

## 1. Function and Configuration

Roller or Lift gates are frequently installed in safety fences. They allow a regular or individual access to production plants, which may be necessary for the inserting or removal of work pieces. If the roller gate is not completely closed, it has to be guaranteed that the plant operator cannot be endangered.

Safety switches, which are integrated into the safety chain of the plant control, serve for recognising the safe position (gate closed). Independently of it further position switches are used, which control the movement of the gate and detect its position.

The advantages of non-contact transponder-based safety switches (insensitivity to dirt, mechanical adjustment, manipulation etc.) can also be used for recognising and controlling the gate position. This special type of SIDENT/IV does not only monitor the "safe" position of the gate; it is further able to detect and to report a total of fife positions (end positions, switching the speed from slow to fast and from fast to slow).

The SIDENT/IV is mounted at a suitable place of the gate (e.g. laterally the gate) so that it can detect the actuating element which is mounted at the gate or integrated into the gate itself. A specific code is assigned to each of the five actuating elements ("safe" end position, two or three change-over positions and one <u>not</u> safety-related end position).

On basis of this specific code SIDENT/IV is able to recognise which actuating element is in the reading range at the moment.

All electronic components of the safety switch are fitted in just one sensor housing. Connectors are used for the connection. Three LEDs indicate the present status of the "safe" part (*red* for "no transponder recognised" and/or "error" and 2 x green for "transponder recognised"), four further LEDs indicate the present position.

The (two-channel) evaluation electronics of the safety-related part is electrically isolated from that part of the switch, which only controls the movement, so that no reaction is possible. Only the reading head, which is turned towards the actuating elements, is common to both systems.

## 2. Versions

2.1 SIDENT/IV for 4 Positions

#### (Ref. no. 13.14-47)

The safety-related position (gate closed) as well as position 1 of the <u>not</u> safety-related part are identical. This means, that the safety-related outputs and one <u>not</u> safety-related output respond to one and the same actuating element.

## 2.2 SIDENT/IV for 5 Positions (Ref. no. 13.14-47-100)

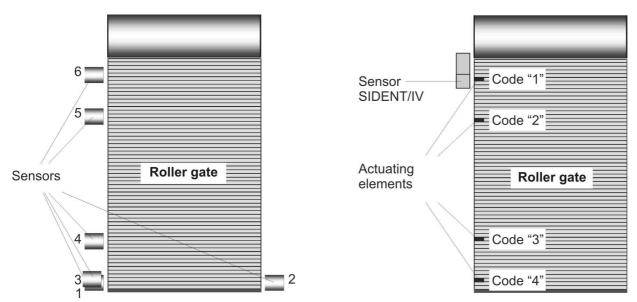
The safety-related position (gate closed) is not identical to any of the <u>not</u> safety-related positions. The switch-off and switching points are independent of the safe position (gate closed).

#### 2.3 SIDENT/IV for 4 Positions with Storage Behaviour (Ref. no. 13.14-47-201)

The safety-related position (gate closed) and position 1 of the <u>not</u> safety-related part are identical. In order to activate the frequency converters directly the positions 2 and 3 are equipped with storage behaviour. When passing position 2 the output A3.2 obtains the status "High" and maintains it until position 1 has been reached. When opening the gate and passing position 3 the output A3.3 obtains the status "High". When position 4 has been reached (upper end position) the output is reset to status "Low" and A3.4 is activated.

