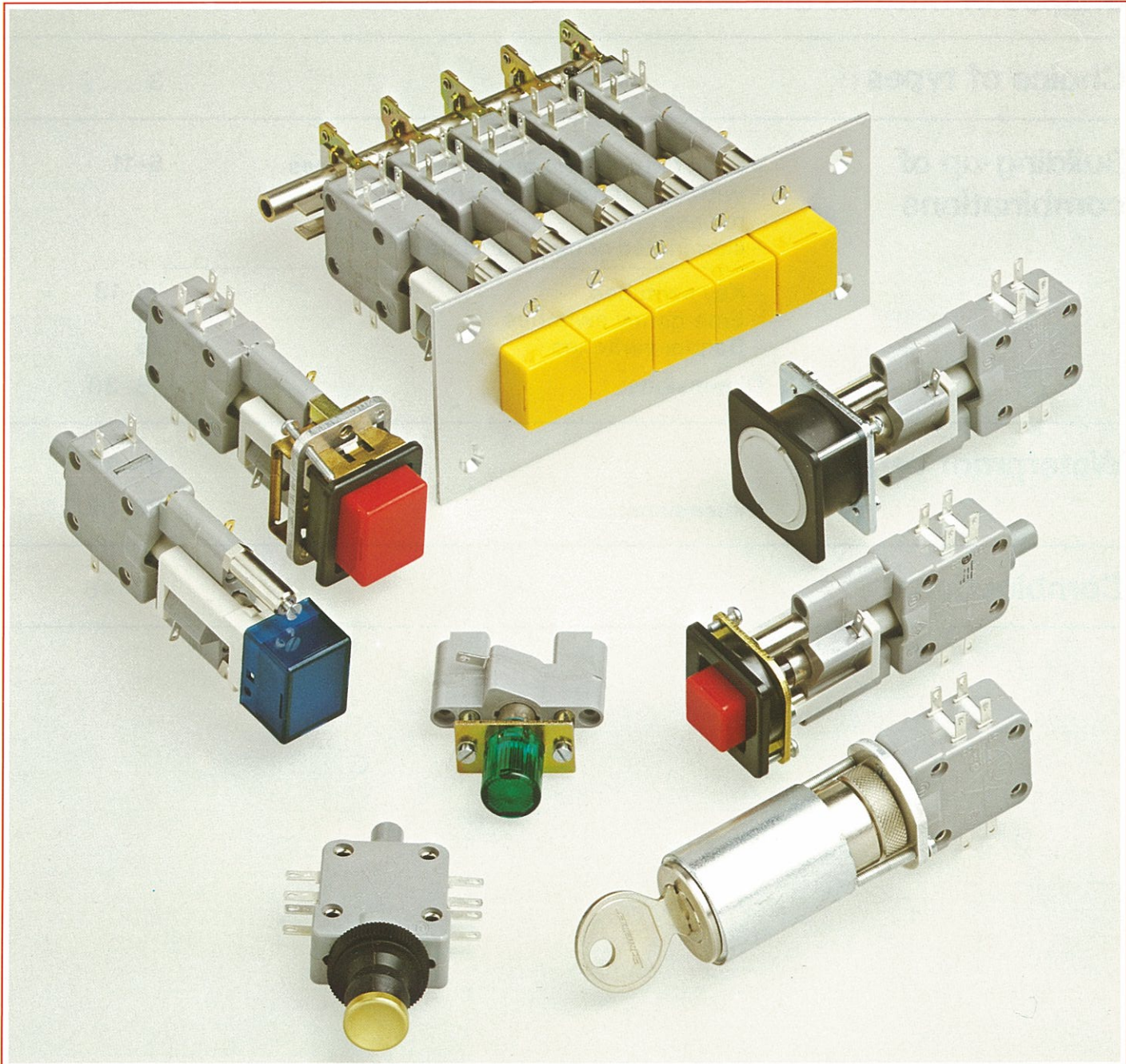


Control and signalling equipment

**Schweitzer Schaltsysteme AG**

Tägerhardstrasse 90

CH-5430 Wettingen

Telefon ++41/56-427 33 00

Telefax ++41/56-427 33 13

info@schweitzer.ch

www.schweitzer.ch

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 - Banner switches

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Dimensions:

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Combinations





















39-46







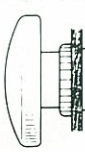

Shapes of push buttons and fixing types



Push-Buttons/Switches and Indicator Lamps

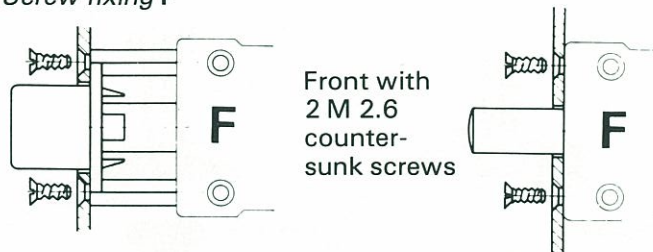
Shapes of lenses and buttons

Illuminated / non illuminated	R 15			Round Ø15 mm Semi-conical
	C 15			Round Ø15 mm Cylindrical
	Q 15			Square 15 mm Semi-tapered
	W 15			Cubed 15 mm
	W 20			Cubed 20 mm
	U 20			Rectangular 20×25 mm
	U 25			Rectangular 25×20 mm
	W 24			Cubed 24 mm
	R 22			Round Ø22 mm With square bezel 36 mm
	R 28			Round Ø 28 mm with square bezel 36 mm

Non illuminated	R 9			Round Ø9 mm
	RP 15			Round mushroom Ø15 mm
	RP 30			Round mushroom Ø30 mm
	RP 45			Round mushroom Ø45 mm

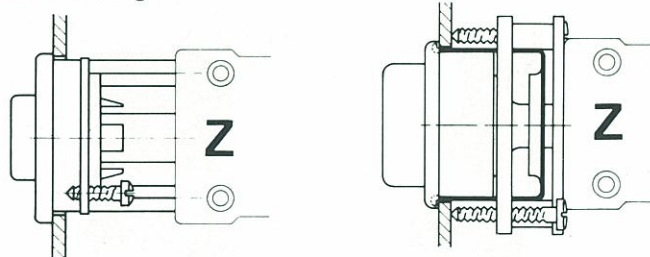
Types of fixing

Screw fixing F



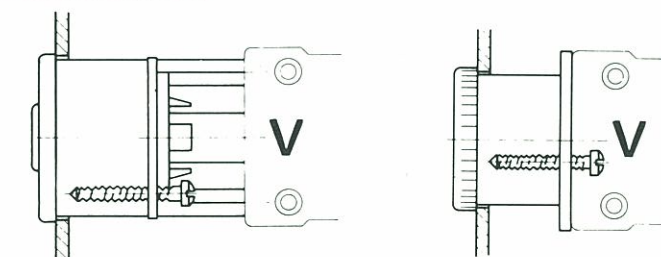
The screw heads may be covered with an anodized 1 mm aluminium plate.

Central fixing Z



With ring nut

Flush mounted V



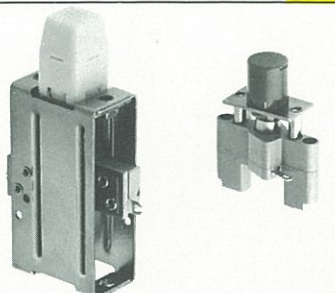
With square bezel

With round bezel

Choice of Types

Indicator lamps

L

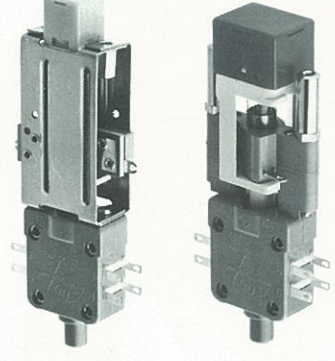


Illuminated push buttons

LDT

Illuminated push button switches

LDS

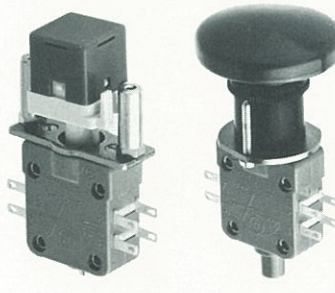


Push buttons

DT

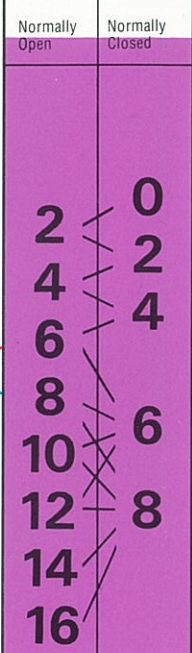
Push button switches

DS



Illuminated Push button switches
4 normally open contacts
2 normally closed contacts
With electromagnetic hold-in and mechanical release
Coil voltage 48
Square 24 x 24 lens
With lens
Lens in translucent Macrolon
Mounting plate fixing
Ba9s lamp socket
Bulb voltage 24

Standardised contact arrangement



Switches with impulse and holding contact for contactors.

J



Push button switches with electromagnetic hold-in

M

With electromagnetic hold-in and mechanical release

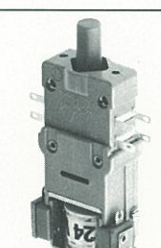
MH

With mechanical hold-in and electromagnetic release

E

With electromagnetic and mechanical release

EH




Voltage of hold-in solenoid

6 12 24 36 48 60 Volts DC

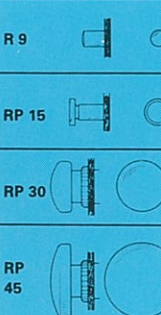
Lens shapes

R 15 C 15 Q 15 W 15 W 20 U 25 U 20 W 24 R 22 R28



Button shapes

R 9 RP 15 RP 30 RP 45



Button colours

transparent Macrolon

k

translucent Macrolon (opal)

o

r

v

w

g

b

s

Button materials

transparent Macrolon

k

translucent Macrolon (opal)

o

F	Z		V	VA	ZG	VG
F	Z		V			
F	Z		V	VA		
F	Z		V			
F	Z		V			
F		Z	V			
F		Z	V			
F		Z	V			
						VG
			V			

Fixing

2 screws M 2.6	Central with ring nut	Central with square bezel	Central with square bezel	Flush with round bezel	Central with square bezel	Flush with cover	Central with rubber seal	Flush with rubber seal	Flush with rubber seal and cover
F	Z	Z	Z	V	V	VA	ZG	VG	VG A

F	Z ^{x)}								
F	Z ^{x)}			V		VA	ZG	VG	VG A
		Z					ZG		
		Z					ZG		

^{x)}Indicate panel thickness

Lamp-socket

PTT T 6,8 or Ba 9s

PTT 2 x T 5,5 or Ba 9s

Filament Lamp Voltages	Neon Lamp Voltages
6 12 24 36 48 60 Volts	110 220 Volts AC for Ba9s and transparent lenses only

For panel cut-outs see pages 16-30 and 36-38

Build up code from left to right selecting only one variant from each of the coloured tables. After each coloured table select only one guide-line to the right.

Designation of complete type:

Example: **LDS** **42** **MH** **48** **W 24** **w** **o** **F** **Ba 9s** **24**

Push buttons and push button switches with or without illumination

Offer a wide variety of new combinations for assembly in groups on the modular principle with various mechanical and electro-mechanical interlocking, locking and release systems.

The contact block comprises a precision switching element of miniature dimensions suitable for tropical operation. Its robust construction ensures complete reliability, particularly in applications where competitive switches have failed.

The contact springs are made in beryllium bronze, hardened and silver plated. The contacts are of fine silver. Both springs and contacts can be gold-plated to a thickness of 5µ. The self-cleaning, sliding-type contacts are particularly suitable for industrial applications with dusty or corrosive atmospheres.

The switching elements are available in two versions, with the following contact arrangements:

All switching elements are available in two basic versions:

Push button **type DT**
Push button Switch **type DS**

On push buttons **type DT**
contact is only maintained as long as pressure is applied.

On push button switches **type DS**
with mechanical hold-in contacts are maintained after pressure is released.

A second pressure re-sets the switch to its normal position.

By mounting several switch elements together the numbers of contacts can be increased as shown below.

2 × type 22 becomes: **Type 44**
4 normally open / 4 normally closed

Type 42 + Type 22 becomes: **Type 64**
6 normally open / 4 normally closed

3 × type 22 becomes: **Type 66**
6 normally open / 6 normally closed

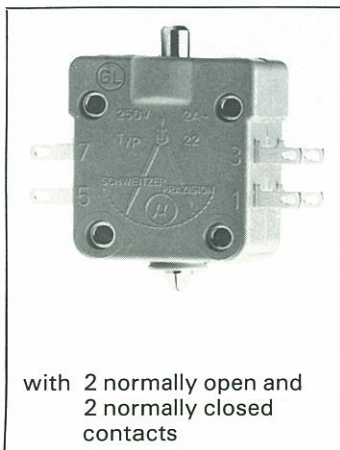
2 × type 42 becomes: **Type 84**
8 normally open / 4 normally closed

Type 42 + 2 × type 22 becomes: **Type 86**
8 normally open / 6 normally closed

4 × type 22 becomes: **Type 88**
8 normally open / 8 normally closed

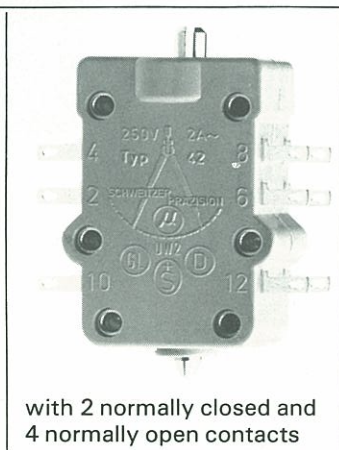
2 × type 42 + type 22 becomes: **Type 106**
10 normally open / 6 normally closed
Etc.

Type 22



with 2 normally open and
2 normally closed
contacts

Type 42



with 2 normally closed and
4 normally open contacts

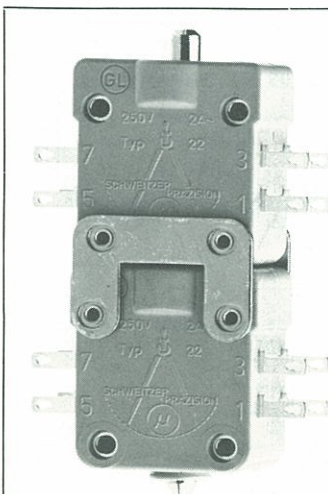
Technical details

Contact pressure: c. 150 g
Contact resistance: < 10 mΩ
Insulation resistance
between contacts: > 10⁴ MΩ
Contact rating: 2 A at 250 V AC
Test voltage: 2000 V for 1 minute

Switch element in tough
plastic (melamin resin)
Protection Type IP 67 possible

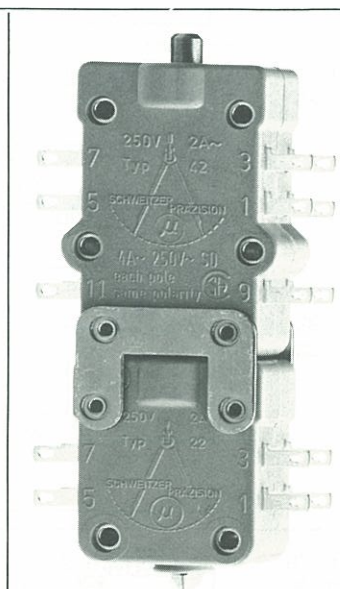


Type 44



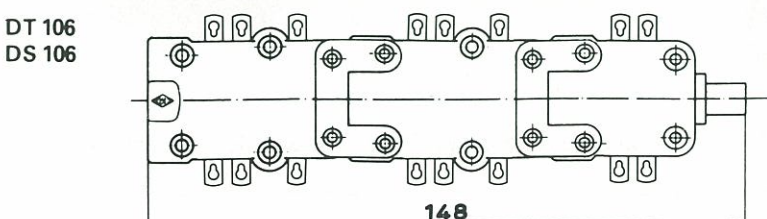
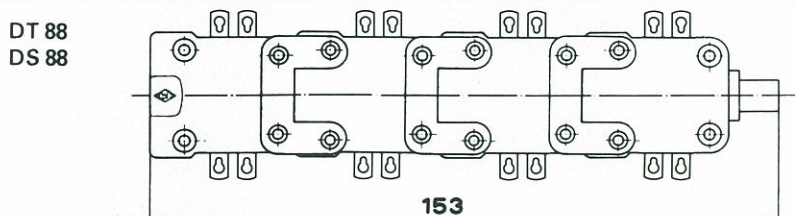
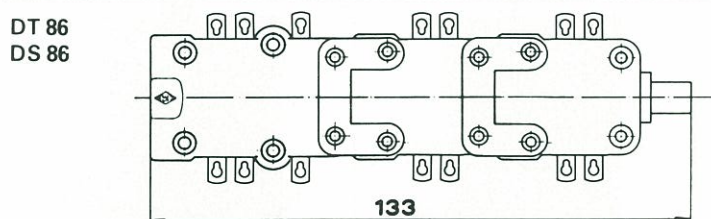
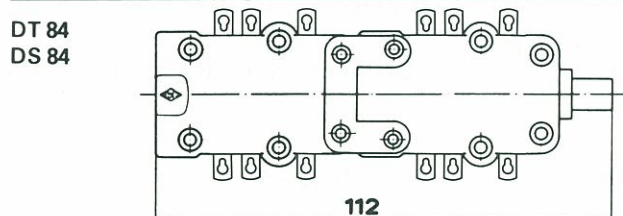
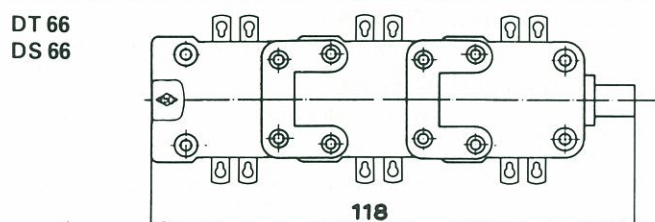
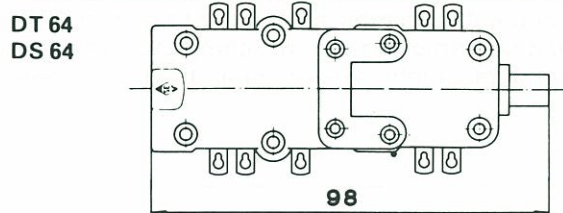
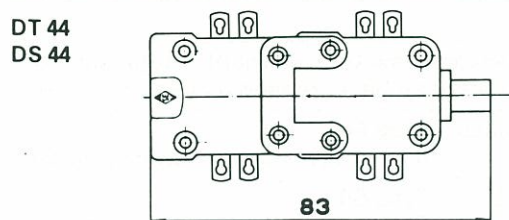
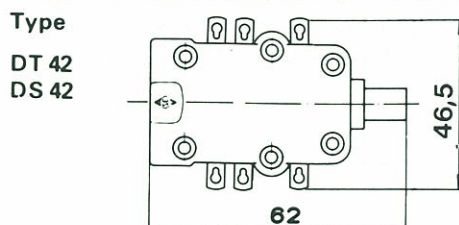
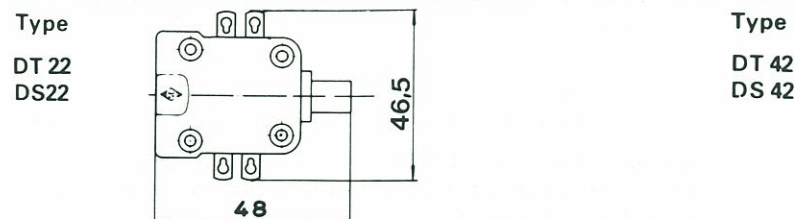
Available only assembled

Type 64



Available only assembled

Series Mounting (Standard) Parallel Mounting

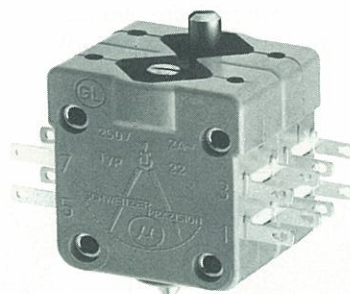


Parallel mounting.

Available to special order
Reference-No. = N

When space behind the panel is limited, the switching elements can also be assembled parallel in blocks operated by a single push button.

Fig. = Type DT 44 N 15 / Spacing 15 mm



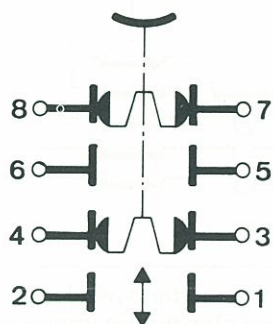
Push button switches and push buttons

Provide new approaches in modern control switching techniques.

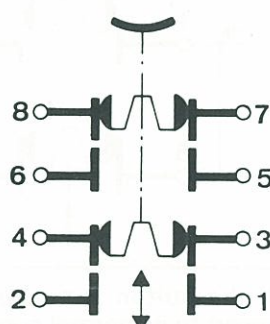
For special applications the switching elements can be provided with make before break contacts, or break before make contacts.

Combined switching elements, in which contacts 1-2 / 3-4 provide make before break switching, whilst the other contacts 5-6 / 7-8 provide break before make switching.

