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SAFETY

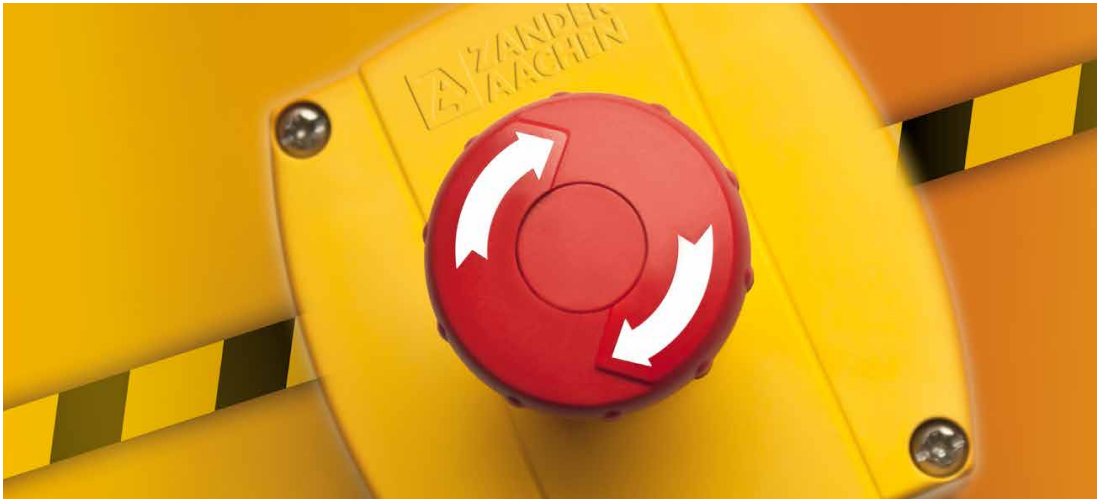
Effective safety of the employees and plants at optimum cost.

ZANDER safety technology offers their customers a comprehensive range of tried and tested switchgear. They all have one common denominator: Risks are minimised effectively and economically. Both man and machine are afforded optimum protection!

Whether it be a safety switch, non-contact safety sensors, guard locking switches, safety rope switches, safety relays or safety control units – providing safe working conditions during every technical phase is the crucial function of each and every one of our products. This is coupled with economic advantages: ZANDER safety components are constructed such that long lasting periods of loss of production and cost-intensive downtime is prevented.

Our service: Upon request we will integrate comprehensive diagnostic tools and control functions or embed our components into existing hardware and software systems solutions.

All ZANDER safety products are of course certified by accredited inspection institutes like TÜV, UL, DNV GL, RINA.



Ultra Slim Safety Relays
MINOS-Series

These ultra slim safety logic modules with a width of just 6 mm have one objective:

to provide a modular, costoptimized safety solution,
which reduces everything to the essential:

- wearless safe semiconductor outputs (MINOS SL-Series)
or relay contacts for galvanically isolated switching (MINOS SD-Series)
- variants for numerous application
- up to PL e / Cat. 4 / SILCL 3

With the wearless safe semiconductor outputs of the MINOS SL-Series the highest safety level is achieved independently of the switching cycles, which is a special advantage by operation with high demand. Despite the minimal width, all modules of the MINOS-Series provide an I/O status LED incl. error LED. An extensive diagnostics option is therefore ensured, which facilitates greatly the installation and later maintenance.

For high switching loads up to 6 A, AC 250 V and potential free switching the MINOS SD-Series is particularly suitable. With a width of just 6.8 mm these variants of the MINOS SD-Series offer the complete functionality of common safety relays.



Ultra Slim Safety Relays with Semiconductor Output, MINOS SLx-Series

MINOS SLx are safety emergency stop relays for monitoring emergency stop buttons, safety doors and light curtains, as well as contact reinforcement of safe outputs (e.g. safe PLC outputs) to machines and plants.

The modules are also type-tested for continuous operation in furnaces according to EN 50156-1 as well as EN 746-2.

For use in the process industry these modules are certified according to IEC 61511-1.

Test pulses at the safe output enable error detection during operation.

MINOS SLx: up to PL e



Ultra Slim Safety Relays with Semiconductor Output, MINOS SLxD-Series

MINOS SLxD are safety emergency stop relays for monitoring emergency stop buttons, safety doors and light curtains, as well as contact reinforcement of safe outputs (e.g. safe PLC outputs) to machines and plants.

The modules are also type-tested for continuous operation in furnaces according to EN 50156-1 as well as EN 746-2.

For use in the process industry these modules are certified according to IEC 61511-1.

MINOS SLxD: up to PL d. Economic variant without output test pulses, which alleviate the control of sensitive actuators.



Ultra Slim Safety Relays
MINOS SD-Series

MINOS SD-Series are our ultra slim safety relays.


MINOS SD1E is a safety emergency stop relay for monitoring emergency stop buttons, safety doors and light curtains, for machines and plants. Certified for safety applications up to PL e, Cat. 4, SILCL 3. Additionally the SD1E is type-tested for operation in furnaces according to EN 50156-1 as well as EN 746-2. With a width of just 6.8 mm the MINOS SD1E offers the complete functionality of common safety relays.

Safe coupling relay SD1K for:

- the coupling of safety related signals, for example output signals of a safe control system to the periphery
- the safe galvanic isolated contact reinforcement and contact multiplication
- the test pulse filtering of safe PLC control systems



MINOS-Series

Safety function	Two-channel safety emergency stop, safety doors, for furnaces in continuous operation
Supply voltage	U _N : DC 24 V (+/- 10 %)
Power consumption at U _N = 24V	1.8 W (Modul enabled via S11. No load)
Number dual-channel inputs	1
Number start input	1 (automatic start or manual start each variant)
Max. switching capacity O1 at U _N	Max. 2.5 A (see derating in the operating instructions)
Maximum switching capacity auxiliary output C1	Max. 100 mA
Max. switch-on delay	10 ms
Max. switch-off delay (if requested via the safety circuit)	13 ms
PL; Cat.; SILCL (EN ISO 13849-1; IEC 62061; IEC 61508)	PL e; Cat. 4; SILCL 3
Approvals	
Dimension	6.2 x 93.1 x 102.5 mm
Order-No. manual start and spring connection	472820
Order-No. manual start and screw terminal	472821
Order-No. automatic start and spring connection	472822
Order-No. automatic start and screw terminal	472823

MINOS SL1E

MINOS SL2E

Light curtains, contact reinforcement, OSSD, single-channel safety emergency stop, for furnaces in continuous operation
U _N : DC 24 V (+/- 10 %)
1.8 W (Modul enabled via S11. No load)
1
1 (automatic start or manual start each variant)
Max. 2.5 A (see derating in the operating instructions)
Max. 100 mA
10 ms
13 ms
PL e; Cat. 4; SILCL 3


6.2 x 93.1 x 102.5 mm
472824
472825
472826
472827

MINOS-Series


Safety function	Two-channel safety emergency stop, safety doors, for furnaces in continuous operation
Supply voltage	U _N : DC 24 V (+/- 10 %)
Power consumption at U _N = 24V	1.8 W (Modul enabled via S11. No load)
Number dual-channel inputs	1
Number start input	1 (automatic start or manual start each variant)
Max. switching capacity O1 at U _N	Max. 2.5 A (see derating in the operating instructions)
Maximum switching capacity auxiliary output C1	Max. 100 mA
Max. switch-on delay	10 ms
Max. Off-delay (if requested via the safety circuit)	13 ms
PL; Cat.; SILCL (EN ISO 13849-1; IEC 62061; IEC 61508)	PL d; Cat. 3; SILCL 2
Approvals	
Further Standards	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
Dimensions	6.2 x 93.1 x 102.5 mm
Order-No. manual start and spring connection	472800
Order-No. manual start and screw terminal	472801
Order-No. automatic start and spring connection	472802
Order-No. automatic start and screw terminal	472803

MINOS SL1D

MINOS SL2D


Light curtains, contact reinforcement, OSSD, single-channel safety emergency stop, for furnaces in continuous operation
U _N : DC 24 V (+/- 10 %)
1.8 W (Modul enabled via S11. No load)
1
1 (automatic start or manual start each variant)
Max. 2.5 A (see derating in the operating instructions)
Max. 100 mA
10 ms
13 ms
PL d; Cat. 3; SILCL 2

EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
6.2 x 93.1 x 102.5 mm
472804
472805
472806
472807

