IN CONTACT WITH MAXIMISED SAFETY

Product catalogue

GELBAU

sales@prom-elec.com / ООО ПРОМЭЛЕКТРОНИКА

CONTENTS

Page

- Corporate philosophy — 4
- Quality commitment — 6
- Functional principle — 8
- Sectoral solutions — 10
  - Gate industry — 10
  - Local public transport — 12
  - Machinery and plant construction — 14
  - Scenery construction — 16
- Service and contact — 18

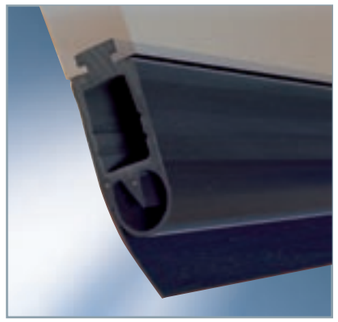
PRODUCT OVERVIEW

- Products — 20
- Profiles — 22
  - Contact-Duo-Profiles — 24
  - Quadro-Profiles — 30
  - Rubber-Sheath-Profiles — 31
- Accessories — 34
  - Terminating plug connectors with resistor — 36
  - Flexible wire jumpers — 37
  - Connecting cables with plug connector — 38
  - End caps with circumferential edge — 40
  - Connection types for end caps — 44
  - Spiral cables — 45
  - Corner connectors — 46
  - Stop buffers — 48
  - Installation accessories — 49
- Switchgears (Evaluators) — 50
- Mounting rails — 66
- Installation instructions — 72
- Imprint — 77

GELBAU

OUR CORPORATE PHILOSOPHY: 100-PER-CENT SAFETY

Protecting people with its products in everyday life – for Gelbau, this goal is a commitment and no less than a freely accepted obligation. Thanks to uncompromising concentration on safety engineering and purposeful translation of customers' sophisticated wishes into reality-driven, highly reliable products, Gelbau has crucially shaped the field of protective closing edge systems. The company began life a good 40 years ago as a producer and vendor of closing edge safety systems and has meanwhile evolved into a leading manufacturer and supplier of switching strips worldwide.



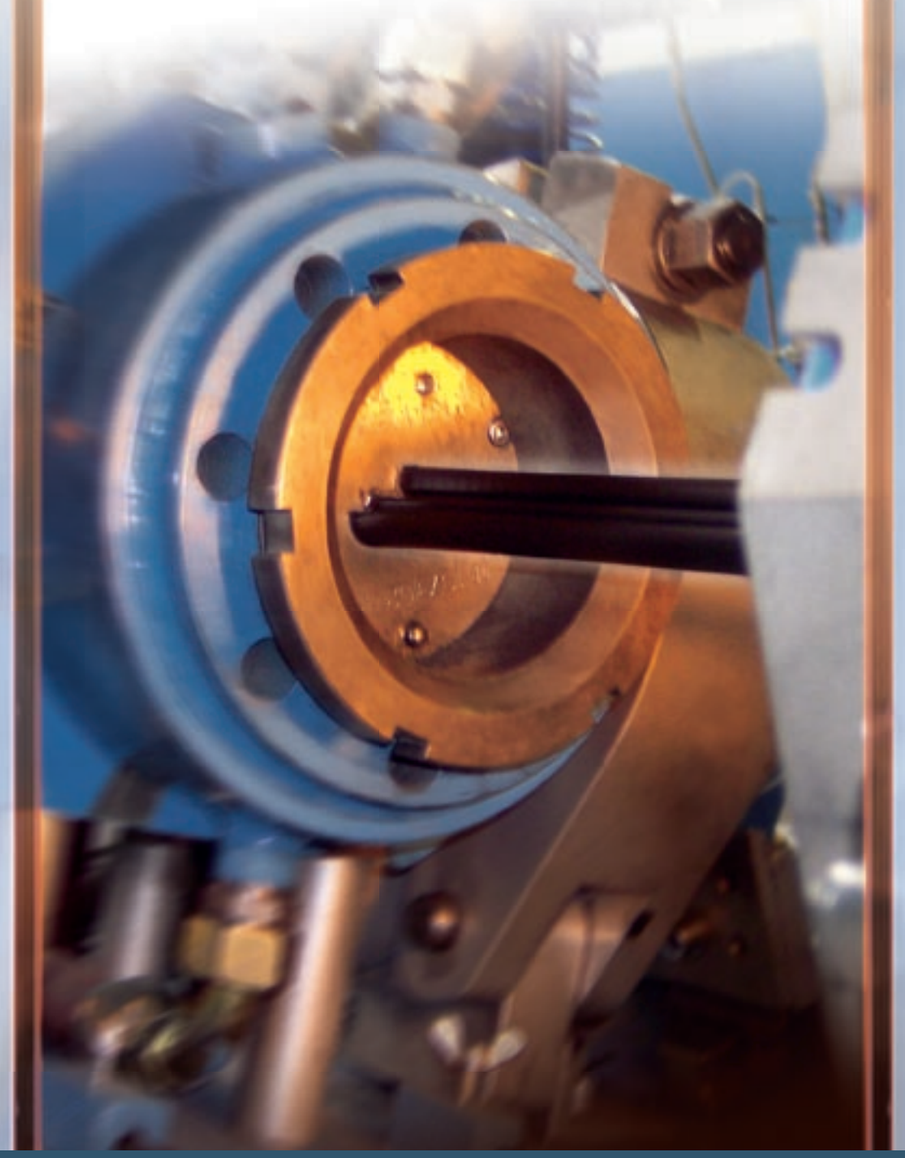
GELBAU – FOCUS ON THE FUTURE

As the years went by, the company's continuing success meant that capacities had to be upsized and secured. At the end of the 1990s, by relocating from Cologne to the nearby town of Niederkassel, the firm laid the vital foundations for a flourishing future. In the present-day company headquarters, Gelbau has assured itself of sufficient production and warehousing capacities for the years ahead.

Purposefully stringent customer focus, enormous flexibility, a committed service culture, deadline-driven, individualised customer support – with the quintessential virtues and the ingrained quality awareness of a German family firm, Gelbau is ideally equipped to meet and master the challenges of the future.

GELBAU

AN UNCOMPROMISING COMMITMENT TO QUALITY



Maximised safety is crucial to qualitative excellence. And this is precisely what Gelbau can guarantee, with 100-per-cent in-house assembly and field-proven, high-quality "German-made" products. As a company with certification, Gelbau operates a stringent quality management system, continually upgraded to cope with new challenges. Carefully chosen vendors from Germany, linked to Gelbau by long-standing business relationships, plus the use of top-quality materials, help to assure the consistent excellence of our product quality.

UNCOMPROMISINGLY HIGH MATERIAL QUALITY

First-class materials constitute the foundation for maximised functionality and long product lifetimes. With the two rubbers NBR and EPDM, Gelbau has opted for materials that make an important contribution to the applicational safety of Gelbau's products.

NBR – Nitrile butadiene rubber

The synthetic special-quality rubber meets tough requirements in terms of swell-resistance to fuels, oil, grease and aliphatic solvents, even at increased temperatures. NBR is not recommended in conjunction with aromatic solvents, pure benzene, toluene, etc., nor should it be exposed to ozone or sunlight.

EPDM – Ethylene propylene monomer rubber

The modern synthetic all-purpose rubber possesses a wide range of applications. It exhibits excellent resistance to ageing, ozone, sunlight, weather conditions and other environmental factors, alkalis, corona and various dyes and chemicals. EPDM is not resistant to hydrocarbon solvents, corresponding oils, chlorinated hydrocarbons, turpentine or petrol.

International abbreviation	NBR	EPDM (APTK)
Hardness range / shore	40 to 90	35 to 90
Tear resistance N/mm² at +20 °C	Up to approx. 20	Up to approx. 20
Tensile deformation	Up to approx. 450%	Up to approx. 450%
Rebound resilience at +20 °C	Satisfactory	Good
Resistance to wear and abrasion	Good	Good
Resistance to permanent deformation	Good	Good
General resistance to weather conditions	Good	Excellent
Resistance to ozone	Satisfactory	Excellent
Resistance to oil	Excellent	Low
Resistance to fuel	Good	Low
Gas impermeability	Good	Satisfactory
Resistance to solvents	Partly good	Low to satisfactory
General resistance to acids	Satisfactory	Good
Dielectric characteristic	Low	Very good
Thermal stability Short-term Longer-term	 Approx. -40 °C to +150 °C Approx. -30 °C to +120 °C	 Approx. -50 °C to +170 °C Approx. -30 °C to +140 °C
Resistance to steam	Good	Very good

* General material specification

GELBAU

SAFETY “MADE BY GELBAU” – THE FUNCTIONAL PRINCIPLE

Gelbau
Contact-Duo-Profile

A flexible copper wire has been permanently extruded into the two parallel electrically conductive and mutually insulated rubber layers.

Mechanical pressure will trigger electrical contacting, which causes the potential-insulated safety contact to open at the evaluator unit.

For a functioning system, you need not only the profile and the evaluator unit, but also a terminating plug connector, which serves as an electrical termination. A plug connector with cable constitutes the link between the profile and the evaluator unit. In addition, end caps are required for closing off the ends. For the Quadro-Profile, you also use a flexible wire jumper in addition to these components.

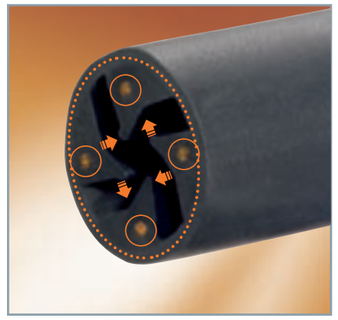
The closing edge safety system from Gelbau essentially consists of two components: a one piece, extruded rubber profile as the sensor element, and the evaluation electronics. The switching chamber of the rubber profile contains either two or four electrically conductive, mutually insulated rubber layers, which serve as the switching surface. A flexible copper wire has been permanently extruded into each of these conductive rubber layers. During assembly, these copper wires are terminated at one end with an 8.2 kΩ resistor, which is continuously monitored by the evaluation electronics using the closed-circuit current.

When the switching strip is operated by mechanical pressure on the rubber profile, the switching surfaces inside the switching chamber will touch each other. In the case of the Quadro-Profile, at least three of the four electrically conductive zones touch each other, thus ensuring redundant contacting. The change in the resistance value caused thereby is detected by the evaluation electronics. The safety relays drop out and open the safety circuit – when the gate moves, the door or the machine component involved will be halted immediately, and persons and material are reliably protected. The evaluation electronics also detect any malfunctions in the system, such as an open circuit. In this case, too, the safety circuit will be interrupted, and the system will go to an operationally safe state. The system’s ongoing status is indicated by the LEDs (green = operational, yellow = error message, red = actuated).

Whether it’s a roller gate for the logistics warehouse, a lifting platform for the municipal theatre or a protective feature for a press – the Contact-Duo-Profile performs its duties reliably wherever shear and pinch edges constitute a safety problem.

GELBAU – FOR SYSTEMATISED SAFETY

The Gelbau Quadro-Profile is used primarily in the field of local public transport, where it serves as a safety feature for the closing edges of passenger doors on buses and trains. The Gelbau Quadro-Profile has an action range of 360°.

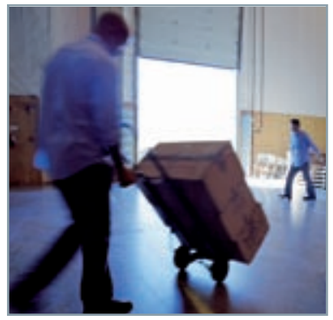


Gelbau Quadro-Profile

GELBAU

GATE INDUSTRY

/ Safety features for gate systems in a range of models and variants are among the standard applications for safety switching strips. Gelbau has been supplying the gate industry for a good four decades now, and has built up an enviable reputation as a reliable, recognised and established partner.



/ The high level of safety in regard to the quality of the switching strips, their reliability even under difficult environmental conditions, their sturdiness even when exposed to mechanical damage and their sensitivity are much in demand among gate manufacturers and users alike. This is not the least of reasons why Gelbau's products are stipulated as mandatory in the company standards in many industrial enterprises, e. g. in the automotive industry.

/ The safety switching strips, with their associated evaluation electronics, meet the requirements laid down in the current stipulations of the relevant European standards. An extensive range of profile types is available for use with almost all industrial gates. Pluggable terminating resistors and cable connections, plus end caps with a circumferential edge, permit easy, dependable self-assembly, thus offering a high degree of flexibility. The units can be assembled as end strips with a terminating resistor or as continuity strips that can be easily connected in series, e. g. for sliding or folding gates. There are no restrictions in regard to the gate widths involved.

GELBAU

LOCAL PUBLIC TRANSPORT

In public-sector local passenger transport, there is one paramount consideration apart from punctuality: the passengers' safety. After all, many millions of people use buses, trains and rail vehicles every day to get to work, to school, etc.

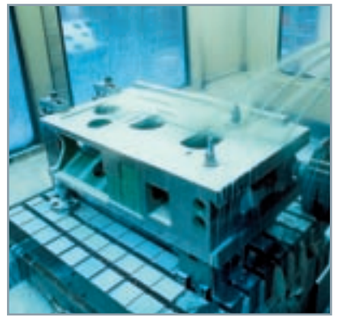
In terms of safety, the passenger doors of buses and rail vehicles are a particular focus. Together with the legislators, the manufacturers, component suppliers and operators of buses and trains have developed standards for pinch protection, including the pinch monitoring feature, that have been incorporated in new vehicles and offer a maximised degree of safety for passengers. On existing vehicles with a lengthy period of service behind them, this level of safety is not always assured. Existing thrust shaft systems are maintenance-intensive and susceptible to malfunctions: the safety function cannot be monitored. Many operators accordingly see a need for action in terms of retrofits particularly; this also applies to modernisation projects involving automation of the doors.

Besides providing equipment for new vehicles, Gelbau has also specialised particularly in retrofit jobs for the entrances to old vehicles. The Gelbau Quadro-Profile developed specifically for this application can in many cases be installed using the existing finger-protection profiles, rendering the modification job simple and affordable. Many transport authorities and operators in Germany and abroad have found this system extremely effective, and have been using it for years.

GELBAU

MACHINERY AND PLANT CONSTRUCTION

The potential hazards emanating from shear and pinch edges in machinery and plant construction facilities are many and various, and involve all sectors, from the automotive industry, to the steel and woodworking industries, all the way through to the plastics industry. Typically dangerous areas are lifting tables and work platforms, automatically operated doors at turning, milling and welding stations, plus machining centres, and protective hoods on presses and punches.



In contrast to other applications, in many cases the closing edge involved is not straight, but follows the contour of the machine. With Gelbau, the use of prefabricated corner connectors with specified angular dimensions, along with the option for providing divergent angular dimensions as a customised package, enables the switching strip to be optimally matched to the contour of the closing edge involved, so that one-part, corner-switching solutions can be easily created.

