



## *Witt Sensoric GmbH Specialist for Safety Sensors on Door and Gate Systems*



### Our expertise

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Since the launch of Witt Sensoric GmbH Berlin in 1993, we have specialized in the development and production of safety sensors and accessories for the industrial door and gate industry.

Thanks to our efficiency in optoelectronic development, mechanical construction and manufacturing we are able to serve small as well as large volume orders. Virtually all large European door and gate manufacturers are now being supplied directly thru us.

Our long time experience is reflected in our extensive and standard-compliant product-portfolio of safety sensors and accessories.

Our numerous trade marks in the form of patents and registered designs attest to our engagement and establishment of new technical standards.

“Our achievements in the past in the door and gate industry back our confidence looking to future prospects.”

### Memberships

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Our focus on the door and gate industry is reflected through our membership in both major door and gate organizations. Thru these memberships we are actively involved with industry relevant developments, such as standardization, information about legal regulations and with recommendations by the organizations.



[www.bast-online.de](http://www.bast-online.de)



[www.bvt-tore.de](http://www.bvt-tore.de)

## Made in Germany

Witt Sensoric GmbH is closely linked to our capital city. We develop, construct and manufacture our products in Berlin. Indeed, all of our important subcontractors have their manufacturing sites in the vicinity of our company headquarters. This gives us direct access to all relevant fabrication steps.

“Made in Germany”, guarantees high quality to you, for us it’s a company philosophy.



Electronic and software development; our own EMC-lab and climate exposure test cabinet



Test device development for the QA of our products



3D constructions for the mechanical assemblies and injection molds



One of our five state-of-the-art assembly lines with integrated optical camera inspection and testing



Quality Assurance QA-visual inspection of the circuit boards



Cable assembly and plug production



Sensor assembly with QA-function-test



Automated filling of 2K-epoxy resin at the moulding station



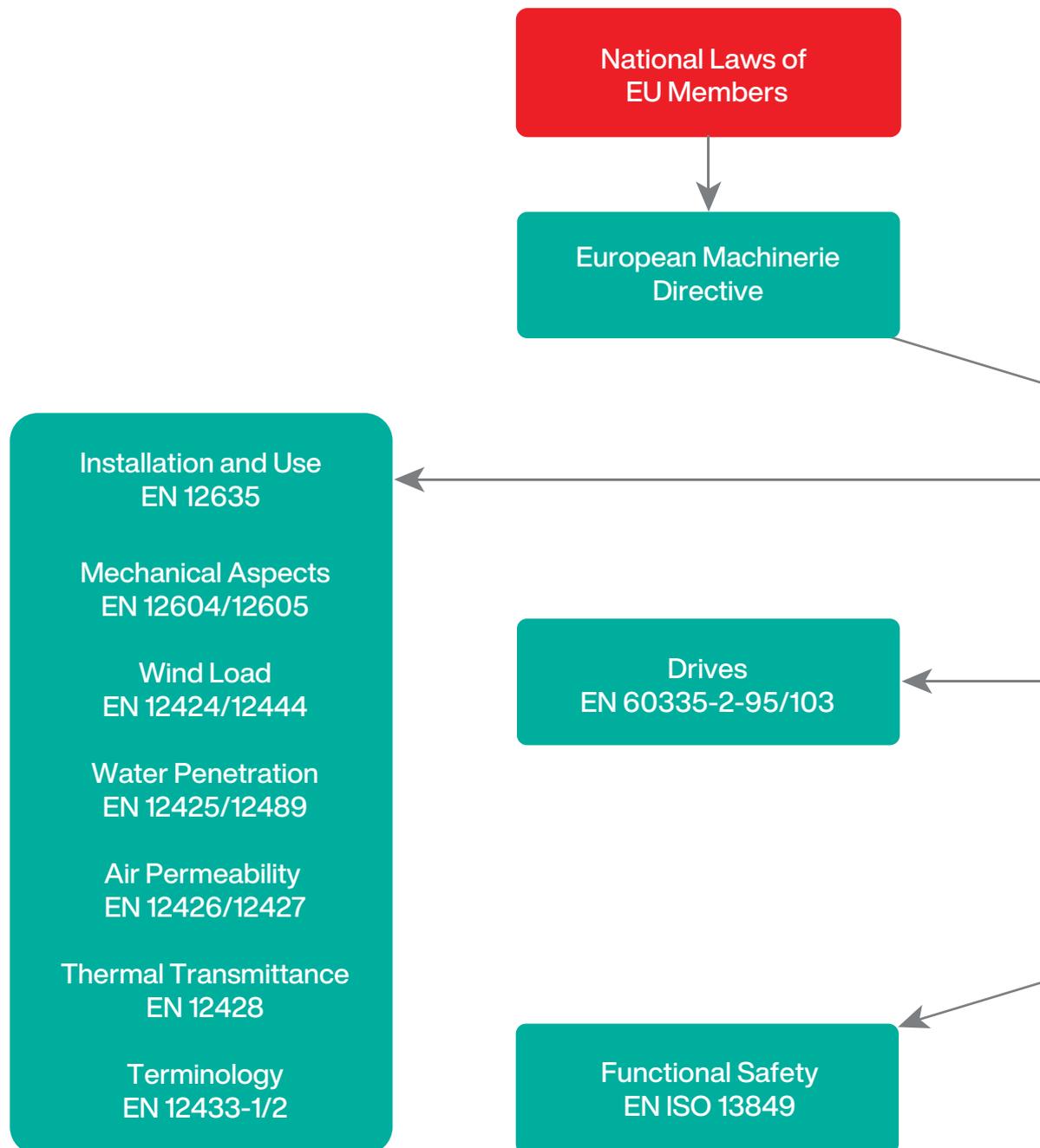
Product identification with modern laser inscription

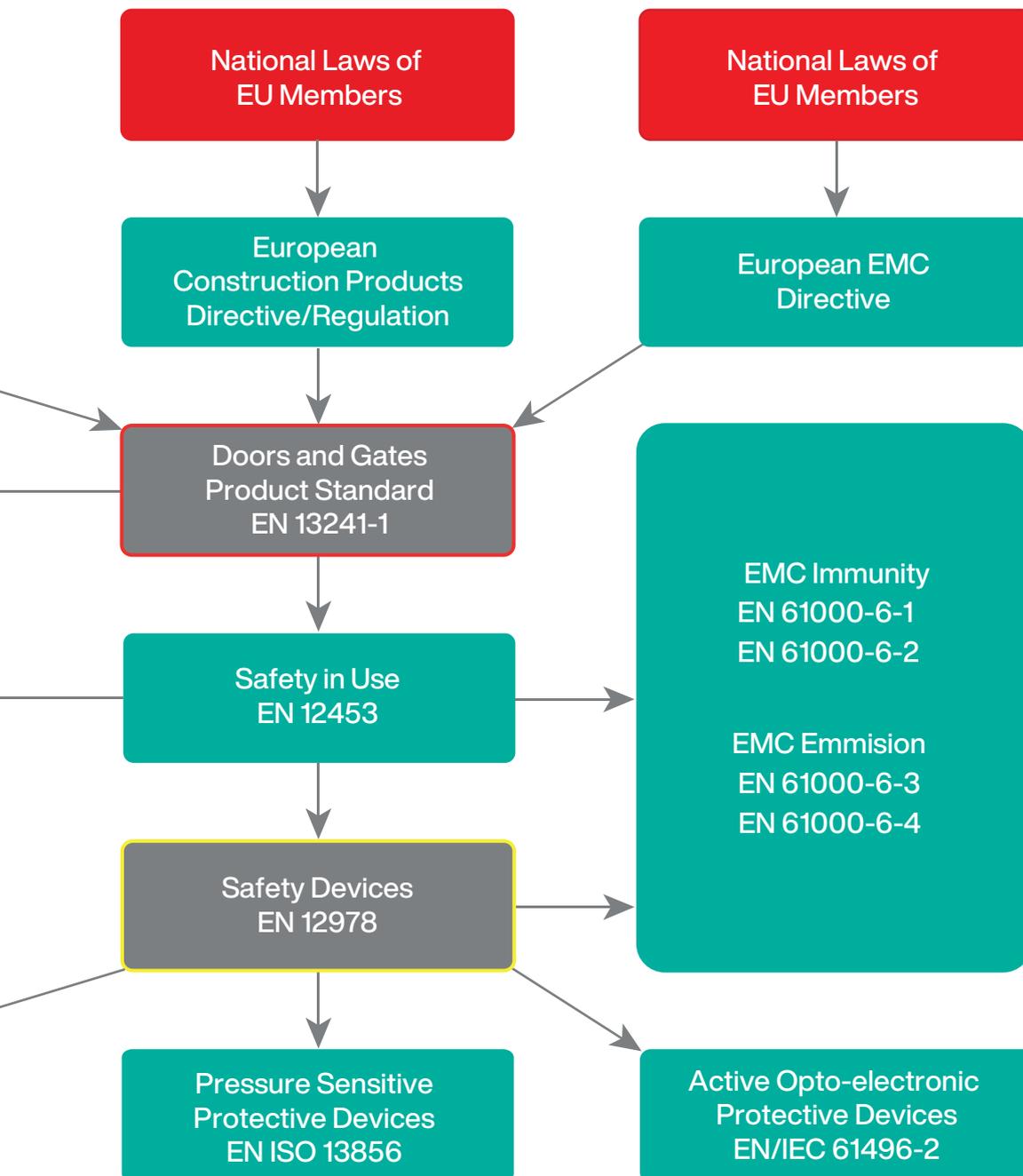
## The most important door and gate standards

Door and gate systems must be compliant with standard EN 13241. Not only the manufacturers but also the installation and maintenance companies are required to comply with these standards.

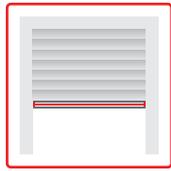
Our products, which are used as safety units in door and gate systems, for example as optoelectronic safety edges, pull-in protections safety units, safety light curtains or non-contact optoelectronic safety edges must all conform to EN 12978.

Below, a graphic illustrates the interconnections and dependencies on laws, guidelines, regulations and standards.

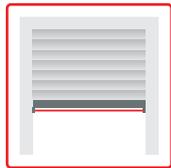




## Explanation to pictograms



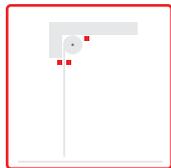
Optoelectronic safety edge



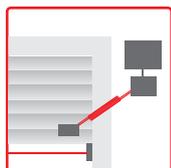
Non-contact safety edge



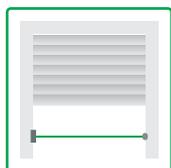
Pull-in protection



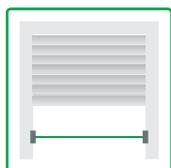
Pull-in protection  
Recommendation for assembly



Safety processing unit for  
optoelectronic safety edges



Reflective photo-electric switch



Through-beam photo switch



Accessories

## Safety sensors

Optoelectronic safety edges page 08

Pull-in protections page 10

Safety processing units page 12

## Standard sensors

Standard photoelectric switches page 14

## Accessories

Rain covers, reflectors, anti-condensation covers and mounting brackets page 16

Power supply unit page 18

Cable junction boxes page 18

Spiral cables page 22

Rubber profiles, aluminum-C-profiles and tools page 23

Approach stoppers page 28

## APPLICATION

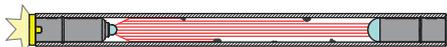
The LOW-POWER-SIGNAL is a 3rd generation optoelectronic safety edge. Our many years of experience with optoelectronic safety edges and modern market-requirements have been innovatively merged in this product.

### Diagnostic display

The components are always checked after connection to the supply voltage. These include the quality of the rubber compound, sensing distances, deflection, contamination, etc. The result of the test reading is displayed in the form of a blink-code with a range of 1 to 3 impulses.



1 LED-flash = ideal conditions



2 LED-flashes = good conditions



3 LED-flashes = operational limit reached

When there are three flashes the operational limit has been reached. The rubber profile should be checked for damages and the light channel should be checked for contaminants.

To repeat the diagnosis, briefly disconnect the optoelectronic safety edge from the supply voltage.

### Switching status

After diagnosis, the LOW-POWER-SIGNAL mode comes into operation. When the light-path is disrupted the yellow LED will illuminate.