MINOS Safety Relays

Safety function	Safety emergency stop, safety doors, light curtains, for furnaces in continuous operation, stopp category 0
Supply voltage	U _N : DC 24 V (+/- 10 %)
Power consumption at U _N = 24V	1.5 W (module enabled. No load)
Number dual-channel inputs	1
Number start input	1 (automatic start or manual start, configurable at the device)
Max. switching capacity	Safe relay contact: AC-15: 5 A, AC 230 V DC-13: 4 A, DC 24 V (see derating in the operating instructions)
Maximum switching capacity auxiliary output C1	max. 100 mA
Max. switch-on delay	< 20 ms
Off-delay (if requested via the safety circuit)	< 20 ms
PL; Cat.; SILCL (EN ISO 13849-1; IEC 62061; IEC 61508)	PL e; Cat. 4; SILCL 3
Approvals	
Further Standards	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
Ambient temperatur	-15 °C to 55 °C (see derating in the operating instructions)
Protection	IP20
Mounting	35 mm DIN-rail
Dimensions / Weight	6.8 x 93.1 x 102.5 mm / 50 g
Order-No.	472841

MINOS SD1E

MINOS SD1K

Safe coupling relay, for furnaces in continuous operation, stopp category 0
U _N : DC 24 V (+/- 10 %)
1.5 W (module enabled. No load)
O1 at U _N : AC-15: 5 A, AC 230 V CD-13: 4 A, DC 24 V (see derating in the operating instructions)
max. 100 mA
< 20 ms
< 20 ms
PL e; Cat. 4; SILCL 3

EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
-15 °C to 55 °C (see derating in the operating instructions)
IP20
35 mm DIN-rail
6.8 x 93.1 x 102.5 mm / 50 g
472851

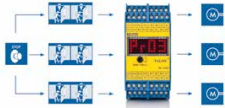
Compact Safety Controller
TALOS® TB-11403

Compact safety controllers are applied in small- to medium-scale plants, where the use of conventional safety relays is no longer economically viable. The combination of safety functions of individual safety relays in only one device offers a flexible and costeffective alternative.

Thus, e.g. the compact safety controller TALOS® is adjusted to the corresponding application by simply selecting and parametrizing an existing configuration.

A characteristic feature of this device is the variety of safety sensors - which can be evaluated with the compact safety controllers - right from the conventional emergency stop button to intelligent safety sensors e.g. light barriers. Same applies to safety outputs. The individual safety outputs can be assigned to the corresponding safety inputs independent of one another and can safely switch on the most varied actuators, e.g. drives or power contactors.

Thus, several independent safety relays can be replaced with only one compact safety controller. The use of in-built logic offers other advantages. Diagnostic measures and operation directly on the device ensure rapid commissioning, shorter downtimes and low maintenance cost.



Compact Safety Controller
TALOS® TB-11403

TALOS® has incorporated the desired functionality in a flexible manner. The desired configuration can be selected and individual functions such as delay times can be parametrized directly on the device via the menu in an easy and quick manner. This implies: no expensive programming operations, quick and easy operation and commissioning without any other ancillary equipment such as PC. A built-in monitoring device avoids long trouble-shooting hours and downtime.

The 14 safety inputs can be variably linked, with or without time functions, with 3 safety and 6 auxiliary outputs by means of logic.



Safety Timer
SCB-Series

The SCB is a universally applicable safety time control device, with which the moving parts of a machine or plant can be brought to a standstill quickly and safely in case of danger. Depending upon the configuration, the safety outputs connect on-delay, off-delay or without delay independent of one another. The SCB has been conceptualized specifically for use in machines and plants as well as in furnaces for continuous operation and is certified in accordance with EN 50156-1 and EN 746-2.

The SCB-Series offers different types with 2 safe semiconductor and/or 2 safe relay contacts:

- SCB-04: The Safety Timer with 2 safe semiconductor and 2 safe relay outputs
- SCB-03: The Safety Timer with 3 safe semiconductor outputs
- SCB-02: The Safety Timer with 2 safe relay outputs

The following applications have been realized with the Safety Timer SCB:

- bypass pressure switches
- filtering short-term fluctuations
- monitoring flushing duration of boilers/furnaces



Safety Relays
SR-Series

With the safety relays of the SR-Series, we offer a modular series for the protection of humans as well as machines. They monitor the function of the connected safety sensors along with the wiring and function as power amplifiers for shutting down the connected power contactors or drives in a safe and supervised manner.

All the safety relays of the SR-Series fulfil the requirements defined by the applicable standards, right from emergency stop and safety door monitoring to 2-hand applications to furnaces in continuous operations and are tested and certified by independent testing institutes such as TÜV-Rheinland, Underwriters Laboratories or DNV GL, RINA.

Safety relays with antivalent inputs are also available (see page 35, SR3AD).



TALOS®	TB-11403 0-990 sec	TB-11403m 0-990 min	TB-11403h 0-99 h
Safety function	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1
Supply voltage	U _s : DC 24 V (+/- 15 %)	U _s : DC 24 V (+/- 15 %)	U _s : DC 24 V (+/- 15 %)
Power consumption	3,8 W (all inputs activated / no load operation)	3,8 W (all inputs activated / no load operation)	3,8 W (all inputs activated / no load operation)
Number of safe inputs	14 safe inputs / 3 start inputs	14 safe inputs / 3 start inputs	14 safe inputs / 3 start inputs
Number of safe semiconductor outputs	3	3	3
Switching capability per safe output	U _s / 500 mA; PNP; short circuit proof	U _s / 500 mA; PNP; short circuit proof	U _s / 500 mA; PNP; short circuit proof
Adjustable time delay	0 - 990 sec	0 - 990 min	0 - 99 h
Number of auxiliary semiconductor outputs	6	6	6
Switching capability per auxiliary output	1 x U _s / 500 mA; 5 x U _s / 50 mA; PNP; short circuit proof	1 x U _s / 500 mA; 5 x U _s / 50 mA; PNP; short circuit proof	1 x U _s / 500 mA; 5 x U _s / 50 mA; PNP; short circuit proof
Number of pulsed outputs	4	4	4
Input voltage	DC 24 V (+/- 15 %)	DC 24 V (+/- 15 %)	DC 24 V (+/- 15 %)
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3
Approvals			
Further Standards	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
Dimensions	45 x 99 x 118 mm	45 x 99 x 118 mm	45 x 99 x 118 mm
Order No. incl. plug-in screw terminals	474600	474601	474602
Order No. incl. plug-in spring-cage terminals	475600	475601	475602

SCB-Series	SCB 0-99 sec	SCB 0-99 min	SCB 0-99 h
Safety function	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1	Emergency stop monitoring, safety guard monitoring, light grids monitoring, for furnaces in continuous operation, stop category 0/1
Supply voltage	U _s : DC 24 V (+/- 10 /- 15 %)	U _s : DC 24 V (+/- 10 /- 15 %)	U _s : DC 24 V (+/- 10 /- 15 %)
Number of safe outputs	Up to 4 (depending on variant)	Up to 4 (depending on variant)	Up to 4 (depending on variant)
Switching capability for each safe relay contact	AC-15: 3 A / 250 V; DC-13: 2 A / 24 V	AC-15: 3 A / 250 V; DC-13: 2 A / 24 V	AC-15: 3 A / 250 V; DC-13: 2 A / 24 V
Switching capability for safe semiconductor outputs	U _s / 500 mA; PNP; short circuit proof	U _s / 500 mA; PNP; short circuit proof	U _s / 500 mA; PNP; short circuit proof
Number of auxiliary semiconductor outputs	2	2	2
Switching capability for auxiliary outputs	C1: U _s / 500 mA; PNP; short circuit proof C2: U _s / 50 mA; PNP; short circuit proof	C1: U _s / 500 mA; PNP; short circuit proof C2: U _s / 50 mA; PNP; short circuit proof	C1: U _s / 500 mA; PNP; short circuit proof C2: U _s / 50 mA; PNP; short circuit proof
Number of non-time delayed outputs	Up to 4 (depending on variant)	Up to 4 (depending on variant)	Up to 4 (depending on variant)
Number of time delayed outputs	Up to 4 (depending on variant)	Up to 4 (depending on variant)	Up to 4 (depending on variant)
Adjustable delay	0 to 99 s, resolution 0.1 sec.	0 to 99 min, resolution 0.1 min.	0 to 99 h, resolution 0.1 h
Number of safe inputs	1 x 2 channel	1 x 2 channel	1 x 2 channel
Starting behavior	Automatic start or manual, monitored start	Automatic start or manual, monitored start	Automatic start or manual, monitored start
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3
Approvals			
Further Standards	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1
Dimensions	22.5 x 99 x 118 mm	22.5 x 99 x 118 mm	22.5 x 99 x 118 mm
Order No. SCB-04, 2 semiconductor and 2 relay contacts	47x460*	47x461*	47x462*
Order No. SCB-03, 3 semiconductor contacts	47x480*	47x481*	47x482*
Order No. SCB-02, 2 relay contacts	47x490*	47x491*	47x492*

* -in screw terminals, x = 5 for push-in spring connection



Basic Safety Relays
SR-Series

The basic relays SR1C, SR2C, SR3C and SR7C are universally applicable safety relays, with which the moving parts of a machine or plant can be brought to a standstill in a hazard situation, quickly and safely.

