Control Units

Series Overview - Actuators

made in germany

SCHLEGEL® ELEKTROKONTAKT

Panel cut-out: Ø 16.2 mm

OKTRON
Front dimensions: 25 x 25 mm
page 16

OKTRON-R
Front dimensions: Ø 25 mm
page 36

QUARTRON
Front dimensions: 25 x 25 mm
page 54

Panel cut-out: Ø 22.3 mm

RONTRON-R-JUWEL
Front dimensions: Ø 28 mm
page 72

RONTRON-Q-JUWEL
Front dimensions: 28 x 28 mm
page 106

SHORTRON
Front dimensions: Ø 28 mm
page 124

SHORTRON for base-plate mounting
Front dimensions: Ø 28 mm
page 154

SHORTRON M12
Front dimensions: Ø 28 mm
page 174

RX-JUWEL
Front dimensions: Ø 28 mm
page 184

RONDEX
Front dimensions: Ø 28 mm
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RONDEX-M
Front dimensions: Ø 28 mm
page 214

DUX-Basic
Front dimensions: Ø 30 mm
page 230

QUARTEX-R
Front dimensions: 30 x 30 mm
page 252

RVA stainless steel
Front dimensions: Ø 28 mm
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Panel cut-out: Ø 30.5 mm

KOMBITAST-R-JUWEL

Front dimensions:
Ø 36 mm

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Panel cut-out: 25x25 mm

OKTRON-JUWEL

Front dimensions:
25 x 25 mm

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Panel cut-out: 27x27 mm

QUARTRON-JUWEL

Front dimensions:
27 x 27 mm

page 328

Panel cut-out: 30x30 mm

QUARTEX-R-JUWEL

Front dimensions:
30 x 30 mm

page 348

Vandalism-proof Actuators

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Emergency Stops

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Nameplates

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Contact Blocks

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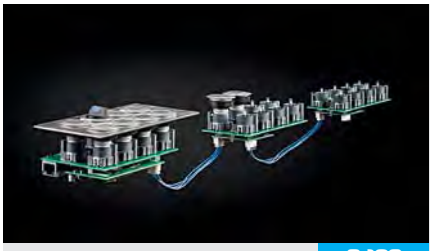
Battery-free Radio Contact Block

page 546

Bus technology



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>> Control Units

Use & Application Fields
Schlegel control units include a variety of complete pushbutton and switch series for front-panel and base-plate mounting. The actuators are designed for exclusive applications as well as for use in harsh environments. They are housed in attractive, square, rectangular or round insulating bodies, allowing side-by-side assembly and thus full keyboard arrangements.
Due to the flexible contact configurations and ease of assembly, the units can be used in every field of application.

Mounting of Actuators
First, the required mounting holes have to be drilled, punched or lasered (refer to the relative drilling pattern on the starting page of each series). For round cut-outs, keep in mind to provide a recess for the locating lug.
The actuators are then inserted into the cut-outs and fixed with a mounting nut on the rear.
Because they are almost completely recessed in the panel, the square Juwel actuator housings require a spacer to be put on from behind before securing them with the mounting nut.
Lenses and nameplates have to be ordered separately unless otherwise stated. This provides high flexibility to the combination of lens colours and inscriptions once the control units are mounted in the panel (see illustration under "Mounting and Service Instructions").

Mounting of Contact Blocks
All Schlegel contact blocks have rounded corners and edges and thus allow a comfortable use without risk of injury.
For the 22 mm series with bayonet applies: With the M...type series, first insert the contact modules into a module holder, then snap the module holder onto the actuator neck by a rotary motion (bayonet coupling). For side-by-side arrangements with the D... type series, snap the module holder onto the actuator neck first by a rotary motion, then insert the contact modules into the module holder. The contact blocks ETR.. (one-piece) do not need a module holder, so snap them directly onto the actuator. As to the actuators with 16mm bayonet, simply snap the contact blocks of the type series A, B, C and P onto the actuator neck (no module holder necessary). A slight twist enables to snap them off again.
The contact units of the type series CTP and CZ (suitable for PCB's) are first soldered onto the PCB, then put onto the actuator of the 16 mm series and fixed by a small locking bolt. This bolt can be moved with a screwdriver through a hole in the PCB.