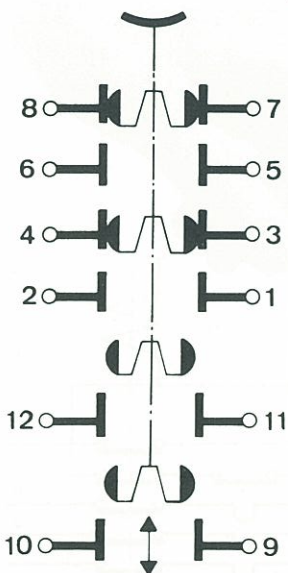
Type 22 break before make switching



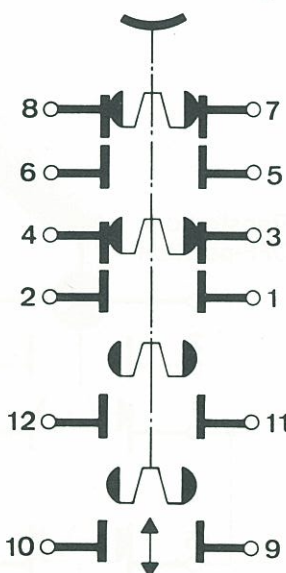
Type 22 make before break switching



Type 42 break before make switching



Type 42 make before break switching

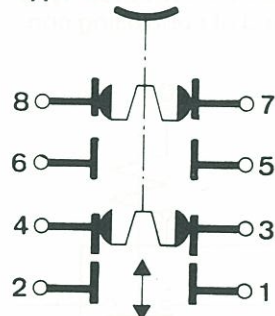


All types of switching element can also be supplied with special contact arrangements to provide, for example: contact 1-2 closes before contact 5-6.

Switching elements can also be provided with one set of contacts giving make before break switching and the other giving break before make switching.

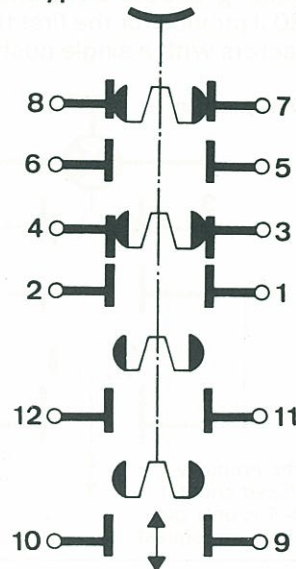
Other special contact arrangements as described in next column can be supplied to customers' specification.

Type 22

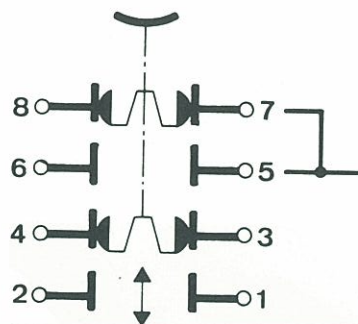


Contacts 1-2 / 3-4
make before break switching
Contacts 5-6 / 7-8
break before make switching

Type 42



To obtain a change over contact connect 1(2) NOC with 1(2) NCC with external wiring



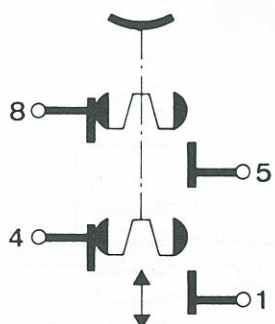
Type 22

change-over

normally closed

normally open

Switching elements can also be supplied with fleeting contacts which close briefly during the operation of the push button, but which provide no continuity when the push button is fully out or fully in.



Type 22

One normally closed contact combined with one normally open contact provides one fleeting contact.

All switching elements are available in two versions:

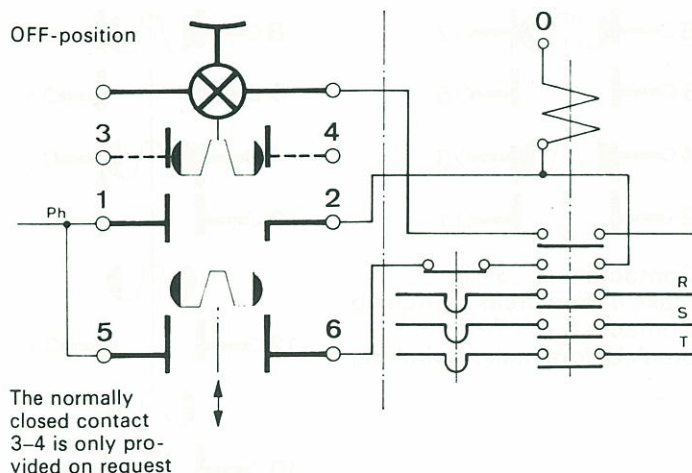
Push button

Push button switch

Type DT
Type DS

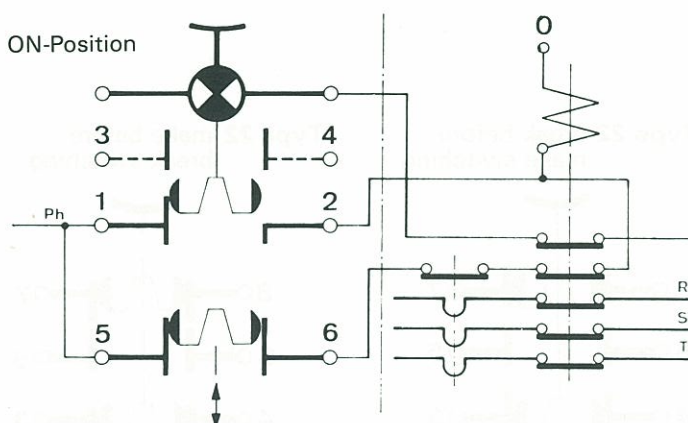
Push button switches with impulse and hold-in contacts type 20 J for contactor operation

Are particularly suitable for mimic diagrams. Generally, contactors are operated by 2 push buttons, 1 giving the "on" pulse and the second "off" button breaking the holding circuit. *Schweitzer* push button switches Type 20 J provide for the first time a method of controlling contactors with a single push button.

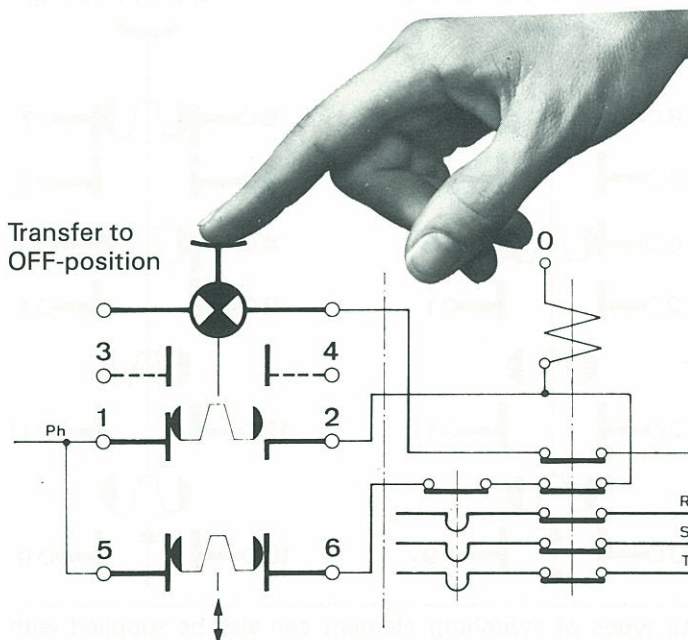
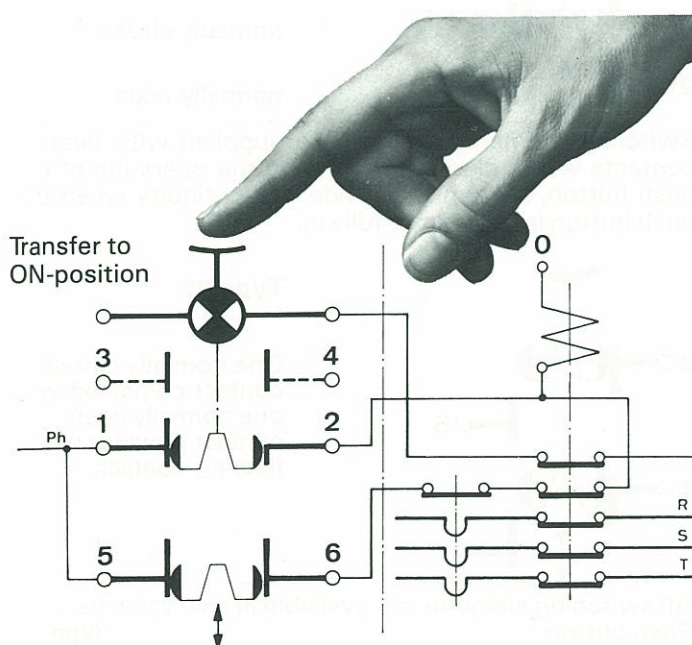


When the button is pushed, 2 normally open contacts are closed, the fleeting contact 1-2 pulls in the contactor which holds in over its own auxiliary contact and over the normally open contact 5-6 which remains closed.

The ingenious mechanical hold-in of the push button switch allows the impuls contact 1-2 to open when pressure is released, whilst the holding contact 5-6 remains closed. If the current is interrupted, the contactor drops out and remains out if the current is re-applied. In this way, this push button switch fulfills the requirements for no-current release.



If the button is pushed a second time, the switch will revert to its normal condition without closing the impulse contact again, opening contact 5-6 which interrupts the contactor circuit.



As with all other switching elements, this switch can be fitted with an illumination unit. The built-in signal lamps signals the current condition of the contactor being controlled.

Thus in a single illuminated push button switch 2 control and 1 signal elements are combined: 1 ON button, 1 OFF button, 1 signal lamp.

Push Button Switches with electromagnetic hold-in or with electromagnetic reset.

Provide *automatic drop-out*. They are engaged manually by pushing the button and can be dropped out by the remote action either of a limit switch or of another push button.

Each type has its own specific function and can be supplied with the contact arrangements previously described, up to a maximum of 6 normally open and 6 normally closed contacts.

All types of push button with the various fixing arrangements, described in the subsequent pages, can be provided with the automatic drop-out feature.

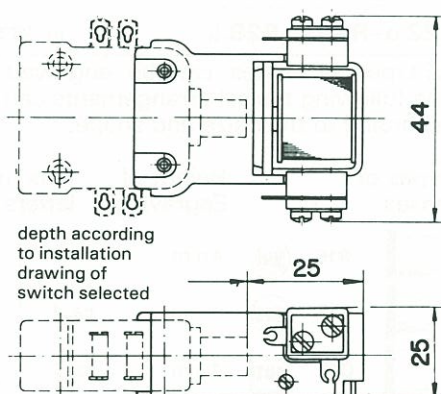
Currently, *Schweitzer* push buttons are available in 4 different basic versions.

Push button switches with electromagnetic hold-in

Types DS . . M . . and LDS . . M . .

After depressing the push button, these switches are retained in the contact position by a DC solenoid. Interruption of the holding current allows the switch to return automatically to its rest position.

Types
DS . . M . .
LDS . . M . .



Push button switches with electro-magnetic hold-in and manual release

Types DS . . MH . . and LDS . . MH . .

Operation of this switch is similar to that described above. However, it is possible to release it by pushing the button a second time even if the hold-in circuit is not interrupted.

Coil voltages for types

DS . . M . . and LDS . . M . .
DS . . MH . . and LDS . . MH . .
6, 12, 24, 36, 48 or 60 volts D.C.

Consumption approximately 1.3 Watts.

For operation on AC the solenoids are provided with rectifiers.
(Please specify carefully when ordering)

Push button Switches with mechanical hold-in and electro-magnetic release

Types DS . . E . . and LDS . . E . .

This switch is mechanically locked in the contact position when the button is depressed.

Release is achieved by a simple electrical pulse to the release solenoid.

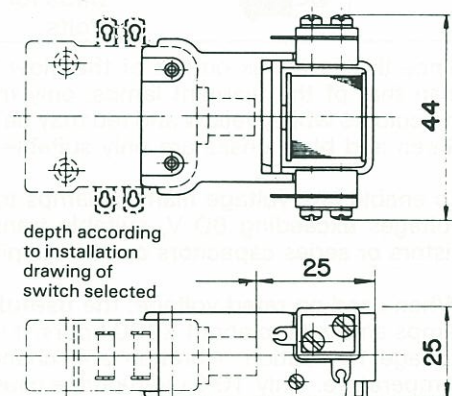
To ensure that the coil is only energised briefly, it is connected via a normally open contact on the push button switch.

Push button switches with mechanical hold-in and with electro-magnetic and mechanical release

Types DS . . EH and LDS . . EH

The operation of this switch is similar to the previous type: not only can it be released by an electrical impulse, but also by depressing the push button a second time.

Types
DS . . MH . .
LDS . . MH . .
DS . . E . .
LDS . . E . .
DS . . EH . .
LDS . . EH . .



Coil voltages for types

DS . . E . . and LDS . . E . .
DS . . EH . . and LDS . . EH . .

6, 12, 24, 36, 48 and 60 volts D.C.
6, 12, 24, 36, 48, 60, 110 and 220 volts A.C.

Consumption of solenoid: approximately 10 watts.

(unless specified to the contrary when ordering, switch types DS . . E . . / LDS . . E . . / DS . . EH . . and LDS . . EH . . will be supplied with AC coils).

Illumination units for: **Indicator lamps** **Illuminated push-buttons** **Illuminated push button switches**

Types L
LDT
LDS

The SCHWEITZER range of control and signalling elements places a wide choice of indicator lamps at the disposal of designers of modern control systems and switching installations. The large variety of lens shapes and colours, as well as the different methods of fixing, makes them ideal for use in mimic diagrams.

The majority of our push buttons and switches can be converted by fitting such illumination units.

Type PTT T6.8



Test voltage:
 1000 Volts 50 Hz 1 min. for
 PTT T 6.8 plug-in lamps 6,
 12, 24, 36, 48 and 60 Volts
 Approx. 1.4 to 2.1 Watts

Type PTT T5.5



Test voltage:
 1000 V, 50 Hz, 1 min. for
 PTT plug-in lamps T5.5; for
 6, 12, 24, 36, 48, 60 V,
 Approx. 0.5 to 1.2 W

Type Ba9s



Test Voltage:
 2000 Volts 50 Hz 1 min. for
 small filament lamps Ba9s 6,
 12, 24, 36, 48 and 60 Volts.
 Approx. 2 or max. 2.4 Watts



Or neon discharge lamps
 Ba9s for 110, 220 and 380
 Volts

Since the luminous output of the glow lamps is much less than that of the filament lamps, only transparent lenses in the colours white, yellow and red may be used for the former. Green and blue lenses are only suitable for filament lamps.

To enable low-voltage filament lamps to be used on supply voltages exceeding 60 V, suitable transformers, series resistors or series capacitors can be supplied (see page A 10).

When used on rated voltage, the **useful life** of the filament lamps amounts to about 2000 hours. It is affected mainly by voltage fluctuation, vibration and changes in the ambient temperature. Only 10% overvoltage causes it to diminish by one third, whereas it is prolonged ten-fold when the lamp is underrun by 20%. But at the same time the light output drops to half its nominal level. It is therefore advisable to use lamps of a higher rating and to underrun them with respect to voltage.

Vibration seriously affects the life of filament lamps. Lamps for high voltages are particularly sensitive in this respect, because they have a thinner filaments. We regard 24 V to be the ideal service voltage.

The ambient temperature can be kept down by ensuring that there is adequate air circulation. Series resistors should always be mounted outside the cubicle or panel. Our luminous attachments are so designed that the lamps are adequately cooled by an unobstructed flow of air.

Interchangeable LENSES for the push buttons can be provided in 5 colours



and in 2 types of material:

in macrolon opal, translucent
 clear, transparent

type...o...
type...k...

In general, opal lenses are used because their colours show up better when they are switched off. However for illuminated blue and green lenses we recommend only clear macrolon and lamps of at least 2 W.

With discharge lamps (neon), only transparent lenses can be used.

The standard types of lenses can be supplied in 5 colours:

R15.o - C15.o - Q15.o - W15.o } for PTT-Lamps T6.8
R15.k - C15.k - Q15.k - W15.k } and
 Ba9s-Lamps

U20.o - U25.o - W20.o - W24.o } for Ba9s-Lamps
U20.k - U25.k - W20.k - W24.k } and for two
 PTT-Lamps T5.5

R22.o - R28.o - R28.k for PTT lamps and Ba9s lamps

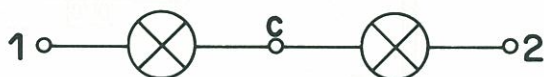
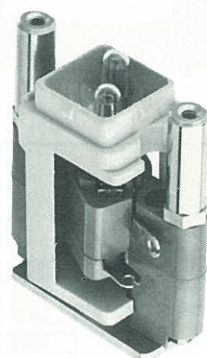
All types of lenses can be engraved or marked.
 The following typical arrangements can be offered,
 according to their size and shape:

Types of lenses	Height of Engraving	Max. number of letters per line
R15 EIN 4 mm ca. 3		
C15 HAND 4 mm ca. 4		
Q15 AUT 4 mm ca. 3		
W15 HORN AUS 4 mm ca. 4		
W20 A 4 mm ca. 7		
U20 8 4 mm ca. 7		
U25 EIN 4 mm ca. 8		
R22 P 4 mm ca. 7		
R28 ON 4 mm ca. 9		
W24 TURBINEN GRUPPE 4 mm ca. 8		

Variable according to the size of the letters

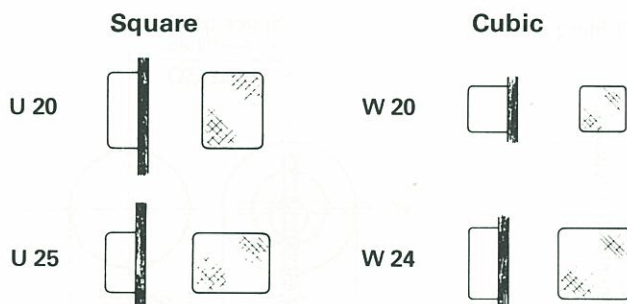
Attachments with 2 filament lamps for: Indicator lamps Illuminated push buttons Illuminated push button switches

Types L 2...
L 2DT...
L 2DS...



Lenses

These attachments can only be supplied with the following sizes of lens:



The twin-lamp attachments are used in two fundamentally different cases:

1. To increase the reliability, the two lamps may be run in parallel, so that if one lamp fails, the indication is still visible.
2. The lamps may be used for two different indications. In the former case it is general practice to employ single-colour lenses **without** a mask.

For the second application it is possible to use:

- a. single-colour lenses (usually white) which light up in two colours provided by lamps of different colour. In this case a mask is seldom used;
- b. two-colour lenses divided down the middle by a mask, each half being used for a different indication. These indications can be given simultaneously.

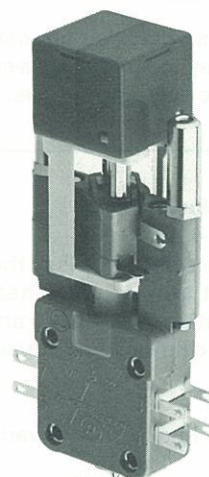
To illuminate white lenses, the following colours of filament lamp are obtainable:

white (w), yellow (g), red (r), green (v)

Two-coloured lenses may combine the following colours: Normal ex stock: red (r)/green (v) or

At extra charge: white (w), yellow (g), red (r), green (v), blue (b)

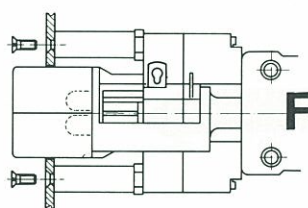
Twin-lamp attachments can **only be supplied with solder connections.**



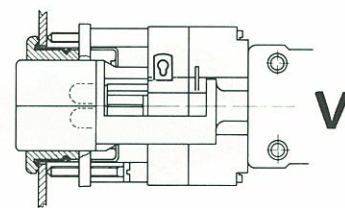
Fixing Methods

Twin-lamp attachments can be supplied with all listed methods of fixing, provided for this type of lens:

Screw fixing

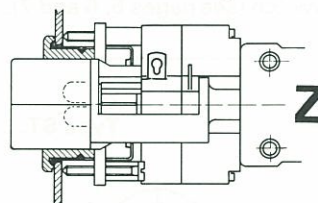


Flush mounting



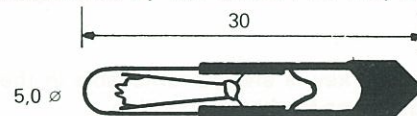
with square flange

Central hole fixing



Filament lamps

For illumination of these lenses only the plug-in lamps type T5.5 authorized by the Swiss PTT may be used.



The rating of such commercially obtainable lamps is between 0.25 and 1.2 W. To ensure that the entire lens is properly illuminated, two lamps of 1 W each should be used. For one half 1 W is sufficient. White lenses can be adequately illuminated by only one lamp rated 1 W.

Filament lamps with the following rated voltages are obtainable ex stock: 6, 12, 24, 36, 48 and 60 V.

Key Push Buttons Key Switches

Are reliable command units designed for the protection of control and switch installations against unauthorised operation. They consist of a cylindrical precision lock to the back of which the switching element is screwed.

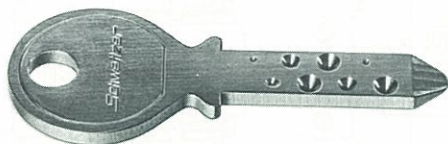
At assembly, the switch element can be turned to any position relative to the key position. However, it remains fixed after tightening the two securing screws.

Cylindrical Precision Lock

The «Schweitzer» safety lock is of the 8 plunger type, i.e. it offers 131,072 different locking combinations. It fulfills the highest requirements relative to reliability and combination possibilities which enables it to be included advantageously in a total locking plan.

A master-key can fit at best 140 various individual locks.

In its measurements the key corresponds to commercially available types, so that combinations with existing locking plans for premises, complexes and/or office furniture are possible.



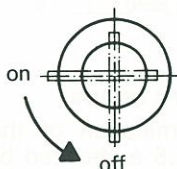
Switching Elements

The large selection of contact arrangements also offers numerous possibilities for the key switch (see pages 5, 6 and 7).

1. Key Push-Button for single pulse

Type ST...

