina-units are designed to decode the dynamic signal in the safety circuit of Vital/Pluto.

1 Tina 2A/B, Tina 3A and Tina 7A

are used to connect safety components with mechanical contacts, such as emergency stops, switches and light curtains/light beams with relay outputs.

Tina 10A/B/C

units are used for connection of Focus light beams/curtains to Vital or Pluto. Tina 10B has an extra M12 connector that enables reset, a reset lamp and switching of the Focus supply voltage. The Tina 10C has an additional M12 connector that permits a Focus transmitter to receive power.

2 Tina 6A

is used to connect door sensitive edges and safety mats.

3 Tina 4A, Tina 8A, Tina 11A and Tina 12A

are used as terminal blocks and simplify connection to a Vital safety circuit.

4 Tina 5A

is used to bypass the safety sensors in Vital security loop.

7

Tina adapters

Description	Group	Part No	Product Hierarchy 4700002 Order Code	Price
Tina 1A plug for Tina 4/8	3	20-054-00	2TLA020054R0000	
Tina 2A adapter unit	1	20-054-01	2TLA020054R0100	
Tina 2B w cable to emergency	1	20-054-11	2TLA020054R1100	
Tina 3A adapter unit	1	20-054-02	2TLA020054R0200	
Tina 4A connection block	3	20-054-03	2TLA020054R0300	
Tina 5A bypass unit	4	20-054-04	2TLA020054R0400	
Tina 8A connection block w M12	3	20-054-05	2TLA020054R0500	
Tina 6A adapter unit	2	20-054-06	2TLA020054R0600	
Tina 7A adapter unit	1	20-054-07	2TLA020054R0700	
Tina 10A	1	20-054-12	2TLA020054R1200	
Tina 10B	1	20-054-13	2TLA020054R1300	
Tina 10C	1	20-054-16	2TLA020054R1600	
Tina 11A	3	20-054-17	2TLA020054R1700	
Tina 12A	3	20-054-18	2TLA020054R1800	

Safety relays

Why should you use safety relays?

to meet existing safety standards

A fault in the control circuit logic, or failure of or damage to the control circuit must not lead to dangerous situations. This is the requirement in the EU´s Machinery Directive 98/37/EC under the heading 1.2.7. " Failure of the control circuit". The directive implies that no person should be put at risk if for example, a relay sticks or if a transistor or two electrical conductors short-circuit.

A safety relay will fulfill these requirements. A safety relay has, for example, inputs that are checked for short-circuits and dual redundant circuits that are checked at each operation. This can be compared to the dual brake circuits in a car. If one of the circuits is faulty the other will stop the car. In a safety relay there is an additional function which only allows a machine to start if both circuits are ok.

The standard for safety related parts of the control system describes various safety categories depending on the level of risk and application. One single universal relay with selectable safety categories solves this.

to supervise safety devices

Light beams

Light grids/curtains

3-position devices

Sensors/ switches

Two-hand controls

Emergency stops

Strips

Mats

for safe stops and reliable restarts

Dual stop signals when the gate is opened.

Entering or putting a hand or limb into a hazardous area must cause all machinery that can cause personal injury to stop safely. Many serious accidents occur when machinery is believed to have stopped but is in fact only pausing in its program sequence. The safety relay monitors the gate interlock switch and cables and gives dual stop signals.

Supervised reset when there can be a person within the risk area.

To make sure that nobody is within the restricted area when activating the reset button. A supervised reset button must be pressed and released before a reset can occur. Many serious accidents have been caused by an unintentional and unsupervised reset.

Timed reset when you cannot see the entire risk area.

Sometimes a double reset function is necessary to make sure that no one is left behind in the risk area. First, after ensuring no other person is inside the hazardous area, the pre-reset button must be activated, followed by the reset button outside the risk area within an acceptable time period e.g 10 seconds. A safety timer and a safety relay can provide this function.

Automatic reset for small hatches.

Where body entry is not possible through a hatch, the safety circuit can be automatically reset. The safety relays are reset immediately when the hatch interlock switch contacts are closed.

Safety relays

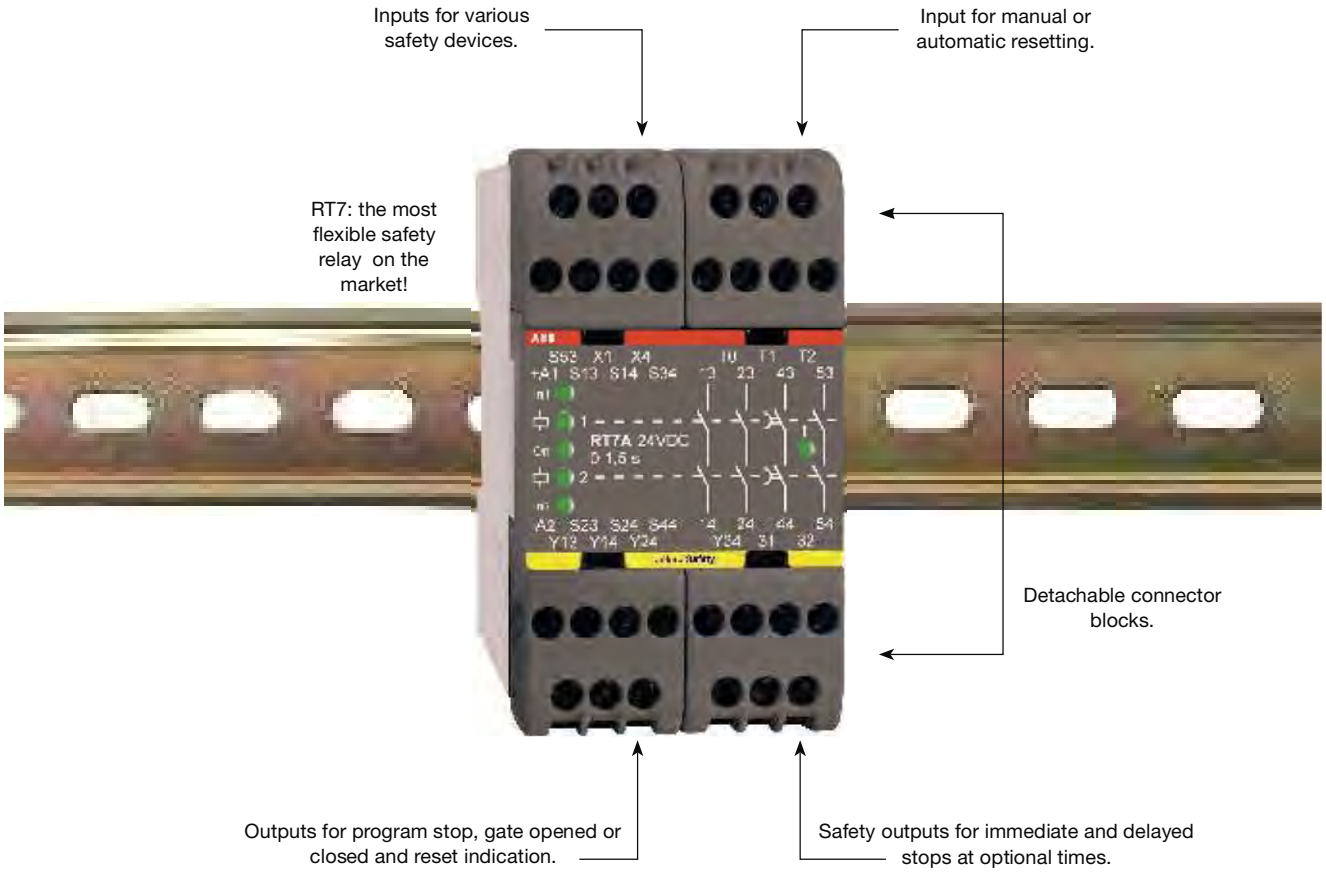
The most flexible safety relays on the market

We have the most flexible safety relays on the market. Our first universal relay was developed in 1988.
Nowadays, the flexibility is even greater and size has been reduced by 85 %. A universal relay is a safety relay with various input options for various safety devices and risk levels.

Internally, the safety relay is of the highest safety level (PL e according to EN ISO 13849-1). A machine supplier can therefore, with one single safety relay, select the input configuration that best suits their customers' safety requirements. In addition, our safety relays have detachable connector blocks for ease of replacement and testing. As our universal relays incorporate all input options, they are compatible with all our previous safety relays as well as with other manufacturers' products.

Is a universal relay expensive? No, our latest patented construction is extremely simple and the number of major components is less compared to our previous universal relays. This means that the safety relays are even more reliable than before.

We also have a great deal of experience from safety solutions in our own system developments. It would be our pleasure to share these experiences with you! Please see the complete safety solutions in the section “Connection examples”. Please do not hesitate to contact us if you should require any other safety solutions.



Some of the advantages with ABB Jokab Safety’s safety relays:

- Universal relays
- Excellent reliability
- Approved in Europe, USA, Canada
- Supervised reset
- Time reset
- Small and compact
- Detachable connector blocks
- Low power consumption
- Permits the use of long emergency stop cables
- EX compatibility
- Functions set by external hardwired links
- LED indication for inputs and outputs
- Powerful switching capacity

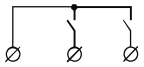
Safety Relays

Selection

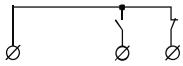
	Safety relays								Safety-timers		Expansion relays			
	RT6	RT7	RT9	JSBRT11	JSBR4	JSBT4	JSBT5T, BT50T, BT51T	JSBT5, BT50, BT51	JSHT1A/B	JSHT2A/B/C	E1T	JSR1T	JSR2A	JSR3T
Interlocking switch/Gate/Hatch	●	●	●	●	●	●	●	●						
Light curtains	●	●	●	●										
Light beams	●	●	●	●										
Safety mats	●	●	●		●	●								
Contact strips	●	●	●		●	●								
Two-hand control device					●									
Emergency stop	●	●	●	●	●	●	●	●						
Hold to run/enabling device	●	●	●	●	●	●				●				
Foot control device	●	●	●	●	●	●				●				
Area supervision	●	●	●	●	●	●								
Time resetting									●					
Time bypassing									●	●				
Inching										●				
Output expansion	●	●	●	●		●	●	●			●	●	●	
Delayed output		●					●				●	●		●

Input alternatives (see also technical data on the next page)

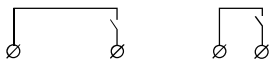
Single-channel, 1 NO from +24 V
Category 1, up to PL c
The input must be closed before the outputs can be activated. A stop signal is given when the input is opened.



Two-channel, 2 NO from +24 V
Category 3, up to PL d
Both the inputs must be closed before the outputs can be activated. A stop signal is given if one or both of the inputs are opened. Both the inputs must be opened and reclosed before the outputs can be reactivated. A short-circuit between the inputs is not monitored by the safety relay. Category 4 can only be achieved if a safety device with short circuit monitored outputs is connected.



Two-channel, 1 NO & 1 NC from +24V
Category 4, up to PL e
One input must be closed and one must be opened before the outputs can be activated. A stop signal is given if one or both of the inputs change position or if the inputs short-circuit. Both inputs must be put into their initial position before the outputs can be reactivated.



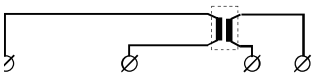
Two-channel, 1 NO from 0 V &
Category 4, up to PL e
Both the inputs must be closed before the outputs can be activated. A stop signal is given if one or both of the inputs are opened. Both the inputs must be opened and reclosed before the outputs can be reactivated. A Stop signal is given if there is a short-circuit between the inputs.

7

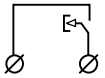
Safety Relays

	Safety relays											Safety-timers		Expansion relays			
	RT6	RT7	RT9	JSBRT11	JSBR4	JSBT4	JSBT5T	BT50T	BT51T	BT50 (JSBT5)	BT51	JSHT1A/B	JSHT2A/B/C	E1T	JSR1T	JSR2A	JSR3T
Safety category	1–4	1–4	1–4	1–4	4	4	1–4°	1–4°	1–4°	1–4°	1–4°	1–4	1–4	1–4	1–4	1–4	1–4
Safety input																	
Single-channel, 1 NO from +24 V	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●
Two-channel, 2 NO from +24 V	●	●	●	●													
Two-channel, 1 NO & 1 NC from +24 V	●	●	●	●													
Two-channel, 1 NO from 0 V & 1 NO from + 24 V	●	●	●	●	●	●						●	●	●	●	●	●
Contact strips/Safety mats	●	●	●		●	●											
Reset & test input																	
Monitored manual	●	●	●	●	●												
Automatic/Unmonitored manual	●	●	●	●		●	●	●	●	●	●						
Testing of contactors, relays, valves, etc.	●	●	●	●	●	●	●	●	●	●	●	●	●				
Output																	
NO	3	2	2	7	3	3				3	4			4*	4*	4	
NO delayed		2					3†	3	4					4*	4*		2¤
NO impulse outputs												2¤	2¤				
NC	1	1		2	1	1				1					1*	1	
NC delayed							1†	1							1*		
Info. output	2	3	1					1	1								
Switching capacity (resistive load)																	
6A/250VAC/1500VA/150W	4	3	2	9	4	4	4	4‡	4‡	4	4			4	5		
4A/250VAC/1000VA/100W												2¤	2¤				2¤
6A/250VAC/1380VA/138W		2‡															
10A/250VAC/1840VA/192W																5	
Width (mm)	45	45	22,5	100	45	45	22,5	22,5	22,5	22,5	22,5	45	45	22,5	45	45	22,5
Supply voltage																	
12VDC							●										
24VDC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
24VAC	●	●		●	●	●	●					●	●			●	●
48VAC	●	●		●	●	●						●	●			●	
115VAC	●	●		●	●	●						●	●			●	
230VAC	●	●		●	●	●						●	●			●	

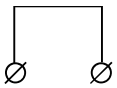
* Indicates the possibility of selecting delayed outputs ¤ Indicates one relay contact per output (other relays having two contacts per output)
‡ delayed ° Category 4 depending on connection (When used as expansion relay with Pluto Safety PLC, then Category 4) † fixed 0.5 s delay



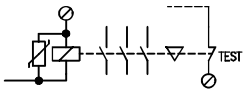
Contact strips/Safety mats
Category 3, up to PL d
For an unpressurised mat/strip, both the relay inputs must be closed for the outputs to be activated. In the case of an activated mat/strip and short-circuit input channels, the relay will be de-energized. Current limitation prevents the safety relay from being overloaded when the channels short-circuit.



Monitored manual reset
A monitored reset means that the safety relay will not be reset if the reset button gets jammed when pressed in or if the input short-circuits. In order for the resetting to be complete, the input must be closed and opened before the outputs can close.



Automatic/unmonitored manual reset
Automatic reset means that the outputs are closed immediately when both the input conditions are satisfied and the test input is closed.



Testing of contactors, relays & valves
Can be carried out with both automatic and manual reset.