Assembly Instructions for Base-plate Mounted Version
- snap the relative contact block onto the actuator neck
- Spacer sleeves ensure the correct distance between PCB and mounting plate.
- Screws must be secured against loosening.

Note for base-plate mounted type "FRVKZ" (with plunger extension): ATTENTION: must not be used for the illuminated version !
Note for base-plate mounted type "FRVKZL" (with plunger extension): ATTENTION. use only for the illuminated version !

Illumination
For the illumination of pushbuttons, selector or key switches and pilot lights either incandescent lamps, neon lamps or LED's can be used. The contact units are optionally available with BA9s, T5,5K or W2x4,6d sockets or integrated LEDs, depending on the particular type series.

Marking Options
With the importance of an efficient component marking in mind, the Schlegel control units have been designed to accept a clearly visible marking, easy to produce and comprising a variety of symbols and inscriptions. Hence, a multitude of standard nameplates are available, but also customer-specific imprints are possible.
The nameplates are inserted under the lenses and are thus protected from wearing and soiling. Still today this is the best system which was originally a development of Georg Schlegel.
Other marking options offer the external markings using special nameplate holders. These nameplates can also be printed with standard symbols or according to users' requirements.

Front Bezel Colours (refer to the relative series)
Other front bezel colours can be supplied on request.

Please refer to www.schlegel.biz/web/de/manuals.php for detailed instructions for use and assembly.

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Degree of Protection (acc. to IEC/EN 60529)
The SCHLEGEL actuators generally comply with IP65 (this refers to the component in front of the switchboard). Special versions, as e.g. for the food processing sector, are classified up to IP69K.
For extremely severe conditions, e.g. coarse dirt, chippings, flour, etc., there are membrane pushbuttons available or actuators with transparent silicone or PVC caps.

Materials
Only top-quality materials such as polyamide 6.6 / polyamide 12 (partially reinforced) and other proven engineering plastics are utilised. Tin-plated brass is mostly used for the terminals of the contact blocks. The contacts are of a silver-nickel alloy but can also be gold-plated on request (gold-plating 5 µm). A special surface makes them self-cleaning.
All products are RoHS compliant.

Technical Characteristics
As to the technical characteristics, approvals and operating and ambient conditions of the contact blocks, please refer to the catalogue information given on the starting pages of the relevant type series.
The stroke / operating travel is shown in pictograms separately for each actuator and in switching diagrams for the relevant contact blocks. This information is included as well in the technical specifications.

The positive opening function of the NC contacts, which is necessary for emergency-stop applications is identified by a symbol (circle with horizontal arrow) next to the relative switching diagram.

Definition of the IP Codes

Standards & Code Digits	Numerals or Letters	Protection of equipments	Protection of persons
EN 60529		Protection against solid foreign objects (incl. dust)	Protection against hazardous parts
First digit	0	non-protected	non-protected
	1	≥ Ø 50 mm	with the back of a hand
	2	≥ Ø 12.5 mm	with a finger
	3	≥ Ø 2.5 mm	with a tool
	4	≥ Ø 1.0 mm	with a wire
	5	dust-protected	with a wire
	6	dust-tight	with a wire
		Protection against ingress of water with harmful effects	
Second digit	0	non-protected	
	1	vertically falling water drops	
	2	water drops (tilted up to 15°)	
	3	spraying water	
	4	splashing water	
	5	water jets	
	6	powerful water jets	
	7	temporary immersion in water	
	8	continuous immersion in water	
	9	high pressure and high temperature water jets	