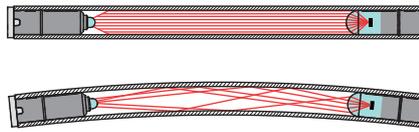
### Easy service

Thanks to the diagnostic display, the assembler can judge the operational safety of the optoelectronic safety edge and the rubber profile.

The switching status display can, when necessary, help identify any faults.

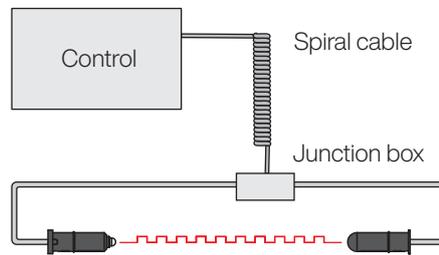
### Optical system

The new optical system allows for a larger sensing distance and a better switch performance with transverse deflections.

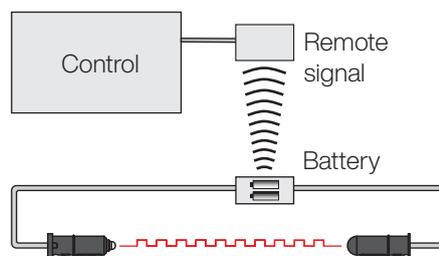


### Universally usable

The LOW-POWER-SIGNAL adjusts itself with the help of its patented "duo-switch" detection method to the spiral cable or the battery power. This happens automatically while the connected operating voltage is being registered. It results in optimal conditions for the respective operating situation.



When the LOW-POWER-SIGNAL is attached directly to the control via a spiral cable, it will work like a standard optoelectronic safety edge. It can be directly connected to any modern control with an OSE-input.

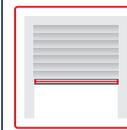


With battery powered control units, the LOW-POWER-SIGNAL will set itself up automatically. The power consumption is significantly reduced to maximize battery life.

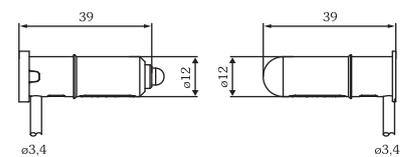
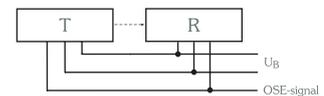
## LOW-POWER-SIGNAL



- universal optoelectronic safety edge
- suitable for remote modules/spiral cables
- diagnostic display
- easy installation
- OSE-output
- high degree of protection IP67



Thanks to its patented detection method, the LOW-POWER-SIGNAL will automatically adjust to being operated either by a radio system module or by spiral cable. With its innovative optics, even large door widths can be reached and it sets new standards with its lack of sensitivity to sagging e.g. through wind load.



### Technical data

|                      |                               |
|----------------------|-------------------------------|
| operating voltage    | 3...27 VDC                    |
| door width           | 1...12m                       |
| output               | OSE-signal                    |
| display              | yellow LED-transmitter        |
| connection           | 3x0.14mm <sup>2</sup>         |
| degree of protection | IP67, filled with epoxy resin |

### Relevant accessories

|                        |         |
|------------------------|---------|
| safety processing unit | page 12 |
| junction box           | page 18 |
| rubber profile         | page 23 |
| approach stopper       | page 28 |

LOW-POWER-SIGNAL | Item number  
see price list 1.01

**64316397**

set consists of:  
Transmitter 1m fixed cable with Molex plug.  
Receiver 10.5m fixed cable with Molex plug.

## APPLICATION

The non-contact safety edge NOCON-ROLL and NOCON-SEC are both easy to install and upgrade. The light-beam is emitted in front of the rubber profile and detects any obstructions before making contact. This leaves the door with a longer traverse path and the resulting closing force can be significantly reduced.



## NOCON-ROLL

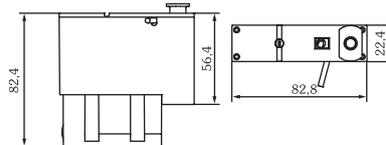
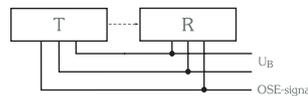


- non-contact safety edge
- for roller shutters
- reduces closing forces
- easy to upgrade
- OSE-output
- high degree of protection IP67



The NOCON-ROLL is a complete functional unit. It consists of a casing with a slim approach stopper for roll-up doors, a retractable sensor element and LED-indicators showing the switching status. It is easy to install on the existing C-rail. The leading light-beam allows obstructions to be registered much earlier and the closing forces are reduced significantly.

The NOCON-ROLL can be connected directly to any current controls with an OSE-input.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10..16 VDC                                      |
| door width           | 1..8m   |
| output               | OSE-signal                                      |
| display              | green/red LED-transmitter<br>green LED-receiver |
| connection           | 3x0.14mm <sup>2</sup>                           |
| degree of protection | IP67, filled with epoxy resin                   |

### Relevant accessories

|                        |         |
|------------------------|---------|
| safety processing unit | page 12 |
| junction box           | page 18 |
| rubber profile         | page 23 |

Set NOCON-ROLL | Item number

**64318028**

set consists of:  
Transmitter 1m fixed cable with Molex plug,  
Receiver 10.5m fixed cable with Molex plug

## NOCON-SEC



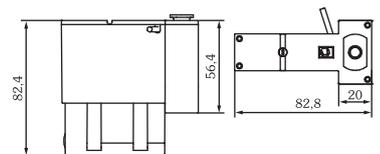
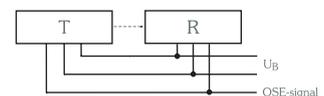
- non-contact safety edge
- for sectional doors
- reduces closing forces
- easy to upgrade
- OSE-output
- high degree of protection IP67



The NOCON-SEC is a complete functional unit. It consists of a casing with a slim approach stopper for sectional doors, a retractable sensor element and an LED-indicators showing the switching status.

It is easy to install on the existing C-rail. The leading light-beam allows obstructions to be registered much earlier and the closing forces are reduced significantly.

The NOCON-SEC can be connected directly to any current controls with an OSE-input.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10..16 VDC                                      |
| door width           | 1..8m   |
| output               | OSE-signal                                      |
| display              | green/red LED-transmitter<br>green LED-receiver |
| connection           | 3x0.14mm <sup>2</sup>                           |
| degree of protection | IP67, filled with epoxy resin                   |

### Relevant accessories

|                        |         |
|------------------------|---------|
| safety processing unit | page 12 |
| junction box           | page 18 |
| rubber profile         | page 23 |

Set NOCON-SEC | Item number

**64317970**

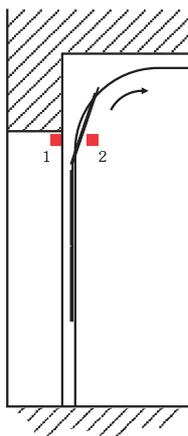
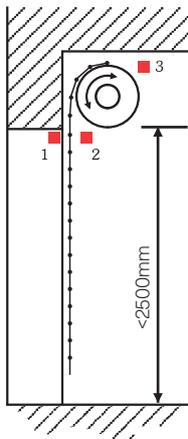
set consists of:  
Transmitter 1m fixed cable with Molex plug,  
Receiver 10.5m fixed cable with Molex plug

## APPLICATION

Photo cells for safety units on roller shutter systems must comply with EN 12978.

Door systems e.g. roller shutters with a design that leaves open the possibility of a "hazardous retraction" during operation or sensing distances heights under 2.5m that can possibly cause a "catch" in the wrapping mechanism of the drive, must be secured.

The safety mechanism is tested with a rod of max 50mm.



## TWIN-SAFE

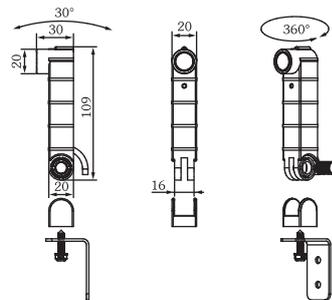
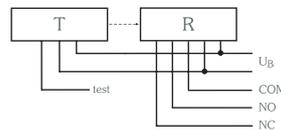


- potential-free relay-output
- test-input
- simple alignment with the pivoted joint
- front-facing LED alignment indicator
- insensitive against ambient light
- high degree of protection IP67



The TWIN-SAFE has a unique design as a pull-in protection, with its overhead optical unit, capability of alignment in all directions and with only a central mounting fixture.

The TWIN-SAFE has a potential-free changeover contact with a test-input and can be connected directly to any current controls that have a test-input.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10...30 VDC   |
| door width           | 1...20m   |
| output               | relay/test-input  |
| display              | green LED-transmitter<br>green/red LED-receiver                       |
| connection           | transmitter: 3x0.25mm <sup>2</sup><br>receiver: 5x0.25mm <sup>2</sup> |
| degree of protection | IP67, filled with epoxy resin   |

Set TWIN-SAFE  
see price list 2.01

Item number

**64322373**

set consists of:  
transmitter and receiver each with a 13m fixed cable, two mounting brackets V2A

## TWIN-PRO

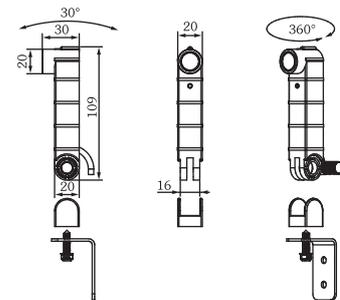
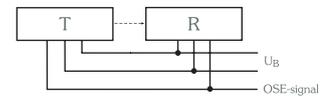


- OSE transmitter-output
- simple alignment with the pivoted joint
- front-facing LED alignment indicator
- insensitive against ambient light
- high degree of protection IP67



The TWIN-PRO has a unique design as a pull-in protection, with its overhead optical unit, capability of alignment in all directions and with only a central mounting fixture.

The TWIN-PRO can be connected directly to any current controls with an OSE-input.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10...15 VDC                                     |
| door width           | 1...20m   |
| output               | OSE-signal                                      |
| display              | green LED-transmitter<br>green/red LED-receiver |
| connection           | 3x0.14mm <sup>2</sup>                           |
| degree of protection | IP67, filled with epoxy resin                   |

Set TWIN-PRO  
see price list 2.02

Item number

**64322488**

set consists of:  
transmitter and receiver each with a 13m fixed cable, two mounting brackets V2A

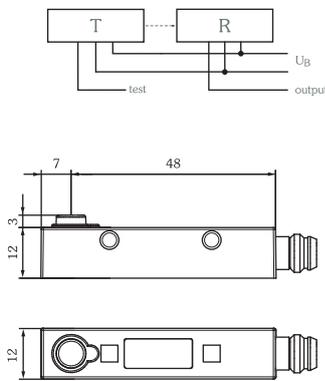
INNO-SAFE



- semiconductor-output
- test-input
- LED-display in the optical window
- high-quality plug
- insensitive against ambient light
- high degree of protection IP67



The INNO-SAFE has a very compact design that allows it to be easily installed in extrusions or in panels. The operating status is displayed by colored LEDs. The high-quality plugs and the complete embedding guarantee environmental stability. The short-circuit-proof semiconductor-output with a test-input allows direct operation from most door controls.



Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10...30 VDC                               |
| door width           | 1...10m                                   |
| output               | PNP-signal/test-input<br>light-on         |
| display              | green LED-transmitter<br>red LED-receiver |
| connection           | pluggable, M8 4-pin                       |
| degree of protection | IP67, filled with epoxy resin             |

Set INNO-SAFE | Item number  
see price list 2.03 | **64316402**

set consists of:  
transmitter and receiver. Connection cable S34G/5m and S34G/15m included

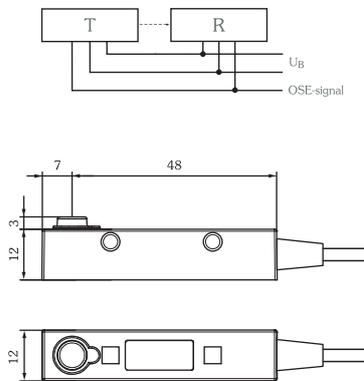
INNO-PRO



- OSE signal-output
- LED-display in the optical window
- insensitive against ambient light
- high degree of protection IP67



The INNO-PRO has a very compact design that allows it to be easily installed in extrusions or in panels. The LED-indicators are visible through the optical window. The high-quality plugs and the complete embedding guarantee environmental stability. The INNO-PRO can be connected directly to any current controls with an OSE-input.