Safety relays are applied in single- or dual-channel emergency stop circuits and in guard monitoring devices in machines and plants.



Time-Delayed Safety Relays
SR4C-Series

SR4C is a safety relay, which combines the non-delayed and delayed contacts in an extremely compact housing. As a result, dangerous parts of a plant can be switched off quickly and safely during an emergency.

At the same time, other electric circuits can be supplied with power for up to 30 seconds, which might be essential for e.g. bringing a tool in the idle position or effecting the deceleration of trailing parts.



Safety Expansion Modules
SREC-, SRTC-Series

With the help of the SREC and SRTC extension relays coupled with any basic device of the ZANDER SR-Series, up to 3 additional and time delayed safety contacts can be obtained per device.

In this way, an existing system can be modularly extended in practically any manner.



2-Hand Safety Relay
S2HC-Series

S2HC is an extremely compact and universally applicable two-hand safety relay. It effectively protects the operator during the stamping and pressing operations. The machine can be actuated only when two buttons are pressed with both hands at an interval of 500 ms.

The S2HC corresponds to EN 574, type III C and is specially designed for the use in safety circuits, e.g. on pressing, stamping and bending tools.



SR-Series

Safety function	Emergency stop monitoring, safety guard monitoring, light grids monitoring			Emergency stop monitoring, safety guard monitoring, light grids monitoring			Emergency stop monitoring, safety guard monitoring, light grids monitoring			Emergency stop monitoring, safety guard monitoring, light grids monitoring		
Supply voltage	AC/DC 24 V AC 115 V AC 230 V			AC/DC 24 V AC 115 V AC 230 V			AC/DC 24 V AC 115 V AC 230 V			AC/DC 24 V		
Number of safe relay contacts	2			2			3			7		
Max. switching capability of safe relay contacts	6 A / 250 VAC resistive load			6 A / 250 VAC resistive load			8 A / 250 VAC resistive load			8 A / 250 VAC resistive load		
Number of auxiliary outputs	-			-			1 relay			4 relay; 2 semiconductor		
Number of non-time delayed contacts	2			2			3			7		
Number of time-delayed contacts	-			-			-			-		
Starting behavior	Automatic start or manual, monitored start			Automatic start or manual, monitored start			Automatic start or manual, monitored start			Automatic start or manual, monitored start		
PL, Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL d; Cat. 3; SILCL 2			PL e; Cat. 4; SILCL 3			PL e; Cat. 4; SILCL 3			PL e; Cat. 4; SILCL 3		
Approvals												
Width	22.5 mm			22.5 mm			22.5 mm			45 mm		
Order No. - fixed screw terminals	472162	472161	472160	472152	472151	472150	472173	472171	472170	472242		
Order No. plug-in screw terminals	474162	474161	474160	474152	474151	474150	474173	474171	474170	474242		
Order No. push-in twin spring connector	475162	475161	475160	475152	475151	475150	475173	475171	475170	475242		
Order No. Spacer for a defined minimum distance between two safety relays	472596			472596			472596			472596		

SR4C-Series

	SR4C 1 non-time delayed contact 3 time delayed contacts			SR4C 2 non-time delayed contacts 2 time delayed contacts			SR4C 3 non-time delayed contacts 1 time delayed contact		
Safety function	Emergency stop monitoring, safety guard monitoring, light grids monitoring, stop category 0/1			Emergency stop monitoring, safety guard monitoring, light grids monitoring, stop category 0/1			Emergency stop monitoring, safety guard monitoring, light grids monitoring, stop category 0/1		
Supply voltage	AC/DC 24 V			AC/DC 24 V			AC/DC 24 V		
Number of safe relay contacts	4			4			4		
Max. switching capability of safe relay contacts	8 A / 250 VAC resistive load			8 A / 250 VAC resistive load			8 A / 250 VAC resistive load		
Number of auxiliary relay contacts	-			-			-		
Number of non-time-delayed contacts	1			2			3		
Number of time-delayed contacts	3			2			1		
Adjustable time delay	1 - 30 s			1 - 30 s			1 - 30 s		
Starting behavior	Automatic start or manual, monitored start			Automatic start or manual, monitored start			Automatic start or manual, monitored start		
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3 - non-delayed contacts PL e; Cat. 3; SILCL 3 - delayed contacts			PL e; Cat. 4; SILCL 3 - non-delayed contacts PL e; Cat. 3; SILCL 3 - delayed contacts			PL e; Cat. 4; SILCL 3 - non-delayed contacts PL e; Cat. 3; SILCL 3 - delayed contacts		
Approvals									
Width	22.5 mm			22.5 mm			22.5 mm		
Order No. fixed screw terminals	472232			472222			472212		
Order No. plug-in screw terminals	474232			474222			474212		
Order No. push-in twin spring connector	475232			475222			475212		
Order No. Spacer for a defined minimum distance between two safety relays	472596			472596			472596		

SREC-, SRTC-Series

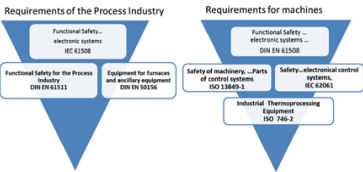
	SREC			SRTC		
Safety function	In combination wit SR-basic relay: emergency stop monitoring, safety guard monitoring, light grids monitoring			In combination wit SR-basic relay: emergency stop monitoring, safety guard monitoring, light grids monitoring		
Supply voltage	AC/DC 24 V AC 115 V AC 230 V			AC/DC 24 V AC 115 V AC 230 V		
Number of safe relay contacts	3			3		
Max. switching capability of safe relay contacts	6 A / 250 VAC resistive load			6 A / 250 VAC resistive load		
Number of auxiliary relay contacts	1 (feedback loop - basic relay)			1 (feedback loop - basic modul)		
Number of non-time delayed contacts	3			-		
Number of time-delayed contacts	-			3		
Adjustable time delay	-			1 - 30 s		
Starting behavior	Switches on and of with basic relay			Switches on and of with basic relay		
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3			PL d; Cat. 3; SILCL 2		
Approvals						
Width	22.5 mm			22.5 mm		
Order No. - fixed screw terminals	472182	472181	472180	472192	472191	472190
Order No. - plug-in screw terminals	474182	474181	474180	474192	474191	474190
Order No. push-in twin spring connector	475182	475181	475180	475192	475191	475190

S2HC-Series

	S2HC		
Safety function	2-hand operation		
Supply voltage	AC/DC 24 V AC 115 V AC 230 V		
Number of safe relay contacts	2		
Max. switching capability of safe relay contacts	6 A / 250 VAC resistive load		
Number of auxiliary relay contacts	-		
Number of non-time delayed contacts	2		
Number of time delayed contacts	-		
Starting behavior	-		
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3		
Approvals			
Further Standards	EN 574, type III C		
Width	22.5 mm		
Order No. fixed screw terminals	472413	472411	472410
Order No. plug-in screw terminals	474413	474411	474410
Order No. push-in twin spring connector	475413	475411	475410

Firing-Series
Process Technology
Furnaces/Boilers – Safe Firing

Specially designed for the use in furnaces/boilers in continuous operation according to EN 50156-1, IEC 61511, EN 746-2, ZANDER developed several safety relays and safety controller, which are all type approved by TÜV Rheinland.



With the friendly support of the IME, Institute of Process Metallurgy and Metal Recycling, RWTH Aachen University

Basic Relay for Safe Firing
SR3D-Series

SR3D is an universally applicable safety relay with three safety relay contacts, specially designed for the use in furnaces in continuous operation according to EN 50156-1. Additionally, it is certified by the Germanischer Lloyd (DNV GL) and RINA and thus, approved for use at sea.

For example, it is being successfully used in waste incineration plants on ships.