ISO 20653:2013		Protection against solid foreign objects (incl. dust)	
Second digit	9K	high pressure and high temperature water jets	

Approvals

Symbol	Name / Organisation	Explication
CE	CE Kennzeichen, Communautès Europèennes	With the CE mark, the manutacturer confirms that the product meets the product-specific requirements of the applicable EC Directives.
VDE	VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V.	The VDE mark indicates conformity with the VDE Standards or European or internationally harmonised standards and confirms conformity with the safety requirements of the applicable directives.
EN 10	ENEC European Norms Electrical Certification	European approval mark (applies to switches for appliances acc. to EN 61058). Replaces the national European Directives of the participating countries. The figure after the ENEC marking refers to the relative national certification authority, e.g. 05=KEMA, 10=VDE.
KEMA KEUR	KEMA Keuring van Elektrotechnische Materialen te Arnhem	Certification mark of the Dutch approval authority
UL LISTED	Underwriters Laboratories	UL Listed mark, representative samples of the product have been tested by UL and are complying with the US safety requirements.
c UL us LISTED	Underwriters Laboratories	UL Listed mark, representative samples of the product have been tested by UL and are complying with the US and Canadian safety requirements.
	Underwriters Laboratories	UL Recognized mark, UL marking for approved components that are part of a larger product or system
c US	Underwriters Laboratories	UL Recognized mark, representative samples of the product have been tested by UL and are complying with the US and Canadian safety requirements.
	Canadian Standards Association	Approval mark of the Canadian certification authority, products bearing this mark have been certified by CSA and are complying with the applicable Canadian Standards.
C US	Canadian Standards Association	Approval mark of the Canadian certification authority, products bearing this mark have been certified by CSA and are complying with the applicable Canadian and US Standards.
D	Demko	Danish approval mark which is registered and provided by UL International Demko A/S. The D mark demonstrates that the certified product complies with the applicable requirements.
N	Nemko	Certification mark of the Norwegian approval authority
S	Semko	Certification mark of the Swedish approval authority
FI	Fimko	Certification mark of the Finnish approval authority
NV	Det Norske Veritas	Certification mark of the Norwegian approval authority Products bearing this mark comply with the ship classification requirements
GL	Germanischer Lloyd	Certification mark of the German approval authority Products bearing this mark comply with the ship classification requirements
	UkrSEPRO	Certification mark of the Ukrainian approval authority
	Gost-R	Certification mark of the Russian approval authority

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Approvals

Symbol	Name / Organisation	Explication
	China Compulsory Certificate	Certification mark of the Chinese approval authority CQC
	TÜV	German approval authority Approval authority for safety-related components such as emergency-off / emergency-stop components
	AS-International Association	Mark for certified AS-Interface components
	Lloyd's Register	Lloyd's Register of Shipping, UK approval authority for ship certification

Mode of Operation of 3-position Selector and Key Switches

One-piece plunger:

The one-piece plunger of the 3-position selector and key switches is not pushed in the left position, in the centre position it is pushed half way whereas in the right switching position it is entirely pushed through.
Using a contact block with a NC contact (opens after a travel of approx. 1.5mm) and a NO contact (closes after a travel of approx. 4mm), the switching mode changes as follows:

1. left-hand = switching travel 0mm = NC closed, NO open
2. centre = switching travel ~3mm = NC and NO are open
3. right-hand = switching travel 6 mm = NC open, NO closed

This yields the advantage that it is not important in which „direction" the contact elements are snapped on, the switching situation always results from the switching travel. This also means that cross coupling of the contact elements is allowed.