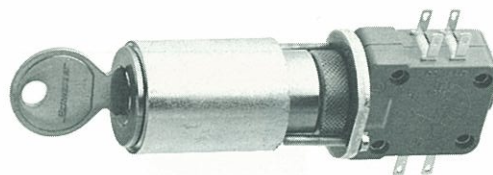
The key is returned under spring pressure to its rest position.



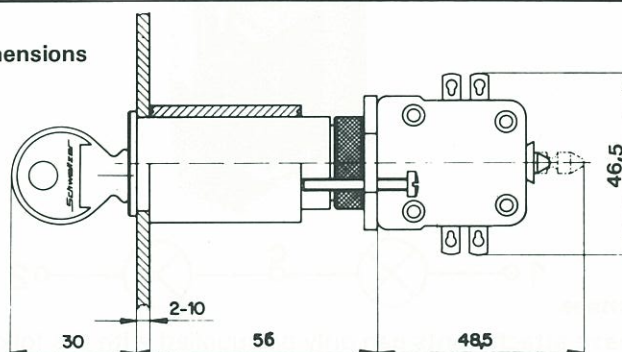
In this version the key is always removable in the rest (OFF) position. It requires no further description.

Please note that with this new design it is no longer necessary to press the key in, but only to turn it through 90°.

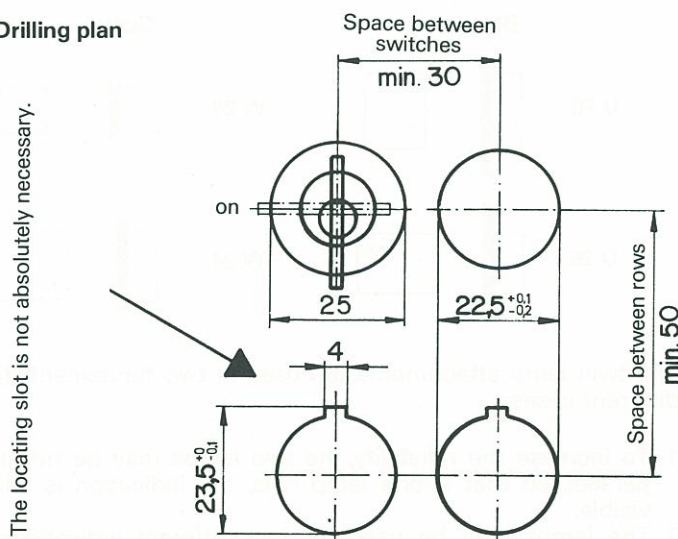
Type ST ... Type SS ...



Dimensions



Drilling plan



2. Key Switch

for permanent contacts with 2 detented positions.

The key latches in the ON and OFF positions and must be manually turned to the other position.

Type SS..x

Key removable in both positions.

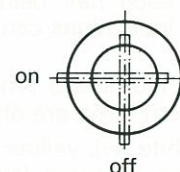
Type SS..y

Key not removable in ON position.

Type SS..z

Key not removable in OFF position.

Type SS...



3-position lock for: Key Switches Key Push Buttons

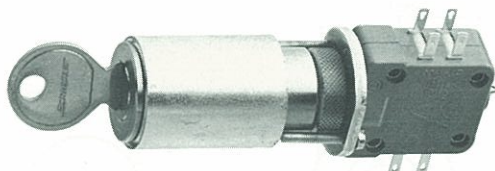
With the precision lock described on page 12, other switches with three definite positions at angles of 0, 45 and 90° can also be made by using other switching cams.

The interesting new feature of this lock is that the key can be made removable not only, as up to now, in the two extreme positions, but on request also in mid-position.

Consequently, in addition to the types SS and ST described overleaf, two further switches can be supplied:

3. with three latching positions (type S3S)

4. with two latching positions and one spring loaded position to the right (type SST).



Key removable

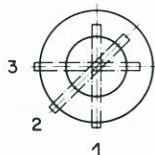


Key not removable

3. Key Switch with 3 latching positions (1-2-3)

Type S3S...

The switch latches in all three positions and must be turned manually from one position to another.



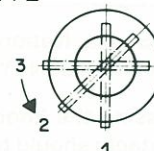
Position:	1	2	3
Type: S3S..x			
S3S..y			
S3S..z			
S3S..r			
S3S..s			
S3S..t			
S3S..u			

Type S3S ... Type SST ... Type S2T ...

4. Key Switch

with 2 latching positions (1+2) and one spring loaded position (3)

The switch latches in the positions 1+2 and returns by spring pressure to position 2 from position 3. (S2T=one latching and two impulse positions)



Position:	1	2	3
Type: SST ..y			
SST ..s			
SST ..t			
S2T ..s			

Contact Arrangement

All locks with three positions can be equipped with maximum two switching elements 22 or 42 (See pages 5, 6 and 7). The three most common contact arrangements of a switching element 22 are shown in the schemes a, b or c below:

	Position 1	Position 2	Position 3
Scheme a			
Scheme b			
Scheme c			

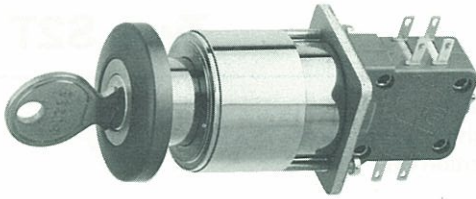
Dimensions

Drilling plan

page 12

EMERGENCY STOP Switches

Typen NA und NAF



The SUVA (Swiss National Accident Insurance Company), requires of an EMERGENCY STOP Switch:

1. When pressing the knob, the circuit will always be broken even if contacts should be welded together (T-bar action).
2. Reset of switch by key release can be done by authorized personnel only.

These conditions are fulfilled entirely by the «SCHWEITZER» EMERGENCY STOP Switch. As the following description shows, it also offers numerous further advantages such as:

The Mushroom knob is entirely aluminium and therefore absolutely shock proof. It is generally supplied in an anodised red finish, but is available in any other colour to order.

The «SCHWEITZER» precision lock is built into the mushroom knob. It is an 8 element lock offering 131,072 different locking combinations. It fulfills the highest requirements regarding reliability and locking combinations.

In its measurements the key corresponds to any widely used type, so that it can easily be included in a total locking plan.

A master-key can fit at best 140 different individual locks.

The switching element is easily removable and is normally equipped with 2 NOC and 2 NCC (Element type 22). As described in the catalogue sheets 5, 6 and 7, a large choice of other contact arrangements is however available. To comply with the regulations, the main circuit must always be connected over a normally closed contact. (3/4 or 7/8).

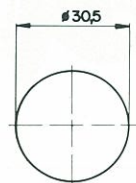
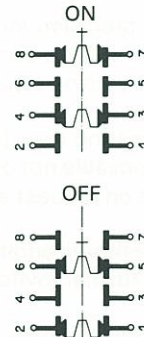
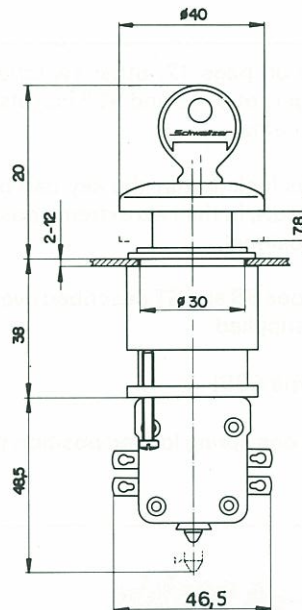
EMERGENCY STOP Switch with interlocked position Type NAF..

Due to the function of the switch, the main circuit (7/8) remains open in the depressed condition, i.e. the contact must open before the button latches. The power circuit can therefore be intentionally broken by depressing the mushroom knob only as far as is necessary to open the contacts, but without the lock latching. As opposed to normal types, the knob will not return to its rest position when released, but rather to an unapparent latch position. It can only be returned to the rest position with the key, but can be fully depressed at any time; is therefore fully operational. The position where the main circuit was broken is readily detectable by the position of the knob or from the marker circuit (1/4).

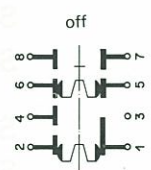
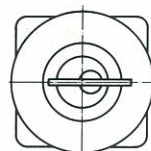
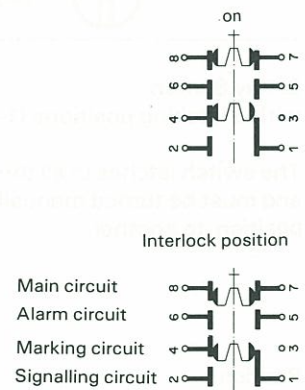
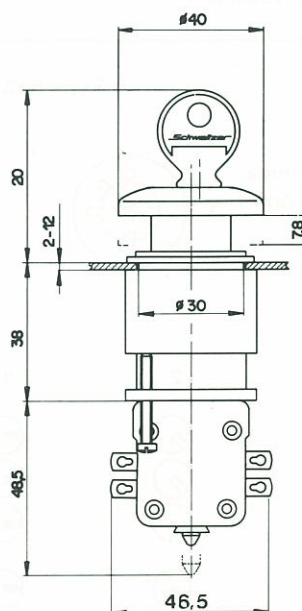
In the OFF position both alarm and reporting contacts (5/6 and 1/2) are available for signalling.

EMERGENCY STOP Switch

TYPE NA ..RP40



EMERGENCY Switch with Interlock Position Type NAF ..RP40



Banner Switches Alternate Action Impulse Action Combined Action

Are reliable switching units designed particularly for incorporation in the lines found on mimic diagrams. Due to the large choice of contact arrangements and methods of operation offered, they are extremely versatile in application.

As described in catalogue sheets 5, 6 and 7, a wide variety of contact arrangements is available. On assembly, the switching element can be set in any position relative to the banner, allowing minimum pitching between switches either vertically or horizontally; when the fixing screws are tightened, the switching element is locked relative to the banner.

On the three visible sides, the nickel plated banner has a recess which can be coloured or fitted with a coloured adhesive tape.

Banner Switch

with 2 detent positions, 0° and 90°.

The switch can be turned manually to either position where it latches.

TYPE BS..



Contact arrangements according to catalogue page 7, i.e.:

- Normally closed contacts with early, normal or late opening.
- Normally open contacts with early, normal or late closing.
- Make-before-break or break-before-make changeover contacts.
- Transient contacts operating in mid position.

Banner Switch

with 3 detent positions at 0°, 45° and 90°

The switch can be manually set in one of the three positions in each of which it latches.

TYPE B3S..



Contact arrangement according to the following block diagram:

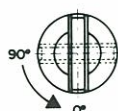
	Position 0°	Position 45°	Position 90°
Scheme a			
Scheme b			
Scheme c			

Rotary Push-Button

for pulse at 90° and spring return to position 0°

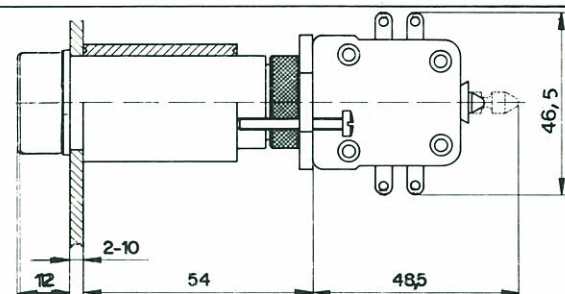
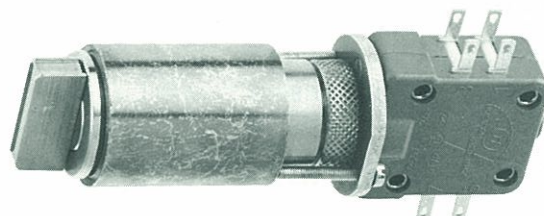
The knob is manually turned from the rest position 0° to the pulse position 90° and springs back when released.

TYPE BT..

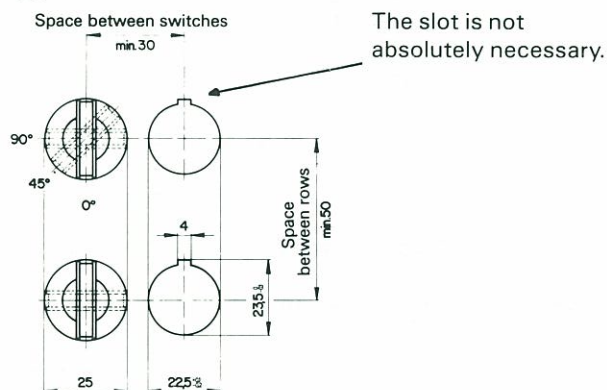


Contact arrangement as banner switch BS and page 7.

Type BS .. und B3S .. Type BT .. und B2T .. Type BST ..



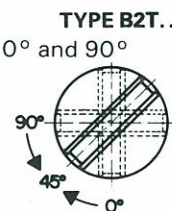
Drilling-plan



Rotary Push-Button

with rest position at 45° and pulse positions at 0° and 90°

The knob is manually turned to pulse positions at 0° and 90° and springs back to the rest position 45°

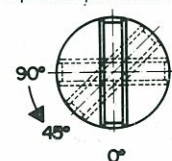


Contact arrangement as per scheme b or c in the margin or according to catalogue page 7.

Push-Button Banner Switch

with two latch positions at 0° and 45° and an impulse position at 90°.

The switch can be turned manually to one of the three positions. At 90° it springs back when released to the rest position 45°



Contact arrangement as per to scheme a, b or c, or catalogue page 7.

Push buttons and Push button switches

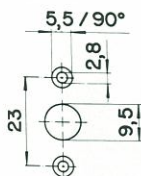
Type DT / Type DS

with non-illuminated buttons

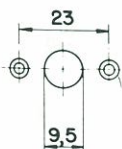
Depth behind the panel with switch element 42 instead of 22: add 14mm
Depth behind the panel for each additional element 22: add 35 mm
Depth behind the panel for each additional element 42: add 50 mm

Drilling plan

Type



DT 22 R9..F
DS 22 R9..F
DS 20 J R9..F



DT 22 RP15..F
DS 22 RP15..F
DS 20 J RP15..F



DT 22 R9..Z
DS 22 R9..Z
DS 20 J R9..Z



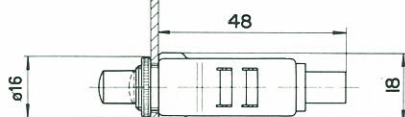
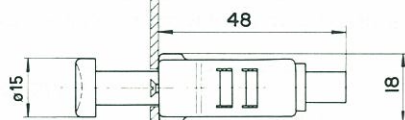
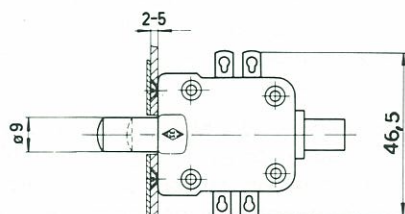
DT 22 RP15..Z
DS 22 RP15..Z
DS 20 J RP15..Z



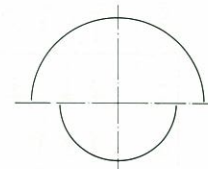
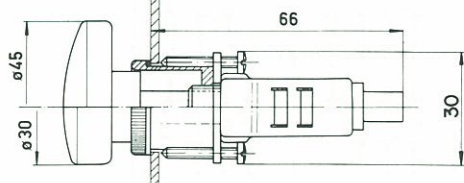
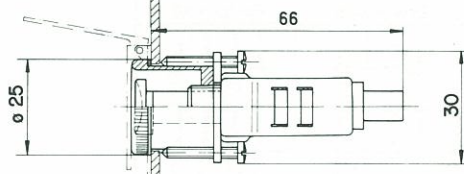
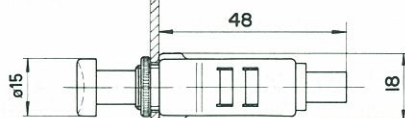
DT 22 RP15..V	DT 22 RP15..VA
DS 22 RP15..V	DS 22 RP15..VA
DS 20 J RP15..V	DS 20 J RP15..VA



DT 22 RP45..Z	DT 22 RP30..Z
DS 22 RP45..Z	DS 22 RP30..Z
DS 20 J RP45..Z	DS 20 J RP30..Z



Please specify thickness of panel with order



Push buttons and Push button switches

Type DT/Type DS

with 15 mm push button

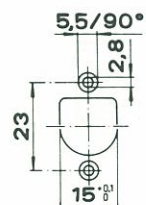
Depth behind the panel with switch element 42 instead of 22: add 14 mm

Depth behind the panel for each additional element 22: add 35 mm

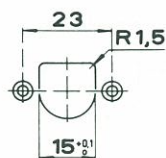
Depth behind the panel for each additional element 42: add 50 mm

Drilling plan

Type



DT 22	Q15..F	DT 22	R15..F
DS 22	Q15..F	DS 22	R15..F
DS 20 J	Q15..F	DS 20 J	R15..F



DT 22	W15..F	DT 22	C15..F
DS 22	W15..F	DS 22	C15..F
DS 20 J	W15..F	DS 20 J	C15..F



DT 22	Q15..Z	DT 22	R15..Z
DS 22	Q15..Z	DS 22	R15..Z
DS 20 J	Q15..Z	DS 20 J	R15..Z



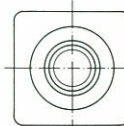
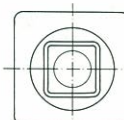
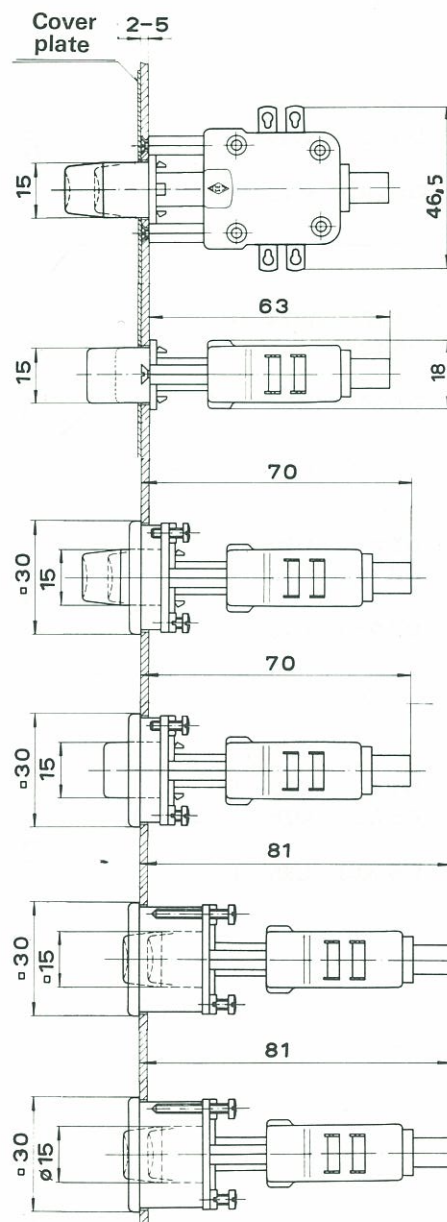
DT 22	W15..Z	DT 22	C15..Z
DS 22	W15..Z	DS 22	C15..Z
DS 20 J	W15..Z	DS 20 J	C15..Z



DT 22	Q15..V
DS 22	Q15..V
DS 20 J	Q15..V



DT 22	R15..V
DS 22	R15..V
DS 20 J	R15..V



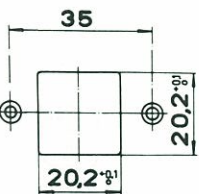
Push buttons and Push button switches

Type DT/Type DS

with large push buttons

Depth behind the panel with switch element 42 instead of 22: add 14mm
Depth behind the panel for each additional element 22: add 35mm
Depth behind the panel for each additional element 42: add 50mm

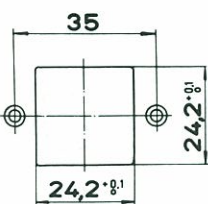
Drilling plan



Type

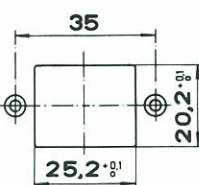
DT 22 W20 .. F
DS 22 W20 .. F

DS 20 J W20 .. F



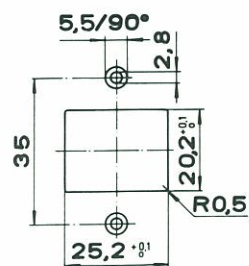
DT 22 W24 .. F
DS 22 W24 .. F

DS 20 J W24 .. F



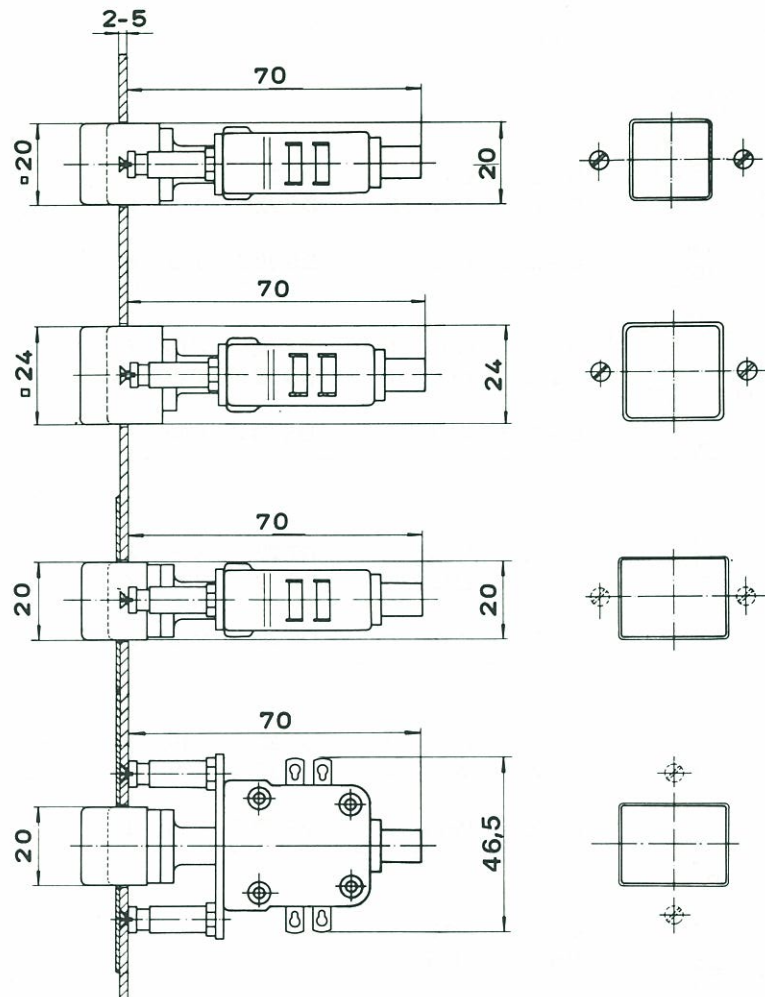
DT 22 U20 .. F
DS 22 U20 .. F

DS 20 J U20 .. F



DT 22 U25 .. F
DS 22 U25 .. F

DS 20 J U25 .. F



Push buttons and Push button switches

Type DT/Type DS

with large push buttons

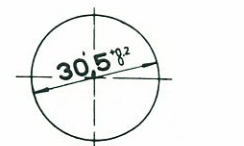
Depth behind the panel with switch element 42 instead of 22: add 14mm