Firing Series
SR-Series

SR3D parallel inputs		SR3AD antivalent inputs		
Safety function	Emergency stop monitoring, safety guard monitoring, light grids monitoring, safe coupling relay	Monitoring of pressure and temperature sensors, safe coupling relay, emergency stop button		
Supply voltage	AC/DC 24 V AC 115 V AC 230 V	AC/DC 24 V	AC 115 V	AC 230 V
Number of safe relay contacts	3	3		
Max. switching capability of safe relay contacts	8 A / 250 VAC resistive load	8 A / 250 VAC resistive load		
Number of auxiliary relay contacts	1	1		
Number of non-time delayed contacts	3	3		
Number of time-delayed contacts	-	-		
Starting behavior	Automatic start or manual, monitored start	Automatic start or manual, monitored start		
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3		
Approvals				
Width	22.5 mm	22.5 mm		
Order No. fixed screw terminals	472272	472271	472270	
Order No. plug-in screw terminals	474272	474271	474270	
Order No. push-in twin spring connector	475272	475271	475270	
Order No. Spacer for a defined minimum distance between two safety relays	472596			
		472302	472301	472300
		474302	474301	474300
		475302	475301	475300
		472596		

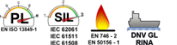
Safe Coupling Relays

In the process industry safe coupling relays are used for coupling safety related signals, for example output signals of a safe control system to the periphery. The use of simple relays would result in the interruption of the safety chain and therefore a safe shutdown in case of failure could not be guaranteed.








This problem can be solved by using safe coupling relays. Redundantly built, self-monitoring coupling relays allow the standardized coupling of safety related signals up to SIL 3 / PL e. ZANDER relays are certified according to EN 50156-1, IEC 61511, EN 746-2, EN ISO 13849-1, IEC 61508.

Typical fields of application:

- galvanically isolated coupling of digital 24V and 230V signals
- safe coupling of sensor signals, e.g. pressure switches
- contact multiplication with limited output power of the used controller
- filtering of test pulses sent by a safe PLC / controller



Safe Coupling Relays

MINOS SD1K		SK3D		SR7D	
Supply voltage	DC 24 V	DC 24 V	AC 115 V	AC 230 V	AC/DC 24 V
Number of forcibly-guided safe relay contacts	1	3	7		
Max. switching capacity safe relay contact	max. 250 V, 8A resistive load AC-15: 5 A, AC 230 V DC-13: 4 A, DC 24 V	max. 250 V, 8A resistive load AC-15: 5 A, AC 250 V DC-13: 4 A, DC 24 V	max. 250 V, 8A resistive load AC-15: 3 A, AC 250 V DC-13: 3 A, DC 24 V		
Auxiliary Output	1 semiconductor	1 relay	4 relay; 2 semiconductor		
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3	PL e; Cat. 4; SILCL 3		
Approvals	 	  	 		
Further Standards	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1	EN 50156-1; EN 746-2; IEC 61508, IEC 61511-1		
Width	6.8 mm	22.5 mm	45 mm		
Order No.	472851				
Order No. fixed screw terminals		472282	472281	472280	472243
Order No. plug-in screw terminals		474282	474281	474280	474243
Order No. push-in twin spring connector		475282	475281	475280	475243
Order No. Spacer for a defined minimum distance between two safety relays		472596			

Elevator Safety Relay
SR3E

Since the 1st of September 2017 all elevator controls have to meet the latest requirements of the standards EN 81-20:2014 and EN 81-50:2014. Compared with conventional safety relay, the safety components for the use in elevators have to fulfill higher requirements with regard to e.g. creepage distances and clearances, mechanical stress (shock / vibration) as well as increased error protection.

The EN 81-20:2014 defines guidelines for the design and technical characteristics of safety components for elevators as well as the framework, which has to be observed during the installation of lifts. Whereas the EN 81-50:2014 determines how the testing of the components and elevators has to be carried out. For example, all elevators have to be equipped with light curtains at the doors and have to ensure an improved stopping accuracy.

The new ZANDER safety relay SR3E is especially designed for the use as a safety component for elevators according to the latest version of the approvals EN-81-20:2014 and EN 81-50:2014 and is certified by TÜV Rheinland.

Feasible applications in lifts are:

- safe light curtain monitoring
- detection of unintended car movements
- checking of the retardation in case of reduced stroke buffers
- as a bypass-circuit in case of maintenance



Elevator Safety Relay

SR3E	
Safety function	Emergency stop monitoring for elevators (Cargo and passenger lifts)
Supply voltage	DC 24 V +/- 10%
Number of safe relay contacts	3
Max. switching capability of safe relay contacts	8 A / 250 VAC resistive load
Number of auxiliary relay contacts	1
Number of non time-delayed safe contacts	3
Number of time-delayed safe contacts	-
Starting behavior	Automatic start or manual, monitored start
PL; Cat.; SILCL (EN ISO 13849-1, IEC 62061, IEC 61508)	PL e; Cat. 4; SILCL 3
Approvals	
Further Standards	EN 81-20:2014; EN 81-50:2014
Width	22.5 mm
Order No. fixed screw terminals	472292
Order No. plug-in screw terminals	474292
Order No. push-in twin spring connector	475292
Order No. Spacer for a defined minimum distance between two safety relays	472596



Safety Rope Switches

Large hazard zones, for which safety doors cannot be used, have to be secured. An effective option is to use fencing ropes with safety rope switches.

Examples are extended manufacturing islands or conveyor belts. The rope is fixed to both ends of the safety rope switches. In a hazard situation, the plant can be immediately locked and safely switched off by tugging at the tight rope. Even when there is a tear in the rope, the switches ensure immediate machine standstill.

Significant advantage of the ZANDER safety rope switches are the integrated monitoring options. A viewing panel shows the correct rope tension. If required this can be quickly and easily adjusted with our tensioning system. A big LED on the switches indicates the current operating status, which is visible from a large distance. If the LED is green, everything is OK; a red flashing light indicates that the machine has been stopped.

For the food and chemical industry, we offer our switches and accessories even in stainless steel housings.



Safety Rope Switches
ZL-Series

Safety rope switches immediately switch off the machine drive if the rope is pulled or if there is a tear in the rope. This condition remains locked till the reset pushbutton is pressed when the rope is under correct tension.

Different variants are available for different rope lengths. An additional emergency stop key can be mounted on both sides of the switches.

With the ZANDER assembly / rope tensioning system ZTK, the pre-tension of the rope can be easily set so that green arrows are visible in the display window of the safety rope switch. This simplifies the assembly, troubleshooting and maintenance procedures.



Accessories
ZL-Series

As the system supplier of safety rope switches, ZANDER offers all components tailored to suit your application.

For easy assembly and rope adjustment, use the ZANDER rope assembly system ZTK.

If the rope has to be installed around corners, it is guided on the universal pulley. In case of short ropes, one end can be fixed to a suitable tension spring instead of a second safety rope switch.

All accessories can also be delivered in stainless steel.



Non-Contact Safety Switches
ZCode-Series

Non-Contact safety switches are designed for the use on safety doors, safety guards or safety covers that are used in several applications, e.g. on machine tools or in the food industry. If the door is opened, the plant automatically shuts down safely.

An important advantage as compared to mechanical safety switches is easy assembly, compact design and high degree of safety against contamination and moisture. Besides, they are wear-resistant, which reduces the maintenance cost to a minimum.

ZANDER safety switches feature high degree of manipulation safety. They are TÜV-approved and can be used up to the highest safety levels. Stainless steel models are available for application in the food industry or in general for high temperature applications.