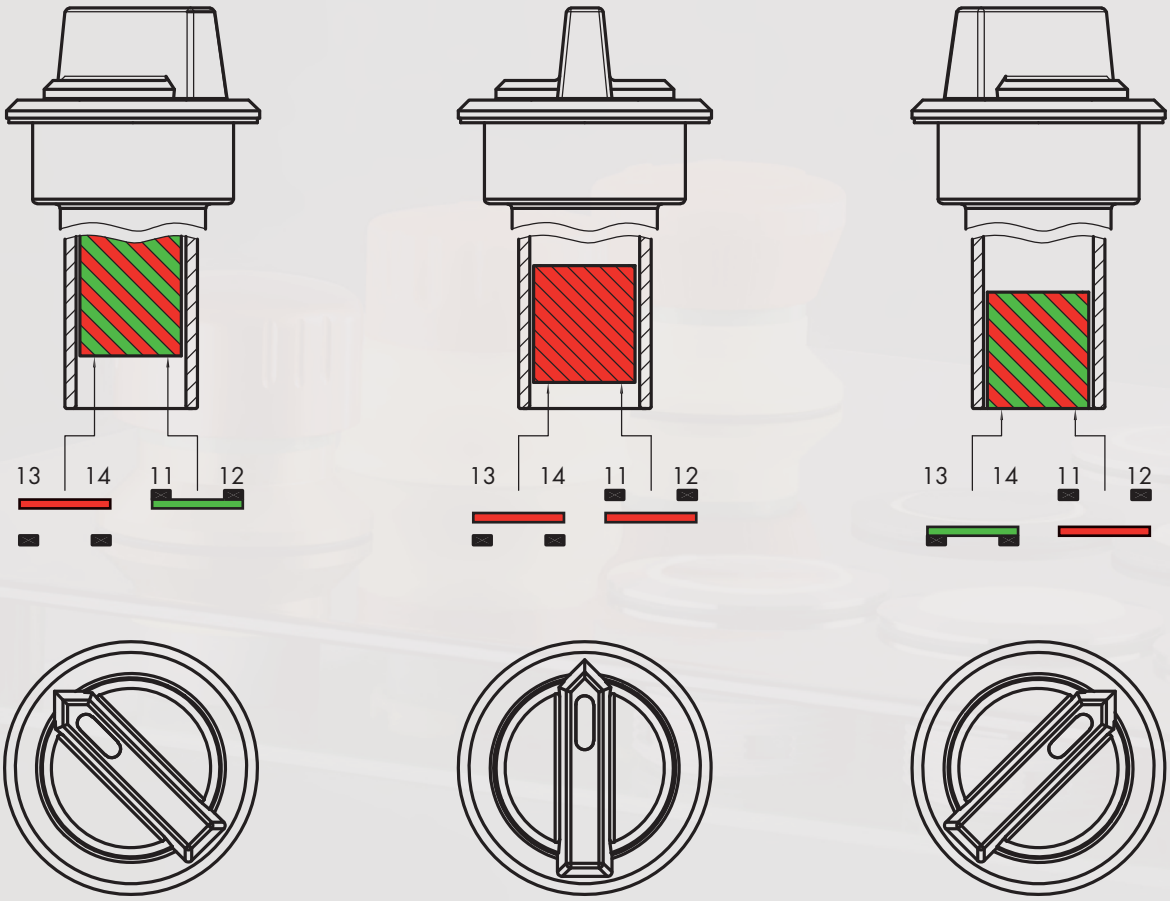

illustration of one-piece plunger

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Two-piece plunger:
The actuator plunger consists of 2 separate half shells. In the left switching position the left plunger part
and therefore the left contact element is operated, in the right switching position it is the right contact element. In the centre position none of the two contact elements is activated. Therefore, it should be noted that a cross-coupling of the contact elements is NOT allowed! In addition, the contact elements must be snapped on correctly, otherwise any actuation will lead to the opposite function.
In order to obtain the same switching situations as mentioned before, two NO contacts must be used:

1. left-hand = left plunger part operated = left NO contact closed, right NO contact open
2. centre = no plunger part operated = both NO contacts open
3. right-hand = right plunger part operated = left NO contact open, right NO contact closed.