Depth behind the panel for each additional element 22: add 35mm

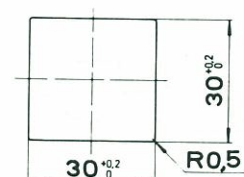
Depth behind the panel for each additional element 42: add 50mm

Drilling plan

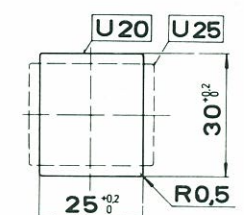
Type



DT 22 W20...Z
DS 22 W20...Z
DS 20 J W20...Z



DT 22 W24...Z
DS 22 W24...Z
DS 20 J W24...Z



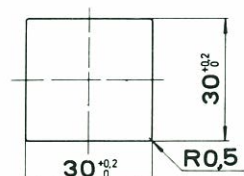
DT 22 U20...Z
DS 22 U20...Z
DS 20 J U20...Z
DT 22 U25...Z
DS 22 U25...Z
DS 20 J U25...Z



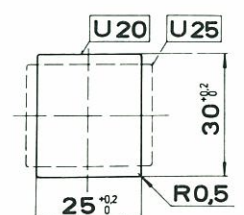
DT 22 W20...V
DS 22 W20...V
DS 20 J W20...V



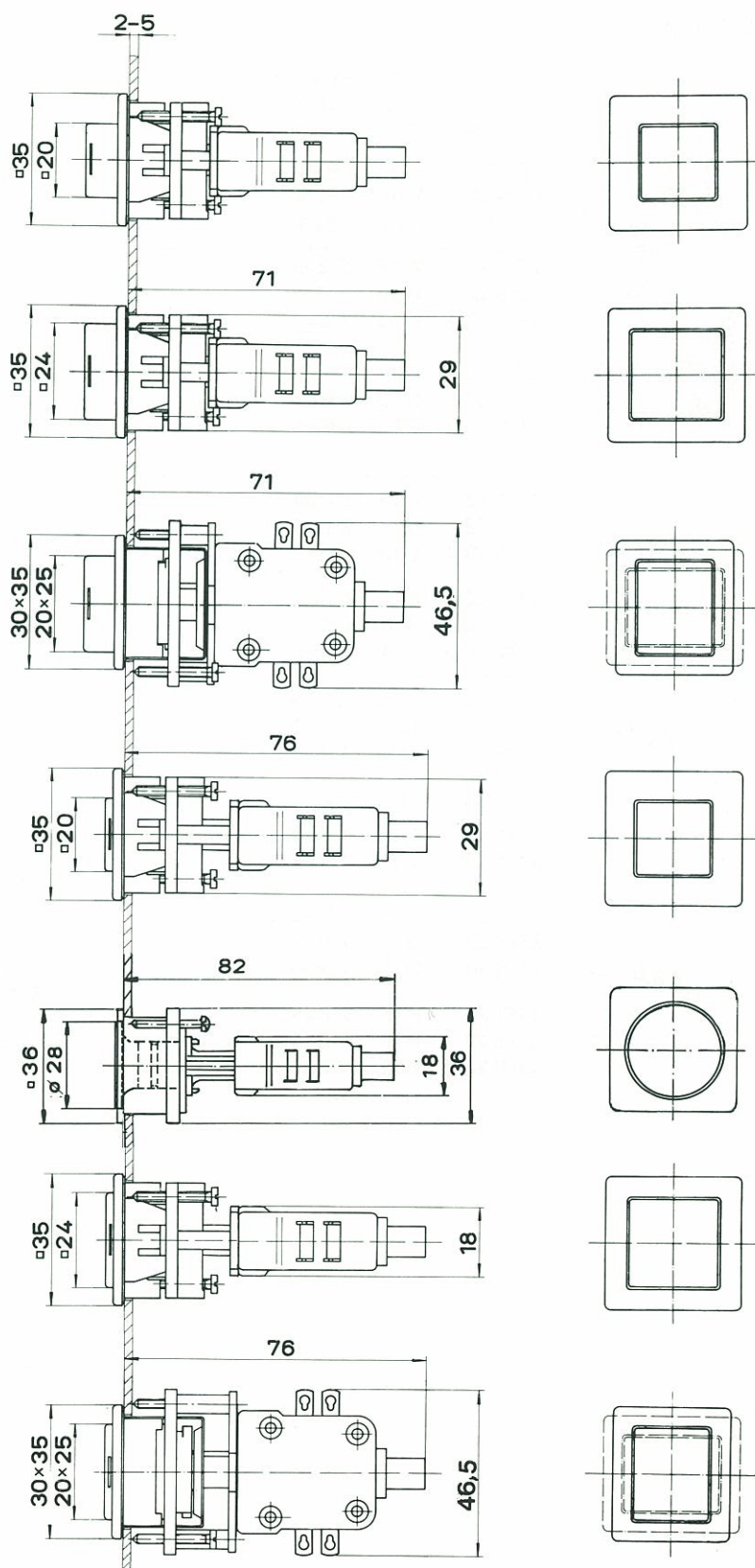
DT 22 R28...V
DS 22 R28...V
DS 20 J R28...V



DT 22 W24...V
DS 22 W24...V
DS 20 J W24...V



DT 22 U20...V
DS 22 U20...V
DS 20 J U20...V
DT 22 U25...V
DS 22 U25...V
DS 20 J U25...V



Depth behind the panel with switch element 42 instead of 22: add 14 mm
 Depth behind the panel for each additional element 22: add 35 mm
 Depth behind the panel for each additional element 42: add 50 mm

20 Subject to change without prior notice

Illuminated push buttons and Push button switches

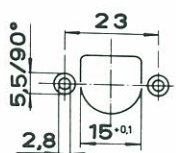
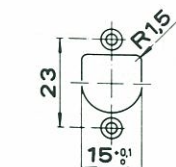
Type LDT / Type LDS

with 15 mm button and PTT lamp socket

Depth behind the panel with switch element 42 instead of 22: add 14 mm
Depth behind the panel for each additional element 22: add 35 mm
Depth behind the panel for each additional element 42: add 50 mm

Drilling plan

Type



LDT 22 Q15.. F PTT ..
LDS 22 Q15.. F PTT ..
LDS 20 J Q15.. F PTT ..

LDT 22 R15.. F PTT ..
LDS 22 R15.. F PTT ..
LDS 20 J R15.. F PTT ..

LDT 22 W15.. F PTT ..
LDS 22 W15.. F PTT ..
LDS 20 J W15.. F PTT ..

LDT 22 C15.. F PTT ..
LDS 22 C15.. F PTT ..
LDS 20 J C15.. F PTT ..

LDT 22 W15.. Z PTT ..
LDS 22 W15.. Z PTT ..
LDS 20 J W15.. Z PTT ..

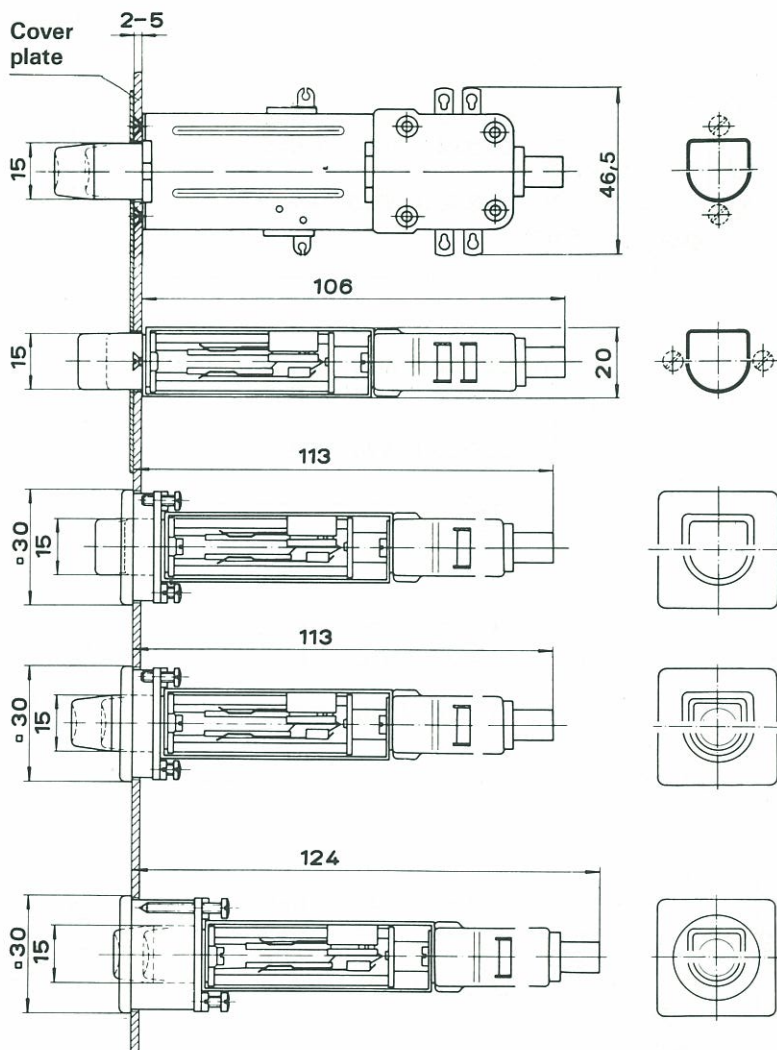
LDT 22 C15.. Z PTT ..
LDS 22 C15.. Z PTT ..
LDS 20 J C15.. Z PTT ..

LDT 22 Q15.. Z PTT ..
LDS 22 Q15.. Z PTT ..
LDS 20 J Q15.. Z PTT ..

LDT 22 R15.. Z PTT ..
LDS 22 R15.. Z PTT ..
LDS 20 J R15.. Z PTT ..

LDT 22 Q15.. V PTT ..
LDS 22 Q15.. V PTT ..
LDS 20 J Q15.. V PTT ..

LDT 22 R15.. V PTT ..
LDS 22 R15.. V PTT ..
LDS 20 J R15.. V PTT ..



Illuminated push buttons and Push button switches

Type LDT / Type LDS

with large button and socket for Ba9 lamp

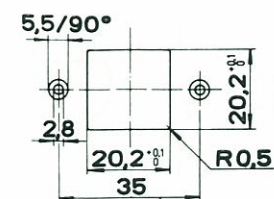
Depth behind the panel with switch element 42 instead of 22: add 14 mm

Depth behind the panel for each additional element 22: add 35 mm

Depth behind the panel for each additional element 42: add 50 mm

Drilling plan

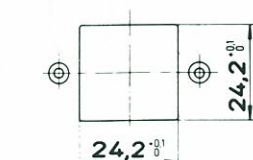
Type



LDT 22 W20 .. F Ba9 ..

LDS 22 W20 .. F Ba9 ..

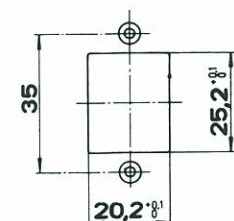
LDS 20 J W20 .. F Ba9 ..



LDT 22 W24 .. F Ba9 ..

LDS 22 W24 .. F Ba9 ..

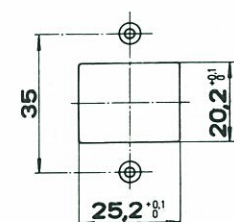
LDS 20 J W24 .. F Ba9 ..



LDT 22 U20 .. F Ba9 ..

LDS 22 U20 .. F Ba9 ..

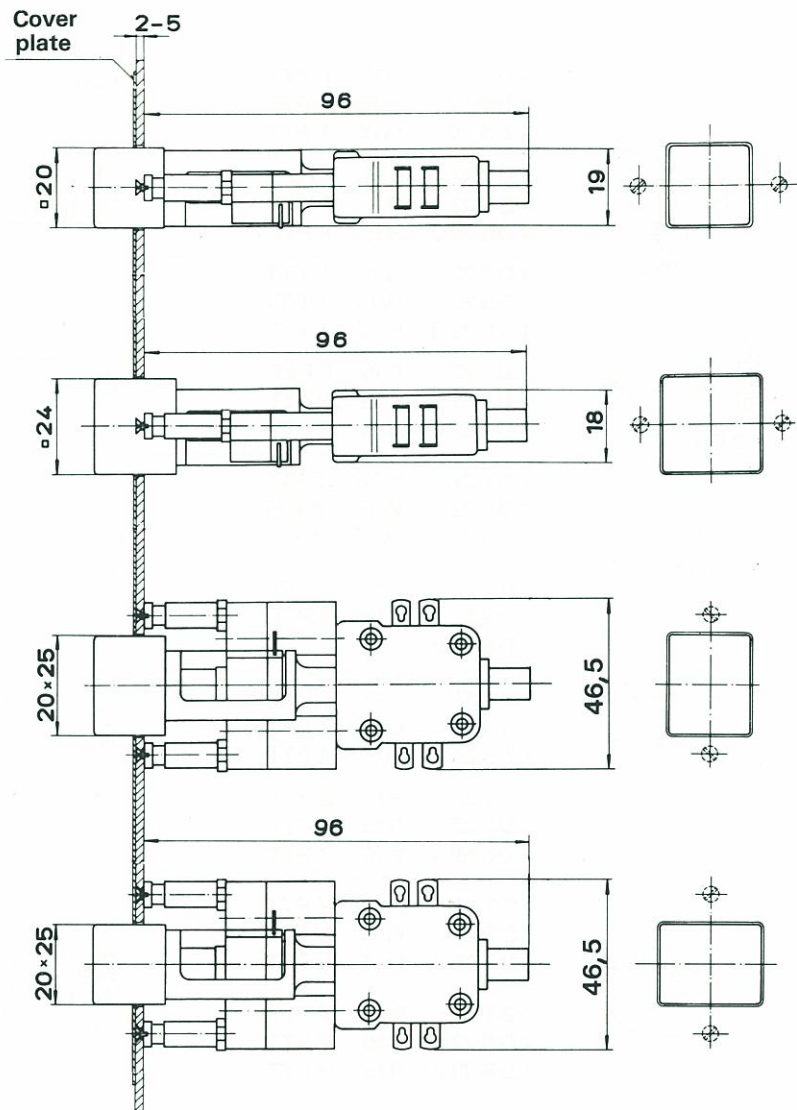
LDS 20 J U20 .. F Ba9 ..



LDT 22 U25 .. F Ba9 ..

LDS 22 U25 .. F Ba9 ..

LDS 22 J U25 .. F Ba9 ..



Illuminated push buttons and Push button switches

Type LDT / Type LDS

with large button and socket for Ba9 lamp

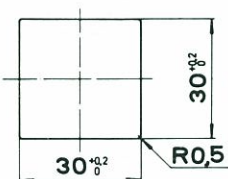
Depth behind the panel with switch element 42 instead of 22: add 14 mm
Depth behind the panel for each additional element 22: add 35 mm
Depth behind the panel for each additional element 42: add 50 mm

Drilling plan

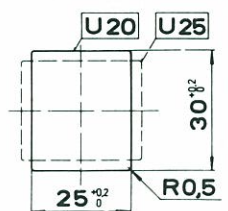
Type



LDT 22 W20 .. Z Ba9 ..
LDS 22 W20 .. Z Ba9 ..
LDS 20 J W20 .. Z Ba9 ..



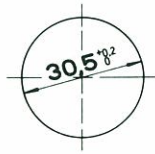
LDT 22 W24 .. Z Ba9 ..
LDS 22 W24 .. Z Ba9 ..
LDS 20 J W24 .. Z Ba9 ..



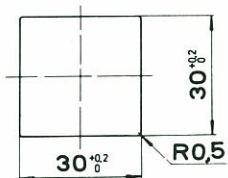
LDT 22 U20 .. Z Ba9 ..
LDS 22 U20 .. Z Ba9 ..
LDS 20 J U20 .. Z Ba9 ..
LDT 22 U25 .. Z Ba9 ..
LDS 22 U25 .. Z Ba9 ..
LDS 20 J U25 .. Z Ba9 ..



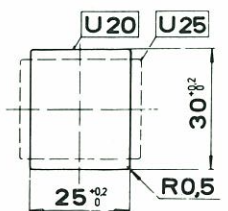
LDT 22 R28 .. V Ba9 ..
LDS 22 R28 .. V Ba9 ..
LDS 20 J R28 .. V Ba9 ..



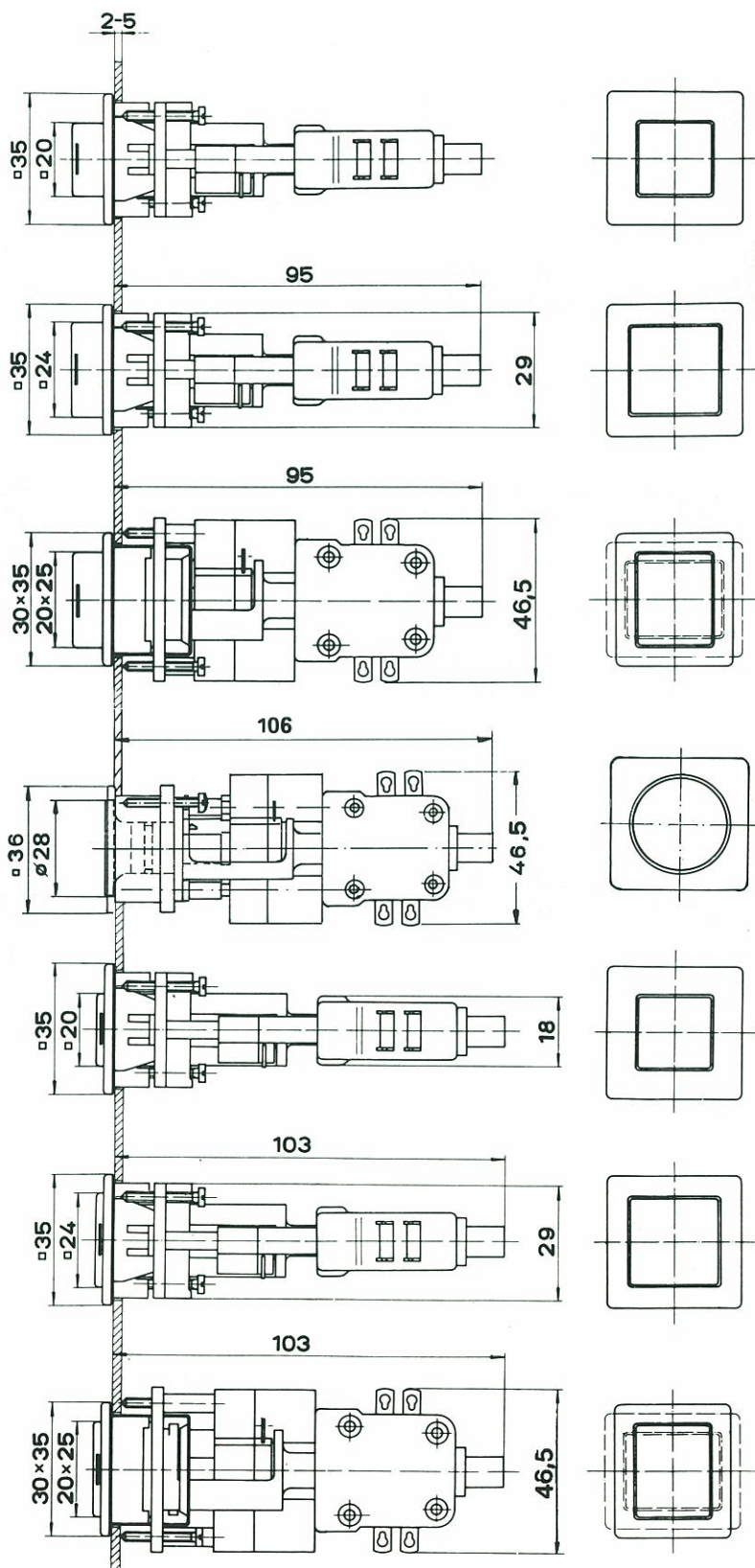
LDT 22 W20 .. V Ba9 ..
LDS 22 W20 .. V Ba9 ..
LDS 20 J W20 .. V Ba9 ..



LDT 22 W24 .. V Ba9 ..
LDS 22 W24 .. V Ba9 ..
LDS 20 J W24 .. V Ba9 ..



