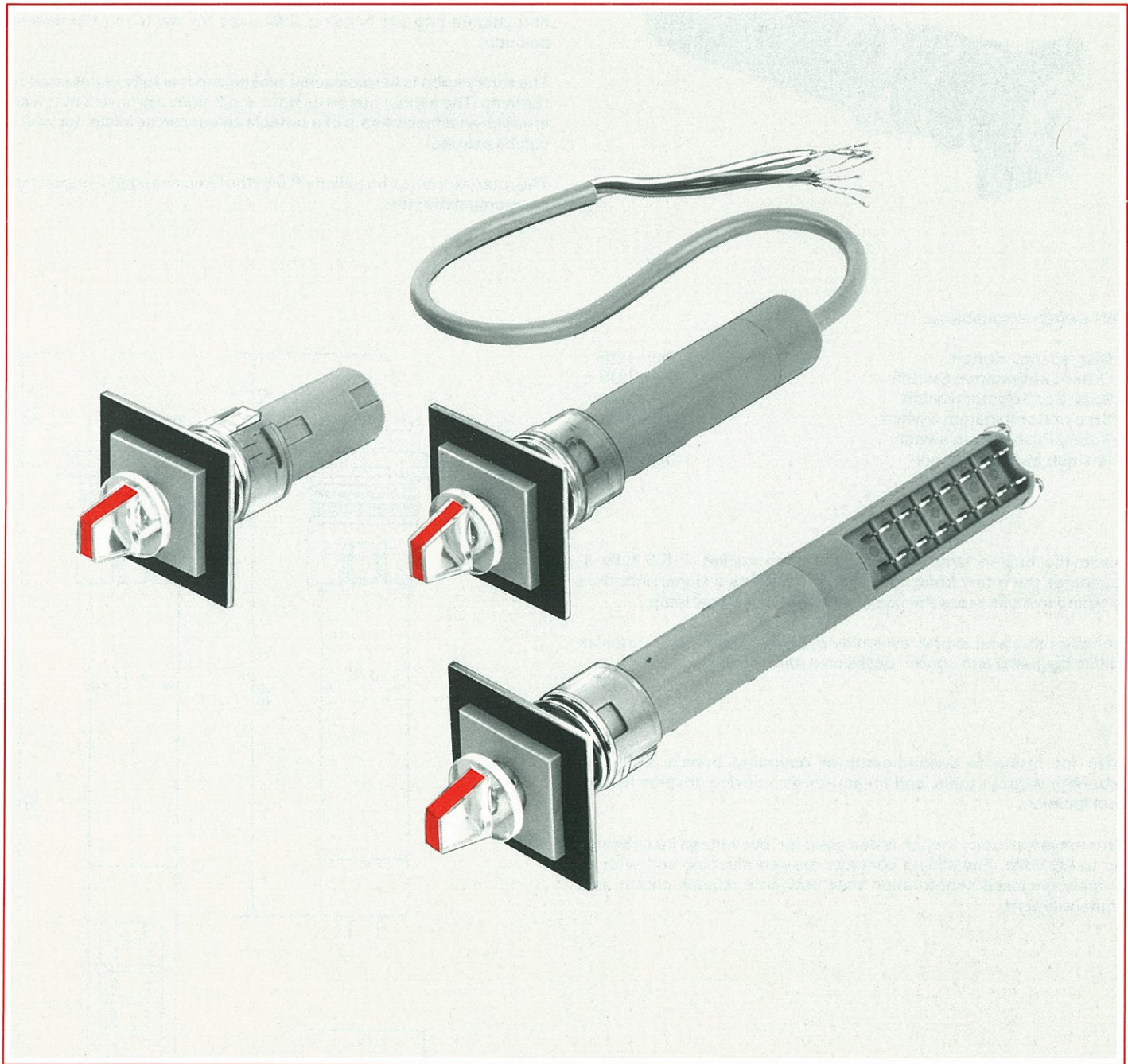


Universal Rotary Switch



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Universal Rotary Switch

Series Q

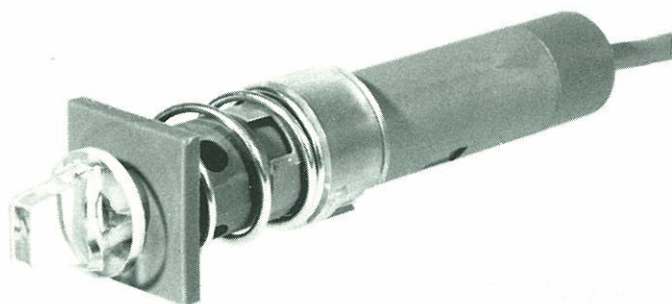
Switch construction

The rear part of a round plastic housing contains up to a maximum of four switch elements. A mounting is located in the mid-portion for the push-in lamp type PTT T 5.5, accessible from the front. The measurements of the square front flange are 24×24 mm, but it can be also supplied in the size 18×18 mm.

A pressure spring between the rear wall of the panel and the locking ring latched into the housing shell fixes the switch in the desired position.