Safety Relays

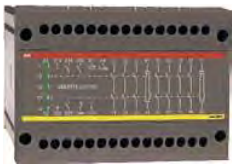
JSBR4

JSBT5

JSHT1

JSHT2

JSR1T



JSBRT11

RT6

JSR2A

Safety Relays

Description	Part No.	Product Hierarchy 4700003 Order Code	Price
JSBR4 24DC Safety relay	10-002-00	2TLA010002R0000	
JSBR4 24AC Safety relay	10-002-02	2TLA010002R0200	
JSBR4 115AC Safety relay	10-002-04	2TLA010002R0400	
JSBR4 230AC Safety relay	10-002-05	2TLA010002R0500	
JSBT5 24AC/DC Safety relay	10-005-01	2TLA010005R0100	
JSBT5 12VDC Safety relay	10-005-07	2TLA010005R0700	
JSBT5T 24AC/DC Safety relay	10-005-11	2TLA010005R1100	
JSHT1A 24DC Time module	10-011-00	2TLA010011R0000	
JSHT1B 24DC Time module	10-011-10	2TLA010011R1000	
JSHT2A 24AC Time module	10-012-02	2TLA010012R0000	
JSHT2B 24DC Time module	10-012-10	2TLA010012R1000	
JSHT2C 24DC Time module	10-012-20	2TLA010012R1000	
JSR1T 0s Expan. relay 6A 24 DC	10-015-00	2TLA010015R0000	
JSR1T 1.5s Expan.relay 6A 24DC	10-015-05	2TLA010015R0500	
JSR1T 8s Expan. relay 6A 24 DC	10-015-06	2TLA010015R0600	
JSR1T 0.5s Expan. relay 6A 24 D	10-015-10	2TLA010015R1000	
JSR1T 10s Expan.relay 6A 24DC	10-015-20	2TLA010015R2000	
JSR1T 1s Expan. relay 6A 24 DC	10-015-30	2TLA010015R3000	
JSR1T 2s Expan. relay 6A 24 DC	10-015-40	2TLA010015R4000	
JSR1T 3s Expan. relay 6A 24 DC	10-015-50	2TLA010015R5000	
JSR1T 5s Expan.relay 6A 24DC	10-015-60	2TLA010015R6000	
JSR3T Expan. relay. 24 AC/DC	10-017-01	2TLA010017R0100	
JSBRT11 24DC Safety relay	10-025-00	2TLA010025R0000	
JSBRT11 115AC Safety relay	10-025-04	2TLA010025R0400	
JSBRT11 230AC Safety relay	10-025-05	2TLA010025R0500	
RT6 24DC Safety relay	10-026-00	2TLA010026R0000	
RT6 24AC Safety relay	10-026-02	2TLA010026R0200	
RT6 115AC Safety relay	10-026-04	2TLA010026R0400	
RT6 230AC Safety relay	10-026-05	2TLA010026R0500	
JSR2A Expan. relay 10A 24AC/DC	10-027-01	2TLA010027R0100	
JSR2A Expan. relay 10A 115AC	10-027-04	2TLA010027R0400	
JSR2A Expan. relay 10A 230AC	10-027-05	2TLA010027R0500	

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Safety Handbook
2TLC172001C0201

Safety Relays

RT7

RT9

E1T

BT50

B51T

Safety Relays

Description	Part No.	Product Hierarchy 4700003 Order Code	Price
RT7B 24DC Safety relay 3s	10-028-10	2TLA010028R1000	
RT7B 115AC Safety relay 3s	10-028-14	2TLA010028R1400	
RT7B 230AC Safety relay 3s	10-028-15	2TLA010028R1500	
RT7A 24DC Safety relay 1.5s	10-028-20	2TLA010028R2000	
RT7A 24AC Safety relay 1.5s	10-028-22	2TLA010028R2000	
RT7A 115AC Safety relay 1.5s	10-028-24	2TLA010028R2400	
RT7A 230AC Safety relay 1.5s	10-028-25	2TLA010028R2500	
RT9 24DC Safety relay	10-029-00	2TLA010029R0000	
E1T 0s Expansion relay 24DC	10-030-00	2TLA010030R0000	
E1T 0.5s Expansion relay 24DC	10-030-10	2TLA010030R1000	
E1T 1s Expansion relay 24DC	10-030-20	2TLA010030R2000	
E1T 1.5s Expansion relay 24DC	10-030-30	2TLA010030R3000	
E1T 2s Expansion relay 24DC	10-030-40	2TLA010030R4000	
E1T 3s Expansion relay 24DC	10-030-50	2TLA010030R5000	
BT50 24DC Safety relay	10-033-00	2TLA010033R0000	
BT50T 24DC Safety relay	10-033-10	2TLA010033R1000	
BT51 24DC Safety relay	10-033-20	2TLA010033R2000	
BT51T 24DC Safety Relay	10-033-30	2TLA010033R3000	

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Safety Handbook
2TLC172001C0201

Safety light grids, curtains and scanners
Focus II

Application:
Optical protection in an opening or around a risk area

A light grid/light curtain with many possibilities

Focus II is a new version of our previous light beam/light curtain Focus. Features such as muting and override are standard in all Focus II light curtains and light beams. For light curtains, blanking and break functions are also standard. The optical sensors on Focus II also have variable frequency. The Focus II units are light grids/curtains with safety functions intended for applications where it is of great importance to protect persons from a dangerous machine, robot or other automated systems where it is possible to access to a dangerous area.

Focus II creates a protection field with infrared beams. If any beam is interrupted the safety mechanism is triggered and the dangerous machine is stopped. Focus II fulfills the requirements for non-contact safety equipment type 4 (Focus 4 series) according to the international regulation standard EN 61496-1.

Units are available with safety heights between 150 and 2400 mm. All electronic control and monitoring functions are included in the light curtain profiles. External connection is made via a M12 connection at the end of the profile. Synchronization between transmitter and receiver is achieved optically. No electrical connection between the units is required. Control and monitoring of the beam transmission is carried out by two micro-processors which also give information on the status and alignment of the light curtain via several LEDs.

Muting and Override included in all Focus II

The ”Muting” and ”Override” functions are available on all Focus II light grids/curtains and is enabled directly when an indication lamp LMS is connected. Muting implies that one or more segments or the whole light curtain can be bypassed during in and out passage of material.

In the Focus II with Muting there is also an Override function which makes it possible to bypass the light grid/curtain i.e. activate the outputs if a machine start is necessary even if one or more light beams are interrupted. This is the case when the muting function is chosen and the A and B inputs

Safety light grids, curtains and scanners Focus II

Features

- Type 4 according to EN 61496
- Flexible assembly
- LED indication
- High protection class (IP65)
- Range 3-40 m
- Time reset
- Muting
- Single/Double Break function
- External Device Monitoring (EDM)
- Available with different resolutions
- Up to PL e according to EN 954-1/EN ISO 13849-1

Technical data - general

Performance

Protective height	150mm - 2400mm
Object resolution	14mm and 30mm
Beam pitch (centre)	7.5mm and 18mm
Operating range	0.2m - 3.0m (14mm resolution), default 3.0m - 6.0m (14mm resolution), DIP switch option 0.2m - 7.0m (30mm resolution), default 7.0m - 14m (30mm resolution), DIP switch option
Effective aperture angle	For FII-2-xx-yyyy: ±-5° maximum, transmitter and reciever according to IEC61496-2 for distances >3m For FII-4-xx-yyyy: ±-2.5° maximum, transmitter and reciever according to IEC61496-2 for distances >3m
Response time ON to OFF	Maximum: 103ms.
Light source	Infrared emitting LEDs, wavelength 880nm Power dissipation: <3mW class 1 acc. EN60825-1

Mechanical

Housing material	Painted aluminium, yellow, RAL 1018
Front plastic material	Polycarbonate
Connector material	Polyamide 6.6
End cup material	Polycarbonate
Sealing, gasket material	EPDM
Mounting bracket material	Black powder coated stainless steel
Mounting bolt	Stainless steel M6
Wiring connectors	8 pin receiver and 5 pin transmitter

Environmental

Enclosure rating	IP65
Operating temperature	-10°C ... +55°C
Storage temperature	-25°C ... +70°C
Relative humidity	95% maximum. non condensing
Vibration (IEC 60086-2-6)	10-70 Hz, 0,35mm, maximum on all 3 axes
Shock (IEC 60086-2-29)	30 G for 16ms, 1000 shock on all 3 axes

Electrical

Power transmitter	24VDC ±20%, maximum current 70mA
Power reciever	24VDC ±20%, maximum current 100mA
Input vo;tage threashold	$V_H$min = 17VDC, $V_L$max = 6V
Test/reset	10mA, 24VDC, normally closed input, >2,5s
Muting A	10mA, 24VDC
Muting B	10mA, 24VDC
EDM	10mA, 24VDC
Muting lamp	50mA min, 24VDC

Safety light grids, curtains and scanners Focus II

Technical data - general

Electrical

Safety outputs (OSSD)	Two PNP safety outputs, each sourcing 500mA 24vDC. Short circuit protection.
Voltage drop	< 2,3 v
Leakage current	< 1 mA
Capacitive load	< 250 nF for OSSD output
Inductive load	Please contact us
Test pulse data	Test pulse <300us Test interval, response time x 0,33 Repetition, response time x 0,66
Power supply	Must meet the requirements of EN/IEC60204-1 and EN/IEC61496-1, and must guarantee safe insulation from the mains voltage in accordance with IEC60742 and be able to cover a drop of supply voltage of at least 20 ms.
Protection class (IEC 536 or VDE 106)	III
Power on delay	<2 s
Insulation resistance	> 20 M ohms
Dielectric voltage strength	350 vAC (1 min)

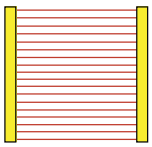
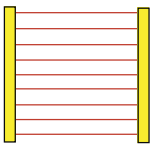
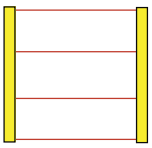
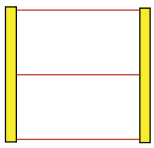
Connections

Cable length Focus II	Sheilded cables: Max. 100m, 0,4mm^2 Max. 50m, 0,2mm^2
Cable length Focas II Mix	Sheilded cables, M12 connector 8-pin these cables are shipped with the sensors. Maximum length is 0,9m.

Conformity

AOPD (ESPE)	FII-2-xx-yyyy: Type 2 acc. to EN/IEC 61496-1 and EN/IEC 61496-2 FII-4-xx-yyyy: Type 4 acc. to EN/IEC 61496-1 and EN/IEC 61496-2
Category	FII-2-xx-yyyy system is suitable for safety control systems up to category 2 acc. EN 954-1 FII-4-xx-yyyy system is suitable for safety control systems up to category 4 acc. EN 954-1
Safety integrity level	Focus II system is suitable for up to SIL 3 per IEC 61508
Performance level	Focus II type 2 systems is suitable for safety control systems up to Performance level c acc. EN ISO 13849-1. Focus II type 4 systems is suitable for safety control systems up to Performance level c acc. EN ISO 13849-1.
Mean time to dangerous failure ($MTTF_d$)	450 years
PFH	$2,5*10^{-09}$
Proof test interval	Every 20 years

Safety light grids, curtains and scanners
Focus II - light curtain/grid, Type 4 (FII-4)

Type 4	FII-4-14-zzzz	FII-4-30-zzzz	FII-4-K4-zzzz		FII-4-K3-800
Resolution	14	30	300	400	400
Height (mm=zzzz)	150 300 450 600 750 900 1050 1200 1350 1500 1650 1800 1950 2100 2250 2400	150 300 450 600 750 900 1050 1200 1350 1500 1650 1800 1950 2100 2250 2400	900	1200	800
Range (m) SR LR	0,2-3 3-6	0,2-7 7-14	0,5-20 20-40		0,5-20 20-40
Reaction time off (ms)	12-68	9-31	13		13
Reaction time on (ms)	138-104	141-119	142		142
Manual reset	•	•	•		•
Automatic reset	•	•	•		•
Pre reset	•	•	•		•
Muting inputs	•	•	•		•
Muting lamp supervision	•	•	•		•
Override	•	•	•		•
Muting T/L/X	• / • / •	• / • / •	• / • / •		• / • / •
Blanking 3 types	• / • / •	• / • / •	- / - / -		- / - / -
Single/Double break	• / •	• / •	- / -		- / -
EDM	•	•	•		•
Dyn. Adaption to Vital/Pluto	¤	¤	¤		¤

• Standard ¤ With Tina 10A/10B/10C or FMC-Tina

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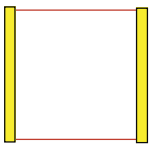	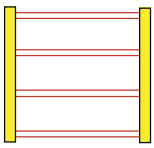	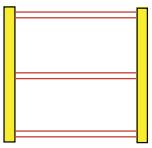	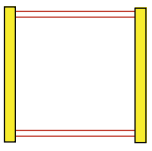	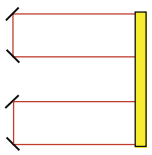	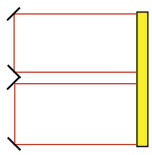	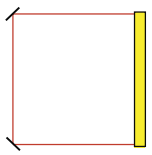	
FII-4-K2-500	FII-4-K4-zzzz D		FII-4-K3-800 D	FII-4-K2-500 D	FII-4-K2C-zzzz		FII-4-K2C-800	FII-4-K1C-500
500	300	400	400	500	300	400	800	500
500	900	1200	800	500	900	1200	800	500
0,5-20 20-40	0,5-20 20-40		0,5-20 20-40	0,5-20 20-40	0,5-7		0,5-8	0,5-12
13	13		13	13	13		13	13
142	142		142	142	142		142	142
•	•		•	•	•		•	•
•	•		•	•	•		•	•
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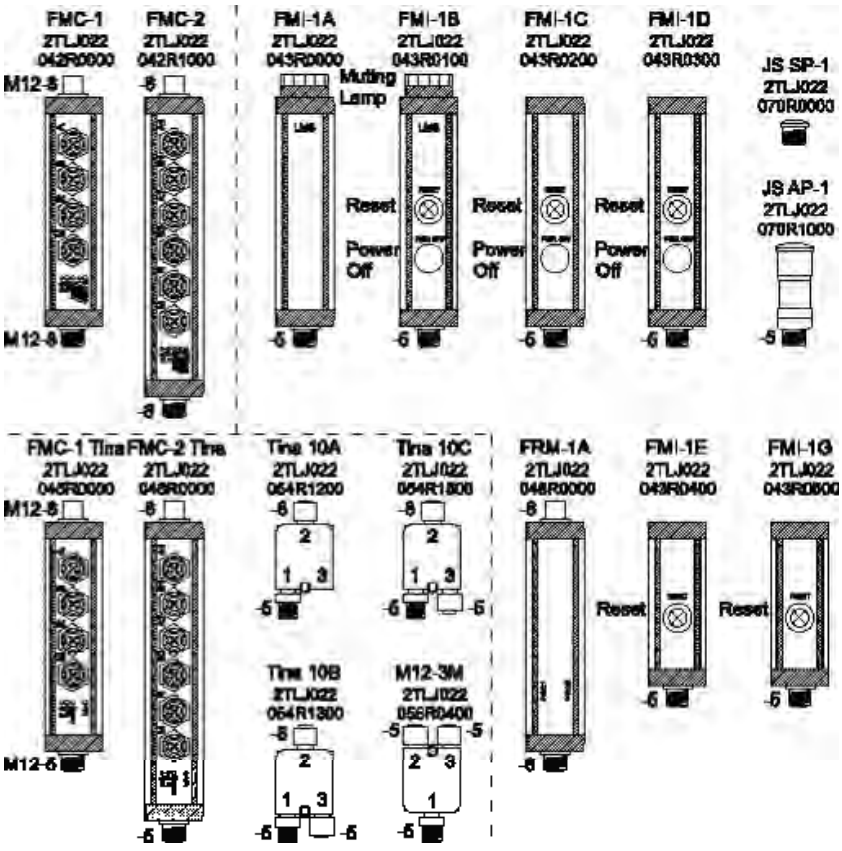
Safety light grids, curtains and scanners
Focus II - FMC, FMI, FRM- versions and Tina units

The FMC Focus Muting Connector, is a small, optimal unit which is used when the Focus light grid/curtain is required to be bypassed for in and out passage to and from a dangerous area. The FMC-unit is easily connected to Focus with a M12 connector.

The FMI Focus Muting Indicator, is a small unit with built-in muting lamp, reset button, "power off" (for alignment and override). The FMI unit is connected to the FMC unit with M12 connectors to facilitate the muting function connection.

Tina-versions have dynamic safety outputs for Vital/Pluto

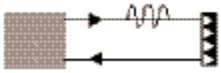


FMC-1(2):	with connectors for muting sensors (A+B), reset, power off and muting lamp (R) and muting lamp (M).
FMI-1A:	with muting lamp only.
FMI-1B:	with reset, power off and muting lamp.
FMI-1C:	with reset and power off.
FMI-1D:	with reset, power off and internal resistor for the muting lamp.
FMI-1E:	as pre reset connected to connector A (A2) on FMC-1(2) (Tina).
FMI-1G:	with reset, and internal resistor for the muting lamp.
FMC-1 (2)Tina:	same as FMC-1(2) but connected to Vital or Pluto.
Tina 10A:	adaptor unit for connecting Focus to Vital or Pluto.
Tina 10B:	simplified FMC-1(2) Tina including only the connector (R).
Tina 10C:	simplified FMC-1(2) Tina including only power supply on con.no.3.
M12-3M	bypass unit for easy connection outside the cabinet
FRM-1A:	translates the two OSSD outputs to relay outputs (and power supply).
JS SP-1:	protection plug for not used connectors.
JS AP-1:	adaptor for FMC units to use instead of FMI-1B or -1D on the (R) connector including muting resistor.

Safety light grids, curtains and scanners
Muting sensors – Mute R

Retro-reflective with polarizing filters

10...30 VDC
PNP
Dark-on output



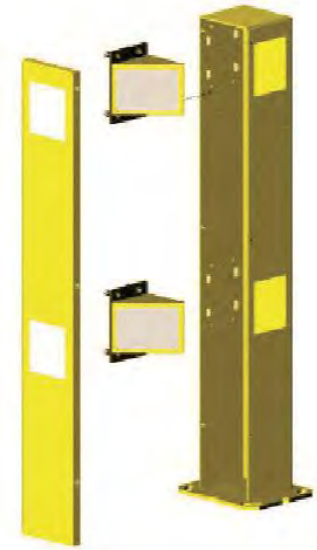
Features

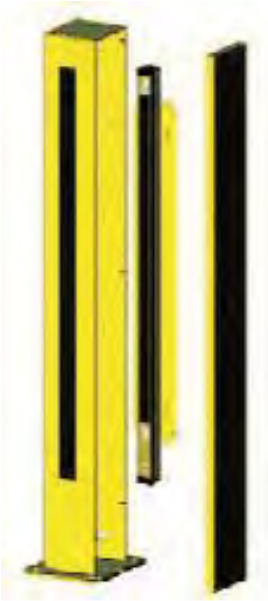
- Range adjustable
- Light reserve warning indicator
- Transistor output, PNP
- 1000 Hz switching frequency
- Short-circuit protection, reverse polarity protection and power-up output suppression
- Connector M12
- EMC tested according to IEC 801 and EN50081-1/EN 50082-2

Technical data - general

		Product Hierarchy 4700004	
Description	Part No	Order Code	Price
	Mute R (FSTR-1)	2TLA022044R0000	227.40
Output	PNP, dark on		
Connection	Connector M12		
Range adjustment	Yes		
Range	0.15... 2.5 m (with reflector FZR 1) 0.15...5m (with reflector FZR 2A)		
Light source	Visible-red, 660 nm, pulsed with polarizing filter		
Supply voltage	10...30 VDC		
Allowable ripple	± 10% of U_S		
Current consumption (without load)	<15 mA		
Max. load current	100 mA		
Residual voltage	<1,6 V		
Max. switching frequency	1000 Hz		
Protection class	IP67		
Temperature (operating and storage)	-25 to +65° C		
Weight	approx. 15 g		
All technical data at 25° C and 24V.			