	ZLM	ZLS	ZLMS	ZLSE
Applications	Protection of large hazardous zones, e.g. conveyor belts, extrusion plants and cutting machinery	Protection of large hazardous zones, e.g. conveyor belts, extrusion plants and cutting machinery	Protection of large hazardous zones, e.g. in food processing, chemical industry	Protection of large hazardous zones, e.g. in food processing, chemical industry
Safety contacts	3 NO / 1 NC	3 NO / 1 NC	3 NO / 1 NC	3 NO / 1 NC
Contact rating, minimum load current	AC-15: 3 A / 240 V; DC 5 V / 10 mA	AC-15: 3 A / 240 V; DC 5 V / 10 mA	AC-15: 3 A / 240 V; DC 5 V / 10 mA	AC-15: 3 A / 240 V; DC 5 V / 10 mA
Typical operating force, rope pulled	< 125 N	< 125 N	< 125 N	< 125 N
Rope spans	50 m	80 m	50 m	100 m
Ambient temperature	-25 °C to +80 °C	-25 °C to +80 °C	-25 °C to +80 °C	-25 °C to +80 °C
LED	-	DC 24 V Red flashing or steady - unsafe condition Green steady - safe condition	DC 24 V Red flashing or steady - unsafe condition Green steady - safe condition	DC 24 V Red flashing or steady - unsafe condition Green steady - safe condition
Housing	Die-Cast, painted yellow	Die-Cast, painted yellow	Stainless Steel	Stainless steel
Protection	IP67	IP67	IP67 / IP69K	IP67 / IP69K
Approvals				
Mechanical reliability	1.5 x 10 ⁶ operations	1.5 x 10 ⁶ operations	1.5 x 10 ⁶ operations	1.5 x 10 ⁶ operations
Approx. weight	670 g	820 g	1460 g	1820 g
Order No.	940020	940010	940050	940040

	Rope Tensioner-/ Gripper ZTK	Eyebolt M8	Ceiling Hook M8	Ceiling Hook M10
Usage	To fix and calibrate the rope with the ZL switch. Tensile strength up to 1500 N.	Rope support eyebolts must be fitted every 3 m of rope	Rope support eyebolts must be fitted every 3 m of rope	Rope support eyebolts must be fitted every 3 m of rope
Size	190 to 248 mm, Ø 39	M8 x 1.25 mm 51 mm thread length, 84 mm total length	125 mm long	120 mm long
Material	Galvanized steel / stainless steel	Galvanized steel / stainless steel	Galvanized steel / stainless steel	Galvanized steel / stainless steel
Order No.	940090 (galvanized steel) 940095 (stainless steel)	940091 (galvanized steel) 940094 (stainless steel)	940060 (galvanized steel) 940061 (stainless steel)	940099 (galvanized steel) 940063 (stainless steel)

	Universal-Pulley	Safety Spring	Thimble	Rope
Usage	For proper rope deflection - suitable for indoor and outdoor use	For one-sided rope fastening	For fastening the rope with the spring	Used as pulling rope
Size	77 x 40 mm	235 mm total length	42 mm total length	Linear meter pulling rope, steel, red PP casing 1770 N/mm², 4 mm outer diameter
Material	Galvanized steel / stainless steel	Stainless steel	Galvanized steel / stainless steel	Steel
Order No.	940092 (galvanized steel) 940096 (stainless steel)	940093	940097 (galvanized steel) 940098 (stainless steel)	900166



Coded Non-Contact Safety Switches
ZCode-Series

All safety switches of the ZCode-Series operate in a non-contact manner via an encoded magnet system with a large switching distance and high tolerance against offset to the safety door. They can be actuated only with the actuator included in the scope of supply. The switching status is indicated by a LED.

The safety relays are completely dust- and waterproof (IP 67) and temperature resistant up to 80°C.



Coded Non-Contact Safety Switches
ZCode-Series

All safety switches of the ZCode-Series operate in a non-contact manner via an encoded magnet system with a large switching distance and high tolerance against offset to the safety door. They can be actuated only with the actuator included in the scope of supply. The switching status is indicated by a LED.

The safety relays are completely dust- and waterproof (IP 67) and temperature resistant up to 80°C.



Coded Non-Contact Stainless Steel Safety Switches, ZCode-Series

All safety switches of the ZCode-Series operate in a Non-Contact manner via an encoded magnet system with a large switching distance and high tolerance against offset to the safety door. They can be actuated only with the actuator included in the scope of supply. The switching status is indicated by a LED.

The non-contact stainless steel safety switches are completely dust- and waterproof (IP 67/69K). The switches have a stainless steel 316 mirror polished finish (Ra4) housing for high temperature requirements up to +105 °C.

Suitable for CIP and SIP cleaning - Food Splash Zones EHEDG guidelines.

Special types with mounting holes at the rear therefore creating no Food Traps - ZCode-MCF, ZCode-CCF.



Coded Non-Contact Stainless Steel Safety Switches, ZCode-Series



ZCode-Series	PC	CC	RC
Applications	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Guard doors, sliding guards or protective covers
Supply voltage	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %	DC 24 V; +/- 10 %
Number of outputs	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output
Contact rating (safe- & auxiliary output)	DC 24 V, max. 200 mA, short-circuit proof	DC 24 V, max. 200 mA, short-circuit proof	DC 24 V; max. 500 mA, short-circuit proof
Minimum load current	DC 24 V; 1 mA	DC 24 V; 1 mA	DC 10 V; 1 mA
Switching distance recommended, maximum	5 mm, 10 mm close / 20 mm open	5 mm, 10 mm close / 20 mm open	5 mm, 10 mm close / 22 mm open
Housing	Red PES (Polyester)	Red PES (Polyester)	Red PES (Polyester)
Protection	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)
Ambient temperature	-25 °C to +80 °C	-25 °C to +80 °C	-25 °C to +80 °C
PL / Cat. / SILCL (EN ISO 13849-1; EN 62061)	PL e; Cat.4	PL e; Cat.4	PL e; Cat.4
Approvals			
Vibration-, shock resistance	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 11 ms / 30 g
Weight, dimensions	200 g, 50 x 25 x 13 mm	200 g, 85 x 20 x 17 mm	110 g, 30 x 60 mm (Actuator: 15 mm)
Order No. with 5 m cable, inclusive actuator	940124	940174	-
Order No. with M12 connector, inclusive actuator	940125	940175	940181
Order No. spare actuator	940129	940179	-
Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable	941200	941200	941200

ZCode-Series	LC	TC	M12 Extension Cable
Applications	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Ideal for the use in areas with extremely restricted space	
Supply voltage	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %	Length 15 m
Number of outputs	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output	Coating Material PUR
Contact rating (safe- & auxiliary output)	DC 24 V, max. 200 mA, short-circuit proof	DC 24 V, max. 200 mA, short-circuit proof	Order No. 941200
Minimum load current	DC 24 V; 1 mA	DC 24 V; 1 mA	
Switching distance recommended, maximum	5 mm, 10 mm close / 20 mm open	5 mm, 10 mm close / 20 mm open	
Housing	Red PES (Polyester)	Red PES (Polyester)	
Protection	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)	
Ambient temperature	-25 °C to +80 °C	-25 °C to +80 °C	
PL / Cat. / SILCL (EN ISO 13849-1; EN 62061)	PL e; Cat.4	PL e; Cat.4	
Approvals			
Vibration-, shock resistance	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g	
Weight, dimensions	200 g, 88 x 25 x 13 mm	200 g, 36 x 26 x 13 mm	
Order No. with 5m cable, inclusive actuator	940144	940154	
Order No. with M12 connector, inclusive actuator	940145	940155	
Order No. spare actuator	940159	940158	
Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable	941200	941200	

ZCode-Series	LCE	TCE	MC	MCF
Applications	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Ideal for the use in areas with extremely restricted space	Areas with highest hygienic requirements, e.g. food processing, chemical industry	Areas with highest hygienic requirements, e.g. food processing, chemical industry
Power supply	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %
Number of outputs	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output
Contact rating (safe- & auxiliary output)	DC 24 V; max. 200 mA; short-circuit proof	DC 24 V; max. 200 mA; short-circuit proof	DC 24 V; max. 200 mA; short-circuit proof	DC 24 V; max. 200 mA; short-circuit proof
Minimum load current	DC 24 V; 1 mA	DC 24 V; 1 mA	DC 24 V; 1 mA	DC 24 V; 1 mA
Switching distance recommended, maximum	5 mm, 10 mm close / 22 mm open	5 mm, 8 mm close / 12 mm open	5 mm, 10 mm close / 20 mm open	5 mm, 10 mm close / 22 mm open
Housing	Stainless steel 316	Stainless steel 316 highly polished surface	Stainless steel	Stainless steel 316
Protection	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)
Ambient temperature	-25 °C up to +105 °C	-25 °C to +105 °C	-25 °C to +105 °C	-25 °C to +105 °C
PL; Cat.; SILCL (EN ISO 13849-1; EN 62061)	PL e; Cat.4	PL e; Cat.4	PL e; Cat.4	PL e; Cat.4
Approvals				
Vibration-, shock resistance	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g
Weight, dimensions	200 g, 88 x 25 x 13 mm	200 g, 36 x 26 x 13 mm	300 g, 50 x 25 x 13 mm	300 g, 50 x 25 x 13 mm
Order No. with 5 m cable, inclusive actuator	-	940153	940104	940107
Order No. with M12 connector, inclusive actuator	940147	940157	940119	940117
Order No. spare actuator	940149	941200	941200	941200
Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable	941200	941200	941200	941200