The rotary knob is in translucent plastic and it is fully illuminated by the lamp. The banner has on its front and 2 sides a groove 3 mm wide in which an adhesive strip of a suitable colour can be inlaid, (or which can be painted).

The rotary knob can be pulled off and the lamp changed using a standard lamp extractor.



This switch is suitable as:

- Discrepancy switch
- Order Confirmation Switch
- Rotary or Selector Switch
- Step or Combination Switch
- Rotary Push Button switch
- Position Indicator switch

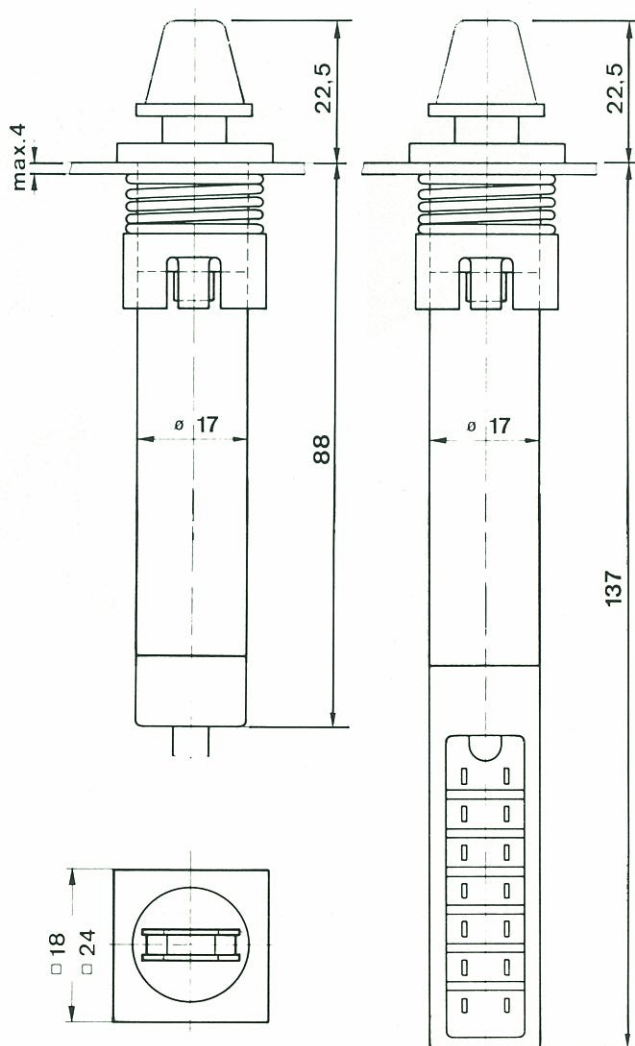
Type LQB ..
Type LQS ..
Type LQW ..
Type LQK ..
Type LQT ..
Type QM ..

Since the built-in lamp with push-in lamp socket T 5.5 fully illuminates the rotary knob, it can be also used as a signal unit, thus avoiding in most cases the use of an additional signal lamp.