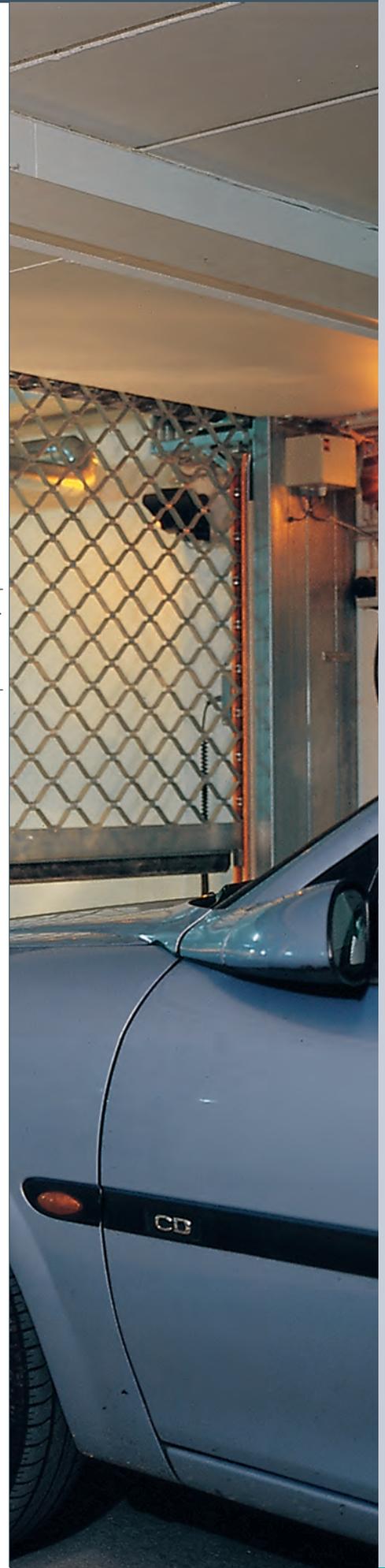


Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10...30 VDC                               |
| door width           | 1...10m                                   |
| output               | OSE-signal                                |
| display              | green LED-transmitter<br>red LED-receiver |
| connection           | 3x0.14mm <sup>2</sup>                     |
| degree of protection | IP67, filled with epoxy resin             |

Set INNO-PRO | Item number  
see price list 2.04 | **64316403**

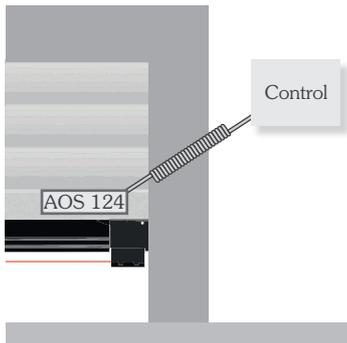
set consists of:  
transmitter and receiver each with a 13m fixed cable



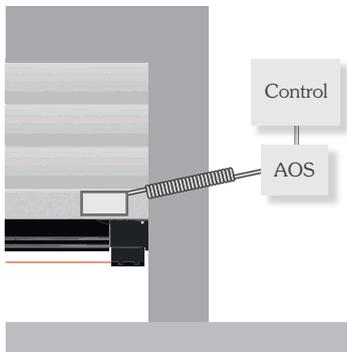
## APPLICATION

All safety light barriers with an OSE-signal or in some cases additionally 8k2 resistor contact strips can be connected to the safety processing units. These are evaluated and then provide a switching function in the form of a potential-free contact. This is often necessary with older controls, as these lack a direct interface for the analysis of the OSE-safety-signal. The safety processing unit can typically be used for upgrading older systems.

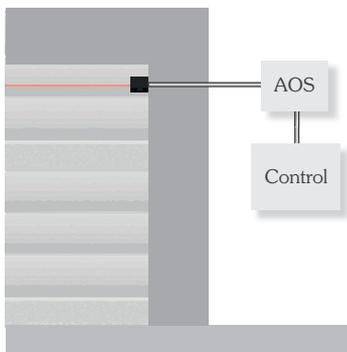
The safety processing units of the AOS-series were developed in accordance with ISO 13849-1 "Safety-related parts of control systems".



Optoelectronic safety edge installed on the door curtain.



optoelectronic safety edge

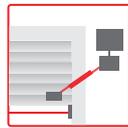


pull-in protection

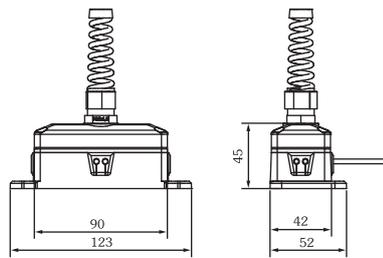
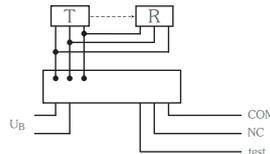
## AOS 124



- one OSE-input
- a safety circuit
- relay-output and test-input
- for mounting on the door curtain
- LED-indicators



The compact safety processing unit AOS 124 is installed directly on the door curtain. It can process an optoelectronic safety edge with an OSE-signal and is available as a potential-free contact for the control.



### Technical data

|                      |                            |
|----------------------|----------------------------|
| operating voltage    | 19...35 VDC or 19...30 VAC |
| input                | 1x OSE-signal              |
| output               | relay/test-input           |
| display              | yellow LEDs                |
| safety               | Cat. 2, ISO 13849-1        |
| degree of protection | IP65                       |

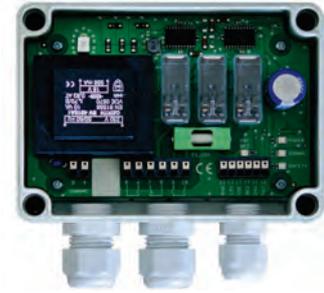
Set AOS 124  
see price list 3.01

Item number

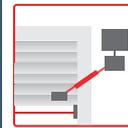
**64315307**

set consists of:  
safety processing unit AOS 124 in an LAD2-casing including seal kit and spiral cable gland M16

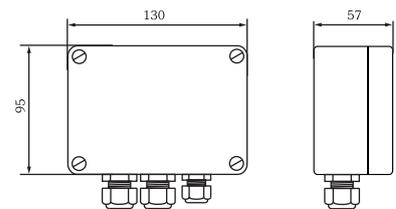
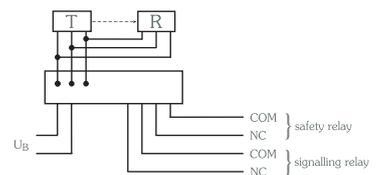
## AOS 3000



- one OSE-input
- a safety circuit
- positively driven safety-relays
- signal contact with pulse function and changer
- power-/function-display-LEDs



The safety processing unit AOS 3000 is suitable for an optoelectronic safety edge or for a pull-in protection and also a light curtain with an OSE-output.



### Technical data

|                      |  |
|----------------------|--|
| operating voltage    | AOS 3024-W 24 VAC/DC<br>AOS 3230-W 230 VAC |
| input                | 1x OSE-signal                              |
| output               | 1x safety contact<br>1x signal contact     |
| display              | yellow LEDs                                |
| safety               | cat. 3, PL c according to ISO 13849-1      |
| degree of protection | IP66                                       |

Set AOS 3230  
see price list 3.02

Item number

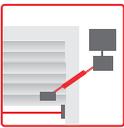
**64319247**

set consists of:  
safety processing unit AOS 3230 including a spiral cable gland M16 and a cable gland M20

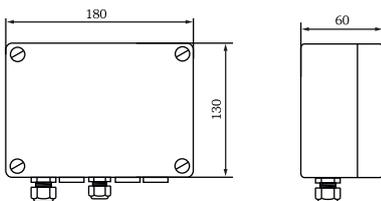
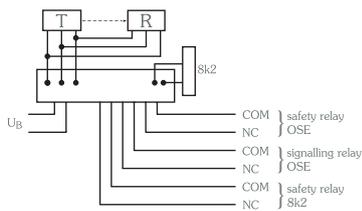
## AOS 4000



- one OSE-input and one 8k2-input
- two safety circuits
- positively driven safety-relays
- signal contact with pulse function
- power-/function-display-LEDs



The safety processing unit AOS 4000 is suitable for an optoelectronic safety edge, pass door switch and 8k2-secondary safety edges.

**Technical data**

|                      |  |
|----------------------|--|
| operating voltage    | AOS 4024 24 VAC<br>AOS 4230 230 VAC      |
| input                | 1x OSE-signal<br>1x 8k2-input            |
| output               | 2x safety contacts<br>1x signal contacts |
| display              | yellow LEDs                              |
| safety               | cat. 3, PL c according to ISO 13849-1    |
| degree of protection | IP66                                     |

Set AOS 4230  
see price list 3.04

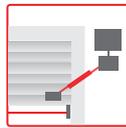
Item number

**64314759**

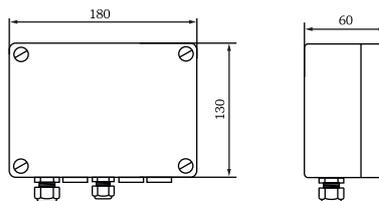
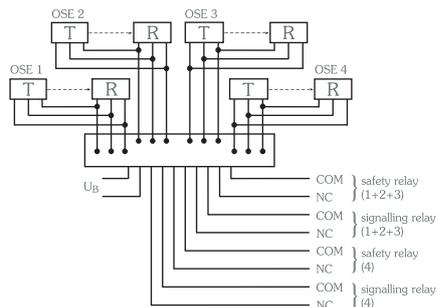
## AOS 6000



- four OSE-inputs
- two safety circuits
- positively driven safety-relays
- signal contact with pulse function
- power-/function-display-LEDs



It is possible to connect three pull-in protections to an OSE-output and one safety edge to the safety processing unit AOS 6000.

**Technical data**

|                      |  |
|----------------------|--|
| operating voltage    | AOS 6230 230 VAC                       |
| input                | 4x OSE-Signal                          |
| output               | 2x safety contact<br>2x signal contact |
| display              | green, yellow, red LEDs                |
| safety               | cat. 3, PL c according to ISO 13849-1  |
| degree of protection | IP66                                   |

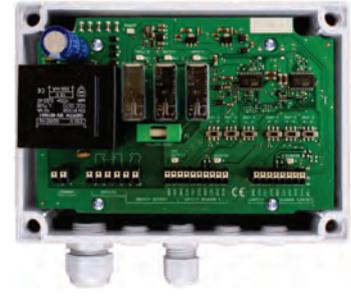
Set AOS 6230  
see price list 3.06

Item number

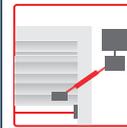
**64315427**

set consists of:  
safety processing unit AOS 6230 including a spiral cable gland M16 and a cable gland M16 and M20

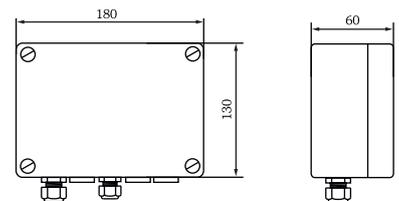
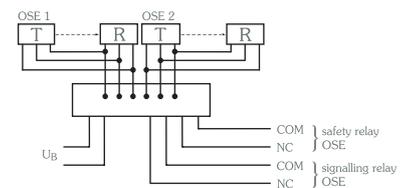
## AOS 7000



- two OSE-inputs or two 8k2-inputs
- one safety circuit
- positively driven safety-relays
- signal contact with pulse function and changer
- power-/function-display-LEDs



The safety processing unit AOS 7000 is suitable for two safety edges or for two pull-in protections units and also two light curtains with OSE-output.