Safety light grids, curtains and scanners
Bjorn - strong supports for light grids and mirrors

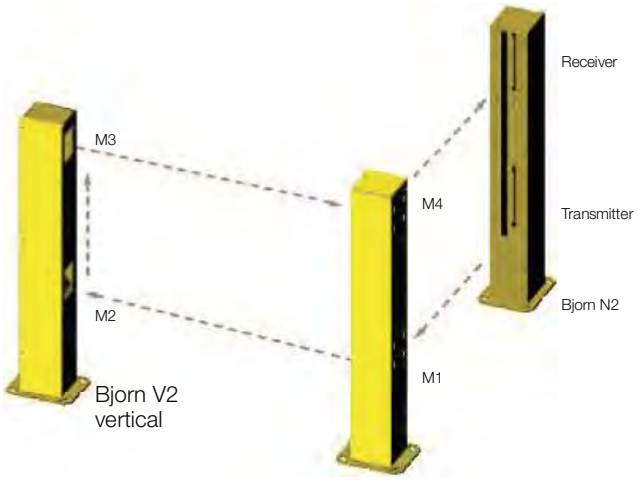




Protects light curtain, light grids and mirror

Bjorn is a very stable and flexible stand system in which Focus safety light beams and mirrors are mounted in the stand. The fixings for the mirrors in the stand can be turned to provide either vertical or horizontal angles. The robust material of the Bjorn protects Focus units from direct collisions, and thus prevents unnecessary material damage and halts in production.

Bjorn is available in stock as a standard version for dual safety light beams. Bjorn versions can also be ordered for Focus 3 and 4-beams.



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Technical data - general

Description	
Colour:	Yellow powder-coated (RAL 1018)
Material:	3 mm steel
Dimensions: Cross section Foot	 146 mm x 130 mm 230 mm x 190 mm
Weight: H2, V2 and N2 H3 H4-1, H4-2 N5	 15 kg/piece 17 kg/piece 20 kg/piece 27 kg/piece
Mirror reduction:	≤10 %

Selection

		Product Hierarchy 4700004	
Type	Part No.	Order Code	Price
Bjorn H2	22-041-40	2TLA022041R4000	
Bjorn V2	22-041-41	2TLA022041R4100	
Bjorn H3	22-041-42	2TLA022041R4200	
Bjorn H4-1	22-041-43	2TLA022041R4300	
Bjorn H4-2	22-041-44	2TLA022041R4400	
Bjorn N2	22-041-45	2TLA022041R4500	
Bjorn N3	22-041-46	2TLA022041R4600	
Bjorn N4-1	22-041-47	2TLA022041R4700	
Bjorn N4-2	22-041-48	2TLA022041R4800	
Bjorn N5	22-041-48	2TLA022041R4900	

H = Horizontal reflection
V = Vertical reflection
N = Floor stand for Focus

Safety light grids, curtains and scanners
Focus Wet - protection against water and dust for Focus light curtains and light beams

Protection in severe environments

- Adjustable ±20°
- Rotatable and replaceable tube
- Capable of draining and through ventilation

Wet is used for protection against water (or dust) where extreme washing conditions are encountered. The protective encapsulation rating (IP68) now enables Focus light curtains and light beams to be used for such applications as the food industry where the use of high pressure washing for cleaning machinery often occurs. The draining and through ventilation capabilities mean that condensation can be avoided.

Wet, with Focus light curtains or light beams, is pre-assembled complete with cabling, on request. During installation on a machine a Wet unit can be adjusted by ± 20° with the accompanying angle bracket. The plastic tube is rotatable and the outside is easy to clean.

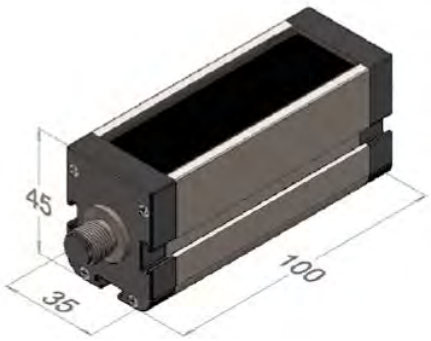
Technical data - general

Description	
Colour:	Transparent plastic
Length including lid:	light curtain/light beam + 66 mm
Material: Tube Lid Angle bracket	 PC PEHD-300 Stainless steel
Max. ambient temperature:	+55°C
Installation adjustment	± 20°
Protection rating	IP68 (IP69K)

Selection

		Product Hierarchy 4700004	
Type	Part No.	Order Code	Price
WET-150 FII	22-038-00	2TLJ022038R0000	
WET-300 FII	22-038-01	2TLJ022038R0100	
WET-450 FII	22-038-02	2TLJ022038R0200	
WET-600 FII	22-038-03	2TLJ022038R0300	
WET-750 FII	22-038-04	2TLJ022038R0400	
WET-900 FII	22-038-05	2TLJ022038R0500	
WET-1050 FII	22-038-14	2TLJ022038R1400	
WET-1200 FII	22-038-06	2TLJ022038R0600	
WET-1350 FII	22-038-15	2TLJ022038R1500	
WET-1500 FII	22-038-07	2TLJ022038R0700	
WET-1650 FII	22-038-08	2TLJ022038R0800	
WET-1800 FII		2TLJ022038R1900	
WET-K-500 FII	22-038-09	2TLJ022038R0900	
WET-K-800 FII	22-038-10	2TLJ022038R1000	
WET-K-900 FII	22-038-11	2TLJ022038R1100	
WET-K-1200 FII	22-038-12	2TLJ022038R1200	
WET-L- FII		2TLJ022038R1800	
WET-T- FII		2TLJ022038R1700	

Safety light grids, curtains and scanners
Laser aligners - JSRL-2 & 3

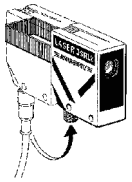


When the solution involves one or more mirrors JSRL-3 facilitates alignment of light beams or light curtains. The JSRL-3 is easily secured using the accompanying elasticated tape around the transmitter and receiver unit, andmust be placed so that the flat rear of the unit is up against the front glass of the light curtain.When the laser aligner is switched on the red laserspot should be visible at the corresponding unit, even via morrors.

The JSRL-3 contains two type AAA batteries that are changed by unscrewing the bottom end cap.

Selection

		Product Hierarchy 4700004	
Type	Part No	Order Code	Price
JSRL-2	20-008-01	2TLA020008R0100	
JSRL-3	20-008-02	2TLA020008R0200	



Laser aligner JSRL2 for light beam Spot T/R.

Safety light grids, curtains and scanners
Spot - safety light beams

Photoelectric guarding of an entrance or risk area

- Safety level Type 4 according to EN 61496
- Versatile mounting
- LED indication
- Protection class IP67
- 10 m or 35 m range
- Bypassing possibility
- Light beam, emergency stop and Eden in the same safety circuit together with Vital/Pluto achieves PL e according to EN SO 13849-1

A light beam for the highest safety level

The light beam is available in two versions Spot 10 for distances up to 10 m and Spot 35 for up to 35 m . The light beams can be mounted at different heights and be angled around a machine using our mirrors and brackets.

Spot and Vital/Pluto in combination fulfils the requirements for PL e according to EN ISO 13849-1 and type 4 according to EN 61496. Several light beams, Eden sensors and emergency stops can be connected in series achieving the high safety level for the safety circuit. A number of solutions for bypassing of light beams for material transport are available.

For indication there are LED´s on the transmitter and on the receiver which indicate 'contact' between transmitter and receiver and safety status. The 'contact' information is available via the light beam receiver connection cables.

Function

The Spot light beam is supervised by the Vital safety controller or by the Pluto safety-PLC. A unique coded signal is sent out from the control unit to the transmitter (Spot T). The signal which comes back from the receiver (Spot R) is then compared in the Vital/Pluto. If the correct coded signal is received the Vital/Pluto switches the necessary safety output contacts to permit dangerous machine movements. Coding guarantees that no output signals can be produced by light from other sources, interference or faults in components in the transmitter or receiver. The light beam is dynamically supervised which means that if the signal stops pulsating at the correct frequency it is immediately detected. By means of coding, the dynamic signal can pass between up to 6 pairs of transmitters and receivers, with only one pair needing to be electrically connected to a Vital.

Technical data - general

Description	
Safety level EN/IEC 61496 EN 954-1 EN ISO 13849-1	 Type 4 with Vital/Pluto Category 4 PL e
PFH_d	$1{,}14x10^{-8}$
Power supply	17 – 27 VDC, ripple ±10%
Light source	Red visible light, 660 nm, <±2°
Protection class	IP 67
Range	
Spot 10:	0 - 10 m
Spot 35:	0 - 35 m
Installation	
Spot 10:	2xM18 nuts (provided)
Spot 35:	Either via mounting holes in the casing or with angle bracket JSM63 (provided)
Operating temperature range	-25°C – +65°C
Cable connection	M12 fixed connector

Selection

		Product Hierarchy 4700004	
Type	Part No	Order Code	Price
Spot 10 T/R	20-009-05	2TLA020009R0600	227.40
Spot 35 T/R	20-009-06	2TLA020009R0500	259.75

Safety light grids, curtains and scanners
Look - laser scanner

Photoelectric guarding of several risk areas

- Type 3, IEC61496-3
- Easy to install
- Protected from welding sparks/arcs
- Easy to program
- 4 individual programmabprotection areas simultaneously with Pluto

A laser scanner that has the ability to scan four individual areas

7

The Laser Scanner 'Look' has the ability to scan four individual areas. Each area can be programmed individually for the specific application, making it ideal for auto-carriers that need to operate along different paths. The safety level is according to Type 3, EN 61496-3. It is approved for use as personnel protection in robot working areas, conveyor equipment etc. The small design makes it easy to install. Look is not affected by ambient light levels (sun etc) or welding arcs/sparks. The protection fields are quick and easy to create on a PC in a Windows environment. It has four individual programmable protection areas. Each area consists of one personnel protection field with maximum 4 m radius, and one warning field of maximum 15 m radius. Changing between the areas is easily achieved using additional sensors.

Selection

	Product Hierarchy 4700004	
Part No	Order Code	Price
Look JS4-4	50034195	251.31

Technical data - general

TÜV Süd

Description	
Safety level	
EN/IEC 61496	Type 3
EN 954-1	Category 3
EN ISO 13849-1	PL d
PFH_d	1,50E-07
General data	
Scanning rate:	25 Scans/sec
Scanning angle:	190°
Operating voltage:	24 VDC +20%/ -30%
Transmitter:	Laserdiode; Protection class 1
Current consumption:	approx. 300 mA
Angle resolution:	0,36°
Weight:	2 kg
Housing:	H=155 mm, W=140 mm, D=135 mm
Personnel protection field	
Scanning distance:	Radius 0.2 - 4 m
Area:	4 areas, switchable by 24 VDC input
	2 x OSSD; 250 mA; failsafe
Output:	transistor PNP outputs 24 VDC
	70 mm at 4 m
Resolution:	80 ms
Response time:	min 1,8 %
Reflectance factor:	
Warning field	
Scanning distance:	Radius 0 - 15 m
Area:	4 areas, switchable by 24 VDC input
	PNP-transistor, 24 VDC/100 mA
Output:	150 mm at 15 m, ± 20%
Resolution:	80 ms
Response time:	min 20%
Reflectance factor:	
Contour measurement	
Measurement range:	Radius 0- 50 m
Output:	RS 232/422
Response time:	80 ms
Reflectance factor:	min 20%
Reset:	manual or automatic
Suitable interface safety relay:	RT6, RT7, RT9, JSBRT11 or Pluto
Conformity:	Machine directive
	2006/42/EG
	EN ISO 12100-1/2, EN 954-1,
	EN ISO 13849-1, -2, EN 61496-1

Stopping time and machine diagnosis tools
Smart manager

Smart is ideal for safety supervision and for diagnosis of machine operation

Smart shows graphs/values for:

- Stopping time
- Stopping distance
- Speed
- Position of stopping signal

Smart has many valuable features for machine diagnosis:

- Graphic presentation of measurements
- Easy to analyse stopping characteristics and movement
- Gives parameters for safety design (e.g. stop time)
- Calculates minimum allowed safety distance
- Shows how the stop distance can be optimised
- Electrical reaction time and mechanical/hydraulic breaking can be identified and analysed
- Digital in/out signals and analogue inputs

Smart is perfect for periodic monitoring of safety parameters and other conditions for the maintenance and trouble-shooting of machines. Because Smart can compare old and new graphs, it becomes easy to find out the reasons for machine malfunctions. One can also supervise machines during operation and compare how they perform over time.

Easy to use:

- Measurements with or without electrical connection
- Ideal for machine performance diagnosis
- Calculation of correct safety distances

Stopping units and sensors

Smart is a further development of our well established JSSM1 Stopping Analyser. All the stopping units and sensors for the JSSM1 can also be used with Smart. The amount of connection possibilities have also increased. Smart has 9 digital I/O, one input for an incremental sensor (for position and speed) and two analogue inputs. This makes it easy to measure sequences in conjunction with motion lapse and other analogue values.

Stopping time and machine diagnosis tools
Smart & accessories

Smart & accessories

Description	Application	Part No	Product Hierarchy 4700005 Order Code	Price
Smart logger	-	70-300-01	2TLA070300R0100	
SM2 button unit	Two-handed control unit, Emergency stop, etc.	70-300-02	2TLA070300R0200	
SM3 Relay unit	Electrical connection providing a stop pulse.	70-300-03	2TLA070300R0300	
SM11 Flag unit	Ligh curtain, light beam	70-300-11	2TLA070300R1100	
SM5/1250 Linear sensor	Linear movement, e.g. press tools	70-300-04	2TLA070300R0400	
SM5/2500 Linear sensor		70-300-05	2TLA070300R0500	
SM7 Rotation sensor	Rotating motion, e.g. lathes, rollers	70-300-07	2TLA070300R0700	
SM13 Battery pack	Negative pole at the centre of the charging connector	70-300-23	2TLA070300R2300	
SM9 Carrying case	-	70-300-09	2TLA070300R0900	
SM6	AC/DC converter for Smart	70-300-06	2TLA070300R0600	
SM14	Charger for flag unit SM11 and battery pack SM13	70-300-24	2TLA070300R2400	
USB cable	USB cable for communication with computer	70-300-15	2TLA070300R1500	
Extension cables	ABB Jokab Safety's extension cables with 5 conductors ideal for all Smart accessories	70-300-01	2TLA020056R2000	
		70-300-01	2TLA020056R2100	
		70-300-01	2TLA020056R2200	
		70-300-01	2TLA020056R2300	
		70-300-01	2TLA020056R2400	

7

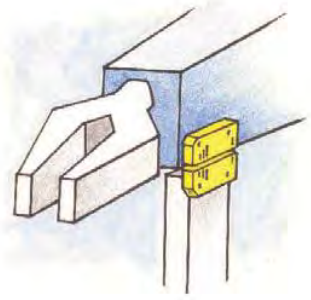
Sensors and switches
Why you should use sensors and switches

- to supervise doors and hatches around dangerous machines!

Assurance that a machine stops when a door or a hatch is opened can be solved by using different types of switches and sensors which are monitored with a safety relay or a safety PLC. Switches and sensors are available both as non-contact (dynamic or magnetic) and various types of interlocking devices. Interlocking devices can be used when it is required, via a signal, to lock a gate during processes that cannot be stopped during certain operations. They are also used with machines that have a long stopping time to prevent someone from entering before the machine has stopped.

- to ensure that a position is reached!

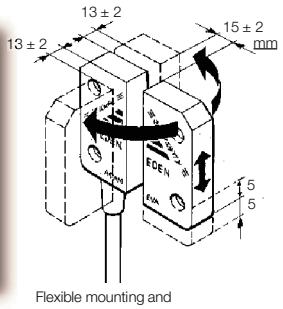
The sensor monitors that the robot is standing still in a monitored position when someone enters the robot´s working area. The robot is then only stopped by the program. If the robot leaves the position the power will be cut directly. This is used when the robot does not stop safely without restarting problems.



- to manage the safety in harsh environments!