Compact size and simple assembly allow the build up of complex mimic diagrams and control desks on a minimal area.

Also for fitting to switchboards or operating panels it can be mounted without tools, and an anti-torsion device ensures its correct location.

This universal rotary switch is designed for low voltage installations up to 60 Volts. The sliding contacts are self-cleaning and with an entirely enclosed construction they provide a reliable control and signal element.



Universal Rotary Switch

Series Q

Connection possibilities

The universal rotary switch is supplied in two versions with different connection types.

For mosaic systems where the switch may need to be moved over quite a large area without disturbing the wiring, a flying lead is used. In this case, there is no interconnection between switches, all connections leading directly back to terminals. This arrangement can give rise to rather thick cable looms so that clamps are more generally used than conduits.

Types...K

Switches having connection blocks mounted directly on them are more suitable where interconnection between switches is needed. This reduces the number of wires but can entail wiring changes if the switches are re-positioned in a mosaic panel.

Types...P

Colours of connecting conductors according to DIN 47100

1 White	8 Red
2 Brown	9 Black
3 Green	10 Violet
4 Yellow	11 Grey-Pink
5 Grey	12 Blue-Red
6 Pink	13 White-Green
7 Blue	14 Green-Brown

Electrical and Mechanical Characteristics

Operating voltage:	max. 60 V. DC/AC
Max. operating current:	0,5 A AC (ohmic Load) 0,4 A AC ($\cos \varphi = 0,75$) 0,2 A = (L/R = 7,5 msec.)
Switching capacity:	max. 30 W.

Testing voltage:

– between switching elements	: 1000 V
– between earth and contacts	: 2000 V
Contact resistance	: < 20 mOhms
Insulation resistance:	
– between the contact elements	: > 10 ³ MOhms
– between the contact segments	: > 1 MOhm
Contact material:	– bridge : BeBz, hard silver tipped – segment : Cu, hard gold plated
Contact pressure	: approx. 30 p
Mechanical service life	: 0,5 × 10 ⁶ switchings
Insulating material	: Polyamid 6
Section of the connections	: 0,14 mm ²
Type of lamps	: PTT push-in lamp T 5.5
Lamp voltages	: 6, 12, 24, 36, 48 and 60 Volts
Lamp power	: approx. 1 Watt
Dimensions	: See sketch on page 2

Mounting –

A. Building into "MOSAIC" Systems.

All universal rotary switches can be pushed directly into the honeycomb structure of mosaic systems with tiles 24 × 24 mm or 18 × 18 mm like normal mosaic tiles.

B. Building into sheet metal panels.

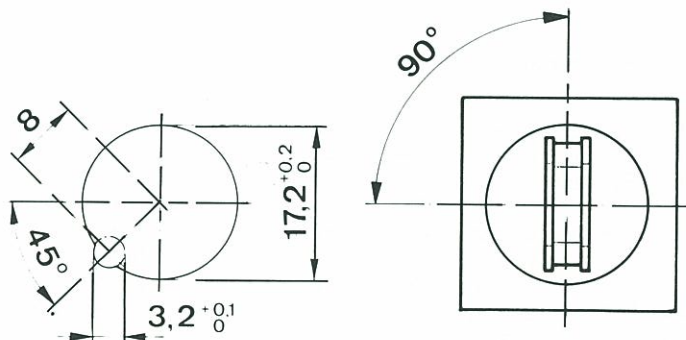
For mounting the switch, the plastic locking ring together with the spiral spring has to be pulled off over the housing.

The switch is then introduced from the front in the cut-out of the switchboard and turned so that the anti-torsion protection cam corresponds with the keyway on the hole rim.

From the rear, push first the pressure spring and then the locking ring (claws backwards) over the switch housing. The locking ring claws are to be aligned with the rectangular slots inside the housing, and the ring pressed forward until both claws engage.

To remove the switch from the panel, press lightly the locking ring against the spring, turn it a little until the claws leave the slots and pull off together with the spring over the housing.