ZCode-Series	CCE	CCEF	RCE
Applications	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Suitable for small and poorly aligned guard doors, sliding guards or protective covers	Guard doors, sliding guards or protective covers
Power supply	DC 24 V; +/- 15 %	DC 24 V; +/- 15 %	DC 24 V; +/- 10 %
Number of outputs	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output	2 contactless safety outputs, 1 auxiliary output
Contact rating (safe- & auxiliary output)	DC 24 V; max. 200 mA; short circuit-proof	DC 24 V; max. 200 mA; short-circuit proof	DC 24 V; max. 500 mA; short-circuit proof
Minimum load current	DC 24 V; 1 mA	DC 24 V; 1 mA	DC 10 V; 1 mA
Switching distance recommended, maximum	5 mm, 10 mm close / 22 mm open	5 mm, 10 mm close / 22 mm open	5 mm, 10 mm close / 22 mm open
Housing	Stainless steel 316	Stainless Steel 316	Stainless Steel 316
Protection	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)	IP67, IP69K (with M12-connector IP67)
Ambient temperature	-25 °C to +105 °C	-25 °C to +105 °C	-25 °C to +105 °C
PL; Cat.; SILCL (EN ISO 13849-1; EN 62061)	PL e; Cat.4	PL e; Cat.4	PL e; Cat.4
Approvals			
Vibration-, shock resistance	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 1 ms / 30 g	10-55 Hz / 1 mm, 11 ms / 30 g
Weight, dimensions	200 g, 85 x 20 x 17 mm	300 g, 83 x 20,6 x 17 mm	110 g, 30 x 60 mm (switch: 15 mm)
Order No. with M12 connector, inclusive actuator	940176	940178	940183
Order No. spare actuator	940177	940173	-
Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable	941200	941200	941200

Coded RFID Safety Switches
ZCode-Series

The ZCode RFID Safety Switches are tamper-proof, non-contact safety switches with magnetic as well as RFID technology for the use in the area of mechanical and plant engineering. This dual-channel and diverse principle once again increases safety. Activation is possible as unicode (32.000.000 unique codes), i.e. only by an assigned actuator, or as mastercode, i.e. an actuator of a particular series activates every switch of the same ZCode-Series.

Up to 20 ZCode-modules can be connected in series to the ZANDER safety relays or to a ZANDER safety controller.

The switching status is indicated by a LED. All the ZCode RFID Switches are dust- and waterproof (IP67, ZCode-LRE: IP67K) and have an additional indicator contact.

RFID provides a high degree of anti-tamper thereby making it virtually impossible to be overridden (ISO 14119, type 4).

A stainless steel type RFID (ZCode-LRE) is also available.



ZCode-Series
RFID

Table with 4 columns: Applications, Semiconductor outputs, Auxiliary contacts, Contact rating (safe- & auxiliary output), Power supply, Switching distance, Housing, Protection, Ambient temperature, PL Cat., Approvals, Vibration-, shock resistance, Weight, dimensions, Order No. mastercode, incl. actuator, Order No. unicode, incl. actuator, Order No. spare actuator, Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable.

Coded Non-Contact RFID Safety Switches
ZCode-Series



ZCode-Series
RFID

Table with 4 columns: Applications, Power supply, Number of outputs, Contact rating (safe- & auxiliary output), Switching distance recommended, maximum, Housing, Protection, Ambient temperature, PL Cat., Approvals, Weight, dimensions, Order No. with M12 connector, incl. actuator, Order No. spare actuator Mastercode, Order No. M12 extension cable, 15 m lengths, PUR, female M12x1, open end cable.

Safety RFID Interlock Switches
ZCode-MZ(E)-Series

ZCode-MZ(E) are coded tamper-proof safety interlocks, which are using magnet - as well as RFID-technology for the process protection in machinery and plant engineering. This two-channel and diverse principle enables maximum protection against manipulation. Heavy Duty or Medium holding forces variants are available (up to 1500 N).

The different housing material versions (Plastic, stainless steel or die-cast metal) allow the use in almost any environment, including the cleaning intensive pharma and food industry. In combination with a Safety Relay (e.g. ZANDER SR-Series, MINOS SD-Series), a safety logic device (e.g. ZANDER MINOS SL-Series) or a safety PLC (e.g. ZANDER TALOS*-Series) the switches operate self-monitoring and with short-circuit protection.



ZCode-Series

Table with 4 columns: Applications, Transistor outputs, Contact rating (safe- & auxiliary output), Power supply, Holding force, Solenoid center offset, Switching distance, max., Housing, Temperature range, PL Cat., Approvals, Weight, Dimensions, Connection, Order No. ZCode-MZ/MZE-LM, mastercode, incl. actuator, Order No. ZCode-MZ/MZE-LU, unicode, incl. actuator, Order No. ZCode-MZ/MZE-SM, mastercode, incl. actuator, Order No. ZCode-MZ/MZE-SU, unicode, incl. actuator, Order No. spare actuator MZ/MZE-LM (mastercode), Order No. spare actuator MZ/MZE-SM (mastercode).

AUTOMATION

ZANDER high-speed FPGA industrial PLCs provide absolute precision. A number of variants are available – from ultra-compact to modular, networked systems for highly complex applications – that provide precise, accurate control even at the highest speed.

Whether in packaging machines, filling systems, machine tools or sorting applications or vision analysis – ZANDER control systems can always match the speed. How is this possible? Our FPGA chips are designed for complete parallel processing without cycle times and without undesirable jitter effects!

In addition, there are technical and ergonomic advantages: all ZANDER control systems, cam controller units or programmable logic solutions can be set up simply and conveniently on a PC and can be optimised without interrupting production.

For more than 35 years, we have been manufacturing programmable logic controllers and cam controllers with real-time operating systems.

Individual programming, system integration, ZANDER offers you the whole solution also in combination with our MVisio HMI 's!



High Speed Industrial PLC's

Production processes are getting faster and faster. There are many examples: Injection moulding machines for plastic products, automatic packaging and cutting machines, labelling systems, filling devices for the food industry and many more.

As a result, high demands are put on the control system. Here, the challenge is not the absolute reaction time, but rather ensuring exactly reproducible switching points at different machine speeds. Because of varying cycle times, it is often very difficult for conventional PLC controllers to meet these demands. ZANDER high-speed PLC's use a Field programmable Gate Array (FPGA) chip instead of a micro controller.

The integrated FPGA chip takes over all the functions in absolute real-time. The cycle time is 0.000s! And it must be emphasized that there are no deviations in the reaction time. The controllers operate in a fault-tolerant manner.

ZANDER High-Speed Industrial PLC's have digital and analog in- and outputs as well as a wide range of communication: Modbus / EtherCat / PROFINET / RS485 / SSI.



High Speed Industrial PLC's
ZX09-Series

The new high speed controller of the ZX09-Series do not have any cycle time and thus, always ensures fastest possible - and even more importantly - constantly fast processes < 3 µsec. How is this possible?

The ZX09-Series has a different core element. This is not a micro controller, but an FPGA chip. Because of this no cyclic program is executed - all programs take place in a parallel manner in real-time, several times faster than in a standard PLC. This also applies to the analogue inputs with a reaction time of < 10 µsec!

For all ZX09 the programming is done via the Ethernet interface; network applications are easily and quickly realized.





Of course, you can program the ZX09 as easily as you are used to in a PLC - with Structured Text (ST) according to IEC 61131-3.

ZX09-Series is very fast and cost efficient and offers 10 digital inputs and 4 digital outputs as well as a high speed analog output.

The ZX09A additionally has RS485 / SSI interfaces.

Analog variants with 6 analog high speed inputs as well as 2 digital inputs and 4 digital outputs are also available (ZX09B, ZX09C).