Besides the standard EPDM material, the safety switching strips are also available in NBR. Thanks to its better resistance to oils, lubricants and coolants, the useful lifetime of the switching strip is prolonged at the machines and systems concerned, such as lathes or drills. These characteristics, together with the products' high quality and sensitive switching capabilities, have convinced many manufacturers and led to Gelbau's safety switching strips being used nowadays by many prestigious companies in series production.

GELBAU

SCENERY CONSTRUCTION

In theatres across the world, sophisticated scenery is often just as crucial as great acting. What's not in the stage directions, however, is warnings against shear and pinch hazards caused by potential inattention to descending platforms. Gelbau safety systems on shear and pinch edges provide effective protection and thus contribute towards ensuring that the performance is a complete success.

Safety switching strips from Gelbau are used by many prestigious theatres and venues in Germany and abroad, and on cruise liners as well. Construction companies that create scenery appreciate the option for self-assembly of the Gelbau safety switching strips, which offers them maximised flexibility in the construction phase.

GELBAU

CAN-DO SERVICE INCLUDED

Gelbau – for conveniently customer-responsive proximity

Thanks to a complete-coverage network of commercial agents and contracted dealers in Germany and Europe, we can provide you with intensive on-the-spot consultancy any time, anywhere, backed up by optimised delivery capabilities.

Gelbau focuses on the requirements and wishes of its customers, and invariably endeavours to be a good, fair, problem-solving partner to them.

Gelbau offers you a comprehensive range of services before, during and after your purchase. On-site consultancy is something you can depend on with Gelbau, as are ultra-fast, prompt quotations. You want to see some samples of our products on your system? No problem! Goal-driven project/development assistance by the company, with its all-round technical support, are services that our customers have particularly lauded.

When it comes to assembly, you can choose whether to have the goods completely assembled by Gelbau in the factory, or to perform the assembly work yourself – you will receive the requisite individual training free of charge. On request, Gelbau will provide special finishes like anodised C-rails or rounding, boreholes and cut-to-size blanks. The same applies for supplying customised profiles. For all your orders placed with Gelbau, you can rely on punctual deliveries.

QUESTIONS? HERE ARE THE ANSWERS!

Gelbau GmbH & Co. KG
Grandkaule 8–10
53859 Niederkassel
Germany
Phone + 49 (0) 22 08/94 55-0
Fax + 49 (0) 22 08/94 55-51
Email info@gelbau.com
www.gelbau.com
Managing Director Dipl.-Ing. Jürgen Menz

Business hours
Monday – Thursday
8:00 a.m. – 12:30 p.m. / 1:00 – 4:00 p.m.
Friday
8:00 a.m. – 1:00 p.m.

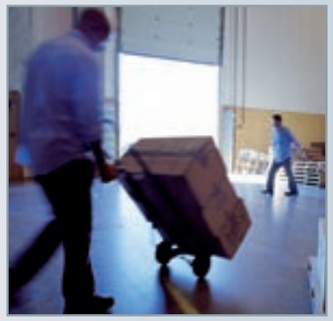
Delivery acceptance times
Monday – Thursday
7:30 a.m. – 12:30 p.m. / 1:00 – 3:30 p.m.
Friday
7:30 a.m. – 12 noon

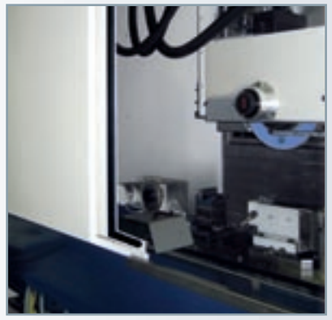
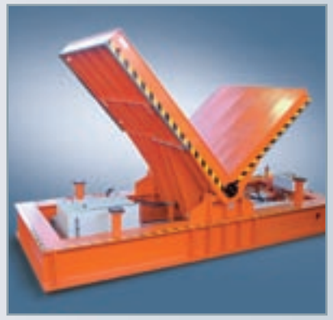
GELBAU

The right solution for each and every sector, whether it's gate systems, passenger doors or work platforms. Wherever they're used, the safety switching strips excel in terms of maximised availability, easy installation and dependability. Gelbau's comprehensive range of products for switching strips and accessories, plus its extensive portfolio of switchgear, cover all of our customers' safety requirements and guarantee maximum flexibility in designing safety-enhanced solutions.

PRODUCT OVERVIEW

- Profiles page 22
- Accessories page 34
- Switchgears (Evaluators) page 50
- Mounting rails page 66

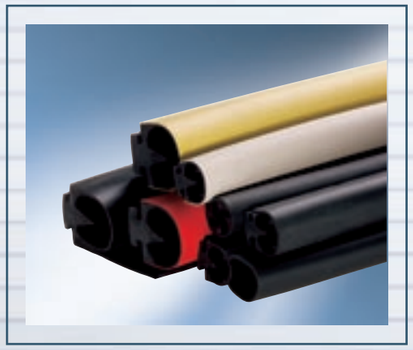


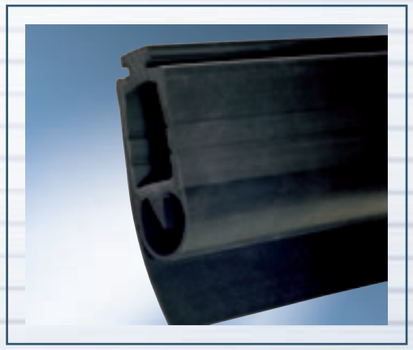



PROFILES

Profile overview

- Contact-Duo-Profiles
- Quadro-Profiles
- Rubber-Sheath-Profiles





Contact-Duo-Profiles – for dependable contacting

The Gelbau Contact-Duo-Profiles are ultra-flexible, one-piece rubber profiles made of EPDM or NBR, ideally matched to the closing edge of the gate or machine involved. The maximum actuating force lies well below the 150 N stipulated in the standard. In conjunction with the accessories offered and plug connection technology, the system can be easily and reliably assembled.

The maximum switching strip length is 100 m. Besides the use of prefabricated corner connectors with specified angles (90°, 120°, 135° and 150°) for the profiles 3100.0110l and 3100.0110N, all profile types can also be assembled with divergent angular dimensions requested by the customer. The switching strip can thus be optimally adapted to suit the contour of the closing edge concerned, enabling one-piece corner-switching solutions to be created. Plane offset and circular installation for a radius of at least 300 mm are possible.

A broad range of profiles is available for the various applications and requirements involved. All of them feature ultra-flexible, one-piece construction. Profile types with a compensation chamber guarantee the required compensation travel, depending on the overall height involved. The optional sealing lip compensates for any unevenness in the floor, and provides reliable sealing for the door. Two different profile feet (standard and Braselmann foot) ensure firm, secure attachment to standard mounting rails.

The rubber mixtures used, featuring EPDM and NBR, guarantee high functional reliability even under adverse conditions like moisture and dirt, as well as cold and heat. Thanks to their permanently resilient properties, they offer a high degree of protection against mechanical damage. Their good resistance to ageing guarantees these characteristics even over a lengthy period of time. NBR is, moreover, highly resistant to oils and lubricants.

The system components available for Gelbau Contact-Duo-Profiles are, in addition to other optional accessories: evaluator, plug connector with connecting cable, terminating plug connector with resistor, and end cap.

Quadro-Profiles – all good things come in fours

The Gelbau Quadro-Profile is used primarily in the field of local public transport, where it is installed as a safety feature for the closing edges of passenger doors in buses and trains. The EPDM profile can be used only in conjunction with a sealing profile. It is simply pushed into the hollow chamber of existing or newly developed sealing profiles. The profiles have a diameter of 18 mm or 22 mm, and require a sheath-profile with a hollow compartment minimum diameter of 21.5 mm or 25.5 mm. The profile is characterised by a high level of sensitivity.

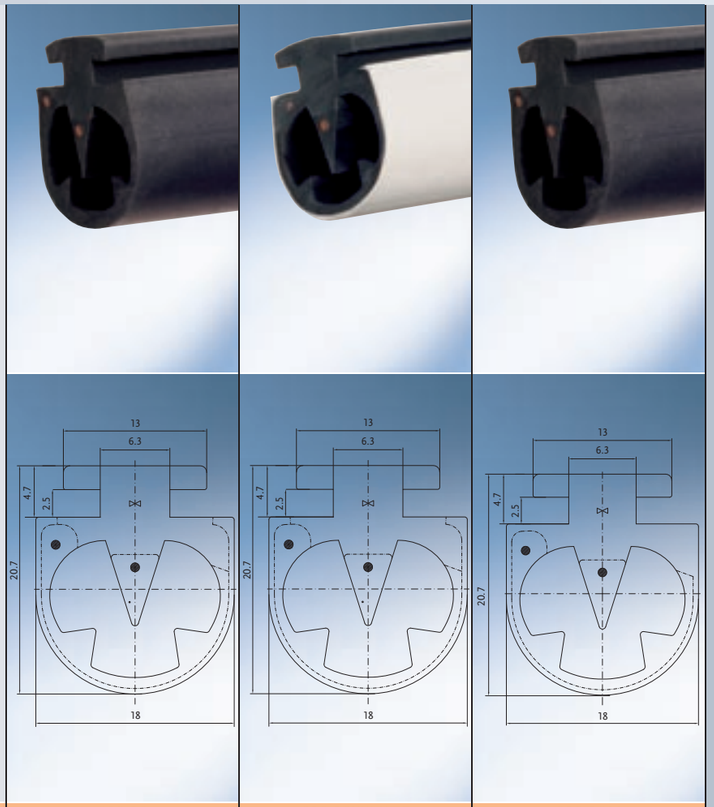
The Gelbau Quadro-Profile has an action range of 360°, and is fully insulated on the outside. When the conductive zones are touched due to mechanical pressure, this results in electrical contacting. At least three out of the four electrically conductive zones will always touch each other when subjected to mechanical pressure, thus ensuring reliable contacting. The evaluation electronics here open the potential-isolated safety contact, which triggers opening of the door. The high contact pressure achieved thanks to a small contact area assures self-cleaning of the contact surface.

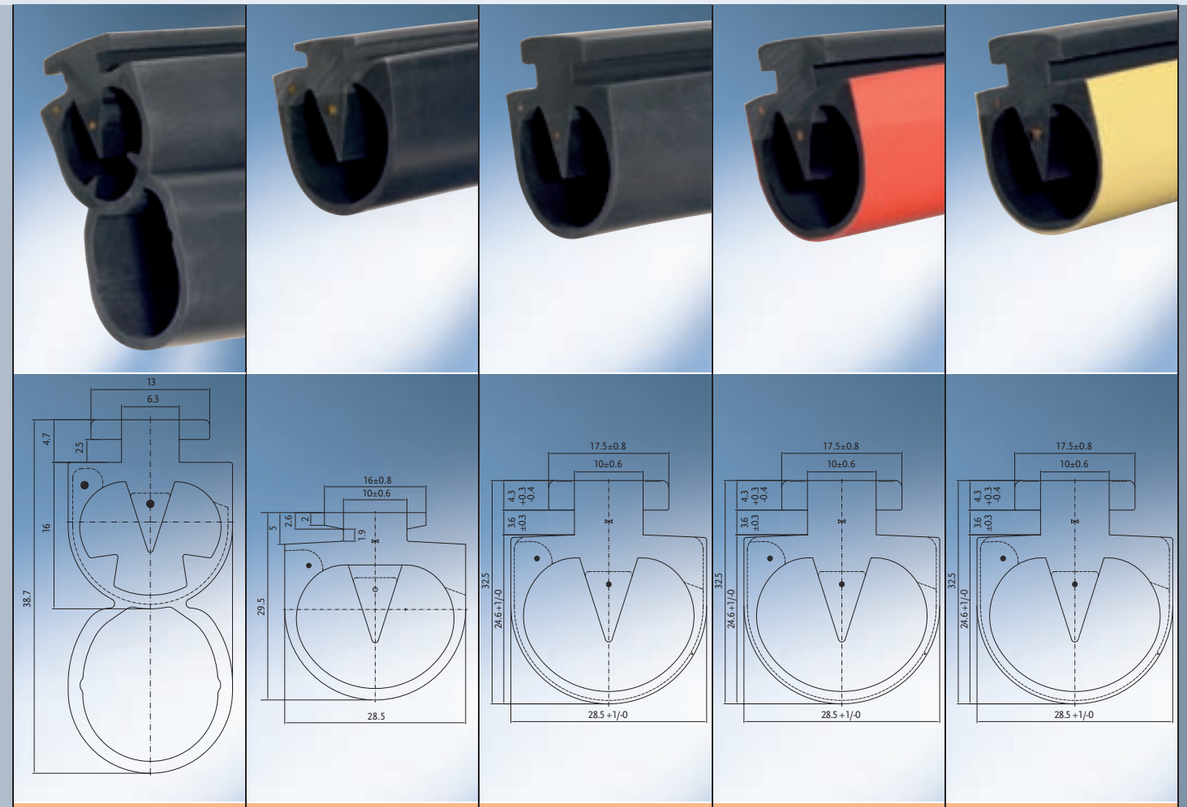
The system components available for the Gelbau Quadro-Profile are: evaluator, plug connector with connecting cable, terminating plug connector with resistor, flexible wire jumper, and end cap. Using these components guarantees a switching sensitivity down to the very last millimetre.

Rubber-Sheath-Profiles – vertical protection

Doors with vertical closing edges, e. g. folding doors, have a crossbeam width of approx. 50 mm and a gap width requiring to be safeguarded of at least 120 mm. The closing edge safety feature is required to cover the entire crossbeam width and to close and seal the gap without triggering the switching strip. At the same time, it is required to possess high lateral sensitivity, so that a possible pinch is detected as soon as the door wings are turned. The rubber-sheath-profile developed specifically for this application, with the associated aluminium special rail and the Contact-Duo-Profile 3100.1610, meets these requirements.