Drilling plan



Changing the Lamp –

To change the lamp pull off the rotary knob. The lamp can be removed with a normal extractor for lamps type T 5.5. Introduce the new lamp with the glass bulb into the extractor. When introducing into the lamp mounting, pay attention to the position of the contacts. Replace the rotary knob.

For descriptions of the individual switches, please refer to pages 4 to 7.

Universal Rotary Switch Discrepancy Switch

Series Q Type LQB

Discrepancy switches are used for the remote control and the remote supervision of power switches and circuit breakers, motors and other electrically controlled devices. For the remote control of a unit, the rotary knob has first to be turned 90° to the preparatory position. The switching action is only given, however, when the knob is pressed in and turned a further 20° to the «overwound» position from which it reverts automatically to the preparatory position when released. The lamp indicates whether the switching action has functioned correctly.

Operating Principle

With the better known "dark diagram" system, the lamp inside the discrepancy switch is extinguished when the discrepancy switch and the switch which it controls are in the same position. The lamp either flashes or comes on steadily when there is any discrepancy between the positions of the two units. It only goes out again after acknowledgement, e.g. if the discrepancy switch is aligned with the controlled switch.

With the less usual "lit-up diagrams", the lamp is illuminated when the two units are in the same position and flashes when a discrepancy between the two positions arises. Particularly in the latter case, an acoustic signal should be linked with the flashing light.

To reverse the original switching action, the discrepancy switch is turned 90° away from the previous position when the lamp will immediately indicate a discrepancy. The switching action will, however, only take place when the switch is pushed in and turned a further 20° to the overwound position. The lamp will once again indicate the synchronization or otherwise of the two units.

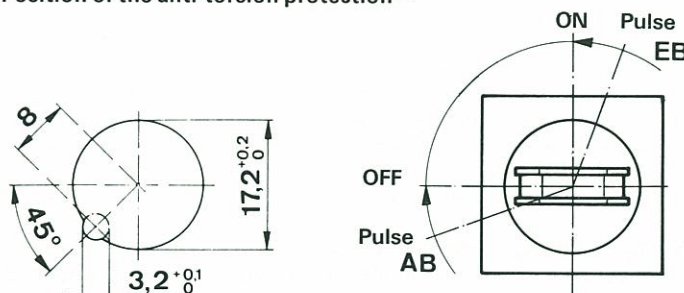
Type Designation –

1st	Position:	Type		=	LQ
2nd	Position:	Discrepancy switch		=	B
3rd	Position:	Number of signal contacts	}total max. 4]=	a
		Number of order transmitting contacts			
4th	Position:	Coloured strip on the knob			c
		Red = r White = w		none	o
				Blue	b
		Green = v Yellow = g		Black	s
5th	Position:	Lamp voltage		=	6, 12, 24, 36, 48 or 60 V
6th	Position:	With cable 2 m		=	K
		(longer cable on request)			
7th	Position:	With plug-in connections 2.8×0.5		=	P

Technical Characteristics –

- The signal contacts **a** remain closed even in the overwound position.
- The order transmission contacts **c** are open in both of the final positions **E** and **A** and closed only in both of the overwound positions **EB** and **AB**.
- For further data such as connection arrangements, mounting, dimensions and electrical details, please refer to pages 2 and 3.

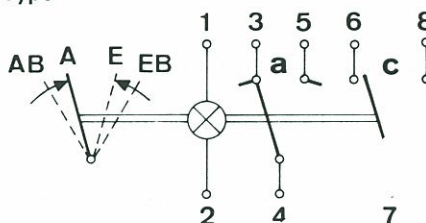
Position of the anti-torsion protection –



Contact Equipment –

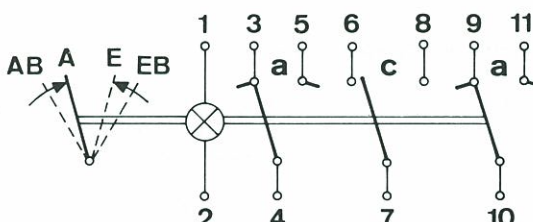
Type

LQB ac ...