**Technical data**

|                      |  |
|----------------------|--|
| operating voltage    | AOS 7024 24VAC/DC<br>AOS 7230 230 VAC  |
| input                | 2x OSE-signal                          |
| output               | 1x safety contact<br>1x signal contact |
| display              | green, yellow, red LEDs                |
| safety               | cat. 3, PL c according to ISO 13849-1  |
| degree of protection | IP66                                   |

Set AOS 7230  
see price list 3.07

Item number

**64318077**

set consists of:  
safety processing unit AOS 7230 including a spiral cable gland M16 and a cable gland M16 and M20

set consists of:  
safety processing unit AOS 4230 including a spiral cable gland M16 and a cable gland M16 and M20

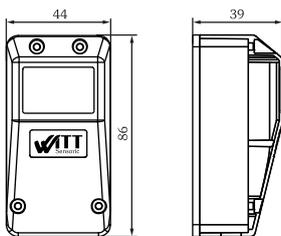
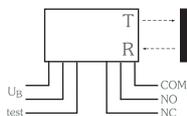
## RP25-12M-LR-SET



- can safely detect any reflective object
- adjustable optical polarizing filter
- alignment- and contamination indicator
- large terminal compartment
- high degree of protection IP65



The RP 25 is a high quality reflective photo switch. The optics are furnished with a polarizing filter that can easily detect reflective metal surfaces. The RP 25 is characterized by its easy installation thanks to its large terminal compartment, a pluggable threaded terminal and a cable screw connection with variable insertion options. Realignment of the optics can easily be done even after installation.



### Technical data

|                      |                           |
|----------------------|---------------------------|
| operating voltage    | 10..40 VDC or 24 VAC ±25% |
| door width           | 0.5 ... 12m               |
| output               | relay/test-input          |
| display              | green/red LEDs            |
| connection           | plug-screw plugs          |
| degree of protection | IP65                      |

### Relevant accessories

|                          |         |
|--------------------------|---------|
| weather protection cover | page 16 |
| reflectors               | page 16 |
| mounting brackets        | page 17 |

Set RP 25  
see price list 4.01

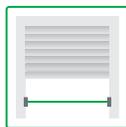
**Item number**  
**64316406**

set consists of:  
reflective photo switch RP 25, reflector RD82 SW4, mounting brackets HW-LS and HW-RD82, anti-condensation cover ISO-RD82, including a cable gland M12 and fastening material for the mounting brackets

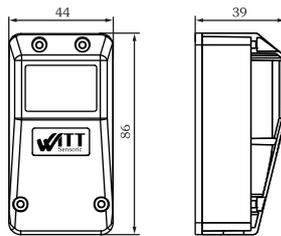
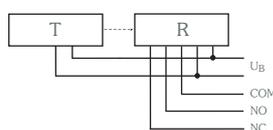
## ARGOS 25-20M-LR-SET



- two programmable transmitter frequencies
- alignment of the transmitters is possible
- large terminal compartment
- contamination indicator
- insensitive against ambient light
- high degree of protection IP65



The through-beam photo switch ARGOS 25 was specifically designed for door and gate systems onto which two photo switches are to be installed without interference with each other. The ARGOS 25 is installed on the surface and thanks to its high degree of protection is suitable for outdoor use.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10..40 VDC or 24 VAC ±25%                         |
| door width           | 1.0..20m  |
| output               | relay/test-input                                  |
| display              | yellow LED-transmitter<br>red/yellow LED-receiver |
| connection           | plug-screw plugs                                  |
| degree of protection | IP65  |

### Relevant accessories

|                          |         |
|--------------------------|---------|
| weather protection cover | page 16 |
| mounting brackets        | page 17 |

Set ARGOS 25 2-Kanal  
see price list 4.02

**Item number**  
**64316407**

set consists of:  
transmitter and receiver, two mounting brackets HW-LS, including a cable gland M12 and fastening material for the mounting brackets

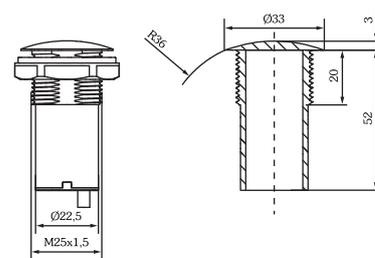
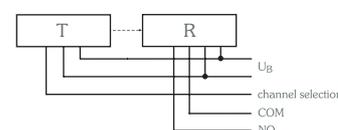
## ARGOS-20M-LR-4m



- two programmable transmitter frequencies
- well-designed built-in casing
- wear-free semiconductor relay
- soiling indication
- insensitive against ambient light
- high degree of protection IP67



Safe operation is guaranteed by the large opening angle, even when installation results in angular deviations. The M25 design conforms to the standardized measurements of cable screw connections. The high degree of protection of the casing is ensured with a gasket.



### Technical data

|                      |   |
|----------------------|---|
| operating voltage    | 10..40 VDC or 10..30 VAC  |
| door width           | 1.0..20m  |
| output               | Semiconductor-output<br>Potential-free closer/<br>test-input          |
| display              | green LED-transmitter<br>red LED-receiver                             |
| connection           | transmitter: 3x0.25mm <sup>2</sup><br>receiver: 5x0.25mm <sup>2</sup> |
| degree of protection | IP67, filled with epoxy resin   |

Set ARGOS 2-Kanal  
see price list 4.03

**Item number**  
**64316408**

set consists of:  
transmitter 4m fixed cable, receiver 4m fixed cable

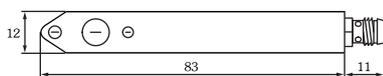
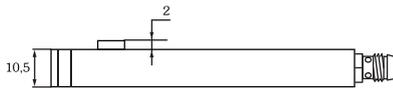
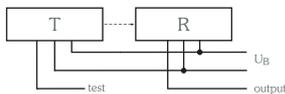
## SLENDER-13M-E5-V31-SET



- installation into the profile
- semiconductor-output
- plug connection M8 4-pin
- front-sided LED-indicator
- insensitive against ambient light
- high degree of protection IP67



The SLENDER is a small through-beam photo switch. The slim design makes it optimally suited for installation in profiles. The wide aperture angle and long range ensure problem-free alignment during installation. The light-source and LED-indicator are situated on the front side of the casing. The Slender is ideally suited for outdoor use. Sunlight and ambient light pose no problem.

**Technical data**

|                      |   |
|----------------------|---|
| operating voltage    | 10...30 VDC                                     |
| door width           | 0.5...13m                                       |
| output               | PNP/test-input<br>light-on                      |
| display              | green LED-transmitter<br>green/red LED-receiver |
| connection           | threaded plug, M8 4-pin                         |
| degree of protection | IP67, filled with epoxy resin                   |

Set SLENDER | Item number  
see price list 4.04

**64316409**

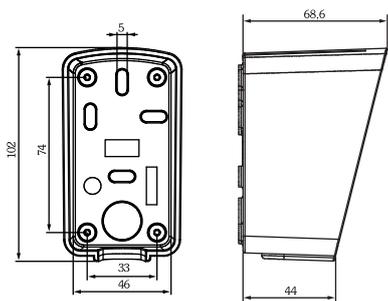
set consists of:  
transmitter and receiver, including connection cable S34G/5m  
and S34/G15m and two adhesive strips



WSH-LS



- stable weather-proof protective cover
- impact-resistant plastic PA6 GF15
- protects against environmental factors

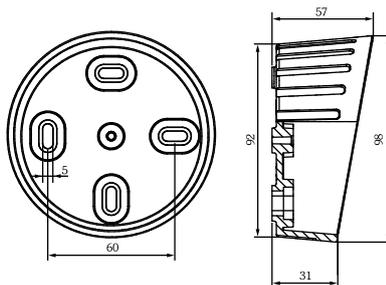


WSH-LS see price list 5.01  
 Item number  
**64315315**

WSH-RD82



- stable weather-proof protective cover
- impact-resistant plastic PA6 GF15
- protects against environmental factors
- suitable for the reflector RD82

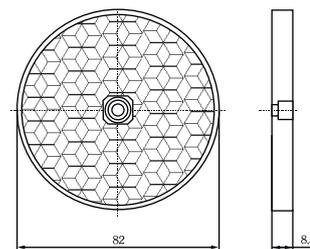


WSH-RD82 see price list 5.02  
 Item number  
**64315316**

RD82 SW4



- reflector for reflective photoelectric switch with polarization filters
- door width 12m (RP 25)

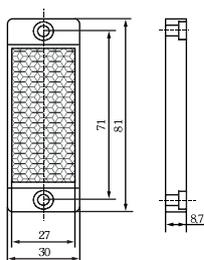


RD82 SW4 see price list 5.03  
 Item number  
**64314811**

R30/60



- reflector for reflective photoelectric switch with polarization filters
- slim design
- door width 8m (RP 25)

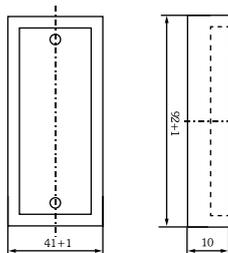


R30/60 see price list 5.06  
 Item number  
**64314810**

ISO-R30/60

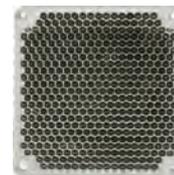


- anti-condensation cover for reflector R30/60
- reduces surface condensation
- thermic isolation from the underground

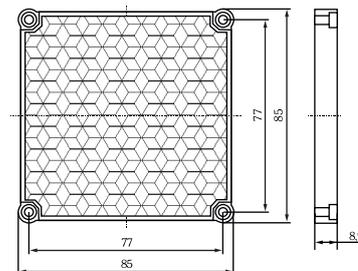


ISO-R30/60 see price list 5.07  
 Item number  
**64314850**

RD85/85



- reflector for reflective photoelectric switch with polarization filters
- door width 12m (RP 25)

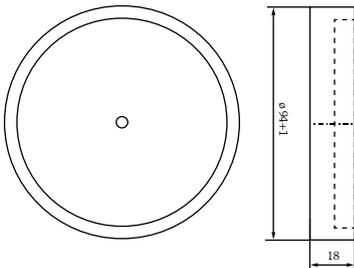


RD85/85 see price list 5.08  
 Item number  
**64314809**

ISO-RD82



- anti-condensation cover for reflector RD82
- reduces surface condensation
- thermic isolation from the ground



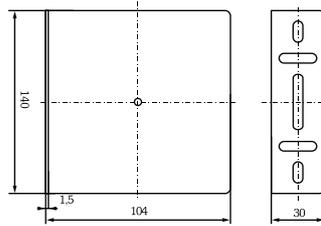
ISO-RD82  
see price list 5.04

Item number  
**64314849**

HW-RD82



- V2A mounting bracket for reflector RD82



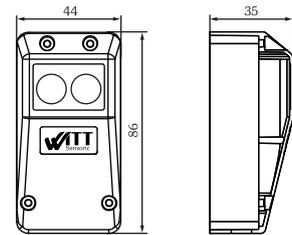
HW-RD82  
see price list 5.05

Item number  
**64314848**

RP25 COVER



- cover for RP 25
- plastic PMMA



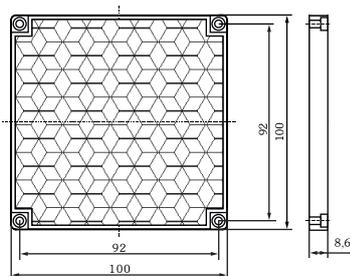
RP25 COVER  
see price list 5.12

Item number  
**64315343**

R100/100



- reflector for reflective photoelectric switch with polarization filters
- door width 15m (RP 25)



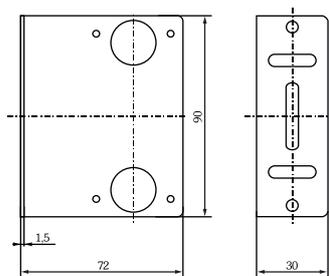
R100/100  
see price list 5.09

Item number  
**64314812**

HW-LS



- V2A mounting bracket for photo switches



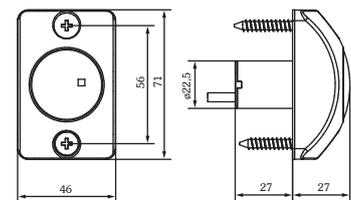
HW-LS  
see price list 5.10

Item number  
**64314847**

APG-AR



- housing for surface mounting of the ARGOS photo switch
- impact-resistant plastic PA6 GF15



APG-AR  
see price list 5.11

Item number  
**64315919**

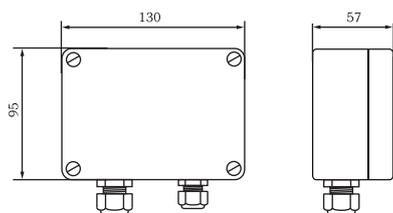
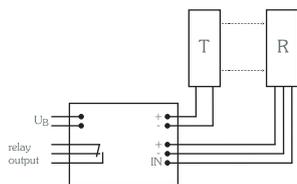
## NGZ 230R



- power supply unit for photo switches and light curtains
- PNP input
- potential free relay output
- adjustable switching delay
- acoustic signal



The power supply unit NGZ 230R is for connecting photo switches with PNP output to standard potential free relay input control panels. If needed a switching delay can be used and also an acoustic signal can be switched on.