LDT 22 U20 .. V Ba9 ..
LDS 22 U20 .. V Ba9 ..
LDS 20 J U20 .. V Ba9 ..
LDT 22 U25 .. V Ba9 ..
LDS 22 U25 .. V Ba9 ..
LDS 20 J U25 .. V Ba9 ..

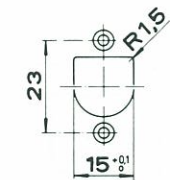


Indicator lamps

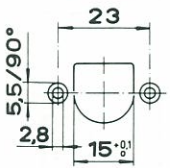
Type L with 15 mm lens and PTT lamp socket

Drilling plan

Type



L Q15 .. F PTT ..
L R15 .. F PTT ..



L W15 .. F PTT ..
L C15 .. F PTT ..



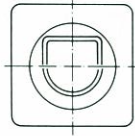
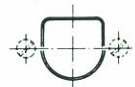
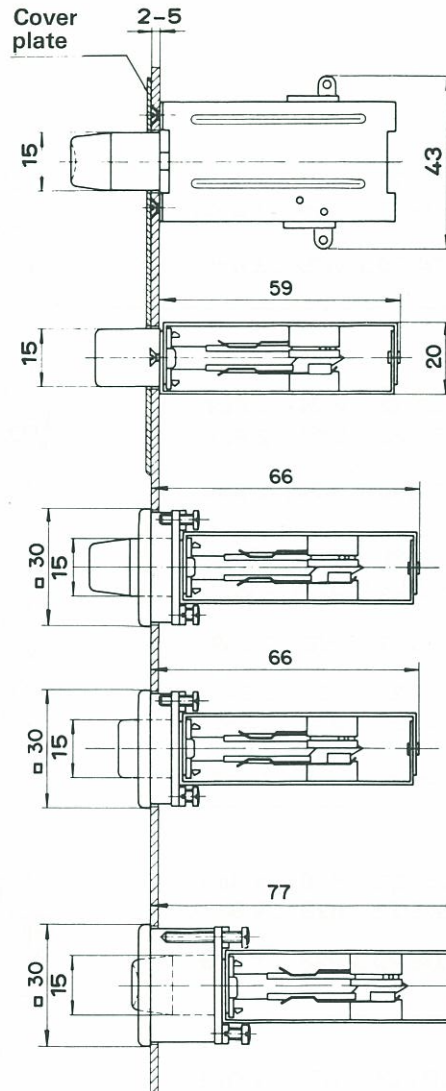
L Q15 .. Z PTT ..
L R15 .. Z PTT ..



L W15 .. Z PTT ..
L C15 .. Z PTT ..



L Q15 .. V PTT ..
L R15 .. V PTT ..



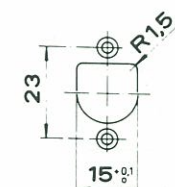
Indicator lamps

Type L

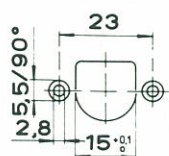
with 15 mm lens and
socket for Ba9 lamp

Drilling plan

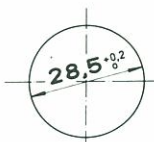
Type



L Q15.. F Ba9..
L R15.. F Ba9..



L W15.. F Ba9..
L C15.. F Ba9..



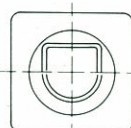
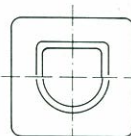
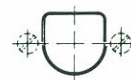
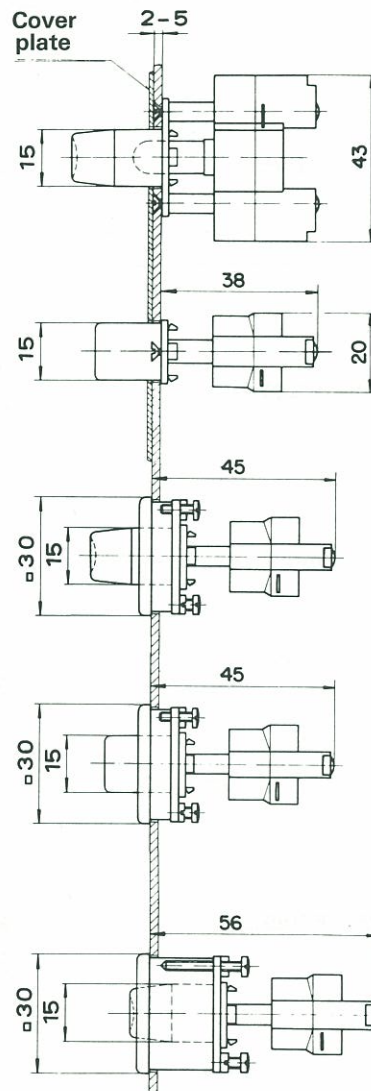
L Q15.. Z Ba9..
L R15.. Z Ba9..



L W15.. Z Ba9..
L C15.. Z Ba9..



L Q15.. V Ba9..
L R15.. V Ba9..



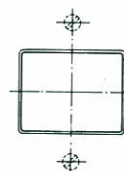
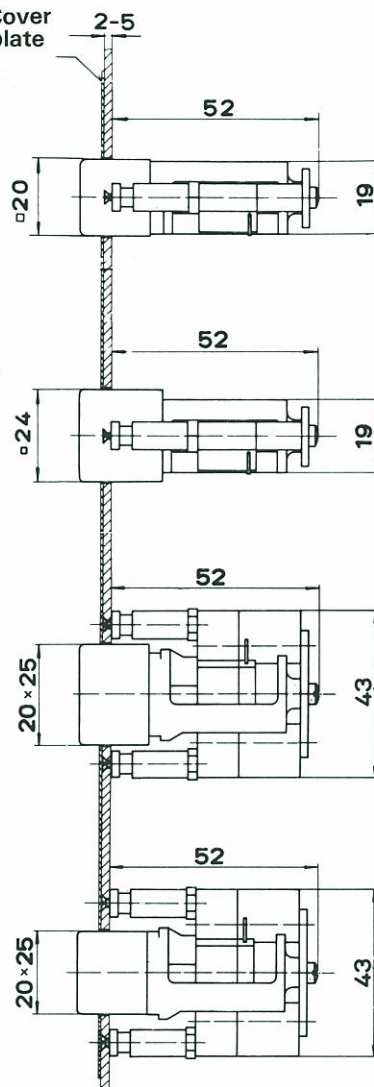
Type L

Drilling plan

Type



**Cover
plate**



Indicator lamps

Drilling plan



Type

L W20 . . Z Ba9 . .

L W24 . . Z Ba9 . .

L U20 . . Z Ba9 . .

L U25 . . Z Ba9 . .

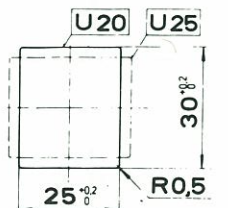
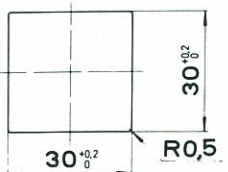
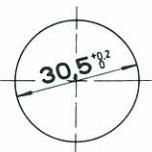
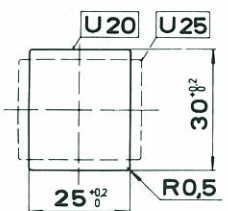
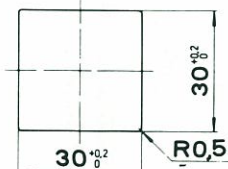
L W20 . . V Ba9 . .

L R28 . . V Ba9 . .

L W24 . . V Ba9 . .

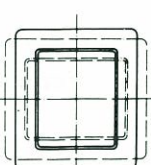
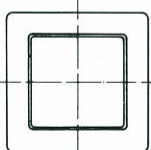
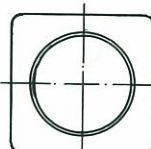
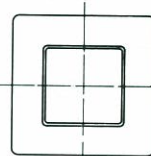
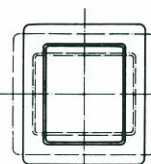
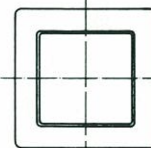
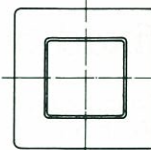
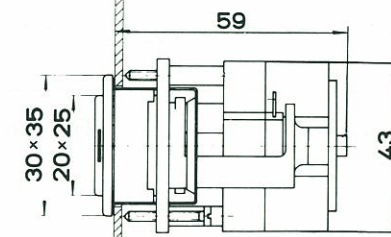
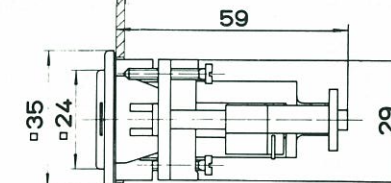
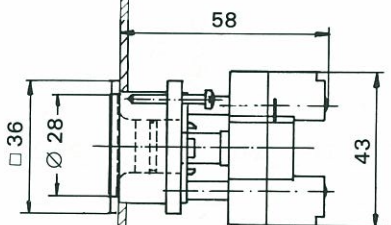
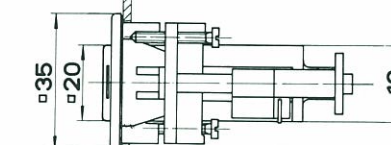
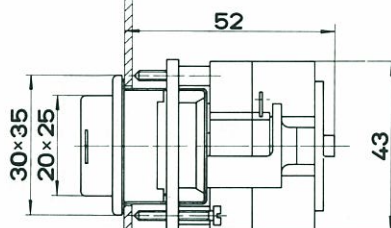
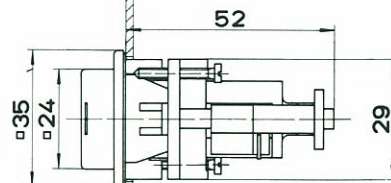
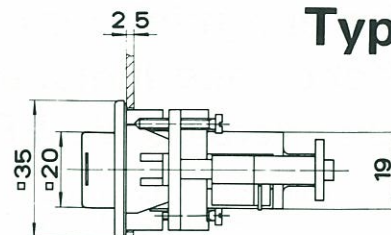
L U20 . . V Ba9 . .

L U25 . . V Ba9 . .



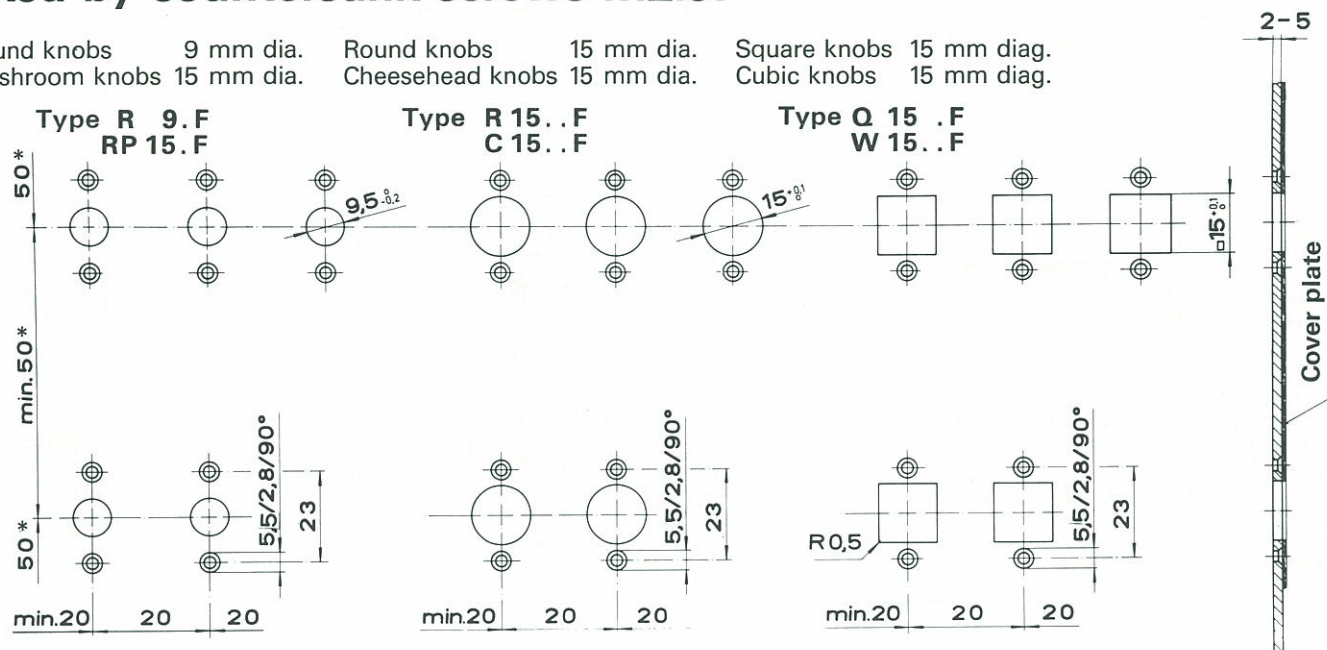
Type L

with large lens and socket for Ba9 lamp

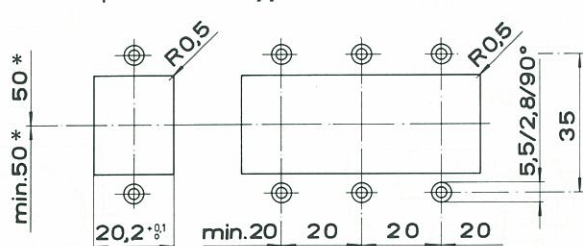


Sizes of fixing holes and minimum spacing for push buttons, switches and indicator lamps fixed by countersunk screws M2.5F

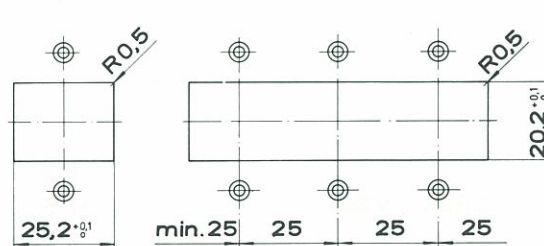
Round knobs 9 mm dia. Round knobs 15 mm dia. Square knobs 15 mm diag.
Mushroom knobs 15 mm dia. Cheesehead knobs 15 mm dia. Cubic knobs 15 mm diag.



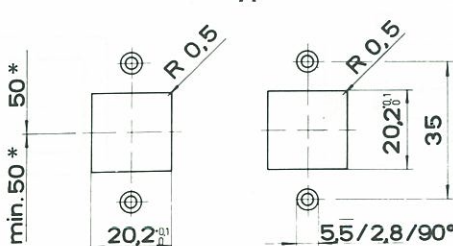
For square knobs type U 20..F



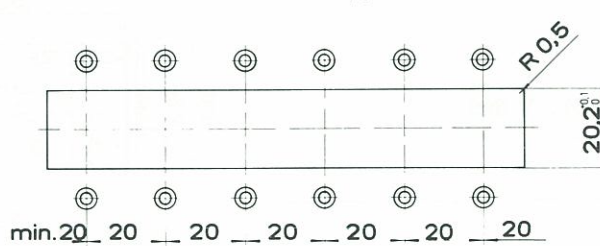
For square knobs type U 25..F



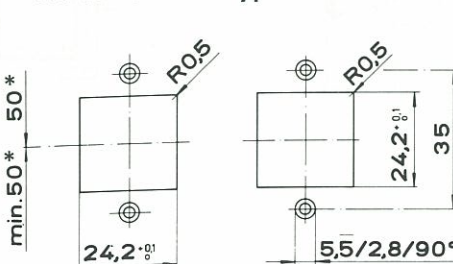
For cubic knobs type W 20..F



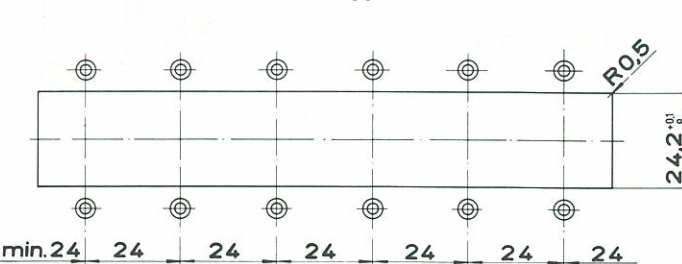
For cubic knobs type W 20..F



For cubic knobs type W 24..F

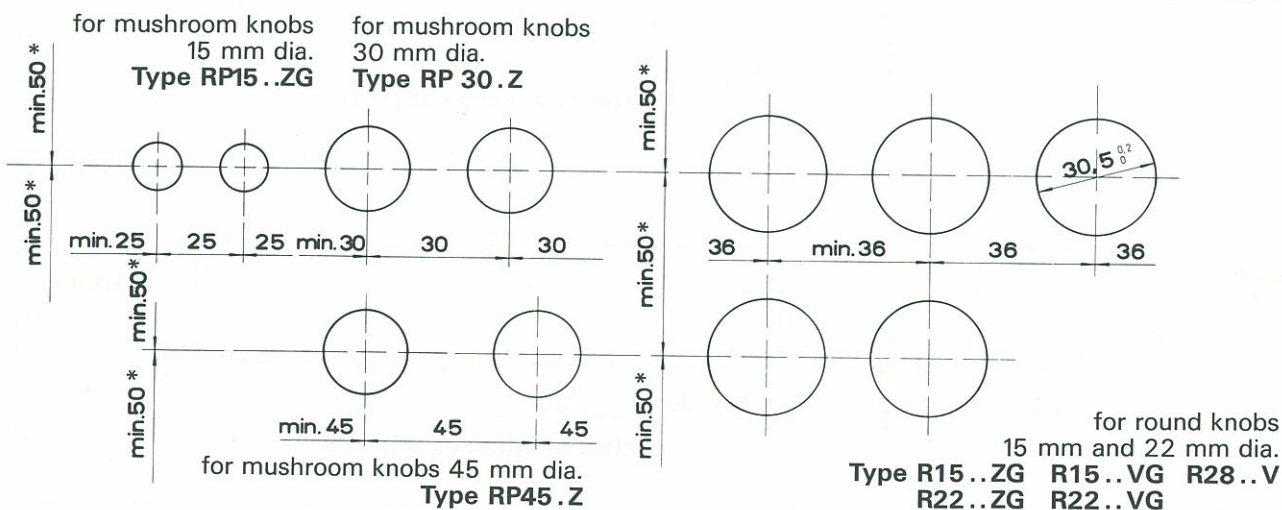
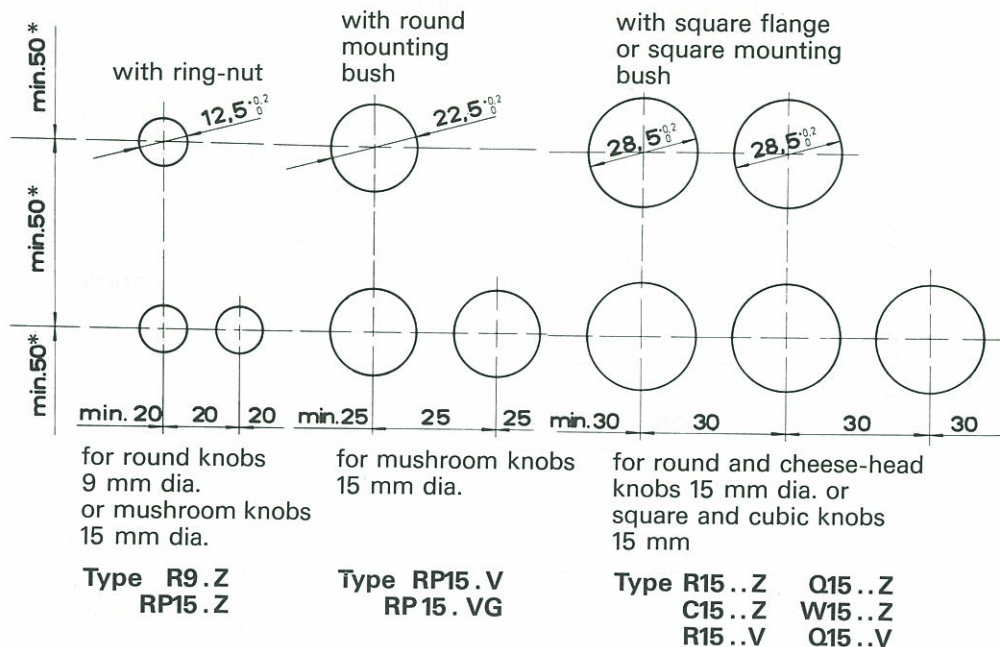


For cubic knobs type W 24..F



* If soldered. For AMP connections = 80 mm.

Sizes of fixing holes and minimum spacings for push buttons, switches and indicator lamps fixed through a central hole, types Z, V and K

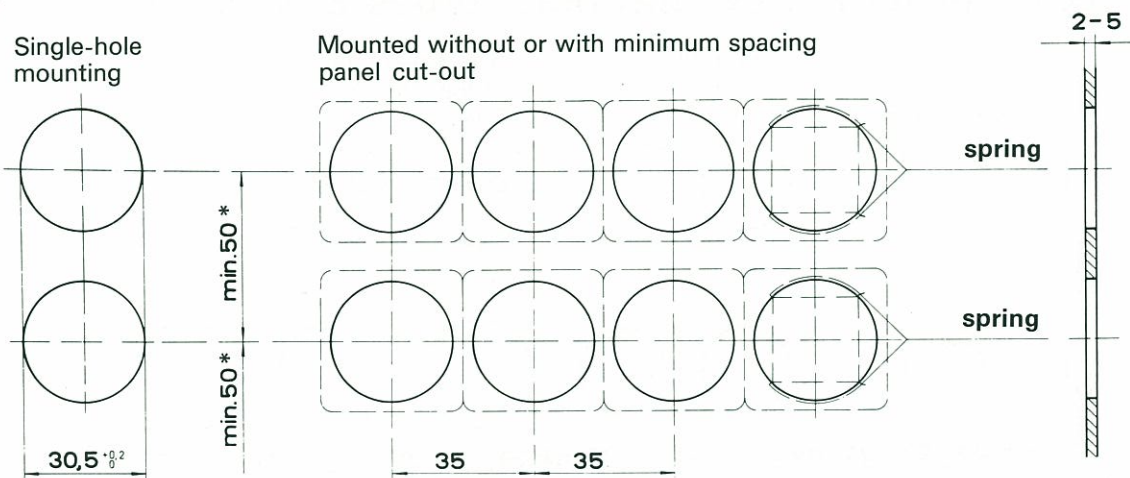


* If soldered. For AMP conn. = 80 mm.