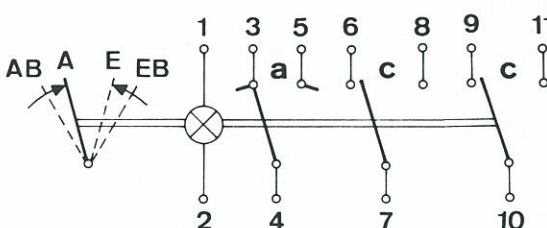
Type

LQB aca ...



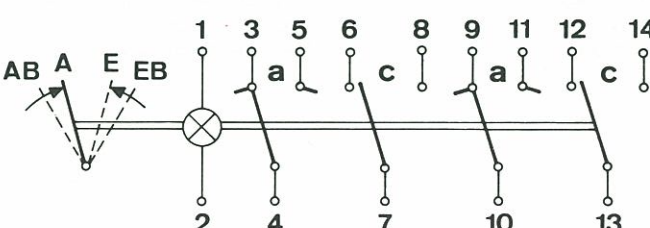
Type

LQB acc ...



Type

LQB ac ac ...



Universal Rotary Switch Order Confirmation Switch Selector Switches

Series Q Type LQS Types LQ1W, LQ2W and LQ3W

Order Confirmation Switch –

Type LQS

These switches are mostly used for the remote monitoring of switch positions. But they can also be used for the monitoring and position acknowledgement of any units with two specific final positions.

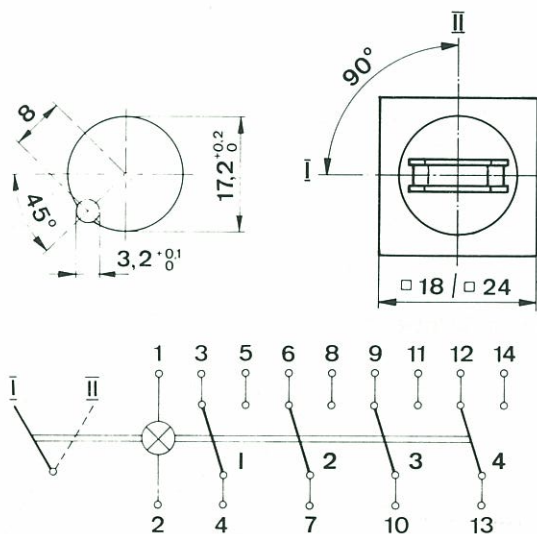
Consequently, order confirmation switches have no operational function to fulfill and are therefore position indicators which call the operator's attention to a changed working condition demanding his acknowledgement on the monitoring panel.

Working Principle –

The unit to be supervised must be equipped in both of the final positions with a contact which operates the built-in signal lamp over a switch contact in the order confirmation switch.

As soon as the position of the unit changes, the lamp begins to flash until the new working condition has been registered by turning the banner of the order confirmation switch.

Mostly, the differential position is not only signalled by the flashing of the built-in signal lamp, but by an acoustic alarm as well.



Type Designation for Basic Types

LQS and LQ1W

1st	Position:	Basic type =	LQS and LQ1W, LQ2W and LQ3W
2nd	Position:	Number of switching elements	= 1, 2, 3 or 4
3rd	Position:	Coloured strips on the knob:	none = o Red = r White = w Blue = b Green = v Yellow = g Black = s
4th	Position:	Lamp voltage	= 6, 12, 24, 36, 48 or 60 V
5th	Position:	With standard cable 2 m (longer cable on request)	= K
6th	Position:	With plug-in connections 2.8 × 0.5	= P

Selector Switches –

Types LQ1W, LQ2W, LQ3W

As a selector switch with 2 positions I/II, the order confirmation switch Type LQS described in the adjacent column will provide good service.