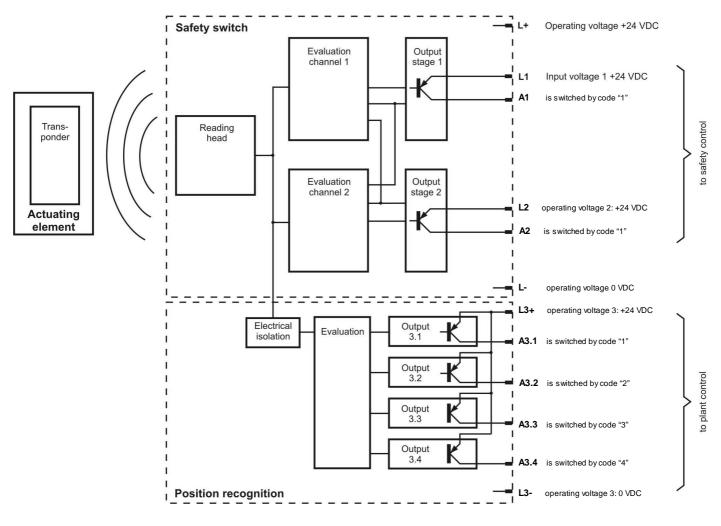
#### 2.4 SIDENT/IV for 4 Positions with 2 Safe Positions and Storage Behaviour (alternating gate) (Ref. no. 13.14-47-202)

Both safety-related positions (gate closed in front and/or in the back) and position 1 of the <u>not</u> safety-related part are identical. For the direct activation of the frequency converters the switchover position 2 and 3 are equipped with storage behaviour. When passing position 2 the output A3.2 obtains the status "High" and maintains it until position 1 has been reached (gate closed in front). When opening the gate and passing position 3 the output A3.3 obtains the status "High". When reaching position 4 (door closed in back) the output is reset on status "Low" and A3.1 is activated. Example of Application with 4 positions:



**Conventional Roller Gate Monitoring** 

**Innovative Roller Gate Monitoring** 



Block diagram of the basic configuration

## 3. System Description

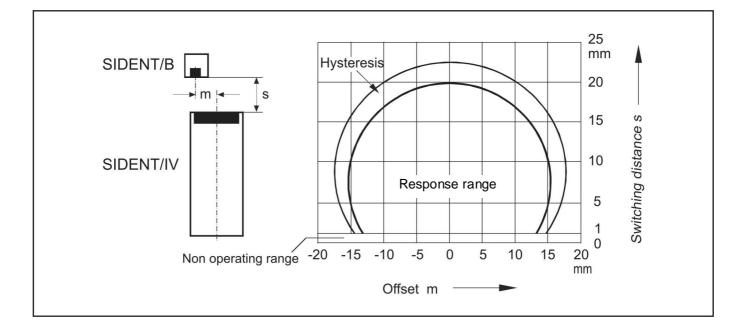
#### 3.1 Principle of the SIDENT/IV Safety Switch

The SIDENT/IV safety switch works together with its actuating element SIDENT/B using the identification principle with a 6-digit safety code which is issued only once. Only one "key", namely the matching SIDENT/B actuating element with its imprinted code, actually fits each "lock" of the SIDENT/IV safety switch.

The safety switch and actuating element work on a noncontact basis. Release is given only when the actuating element is within the response range of the switch and the code number of the actuating element matches that of the switch. At this point, the two green safety-switch indicators (**CH1** + **CH2**) light up. The hysteresis zone is identified by the blinking of the red display (ERR), while the green indicators continue to flash (both outputs remain either connected or disconnected, depending on the direction of the movement, and show the typical hysteresis behaviour). After exit from the hysteresis zone, both green indicators extinguish and a red indicator lights up. The code numbers in the safety switch undergo a twochannel analysis procedure. The two channels monitor each other on a reciprocal basis. Each channel is provided with one output which features two output transistors. The output is continuously monitored also in a switched condition.

By the monitoring of the outputs a short circuit between output and supply is recognised and a switching-on is prevented. In the event of a ground fault or low voltage at one output, both outputs are switched-off. The presence of such disturbance is verified cyclically. This results in short pulses on the non-faulty channel and, at the same time, constitutes a short-circuit protection during normal operation. A resetting of short-circuit monitoring is not necessary due to the intermittent operation mode.