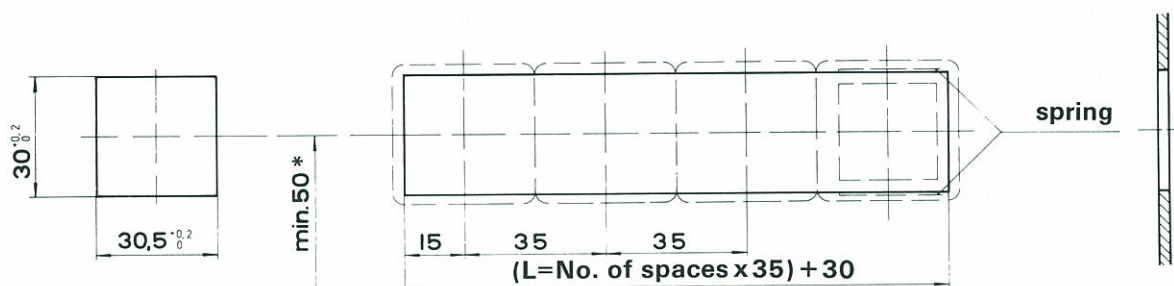


Sizes of fixing holes and minimum spacings for push buttons, switches and indicator lamps fixed through a central hole, types Z and V

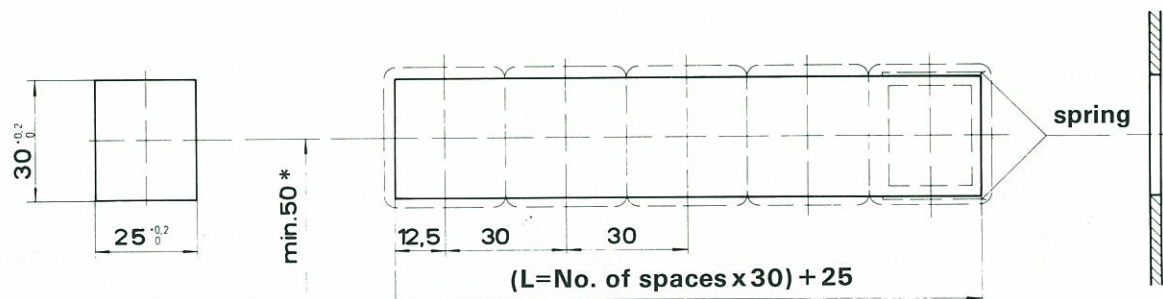
for cubic knobs
Type W20...Z
Type W20...V



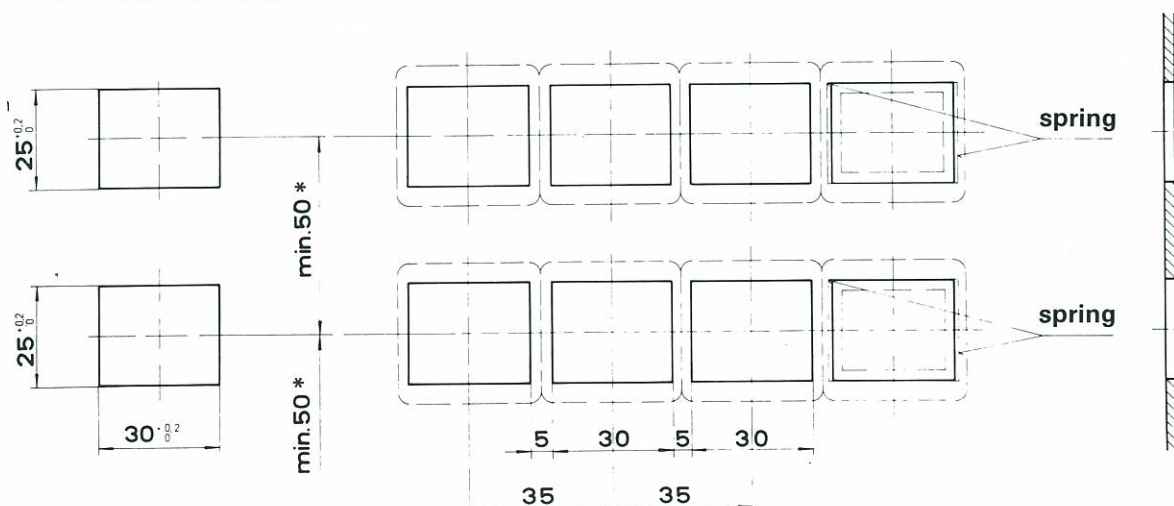
for cubic knobs
Type W24...Z
Type W24...V



for square knobs
Type U20...Z
Type U20...V



for square knobs
Type U25...Z
Type U25...V



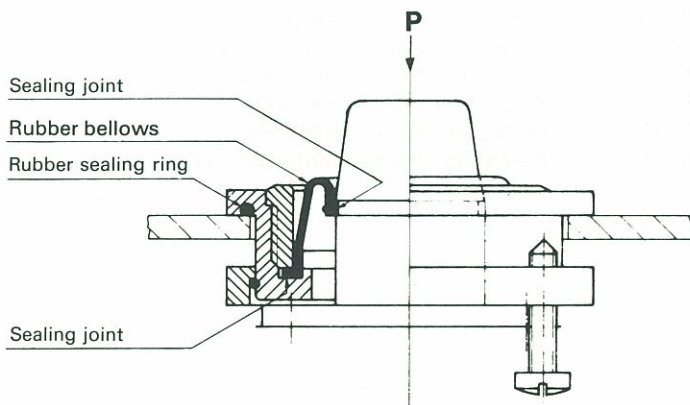
* If soldered. For AMP conn. = 80 mm.

Waterproof Push Buttons and Push Button Switches Illuminated Push Buttons and Push Button Switches Indicator lamps

**Types . . ZG/VG/GA
Types DT and DS**

**Types LDT/LDS
Type L**

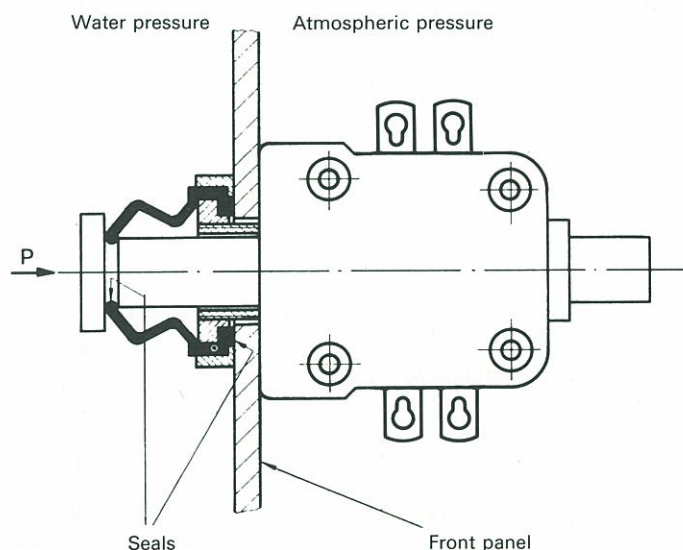
Are particularly suitable for control and signalling panels in damp areas, such as water supply and treatment plants, dye works, car washes and in the open air. The push button switches and their illuminated attachments designed for such installations are made exclusively in materials which are resistant to the effects of damp and salty atmospheres, as well as being capable of withstanding ambient temperatures up to 60°C. They have been used successfully in tropical countries. The protection against splashes and even occasional jets of water is provided by a rubber bellows making a sealed joint between the lens and the body of the push button, and by a rubber sealing ring between the body of the push button and the panel in which it is mounted. The switch element and illumination unit must never of course be subjected to a continuous flow of water, nor immersed. Separation is always with the front panel.



SEV 3047.1963 regulations describe this problem at the top of page 8:

"Material for use in damp or wet environments is only proof against dripping or sprayed water if, for example, it is contained in a housing which provides protection against dripping or sprayed water as per lit. B."

Sealed panels with Schweitzer push buttons, switches and indicator lamps have undergone type tests under a pressure of 7 atmospheres maintained for long periods. The illuminated and non-illuminated push buttons and switches are not, however, designed for service under conditions of such high water pressure. The difference of pressure between the side exposed to water pressure and the rear face of the panel exercises a force P which, at approximately 0.3 atm., is sufficient to operate the switches.



For the rear side of our waterproof command and signalling equipment the following protection classes apply:

SEV: pressurised waterproof

DIN: dust proof and proof against immersion* in water: IP 67.

*Test pressure 70 m water column (7 atm.)



Explanation of the types of protection for electrical equipment

SEV

The Technical Commission EK-FB of the "Comité Electrotechnique Suisse (CES)" has established "test requirements for electrical equipment for use in humid or wet conditions". These have been accepted by the "Association Suisse des Electriciens (ASE)" and have been put into operation under ASE 3047 1963.

Subdivisions, denominations and types of material are listed below in the chart which gives basic requirements for waterproof equipment:

Subdivision according to conditions	Subdivision according to the type of equipment		Marking
	with normal protection against humidity and water	with additional water proofing	
dry	ordinary	—	none
humid	—	—	①
	resistance to water droplets	—	⦿
		spray	⦿
		jet	⦿
wet	—	—	②
	resistance to water spray	—	⚠
		spray	⚠
		jet	⚠
	waterproof	—	⦿
		under pressure	⦿ 5 ¹⁾

²The number following the 2 drops of water can be taken as an example and signifies the maximum permissible water pressure in atmospheres to which the equipment may safely be subjected in service.

DIN/IEC

The "DIN" German Industrial Standards 40050 of 1980 corresponds in content to the "IEC" International Electrotechnical Committee publication 529 of 1976 and 1978. Both DIN and IEC have established protection classes with various degrees of protection for electrical equipment against infiltration of solid material and against harmful infiltration of water.

The corresponding abbreviation comprises the letters IP (International Protection) and two subsequent letters.

The first of these letters defines the degree of protection against infiltration of solid material:

- IP 0x: No special protection
- IP 1x-IP 4x: Protection against infiltration of solid material (coarse for IP 1x, fine for IP 4x)
- IP 5x: Protection against harmful dust deposits
- IP 6x: Dust proof

The second letter defines the degree of protection against harmful infiltration of water:

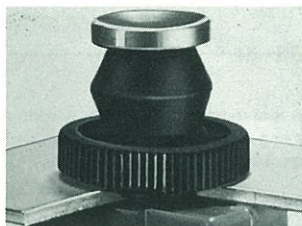
- IP x0: No special protection
- IP x1: Protection against water drops
- IP x2: Protection against obliquely falling water drops
- IP x3: Protection against water mist
- IP x4: Protection against water spray
- IP x5: Protection against water jets
- IP x6: Protection against flooding
- IP x7: Protection against immersion
- IP x8: Protection against immersion in deep water.

Push Buttons and Push Button Switches with Mushroom Knob Waterproof

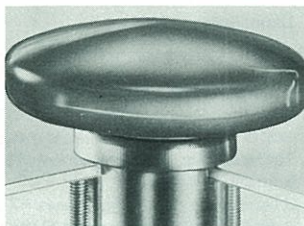
Protection IP 67

Type DT
Type DS
Types RP15/30/45
Types ZG/VG/VGA

Type RP 15 . ZG



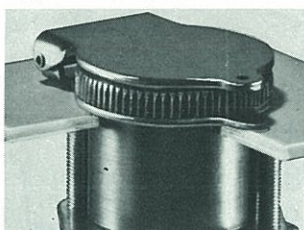
Type RP 45 . ZG



Type RP 15 . VG



Type RP 15 . VGA



Type RP15.ZG

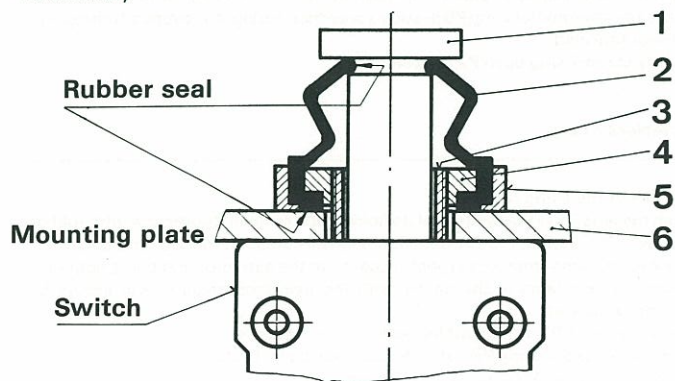
A. Assembly

The switch or push button is supplied by us ready assembled so that the operating part has to be removed before installation.

1. The stem P1, the rubber bellows P2 and the ring nut inside P4 are screwed off the central fixing nipple P3 by turning the plastic skirted ring P5 anticlockwise.
2. All the above parts are now pulled off the spindle of the switch with the stem P1, overcoming slight resistance in the process.
3. The lower sealing surface of the bellows P2, which bears against the front of the panel, should be coated with a thin film of oil or grease, in order that it slides freely when tightened.
4. Insert the central fixing nipple P3 into the mounting plate from the rear and check whether the nipple is hard up against the stop on the right of the switch casing.
5. Push the stem P1 on the spindle from the front and press down until it meets the stop.
6. Screw the ring-nut P4 on the central fixing nipple P3 and secure by turning the plastic skirted ring P5.

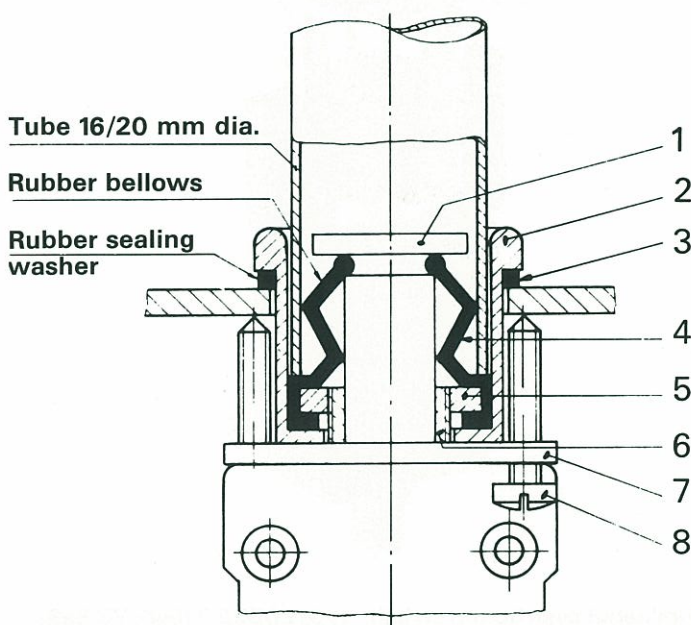
B. Dismantling

To remove a switch from a mounting plate proceed in the reverse sequence to that for assembly.



A. Dismantling

1. Slacken screw P8 until the button or switch loose.
2. Unscrew sleeve P2 anticlockwise from central bush P6.
3. Withdraw sleeve P2 with mushroom button P1 from the switch element.



B. Assembly

1. Insert the central bush P6 into the switch element and turn 45° to the right.
2. Put the intermediate plate P7, complete with 2 fixing screws, P8, on the central bush P6.
3. Put the rubber washer under the sleeve P2.
4. Introduce the sleeve P2 into the panel from the front and hold it there, applying pressure on the mushroom knob P1.
5. Place the switch element with intermediate plate P7 and bush P6 from behind on to the stem of button P1, then introduce the switch element spindle, then the bush P6, into the inside of sleeve P2 and attach by turning the ring nut P5 carrying the rubber bellows, to the right.
6. Turn the entire switch to the desired position and then tighten the 2 fixing screws P8 lightly and evenly.

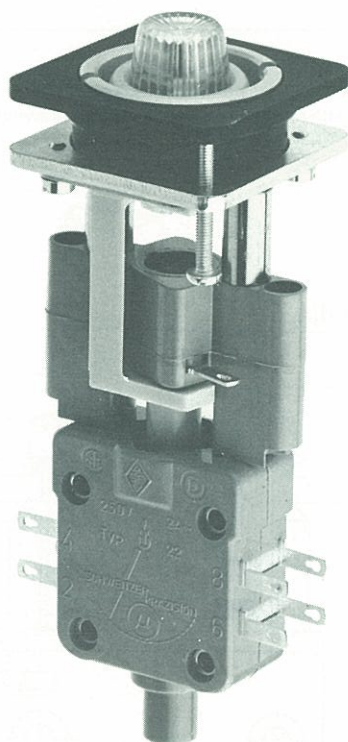
C. Replacement of Rubber Bellows

1. Dismantle the switch assembly as at A.
2. Push out the mushroom knob to the front.
3. Withdraw the rubber bellows P4 complete with ring nut P5, from the sleeve P2.
4. Remove the ring nut P5 and insert it into the new rubber bellows P4. The conical portion of the ring nut P5 should face towards the rear of the bellows.
5. Lightly grease the forward face (at the ring nut end) of the bellows P4 and insert it into the sleeve P2 pushing it to the bottom of the bush by means of a tube, diameter of 16/20 mm.
6. Re-assemble the switch as at B.

Illuminated Push Buttons and Illuminated Push Button Switches Indicator Lamps with Lens Waterproof

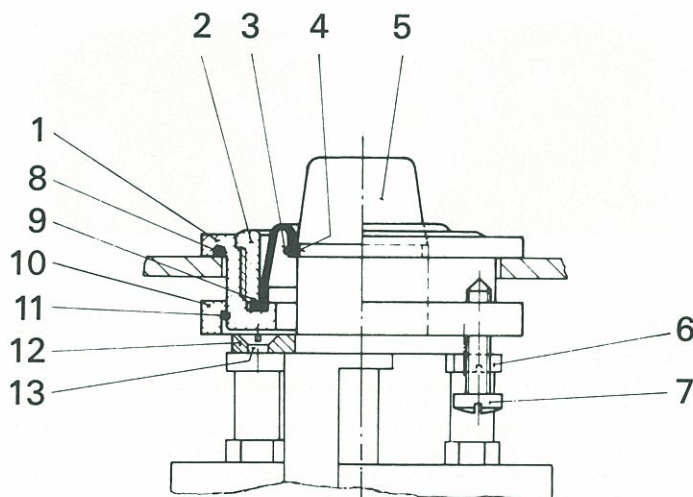
Protection IP 67

Type LDT
Type LDS
Type L
Type R15
Type VG



A. Dismantling

1. Unscrew locking ring P1.
2. Push the lens P5 sideways (out of its holder) and remove it complete with the rubber bellows P3. Caution: the intermediate ring will come too, do not bend it.
3. Screw out the two fixing screws P6. This releases the switch and fixing plate P12 from the front part.
4. Unscrew the two fixing screws P7 about ½ inch.
5. Push flange P10 forwards until the clamp ring P11 is free.
6. Lift out clamp ring P11 with a knife or screwdriver, push it to the rear and pull flange P10 together with clamp ring P11 out of the mounting bush.



B. Assembly

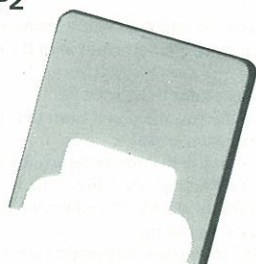
1. Insert the mounting bush P1 containing the sealing ring P8 through the mounting plate or the hole in the panel, from the front.
2. Push the square flange P10 with the two fixing screws P7 on to the rear part of the bush.
3. Push clamp ring P11 on the bush P1 from the rear and insert it in its groove.
4. Pull flange P10 back over clamp ring P11. Turn the bush and flange into the desired position and tighten up the two fixing screws evenly.
5. Screw the switch with fixing plate P12 on the rear of flange P10 with the two screws P6.
6. With the rubber bellows pulled on, insert the lens in its holder from the front.
7. Insert the intermediate ring P9 in such a way that the lug to prevent it turning is in the slot provided.
8. Lightly screw fixing bush P2 in position.

C. To replace a lamp

1. Screw out the fixing ring P2.
2. Push the lens P5 sideways (out of its holder) and remove it complete with rubber bellows P3. Caution: the intermediate ring will come out too; do not bend it.
3. Release the lamp from its bayonet holder with the extractor and pull it right out.
4. Insert the new lamp in the holder with the extractor, press in and secure by turning clockwise.
5. Press the lens P5 with the rubber bellows into its holder.
6. Insert intermediate ring P9, with the locating lug in its slot.
7. Screw fixing bush P2 in position and tighten up.

Illuminated push button switch type LDS22 R15wk VG Ba9s..