### Technical data

|                      |                           |
|----------------------|---------------------------|
| operating voltage    | 230 VAC                   |
|                      | secondary 18 VDC / 250 mA |
| switching delay      | adjustable 0.1-5s         |
| output               | relay 250 V / 6 A         |
| display              | LED, yellow               |
| degree of protection | IP66                      |

NGZ 230R | Item number  
see price list 6.01

**64314410**

set consists of:  
power supply unit NGZ 230R, including a spiral cable gland M16 and a cable gland M16

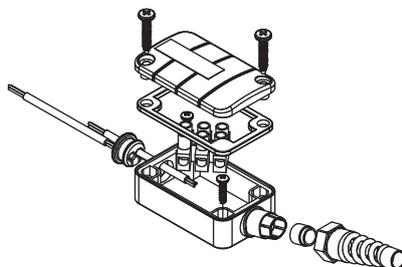
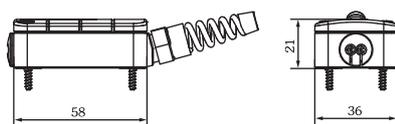
## LAD 1



- compact design
- angled cable-output for the spiral cable
- degree of protection IP54



The LAD 1 is used as a wiring box between the optoelectronic safety edge and the spiral cable and is installed on the door leaf. The angled cable-output keeps the spiral cable away from the frame.



LAD 1 | Item number  
see price list 6.02

**64314776**

set consists of:  
cable junction box with a spiral cable protector and a 3-pin screw terminal

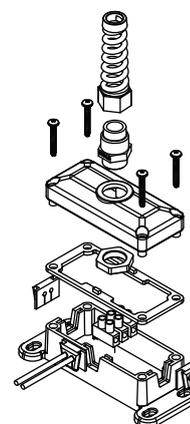
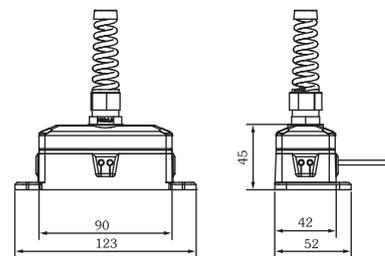
## LAD 2



- compact design
- impact-proof plastic
- MODULE 2- and 3-PCB can be installed
- degree of protection IP65



The LAD 2 is installed as a wiring box directly onto the door leaf. It is very stable and has a compact design. The enclosed seal kit gives it an IP65 degree of protection. The terminal compartment offers ample space for the wiring of optoelectronic safety edges, slack rope and a door contact with a spiral cable. It is also possible to install a MODULE 2-printed circuit board.



LAD 2 | Item number  
see price list 6.03

**64314782**

set consists of:  
cable junction box with a 5-pin push connector including a spiral cable gland M16 and screw set

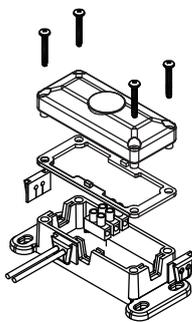
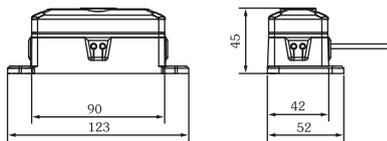
LAD 2B



- compact design
- impact-proof plastic
- MODULE 2- and 3-PCB can be installed
- degree of protection IP65



The LAD 2B is the ideal cable junction box in addition to the LAD 2. The design is exactly the same as the LAD 2 except the closed cover. It is thought to be the 2nd cable junction box on the door for the connection of optical safety edge, pass door switch and slack rope switch and can be used with MODULE 3.



LAD 2B  
see price list 6.04

Item number  
**64314731**

set consists of:  
cable junction box with a 5-pin push connector and screw set

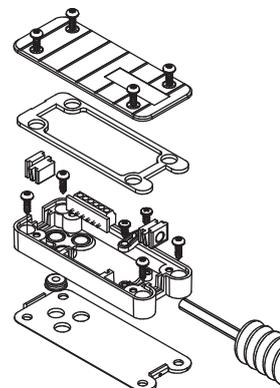
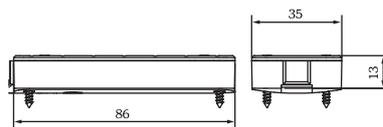
LAD 3



- very flat design
- circuit board with screw clamps
- suitable for roller shutters
- strain-relief for spiral cables
- degree of protection IP65



The LAD 3 is installed as a wiring box directly onto the door curtain. Thanks to its flat design it fits between the door and the facing. The separate clamping points allow easy wiring for optoelectronic safety edges and spiral cables.



LAD 3  
see price list 6.05

Item number  
**64316492**

set consists of:  
cable junction box with a seal kit, strain-relief and terminal block, including a screw set, 1 screwdriver and adapter for mounting on curved profiles

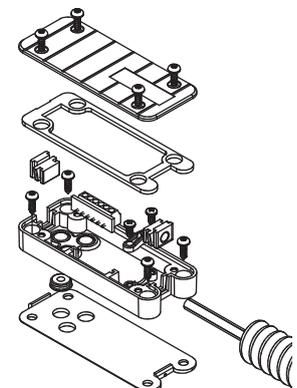
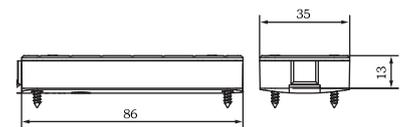
LAD 3 / LED



- Power-on indicator-LED
- transparent cover
- suitable for roller shutters
- strain-relief for spiral cables
- degree of protection IP65



The LAD 3 / LED is installed as a wiring box directly onto the door curtain. Thanks to its flat design it fits between the door and the facing. The separate clamping points allow easy wiring for optoelectronic safety edges and spiral cables. The green LED indicates power on.



LAD 3 / LED  
see price list 6.06

Item number  
**64316445**

set consists of:  
cable junction box with Power-on indicator-LED, with a seal kit, strain-relief and terminal block, including a screw set, 1 screwdriver and adapter for mounting on curved profiles

## LAD 4 90°

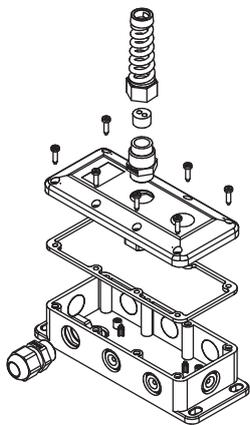
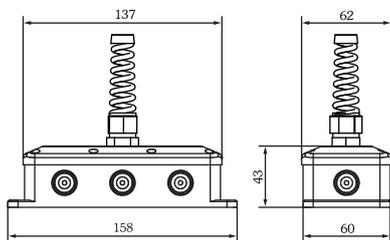


- large terminal compartment
- impact-proof plastic
- 90° cable exit
- pre stamped cable entries
- high degree of protection IP66



The LAD 4 offers large connection space for wiring all components on the door leaf. The high-quality design with a cover seal and 8 screw attachments guarantee excellent protection. Transparent cover with 90° cable exit.

For an easy and service-friendly electrical connection, the MODULE 2-PCB is available that can be installed directly into the LAD 4.



LAD 4 90°  
see price list 6.07

Item number

**64315300**

## LAD 4 45°

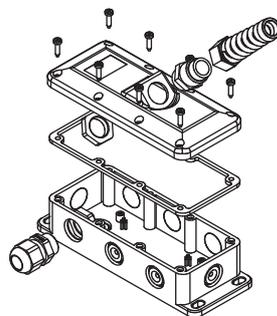
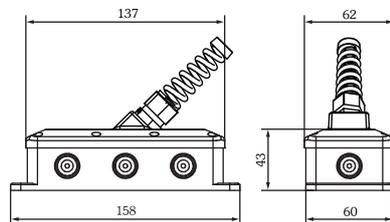


- large terminal compartment
- impact-proof plastic
- 45° cable exit
- pre stamped cable entries
- high degree of protection IP66



The LAD 4 offers large connection space for wiring all components on the door leaf. The high-quality design with a cover seal and 8 screw attachments guarantee excellent protection. Transparent cover with 45° cable exit.

For an easy and service-friendly electrical connection, the MODULE 2-PCB is available that can be installed directly into the LAD 4.



LAD 4 45°  
see price list 6.08

Item number

**64315302**

## LAD 4 CLOSED

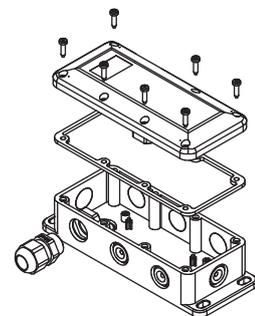
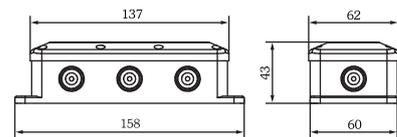


- large terminal compartment
- impact-proof plastic
- closed cover
- pre stamped cable entries
- high degree of protection IP66



The LAD 4 offers large connection space for wiring all components on the door leaf. The high-quality design with a cover seal and 8 screw attachments guarantee excellent protection. Closed transparent cover.

For an easy and service-friendly electrical connection, the MODULE 2-PCB is available that can be installed directly into the LAD 4.



LAD 4 closed°  
see price list 6.09

Item number

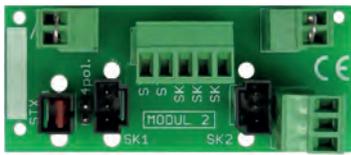
**64315398**

set consists of:  
cable junction box LAD 4, cover with 90° cable exit, including 1 spiral cable gland M16 and 3 cable screw connections M16 and seal kit

set consists of:  
cable junction box LAD 4, cover with 45° cable exit, including 1 spiral cable gland M16 and 3 cable screw connections M16 and seal kit

set consists of:  
cable junction box LAD 4, with closed cover including 1 spiral cable gland M16 and 3 cable screw connections M16 and seal kit

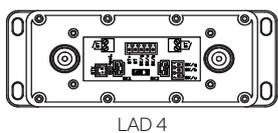
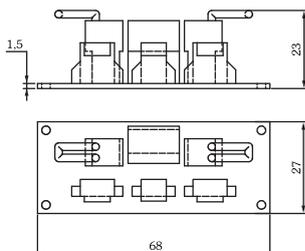
MODULE 2



- easy wiring of all door leaf components
- suitable for 4- and 5-core spiral cables
- GfA- and MFZ-compatible
- can be installed directly into an LAD 2/LAD 4



The MODULE-2-printed circuit board ensures quick and easy installation of door leaf components. The optoelectronic safety edges can be connected directly with a Molex-plug. Slack rope switch and pass door switch have their own clamping points. For especially wide doors, two MODULE-PCBs can be installed at the end and connected internally. The advantage in this case is that the sensors always have equal termination lengths and the variable cable length for the door width will only affect the connecting cable. The system can be configured for 4-core (such as GfA) or 5-core spiral cables (such as MFZ).