The evaluation device is typically a safety PLC (programmable logic controller) or an emergency stop relay (e.g. Klaschka type ZSY). It supplies the operating voltage for the safety switch and its two outputs. The supply of the outputs can give short timing signals which allow the PLC to check the connecting lines for circuit breaks and cross circuits (for further details, refer to the technical data of the respective safety PLC). These are tolerated by SIDENT/IV to a large extent and do not impair its safety function. However, we recommend comparing with our compatibility list, which is continuously updated and can be requested on demand.



#### 3.2 Response range

In case of parallel and centric alignment of the sensing faces of safety switch and actuating element, the following values apply. If the sensing faces are inclined at an angle of up to  $30^{\circ}$  to each other, deviations by  $\pm 10$  % from the standard values occur.

Switching distances = 20 mmWidth of the response rangeW = 34 mmDepth of the response rangeD = 24 mmWidth of hysteresis $h = 1 \dots 2 \text{ mm}$ 

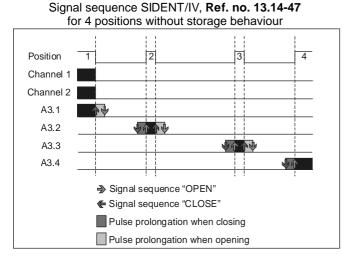
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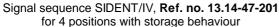
## 3.3 LEDs

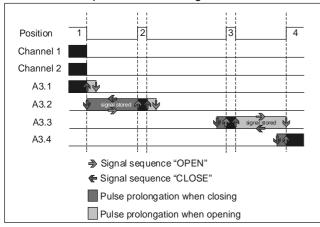
The status of the SIDENT/IV (actuated/non-actuated) and possible error situations can be derived from the LED indication. Some possibilities are represented below (version with 4 positions):

Situation	LED CH 1	LED CH 2	LED Error	LED A3.1	LED <b>A3.2</b>	LED A3.3	LED A3.4
Normal operation							
Sensor actuated with safe position	on	on	off	on	off	off	off
position 2	off	off	on	off	on	off	off
position 3	off	off	on	off	off	on	off
position 4	off	off	on	off	off	off	on
Sensor non-actuated	off	off	on	off	off	off	off
Hysteresis zone of the correspon. actuator	on	on	is flashing	on	on	on	on
Error situation (corresp	oonding actuator	in the response	range)				
Channel 1 defective	off	on	on	off	off	off	off
Channel 2 defective	on	off	on	off	off	off	off
Short circuit Ch. 1*	is flashing	is flashing	on	off	off	off	off
Short circuit Ch. 2*	is flashing	is flashing	on	off	off	off	off
Short circuit A3.1*	on	on	off	is flashing	off	off	off
Short circuit A3.2*	off	off	off	off	is flashing	off	off
Short circuit A3.3*	off	off	off	off	off	is flashing	off
Short circuit A3.4*	off	off	off	off	off	off	is flashing

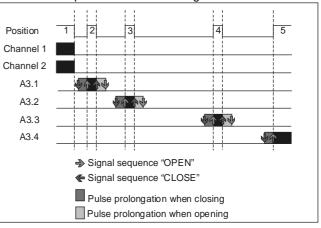
\* against power supply (L-)



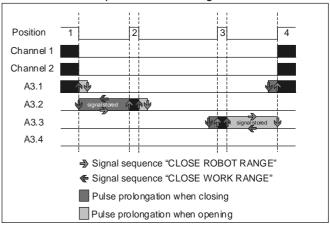




Signal sequence SIDENT/IV, **Ref. no. 13.14-47-100** for 5 positions without storage behaviour



Signal sequence SIDENT/IV, **Ref. no. 13.14-47-202** for 2 safe positions and storage behaviour



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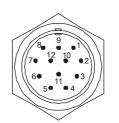
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# 4. Technical data