/ Contact-Duo-Profile overview



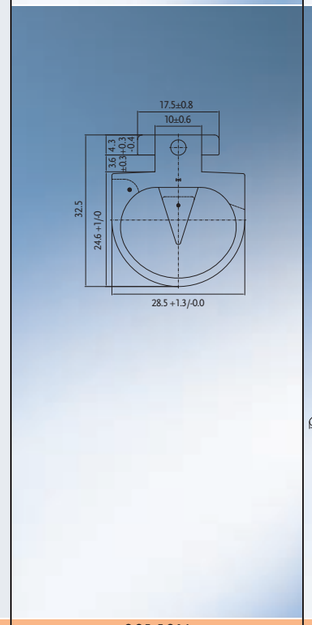


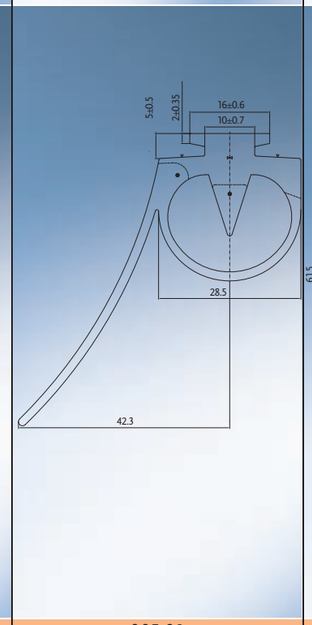
Profile overview

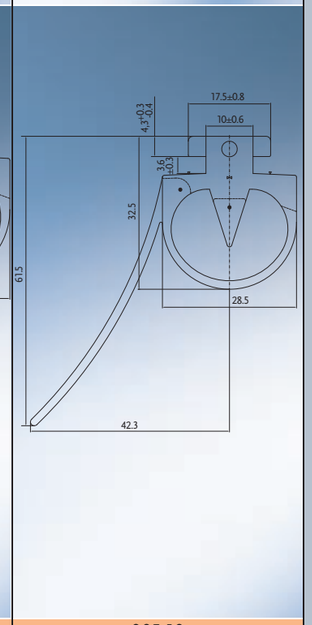
Type	018.10	018.10WHITE	018.10N	018.30	001.02	001.10I	001.10RED	001.10YELLOW
Article no.	3100.0118	3100.0118W	3100.0118N	3100.1830	3100.0102	3100.0110I	3100.0110RED	3100.0110Y
Colour	Black	White	Black	Black	Black	Black	Red	Yellow
Material	EPDM	EPDM	NBR	EPDM	EPDM	EPDM	EPDM	EPDM
Profile foot	T-foot	T-foot	T-foot	T-foot	Braselmann	T-foot	T-foot	T-foot
Switching head, insulated	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Sealing lip	No	No	No	Yes (sealing bag)	No	No	No	No
Connection types	AAS/AOS	AAS/AOS	AAS/AOS	AAS/AOS	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS/ASS
Delivery length	30 m	30 m	20 m	25 m	20 m	20 m	20 m	20 m
Min. diameter, sheath profile								

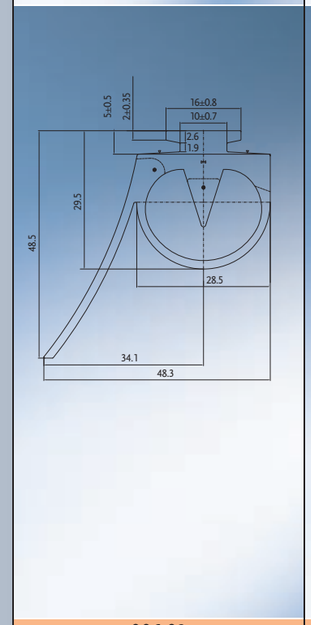
For dimensions without tolerance particulars, tolerance-free dimensions as per DIN ISO 3302-1 E2 shall apply.

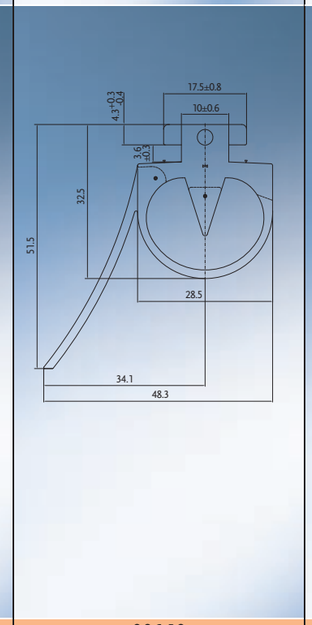
/ Contact-Duo-Profile overview

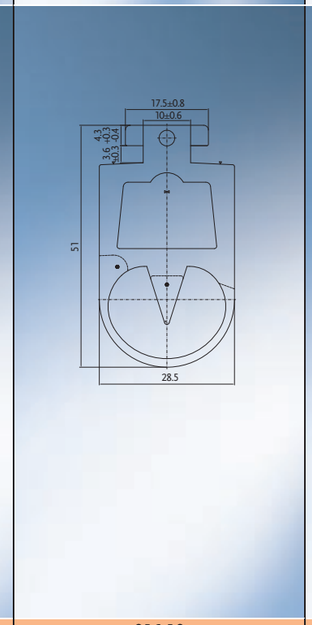


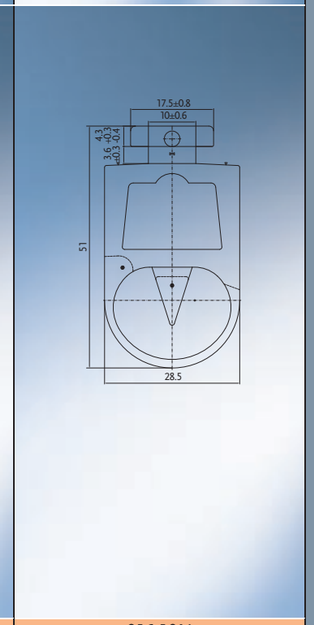










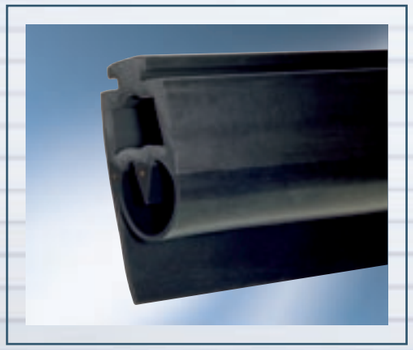


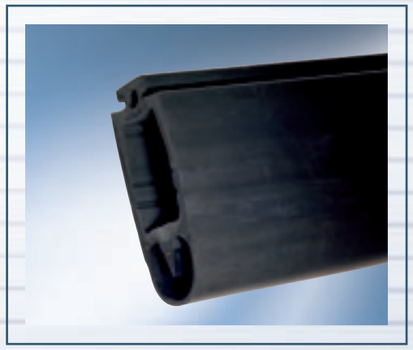
Profile overview

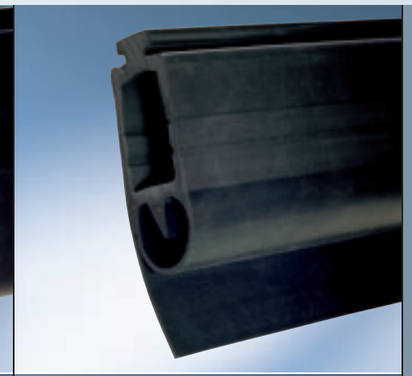
Type	001.10N	005.02	005.10	006.02	006.10	016.10	016.10N
Article no.	3100.0110N	3100.0502	3100.0510	3100.0602	3100.0610	3100.1610	3100.1610N
Colour	Black	Black	Black	Black	Black	Black	Black
Material	NBR	EPDM	EPDM	EPDM	EPDM	EPDM	NBR
Profile foot	T-foot	Braselmann	T-foot	Braselmann	T-foot	T-foot	T-foot
Switching head, insulated	No	No	No	No	No	No	No
Sealing lip	No	Yes	Yes	Yes	Yes	No	No
Connection types	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS/ASS	AAS/AOS (standard)	AAS/AOS (standard)
Delivery length	20 m	20 m	20 m	20 m	20 m	20 m	20 m
Min. diameter, sheath profile							

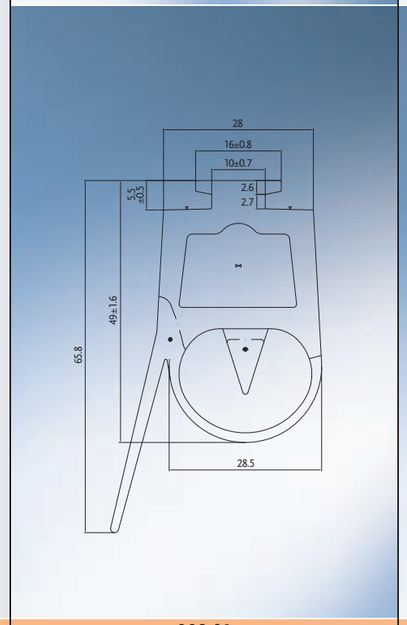
For dimensions without tolerance particulars, tolerance-free dimensions as per DIN ISO 3302-1 E2 shall apply.

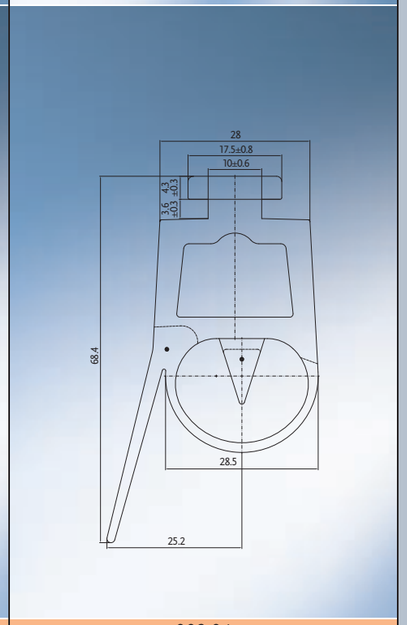
/ Contact-Duo-Profile overview

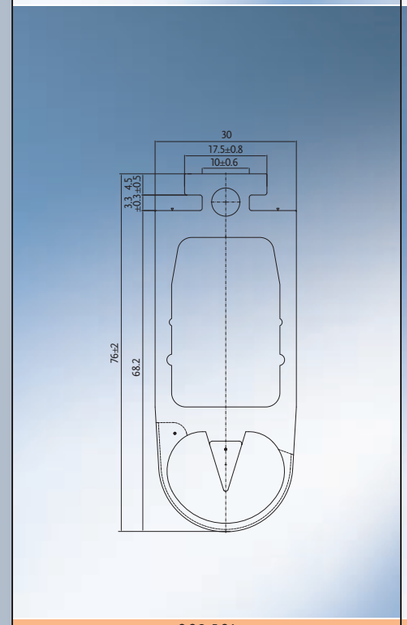


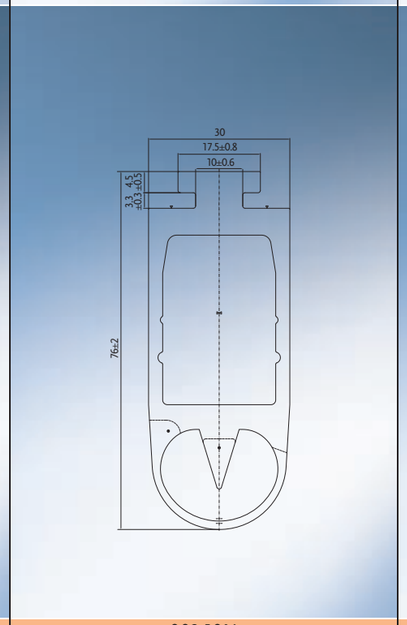


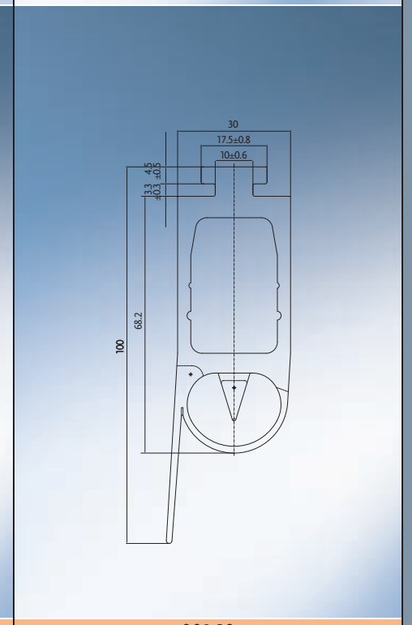












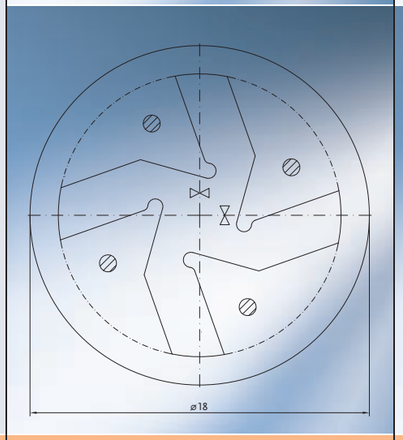
Profile overview

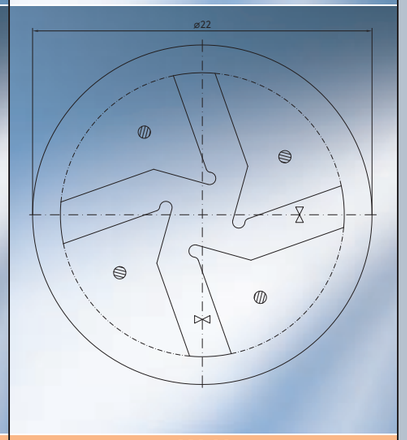
Type	008.02	008.04	003.10I	003.10N	002.10
Article no.	3100.0802	3100.0804	3100.0310I	3100.0310N	3100.0210
Colour	Black	Black	Black	Black	Black
Material	EPDM	EPDM	EPDM	NBR	EPDM
Profile foot	Braselmann	T-foot	T-foot	T-foot	T-foot
Switching head, insulated	No	No	Yes	No	No
Sealing lip	Yes	Yes	No	No	Yes
Connection types	AAS/AOS (standard)	AAS/AOS (standard)	AAS/AOS (standard)	AAS/AOS (standard)	AAS/AOS (standard)
Delivery length	20 m	20 m	20 m	20 m	20 m
Min. diameter, sheath profile					

For dimensions without tolerance particulars, tolerance-free dimensions as per DIN ISO 3302-1 E2 shall apply.

QUADRO-PROFILE

/ Quadro-Profile overview



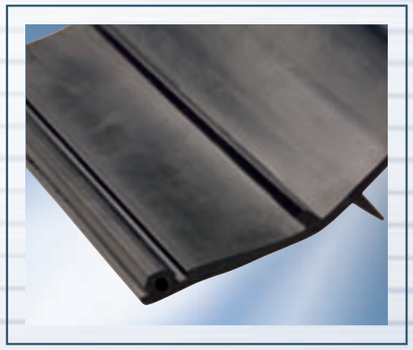


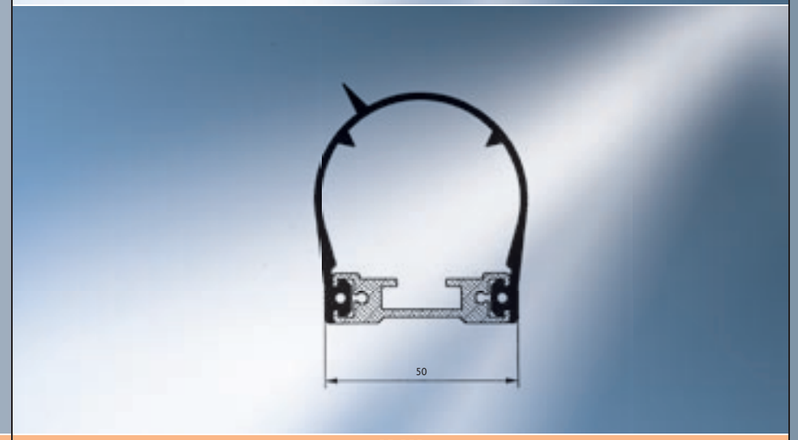
Profile overview		
Type	060.00	080.00
Article no.	3100.6000	3100.8000
Colour	Black	Black
Material	EPDM	EPDM
Profile foot		
Switching head, insulated	Yes	Yes
Sealing lip	No	No
Connection types	AAS	AAS
Delivery length	Max. 2.5 m	Max. 2.5 m
Min. diameter, sheath profile	21.5 mm	25.5 mm

For dimensions without tolerance particulars, tolerance-free dimensions as per DIN ISO 3302-1 E2 shall apply.