ZX09-Series		ZX09	ZX09A	ZX09B	ZX09C
					
Applications		Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller
Supply voltage		DC 24 V +/- 15%	DC 24 V +/- 15%	DC 24 V +/- 15%	DC 24 V +/- 15%
Digital inputs		10 x DC 18..30 V	10 x DC 18..30 V	2 x DC 18..30 V	2 x DC 18..30 V
Digital outputs		4 x DC 10..30 V; 0.5 A	4 x DC 10..30 V; 0.5 A	4 x DC 10..30 V; 0.5 A	4 x DC 10..30 V; 0.5 A
Analog inputs		-	1 x 0..10 V or 0..20 mA	4 x 0..10 V (set) 2 x 0..10 V or 0..20 mA, switchable	4 x 0..20 mA (set) 2 x 0..20 mA or 0..10 V, switchable
Analog outputs		-	-	-	-
Interfaces		Ethernet	RS485/RS422/SSI Ethernet	Ethernet	Ethernet
Response time		< 20 ns	< 20 ns	< 20 ns	< 20 ns
Logic Capacity: Amount of configurable Logic Blocks (CLB's*)		715 CLBs; *each CLB includes more than 100 Gates, FlipFlops	715 CLBs; *each CLB includes more than 100 Gates, FlipFlops	715 CLBs; *each CLB includes more than 100 Gates, FlipFlops	715 CLBs; *each CLB includes more than 100 Gates, FlipFlops
Time delay digital inputs / outputs		< 3 µs	< 3 µs	< 3 µs	< 3 µs
Time delay analog inputs		-	< 10 µs	< 10 µs	< 10 µs
Max. input frequency		500 kHz	500 kHz	500 kHz	500 kHz
Number of programmable timer		2000	2000	2000	2000
Programming		EX_PRESS 5 for Windows Structured Text according to IEC 61131-3	EX_PRESS 5 for Windows Structured Text according to IEC 61131-3	EX_PRESS 5 for Windows Structured Text according to IEC 61131-3	EX_PRESS 5 for Windows Structured Text according to IEC 61131-3
Width		108 mm	108 mm	108 mm	108 mm
Order No. basic module		589200	589201	589202	589203
Order No. software EX_PRESS 5		589092	589092	589092	589092

High Speed Industrial PLC's
ZX20-Series

The high speed industrial PLC ZX20-Series also do not have any cycle time and thus, always ensures fastest possible - and even more importantly - constantly fast processes, < 9 µsec.

Because of the FPGA chip, instead of a micro controller, no cyclic program is executed - all programs take place in a parallel manner in real-time, several times faster than in a standard PLC, no jitter effects.

For all ZX20 the programming is done via the Ethernet interface; network applications are easily and quickly realized.





Of course, you can program the ZX20 as easily as you are used to in a PLC - with Structured Text (ST) according to IEC 61131-3.

The ZX20-Series offers 20 digital inputs and 16 digital outputs.

Special bus variants with integrated PROFINET (ZX20TP) and EtherCAT (ZX20TC) are also available.

Furthermore, the ZX21TP variant has a higher chip capacity / processing power for complex, multi networked applications.



ZX20-Series		ZX20T	ZX20TP	ZX21TP	ZX20TC
					
Applications		Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller	Packaging machines, cutting facilities, bottling plants, gluing stations, plastic injection moulding machines, camshaft controller
Supply voltage		DC 24 V +/- 15%	DC 24 V +/- 15%	DC 24 V +/- 15%	DC 24 V +/- 15%
Digital inputs		20 x DC 18..30 V	20 x DC 18..30 V	20 x DC 18..30 V	20 x DC 18..30 V
Digital outputs		16 x semiconductor DC 10..30 V; 0.5 A	16 x semiconductor DC 10..30 V; 0.5 A	16 x semiconductor DC 10..30 V; 0.5 A	16 x semiconductor DC 10..30 V; 0.5 A
Analog inputs		-	-	-	-
Analog outputs		-	-	-	-
Interfaces		Ethernet	Ethernet PROFINET IO Device interface	Ethernet PROFINET IO Device interface	Ethernet EtherCAT slave interface
Response time		< 20 ns	< 20 ns	< 20 ns	< 20 ns
Logic Capacity: Amount of configurable Logic Blocks (CLB's*)		448 CLBs; *each CLB includes more than 100 Gates, FlipFlops	448 CLBs; *each CLB includes more than 100 Gates, FlipFlops	896 CLBs; *each CLB includes more than 100 Gates, FlipFlops	448 CLBs; *each CLB includes more than 100 Gates, FlipFlops
Time delay digital inputs / outputs		< 9 µs at 250 mA per output	< 9 µs at 250 mA per output	< 9 µs at 250 mA per output	< 9 µs at 250 mA per output
Max. input frequency		500 kHz	500 kHz	500 kHz	500 kHz
Number of programmable timer		2000	2000	2000	2000
Programming		EX_PRESS 5 for Windows Structured Text according to IEC61131-3	EX_PRESS 5 for Windows Structured Text according to IEC61131-3	EX_PRESS 5 for Windows Structured Text according to IEC61131-3	EX_PRESS 5 for Windows Structured Text according to IEC61131-3
Width		108 mm	108 mm	108 mm	108 mm
Order No. basic module		589000	589002	589052	589003
Order No. software EX_PRESS 5		589092	589092	589092	589092


ZX Programming Software
EX_PRESS

With the EX_PRESS software for Windows, all the ZX controllers can be programmed easily and comfortably.

Although the controllers internally operate with the CPLD or FPGA technology instead of micro controllers, **you do not need to learn a new complex programming language. The programming is the same as with conventional PLC's.**

Thus, EX_PRESS gives a quick tailor-made solution for your control task. Language is ST - Structured Text according to EN 61131-3.



Software		EX_PRESS 5
		
Applications		Programming Software for ZX-Series
For PLC		all ZX-Controller
Operating system		Windows 7, 8, 10 / 32 and 64 Bit
Programming via		Ethernet
Programming language		Structured Text according to EN 61131-3
Order No.		589092

HMI Visualization
MVisio-Series

The MVisio HMI is a Human Machine interface that can be used as a Master/Slave or as an independent PLC.

In cooperation with other PLC´s, e.g. the ZANDER ZX20, or as a stand alone device it allows the visualization, parameterization and control of processes. The HMI offers support of various communication protocols, such as PROFINET I/O, Modbus TCP/RTU or EtherNet/IP.

The practical manual offers a quick entry to graphical user interface programming with the free software CodeSys V3.5.



MVisio-Series

Applications	e.g. packaging machines, cutting equipment, filling plants, gluing stations, plastic injection molding machines, ...	e.g. packaging machines, cutting equipment, filling plants, gluing stations, plastic injection molding machines, ...	e.g. packaging machines, cutting equipment, filling plants, gluing stations, plastic injection molding machines, ...	In combination with the MVisio HMI e.g. for packaging machines, cutting equipment, filling plants, gluing stations, plastic injection molding machines, test stands
Display	7" TFT Color / LED, 800 x 480 px *	5", 7" TFT Color / LED, 800 x 480 px *	7" TFT Color / LED, 800 x 480 px	-
Touch	Resistive	Capacitive	Resistive	-
Protection	IP66 (front), IP20 (back)	IP66 (front), IP20 (back)	IP66 (front), IP20 (back)	IP20
Power supply	DC 24 V	DC 24 V	DC 24 V	DC 24 V (from MVisio HMI)
Processor	ARM Cortex A8, 1 GHz	ARM Cortex A9, dual-core 800 MHz	ARM Cortex A9, dual-core 800 MHz	-
RAM	256 MB	1024 MB	1024 MB	-
Connections	Serial 1x RS232 / RS485 / RS422 USB 2x USB Host Ethernet 2x RJ45 Ethernet Plug-In slot 2x SD-card slot 1x	Serial 1x RS232 / RS485 / RS422 USB 2x USB Host Ethernet 3x RJ45 Ethernet Plug-In slot 2x SD-card slot 1x	Serial 2x RS232, 2x RS485 / RS422, 2x CAN 2.0b USB 2x USB Host Ethernet 2x RJ45 Ethernet	20 digital Inputs (DC 24 V, pnp) 12 digital Outputs (DC 24 V 0.5 A, pnp) 8 analogue Inputs (U, I, RTD, TC) 4 analogue Outputs (U, I)
Communication (also in parallel operation)	PROFINET EtherNet/IP Modbus TCP/RTU CANopen OPC UA	Controller/Master Scanner/Master Master/Slave Master Client/Server	PROFINET EtherNet/IP Modbus TCP/RTU CANopen OPC UA	Controller/Master Scanner/Master Master/Slave Master Client/Server
Order no.	589100	589103 (5") / 589102 (7")	589101	589105
Variants	* Iso available in 10.4", 13.3"	* Iso available in 5", 10.1", 15.6", 21.5"	-	* ther I/O variants also available

Micro-PLC´s
SPEEDY ZX4, ZX8

The SPEEDY-ZX-Series are Micro-PLC´s. They are much faster than any conventional PLC. This means: SPEEDY processes your programme internally in an absolutely parallel manner in real-time, without cycle time, jitter effects.