General Tec	chnical Data
Switching distance, hysteresis	
Assured switching off distance	35 mm
Design, housing material	cube 40 x 40 x 114 mm, KS
Installation	non-flush
Wiring	plug, 12-poles
Max. permitted lead length	300 m, with/without shield
Ambient temperature range	- 30 + 70 °C
Protection rating, weight	IP 67, 300 g
Protective insulation	Prot. class II conform IEC 947
Technical Data of S	Safety-Related Part
Wiring diagram	
winng diagram	$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $
Identification	by a 6-digit numeric code
Control category	4 conform to EN 13849-1
Configuration	2-channel, reciprocal monitoring
Operating voltage range L+	15 24 30 VDC
Current consumption	< 90 mA
Operating mode	2 NO
Input voltage L1, L2	12 24 30 VDC, clockable
Output voltage A1, A2	min. $U_{L1,2}$ –3 V (400 mA); typ. $U_{L1,2}$ -1.75 V (100 mA)
Output current	< 400 mA per output
Actuating time	> 150 ms, typ. 185 ms
Drop-out time	> 75 ms, typ. 100 ms
Switch-on delay	approx. 2 s
Max. operating frequency	1 Hz
Indicators	2 x identification (green), 1 x fault (red)
Rev. polarity, short circuit prot.	installed
Technical Data for F	Position Recognition
Ref. no.	13.14-47, 13.14-47-100
Wiring diagram	$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $
Operating voltage range L3+	15 24 30 VDC
Current consumption	< 45 mA
Operating mode	4 NO
Output voltage A3.1 A3.4	typ. U <sub>L3</sub> – 1.75 V (100 mA)
Output current	< 400 mA per output
Actuating time	typ. 10 ms
Drop-out time (pulse prolong.)	typ. 200 ms
Switch-on delay	approx. 1 s
Moving speed	max. 1 m/s
Indicators	4 x position (green)
Rev. polarity, interference prot.	installed

Technical Data for Position Recognition		
Ref. no.	13.14-47-201, 13.14-47-202	
Wiring diagram	$ \begin{array}{c}                                     $	
Operating voltage range L3+	15 24 30 VDC	
Current consumption	< 45 mA	
Operating mode	4 NO	
Output voltage A3.1 A3.4	typ. U <sub>L3</sub> – 1.75 V (100 mA)	
Output current	< 400 mA per output	
Actuating time	typ. 10 ms	
Drop-out time (pulse prolong.)	typ. 200 ms	
Storage behaviour	when A3.2 + A3.3	
Switch-on delay	approx. 1 s	
Moving speed	max. 1 m/s	
Indicators	4 x position (green)	
Rev. polarity, short circuit prot.	installed	

## Table: pinning diagram



Pin number	Function	Wire colour
3	L+	green
2	L1	brown
1	A1	white
4	L2	yellow
5	A2	grey
6	L-	pink
7	L3+	blue
8	A3.1	red
9	A3.2	black
10	A3.3	violet
11	A3.4	grey/pink
12	L3-	red/blue



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- When mounting actuating elements in metallic environment, switching distances may change. Therefore it is strongly recommended to contact the producer.

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Designation	Actuating Element	Actuating Element	
Туре	SIDENT/B-22fv20-4O1	SIDENT/B-11fs14-401	
Ref. no.	13.14-30	13.14-40	
Index no. safety position and pos.1	-001, yellow	-001, yellow	
Index no. safety position (spare part)	-002, yellow	-002, yellow	
Index no. position 1(for 13.14-47-100 only)	-012, grey	-012, grey	
Index no. position 2	-022, blue	-022, blue	
Index no. position 3	-032, green	-032, green	
Index no. position 4	-042, red	-042, red	
Design, housing material	Cube 22 x 22 x 20 mm, KS	Cylinder Ø 10.8 mm, Crastin	
Installation	non-flush; mounting preferably	with one-way screws or by gluing	
Protection rating, weight	IP 67, 13 g	IP 67, 2 g	
Protective insulation	Prot. class II conform IEC 947		
Dimensions	22 1 0 0 0 0 0 0 0 0 0 0 0 0 0	Ø10.8-0.1 0 0 0 0 0 0 0 0 0 0 0 0 0	
Identification	by a 6-digit	numeric code	
Control category	4 conform to	) EN 13849-1	
Configuration	Transponder		
Ambient temperature range	-30 +70 °C		