RUBBER-SHEATH-PROFILE

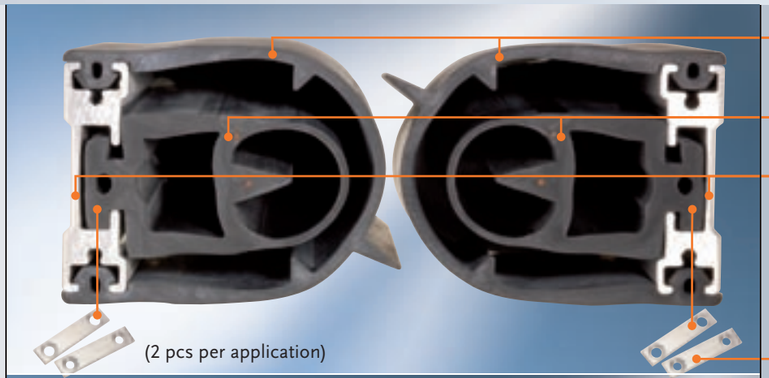
/ Rubber-Sheath-Profile overview



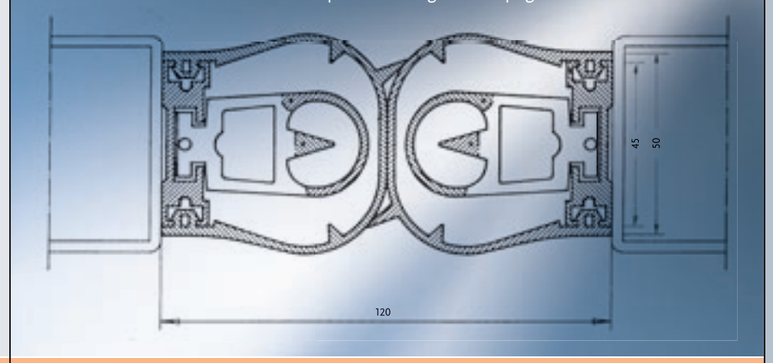


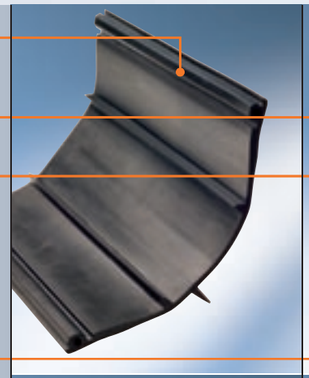
Profile overview	
Type	01.111
Article no.	3100.1111
Colour	Black
Material	EPDM
Profile foot	Suitable for aluminium special rail 3045.2151
Delivery length	30 m

/ Rubber-Sheath-Profiles for special applications

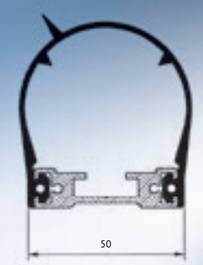


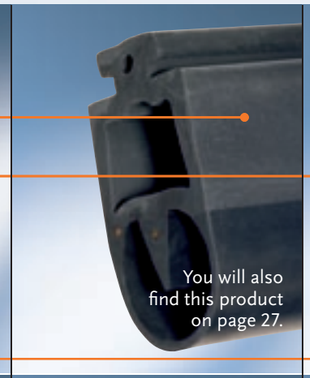
Rubber-Sheath-Profile in use – main closing edge with safety strip in installed state. Materials required: see right-hand page.



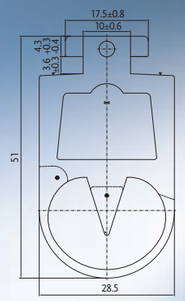


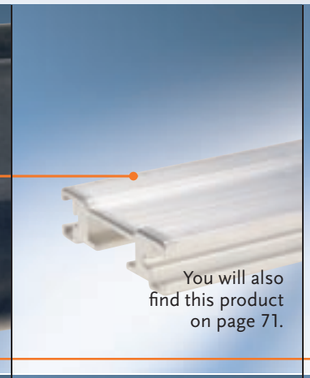
Rubber-Sheath-Profile 01.111





Contact-Duo-Profile 016.10





Aluminium special rail

Aluminium plate for 3045.2151

Profile overview

Type		01.111	016.10	02.151	
Article no.		3100.1111	3100.1610	3045.2151	3050.2152
Colour		Black	Black		
Material		EPDM	EPDM	Aluminium Al Mg Si 0.5 F 22	Aluminium
Profile foot		Suitable for aluminium special rail 3045.2151	T-foot		
Switching head, insulated			No		
Connection types			AAS/AOS (standard)		
Delivery length		30 m	20 m	2 m standard length/6 m length with minimum purchase quantity	

For dimensions without tolerance particulars, tolerance-free dimensions as per DIN ISO 3302-1 E2 shall apply.

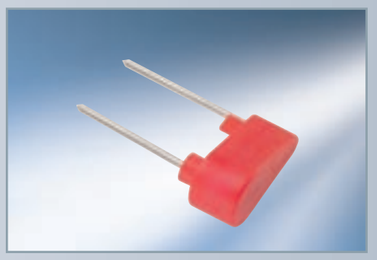
Accessory overview

- Terminating plug connectors with resistor
- Flexible wire jumpers
- Connecting cables with plug connector
- End caps with circumferential edge

- Spiral cables
- Corner connectors
- Stop buffers
- Installation accessories

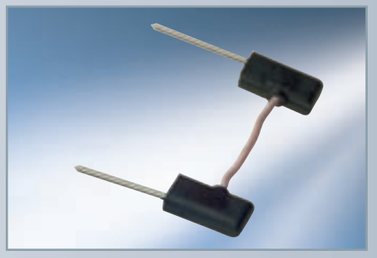
Terminating plug connectors with resistor – the termination with 8.2 kΩ

The terminating plug connector with resistor is a system component that constitutes the switching strip's electrical termination in conjunction with a resistance evaluator. The resistance value is 8.2 kΩ.



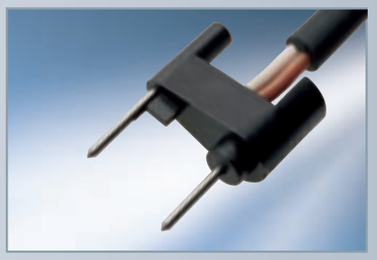
Flexible wire jumpers – a link for the Quadro-Profile

The wire jumpers are used for the Quadro-Profiles, and are here a part of the system. They form the cross-connection at the termination side.



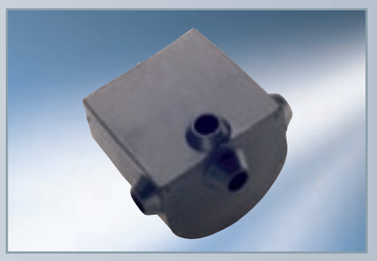
Connecting cable with plug connector – always in touch

The connecting cable with plug connector is a system component that is used to establish the link between the switching strip and the evaluator or control system on the connection side. It is available in lengths from 0.35 m to 15 m.



End caps with circumferential edge – dependable protection

The end caps are a part of the system components of the Gelbau Contact-Duo and Quadro-Profiles. They serve to seal off the ends of the switching strips in a moisture-proof configuration. Various types of connection are available. The caps can be supplied in NBR and EPDM, and in different colours, to suit the profiles concerned.

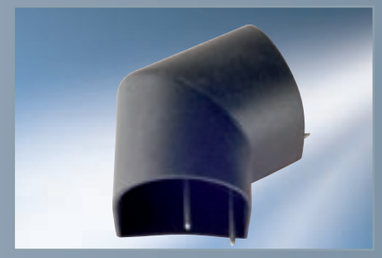


Spiral cables – for bridging distances

The spiral cables are used in gate construction for bridging the distance to the evaluator electronics. The connecting cable of the switching strip is led to the terminal box on the moving part of the gate. The connecting cable leads from here via a cable spacer (if needed) to another terminal box on the fixed part of the gate. From there, the link to the evaluator electronics is completed with an independently insulated cable, provided by the customer. A guard spiral at the terminal box and at the spacer serves for strain relief and as anti-kinking protection for the spiral cable.

Corner connectors – for all angles

The corner connectors, which are not a part of the system, solve the problem of non-switching corners in the construction of customised angular solutions. They provide connections with full elasticity. The corner connectors are available as horizontal and vertical versions in a choice of angles with leg lengths of 45 mm. Unlike the standard angles for the 3100.0110I and 3100.0110N profiles, it is possible to assemble all profile types with angular dimensions to the customer's specification.



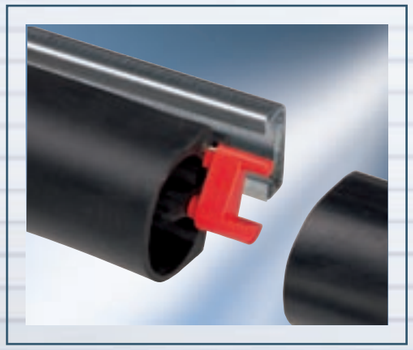
Stop buffers – for extended lifetimes

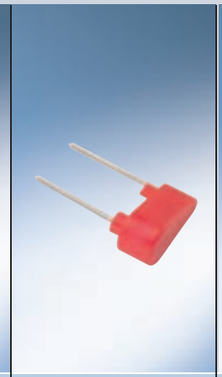
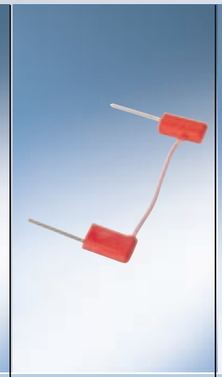
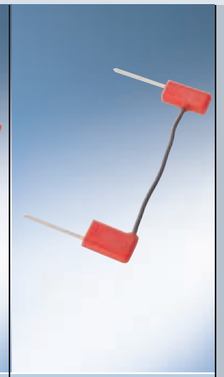
The stop buffers are not a part of the system, but prevent the switching strip suffering from a ground impact when the gate is lowered, thus extending its useful lifetime. Depending on the profile height involved, the stop buffers are available in the appropriate sizes, in black. The scope of delivery also includes a hammerhead screw for attaching the buffer to the mounting rail.

Installation accessories – for self-assembly

We provide various aids for customers to assemble their systems on site. The Cyanoacrylat adhesive from Gelbau (as shown in the installation instructions) is suitable for affixing and sealing the end cap in both the NBR and EPDM qualities, and also for sealing the cable outlet. The adhesive is available in two different package sizes. The rubber scissors mean that cutting the safety switching strips without a compensation chamber, in particular, is child's play as easy as pie.

Terminating plug connector with resistor overview



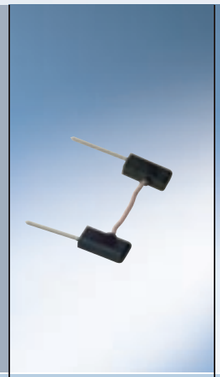
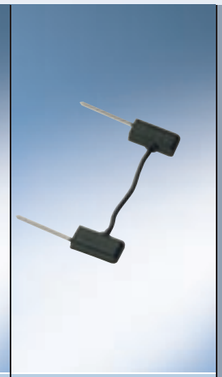
Accessories
Terminating plug connectors with resistor

Electrical termination of the switching strip in conjunction with a resistance evaluator

Article description		8.2 kΩ	8.2 kΩ	8.2 kΩ	8.2 kΩ
Article no.		3031.1306B	3031.1186	3031.1806	3031.2206
For switching strip profile					
Type	Article no.				
001.02	3100.0102	X			
001.10I	3100.0110I	X			
001.10N	3100.0110N	X			
001.10RED	3100.0110RED	X			
001.10YELLOW	3100.0110Y	X			
018.10	3100.0118		X		
018.10N	3100.0118N		X		
018.10WHITE	3100.0118W		X		
002.10	3100.0210	X			
003.10I	3100.0310I	X			
003.10N	3100.0310N	X			
005.02	3100.0502	X			
005.10	3100.0510	X			
006.02	3100.0602	X			
006.10	3100.0610	X			
008.02	3100.0802	X			
008.04	3100.0804	X			
016.10	3100.1610	X			
016.10N	3100.1610N	X			
018.30	3100.1830		X		
060.00	3100.6000			X	
080.00	3100.8000				X

Flexible wire jumper overview

For the Quadro-Profile

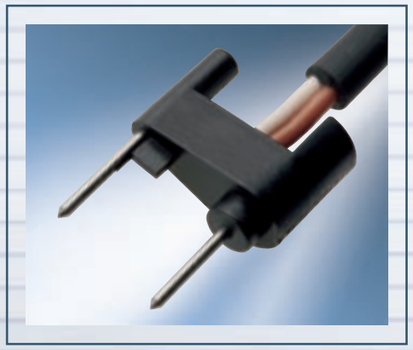



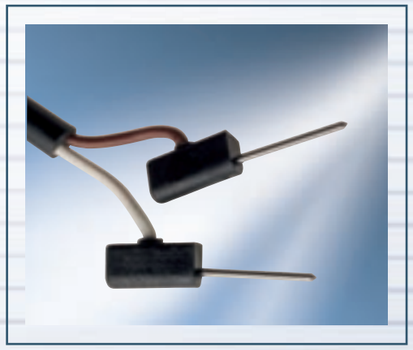
Accessories
Flexible wire jumpers

For establishing the cross-connections only for the Quadro-Profile

Article description			
Article no.		3031.1800	3031.2200
For switching strip profile			
Type	Article no.		
001.02	3100.0102		
001.10I	3100.0110I		
001.10N	3100.0110N		
001.10RED	3100.0110RED		
001.10YELLOW	3100.0110Y		
018.10	3100.0118		
018.10N	3100.0118N		
018.10WHITE	3100.0118W		
002.10	3100.0210		
003.10I	3100.0310I		
003.10N	3100.0310N		
005.02	3100.0502		
005.10	3100.0510		
006.02	3100.0602		
006.10	3100.0610		
008.02	3100.0802		
008.04	3100.0804		
016.10	3100.1610		
016.10N	3100.1610N		
018.30	3100.1830		
060.00	3100.6000	X	
080.00	3100.8000		X