MODULE 2 | Item number  
see price list 6:10  
**64314749**

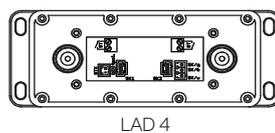
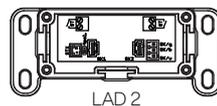
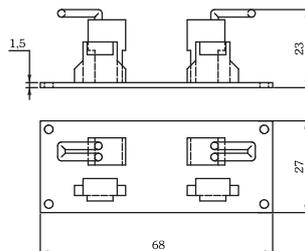
MODULE 3



- use in conjunction with MODULE 2
- easy wiring of all door leaf components
- GfA- and MFZ-compatible
- can be installed directly into an LAD 2/LAD 4



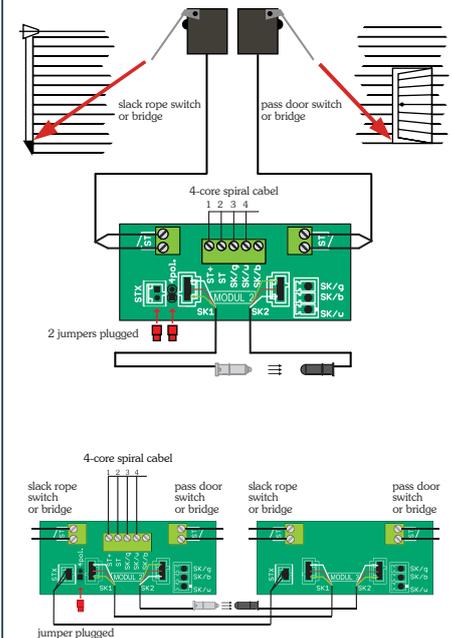
Quick installation of all door leaf components using MODULE 3 in conjunction with MODULE 2. Optical safety edge with connection cable of 0.5m and Molex plug on each side can be directly connected. In case of repairs the sensors can be quick and easy exchanged. Pass door switch and slack rope switch can be connected using the terminals on both modules as needed.



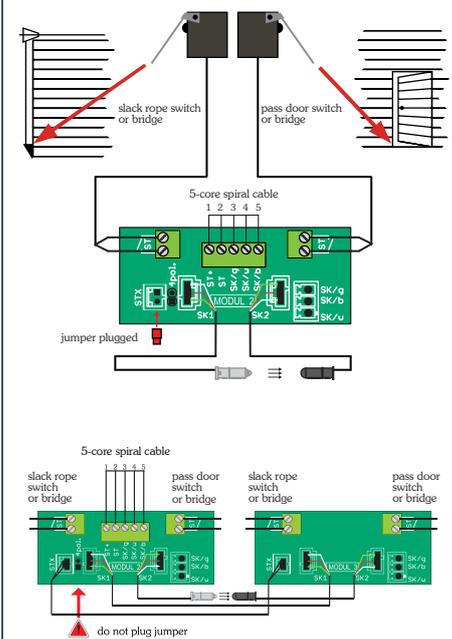
MODULE 3 | Art.-Nr.  
see price list 6:11  
**64318046**

APPLICATION

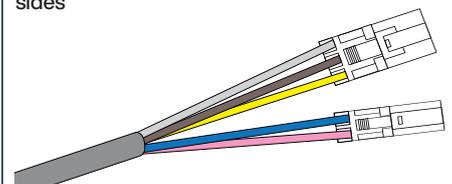
Example for connecting a 4-core spiral cable



Example for connecting a 5-core spiral cable



Link wire with 2- and 3-pin Molex plugs on both sides



see price list ab 6:12

## SPIRAL CABLE SPK



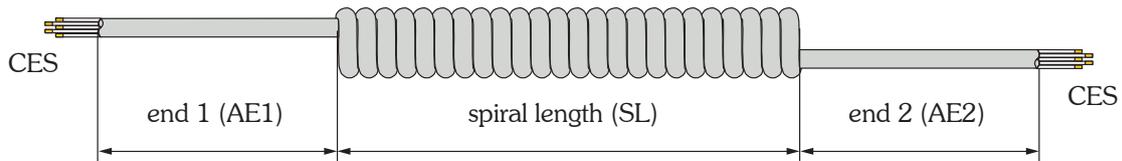
The spiral cables are manufactured with a high industrial quality, are tested to 100.000 guaranteed cycles and are suitable for operation in rough conditions. Strong retraction and long extension lengths guarantee a long life. The extension factor is four times that of the spiral length (SL).

Thanks to a special coating-mix the spiral cables are resilient to microbes, hydrolysis and almost all mineral oils. Furthermore the spiral cables are stable to UV and are free of halogens.

Material is PUR/PUR black, wire colors according to DIN 47100:

- 3-core = brown, white, green
- 4-core = brown, white, green, yellow
- 5-core = brown, white, green, yellow, grey
- 6-core = brown, white, green, yellow, grey, pink

Variable wire ends (see table), 40, 50, 60, 80, 100 or 200mm on both ends without sheathing and with core end sleeve (CES).



| name                      | spiral length | extended length | end 1 (AE1) | end 2 (AE2) | item number | price list |
|---------------------------|---------------|-----------------|-------------|-------------|-------------|------------|
| <b>3-core</b>             |               |                 |             |             |             |            |
| SPK 3x0.5mm <sup>2</sup>  | 750           | 3000            | 200         | 200         | 64314769    | 7.01       |
| SPK 3x0.5mm <sup>2</sup>  | 900           | 3600            | 200         | 200         | 64314780    | 7.02       |
| SPK 3x0.5mm <sup>2</sup>  | 900           | 3600            | 4000        | 350         | 64314927    | 7.03       |
| SPK 3x0.5mm <sup>2</sup>  | 750           | 3000            | 500         | 200         | 64314931    | 7.04       |
| SPK 3x0.5mm <sup>2</sup>  | 600           | 2400            | 500         | 200         | 64314921    | 7.05       |
| SPK 3x0.5mm <sup>2</sup>  | 950           | 3800            | 500         | 200         | 64314924    | 7.06       |
| <b>4-core</b>             |               |                 |             |             |             |            |
| SPK 4x0.25mm <sup>2</sup> | 750           | 3000            | 200         | 200         | 64314851    | 8.01       |
| SPK 4x0.25mm <sup>2</sup> | 900           | 3600            | 1000        | 400         | 64314772    | 8.02       |
| SPK 4x0.25mm <sup>2</sup> | 1200          | 4800            | 4000        | 400         | 64314774    | 8.03       |
| SPK 4x0.25mm <sup>2</sup> | 900           | 3600            | 2000        | 350         | 64315455    | 8.04       |
| <b>5-core</b>             |               |                 |             |             |             |            |
| SPK 5x0.25mm <sup>2</sup> | 500           | 2000            | 1000        | 200         | 64314767    | 9.01       |
| SPK 5x0.25mm <sup>2</sup> | 750           | 3000            | 200         | 200         | 64314721    | 9.02       |
| SPK 5x0.25mm <sup>2</sup> | 800           | 3200            | 1500        | 200         | 64314765    | 9.03       |
| SPK 5x0.25mm <sup>2</sup> | 900           | 3600            | 200         | 300         | 64314745    | 9.04       |
| SPK 5x0.25mm <sup>2</sup> | 900           | 3600            | 2000        | 350         | 64314923    | 9.05       |
| SPK 5x0.25mm <sup>2</sup> | 1000          | 4000            | 1000        | 1500        | 64314874    | 9.06       |
| <b>6-core</b>             |               |                 |             |             |             |            |
| SPK 6x0.25mm <sup>2</sup> | 900           | 3600            | 4000        | 350         | 64316978    | 9.07       |

### Mounting bracket spiral cable

Mounting bracket to secure the spiral cable



HW-SPK-SV16  
see price list 10.01

Item number

**64315097**



HW-SPK-160/25-SV16  
see price list 10.02

Item number

**64315098**

set consists of:  
mounting bracket including a spiral cable gland M16

set consists of:  
mounting bracket including a spiral cable gland M16

APPLICATION

GP12/14-38-00

GP12/14-38-01

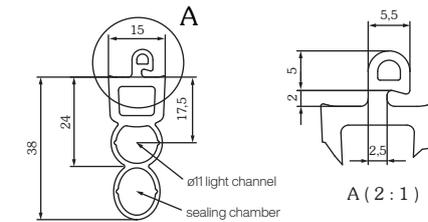


RUBFLEX® is a rubber compound specially developed to our specifications. In addition to the flexibility necessary over a wide range of temperatures, it also has excellent optophysical features for the light-channel of optical optoelectronic safety edges, a feature that was a special requirement during development. To guarantee the required physical characteristics, our company developed new testing methods that ensure the high-quality of the RUBFLEX® rubber compound.



Technical data

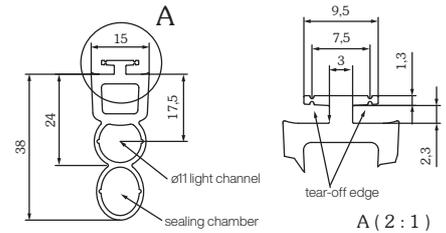
color black  
 material EPDM  
 shore-hardness A 65 ±5



GP12/14-38-00  
 see price list 11.01

Item number

64314857



GP12/14-38-01  
 see price list 11.02

Item number

64315283

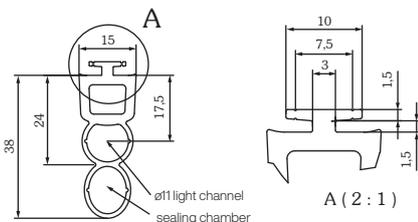
GP12/14-38-02

GP12/14-28

GP12/14-36



- suited for designs from ø11-12mm
- relevant accessories: RAS 30



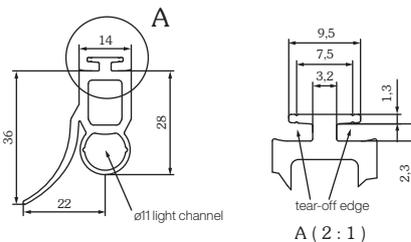
GP12/14-38-02  
 see price list 11.03

Item number

64315290



- suited for designs from ø11-12mm
- relevant accessories: RAS 30



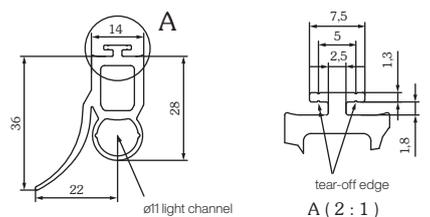
GP12/14-28  
 see price list 11.04

Item number

64315285



- suited for designs from ø11-12mm
- relevant accessories: RAS 20



GP12/14-36  
 see price list 11.05

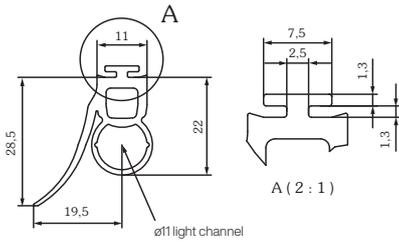
Item number

64315286

GP12/11-30



• suited for designs from  $\varnothing 11-12\text{mm}$

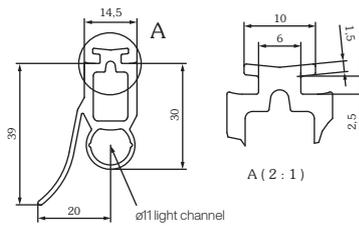


GP12/11-30 | Item number  
see price list 11.06  
**64315284**

GP12/145-295



• suited for designs from  $\varnothing 11-12\text{mm}$   
• relevant accessories: RAS 30

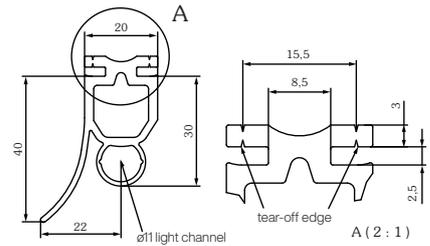


GP12/145-295 | Item number  
see price list 11.07  
**64315287**

GP12/20-40-00



• suited for designs from  $\varnothing 11-12\text{mm}$   
• relevant accessories: ALS 30, ALS 35, ALU 20x9

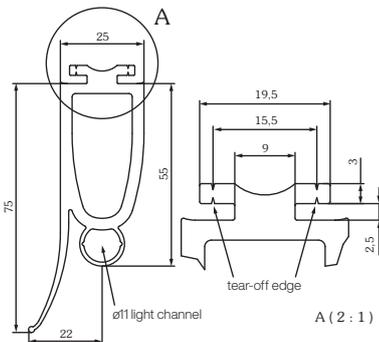


GP12/20-40-00 | Item number  
see price list 11.08  
**64315288**

GP12/25-75



• suited for designs from  $\varnothing 11-12\text{mm}$   
• relevant accessories: ALS 55, ALU 25x12