SIDENT/B-10fs25-4O1	SIDENT/B-6fs12-401
	JIDEN 1/D-01512-401
13.14-64	13.14-66
-001, yellow	-001
-002, yellow	-002
-012, grey	-012
-022, blue	-022
-032, green	-032
-042, red	-042
25 x 10 x 3 mm, KS	12.1 x 5.9 x 3 mm, KS
non-flush; undoable fastening by screws or by glue in order to guarantee manipulation safety	
IP 67, 1 g	IP 67, 0.8 g
Prot. class II conform IEC 947	
thickness 3 mm	thickness 3 mm
by a 6-digit numeric code	
4 conform to	DEN 13849-1
Transponder	
-30 +70 °C	
	-001, yellow -002, yellow -012, grey -022, blue -032, green -042, red 25 x 10 x 3 mm, KS non-flush; undoable fastening by sc manipula IP 67, 1 g Prot. class II c Prot. class II c by a 6-digit 4 conform to Trans

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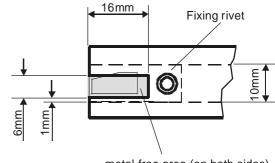
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#### Installation Instructions

When the actuating elements are installed in a metallic environment, e.g. in lamellas of roller gates, the switching distance may be reduced. Metal lamellas must therefore be slit within the transponder range. When the actuating elements SIDENT/B-10fs25-4O1 are used, the lamellas must be treated as shown in the diagram. Doing this, the metal-free range has to be observed. The same applies to the actuating elements SIDENT/B-6fs12-4O1.

The mounting in the lamella should take place with a flush rivet or similar device. For this, the holder of the transponder in the rear part can be perforated (see diagram).



metal-free area (on both sides)

## Mounting example:

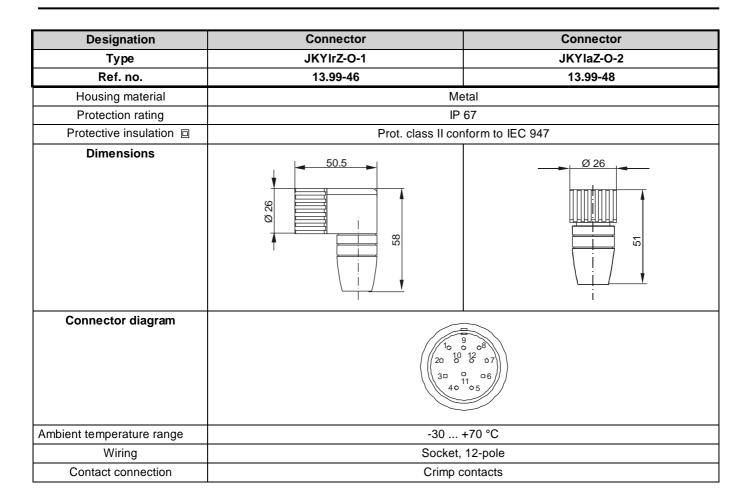
SIDENT/B-10fs25-4O1

## 5. Accessories

Designation	Connecting lead	Connecting lead	
Туре	VLG 12E/12/X-2	VLG 12E/12/X-3	
Ref. no.	20.18-52	20.18-55	
Housing material	Metal		
Protection rating	IP 67		
Protective insulation	Prot. class II con	form to IEC 947	
Dimensions			
Connector diagram			
Connection	5: grey	7: blue 8: red 9: black 10: violet 11: grey/pink 12: red/blue	
Ambient temperature range	- 30	+ 70 °C	
Cross section	12 x 0.5 mm <sup>2</sup>		
Wiring	Socket, 12-pole		
Contact connection	Solder c	contacts	

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## 6. Proper Use

The purpose of the SIDENT/IV safety switch is to monitor *mobile, separating safety devices.* These are intended to ensure that dangerous work carried out on or with a machine or plant can only be executed when the safety device is closed.