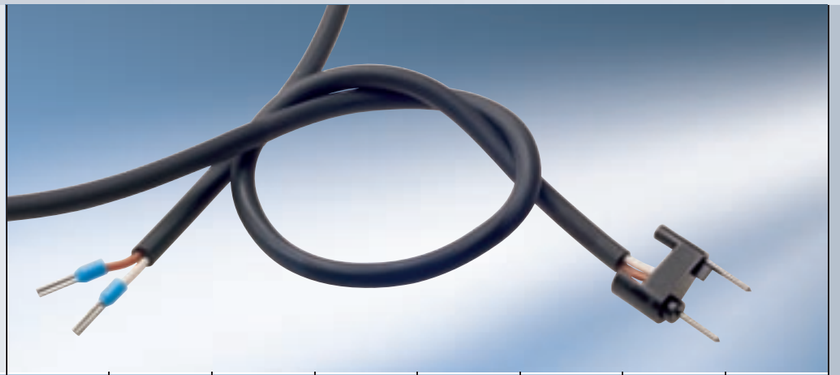
Connecting cable with plug connector overview





Accessories
Connecting cables with plug connector

For establishing the connection between the switching strip and the evaluator/control system

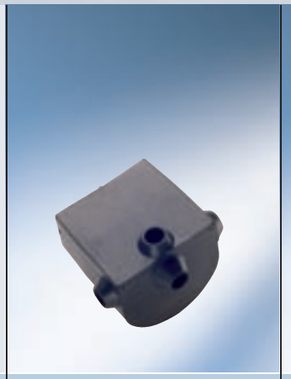


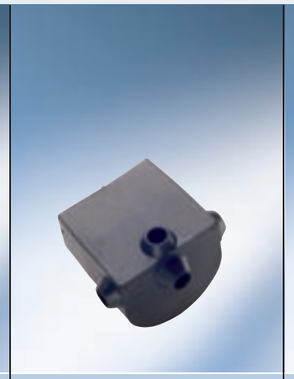
Article description	Length	0.35 m	1 m	2 m	3 m	4 m	5 m	10 m	15 m	0.35 m	1 m	3 m	5 m	0.35 m	1 m	2 m	3 m	5 m	10 m
Article no.		3020.1300B	3020.1301B	3020.1302B	3020.1303B	3020.1304B	3020.1305B	3020.1306B	3020.1307B	3020.1180	3020.1181	3020.1183	3020.1185	3020.2200	3020.2201	3020.2202	3020.2203	3020.2205	3020.2206
For switching strip profile																			
Type	Article no.																		
001.02	3100.0102	X	X	X	X	X	X	X	X										
001.10I	3100.0110I	X	X	X	X	X	X	X	X										
001.10N	3100.0110N	X	X	X	X	X	X	X	X										
001.10RED	3100.0110RED	X	X	X	X	X	X	X	X										
001.10YELLOW	3100.0110Y	X	X	X	X	X	X	X	X										
018.10	3100.0118									X	X	X	X						
018.10N	3100.0118N									X	X	X	X						
018.10WHITE	3100.0118W									X	X	X	X						
002.10	3100.0210	X	X	X	X	X	X	X	X										
003.10I	3100.0310I	X	X	X	X	X	X	X	X										
003.10N	3100.0310N	X	X	X	X	X	X	X	X										
005.02	3100.0502	X	X	X	X	X	X	X	X										
005.10	3100.0510	X	X	X	X	X	X	X	X										
006.02	3100.0602	X	X	X	X	X	X	X	X										
006.10	3100.0610	X	X	X	X	X	X	X	X										
008.02	3100.0802	X	X	X	X	X	X	X	X										
008.04	3100.0804	X	X	X	X	X	X	X	X										
016.10	3100.1610	X	X	X	X	X	X	X	X										
016.10N	3100.1610N	X	X	X	X	X	X	X	X										
018.30	3100.1830									X	X	X	X						
060.00	3100.6000													X	X	X	X	X	X
080.00	3100.8000													X	X	X	X	X	X

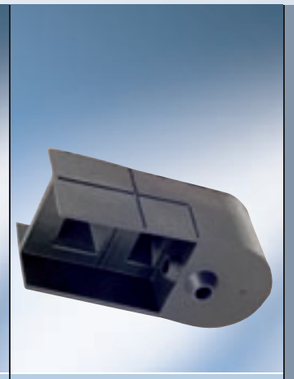
End cap with circumferential edge overview

Accessories
End caps with circumferential edge

For sealing the switching strip ends against dust and moisture





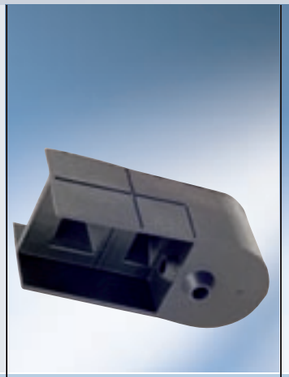


Article description		EPDM cap with four possible cable outlets*	EPDM cap with two possible cable outlets*	EPDM cap with four possible cable outlets, red*	EPDM cap with four possible cable outlets, yellow*	NBR cap with four possible cable outlets*	NBR cap with two possible cable outlets*	EPDM cap with two possible cable outlets*
Article no.		3050.1302	3050.1302-2	3050.1302R	3050.1302Y	3050.1302N	3050.1302N-2	3050.1303B
For switching strip profile								
Type	Article no.							
001.02	3100.0102	X	X					
001.10I	3100.0110I	X	X					
001.10N	3100.0110N					X	X	
001.10RED	3100.0110RED			X				
001.10YELLOW	3100.0110Y				X			
018.10	3100.0118							
018.10N	3100.0118N							
018.10WHITE	3100.0118W							
002.10	3100.0210							X
003.10I	3100.0310I							X
003.10N	3100.0310N							
005.02	3100.0502	X	X					
005.10	3100.0510	X	X					
006.02	3100.0602	X	X					
006.10	3100.0610	X	X					
008.02	3100.0802							X
008.04	3100.0804							X
016.10	3100.1610							X
016.10N	3100.1610N							
018.30	3100.1830							
060.00	3100.6000							
080.00	3100.8000							

* See connection types, page 44

End cap with circumferential edge overview

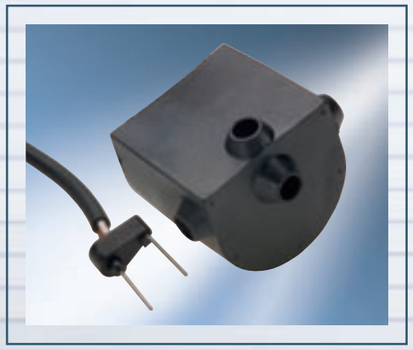
Accessories
End caps with circumferential edge
For sealing the switching strip ends against moisture



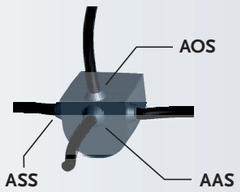
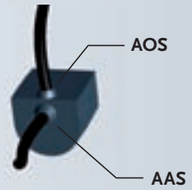
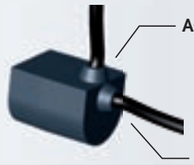
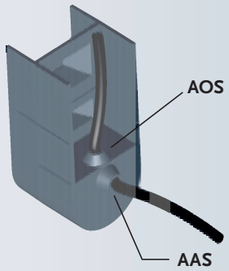
Article description		NBR cap with two possible cable outlets*	EPDM cap with two possible cable outlets*	EPDM cap with one possible cable outlet*	EPDM cap with two possible cable outlets, white*	NBR cap with two possible cable outlets*	EPDM cap with one possible cable outlet*	EPDM cap with one possible cable outlet*
Article no.		3050.1303N	3050.1318	3050.1318-1	3050.1318W	3050.1318N	3050.1802	3050.2202
For switching strip profile								
Type	Article no.							
001.02	3100.0102							
001.10I	3100.0110I							
001.10N	3100.0110N							
001.10RED	3100.0110RED							
001.10YELLOW	3100.0110Y							
018.10	3100.0118		X	X				
018.10N	3100.0118N					X		
018.10WHITE	3100.0118W				X			
002.10	3100.0210							
003.10I	3100.0310I							
003.10N	3100.0310N	X						
005.02	3100.0502							
005.10	3100.0510							
006.02	3100.0602							
006.10	3100.0610							
008.02	3100.0802							
008.04	3100.0804							
016.10	3100.1610							
016.10N	3100.1610N	X						
018.30	3100.1830		X	X				
060.00	3100.6000						X	
080.00	3100.8000							X

* See connection types, page 44

Connection types for end caps



Selection of connection type with assembly in the factory

Connection types/Cap type			Profile types
Article no.		Article no.	Article no.
3050.1302 3050.1302R 3050.1302Y 3050.1302N		 3050.1302-2 3050.1302N-2	3100.0102 3100.0110I 3100.0110N 3100.0110RED 3100.0110Y 3100.0502 3100.0510 3100.0602 3100.0610
3050.1318 3050.1318W 3050.1318N		3050.1318-1	3100.0118 3100.0118N 3100.0118W 3100.1830
		3050.1303B 3050.1303N	3100.0210 3100.0310I 3100.0310N 3100.0802 3100.0804 3100.1610 3100.1610N
3050.1802 3050.2202			3100.6000 3100.8000

ASS: The side must always be specified (left or right).
AOS/AAS: Specifying the side is necessary only for profiles with a sealing lip.

The side must always be specified as if viewing the gate from the inside. For profiles with sealing lip, the lip is always outside.

Spiral cable overview

Accessories
Spiral cables

For connecting the moving part of the gate to the evaluator electronics

Article description	Spiral cable Helical cable 500 mm Extended length 2.50 m For gate height 4.50 m	Spiral cable Helical cable 750 mm Extended length 3.00 m For gate height 5.50 m	Spiral cable Helical cable 900 mm Extended length 3.50 m For gate height 7.00 m	Terminal box 53 x 50 x 35 mm Connection between switching strip and spiral cable at the moving part Scope of delivery: housing, 2-pole terminal and anti-bending spiral	Cable spacer Mounting for spiral cable at stationary part Scope of delivery: spacer with anti-bending spiral
Type	SK 450	SK 550	SK 700	116	107
Article no.	3020.2450	3020.2600	3020.2700	3090.0116	3090.0107
Colour	Orange	Orange	Orange		
Cable cross-sectional area	2 x 0.75 mm²	2 x 0.75 mm²	2 x 0.75 mm²		
Cable ends	Pre-assembled connector sleeves	Pre-assembled connector sleeves	Pre-assembled connector sleeves		

Corner connector overview

Horizontal

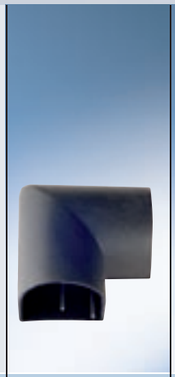
Vertical

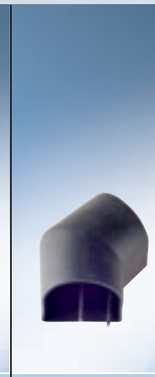
Accessories
Corner connectors

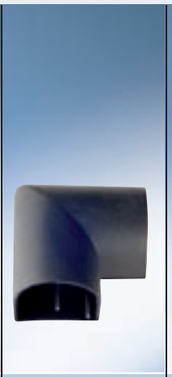
For establishing switching corner connections

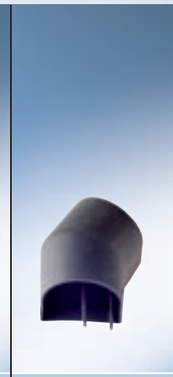
Horizontal: for connecting parts with directional changes without plane offset

Vertical: for connecting parts with plane offset



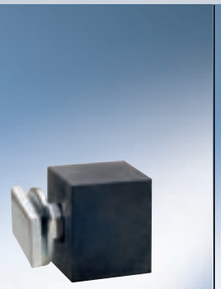






Article description		EPDM, 90° horizontal	EPDM, red, 90° horizontal	EPDM, 120° horizontal	EPDM, 135° horizontal	EPDM, 150° horizontal	EPDM, 90° vertical	EPDM, yellow, 90° vertical	NBR, 90° horizontal	NBR, 120° horizontal	NBR, 135° horizontal	NBR, 150° horizontal	NBR, 90° vertical
Article no.		3050.0071	3050.0071R	3050.0071A	3050.0071B	3050.0071C	3050.0072	3050.0072Y	3050.0071N	3050.0071NA	3050.0071NB	3050.0071NC	3050.0072N
For switching strip profile													
Type	Article no.												
001.02	3100.0102												
001.10I	3100.0110I	X		X	X	X	X						
001.10N	3100.0110N								X	X	X	X	X
001.10RED	3100.0110RED		X										
001.10YELLOW	3100.0110Y							X					
018.10	3100.0118												
018.10N	3100.0118N												
018.10WHITE	3100.0118W												
002.10	3100.0210												
003.10I	3100.0310I												
003.10N	3100.0310N												
005.02	3100.0502												
005.10	3100.0510												
006.02	3100.0602												
006.10	3100.0610												
008.02	3100.0802												
008.04	3100.0804												
016.10	3100.1610												
016.10N	3100.1610N												
018.30	3100.1830												
060.00	3100.6000												
080.00	3100.8000												

Stop buffer overview



Accessories
Stop buffers

Prevents the switching strip impacting on the ground when the gate is lowered, thus extending the switching strip's lifetime.

Article description		Size 30 x 35 x 30 mm Scope of delivery: stop buffer and hammerhead screw for mounting	Size 30 x 35 x 46 mm Scope of delivery: stop buffer and hammerhead screw for mounting	Size 30 x 35 x 70 mm Scope of delivery: stop buffer and hammerhead screw for mounting
Article no.		3090.1150	3090.1151	3090.1152
For switching strip profile				
Type	Article no.			
001.02	3100.0102			
001.10I	3100.0110I	X		
001.10N	3100.0110N	X		
001.10RED	3100.0110RED	X		
001.10YELLOW	3100.0110Y	X		
018.10	3100.0118			
018.10N	3100.0118N			
018.10WHITE	3100.0118W			
002.10	3100.0210			X
003.10I	3100.0310I			X
003.10N	3100.0310N			
005.02	3100.0502			
005.10	3100.0510	X		
006.02	3100.0602			
006.10	3100.0610	X		
008.02	3100.0802			
008.04	3100.0804		X	
016.10	3100.1610		X	
016.10N	3100.1610N			
018.30	3100.1830			
060.00	3100.6000			
080.00	3100.8000			

Installation accessory overview

Installation accessories

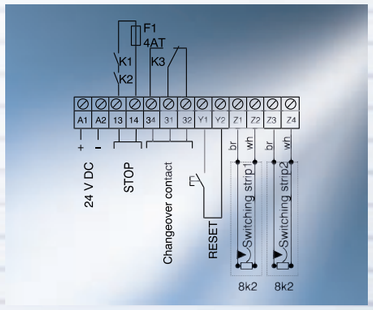
Aids for self-assembly

Article description	Sticks and seals the end caps and the cable outlet* incl. pipette		Special scissors for cutting rubber materials
Article no.	3057.0012	3057.0050	0100.3084
Filling	20 g	5 g	

* See installation instructions

Switchgear overview

Switchgear in housing types A, B, C and D



Switchgear – full monitoring

The switching devices monitor the switching strip connected in regard to actuation and interruption. They provide a potential-isolated safety relay contact for “Stop”.