Non-contact dynamic sensors have a long lifetime because they are not physically mechanically operated. They also endure very harsh environments, e.g. cold, heat, high-pressure wash-down which is important in the food industry for example. Because the sensors are small, they are very easy to position and can even be completely concealed in doors and hatches.

Sensors and switches
Eden - non contact safety sensor



Flexible mounting and
The ability to operate at long distances.

A non-contact safety sensor for the highest safety level

Eden - Adam and Eva are a non-contact safety sensor for use on interlocked gates, hatches etc. A coded signal is transmitted from the control device Vital or from the safety PLC Pluto via Adam to Eva which modifies the signal and sends it back again. The maximum sensing distance between Adam and Eva is currently 15 mm ± 2 mm.

Up to 30 Edens can be connected in series to Vital and still achieve the same safety level in the safety circuit. It is also possible to connect safety light beams and E-stops in the same safety circuit.

Adam is available with cable lengths up to 10 m and with M12 connectors. The LED on Adam provides indication of three different conditions, contact/non-contact between Adam and Eva and safety status. The same information is also available via the Adam connection cable. Eden E is available for harsh environments, as are Adam E and Eva E. Rapid blinking serves as an alignment aid. There are also coded versions, Eden C, Eden EC, Adam EC and Eva EC.

		Product Hierarchy 4700006	
Type	Part No	Order Code	Price
Eva	20-046-00	2TLA020046R0000	POA
Eva E	20-046-06	2TLA020046R0600	POA
Adam M12	20-051-00	2TLA020051R0000	POA
Adam 3 m	20-051-02	2TLA020051R0200	POA
Adam 5 m M12	20-051-03	2TLA020051R0300	POA
Adam 10 m	20-051-04	2TLA020051R0400	POA
Adam 20 m	20-051-05	2TLA020051R0500	POA
Adam E 10 m M12	20-051-06	2TLA020051R0600	POA
Adam E 0.5 M12	20-051-07	2TLA020051R0700	POA
Adam E 20 m M12	20-051-08	2TLA020051R0800	POA
Adam E 1 m	20-051-09	2TLA020051R0900	POA
Eden C 10 m	20-051-14	2TLA020051R0400	POA
Eden EC 10 m	20-051-16	2TLA020051R0600	POA
Adam 0.5 m M12	20-051-20	2TLA020051R2000	POA

Applications

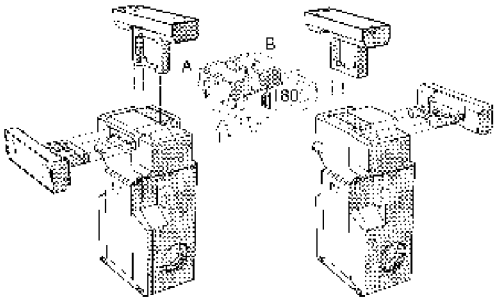
- Doors and hatches
- Position control
- Sector detection
- Slot detection

Technical data - general

TÜV Nord

Description		
Safety level IEC/EN 61508-1...7 EN 62061 EN ISO 13849-1		 SIL3 SIL3 cat. 4/PL e
Power supply		24VDC +15%-25%
Protection class Eden Eden E		 IP67 IP69K
Detection distance max Adam/Eva Adam E/Eva E Hysteresis approx. 1 mm	 15 ± 2 mm 12 ± 2 mm	 Flash 2 mm before red position. Flash 2 mm before red position.
Metal may have influence on detection distance. This can be prevented by protection plates, DA1.		
Minimum distance to metal when there is metal on one or more sides. Adam/Eva Adam E/Eva E		 One / More 0 mm / 2,5 mm 0 mm / 0 mm
Minimum distance between Eden pairs		50 mm
Cable		3 or 10 m, ø 5.7mm, black, PVC 5 x 0.34mm² + screen, UL 2464
Connector		M12: 5-pin male contact

Sensors and switches
JSNY5 - safety interlock switch



After opening the snap-on cover, the head portion can be removed (version A), after turning the head through 180° (version B) it can be replaced onto the body of the switch and be locked into position by closing the snap-on cover. This ensures 4 actuating positions are possible.

Applications

- Gates
- Hatches

Features

- 2 NC + 1 NO (actuator in)
- 4 actuating positions
- Actuator holding force 10 or 30 N

Switch operational description

JSNY5 offers three contacts which gives both the two contacts needed for high safety level as well as a contact for the indication of operating status.

The advanced design offers the choice of four operating positions from only two actuator entries by simply rotating the head through 180°.

However, when installed and in it's working condition only one entry can be used, ensuring no other element can tamper with the switch function.

When mounting the switch from the front two elongated holes are provided to aid alignment with two set screw holes for accurate fixing. Top fixing is also possible.

Three cable entries allow for a variety of cabling options including through wiring.

Positive forced disconnected contacts

The design assures that the contacts will not fail or be held in a normally closed position, due to failure of the spring mechanism or the welding/sticking of the contacts.

Protection from unauthorised or incidental access

To avoid unauthorised operation the JSNY5 switch is manufactured using multicoding to GS-ET 15. The switch cannot be defeated by screwdrivers, magnets or any other mechanism.

Safety level

The positive forced disconnect contacts gives a high safety level. By combining the JSNY 5 with one of our suitable safety relays as for example from the RT-series, the safety PLC Pluto or Vital (Tina) the requirements for both hatch and gate switch supervision can be fulfilled. To obtain the same level of safety as Eden, two switches per gate are required.

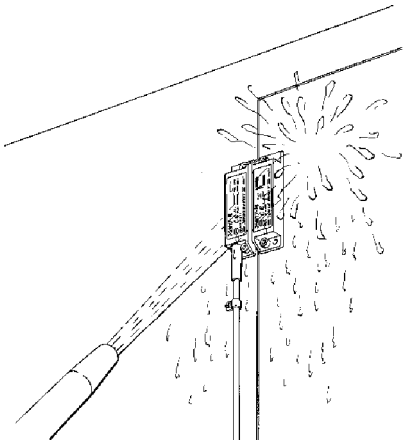
Regulations and Standards

The JSNY5 is designed and approved in accordance with appropriate directives and standards. See technical data

Selection

Part No	Product Hierarchy 4700006 Order Code	Price
JSNY5A holding force 10 N	2TLA020022R0000	
JSNY5B holding force 30 N	2TLA020022R0100	
JSNYN5 flexible key	2TLA020032R0600	
Contacts (actuator key inserted)	2 NC + 1NO (NC are direct opening action)	

Sensors and switches
JSNY7 - magnetic switch



JSNY7 is resistant to both dirt and water.

Applications

- Gates
- Hatches
- Position control

Features

- Small size
- IP67

Switch operational description

The magnetic switch is designed to operate in dirty industrial environments and is certified to the highest level of safety regulation when working together with a suitable ABB Jokab Safety safety relay or Safety-PLC Pluto. The magnetic switch is small and resistant to both dirt and water, and has no dust collecting cavities making it usefull in environments where hygiene is paramount. The small size of the switch makes it easy to position and hide on gates and hatches.

The magnetic switch has a long working life since no mechanical contact is made during operation.

Contacts

The magnetic switch has one closing and one opening contact. Both contacts have to be monitored. The contacts may be monitored by either the RT9 safety relay or other suitable relays in the new RT-series, i.e. RT6, RT9 or Safety PLC Pluto.

Protection from unauthorised or incidental access

To avoid unauthorised operation of the JSNY7 switch it is only possible to actuate the JSNY7R with the coded magnet, JSNY7M. Other magnets, screwdrivers and tools have no affect on the switch contacts.

Safety level

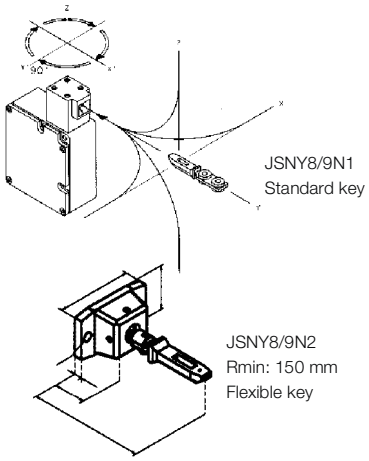
The JSNY7 is approved to the highest level of safety regulations, PL e according to EN ISO 13849-1 together with safety relay in the RT-series or Pluto PLC.

Regulations and Standards

The JSNY7 is designed and approved in accordance with appropriate directives and standards. See technical data.

Selection	Product Hierarchy 4700006	
Part No	Order Code	Price
JSNY7R-3 Magnetic switch 3m cable	2TLA020023R0000	
JSNY7R-6 Magnetic switch 6m cable	2TLA020023R0100	
JSNY7R-10 Magnetic switch 10 m cable	2TLA020023R0200	
JSNY7M Magnetic switch	2TLA020024R0000	
Supply voltage max	30 VDC	
Protection class	IP67	

Sensors and switches
JSNY8 - safety interlock switch



Applications

- Gates
- Hatches

Features

- Robust design
- Universal installation
- 2 NC + 2 NC outputs
- 1000 N actuator holding force

Description

The JSNY8 Safety Interlock Switch, in conjunction with the machine control system, enables gates/movable guards etc to be locked in their protective positions, thus preventing access to machinery until dangerous operations have ceased.
Applications include:

- processes which cannot be interrupted, such as welding.
- machinery with a long stopping procedure, such as paper machinery that requires a long braking operation.
- prevention of unauthorised access to a particular area.

The JSNY8 has 2 NC + 2 NC positive force disconnection contacts. The first pair closes when the actuator key is pushed into the head. The other pair closes when the locking mechanism is in the locked position. The head can be set in four positions, thus providing the safety device with four different operating positions. These are selected by twisting the head as shown in the diagram above. The leading edges of the actuator key are reinforced and bevelled in order to guide it properly into the hole. The JSNY8 is encased in a robust metal housing (IP67) providing a high level of protection to the internal operating components.

Two versions

The JSNY8 is available in two basic versions, either with a spring lock or a magnetic lock.
In the spring lock (JSNY8S) version, the locking mechanism moves into the locked position directly when the door is closed and the actuator key is pushed into the lock. The actuator key can only be released and the gate opened by supplying operational voltage to the solenoid (E1-E2).
The JSNY8S also has a emergency 'unlocking' facility to enable the actuator key to be released without the energisation of the solenoid (E1-E2).
In the magnetic lock (JSNY8M) version, the locking mechanism is only in the locked position when the solenoid (E1-E2) is supplied with operating voltage. Release of the actuator key is only possible when the operating voltage is removed from the solenoid (E1-E2).

Optional features

The following optional features are available:

- actuator to operate at smaller radius.
- customer specific applications.

Safety level

The JSNY8 has double forced disconnection contacts to the actuator key and the locking mechanism. The actuator key has a triple coding design. To achieve maximum safety level in the connection to the machine's control system, it is recommended that the JSNY8 is monitored by an appropriate ABB Jokab Safety safety relay, Pluto safety-PLC or Vital. To obtain the same level of safety as Eden, two switches per gate are required.

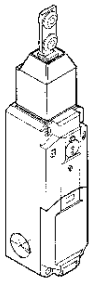
Regulations & standards

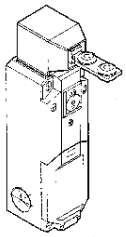
The JSNY8 is designed and approved in accordance with appropriate directives and standards. See technical data.

Selection

Product Hierarchy 4700006		
Part No	Order Code	Price
JSNY8M 24DC	2TLA020030R0000	
JSNY8S 24DC	2TLA020030R0100	
JSNY8S 230AC	2TLA020030R0500	
JSNY8M 230AC	2TLA020030R1500	
JSNY8/9N1 standard key	2TLA020032R0400	
JSNY8/9N2 flexible key	2TLA020032R0500	
Enclosure	Metal housing	
Actuator holding force	1000 N	
Contacts actuator key inserted locking mechanism, locked position	 2 NC 2 NC	
Enclosure class	IP67	
Operating voltage	24V DC, 230 V AC	

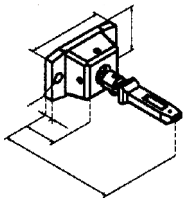
Sensors and switches
JSNY9 - safety interlock switch





The control unit offers eight operating positions that provide the actuator with eight different input options.

Standard key.



JSNY8/9N2
Rmin: 150 mm
Flexible key

Applications

- Gates
- Hatches

Features

- Compact and robust
- Universal installation
- 2x(1NO+1NC)
- Actuator holding force 1500 N
- Eight head configurations
- LED status indication (optional)

Description

The JSNY9 is used for locking a gate/hatch, to prevent access to machinery, until hazardous operations have ceased.
Applications include:

- processes which cannot be interrupted, e.g. welding.
- machinery with a long stopping time, e.g. paper machinery which requires a long braking operation.
- prevention of unauthorised access to a particular area.

The JSNY9 is equipped with a 2 x (1NO +1 NC) contact configuration, the first pair of contacts changeover when the key is inserted. The second pair of contacts changeover when the locking mechanism is in the locked position.

The JSNY9 switch is encased in a robust plastic housing and can be mounted either horizontally or vertically. The advanced design of the head provides eight possible key insertion options, this is achieved by mounting the head either vertically or horizontally on the base unit, as shown in the diagram. The location for the actuator key is reinforced and bevelled to ensure a smooth operation.

Two versions

The JSNY9 switch is available in two basic versions, either with a spring lock or an electro-magnetic locking mechanism.

The JSNY9S (spring lock) switch operates immediately when the gate/hatch is closed, i.e. when the key actuator is inserted into the locking mechanism. The gate/hatch can be opened and the actuator key released only by supplying the operational voltage to the solenoid connections (E1 E2). The JSNY9S also has a manual emergency unlocking facility to enable authorised release of the actuator key.

In the JSNY9M (magnetic lock) version, the mechanism is only locked when the gate/hatch is closed i.e. the actuator key inserted and the solenoid (E1 E2) supplied with the operating voltage. The gate/hatch can only be opened when this operating voltage is removed

Optional features

The following optional features are available:

- LED display, indicating the status of the actuator key, locking mechanism and contacts.
- Actuator to operate at smaller radii.
- Customer specific applications.

Safety level

In order to achieve a high safety level, the JSNY9 switch is equipped with dual sets of contacts operated with a coded actuator key . In order to meet the required installation safety level it is recommended that the JSNY9 safety switch is monitored by an appropriate ABB Jokab Safety safety relay. To obtain the same level of safety as Eden, two switches per gate are required.

Regulations & standards

The JSNY9 is designed and approved in accordance with appropriate directives and standards. See technical data.

Selection

Product Hierarchy 4700006		
Part No	Order Code	Price
JSNY9S 24V DC	2TLA020036R0100	9.23
JSNY9LA 24V UC	2TLA020036R0200	
JSNY9M 24V UC	2TLA020036R2100	
JSNY9MLA 24V UC	2TLA020036R3200	
JSNY9LA 24V UC	2TLA020036R0200	
Enclosure	Metal housing	
Actuator holding force	1500 N	
Contacts actuator in Locking mechanism in locked position	 1 NO + 1 NC 1 NO + 1 NC (NC are direct opening action)	
Enclosure class	IP67	
Operating voltage	24 V AC/DC	

Sensors and switches
Magne - magnetic lock with indication

TÜV Nord CE

Magnetic lock with indication

Magne is a magnetic lock that is designed for industrial applications and that can withstand harsh environments. As it is designed with no moving parts, it is durable and long lasting. Magne, with its electro-magnet, keeps a door locked with a holding force up to 1,500 N and also magnetic material does not attach to the magnetic surface when the power is off.

Use of M12 connectors makes it easy to connect several Magne units and Eden sensors in series enabling control and monitoring by either a Pluto safety PLC or a Vital safety controller. Via the connection cable it is also possible to obtain an indication signal informing if the Magne unit is locked or not.

Accessories:

- Mounting kit for conventional door, with fitting and screws for assembly on ABB Jokab Safety Quick-Guard fencing system (5-15 mm door gap)
- Plastic handle
- Handle profile for mounting on a hinged door with ABB Jokab Safety's Quick-Guard fencing system (5-15 mm door gap).

Magne is easy to assemble, adjust and dismantle in and out of the T-slot of the Quick-Guard fencing system.

Applications

- Electrical locking of doors and hatches to production applications that are sensitive to unintentional/unnecessary interruptions.
- For safety supervision the Magne 2 has an integrated Eden.