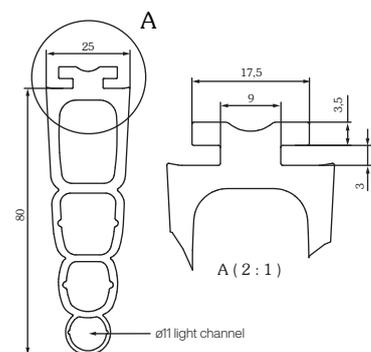


GP12/25-75 | Item number  
see price list 11.12  
**64315289**

GP12/25-80



• suited for designs from  $\varnothing 11-12\text{mm}$   
• relevant accessories: ALU 25x12

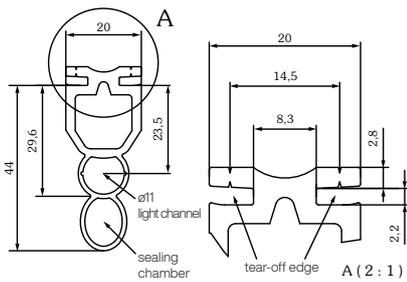


GP12/25-80 | Item number  
see price list 11.14  
**64315447**

GP12/20-40-01



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: ALS 30, ALS 35, ALU 20x9



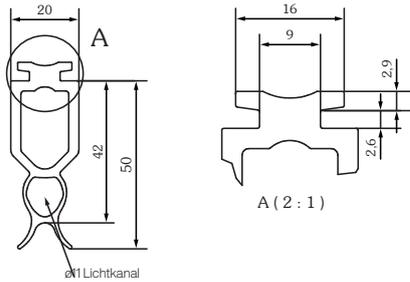
GP12/20-40-01  
see price list 11.09

Item number  
**64315291**

GP12/20-50



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: ALS 40, ALU 20x9



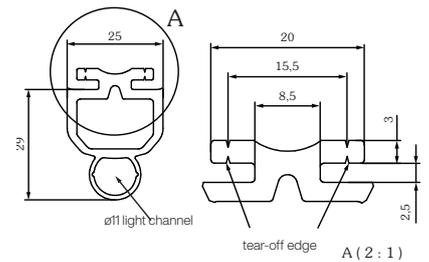
GP12/20-50  
see price list 11.10

Item number  
**64318318**

GP12/25-29



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: ALS 30, ALU 25x12



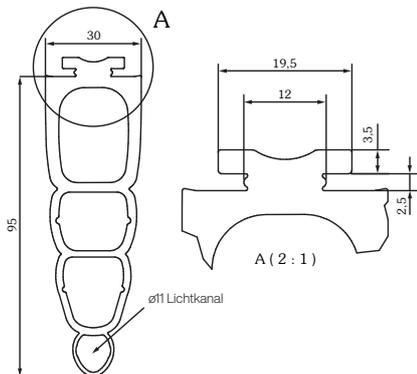
GP12/25-29  
see price list 11.11

Item number  
**64315386**

GP12/30-90



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: MAS-1 und MAS-E



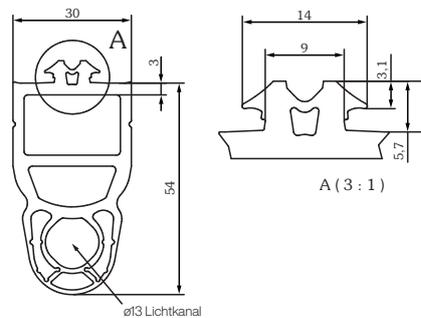
GP12/30-90  
see price list 11.15

Item number  
**64317856**

GP14/30-54-01



- suited for designs from  $\varnothing 13-15\text{mm}$
- relevant accessories: ALS45



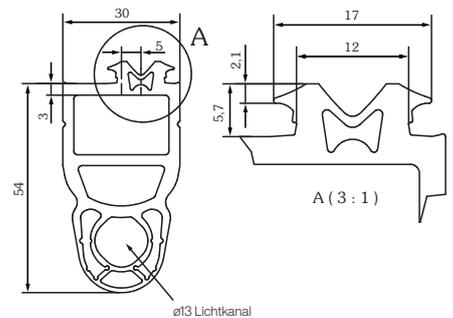
GP14/30-54-01  
see price list 11.16

Item number  
**64319073**

GP14/30-54-02



- suited for designs from  $\varnothing 13-15\text{mm}$
- relevant accessories: ALS45



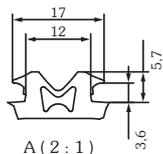
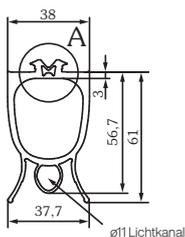
GP14/30-54-02  
see price list 11.17

Item number  
**64319074**

GP12/38-65



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: MAS-1 und MAS-E oder ALS55



GP12/38-65  
see price list 11.18

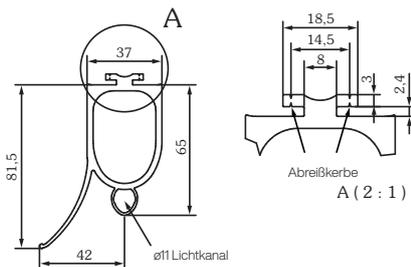
Item number

**64316120**

GP12/37-80



- suited for designs from  $\varnothing 11-12\text{mm}$
- relevant accessories: MAS-1 und MAS-E



GP12/37-80  
see price list 11.19

Item number

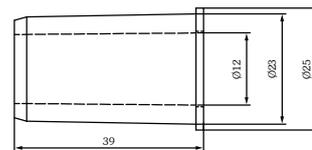
**64318670**

ADOS15/12

ADOS21/12



- Adapter for safety edge Sensors with  $\varnothing 11\text{mm}$
- For use in a light channel with a diameter of  $\varnothing 15\text{mm}$  or  $22\text{mm}$



ADOS/15-12  
see price list 12.04

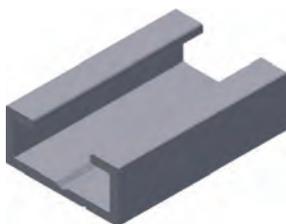
Item number

**64314733**

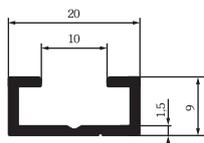
ADOS/21-12  
see price list 12.05

**64314725**

ALU 20x9



- aluminum-C-profile with drilling line

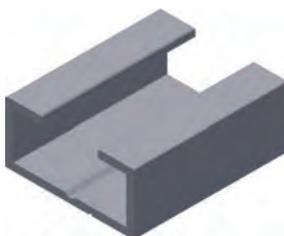


ALU 20x9  
see price list 12.01

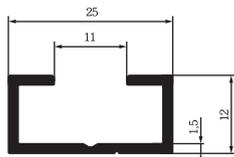
Item number

**64315460**

ALU 25x12



- aluminum-C-profile with drilling line



ALU 25x12  
see price list 12.02

Item number

**64315461**

LS-3305



- cutting length 75mm

High-quality rubber profile cutter, to cleanly cut the rubber profiles

LS-3305  
see price list 12.03

Item number

**64314778**

## Production of sealing profiles

Extrusion is used for the production of EPDM sealing profiles. During the extrusion process, raw material is pushed continuously under high pressure through the extrusion die. This creates an endless profile.



The even flow of the well-mixed raw materials at the right temperature is the basis for a high performing safety edge profile.



The last steps mounting the extrusion die.



Continuous monitoring of the operating temperature ensures an optimum profile geometry.



The first centimetre shows whether the toolmakers and the setter have done a good job.



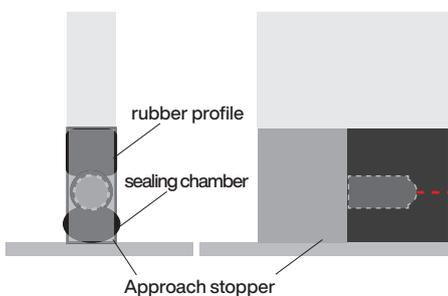
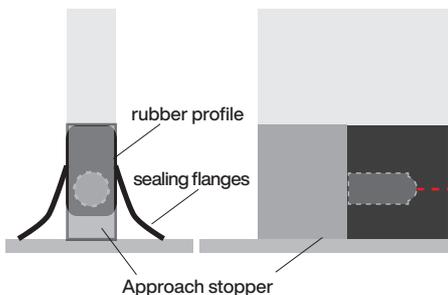
The correct positioning of the extrusion die lays the foundation for a faultless product.



On the way to further flexibilisation by means of salt bath vulcanization. Last tension release for the freshly pressed sealing profile.

APPLICATION

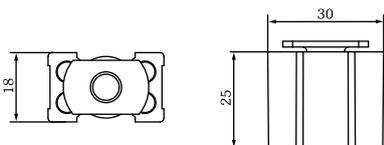
In a closed state the door leaf sits on the approach stoppers. These protect the rubber profile and/or the inner optical closing edge device from damage. The installation height is selected to ensure that the hollow chamber containing the closing edge sensor is not deformed, but that the sealing flanges or the sealing chamber make tight contact with the floor.



ALS 25



• approach stopper, including screw + T-nut M8

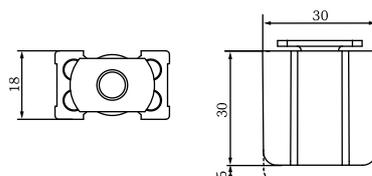


ALS 25 | Item number  
see price list 13.01 | **64314723**

ALS 30/ALS 35



• approach stopper, including screw + T-nut M8

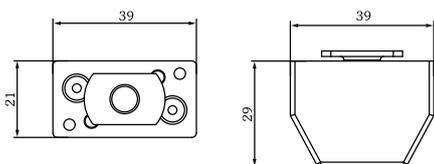


ALS 30 | Item number  
see price list 13.02 | **64314799**  
ALS 35 | Item number  
see price list 13.03 | **64314768**

MAS 1



• modular approach stopper for sectional doors, including screw + T-nut M8

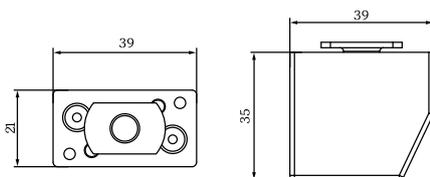


MAS 1 | Item number  
see price list 13.07 | **64314795**

MAS 2



• modular approach stopper for roller grill doors, including screw + T-nut M8

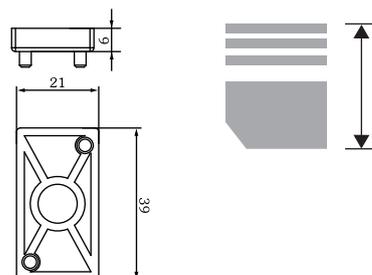


MAS 2 | Item number  
see price list 13.08 | **64314800**

MAS E



• extension module for MAS 1 and MAS 2

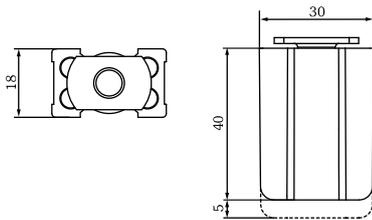


MAS E | Item number  
see price list 13.09 | **64314803**

ALS 40/ALS 45



- approach stopper, including screw + T-nut M8



ALS 40  
see price list 13.04

Item number

**64315746**

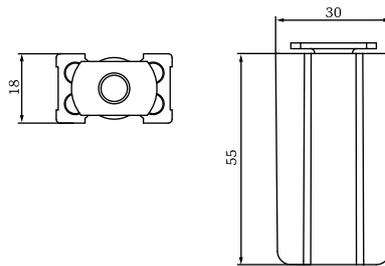
ALS 45  
see price list 13.05

**64315831**

ALS 55



- approach stopper, including screw + T-nut M8



ALS 55  
see price list 13.06

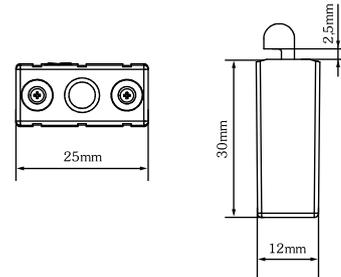
Item number

**64314724**

RAS 10



- approach stopper, including 2 screws Plasfast 3x12



RAS 10  
see price list 13.10

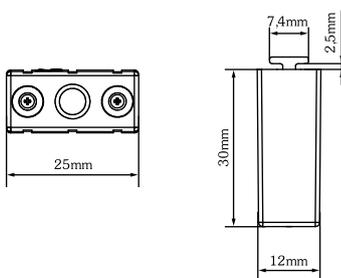
Item number

**64315294**

RAS 20



- approach stopper, including 2 screws Plasfast 3x12



RAS 20  
see price list 13.11

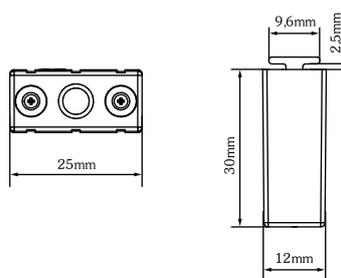
Item number

**64315296**

RAS 30



- approach stopper, including 2 screws Plasfast 3x12



RAS 30  
see price list 13.13

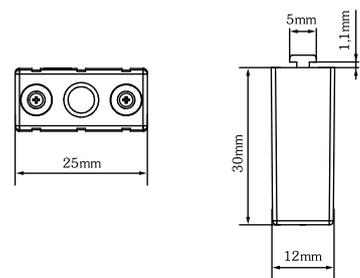
Item number

**64315297**

RAS 40



- approach stopper, including 2 screws Plasfast 3x12



RAS 40  
see price list 13.13

Item number

**64315298**

**Our fine print**

This catalogue was put together with a great deal of care. Despite this, mistakes cannot be completely ruled out. We accept no liability for such cases.