Switching strips with a length of up to 100 m can be connected to the switchgear. Monitoring is performed on the closed circuit current principle with an 8.2 kΩ resistor as the electrical termination. The switchgears possess three LEDs (green, yellow, red), which are used to indicate different states:

- **Green:** switching strip connected, system ready for operation, safety contacts closed
- **Yellow:** error message “Open sensor circuit”, safety contacts opened
- **Red:** switching strip actuated, safety contacts opened

If, in the case of fail-safe (redundant) devices (Safety Category 3), the channels indicate a differing status; this signals a system malfunction and the safety contacts will be opened.

When the switching strip is actuated, the relay will drop out and the safety contacts will be opened.

Housing type A

Housing type B

Housing type A

The housing for installing the switchgear in a control cabinet is used for evaluators of Safety Categories 1 and 3. It is chosen when there is sufficient space in the control cabinet. The housing’s overall dimensions are 45 x 75 x 120 mm (W x H x D).

Housing type B

The housing for surface installation is used for evaluators of Safety Categories 1 and 3.

Housing type C

Housing type C

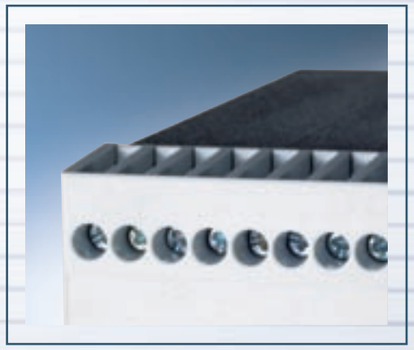
The housing for control cabinet installation is used for evaluators of Safety Category 3. Since the housing has a width of only 22.5 mm, it is chosen when there is not sufficient space in the control cabinet. The housing’s overall dimensions are 22.5 x 100 x 110 mm (W x H x D).

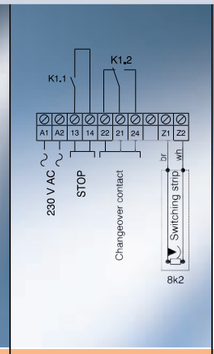
Housing type D

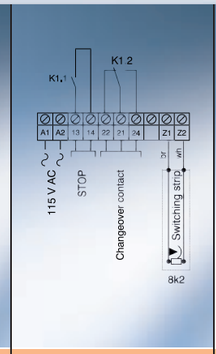
The housing for control cabinet installation is used for evaluators of Safety Category 1. Thanks to its small width of 22.5 mm, this housing is also chosen in control cabinets with a restricted amount of space available. The housing’s overall dimensions are 22.5 x 75 x 111 mm (W x H x D).

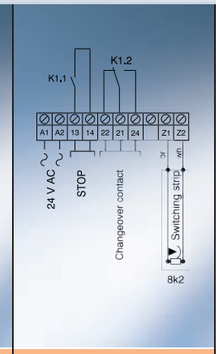
Housing type D

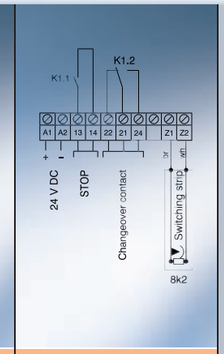
Switchgear overview

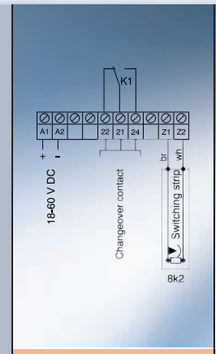


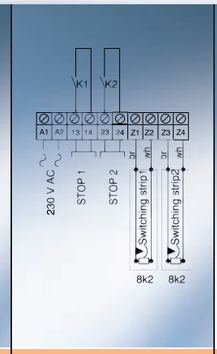


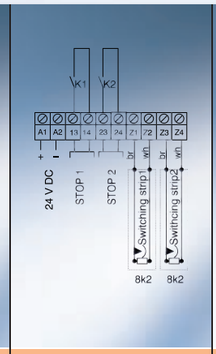


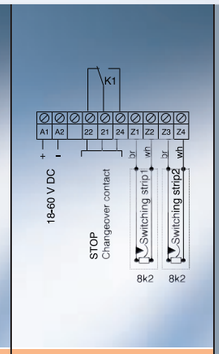










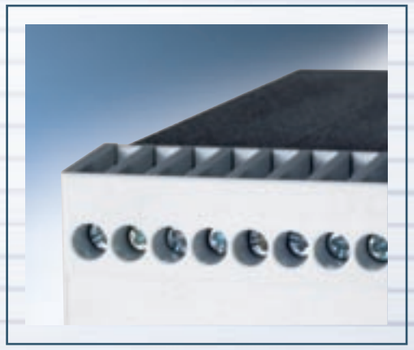


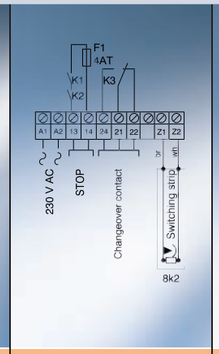
Housing type A

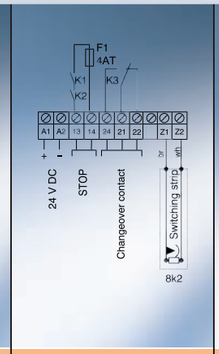
Type	212.00	212.01	212.04	212.06	212.08T	232.00	232.06	232.08T
Article no.	3002.1200	3002.1201	3002.1204	3002.1206	3002.1208T	3002.3200	3002.3206	3002.3208T
Safety category to EN 954-1	1	1	1	1	1	1	1	1
Functions								
Input:								
1 switching strip	X	X	X	X	X			
2 switching strips						X	X	X
Output:								
1 output with 2 relays each with 1 NC contact in series, forced								
2 outputs with 2 relays each with 1 NC contact in series, forced								
1 output with 2 relays, NC contact available separately, forced								
1 output with 1 relay contact (NC)	X	X	X	X				
2 outputs each with 1 relay contact (NC)						X	X	
Additional functions:								
Changeover contact	X	X	X	X	X			X
Changeover contact approx. 0.5 s time delayed								
Reset								
Slip-door contact								
Supply voltage A1 – A2	230 V AC	115 V AC	24 V AC	24 V DC	18 – 60 V DC	230 V AC	24 V DC	18 – 60 V DC
Rated power	4 VA	4 VA	4 VA	1.5 VA	1 VA	4 VA	4 VA	4 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24								
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:								
Dimensions (W x H x D) in mm	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120
Degree of protection for housing/contacts	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20
Weight	390 g	390 g	390 g	390 g	390 g	390 g	390 g	390 g
Tests:								
EN 954-1	X	X	X	X	X	X	X	X
EN 50121-3-2					X			X
EN 50155					X			X

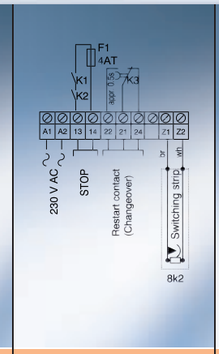
Diode evaluators are available as an option.

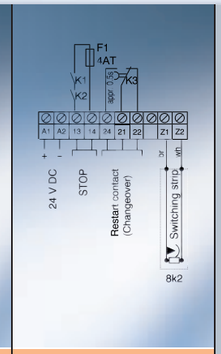
Switchgear overview

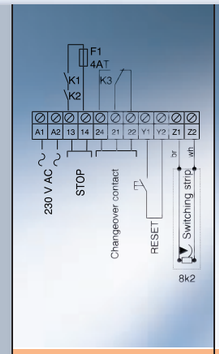


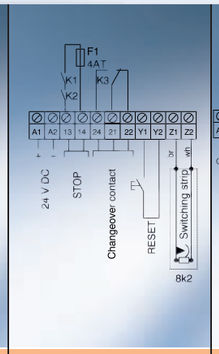


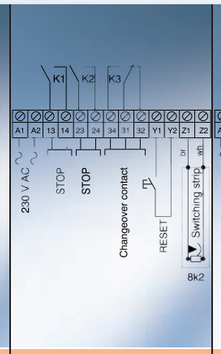


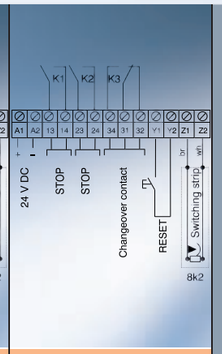








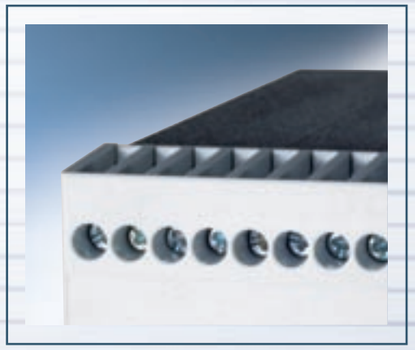


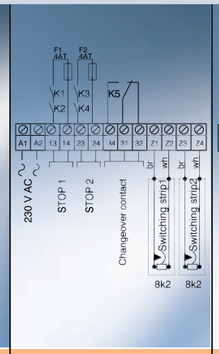


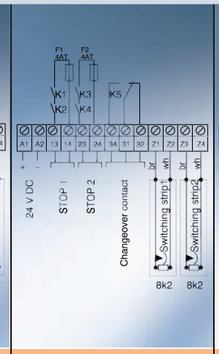
Housing type A

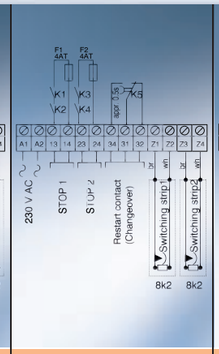
Type	252.00Z	252.06Z	252.10Z	252.16Z	252.40Z	252.46Z	252.40Z2	252.46Z2
Article no.	3002.5200Z	3002.5206Z	3002.5210Z	3002.5216Z	3002.5240Z	3002.5246Z	3002.5240Z2	3002.5246Z2
Safety category to EN 954-1	3	3	3	3	3	3	3	3
Functions								
Input:								
1 switching strip	X	X	X	X	X	X	X	X
2 switching strips								
Output:								
1 output with 2 relays each with 1 NC contact in series, forced	X	X	X	X	X	X		
2 outputs with 2 relays each with 1 NC contact in series, forced								
1 output with 2 relays, NC contact available separately, forced							X	X
1 output with 1 relay contact (NC)								
2 outputs each with 1 relay contact (NC)								
Additional functions:								
Changeover contact	X	X			X	X	X	X
Changeover contact approx. 0.5 s time delayed			X	X				
Reset					X	X	X	X
Slip-door contact								
Supply voltage A1 – A2	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC
Rated power	3 VA	3 VA	3 VA	3 VA	3 VA	3 VA	3 VA	3 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24								
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:								
Dimensions (W x H x D) in mm	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120
Degree of protection for housing/contacts	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20
Weight	390 g	390 g	390 g	390 g	390 g	390 g	390 g	390 g
Tests:								
EN 954-1	X	X	X	X	X	X	X	X
EN 50121-3-2								
EN 50155								

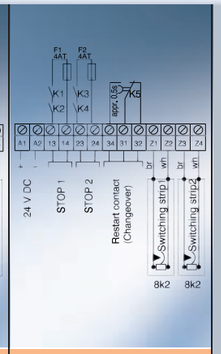
Switchgear overview

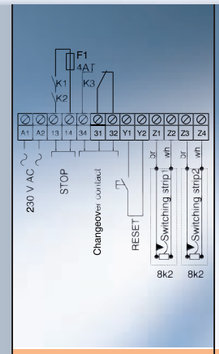


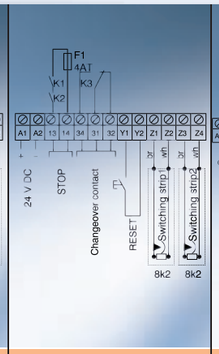


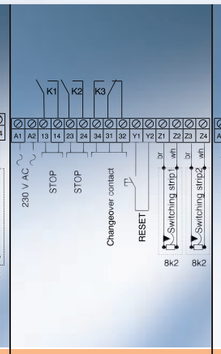


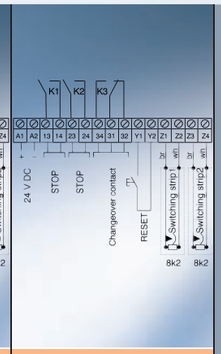










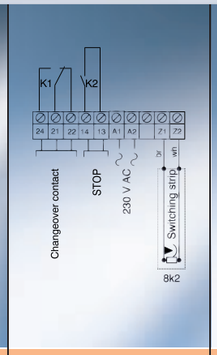


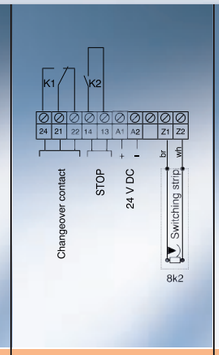
Housing type A

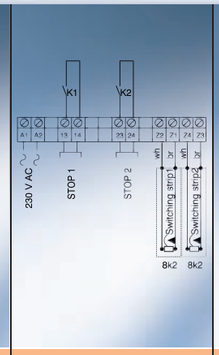
Type	262.00Z	262.06Z	262.10Z	262.16Z	262.40Z	262.46Z	262.40Z2	262.46Z2
Article no.	3002.6200Z	3002.6206Z	3002.6210Z	3002.6216Z	3002.6240Z	3002.6246Z	3002.6240Z2	3002.6246Z2
Safety category to EN 954-1	3	3	3	3	3	3	3	3
Functions								
Input:								
1 switching strip								
2 switching strips	X	X	X	X	X	X	X	X
Output:								
1 output with 2 relays each with 1 NC contact in series, forced					X	X		
2 outputs with 2 relays each with 1 NC contact in series, forced	X	X	X	X				
1 output with 2 relays, NC contact available separately, forced							X	X
1 output with 1 relay contact (NC)								
2 outputs each with 1 relay contact (NC)								
Additional functions:								
Changeover contact	X	X			X	X	X	X
Changeover contact approx. 0.5 s time delayed			X	X				
Reset					X	X	X	X
Slip-door contact								
Supply voltage A1 – A2	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC
Rated power	5 VA	5 VA	5 VA	5 VA	5 VA	4 VA	5 VA	4 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24								
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:								
Dimensions (W x H x D) in mm	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120	45 x 75 x 120
Degree of protection for housing/contacts	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20	IP 40/IP 20
Weight	390 g	390 g	390 g	390 g	390 g	390 g	390 g	390 g
Tests:								
EN 954-1	X	X	X	X	X	X	X	X
EN 50121-3-2								
EN 50155								