Features

- No moving parts
- Strong Magnetic holding force: 1500N
- Can stand and operate in harsh environments
- Locked/unlocked indication. Possible to connect in series with Eden sensors
- No current peaks on activation
- Magne 2 in combination with a handle profile provides a complete door solution

Selection

Part No	Description	Product Hierarchy 4700006 Order Code	Price
Magne 1A	Process lock, Incl. anchor plate	2TLA042022R0000	
Magne 2A	Process lock with built-in Eden, incl. anchor plate	2TLA042022R1000	
Magne 1B	Process lock incl. anchor plate with built-in permanent magnet (30 N)	2TLA042022R0100	
Magne 2B	Process lock incl. anchor plate with built-in Eden and built-in permanent magnet (30 N)	2TLA042022R1200	
Magne 2Ax	Process lock with built-in Eden and 5-pin M12 connector for Urax, incl. anchor plate	2TLA042022R1300	
Magne 2Bx	Process lock with built-in Eden and 5-pin M12 connector for Urax, incl. anchor plate with built-in permanent magnet (30 N)	2TLA042022R1400	
Accessories			
JSM D21B	Assembly kit for anchor plate	2TLA042023R0100	
	Handle profile for Magne	2TLA042023R0200	
JSM D23	Fixture for sliding door	2TLA042023R0300	
JSM D24	Assembly kit for Eva	2TLA042023R0400	
	Anchor plate with permanent magnet	2TLA042023R1000	
	Handle for JSM D21B	2TLA042023R1000	

7

Sensors and switches
Dalton - process lock

Applications

- Doors
- Hatches

Advantages

- Small and robust
- Integrated with Eden
- Flexible installation
- High enclosure classification – IP 67
- Withstands severe environments
- Low current consumption
- Status information with LED on the lock housing and in the cable connection.

Dalton – the intelligent process lock

Dalton is a locking unit that is intended for use in preventing unnecessary process stoppages, i.e. it is not a safety lock. It can be used either as a free-standing lock or integrated with Eden as a safety sensor. In the unlocked state the door is held closed by a ball catch and in locked state the balls are mechanically blocked so the lock tongue can not be pulled out. If necessary, the holding force of the ball catch can be adjusted. The device only allows to lock when the ball latch is centred around the lock tongue, and when Eva is with Adam (depending on version). When an input is supplied with voltage, the ball catch is locked.

Dalton is easily connected with an M12 connector. The Tina junction block can be used for distribution of both the safety and locking functions. The Dalton status is indicated by LEDs and can also be read by a PLC via the information output.

Dalton has a modular structure

The Dalton process lock has a modular structure and can be combined in different ways depending on position, installation and function. You choose the lock housing, lock tongue and fixing plate yourself to create a complete Dalton.

Installation

Dalton offers many different installation possibilities as the lock tongue may enter the ball catch from three directions. In order to ensure that Dalton works without any problems, the ball catch must be resting, i.e. the balls not pressed in by the lock tongue when the door is in closed position. Dalton's brackets are therefore made to ensure easy adjustment of the lock tongue and ball latch positions.

Selection

Description
Locking function M - Locked when energised L - Only ball latch
Operating voltage 24 VDC +25/–20%
Enclosure classification IP67
Holding force Unlocked 25-100 N Locked 2000 N

Dalton is easy to install, adjust and dismantle in the Quick-Guard fence system's T-slots.

Sensors and switches
Knox - safety lock

Knox is easy to assemble, adjust and dismantle in and out of the T-slot of the Quick-Guard fencing system.

Applications

- Safe locking of door to a cell/line with long stopping time.
- Prevents unintentional interrupts of processes

Advantages

- Double locking function as specified in PL e/ cat. 4 (EN ISO 13849-1)
- Withstands harsh environments
- Status information with LEDs on the lock and at cable connection
- Controlled to locked and unlocked positions- position remains in the event of power failure
- Electronic connection only on the door frame
- Robust design

Knox - double safety lock

Knox is a double lock that complies with the highest safety level (two lock cylinders with monitored positions) that can be used both as a safety and process lock. The locking function is electrically controlled and is bi-stable, i.e. it retains its position (unlocked/locked) in the event of a power failure. Dual signal for unlocking is safe at both short-circuits and cable breaks.

The handles operate as they would on a normal door but the exterior handle also have a reset function, why a separate reset button is not necessary and the interior handle that can be used for emergency opening also in locked state. The design and durability of the lock mean that it is ideal for harsh environments as the sensors are non-contact and the lock is manufactured of stainless steel. Knox is available in a number of adaptations such as left-hung door, right-hung door, inward and outward opening, with manual unlocking and for sliding door.

7

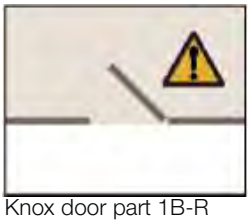
Selection

		Product Hierarchy 4700006	
Description	Part No	Order Code	Price
Knox door part for inward-opening right-hung door	Knox 1B-R v2	2TLA020105R5200	
Knox door part for inward-opening left-hung door	Knox 1B-L v2	2TLA020105R5300	
Accessories			
Distribution block for two Knox	Tina 12A	2TLA020054R1800	

Sensors and switches
Knox - safety lock


Knox door part 1A-R and frame part 2A


Knox door part 1A-L and frame part 2A


Knox door part 1B-R and frame part 2A

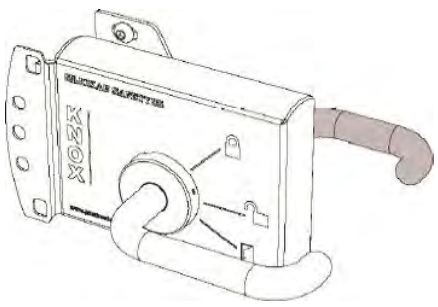

Knox door part 1B-L and frame part 2A


Knox door part 1F-R and frame part 2A


Knox door part 1F-L and frame part 2A

Models and ordering data

		Product Hierarchy 4700006	
Door part		Order Code	Price
Knox 1B-R v2	Knox door part for inward-opening right-hung door	2TLA020105R5200	
Knox 1B-L v2	Knox door part for inward-opening left-hung door	2TLA020105R5300	
Knox 1AX-R v2	Knox door part for outward-opening right-hung door with the option for manual unlocking from the outside	2TLA020105R5800	
Knox 1AX-L v2	Knox door part for outward-opening left-hung door with the option for manual unlocking from the outside	2TLA020105R5900	
Knox 1F-R v2	Knox door part for sliding door that opens to the right. Incl. additional fastening fixtures for the frame.	2TLA020105R6000	
Knox 1F-L v2	Knox door part for a sliding door that opens to the left. Incl. additional fastening fixtures for the frame.	2TLA020105R6100	
Knox 1BX-R v2	Knox door part for inward-opening right-hung door with the option for manual unlocking from the outside	2TLA020105R6200	
Knox 1BX-L v2	Knox door part for inward-opening left-hung door with the option for manual unlocking from the outside	2TLA020105R6300	
Knox 1FX-R v2	Knox door part for sliding door that opens to the right with the option for manual unlocking from the outside. Incl. additional fastening fixtures for the frame.	2TLA020105R6400	
Knox 1FX-L v2	Knox door part for sliding door that opens to the left with the option for manual unlocking from the outside. Incl. additional fastening fixtures for the frame.	2TLA020105R6500	
Frame part			
Knox 2X v2	Knox process lock, no duplicate unlocking signal, with 5-pin M12 contact	2TLA020105R2300	
Accessories			
Tina 12A	Distribution block for two Knox	2TLA020054R1800	



Door part Knox1


Frame part Knox 2

Control devices
Why you should use control devices

for the machine operator to be able to directly start and stop dangerous machine movement

Three-position device

Three-position devices, hold-to-run devices and enabling devices are used during trouble-shooting, programming and test running when no other safety components are possible or suitable. The device is held in the hand and the operator can in an emergency situation either press harder or entirely release the device to stop the machine.

In an emergency situation the operator can either press harder or release the three-position device to stop the machine.

Two hand control device

A two-hand control device is used when it must the guaranteed that the operator's hands will be kept outside the risk area. If there is a risk that someone else other than the operator can reach into the machine without the operator seeing it, the safety device must be supplemented by something more, e.g. a light beam.

To be able to operate the machine with the two-hand device, all the buttons on the device have to be operated within 0.5 seconds of each other. This is called concurrence. All the buttons also have to be returned to their initial position before one can start again. If any button is released during the machine movement the machine will be stopped. Using the stopping time one can calculate the necessary safety distance. A safety distance of less than 100 mm must not be used.

The highest safety level is assured by connecting the buttons of the two-hand device to a safety relay. The safety relay checks for concurrence and that all the buttons have returned to their initial position before a new start can be made. The safety relay also gives a stop signal if any of the buttons are released.

The two-hand device protects against "after-grasp"; if the operator by reflex tries to enter or reach into a machine during the dangerous machine movement.

Foot operated switches

A foot operated switch is used when the operator has to hold the material during processing. The pedal must have a safety cover to prevent unintentional start. For seated work one must also have a foot support to facilitate the operator holding his foot in the pedal´s off position.

The highest safety level is secured by monitoring the pedal with a safety relay.

The foot operated switch is used when the operator has to hold the material with both hands during processing.

Control devices
JSHD4 three position devices

Applications

- Troubleshooting
- Test running
- Programming

Advantages

- Ergonomic
- LED information
- Adaptable
- Cheat Safe
- Adapted for AS-i

Pre-assebled three position devices

Selection	Product Hierarchy 4700007	
Part No	Order Code	Price
JSHD4-1AA	2TLA019995R0000	
JSHD4-1AC	2TLA019995R0100	
JSHD4-2AB	2TLA019995R0200	
JSHD4-2AB-A	2TLA019995R0300	
JSHD4-2AD	2TLA019995R0400	
JSHD4-2AD-A	2TLA019995R0500	
JSHD4-2AF	2TLA019995R0600	
JSHD4-2AF-A	2TLA019995R0700	
JSHD4-2AH	2TLA019995R0800	
JSHD4-2AH-A	2TLA019995R0900	
JSHD4-3AB	2TLA019995R1200	
JSHD4-3AB-A	2TLA019995R1300	
JSHD4-3AD	2TLA019995R1400	
JSHD4-3AD-A	2TLA019995R1500	
JSHD4-3AE	2TLA019995R1600	
JSHD4-3AF	2TLA019995R1700	
JSHD4-3AF-A	2TLA019995R1800	
JSHD4-3AG	2TLA019995R1900	
JSHD4-3AH	2TLA019995R2000	
JSHD4-3AH-A	2TLA019995R2100	
JSHD4-4AB	2TLA019995R2400	
JSHD4-4AB-A	2TLA019995R2500	
JSHD4-4AD	2TLA019995R2500	
JSHD4-4AD-A	2TLA019995R2700	
JSHD4-4AF	2TLA019995R2800	
JSHD4-4AF-A	2TLA019995R2900	
JSHD4-4AH	2TLA019995R3000	
JSHD4-4AH-A	2TLA019995R3100	
JSHD4-5AB	2TLA019995R3400	
JSHD4-5AB-A	2TLA019995R3500	
JSHD4-5AD	2TLA019995R3600	
JSHD4-5AD-A	2TLA019995R3700	
JSHD4-5AF	2TLA019995R3800	
JSHD4-5AF-A	2TLA019995R3900	
JSHD4-5AH	2TLA019995R4000	
JSHD4-5AH-A	2TLA019995R4100	

Control devices
JSHD4 design a three position device for your needs

1. Choose between five different top units


JSHD4-1


JSHD4-2


JSHD4-3


JSHD4-4


JSHD4-5

2. Choose a bottom part suitable for your assembly


AA, AH, AJ


AB


AC, AD


AF, AG


AE


3 2TLA020005R0900


4 2TLA020205R6300


4 2TLA020205R6400

1. Choose between five different top units	Product Hierarchy 4700007	
Description	Order Code	Price
JSHD4-1	2TLA020006R2100	
JSHD4-2 LEDs, front button, top button	2TLA020006R2200	
JSHD4-3 LEDs	2TLA020006R2300	
JSHD4-4 LEDs, front button	2TLA020006R2400	
JSHD4-5 LEDs, top button	2TLA020006R2500	
2. Choose a bottom part suitable for your assembly		
AA – with cable gland	2TLA020005R1000	
AB – with Cannon connection	2TLA020005R1100	
AC – with M12 connection (5 poles)	2TLA020005R1200	
AD – with M12 connection (8 poles)	2TLA020005R1300	
AE – with M12 connection (8 poles) and emergency stop	2TLA020005R1400	
AF – with M12 connection (4 poles) and 2 AS-i nodes (for front and top button)	2TLA020005R1500	
AG – with M12 connection (4 poles) and 1 AS-i node (without front and top button)	2TLA020005R1600	
AH – with cable gland and PCB with 10 screw connections	2TLA020005R1700	
AJ – with cable gland and PCB with 16 screw connections	2TLA020005R1800	
3. Choose hand recognition for making your three position device cheat protected (option)		
Anti-tamper PCB	2TLA020005R0900	
4. Choose a bottom plate (option)		
JSM50G, bottom plate for Safety Interlock switch JSNY5	2TLA020205R6300	
JSM50H, bottom plate for non-contact sensor Eden (Eva)	2TLA020205R6400	

Control devices
JSHD4 combination and accessories

Available combinations of bottom - and top parts

Type	Function	JSHD4-1	JSHD4-2	JSHD4-3	JSHD4-4	JSHD4-5
AA	without Cheat Safe	JSHD4-1AA	–	–	–	–
	with Cheat Safe	–	–	–	–	–
AB	without Cheat Safe	–	JSHD4-2AB	JSHD4-3AB	JSHD4-4AB	JSHD4-5AB
	with Cheat Safe	–	JSHD4-2AB-A	JSHD4-3AB-A	JSHD4-4AB-A	JSHD4-5AB-A
AC	without Cheat Safe	JSHD4-1AC	–	–	–	–
	with Cheat Safe	–	–	–	–	–
AD	without Cheat Safe	–	JSHD4-2AD	JSHD4-3AD	JSHD4-4AD	JSHD4-5AD
	with Cheat Safe	–	JSHD4-2AD-A	JSHD4-3AD-A	JSHD4-4AD-A	JSHD4-5AD-A
AE	without Cheat Safe	–	–	JSHD4-3AE	–	–
	with Cheat Safe	–	–	–	–	–
AF	without Cheat Safe	–	JSHD4-2AF	JSHD4-3AF	JSHD4-4AF	JSHD4-5AF
	with Cheat Safe	–	JSHD4-2AF-A	JSHD4-3AF-A	JSHD4-4AF-A	JSHD4-5AF-A
AG	without Cheat Safe	–	–	JSHD4-3AG	–	–
	with Cheat Safe	–	–	–	–	–
AH	without Cheat Safe	–	JSHD4-2AH	JSHD4-3AH	JSHD4-4AH	JSHD4-5AH
	with Cheat Safe	–	JSHD4-2AH-A	JSHD4-3AH-A	JSHD4-4AH-A	JSHD4-5AH-A

JSHK0 12 pole connector for JSHD4.

Cable, available in different lengths.

Spiral cable, available in different lengths.

JSM55 Wall bracket for three-position device.

JSM5B Wall bracket for interlock switches and three-position device.

JSHD4 protection coat

Cable drum

Accessories

Selection

Description	Product Hierarchy 4700007 Order Code	Price
M12-C01 M12 5-pole female, straight	2TLA020055R1000	
M12-C03 M12 8-pole female, straight	2TLA020055R1600	
JSHK0 12-pole connector for JSHD4	2TLA020003R0300	

Cable with 5 conductors:

C5 Cable 5x0,34 cut to length	2TLA020057R0000	
C5 Cable 5x0,34 cut to length	2TLA020056R1000	
C5 Cable 5x0,34 cut to length	2TLA020056R1400	
C5 Cable 5x0,34 cut to length	2TLA020057R1000	
C5 Cable 5x0,34 cut to length	2TLA020056R4000	
C5 Cable 5x0,34 cut to length	2TLA020056R4100	

Cable with 12 conductors:

HKC12 Cable 12x0,25 cut to length	2TLA020003R5500	
HKC12 Cable 12x0,25 cut to length	2TLA020003R4700	
HKC12 Cable 12x0,25 cut to length	2TLA020003R4800	
HKC12 Cable 12x0,25 cut to length	2TLA020003R4900	
HKC12 Cable 12x0,25 cut to length	2TLA020003R5000	
HKC12 Cable 12x0,25 cut to length	2TLA020003R5100	
HKC12 Cable 12x0,25 cut to length	2TLA020003R5200	
HKC12 Cable 12x0,25 cut to length	2TLA020003R3500	
HKC12 Cable 12x0,25 cut to length	2TLA020003R3600	
HKC12 Cable 12x0,25 cut to length	2TLA020003R5300	
HKC12 Cable 12x0,25 cut to length	2TLA020003R5400	

Brackets:

JSM55 Wall bracket for three position device	2TLA040005R0500	
JSM5B Wall bracket for 2 JSNY5 (ordered separately)	2TLA040005R0700	

Other:

JSHD4 protection coat	2TLA020200R4600	

Control devices
Safeball™ one and two hand devices

Applications

- Presses
- Punches
- Fixtures
- Shearing machines

Advantages

- Ergonomic
- Low activation force
- Flexible mounting
- Several grip possibilities
- Highest safety level
- Two channel switching in each hand

SAFEBALL™

Unique world wide two hand device

Safeball™ consists of a spherical ball containing two embedded pushbutton switches, one on each side of the ball. By using this pushbutton configuration, the risk of unintentional activation is minimised and the device is simple and ergonomic to use.

Safeball™ can be utilised for either One hand (one Safeball™) or Two hand (two Safeballs™) applications. In either application, and in order to meet the required level of safety, the Safeball™ switches are monitored by specified/certified ABB Jokab Safety Safety relays.