The contents correspond with the state at the time of printing. Due to the ongoing further development of our products, alterations may occur. Our technical data can change over time as our products are upgraded.

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The general conditions of sale, delivery and payment of Witt Sensoric GmbH Berlin apply.



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- accounting:** 030 - 75 44 94 - 122
- fax:** 030 - 75 44 94 - 123

or send us an email at:  
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**Made in Germany – We deliver quality from Berlin to you**

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## Terms and Conditions of Sale, Delivery and Payment of Witt Sensoric GmbH, Berlin

### 1. Conclusion of contract

We shall deliver goods solely on the basis of the following conditions. The Buyer's purchasing conditions shall not place us under obligation, even if we have not expressly contradicted them. Our General Terms and Conditions of Sale, Delivery and Payment shall be deemed accepted at the latest upon receipt of the goods.

Our offers are subject to change without notice. Concluded contracts and agreements, in particular insofar as they amend these conditions, shall only be binding for us following our written approval. Oral or written orders shall be deemed accepted when the written confirmation of order is issued or the goods ordered are delivered.

Information on technical data, dimensions, quantities, colours and other properties in catalogues, data sheets, product descriptions and similar documents are subject to change in line with developments and improvements and do not therefore constitute a guarantee.

### 2. Prices and terms and conditions of payment

The prices are to be construed as ex works and without packaging but plus the respective, valid, statutory value added tax. Payments are to be effected ex paying agent of the Supplier. The Buyer may only set off using claims that are not disputed or are res judicata. All prices shall cease to be valid upon the publication of a new price list.

### 3. Reservation of title

The delivery items (reserved goods) shall remain the Supplier's property until all the Supplier's claims against the Buyer resulting from the business association have been settled. Insofar as the value of all security rights to which the Supplier is entitled exceed the amount of all secured claims by more than 20%, the Supplier shall, at the Buyer's request, release an appropriate part of the security rights.

During the period in which the reservation of title applies, the Buyer shall be prohibited from pledging or ownership transfer by way of security while resale shall only be permitted to retailers during the ordinary course of business and only on condition that the retailer receives payment from its customers or makes the reservation that ownership shall only pass to the customers when they have honoured their payment obligations.

The Buyer shall inform the Supplier without delay in the case of seizure, confiscation or other orders or intervention on the part of third parties. If the Buyer violates an obligation, in particular in the case of default in payment, the Supplier shall be entitled to withdraw, and take back goods, following the unsuccessful lapse of a reasonable period set for the Buyer. This shall not affect the statutory provisions on the superfluous nature of setting a time limit. The Buyer shall be under obligation to surrender.

The Supplier shall be entitled to withhold its services or to withdraw from the contract if it becomes aware of circumstances, under which there is a threat of the Buyer becoming insolvent, or if the Buyer is not willing or able to meet its payment obligations on the due date for other reasons.

### 4. Delivery

The delivery time is agreed merely as an approximate time. The delivery period shall commence on the day on which the confirmation of order is dispatched and shall be deemed met if the goods have left our warehouse by the end of the delivery period, or notification of the readiness for dispatch has been provided for such goods. The delivery period shall be extended accordingly – including during a period of default in delivery – in the event of unforeseeable obstructions, which the Supplier was unable to ward off irrespective of acceptable care taken in accordance with the circumstances of the case – and irrespective of whether such obstructions apply to us or our subcontractors – such as operational disruption, intervention by the authorities, industrial action, war, mobilization, unrest, delays in the delivery of key raw materials and building materials or force majeure.

Meeting the times for deliveries shall be conditional on the timely receipt of all documents, necessary licenses and releases to be provided by the Buyer, in particular plans, as well as adherence to the agreed terms of payment and other obligations incumbent upon the Buyer. The periods shall be extended accordingly if such conditions are not met in good time. This shall not apply if the Supplier is responsible for the delay. In the event that we default in delivery, the Buyer shall be entitled to set an appropriate additional period of time.

The Buyer shall be entitled to withdraw from the contract once this additional period of time has lapsed. Claims for damages due to non-performance or delayed performance are excluded. The Buyer may not reject partial deliveries. We reserve the right to provide one or more deliveries in respect of special versions.

### 5. Freight, shipping

In the absence of agreements to the contrary, goods shall be shipped carriage forward. The risk shall pass to the Buyer upon the hand-over of the goods to the carrier, at the latest however when the goods leave our warehouse. Goods for which notification of dispatch is provided on the agreed date must be called up without delay. Otherwise, or in the event of the impossibility of shipping, we shall be entitled at our own discretion to store the goods at the Buyer's cost and risk and charge the Buyer for these as delivered "ex works". The Buyer shall be obliged, upon any export, to observe the export control regulations applicable to the delivery items. In the event that the export provisions are breached, the Supplier shall be entitled to withdraw from the contract.

### 6. Warranty, liability, notification of defects

Irrespective of a shorter requirement to give notice of defects, notification of defects is to be given at the latest two weeks following receipt of the goods. Notification of defects that cannot be identified by way of careful checking within that period is to be provided without delay once they are identified, at the latest within the warranty period. The delivery shall be deemed authorized if notification of defects is not provided in good time. The warranty period is 24 months from delivery of the goods. Insofar as notification of defects is justified, we shall, at our discretion, provide replacements, subsequent improvement or reimburse the reduced value. Further warranty claims are excluded.

Claims for damages due to the impossibility of performance, delay, positive breach of an obligation, negligence in respect of entering into the contract and unlawful actions shall be excluded unless these are based on intent or gross negligence on our part or our executive personnel. The Buyer's claims for damages and compensation of expenses (hereinafter: claims for damages) are excluded, irrespective on whichever legal grounds, in particular due to a breach of obligations resulting from the contractual relationship and unlawful actions.

This shall not apply insofar as liability is mandatory, e.g. in accordance with the German Product Liability Act, in cases of intent, gross negligence, danger to life and limb or breaching key contractual obligations. However, claims for damages in respect of breaching key contractual obligations shall be limited to the foreseeable damage that is typical of contracts insofar as intent or gross negligence do not apply or liability applies due to danger to life and limb. The regulations above are not associated with changing the onus of proof to the detriment of the Buyer.

Insofar as the Buyer is entitled to claims for damages in accordance with this Article, such claims shall fall under the statute of limitations following the lapse of the limitation period that applies to claims in respect of defects. The statutory statute of limitations shall apply to claims for damages in accordance with the German Product Liability Act.

### 7. Place of jurisdiction and applicable law

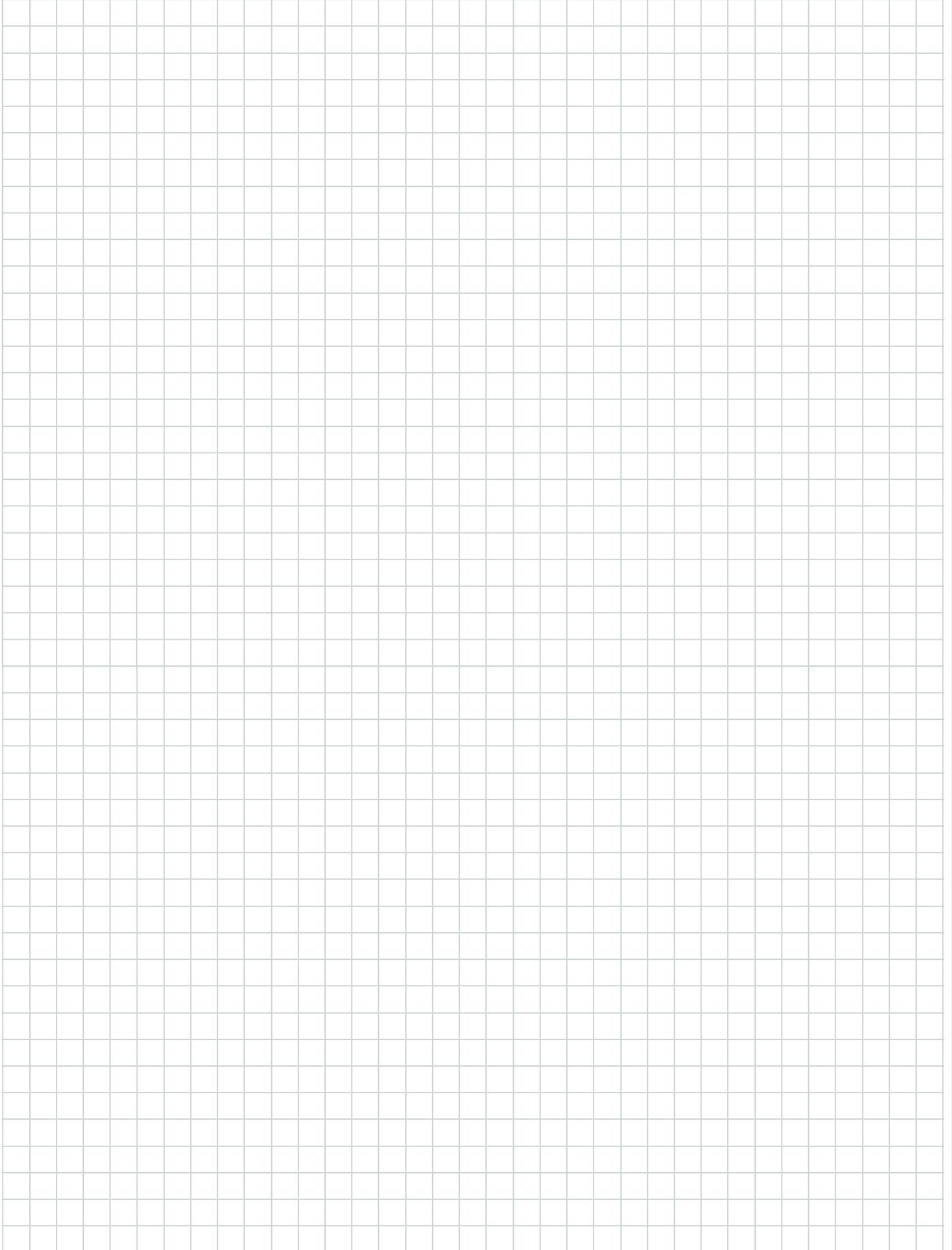
Even if the Buyer is a merchant, the court with jurisdiction for the Supplier's registered office is deemed the sole place of jurisdiction in respect of all disputes resulting directly or indirectly from the contractual relationship. However, the Supplier is also entitled to bring an action at the court with jurisdiction for the Buyer's registered office. German substantial law is deemed applicable to the legal relations in conjunction with this contract by way of exclusion of the United Nations Convention on Contracts for the International Sale of Goods (CISG).

### 8. Binding force of contract

The contract shall retain its binding force even in the event of the legal invalidity of individual provisions in other parts of the contract. This shall not apply if adhering to the contract would constitute reasonable hardship for one party.



## Notes







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