The SIDENT/IV safety switch can accomplish its task only if it is employed, wired and installed according to the instructions of the manufacturer. In all other respects the relevant requirements and regulations must be kept.

These are inter alia:

- EN 13849-1 safety-related parts of control devices,
- EN 1088 locking devices in connection with separating safety devices,
- EN 60204-1 electrical equipment of machines,
- EN 60947-5-3 requirements for proximity switches with a defined action under fault conditions.

It is required to carry out a risk evaluation for the machine or plant itself based on the following standards:

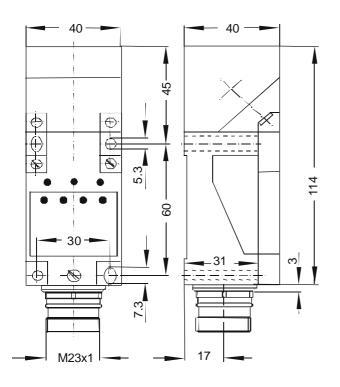
- EN 13849-1 safety-related parts of control devices,
- EN 14121 safety of machines, risk evaluation.

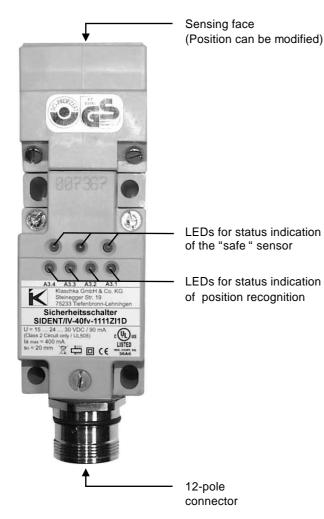
The described product was developed, produced, inspected and documented under consideration of the relevant safety standards. If you observe the handling regulations and safety instructions concerning projecting, installation, proper use, and maintenance as described in this manual, the SIDENT, in the normal case, neither cause personal injury nor damage to property.

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# 7. Dimensions





# 8. Order Data

#### Safety Switches for multiple positions 8.1

SIDENT/IV-40fv-1111ZI1D for four positions,	Ref. no. 13.14-47
SIDENT/IV-40fv-1111ZI1D for five independent positions	Ref. no. 13.14-47-100
<b>SIDENT/IV-40fv-1111ZI1D</b> for four positions, with storage behaviour	Ref. no. 13.14-47-201
<b>SIDENT/IV-40fv-1111ZI1D</b> for four positions, with 2 safe positions and storage behaviour	Ref. no. 13.14-47-202
8.2 Actuating Elements	

## 8.2.1 Actuating Elements in cubic housing

SIDENT/B-22fv20-4O1 for safety-related position and position 1	Ref. no. 13.14-30-001 (yellow)
SIDENT/B-22fv20-4O1 for safety-related position (spare part)	Ref. no. 13.14-30-002 (yellow)
SIDENT/B-22fv20-401 for position 1 (for 13.14-47-100 only)	Ref. no. 13.14-30-012 (grey)
SIDENT/B-22fv20-4O1 for position 2	Ref. no. 13.14-30-022 (blue)
SIDENT/B-22fv20-4O1 for position 3	Ref. no. 13.14-30-032 (green)
SIDENT/B-22fv20-4O1 for position 4	Ref. no. 13.14-30-042 (red)
8.2.2 Actuating Elements of minim housing	al size in cylindrical
	<b>B</b> <i>i i i i i i i i i i</i>

SIDENT/B-11fs14-401 for safety-related position and position 1

SIDENT/B-11fs14-401 for safety-related position (spare part)