In the case where Two hand control is used, both Safeballs™ i.e. all four pushbuttons have to be activated within 0.5 seconds. If one or more pushbuttons are released a Stop signal is given to the machine. In order to provide the highest level of safety the Safeball™ design provides the operator with a dual switching function and short-circuit supervision in each hand.

Each Safeball™ is ergonomically designed and has both its cover and actuator made of environmentally-friendly polypropylene. The design allows for comfort of use for all hand sizes and operation from numerous gripping positions. Mounting of the Safeball™ is also very flexible allowing the device to be mounted in the most ergonomic position for the operator.

When can a two hand or one hand control be used ?

A Two hand control can be used when it is necessary to ensure that the operator is outside and must be prevented from reaching into the hazardous area. If the operator decides, after the start signal has been given to the machine, to make an 'after-grasp' i.e. try to adjust the part that has been placed into the machine, then a dual stop signal is given to the machine.

A one hand control device can be used when the operator cannot reach the hazardous area with his/her free hand or on less dangerous machines.

Highest safety level

The Safeball™ is certified by Inspecta in Sweden for use as a Two hand control device, when used with a JSBR4 ABB Jokab Safety Safety relay or Pluto Safety-PLC, in accordance with the highest safety level in standard EN 574 (type IIIc).

Two hand device adapted for AS-i

The two hand device, Safeball also comes in a version adapted for direct attachment to the AS-i bus.

Selection	Product Hierarchy 4700007	
Description	Order Code	Price
JSTD1-A Safeball 1 NO + 1 NC with 2 m cable	2TLA020007R3000	
JSTD1-B Safeball Safeball 1 NO + 1 NC with 0.2 m cable	2TLA020007R3100	
JSTD1-C Safeball 1 NO + 1 NC with 10 m cable	2TLA020007R3200	
JSTD1-E Safeball 2 NO 0,2 m cable	2TLA020007R3400	
Protection class: IP67. Not intended for use under water		

Control devices
Safeball™ JSTD25 two hand devices

Applications

- Presses
- Punches
- Fixtures
- Shearing machines

Advantages

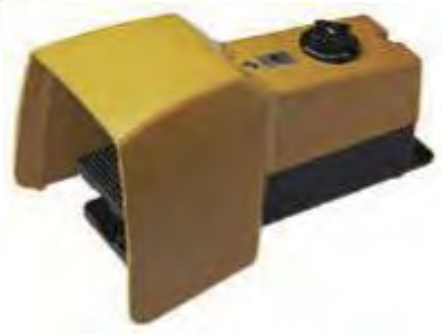
- Ergonomic
- Low activation force
- Flexible mounting
- Several grip possibilities
- Highest safety level
- Two channel switching in each hand

With a JSTD25 two hand control station you have a prepared two hand unit that is easy to install, while utilising the good ergonomics of the Safeball. There are several variants to meet differing needs. All versions meet EN 574, EN 954-1 and EN 13849-1 and are supplied with the internal connections made, to simplify installation.

Selection

Description	Part No	Product Hierarchy 4700007 Order Code	Price
JSTD25 for fixed installation			
2 Safeball control station	JSTD25A	2TLA020007R5000	
2 Safeball control station, JSMC5	JSTD25D	2TLA020007R5300	
2 Safeball control station and emergency stop button	JSTD25B	2TLA020007R5100	
2 Safeball control station JSM C5 and emergency stop button	JSTD25E	2TLA020007R5400	
JSTD25 for mobile installation			
2 Safeball control station, 5 pole M12 connection	JSTD25F	2TLA020007R6000	
2 Safeball control station, 8 pole M12 connection	JSTD25H	2TLA020007R6300	
As JSTD25F but can be customised	JSTD25G	2TLA020007R6200	
JSTD25 for mobile installation with built in Eden sensor			
2 Safeballs mounted on the ends, shield over hand guards built-in Eva sensor for position control	JSTD25P-1	2TLA020007R6500	
Accessories - JSTD25			
Stand with spacer ring for JSTD25 A-E (JSTS30 without spacer ring). Height 850 to 1100mm	JSTS31	2TLA020007R4100	
Angled ball joint for installation of a Safeball on a table or a steel housing	JSM C5	2TLA020007R0900	
4 m long spiral cable for JSTD25P-1	JSTK40S	2TLA020007R6700	
8 m long spiral cable for JSTD25P-1	JSTK80S	2TLA020007R6800	

Control devices
Fox foot operated safety switches



Features

- Control device that frees the hands
- Three-position pedal
- High safety level
- Robust

In order to fulfil the need for a small and easy to install E-stop, Smile has been developed. The size of the device makes it possible to be installed wherever you want. With M12 connections or cable and centralised mounting holes Smile is very easy to install, especially on aluminium extrusions. Smile is available for E-stops in both dynamic and static safety circuits i.e. for interfacing to Vital system/Pluto safety PLC and Safety relays. Each version is available with either one or two M12 connections or cable. Two M12 connectors are used to enable the connection of E-stops in series, which is often used with dynamic safety circuits fulfilling safety category 4. In the top of the Smile Tina E-stop unit, LEDs show the actual status according to the dynamic system:
Green = everything is OK, Red = E-stop activated.
Flashing Red/Green = Stop activated from another preceding device. Smile is also available with black push button and used as a safety stop. See section on safety stops.

Three-position function, Fox 31/32

A safe three-position foot operated device means that:
1. Stop signals are provided in the top and bottom positions.
2. Start/ready signals for separate starting are provided in a distinct middle position.
3. After a stop in the bottom position a start or clear signal cannot be given before the reset knob has been operated and then the pedal pushed into its middle position.

Two-position function, Fox 21/22

A two-position foot operated device means that:
1. A stop signal is provided in the top, or pedal released, position.
2. A start/ready signal for separate starting is given in the bottom, or fully depressed, position

Safety cover protects against unintentional actuation.
A robust metal safety cover prevents unintentional machine start by a person or falling objects, thereby fulfilling the standards which demand this. The robust aluminium safety cover can withstand harsh environments.

Safety level

A high safety level is secured by monitoring the pedal's double contacts with one of our safety relays. Furthermore the third 'emergency' position of the Fox 31/32 pedal enhances safety.

7

Selection

		Product Hierarchy 4700007	
Description	Part No	Order Code	Price
FOX 21 Two position single footswitch	20-160-21	2TLA020007R5000	
FOX 22 Two position double footswitch	20-160-22	2TLA020007R5300	
FOX 31 Three position single footswitch	20-160-01	2TLA020007R5100	
FOX 32 Three position double footswitch	20-160-02	2TLA020007R5400	

Emergency stops
Why you need emergency stops

So that anyone is able to stop a machine during a malfunction or if someone is in danger

How do I recognise an E-stop?

E-stop buttons shall according to relevant standards be red with a yellow background. An emergency stop grab wire shall be red for high visibility. A sign that indicates the location of the E-stop shall be green with a white picture and possibly with text in the local country's language.

How shall an E-stop stop the machine?

An E-stop shall stop the machine as quickly as possible. To obtain a quick stop one either removes the power directly or one lets a frequency converter 'run down' and afterwards after a little delay, remove the power. An E-stop shall not create other hazards. Therefore a risk analysis must be made for the E-stop to be correctly connected.

Requirements for E-stops are stated in the following standards and regulations

2006/42/EC The Machinery Directive
Clause 1.2.4.3 in Annex 1 gives requirements for the emergency stop function for new machines). See also clause 1.2.2 Control devices. (see chapter “Standard and Regulations”)

Council Directive 89/655/EEC (with amendments) concerning the minimum safety and health requirements for the use of work equipment by workers at work
Clause 2.4 gives the requirements for the emergency stop function for older machines. See also clause 2.1. (see chapter “Standard and Regulations”)

EN ISO 13850 Safety of machinery - Emergency stop Principles for design
A harmonized standard that gives technical specifications for the requirements in the Machinery Directive. Could also be used for older machinery.

EN 60204-1 Safety of Machinery - Electrical equipment of machines – Part 1: General requirements.
Harmonized standard that gives requirements for the electrical equipment of machinery including the emergency stop actuator/function. Se clauses 9.2.2 and 9.2.5.4.2.

Emergency stops
Inca1 & Inca1 Tina emergency stops for enclosures

Advantages

- Terminal blocks
- Emergency push button up to cat. 4/PL e acc. to EN ISO 13849-1
- Only 53 mm's construction depth
- Push button IP65, connector IP20
- Available as safety stop (black pushbutton)
- With LED info in print
- With LED info in push button (Inca1 Tina)
- Info output (Inca1 Tina)

Inca1 is an emergency stop designed for installation in 22.5 mm holes on cabinets. "INCA 1" has potential free contacts for connection to safety relays. The connection is made in cabinets via a removable terminal which also have excellent measuring points. Inca 1 is also available with a black pushbutton and used as a safety stop.

Inca1 Tina is also available with electronic adjustment of the dynamic safety loop for connection to the Vital and Pluto units. The connection is made in equipment cabinets via a removable terminal block which also has marked measuring points. Inca 1 Tina is also available with black push button and is used in this case as a safety stop.

Selection

Description	Part No	Product Hierarchy 4700008 Order Code	Price
INCA 1	30-054-01	2TLA030054R0100	
INCA 1 Tina	30-054-00	2TLA030054R0000	
INCA 1S	30-054-03	2TLA030054R0300	
INCA 1S Tina	30-054-02	2TLA030054R0200	
Mounting:	22,5mm diameter		
Operating voltage (LED):	INCA 1: 24 VDC INCA 1 Tina: 24VDC +15% -25%		

Emergency stops
Smile emergency stops with LED

Advantages

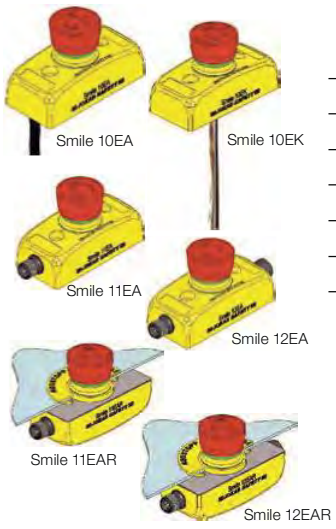
- Emergency push button up to cat. 4/PL e acc. to EN ISO 13849-1
- Robust
- Push button IP65, enclosure IP67
- Available as safety stop (black pushbutton)
- With LED info in push button

Smile
small and cost effective E-stop

In order to fulfil the need for a small and easy to install E-stop, Smile has been developed. The size of the device makes it possible to be installed wherever you want. With M12 connection/s or cable and centralised mounting holes Smile is very easy to install, especially on aluminium extrusions. Smile is available for E-stops in both dynamic and static safety circuits i.e. for interfacing to Vital/Pluto and Safety relays. Each version is available with either one or two M12 connections or cable. At the top of Smile, a LED shows the current status as: green = protection OK, red = this emergency stop has been pressed and if the LED is off, an emergency stop earlier in the loop has been actuated. Smile is also available with black push button and is used as a safety stop. See section on safety stops.

Smile emergency stop has six different variants:

1. Smile 10EA has a 1 m cable connected through the base of the unit.
2. Smile 10EK has four 1 m short connecting leads through the base of the unit. No LED.
3. Smile 11EA has a five-pole M12 connector on one end of the unit.
4. Smile 12EA has two five-pole M12 connectors, one on each end of the unit.
5. Smile 11EAR has one 5-pole M12 connector at one end.
6. Smile 12EAR has two 5-pole M12 connectors at each end.



Selection

		Product Hierarchy 4700008	
Description	Part No	Order Code	Price
Smile 10EA with 1 m cable	30-051-04	2TLA030051R0400	
Smile 10EK with short connecting leads (No LED connection)	30-051-06	2TLA030051R0600	
Smile 11EA with M12 male connector	30-051-00	2TLA030051R0000	
Smile 12EA with male and female M12 connectors	30-051-02	2TLA030051R0200	
Smile 11EAR	30-051-01	2TLA030051R0100	
JST2 termination for Smile 12	-	2TLA030051R1300	

Emergency stops
Smile Tina emergency stops with LED

Advantages

- Emergency push button up to cat. 4/PL e acc. to EN ISO 13849-1
- Light grids, emergency stop and Eden in the same safety loop together with Vital or Pluto gives cat. 4/PL e acc. to EN ISO 13849-1
- With LED indication on push button
- Robust
- Info-signal from each emergency stop
- Push button IP 65, housing IP67
- Available as safety stop (black push button)

Smile
small and cost effective E-stop

In order to fulfil the need for a small and easy to install E-stop, Smile has been developed. The size of the device makes it possible to be installed wherever you want. With M12 connections or cable and centralised mounting holes Smile is very easy to install, especially on aluminium extrusions. Smile is available for E-stops in both dynamic and static safety circuits i.e. for interfacing to Vital system/Pluto safety PLC and Safety relays. Each version is available with either one or two M12 connections or cable. Two M12 connectors are used to enable the connection of E-stops in series, which is often used with dynamic safety circuits fulfilling safety category 4. In the top of the Smile Tina E-stop unit, LEDs show the actual status according to the dynamic system:
Green = everything is OK, Red = E-stop activated.
Flashing Red/Green = Stop activated from another preceding device. Smile is also available with black push button and used as a safety stop. See section on safety stops.

Smile emergency stop has four different variants:

1. Smile 10EA Tina has a 1 m cable connected via the base of the unit.
2. Smile 11EA Tina has a five-pole M12 connector on the end of the unit for connecting the ABB Jokab Safety cable.
3. Smile 12EA Tina has two five-pole M12 connectors, one on each end of the unit for connecting the ABB Jokab Safety cable.
4. Smile 11EAR Tina has one 5-pole M12 connector at one end for connection of cable from ABB Jokab Safety.


Smile 10EA Tina


Smile 10EK Tina


Smile 11EA Tina

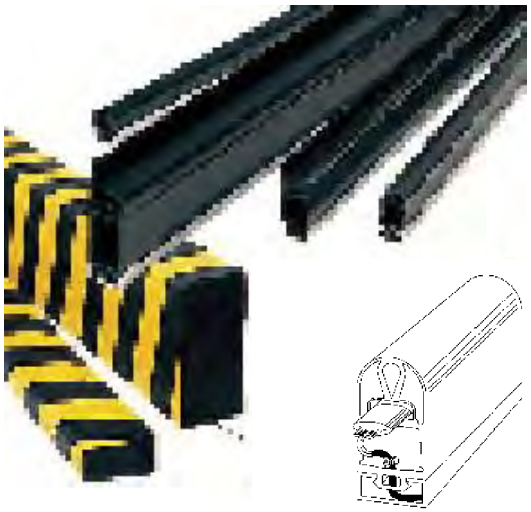

Smile 12EA Tina

Selection

Description	Part No	Product Hierarchy 4700008 Order Code	Price
Smile 10EA Tina with 1 m connection cable	30-050-04	2TLA030050R0400	
Smile 11EA Tina with M12 male connector	30-050-00	2TLA030050R0000	
Smile 12EA Tina with male and female M12 connectors	30-050-02	2TLA030050R0200	
Smile 11EAR Tina	30-050-01	2TLA030050R0100	
Smile 11SA Tina	30-050-05	2TLA030050R0500	

Note. There are versions for use with relay technology (without Tina).

Contact rails and bumpers



Utilisation

- Protection against squeezing accidents on moving machine parts and automatic doors

Advantages

- Can be connected to a safety relay, Vital or Pluto
- Supplied in customised lengths
- IP 65
- Simple assembly on site
- Lengths up to 25 m

Safety contact rails and bumpers as safety devices for potentially dangerous machines

Safety contact rails

Contact edges are used as protection against crushing injuries, for example, moving machine parts, automatic doors.

Contact edges with cast-in contact strips

Our new contact edges consist of a rubber profile with a cast-in contact strip. They are made up simply using connection plugs that are glued to the ends together with a terminal cap. The rubber profile is fitted on an aluminium profile.
Available in EPDM design. Supplied in lengths up to 25 m.

Contact edges with contact strips SKS 18

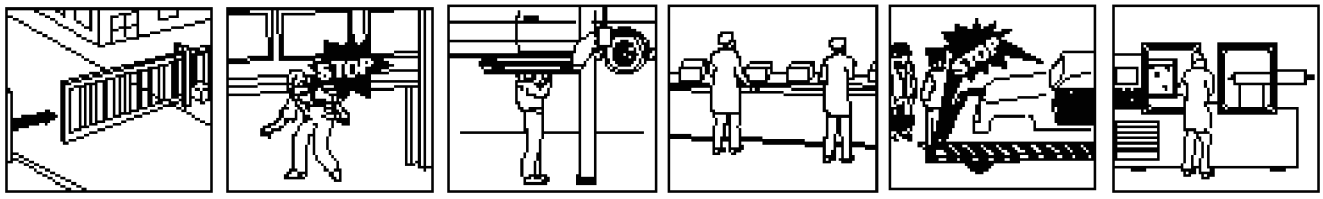
The contact edge consists of a rubber profile with a safety contact strip inside. The contact edge is fitted on an aluminium profile.
The special design of rubber profiles of EPDM or NBR rubber protect the inner contact strip in the best way possible against damage and also allow for a contact angle exceeding ±45°.
Normally supplied in lengths up to 25 m.