Key for locking ring P2

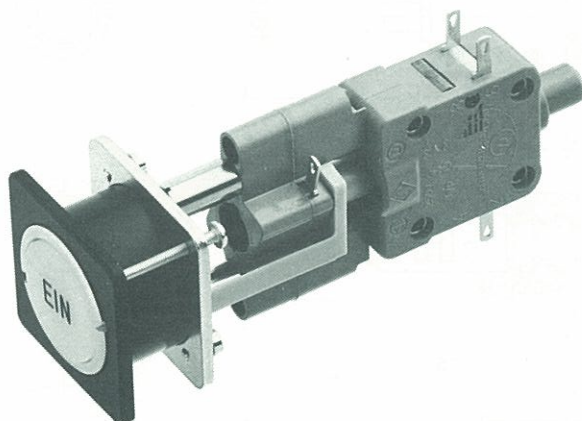


Lamp extractor Ba9s



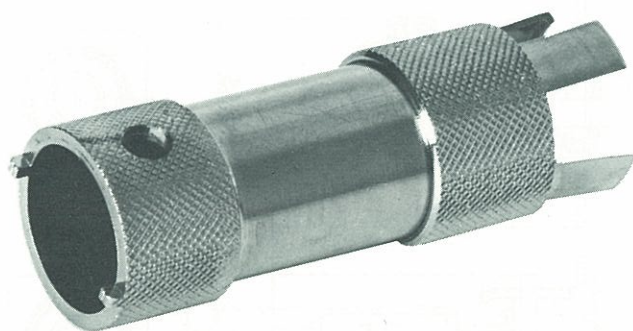
Illuminated Push Buttons and Illuminated Push Button Switches Indicator Lamps with Lens Waterproof Protection IP 67

**Type LDT
Type LDS
Type L
Type 22
Type VG**

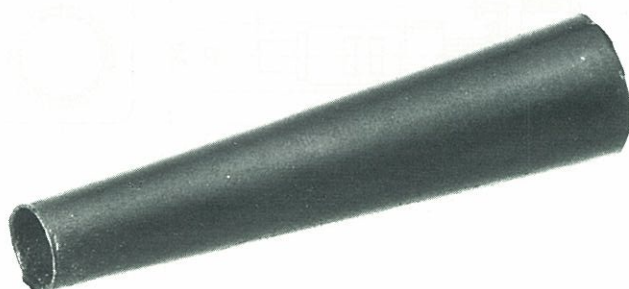


**Illuminated push-button switch
type** LDS20J R22 wk VG Ba9s.

Lens extractor with key for types R22

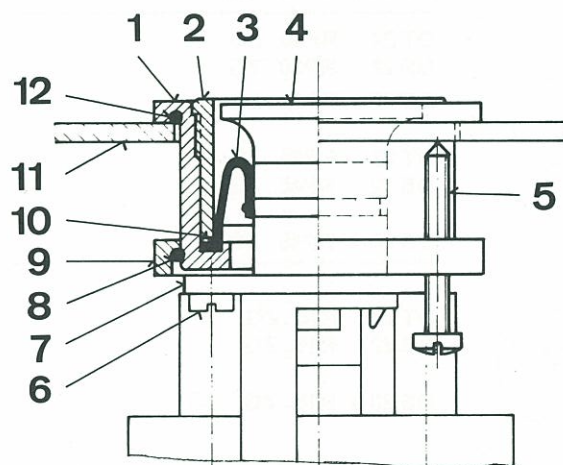


Lamp extractor Ba9s



A. Dismantling

1. Release the fixing bush P2 with the key at the rear end of the lens extractor and unscrew completely by hand.
2. Insert the four sprung claws of the lens extractor in the resultant gap between the mounting bush P1 and the lens P4 and press the clamping sleeve right in.
3. Pull off the lens P4. The rubber bellows P3 and the intermediate ring P10 will come too. Do not lose them.
4. Release the two fixing screws P6 and detach the switch with the fixing plate P7.
5. Turn the two pressure screws P7 back about 1/2 inch.
6. Push the flange P9 forwards until clamp ring P8 is exposed.
7. Extract the clamp ring P8 from its groove with a knife or screwdriver and remove it.
8. Remove flange P9 with the two pressure screws P7 from the mounting bush P1.



B. Assembly

1. Insert the mounting bush P1 with the sealing ring P12 in place through the opening, from the front.
2. From the rear push the square flange P9 with the two pressure screws P5 on the mounting bush P1.
3. Insert clamp ring P8 in its groove in the mounting bush P1.
4. Pull flange P9 back over clamp ring P8.
5. Turn the mounting bush P1 and flange P9 into the desired position and tighten up the two pressure screws evenly.
6. Screw the switch and fixing plate P7 on to the rear of flange P9 with the two screws P6.
7. Press the lens P4 with the rubber bellows P3 into the lens holder from the front.
8. Insert the intermediate ring P10 in such a way that its lug engages in the slot in the mounting bush P1, thus preventing it from rotating.
9. Screw the fixing ring P2 in and tighten up moderately with the key on the lens extractor.

C. To replace a lamp

1. Release the fixing ring P2 with the key and pull out.
2. Pull the lens off with the extractor.
3. Remove the old lamp with the extractor Ba9s and insert the new lamp in the bayonet lampholder.
4. Press the lens P4 and rubber bellows P3 back in position.
5. Insert the intermediate ring P10, with the lug in the slot.
6. Screw the fixing ring P2 in and tighten lightly with the key.

Waterproof push buttons and Push button switches

Types DT / DS

Protection IP 67

Drilling plan

Type



DT 22 RP15 . ZG
DS 22 RP15 . ZG

DS 20 J RP15 . ZG



DT 22 RP15 . VG
DS 22 RP15 . VG

DS 20 J RP15 . VG

DT 22 RP15 . VGA
DS 22 RP15 . VGA

DS 20 J RP15 . VGA



DT 22 RP30 . ZG
DS 22 RP30 . ZG
DS 20 J RP30 . ZG

DT 22 RP45 . ZG
DS 22 RP45 . ZG

DS 20 J RP45 . ZG



DT 22 R15 . ZG
DS 22 R15 . ZG

DS 20 J R15 . ZG



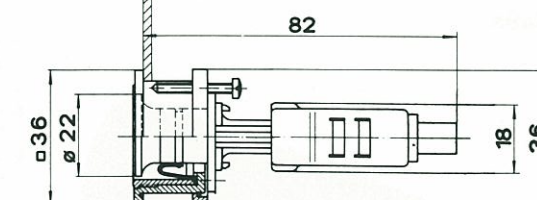
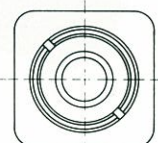
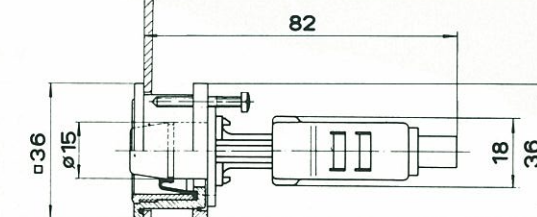
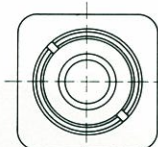
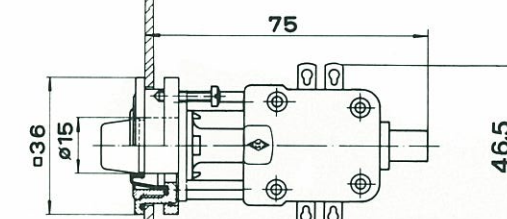
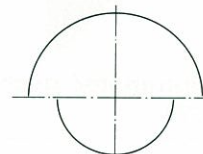
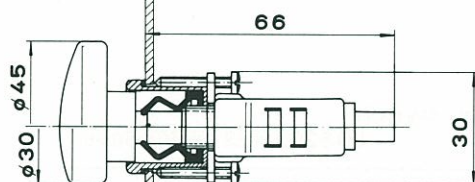
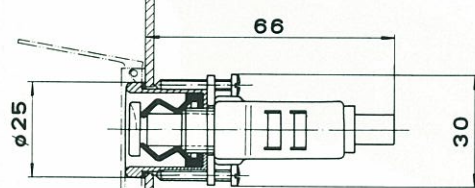
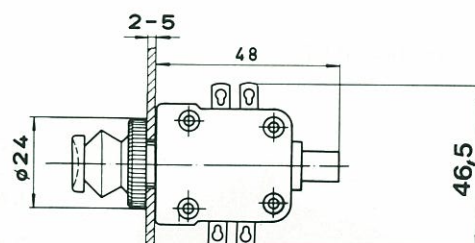
DT 22 R15 . VG
DS 22 R15 . VG

DS 20 J R15 . VG



DT 22 R22 . VG
DS 22 R22 . VG

DS 20 J R22 . VG



Protection IP 67

Type



Waterproof Indicator lamps

Type L

Protection IP 67

Drilling plan

Type



LR 15.. ZG PTT ..



LR 15.. VG PTT ..



LR 15.. ZG Ba9 ..



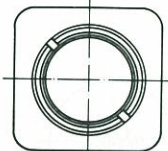
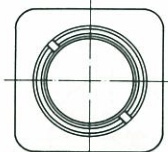
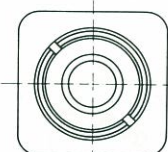
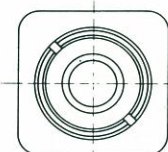
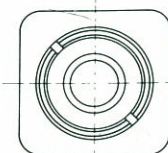
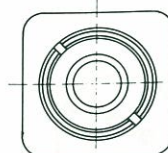
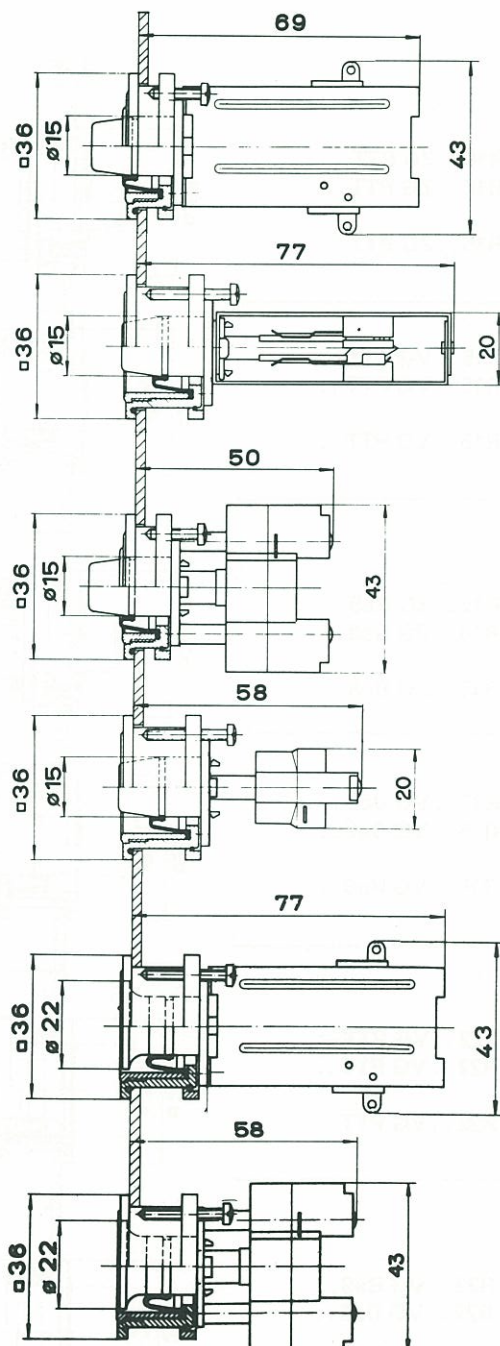
LR 15.. VG Ba9 ..



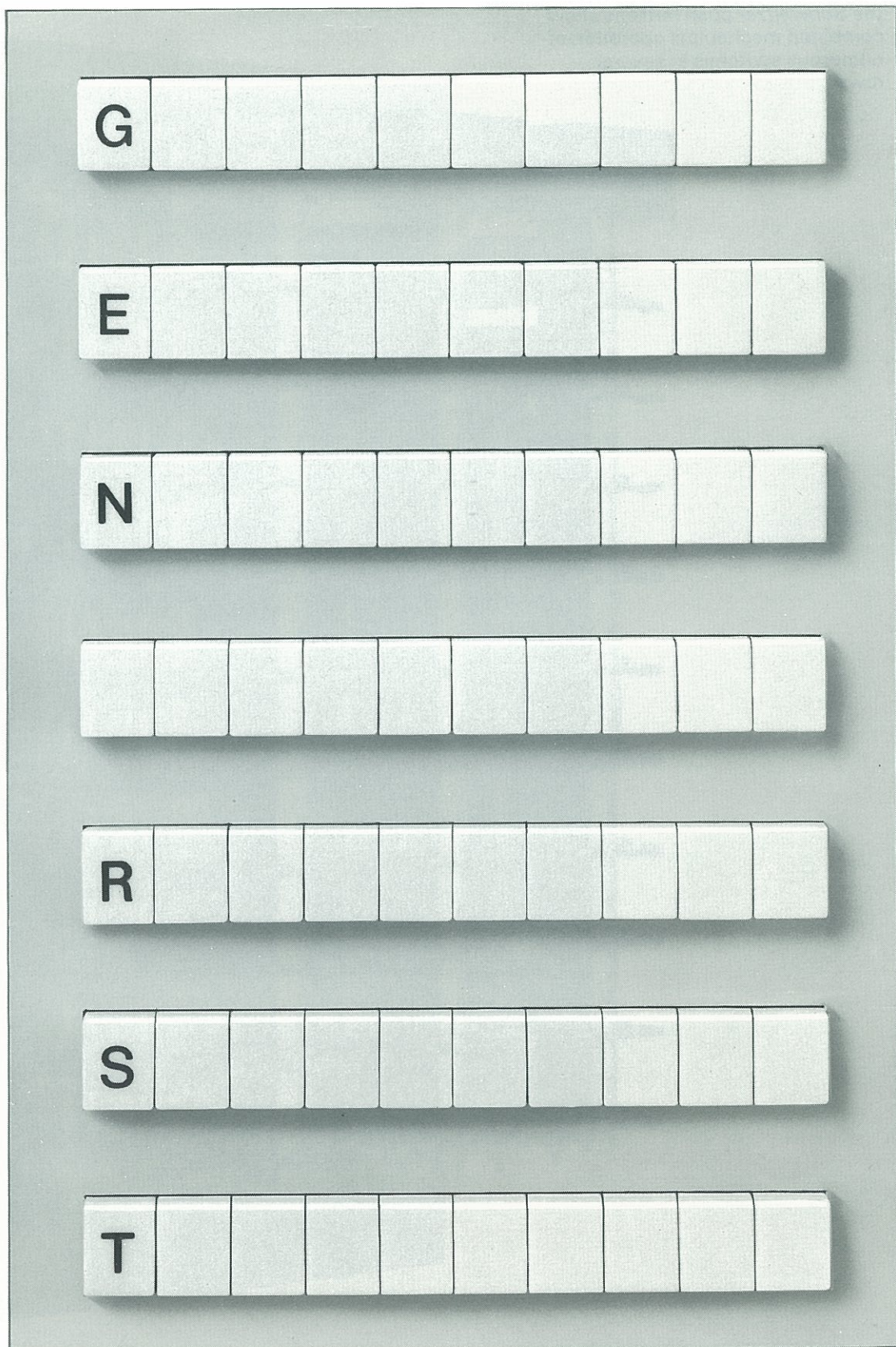
LR 22.. VG PTT ..



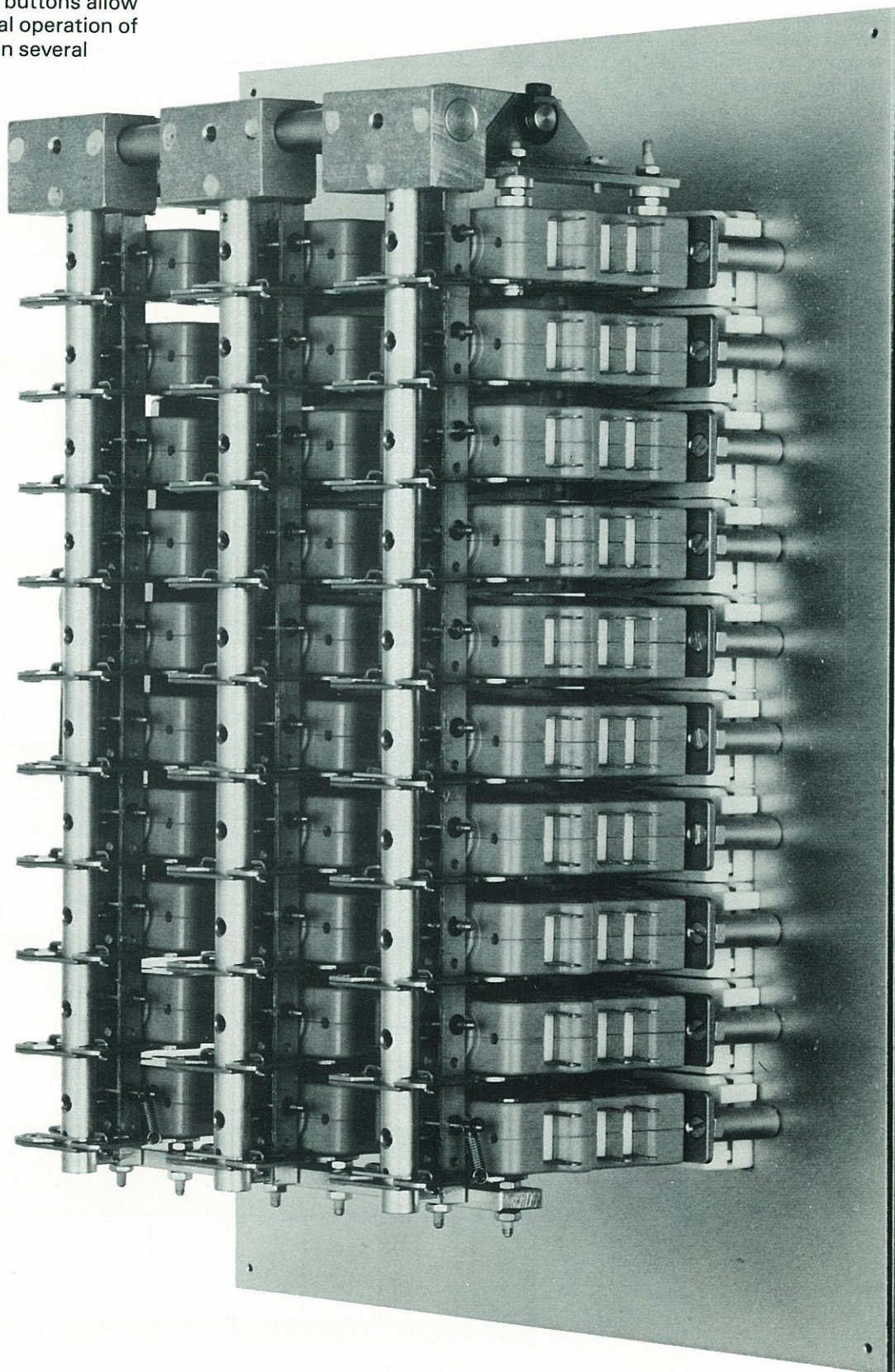
LR 22.. VG Ba9 ..



Push button
switch combi-
nation with
latching, mutual
release and
locking over all
7 rows



The precision and high quality of the *Schweitzer* push buttons allow combined mechanical operation of numerous switches in several rows.



Push button switch combinations

A principal advantage of the SCHWEITZER push button range lies in the virtually unlimited number of different combinations which can be achieved. The push button switches can be mounted individually or in modular fashion in groups as control key boards.

These assemblies can be provided with electromagnetic interlocking, blocking and release systems which make complex contactor or relay interlocks unnecessary.

In the following description it is only possible to give a brief idea of the number of combinations which can be achieved.

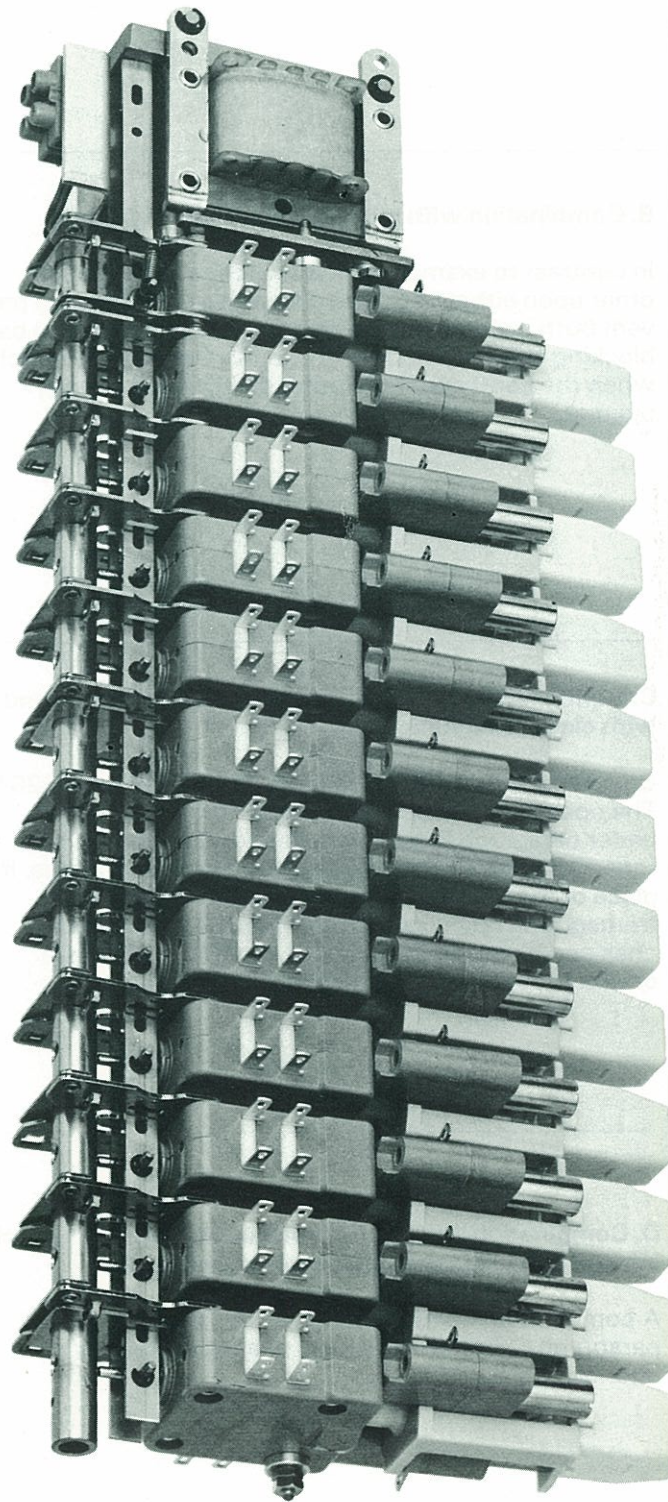
In the following pages a few of the most commonly used standard types are described.