Types with 4 inputs / 4 outputs (ZX4T) or with 9 inputs / 8 outputs (ZX8T) are available.

Programming via ZANDER Software EX_PRESS 4 in Structured Text (ST) according to IEC 61131-3.



Programmable Cam Controllers
EPR, EPC

The position of the machine is identified by an absolute rotary encoder, which transfers an absolute angle or path dimension to the cam controller, depending upon the machine position.

A significant advantage of the devices EPR, EPC with 16 or 48 outputs is the possibility of optimising switching points in operating machines and compensating delay times of connected actuators, depending upon the speed (downtime compensation). Up to 32 programmes can be stored.

Programmable sequential logic controller are also available.



Thermistor Motor Protection Relay
DHC

The DHC motor protection relay is a temperature monitoring relay for electro motors. It evaluates the resistance values of the PTC resistor integrated in the motor coil. A zero-voltage safe electronic restart interlock ensures that the relay will remain locked upon activation even in the event of power failure, i.e. an uncontrolled restart will be avoided.



Fault Indicator Systems
ENQ4

The electronic ENQ4 fault indicator system offers a complete fault indicator unit for recording unapproved operating conditions such as excessive pressure or excessive temperature in a compact design.

ENQ are successfully used with compressors, automatic production machines, vehicles, heating systems and air-conditioners.

The collective alarm contact is enabled as soon as a fault alarm input opens. The machine is switched off or an alarm warning is given out till the fault is acknowledged. The fault is displayed on the front side.



Timer Modules
DMC, ENS

The multi-function timers DMC and DVC with analog time setting offer different functions (e.g. on-delay, flicker, pulse shaping etc.) and time ranges (e.g. 0.3-3s or 1-10 min etc.) in one device. Moreover, DMC can be used as a sensor relay. A remote potentiometer connection is also available.

If an absolute digital time setting is necessary, ENS20 is the correct choice. ENS20 is a compact digital timer / digital counter, which can be easily programmed in various functions (e.g. on-delay, flashing, off-delay, etc.) and time ranges (e.g. 0.1-99.9 sec; 0.1 - 99.9 h; etc.), in which time can be set via a waterproof keyboard.



Interface Modules
DSRC

Interface modules are useful for power amplification and galvanic isolation between the controls and load circuit.

DSRC1 is a single-channel module with 2 changeover contacts.

The DSRC4 module includes four relay interfaces that are completely independent of one another. As a result, the space requirement is much less as compared to the individual components.



Micro Switches
KL, MS, AS

KL-Series: The single-pole toggle switch allows a switching frequency of 1000 switching operations / min. Under the designation KL_B, the switches are also available with lateral mounting cams.

MS-Series: Single-pole changeover contact with high switching capacity, long service life and small dimensions.

AS-Series: The proven structure of the KL switching elements is also used with the AS-Series. AS has a slender design. For this reason, micro switches are particularly suitable for small spaces.



Subminiatur Micro Switches
DM, SM, VMN,...

DM-Series: Subminiature micro switches for all applications with a high degree of precision and minimum dimensions.

SM-Series: Single-pole micro switches with diverse coupling variants such as solder lugs, solder pins, straight and bent.

VMN-Series: Micro switches. For the series use, the switches are available in a number of additional variants.

Series CNR, DF, DS, VA2 with different housings / actuators are also available.

Waterproof types (IP67) are available: DW, SW, VW1



ENGINEERING

We are your solution partner for all questions concerning industry automation and functional safety with focus on medium-sized companies.

In this field we have over 65 years of experience. Together with our team, consisting of mechatronic engineers, electrical development engineers, computer scientists and mechanical engineers you will obtain tailored made, cost efficient and individual solutions. Our portfolio comprises of programming, communicating interface integration up to a full automatization concepts including launching the system.

Our core competences are characterized by the following areas:

- advising in selection of components
- individual software creation for your safety- and automation solution, e.g. by a certified safety engineer
- creation of automation concepts
- providing support of standards requirements
- providing support and realization during the Retrofit/Redesign of your existing installation
- digitalization of Human-/Machine interface within the support of latest HMI solutions
- customized development of components as well as production
- support of the EMC Design for your electrical solution



ZANDER Aachen -
Your Expert for Medium-Sized
Companies Looking for Industry
4.0 Solutions

The word „Industry 4.0“ is currently on everyone's lips – we make it accessible and real. In our view Industry 4.0 stands for optimization of the machines communication structure and processes, meaning networking possibilities from undermost processing level to the master computer.

Industry 4.0 as well stands for an optimization of the Human-Machine interaction, for example the visualization of a digital process twin, as well as the automatization and flexibilization of the operator in connection with our human machine interface (HMI). Beside the process the focus lies especially on the human being. Together with the operator the processes as well as the parameterization will be optimized.

Industry 4.0 for medium-sized businesses - please feel free to contact us!



Redesign of the Automated Jam Packages for the Sweets Manufacturer Zentis

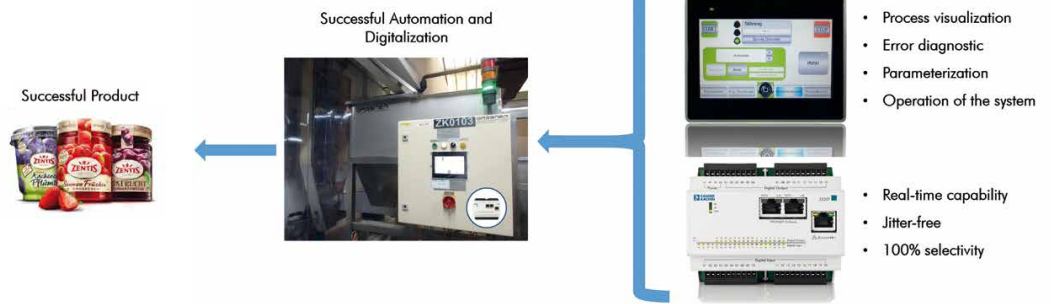
Together with the operator we optimized the already existing automated lid feeder for Zentis.

Within the project the following tasks have been realized:

- status review of the existing system and hardware, including software analysis and current problem description
- concept development with ZANDER MVisio HMI and High-Speed Controller ZX20TP
- definition of software specifications were defined together with the operator
- realization of the whole software solution
- implementation of the software based on the requirement
- putting the system into operation
- individual adjustments together with the operator
- documentation and training of application software

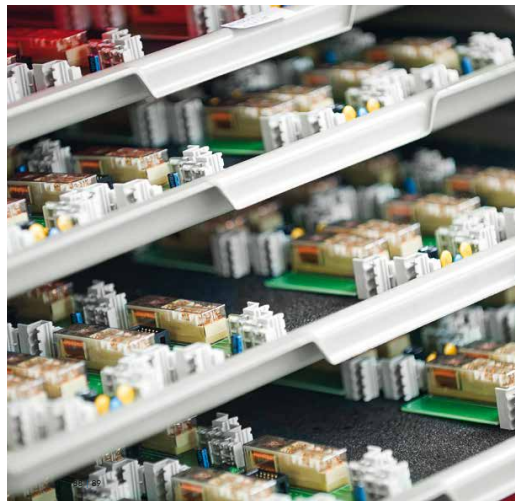
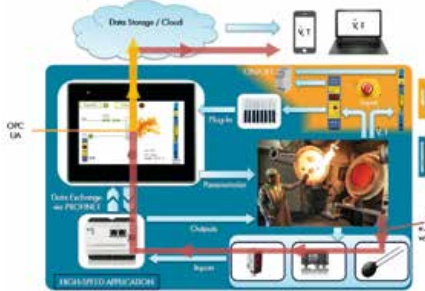
In cooperation with the client the following benefits have been developed:

- higher selectivity and real-time processing through High-Speed Controller ZX20
- fast diagnosis and error messaging by process visualization together with the MVisio HMI's
- saving of hardware by software parameterization with MVisio HMI
- enabling of access rights / free program extension and desired parameterization



Further Project References: Industry 4.0 Automatization Solutions

- optimization and automation of packed liquid samples for a recycling plant:
- speed optimization of a packing machine with ZX20 High-Speed Controller
- concept, selection of hardware and integration of automatic sorting with high speed image recognition with ZX20 Controller
- whole process visualization/parameterization with ZANDER MVisio HMI
- controlling with access rights and communication master with ZANDER MVisio HMI for a logistic center
- automatization of the quality control in the food industry
- data collection and visualization with ZANDER HMI MVisio over OPC UA in a web browser for remote monitoring in the process industry



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