Bumpers

Bumpers are employed on automatic production lines to minimise danger to both people and machines. The large foam rubber cushions enable long practical braking and run-through distances, thus enabling designers to optimise protection for both personnel and machines.

The safety contact strips are mounted inside aluminium profiles which are, in turn, protected by the large foam cushions that are glued to the carrier profile and then sprayed with a thin film of polyurethane which makes the bumper waterproof and helps to minimise wear and tear.

The bumpers are delivered mounted to the carrier profile in ordered lengths (0,2 m – 3 m).



Contact rails and bumpers

Technical data - Contact Rails

Mechanical load max [1]	500 N
Actuating angle (DIN)[1]	2x 20°
Mechanical life[1]	10^5
Max. operate temp. range[2]	-20C° to +55°C
Max. temperature range	-25°C to +70°C
Protection classification	IP 65
Max. Electrical load	24V 100mA
Resistance	0.6 Ohm/m
Conductors	GP: 2x 0.38 mm^2 GE: 2x 0.34 mm^2
Conductors insulation material	GP: PVC GE: PUR matt blackt

(1) According to DIN 31006-2 (GS - BE - 17)
(2) Not including DIN 31006-2 (GS - BE - 17)

Technical data - Bumpers

Dimensions - Length	Max. 3000mm
Protection rating	IP 65
Connection cable	2 x 2m; 2 x 0,34 mm^2 PU

Selection

		Product Hierarchy 4700008	
Description	Part No	Order Code	Price
Safety contact rail 25-25 EPDM	76-025-25	2TLJ076025R2500	
Safety contact rail 25-40 EPDM	76-025-40	2TLJ076025R4000	
Safety contact rails 25-25 NBR	76-125-25	2TLJ076125R2500	
Safety contact rails 25-40 NBR	76-125-40	2TLJ076125R4000	
Production cost 2+2m cable	76-009-01	2TLJ076009R0100	
Production cost 5+5 m cable	76-009-05	2TLJ076009R0500	
Production cost 7+7 m cable	76-009-08	2TLJ076009R0800	
Production cost 10+10 m cable	76-009-10	2TLJ076009R1000	
Bumper ASB 53/100 black	76-200-01	2TLJ076200R0100	
Bumper ASB 100/200 black	76-200-02	2TLJ076200R0200	
Bumper ASB 150/300 black	76-200-03	2TLJ076200R0300	
Bumper ASB 200/400 black	76-200-04	2TLJ076200R0400	
Bumper ASB 53/100 black/yellow	76-200-05	2TLJ076200R0500	
Bumper ASB 100/200 bl./yl.	76-200-06	2TLJ076200R0600	
Bumper ASB 150/300 bl./yl.	76-200-07	2TLJ076200R0700	
Bumper ASB 200/400 bl./yl.	76-200-08	2TLJ076200R0800	

Safety mats

Certified according to EN 1760-1.

Application:

- Personal protection within the dangerous areas around presses, robots, production lines, machines etc.

Features:

- Can be connected to a safety relay, Vital or Pluto
- Very durable
- IP 67

CE

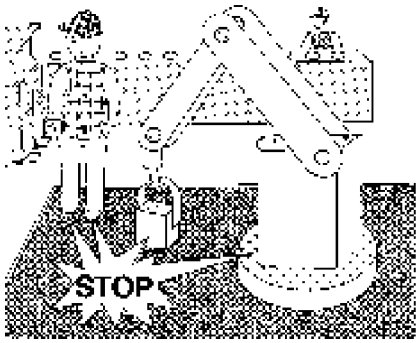
The ASK Safety Mat is used as personal protection within the dangerous areas.

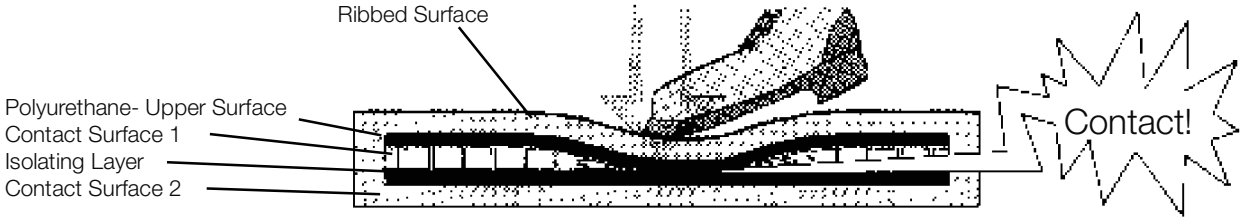
When connected to a suitable monitoring system stepping on the Safety Mat will immediately be detected causing dangerous machine movements to be stopped. This is made possible by the detection of electrical contacts closing within the sandwich construction of the Mat. As a load-bearing component the Mat is made with a bottom plate of either synthetic material or metal. The Safety Mat is provided with a ribbed surface, which is fixed by adhesive to the surface of the Safety Mat.
The safety mat and its connection cabling can be supervised by a suitable ABB Jokab Safety safety relay, which provides PL d.

The basic Mat construction consists of a ground plate of either PVC, Aluminium or Stainless Steel which provides protection against uneven ground etc. The Mat is made up of a sandwich construction, the pressure contact switch consisting of two conducting sheets separated from each other by a webbed isolating layer. The internal switching surface is cast into a durable polyurethane to protect against moisture, and this is then covered with a top layer of ribbed or chequered rubber mat or a thin aluminium plate.

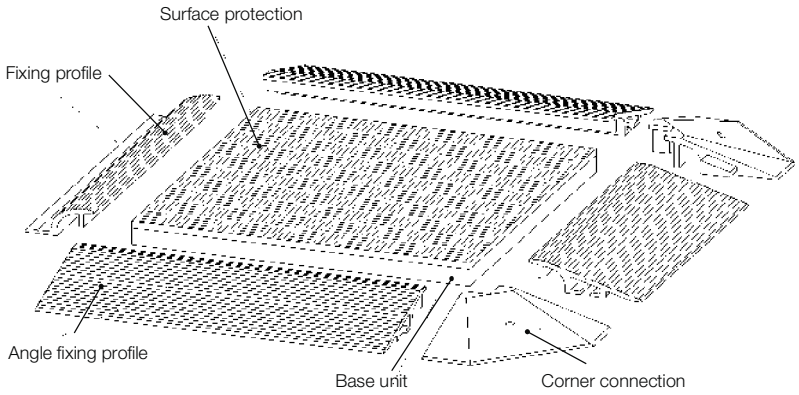
Attachment to the floor is by means of a ramped edge trim or a z-profile made of aluminium. The ramp profile has a channel for connection cables.

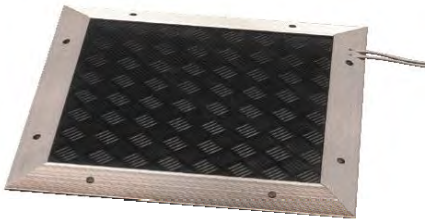
Custom Mats can be made, i.e. special shape, resistant against harsh industrial environments (mineral oil, acid, bleach etc.) or with a non-slip surface or M12-contacts.





Safety mats





Technical data - general	
Max. area	Entire mat = 2350 x 1350 mm 10 m^2 (divided mat) Rec. relation max 3:1 Min 100x100 mm
Height	10mm without ribbed surface max 14.5 mm with ribbed surface
Inactive Area	Nominally 10 mm from Mat edge
Material	Black polyurethane, other colours on request
Protection Class	IP 67
Ambient Air Temperature	0°C to +60°C
Chemical Resistance Oil, grease 10% acid 10% alkaline (caustic) solutions	 good resistant resistant
Cable	2 x 5 m, 2 x 0,34 mm^2, PU sheathed
Mechanical Life	> 1,5x10^6 load shifting

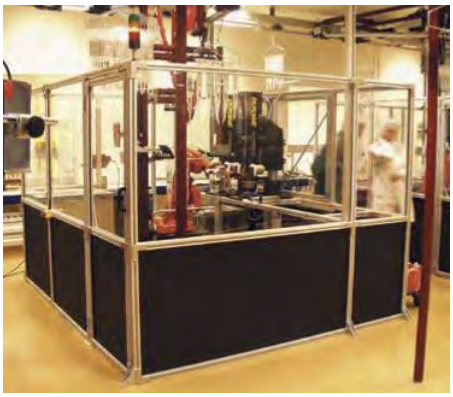
7

Selection

		Product Hierarchy 4700009	
Description	Part No	Order Code	Price
Safety mat ASK-1U4.4-RF 750x1000mm, 5+5m cables	76-310-05	2TLJ076310R0500	
Safety mat ASK-1U4.4-RF 1000x1000mm, 5+5m cables	76-310-06	2TLJ076310R0600	
Safety mat ASK-1U4-RF 1000x1500mm, 5+5m cables	76-310-07	2TLJ076310R0700	
Safety mat ASK-1T4.4-RF 750x1000mm, 5+5m cables	76-310-10	2TLJ076310R1000	
Safety mat ASK-1T4.4-RF 1000x1000mm, 5+5m cables	76-310-11	2TLJ076310R1100	
Safety mat ASK-1T4.4-RF 1000x1500mm, 5+5m cables	76-310-12	2TLJ076310R1200	
RS 14, Ramp rail in aluminium	76-300-05	2TLJ076300R0500	
BS 14 profile for ASK and KMS in alumini	76-300-08	2TLJ076300R0800	
Corner piece	76-300-09	2TLJ076300R0900	

Fencing systems
Quick-Guard

Quick-Guard Standard assembled with mesh.

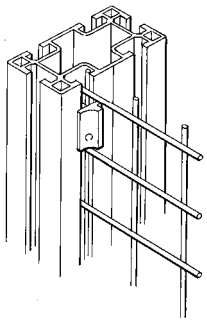


Quick-Guard Standard with black and transparent Polycarbonate in-fill panels as used for medical applications.

Quick-Guard E with few components and easy to angle at up to 45°.

Adaption and Modification

Quick-Guard is a very flexible fencing system consisting of a minimum of different components, e.g. aluminium profiles, patented brackets, net-locks, mesh, solid or noise reduction panels. Using these components there are almost no limitations as to what can be built. Quick-Guard fencing costs little to assemble and modify.

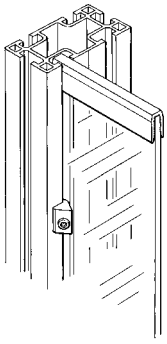


Assembly

Due to our patented screw-lock system, we can supply all brackets pre-mounted with fixing screws and nuts. No holes need to be drilled in the profiles and all cutting is straight. This makes assembly and modification very easy.

Two versions of Quick-Guard

The Quick-Guard fencing system is available in two versions, Quick-Guard (Standard) and Quick-Guard E which also can be combined. The fencing systems are also easy to adjust when production equipment is modified and/or moved.



Proposal and ordering

By utilising our AutoCAD-based SafeCAD program we are able to make system designs in 3-D very quickly. Drawings, cutting lists, etc. are generated from SafeCAD and the drawings can also be used for installation purposes.

Our policy - To create systems that are environmentally friendly and provide ergonomic working conditions.

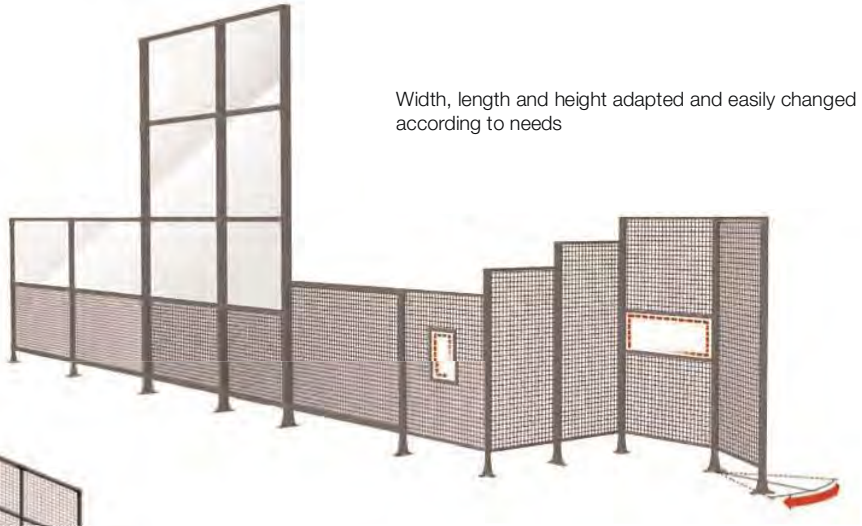
Quick-Guard is environmentally friendly. All components in the Fencing System can easily be disassembled and reused. All materials in the Fencing System are 100% recyclable. Quick-Guard can also provide a pleasing ergonomic working environment.

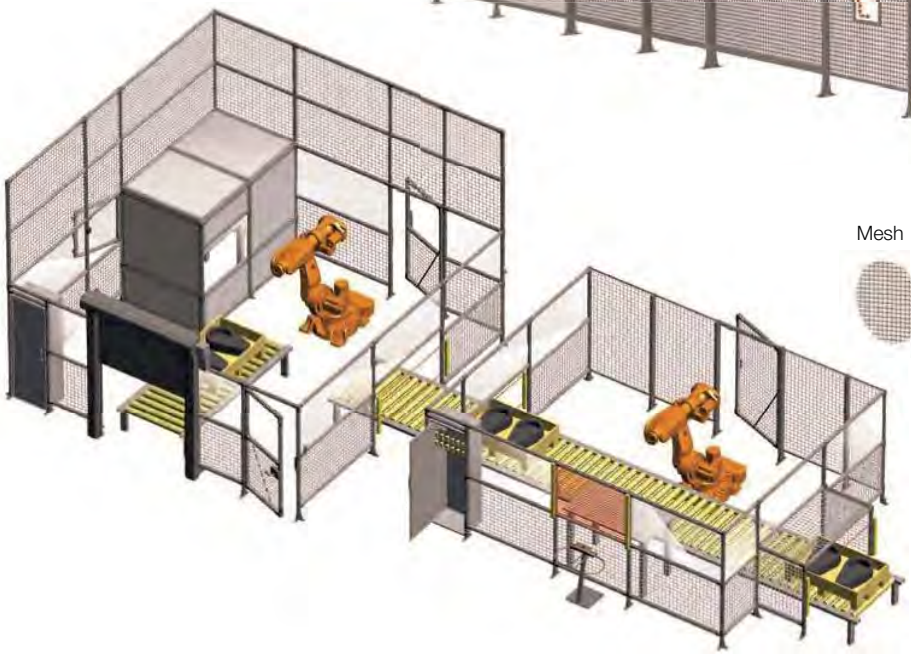
Fencing systems
Quick-Guard

A flexible and stable fencing system which is easy to install

Fixings with pre-mounted screws and nuts mean easy assembly

Width, length and height adapted and easily changed according to needs





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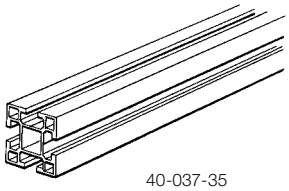
Fencing systems
Quick-Guard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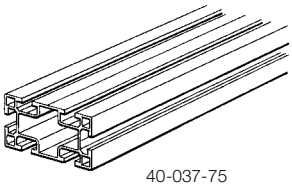
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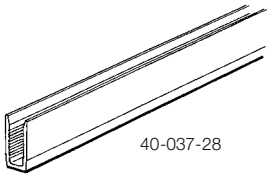
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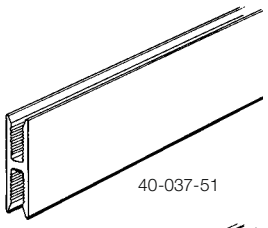
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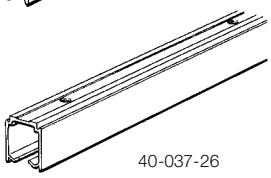
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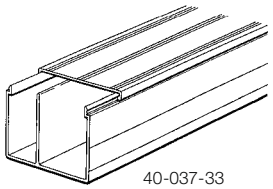
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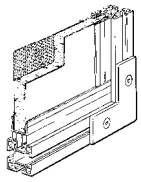
Selection