The full range of standard types can be selected with the ordering code on page 45. The reference letters from the individual section, arranged in the correct sequence, provide a clear indication (Code word) for the required switch combination.

For banked switches, the minimum pitch between switch centers is 20 mm. This can be expanded if required, but a dimension should be chosen which is divisible by 5 (eg. 20, 25, 30, 35 mm etc.) or 6 (eg. 24, 30, 36, 42, 48 mm etc.)

The parallel row interlocking and blocking of such switch combinations is possible over an almost unlimited number of switches and rows. The minimum pitch between rows must not be less than 50 mm.

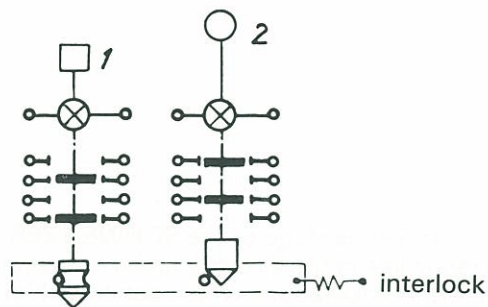
Please refer your control technology problems to us. In many cases a simple solution can be provided with our push button switch combinations. We have extensive experience and our fully qualified technicians are always pleased to be of service at any time.



A. Combination with mutual release or reset.

Code: «AMDEG»

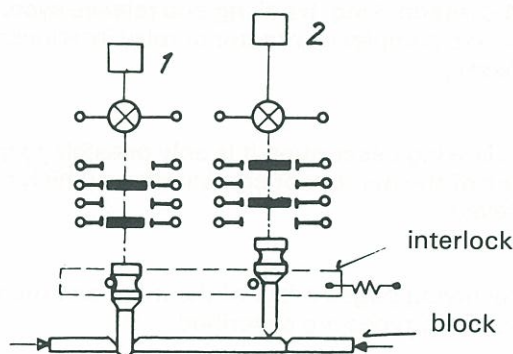
Switch 1 is locked in the ON position. When the second switch is operated, the first is released and returns to its normal position. The interlocking is arranged so that the contacts on switch 1 open before those on switch 2 close.



B. Combination with mutual release and blocking.

Code: «AMBIG»

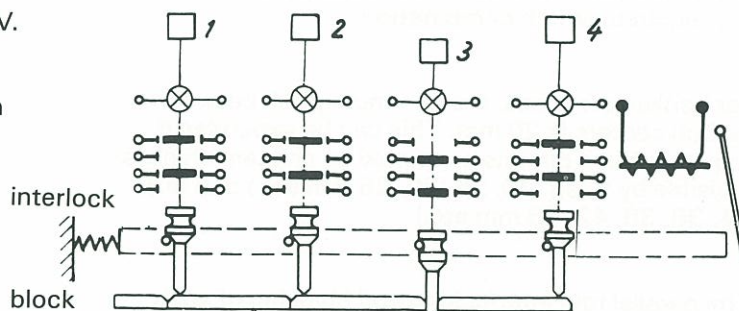
In contrast to example A, the switches release each other upon either of them being pressed. In order to prevent both switches being pressed simultaneously, a ball blocking tube is included. This only releases the switch when the contacts of the other switch have already opened.



C. Combination with mutual release and blocking, and with electromagnetic reset.

Code «AMSIG»

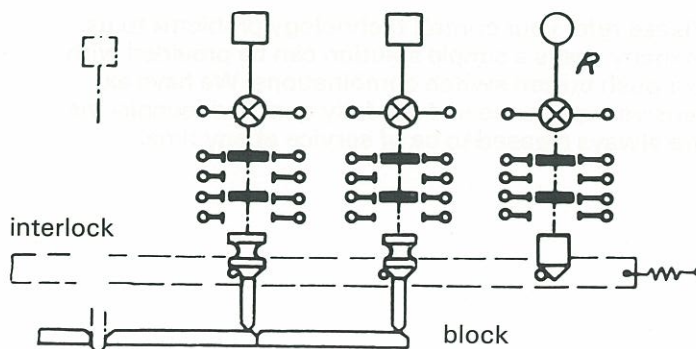
Operating voltage: 6, 12, 24, 36, 48, 60, 110 and 220 V. The operating principle is identical to that described under paragraph B, but is applied to several push buttons. Only one push button can be pressed at a time. In place of mechanical reset, on groups A–E an electromagnetic reset is possible. In this way, the switches can be remotely reset, e.g. with limit switches or other types of circuit breaker.



Code: «AMDIG»

D. Combination with mutual release and reset, interlocking and blocking, and additional release button.

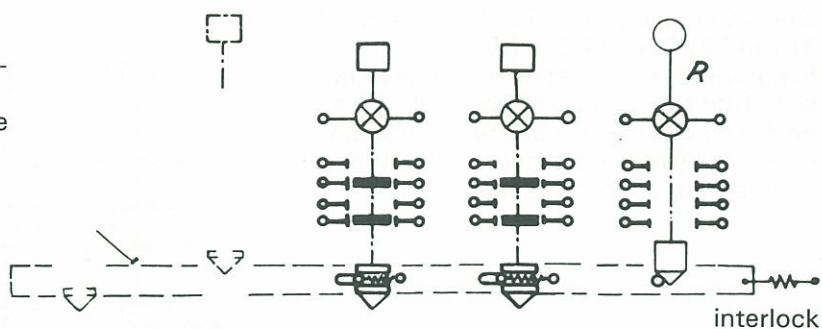
A combination corresponding to that described in paragraph C, but an additional release button without interlocking is provided.



E. Combination with interlock and mutual release button

This combination allows one or all of the push buttons to be pushed in, when they will hold-in. They can all be released by operating the mutual release button.

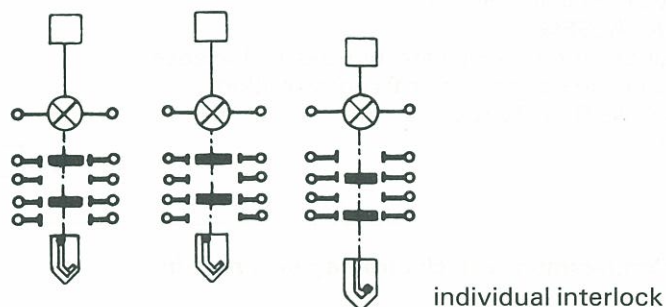
Code: «ALDEG»



F. Combination of switches with individual interlocks without blocking (types DS... and LDS...)

Each switch will interlock mechanically when pushed in. Each switch must be pressed again to release. Any or all of the buttons can be pushed in together or in sequence.

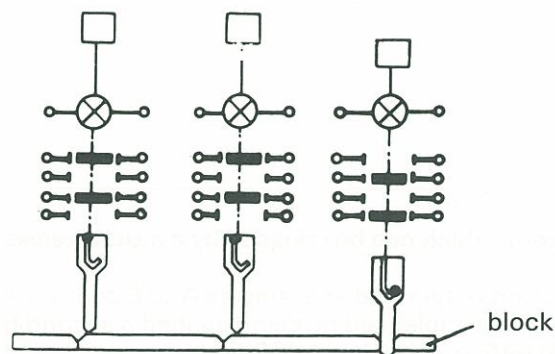
Code: «ARBEG»



G. Combination of switches with individual interlock and mutual blocking (types DS... and LDS...)

Here only one push button can be pushed in at a time and must be released by pushing again before a second button can be pushed in. This releases the ball lock mechanism. Only then another switch can be pushed in and locked.

Code: «ARBIG»

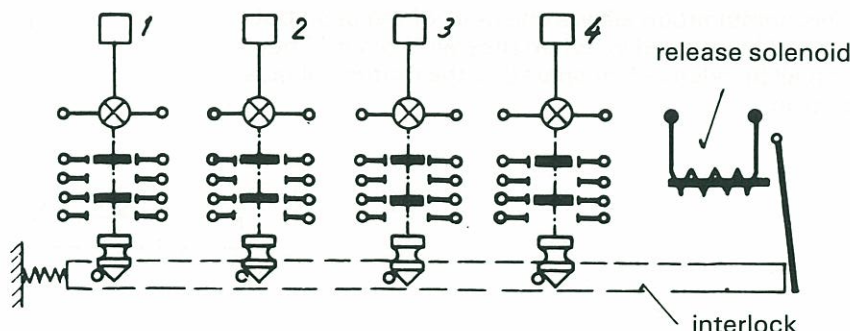


H. Combination with electromagnetic release

Code «AMSEG»

Operating voltages: 6, 12, 24, 36, 48, 60, 110 and 220 volta AC or DC.

For group A–E the mechanical mutual release button can be replaced by a release solenoid. This enables release to be effected remotely by limit switches or other types of contactor or contact breaker.



I. Combination with common hold-in, without mutual reset but with common electromagnetic release

Code «ALSEG»

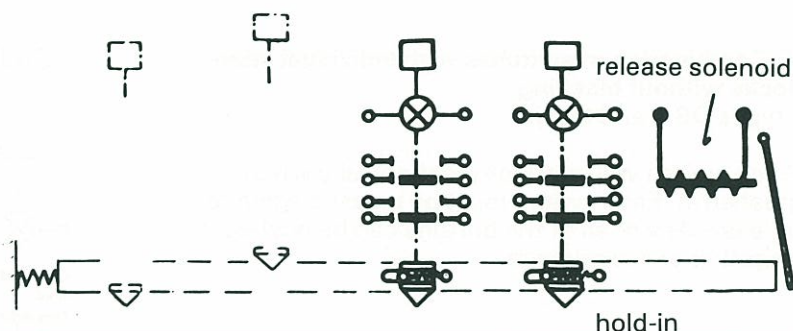
Solenoid voltages: 6, 12, 24, 36, 48, 60, 110 and 220 volts AC or DC.

A solenoid is used in place of the reset button described under E. The interlocked switch can only be released electrically.

Code: **ALSEG**

If necessary a mechanical or electrical release button can be added to this combination.

Code: **ALTEG, ALZEG**

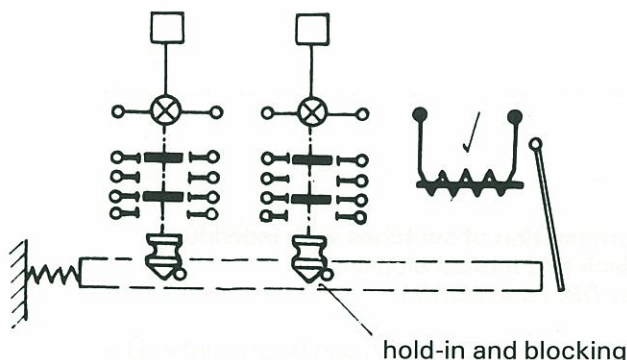


K. Combination with electromagnetic hold-in

Code «ALKEN»

When any one button is pushed in, the solenoid is energised and not only holds this button in, but blocks the others in the out position.

The release of the push button can only be achieved by interrupting the solenoid current. This can, for example, be done by a key switch (Type SS), to prevent tampering with the push button selection. Only the keyholder is able to alter the switching programme. The solenoids are only suitable for DC operation.



L. Push buttons which can be released by a mutual release button or by being pushed a second time

The push buttons described in examples A to E and H to K, can be fitted with a supplementary mechanism allowing them to be released by being pushed a second time.

Code: E.g. **AUBIG** or **AUSIG** or **AUSEG**, etc.

M. Special versions with blocking, interlocking and release, operating between several rows of push buttons

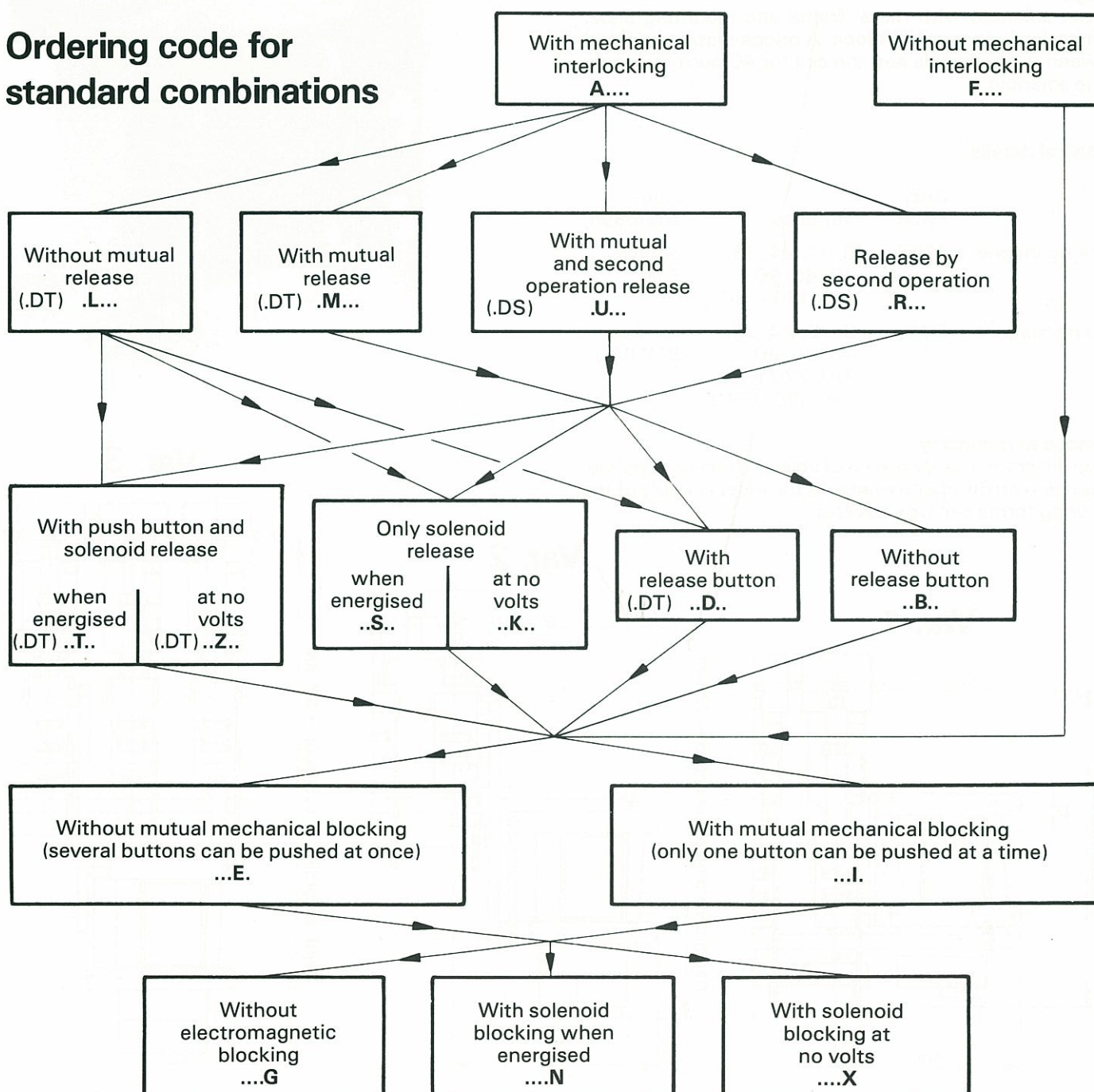
In the combinations previously described, the push buttons are shown only in a single row. In many cases, however, it is desirable to arrange the switches in several rows (see illustrations on pages 39 and 40).

Ordering specification for push button switch combinations

To ensure that orders are correctly executed the following information should be provided:

- type of push button switch, type of fixing, shape and colour of button and, if applicable, type and voltage of lamps.
- type of interlocking as per examples A and M previously described, using the code compiled from the following chart.
- mutual blocking as per examples B, C, D and G previously described, coded from the following chart.
- the pitch between the switch centres. If possible divisible by 5, e.g. 20, 25, 30 mm. etc., or 6, e.g. 24, 30, 36, 42, 48 mm etc.
- for release solenoids the voltage required (6, 12, 24, 36, 48, 60, 110 or 220 volts AC or DC).
- for hold-in and blocking solenoids the voltage required (6, 12, 24, 36, 48 and 60 DC, only).

Ordering code for standard combinations



Code Examples:

AMBIG
ALDEG

FIG
ARBEX

AUBIG
ARBIG

AMDEG
AMSIG

AMDIG
ALKEN

Tripping and Blocking Solenoids

General

These solenoids are used for electrically releasing engaged combinations of switches, or for blocking them against unauthorised interference with the switch conditions in the installation. The two functions of tripping and blocking when energised or at no volts can also be combined (see page 45).

Design

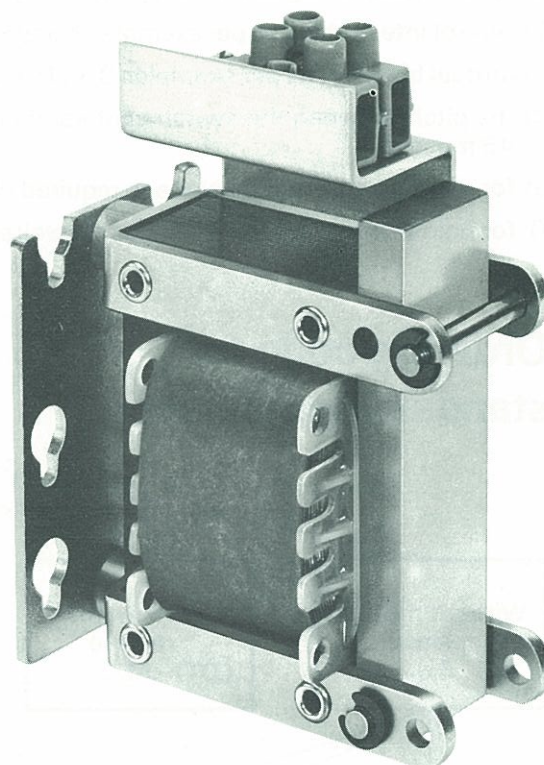
Robust solenoid with metal frame and mounting plate. Connections via terminal block. A bridge rectifier is fitted between the terminals and the coil for AC current supply to the solenoid.

Technical details

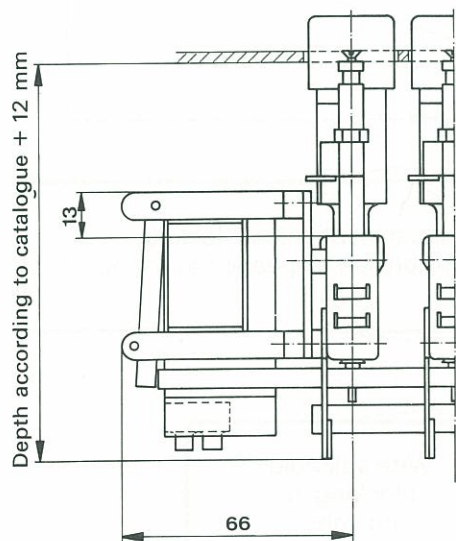
	Duty cycle	Voltages	Consumption
Blocking magnet	100 %	6, 12, 24, 36, 48, 60, 90, 110, 180 V DC	approx. 6 W
Tripping magnet	30 %	6, 12, 24, 36, 48, 60, 90, 110, 220 V AC (coil 180 V DC)	approx. 9 W (VA)

Methods of mounting

Three different arrangements of solenoid can be supplied. Depending on the space available, the most suitable of the following forms can be selected:

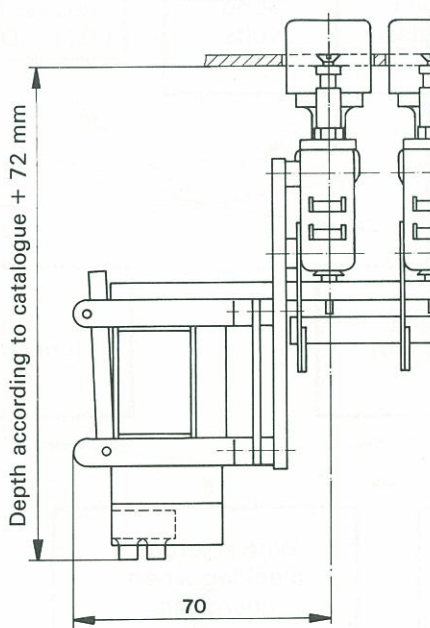


Var. 1



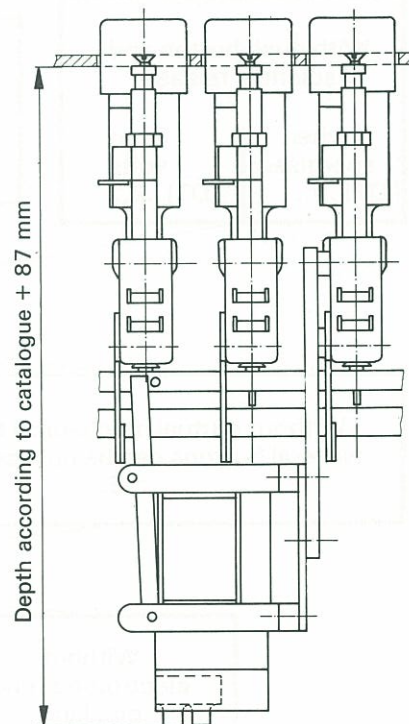
Mounted at the side pointing forwards, on switches with illumination unit

Var. 2



Mounted at the side pointing backwards, on switches without illumination unit

Var. 3



Mounted at the rear, when no space is available at the side