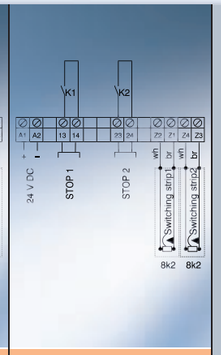
/ Switchgear overview

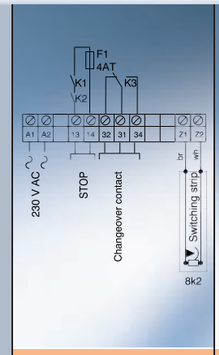
Housing type B

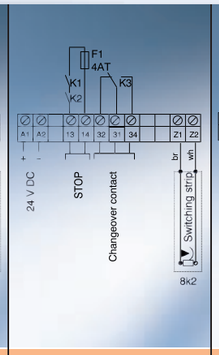


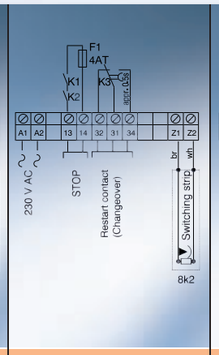


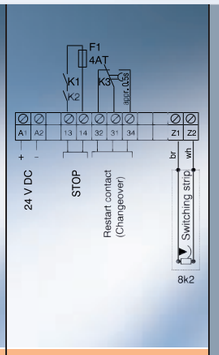








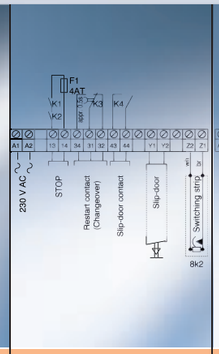


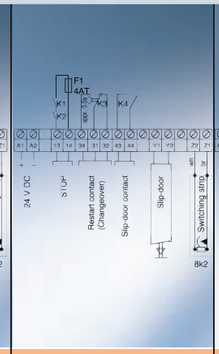


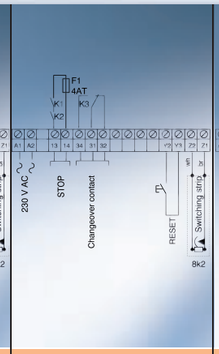
Type	312.00	312.06	332.00	332.06	352.00Z	352.06Z	352.10Z	352.16Z
Article no.	3003.1200	3003.1206	3003.3200	3003.3206	3003.5200Z	3003.5206Z	3003.5210Z	3003.5216Z
Safety category to EN 954-1	1	1	1	1	3	3	3	3
Functions								
Input:								
1 switching strip	X	X			X	X	X	X
2 switching strips			X	X				
Output:								
1 output with 2 relays each with 1 NC contact in series, forced					X	X	X	X
2 outputs with 2 relays each with 1 NC contact in series, forced								
1 output with 2 relays, NC contact available separately, forced								
1 output with 1 relay contact (NC)	X	X						
2 outputs each with 1 relay contact (NC)			X	X				
Additional functions:								
Changeover contact	X	X			X	X		
Changeover contact approx. 0.5 s time delayed							X	X
Reset								
Slip-door contact								
Supply voltage A1 – A2	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC
Rated power	3.6 VA	1 VA	5 VA	3 VA	5 VA	4 VA	5 VA	4 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24								
Max. switching voltage AC/DC	230 V/24 V	230 V/24 V	230 V/24 V	230 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	6 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:								
Dimensions (W x H x D) in mm	94 x 94 x 57	94 x 94 x 57	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75
Degree of protection for housing/contacts	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65
Weight	300 g	300 g	600 g	600 g	600 g	600 g	600 g	600 g
Tests:								
EN 954-1	X	X	X	X	X	X	X	X
EN 50121-3-2								
EN 50155								

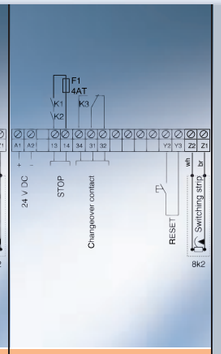
Switchgear overview

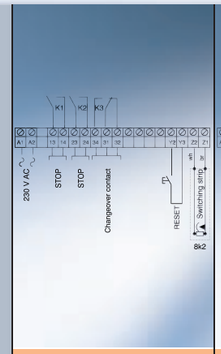
Housing type B

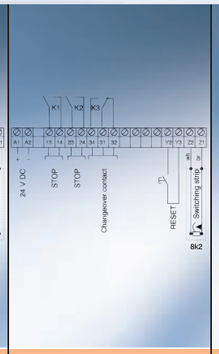


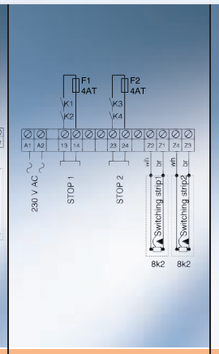


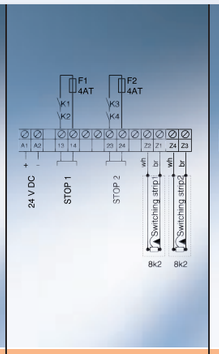


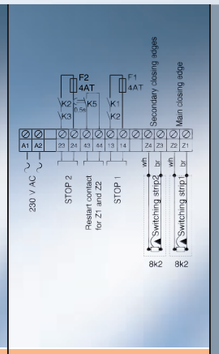








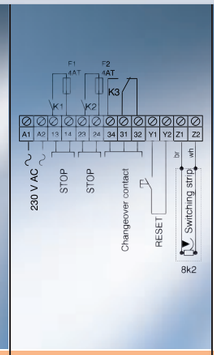


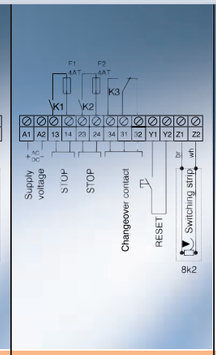


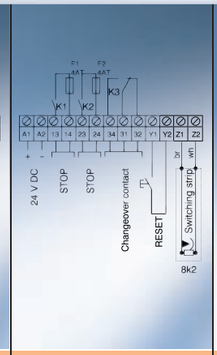
Type	352.30Z	352.36Z	352.40Z	352.46Z	352.40Z2	352.46Z2	362.00Z	362.06Z	362.10Z
Article no.	3003.5230Z	3003.5236Z	3003.5240Z	3003.5246Z	3003.5240Z2	3003.5246Z2	3003.6200Z	3003.6206Z	3003.6210Z
Safety category to EN 954-1	3	3	3	3	3	3	3	3	3
Functions									
Input:									
1 switching strip	X	X	X	X	X	X			
2 switching strips							X	X	X
Output:									
1 output with 2 relays each with 1 NC contact in series, forced	X	X	X	X					
2 outputs with 2 relays each with 1 NC contact in series, forced							X	X	X
1 output with 2 relays, NC contact available separately, forced					X	X			
1 output with 1 relay contact (NC)									
2 outputs each with 1 relay contact (NC)									
Additional functions:									
Changeover contact			X	X	X	X			
Changeover contact approx. 0.5 s time delayed	X	X							X
Reset			X	X	X	X			
Slip-door contact	X	X							
Supply voltage A1 – A2	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC	24 V DC	230 V AC
Rated power	5 VA	5 VA	5 VA	5 VA	5 VA	5 VA	6.4 VA	4.5 VA	6.5 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24									
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	6 A/2 A	6 A/2 A	6 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:									
Dimensions (W x H x D) in mm	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75	130 x 130 x 75
Degree of protection for housing/contacts	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65	IP 65
Weight	600 g	600 g	600 g	600 g	600 g	600 g	600 g	600 g	600 g
Tests:									
EN 954-1	X	X	X	X	X	X	X	X	X
EN 50121-3-2									
EN 50155									

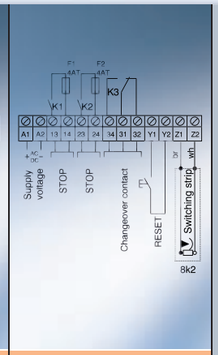
Switchgear overview

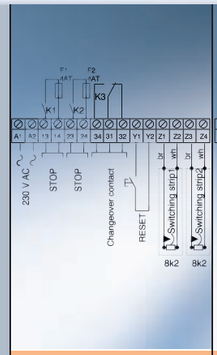
Housing type C

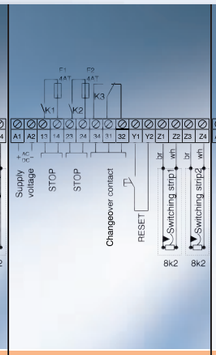


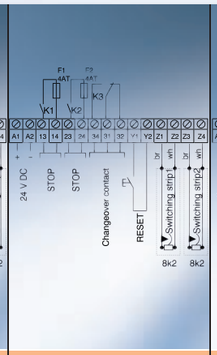


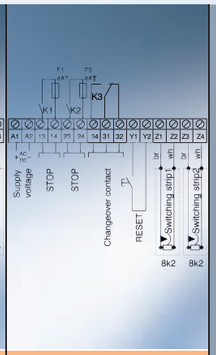








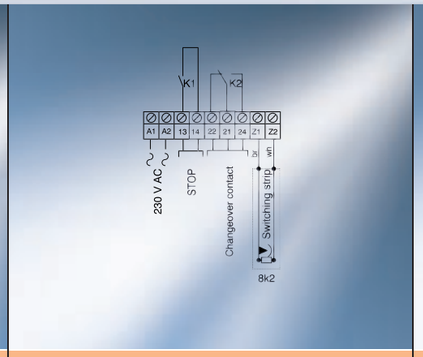


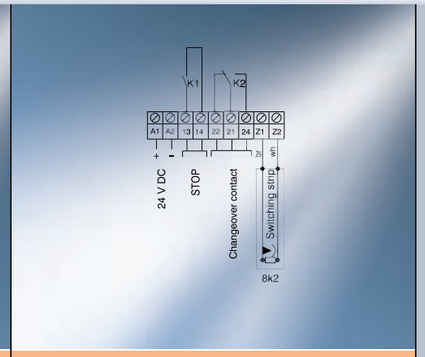


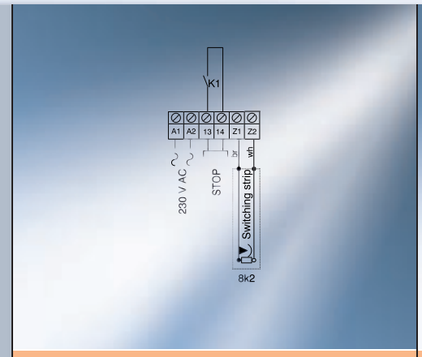
Type	452.40	452.42	452.46	452.49	462.40	462.42	462.46	462.49
Article no.	3004.5240	3004.5242	3004.5246	3004.5249	3004.6240	3004.6242	3004.6246	3004.6249
Safety category to EN 954-1	3	3	3	3	3	3	3	3
Functions								
Input:								
1 switching strip	X	X	X	X				
2 switching strips					X	X	X	X
Output:								
1 output with 2 relays each with 1 NC contact in series, forced	X	X	X	X	X	X	X	X
2 outputs with 2 relays each with 1 NC contact in series, forced								
1 output with 2 relays, NC contact available separately, forced								
1 output with 1 relay contact (NC)								
2 outputs each with 1 relay contact (NC)								
Additional functions:								
Changeover contact	X	X	X	X	X	X	X	X
Changeover contact approx. 0.5 s time delayed								
Reset	X	X	X	X	X	X	X	X
Slip-door contact								
Supply voltage A1 – A2	230 V AC	24–230 V AC/24–110 V DC	24 V DC	24 – 60 V AC/DC	230 V AC	24–230 V AC/24–110 V DC	24 V DC	24 – 60 V AC/DC
Rated power	3 VA	4 VA/6 VA	3 VA	4 VA/6 VA	3 VA	4 VA/6 VA	3 VA	4 VA/6 VA
Power pack potential-isolated	X	X	X	X	X	X	X	X
Relay contacts 13 – 14; 21 – 24								
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:								
Dimensions (W x H x D) in mm	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110	22.5 x 100 x 110
Degree of protection for housing/contacts	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Weight	250 g	190 g	175 g	190 g	250 g	190 g	175 g	190 g
Tests:								
EN 954-1	X	X	X	X	X	X	X	X
EN 50121-3-2				X				X
EN 50155				X				X

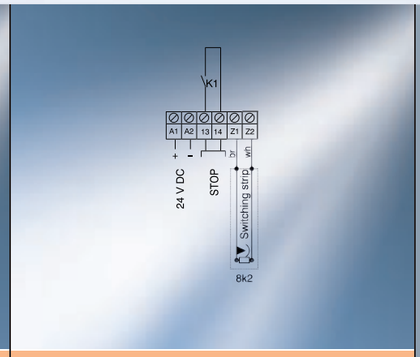
Switchgear overview

Housing type D





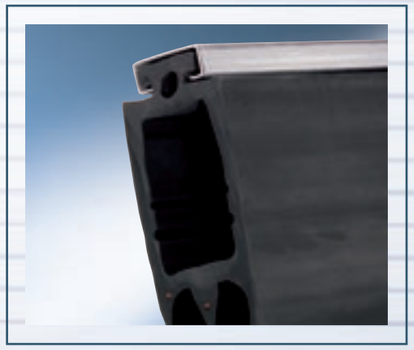




Type	B212.00	B212.06	B412.00	B412.06
Article no.	30B2.1200	30B2.1206	30B4.1200	30B4.1206
Safety category to EN 954-1	1	1	1	1
Functions				
Input:				
1 switching strip	X	X	X	X
2 switching strips				
Output:				
1 output with 2 relays each with 1 NC contact in series, forced				
2 outputs with 2 relays each with 1 NC contact in series, forced				
1 output with 2 relays, NC contact available separately, forced				
1 output with 1 relay contact (NC)	X	X	X	X
2 outputs each with 1 relay contact (NC)				
Additional functions:				
Changeover contact	X	X		
Changeover contact approx. 0.5 s time delayed				
Reset				
Slip-door contact				
Supply voltage A1 – A2	230 V AC	24 V DC	230 V AC	24 V DC
Rated power	3 VA	1.5 VA	3 VA	1.5 VA
Power pack potential-isolated	X	X	X	X
Relay contacts 13 – 14; 21 – 24				
Max. switching voltage AC/DC	250 V/24 V	250 V/24 V	250 V/24 V	250 V/24 V
Max. switching current AC/DC	4 A/2 A	4 A/2 A	4 A/2 A	4 A/2 A
Perm. operating temperature	–20..+55 °C	–20..+55 °C	–20..+55 °C	–20..+55 °C
Housing:				
Dimensions (W x H x D) in mm	22.5 x 75 x 111	22.5 x 75 x 111	22.5 x 75 x 111	22.5 x 75 x 111
Degree of protection for housing/contacts	IP 20	IP 20	IP 20	IP 20
Weight	100 g	65 g	85 g	55 g
Tests:				
EN 954-1	X	X	X	X
EN 50121-3-2				
EN 50155				

Mounting rail overview

C-rails

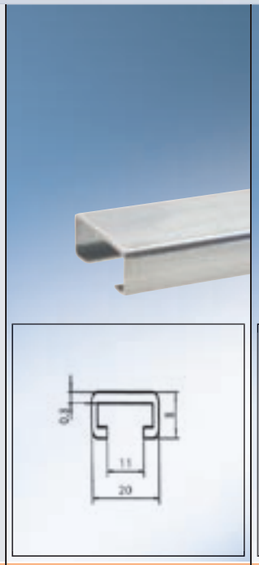


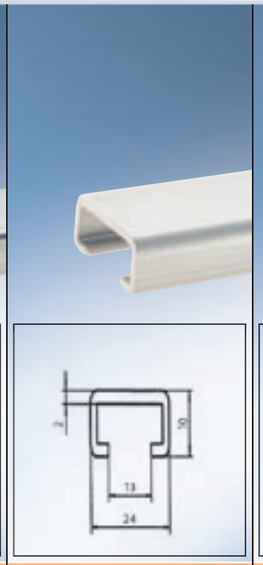
C-rails – for secure mounting

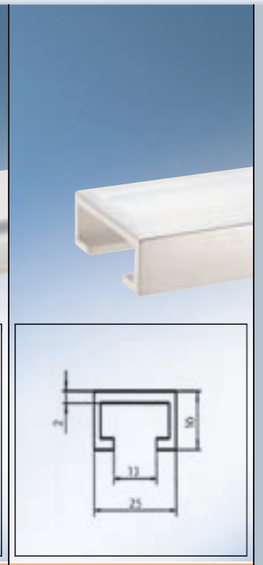
To affix the safety switching strips to the gate, machine or system involved, you can choose from a wide range of mounting rails. Depending on the application and profile types concerned, the mounting rails can be supplied in steel or aluminium. Different models (e. g. with and without a flange) provide multifarious options for mounting configurations.