The two-piece plunger is used in the selector heads and key actuators of the following series:
Oktron, Oktron-R, Oktron-Juwel, Rontron-R-Juwel, Rontron-RJ-Edelstahl, Rontron-Q-Juwel and RX-Juwel (RXJZSSA12E and RXJZWBL), Kombitast-R-Juwel (KRJZ...).

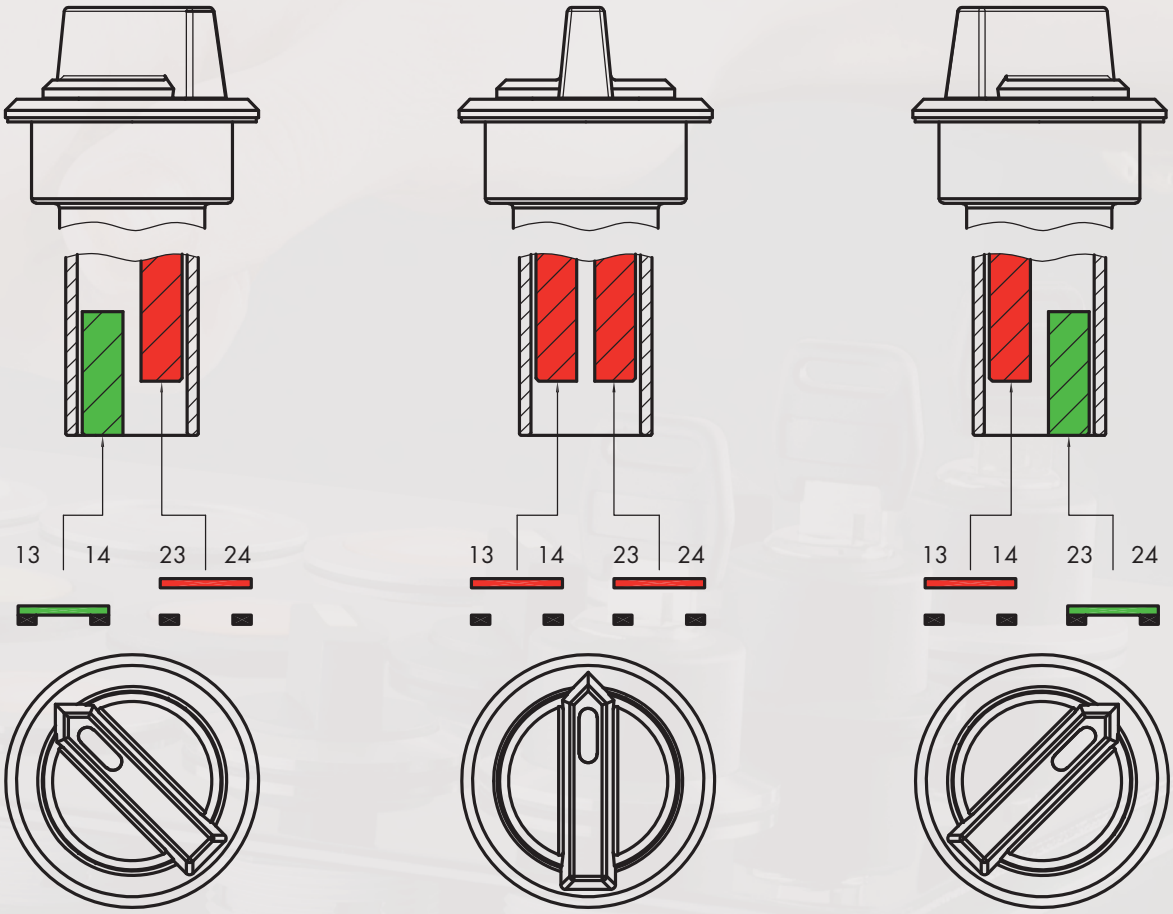

illustration of two-piece plunger