SIDENT/B-11fs14-401 for position 1 (for 13.14-47-100 only)

SIDENT/B-11fs14-4O1 for position 2

SIDENT/B-11fs14-401 for position 3

SIDENT/B-11fs14-4O1 for position 4

Ref. no. 13.14-40-001 (yellow)

Ref. no. 13.14-40-002 (yellow)

Ref. no. 13.14-40-012 (grey)

Ref. no. 13.14-40-022

(blue) Ref. no. 13.14-40-032

(green)

Ref. no. 13.14-40-042 (red)

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Accessories for Increasing the Manipulation

Ref. no. 92.18-20

Ref. no. 92.18-21

8.5

Safety

Self-cutting one-way screw

one-way slot, stainless steel, for fixing the actuating element SIDENT/B-22fv20-4O1

Self-cutting one way screw

Flat head tapping screw, 3.5 x 32 mm,

Flat head tapping screw, 4.8 x 50 mm,

## 8.2.3. Actuating Elements in fork holder

SIDENT/B-10fs25-4O1 for safety-related position and position 1	Ref. no. 13.14-64-001 (yellow)
SIDENT/B-10fs25-4O1 for safety-related position (spare part)	Ref. no. 13.14-64-002 (yellow)
SIDENT/B-10fs25-401 for position 1 (for 13.14-47-100 only)	Ref. no. 13.14-64-012 (grey)
SIDENT/B-10fs25-4O1 for position 2	Ref. no. 13.14-64-022 (blue)
SIDENT/B-10fs25-4O1 for position 3	Ref. no. 13.14-64-032 (green)
SIDENT/B-10fs25-4O1 for position 4	Ref. no. 13.14-64-042 (red)
8.2.4. Actuating Elements without I	housing
8.2.4. Actuating Elements without I SIDENT/B-6fs12-401 for safety-related position and position 1	h <b>ousing</b> Ref. no. 13.14-66-001
SIDENT/B-6fs12-401 for safety-related position	-
SIDENT/B-6fs12-401 for safety-related position and position 1 SIDENT/B-6fs12-401 for safety-related position	Ref. no. 13.14-66-001
SIDENT/B-6fs12-401 for safety-related position and position 1 SIDENT/B-6fs12-401 for safety-related position (spare part) SIDENT/B-6fs12-401	Ref. no. 13.14-66-001 Ref. no. 13.14-66-002
SIDENT/B-6fs12-401 for safety-related position and position 1 SIDENT/B-6fs12-401 for safety-related position (spare part) SIDENT/B-6fs12-401 for position 1 (for 13.14-47-100 only) SIDENT/B-6fs12-401	Ref. no. 13.14-66-001 Ref. no. 13.14-66-002 Ref. no. 13.14-66-012

#### 8.3 Connecting Leads for SIDENT

Please indicate lead length X when placing the order (standard length X = 5 m).

VLG 12E/12/X-2 with angled outlet, 12-lines, (12 x 0.5 mm <sup>2</sup> ), with Coninvers connector	Ref. no. 20.18-52
VLG 12E/12/X-3 with straight outlet, 12-lines, (12 x 0.5 mm <sup>2</sup> ), with Coninvers connector	Ref. no. 20.18-55
8.4 Connector	
JKYIrZ-O-1 Conjuyers connector	Ref. no. 13.99-46

Coninvers connector,
coupling, series RC,
angled outlet,
12-pole, crimp contacts

JKYIaZ-O-2 Coninvers connector, coupling, series RC, straight outlet, 12-pole, crimp contacts one-way slot, stainless steel, for fixing the safety switch SIDENT on a sheet metal base One way screw with metrical thread Semi-circular head screw, M5 x 35 mm, one-way slot, stainless steel, for fixing the safety switch SIDENT SIDENT

We are certified according to DIN EN ISO 9001

Subject to changes!

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Ref. no. 13.99-48

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