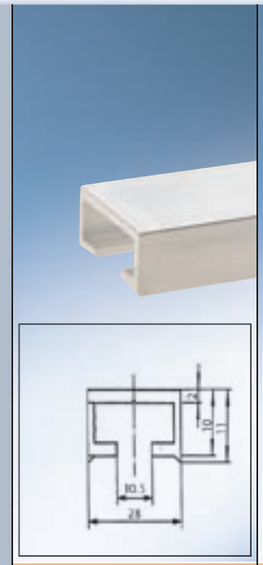
If the customer so requests, Gelbau also offers an option for supplying the C-rails with boreholes, press-fit threaded bolts or press-fit nuts.

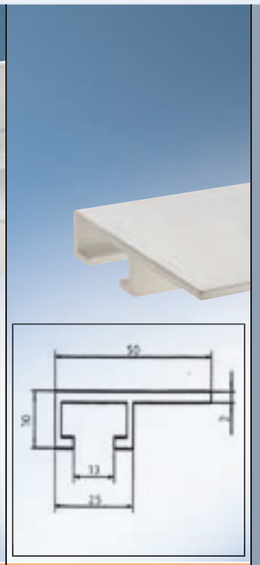
/ C-rail overview







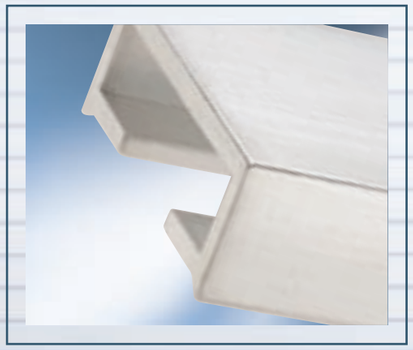


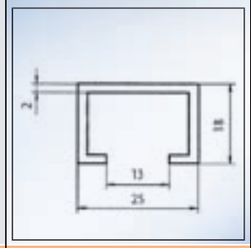


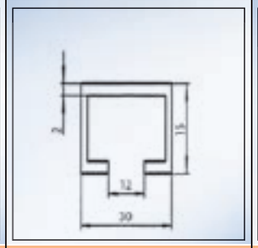
Type		C-rail 112/KS	C-rail 112/S	C-rail 112/A	C-rail 112/A1	C-rail 112/A2	C-rail 112/A3
Article no.		3045.1111	3045.1112	3045.1212	3045.1213*	3045.1214	3045.1215
Material		Steel galvanised	Steel galvanised	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22
Delivery lengths		2 m	2 m	2 m/4 m	2 m	2 m/4 m	2 m/4 m
For switching strip profile/rubber-sheath-profile							
Type	Article no.						
001.02	3100.0102	X					
001.10I	3100.0110I		X	X	X	X	X
001.10N	3100.0110N		X	X	X	X	X
001.10RED	3100.0110RED		X	X	X	X	X
001.10YELLOW	3100.0110Y		X	X	X	X	X
018.10	3100.0118						
018.10N	3100.0118N						
018.10WHITE	3100.0118W						
002.10	3100.0210		X	X	X	X	X
003.10I	3100.0310I		X	X	X	X	X
003.10N	3100.0310N		X	X	X	X	X
005.02	3100.0502	X					
005.10	3100.0510		X	X	X	X	X
006.02	3100.0602	X					
006.10	3100.0610		X	X	X	X	X
008.02	3100.0802	X					
008.04	3100.0804		X	X	X	X	X
016.10	3100.1610		X	X	X	X	X
016.10N	3100.1610N		X	X	X	X	X
018.30	3100.1830						
01.111	3100.1111						

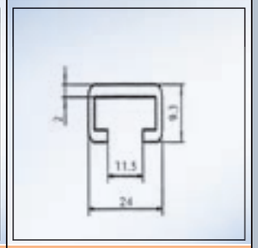
*Only for profile lengths of up to max. 2 m

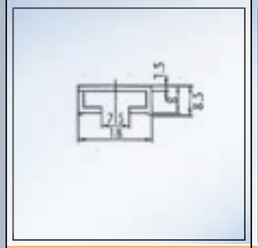
/ C-rail overview











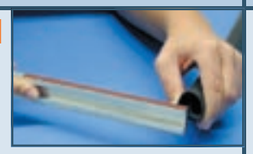
Matches sheath-profile on page 33

Type		C-rail 112/A4	C-rail 112/A5	C-rail 112/A6	C-rail 112/A7	Aluminium special rail 02.151
Article no.		3045.1216	3045.1217	3045.1218	3045.1219	3045.2151
Material		Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22	Aluminium Al Mg Si 0.5 F 22
Delivery lengths		2 m/4 m	2 m/4 m	2 m/4 m	2 m	2 m standard length/6 m length with minimum purchase quantity
For switching strip profile/rubber-sheath-profile						
Type	Article no.					
001.02	3100.0102					
001.10I	3100.0110I	X	X	X		
001.10N	3100.0110N	X	X	X		
001.10RED	3100.0110RED	X	X	X		
001.10YELLOW	3100.0110Y	X	X	X		
018.10	3100.0118				X	
018.10N	3100.0118N				X	
018.10WHITE	3100.0118W				X	
002.10	3100.0210	X	X	X		
003.10I	3100.0310I	X	X	X		
003.10N	3100.0310N	X	X	X		
005.02	3100.0502					
005.10	3100.0510	X	X	X		
006.02	3100.0602					
006.10	3100.0610	X	X	X		
008.02	3100.0802					
008.04	3100.0804	X	X	X		
016.10	3100.1610	X	X	X		
016.10N	3100.1610N	X	X	X		
018.30	3100.1830				X	
01.111	3100.1111					X

INSTALLATION INSTRUCTIONS

/ Installation instructions for Contact-Duo-Profiles

as exemplified by a profile without compensation chamber and without sealing lip

Step	Detailed description	Notes
0	**Tools required** Rubber scissors, knife, electronic side-cutter, sandpaper (grain size 80), belt punch, pointed pliers	
1 **Cutting the profile to size**	**Cutting the profile to length** 1.1 Total length of the switching strip minus 34 mm for the end caps (17 mm per cap).	When cutting to size, make sure the cut edges are straight, smooth and right-angled.
2 **Shortening the foot by the dimension of the end cap's circumferential edge**	**Right-angled cross-section** 2.1 Cut at right angles into the foot after 12 mm. **Axial cross-section** 2.2 Cut off the foot after 12 mm up to the right-angled cut. Any protruding remains of the foot will have to be sanded off later.	Take care to ensure that you do not damage the profile when making the right-angled cut.
3 **Shortening the copper wires**	**Shortening** 3.1 Shorten the copper wire with flush precision.	This step enables you to achieve a smooth sanding surface.
4 **Sanding the profile**	**Cut surface** 4.1 Sand the cut surface until it is even and matt.  **Profile foot** 4.2 The remaining rib of the profile foot must be completely sanded until it is even.	Important: the edges must not be sanded until they are round. Straight-cut edges guarantee reliable adhesion. During this procedure, take care to ensure that soiling (grinding dust, foreign bodies, adhesive, etc.) does not penetrate into the switching chamber. Sanding the end of the profile prepares the surface for gluing.

Step	Detailed description	Notes
4	**Switching head** 4.3 Sand the surface of the switching head to the width of the circumferential edge (at least 12 mm) until it is matt.	
5 **Preparing the end cap for the connecting cable**	**Opening the cable bushing** 5.1 The cable bushings are closed inside. In accordance with the type of connection involved, open the desired bushing with a belt punch (pipe 4.5). Remove the remaining closure, using pointed pliers if necessary. **Pulling through the cable** 5.2 Pull the connecting cable in through the perforated cable bushing until shortly before the cap, using pointed pliers if necessary.	Insert the spike of the belt punch precisely into the cable bushing, taking care not to damage the bushing.
6 **Inserting the plug connector with the connecting cable**	**Prepunching** 6.1 Use the needle of the terminating plug connector to prepunch in the centre of the top and bottom copper wires. **Insertion** 6.2 Now plug the plug connector with the connecting cable into the prepunched copper wire.	The plug connector must be inserted in the centre of the copper wires, so as to ensure reliable contacting. The tapering end of the plug connector must face outwards and the round side towards the switching wedge. Only in this configuration will the cap close properly. In the case of a cable exiting at the side, the corresponding spacer must be removed at the plug connector on the cable outlet side, using a side-cutter. Be careful of parts flying off! Wear eye protection.

Installation instructions for Contact-Duo-Profiles

as exemplified by a profile without compensation chamber and without sealing lip

Step	Detailed description	Notes
7 **Wetting the interior rib with adhesive**	**Wetting** Apply a thin but even film of adhesive to the rib. Applying too much adhesive will impair the adhesion properties. 7.1 	Important: when wetting the rib with adhesive, make sure that no adhesive gets onto the inner sealing edge of the end cap and on the cable of the plug connector. The adhesive sets immediately, and then it will no longer be possible to shift the parts. Use the adhesive with the utmost care. Avoid any contact with skin and eyes, and always comply with the safety instructions on the tube. Only our adhesive is matched to the components involved.
8 **Fitting the end cap**	**Fitting** Place the end cap on the profile from the profile foot side. It is particularly important to make sure the corners are positioned correctly, so that the cap does not jam when being pushed on. Then press the cap firmly for about 10 seconds. Only a short time should elapse between applying the adhesive and pressing on the cap. 8.1 	When fitting the cap, the cable must also be pulled through the bushing, without withdrawing the plug connector from the copper wires. We recommend practising this procedure several times without adhesive. With adhesive, there will no longer be any opportunity to make a correction. When practising, repeatedly pull the plug connector approx. 50 mm out of the end cap again, then plug the plug connector into the copper wires, and then fit the end cap.
9 **Gluing the end cap in place**	**Gluing on the foot side of the profile** Fold back the circumferential edge and apply a thin, even film of adhesive to the adhesive surface of the foot. Fold the sealing edge back into position, first press the two corners down so that the end cap cannot shift, and for approximately 10 seconds press onto the entire adhesion surface. 9.1 **Gluing the switching chamber** Fold back the circumferential edge, and apply a thin, even coating of adhesive to the right or left half as far as the centre, all the way into the corners. Fold the circumferential edge back into position and for approx. 10 seconds press the adhesion surface. Then fold back the circumferential edge again... 9.2	

Step	Detailed description	Notes
9 **Gluing the end cap in place**	...and likewise spread the other half with a thin, even film of adhesive right into the corners. Fold the circumferential back into position, and once more press the adhesion surface for approx. 10 seconds. 9.2 **Gluing the cable exit** Carefully bend away the cable protruding from the bushing and allow the adhesive to run into the bushing around the cable. 9.3	
10 **Sealing**	**Sealing the end cap** Apply a thin film of adhesive to the edge of the end cap. 10.1 **Sealing the edge at the cable bushing** Apply a thin film of adhesive to the edge of the cable bushing. 10.2	If the adhesive cracks when the dry profile is pressed together, this is only a sign that there is superfluous adhesive present.
To process the other side of the profile, repeat steps 1 to 4 and then proceed from step 11.		
11 **Fitting the terminating plug connector (diode/resistor)**	**Prepunching** Use the needle of the terminating plug connector to prepunch the centre of the top and bottom copper wires (see also sections 6.1 and 6.2). 11.1 **Inserting** Now insert the terminating plug connector in the prepunched copper wire. 11.2	The plug connector must be inserted in the centre of the copper wires, so as to ensure reliable contacting. The tapering end of the plug connector must face outwards and the round side towards the switching wedge. Only in this configuration will the cap close properly.
From here, repeat steps 7 to 10.		

IMPRINT

Responsible for content

Gelbau GmbH & Co. KG, Niederkassel
Ms Yvonne Riem
Phone +49 (0) 22 08/94 55-33
Fax +49 (0) 22 08/94 55-50

Design and text

trio-group communication & marketing gmbh, Mannheim

Printed by

Nino-Druck, Neustadt an der Weinstrasse

Picture credits

Publication of the following pictures by kind permission of:
Rheinbahn AG, Düsseldorf: public transport photos, pages 1 and 12/13
SBS Bühnentechnik GmbH, Dresden: stage photos, pages 1 and 16/17

Subject to errors and alterations
© Gelbau GmbH & Co. KG, Niederkassel
Status July 2008

GELBAU

GELBAU

GELBAU –
FOR WHENEVER YOU NEED US

Gelbau GmbH & Co. KG
Grandkaule 8–10
53859 Niederkassel
Germany
Phone + 49 (0) 22 08/94 55-0
Fax + 49 (0) 22 08/94 55-51
Email info@gelbau.com
www.gelbau.com
Managing Director Dipl.-Ing. Jürgen Menz

Business hours
Monday – Thursday
8:00 a.m. – 12:30 p.m. / 1:00 – 4:00 p.m.
Friday
8:00 a.m. – 1:00 p.m.

Delivery acceptance times
Monday – Thursday
7:30 a.m. – 12:30 p.m. / 1:00 – 3:30 p.m.
Friday
7:30 a.m. – 12 noon

GELBAU