Description	Part No	Product Hierarchy 4700009 Order Code	Price
Fencing profiles			
JSM A44A Al. extrusion 44x44mm, untreated, per m	40-037-97	2TLJ040037R9700	
JSM A44A Al. extrusion 44x44mm, L=1400mm	40-037-98	2TLJ040037R9800	
JSM A44A Al extr. 44x44mm per m	40-037-35	2TLJ040037R3500	
JSM A44A Al extr. 44x44mm, L=1100mm	40-037-36	2TLJ040037R3600	
JSM A44A Al extr. 44x44mm, L=2000mm	40-037-37	2TLJ040037R3700	
JSM A44A Al extr. 44x44mm, L=2200mm	40-037-38	2TLJ040037R3800	
JSM A44A Al extr. 44x44mm, L=2400mm	40-037-39	2TLJ040037R3900	
JSM A44A Al extr. 44x44mm, L=2500mm	40-037-40	2TLJ040037R4000	
JSM A44A Al extr. 44x44mm, L=6000mm	40-037-41	2TLJ040037R4100	
JSM A4488A Al extr. 44x88mm per m	40-037-42	2TLJ040037R4200	
JSM A4488A Al extr. 44x88mm, L=2200mm	40-037-44	2TLJ040037R4400	
JSM A4488A Al extr. 44x88mm, L=6000mm	40-037-45	2TLJ040037R4500	
JSM A4416 Al. extrusion 44x16.5mm per m	40-037-70	2TLJ040037R7000	
JSM A4416 Al. extrusion 44x16.5mm, L=6000mm	40-037-74	2TLJ040037R7400	
JSM A8888 Al. extrusion 88x88mm per m	40-037-75	2TLJ040037R7500	
JSM A8888 Al. extrusion 88x88mm, L=6000mm	40-037-79	2TLJ040037R7900	
JSM A4426 Al. extrusion 44x26mm per m	40-037-80	2TLJ040037R8000	
JSM A4426 Al. extrusion 44x26mm, L=6000mm	40-037-81	2TLJ040037R8100	
Fencing U profiles			
JSM A12 Edge protection U-profile per m	40-037-28	2TLJ040037R2800	
JSM A12-1076 U-profile L=1076mm	40-037-27	2TLJ040037R2700	
JSM A12-1476 U-profile L=1476mm	40-037-46	2TLJ040037R4600	
JSM A12-2000 U-profile L=2000mm	40-037-47	2TLJ040037R4700	
Fencing H profiles			
JSM A13 H-profile, natural anodised for Express per m	40-037-50	2TLJ040037R5000	
JSM A13-1076 H-profile natural anodised for Express, L=1076mm	40-037-51	2TLJ040037R5100	
JSM A13-1076 H-profile natural anodised for Express, L=1476mm	40-037-52	2TLJ040037R5200	
JSM A13-1076 H-profile natural anodised for Express, L=2020mm	40-037-53	2TLJ040037R5300	
Guide rails			
JSM A3130B guide rail incl. mounting components	40-037-26	2TLJ040037R2600	
JSM A56 Guiding rail in alu. incl. screw, L=2m	40-037-08	2TLJ040037R0800	
JSM A56 Guiding rail in alu. incl. screws	40-037-49	2TLJ040037R4900	
JSM A56-6000 Guiding rail in alu. L=6m incl. screws	40-037-48	2TLJ040037R4800	
Cable ducting			
JSM A11 Coverstrip alu. L=2m	40-037-12	2TLJ040037R1200	
JSM A25A Cable duct 44x25mm, w. holes incl. cap, L=2m	40-037-13	2TLJ040037R1300	
JSM A25B Cable duct 44x25mm incl. cap, L=2m	40-037-14	2TLJ040037R1400	
JSM A60A Cable duct 44x60mm w. holes incl. cap, L=2m	40-037-15	2TLJ040037R1500	
JSM A60B Cable duct 44x60mm incl. cap, L=2m	40-037-16	2TLJ040037R1600	
JSM A88 Cable duct 88x68mm, L=2m	40-037-33	2TLJ040037R3300	
JSM A4488A Al extr. 44x88mm, L=2000mm	40-037-43	2TLJ040037R4300	
JSM A4488A Al extr. 44x88mm, L=2000mm	40-037-43	2TLJ040037R4300	

Fencing systems
Quick-Guard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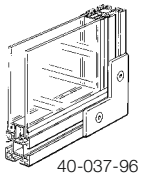
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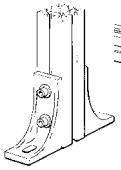
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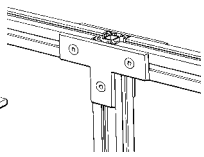
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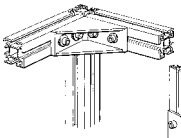
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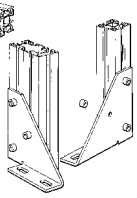
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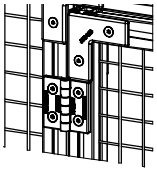
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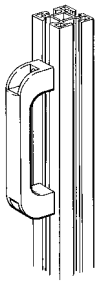
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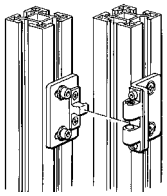
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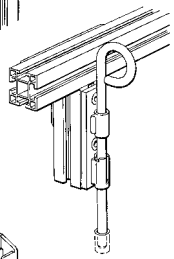

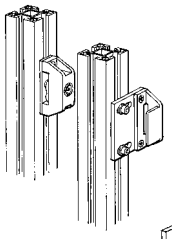
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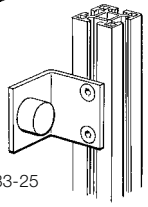
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Selection

Description	Part No	Product Hierarchy 4700009 Order Code	Price
Acoustic damping profiles			
JSM AS1 Al-Profile for 25mm sound absorbing panel, per m	40-037-95	2TLJ040037R9500	
JSM AS2 Al-Profile for 2x5mm PC sheet, per m	40-037-96	2TLJ040037R9600	
JSM AS1 Al-Profile for 25mm sound abs. panel, L=2m	40-037-09	2TLJ040037R0900	
JSM AS2 Al-Profile for 2x5mm PC sheet, L=2m	40-037-10	2TLJ040037R1000	
Fittings			
JSM 39-K Floor/angle bracket Alu. Premounted	40-030-14	2TLJ040030R1500	
JSM 30B-K Floor bracket	40-030-06	2TLJ040030R0700	
JSM 30B-K1 Angle bracket with four screws	40-030-11	2TLJ040030R1300	
JSM 31B-K Small angular bracket	40-030-13	2TLJ040030R1400	
JSM 36-K1 Floorbracket in steel for JSM A4488A	40-030-09	2TLJ040030R1000	
JSM 36-K2 Floorbracket in steel for JSM A44A	40-030-10	2TLJ040030R1100	
JSM 32B-K L-bracket premounted	40-030-07	2TLJ040030R0800	
JSM 33B-K T-bracket premounted	40-030-08	2TLJ040030R0900	
JSM 37 Support clip Express	40-033-31	2TLJ040033R3100	
JSM 35-K Hinge w. screw c-c47	40-033-14	2TLJ040033R1500	
JSM 34B-K I-bracket premounted with screws	40-030-15	2TLJ040031R0600	
Door components			
JSM D1A Hinge incl screw c-c62	40-033-15	2TLJ040033R1600	
JSM D2 Handle incl. screws	40-033-01	2TLJ040033R0200	
JSM D3 Doorcloser incl mounting comp	40-033-02	2TLJ040033R0400	
JSM D11B Ball latch	40-033-41	2TLJ040033R4100	
JSM D11C Ball latch for sliding door	40-033-42	2TLJ040033R4200	
JSM D16 Key for JSM D15 Cam lock	40-033-44	2TLJ040033R4400	
JSM D4K Fitting EDEN/EDEN E Stainless steel	40-033-45	2TLJ040033R4500	
JSM D10A Pullock extended	40-033-21	2TLJ040033R2200	
JSM D10 Pullock	40-033-20	2TLJ040033R2100	
JSM D10B Door bolt with spring	40-033-38	2TLJ040033R3800	
JSM D15 Cam lock excl. key, polyamid black	40-033-39	2TLJ040033R3900	
JSM D13A Doorstop angular	40-033-26	2TLJ040033R2700	
JSM D13B Doorstop horizontal	40-033-27	2TLJ040033R2800	
JSM D14 Crossbar L= 1160 mm	40-033-28	2TLJ040033R3000	
JSM D5 Suspension wheel	40-033-04	2TLJ040033R0500	
JSM D6 Sliding element, rect.	40-033-05	2TLJ040033R0600	
JSM D7 Sliding element, round	40-033-06	2TLJ040033R0700	
JSM D8 Sliding element, guide	40-033-07	2TLJ040033R0800	
JSM D12 Guiding pin vertical	40-033-22	2TLJ040033R2300	
JSM D12A Guiding pin horizontal	40-033-23	2TLJ040033R2400	
JSM D12B Guiding bracket	40-033-24	2TLJ040033R2500	
JSM D13 Doorstop vertical	40-033-25	2TLJ040033R2600	
JSM D9 Guide roller w. locking mechanism	40-033-08	2TLJ040033R0900	
JSM D4A Fittings for JSNY5 conv. opening door	40-033-09	2TLJ040033R1000	
JSM D4B Fittings for JSNY5 switch fittings	40-033-10	2TLJ040033R1100	
JSM D9-K Guide roller w. Lock mechanism 75/79 incl. angle	40-033-11	2TLJ040033R1200	

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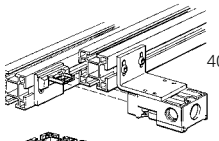
Fencing systems
Quick-Guard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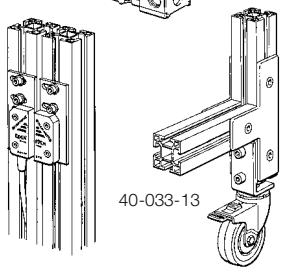
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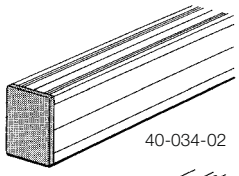
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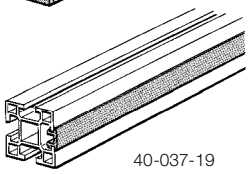
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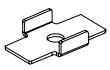
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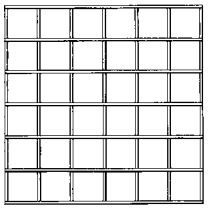
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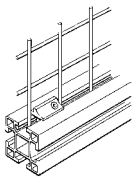
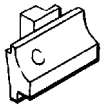
Selection

Description	Part No	Product Hierarchy 4700009 Order Code	Price
Door components cont.			
JSM D9A Guide roller 75/79	40-033-12	2TLJ040033R1300	
JSM D9A-K Guide roller 75/79 incl. angle	40-033-13	2TLJ040033R1400	
JSM D4H Fitting for ADAM/EVA incl. accessories	40-033-36	2TLJ040033R3600	
JSM D4AA Fittings for JSNY5	40-033-34	2TLJ040033R3400	
JSM D4D Fittings for JSNY8 sliding door	40-033-17	2TLJ040033R1800	
JSM D4E Fitting for JSNY7M/R	40-033-18	2TLJ040033R2000	
JSM D4G Fittings for JSNY7	40-033-33	2TLJ040033R3300	
JSM D4C Fittings for JSNY8/9 conventional door	40-033-16	2TLJ040033R1700	
Terminal caps and strips			
JSM L1A Terminal cap yellow for JSM A44A	40-034-00	2TLJ040034R0000	
JSM L2 Term. cap for JSM A25 grey	40-034-01	2TLJ040034R0100	
JSM L3 Term. cap for JSM A60 grey	40-034-02	2TLJ040034R0200	
JSM L1B Terminal cap grey for JSM A44A	40-034-03	2TLJ040034R0300	
JSM L4A Terminal cap yellow for JSM A4488A	40-034-04	2TLJ040034R0400	
JSM L4B Terminal cap grey for JSM A4488A	40-034-05	2TLJ040034R0500	
JSM T3A Coverstrip yellow, L=2m	40-037-31	2TLJ040037R3100	
JSM T3B Coverstrip grey, L=2m	40-037-32	2TLJ040037R3200	
JSM T2A Wide cover strip yellow	40-037-19	2TLJ040037R1900	
Accessories			
JSM M5B Specialnut M5	40-035-04	2TLJ040035R0400	
JSM M6B Specialnut M6	40-035-05	2TLJ040035R0500	
JSM M8B Specialnut M8	40-035-06	2TLJ040035R0600	
JSM M4B Specialnut M4	40-035-07	2TLJ040035R0700	
JSM X1 Cable tie 2.5-7.8mm, nylon black UV stable, 10pcs	40-033-43	2TLJ040033R4300	
JSM B4C Centering plate M4 Steel galvanised	40-035-50	2TLJ040035R5000	
JSM B5C Centering plate M5 Steel galvanised	40-035-51	2TLJ040035R5100	
JSM B6C Centering plate M6 Steel galvanised	40-035-52	2TLJ040035R5200	
JSM B8C Centering plate M8 Steel galvanised	40-035-53	2TLJ040035R5300	
Surfaces			
JSM YN40W1 Welded mesh black, 40x40x3.5mm, 2020x865mm	40-040-13	2TLJ040040R1300	
JSM YN40W2 Welded mesh black, 40x40x3.5mm, 1074x1816mm	40-040-14	2TLJ040040R1400	
JSM YN40W3 Welded mesh black, 40x40x3.5mm, 1074x2016mm	40-040-15	2TLJ040040R1500	
JSM YN40W9 Welded mesh black, 40x40x3.5mm, cut to size	40-040-16	2TLJ040040R1600	
JSM YN40WE2 Stainless steel, 40x40x3.5mm, 1074x1816mm	40-040-18	2TLJ040040R1800	
JSM YN40WE9 Stainless steel, 40x40x3.5mm, cut to size	40-040-19	2TLJ040040R1900	
JSM YN40W4 Welded mesh black, 40x40x3.5mm, 1474x2016mm	40-040-20	2TLJ040040R2000	
JSM YN40W5 Welded mesh black, 40x40x3.5mm, 1474x1816mm	40-040-21	2TLJ040040R2100	
JSM YN40WE1 Stainless steel, 40x40x3.5mm, 2020x864mm	40-040-25	2TLJ040040R2500	
JSM YN40W6 Welded mesh black, 40x40x3.5mm, 2020x754mm	40-040-26	2TLJ040040R2600	
JSM YN40W7 Welded black mesh, 40x40x3.5mm, 2020x1174mm	40-040-27	2TLJ040040R2700	
JSM YN40W10 Welded black mesh 40x40x3,5m	40-040-28	2TLJ040040R2800	
JSM YN40W11 Welded black mesh 40x40x3,5m	40-040-29	2TLJ040040R2900	

Fencing systems
Quick-Guard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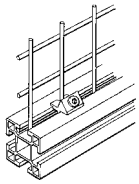

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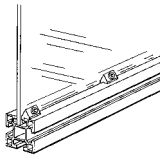

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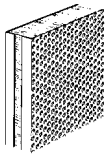
40-039-26

Selection

Description	Part No	Product Hierarchy 4700009 Order Code	Price
Surfaces cont.			
JSM NL2 Netlock in PA f welded	40-031-06	2TLJ040031R0800	
JSM NL3 Netlock f. welded mesh	40-031-08	2TLJ040031R0900	
JSM YPC5A1 PC sheet 5mm, uncoloured, 2020x865mm	40-039-10	2TLJ040039R1000	
JSM YPC5A2 PC sheet 5mm, uncoloured, 2020x1175mm	40-039-11	2TLJ040039R1100	
JSM YPC5A9 PC sheet 5mm, uncoloured, cut to size	40-039-12	2TLJ040039R1200	
JSM YPC4A9 PC sheet 4mm, uncoloured, cut to size	40-039-16	2TLJ040039R1600	
JSM YPC5A3 PC sheet 5mm, uncoloured, 1076x1816mm	40-039-17	2TLJ040039R1700	
JSM YPC5A4 PC sheet 5mm, uncoloured, 1076x2016mm	40-039-18	2TLJ040039R1800	
JSM YPC5A5 PC sheet 5mm, uncoloured, 960x1698mm	40-039-19	2TLJ040039R1900	
JSM YPC3AC9 PC for welding, dark brown 3mm, cut to size	40-039-24	2TLJ040039R2400	
JSM YPC3AC1 PC for welding, dark brown 3mm, 2050x3000mm	40-039-25	2TLJ040039R2500	
JSM YLA25A1 Sound absorbing panel 25mm, white/gal, 1963x1200mm	40-039-26	2TLJ040039R2600	
JSM YGP1A9 Steel panel 1.0mm, X-reinforced, per m2	40-039-07	2TLJ040039R0700	
JSM PL1A Securing strip L=842mm	40-038-01	2TLJ040038R0100	
JSM PL1B Securing strip L=1152mm	40-038-02	2TLJ040038R0200	
JSM PL1C Securing strip L=2000mm	40-038-03	2TLJ040038R0300	
JSM PL1D Securing strip L=732mm	40-038-04	2TLJ040038R0400	
JSM G2 Cellular rubber for securing glass, self-adhesive	40-038-06	2TLJ040038R0600	
JSM PL2A Securing strip L=842mm, for 4mm sheets	40-038-07	2TLJ040038R0700	
JSM PL2B Securing strip L=1152mm, for 4mm sheets	40-038-08	2TLJ040038R0800	
JSM PL2C Securing strip L=2000mm, for 4mm sheets	40-038-09	2TLJ040038R0900	
JSM PL2D Securing strip L=732mm, for 4mm sheets	40-038-10	2TLJ040038R1000	
JSM PL3 Securing component for 5mm infill panels	40-038-11	2TLJ040038R1100	