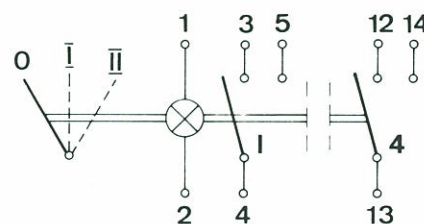
For a selector switch with 3 positions, two models are available:

- with neutral position to the left:
- with neutral position in the middle:

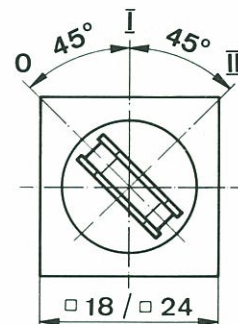
Type LQ1W –
Type LQ2W –

With both types a maximum of four switching elements can be included and the neutral position has neither contacts nor connections.

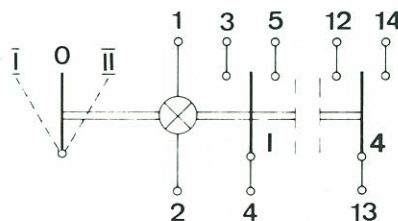
Type



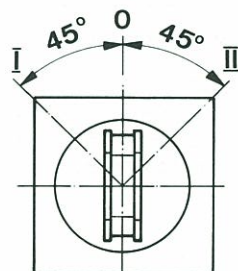
LQ1W ...



Type

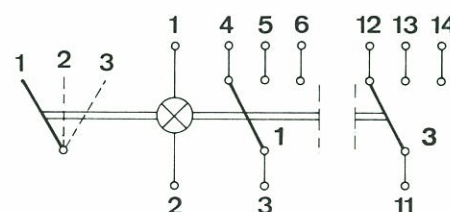


LQ2W ...

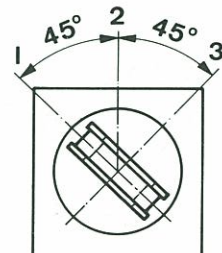


If all three positions are to be equipped with contacts and connections, the type designation is LQ3W. With this model, only three further switching elements can be built-in.

Type



LQ3W ...



For further technical details please refer to pages 2 and 3.

Universal Rotary Switches Step and Combination Switches

Series Q Types LQ.K and Q.K

The universal rotary switch described on pages 2 and 3 can also be supplied as a step or a combination switch with 4 or 5 positions. Both models permit the inclusion of a maximum of four switching elements, each one being provided with three connections.

The switch is only supplied as a finished product, i.e. assembly is at the factory. When placing orders, please indicate always in which way the different segments of the switch elements are to be connected mutually and onto the outgoing connections. It is advantageous to use our printed order forms which we gladly supply on request. See ordering example in next column.

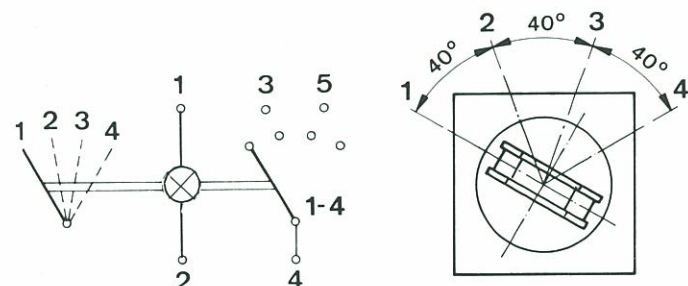
Type Designation –

1st Position:	Type	= LQ
2nd Position:	Number of positions: 4 positions	= 4
	5 positions	= 5
3rd Position:	Combination switch	= K
4th Position:	Number of switching elements	= 1, 2, 3 or 4
5th Position:	Coloured strip on knob	Red = r
	Yellow = g	Green = v
	White = w	Black = s
		Blue = b
		none = o
6th Position:	Lamp voltage	= 6, 12, 24, 36, 48, or 60 V
7th Position:	With standard cable 2 m (longer cable on request)	= K
8th Position:	with plug-in connections	= P

Switches with 4 Positions –

Type LQ4K..

The four positions are located symmetrically about the vertical centre line. The spacing between positions is 40°, the complete movement being therefore 120°.



Per switching element, only three connections are available on the terminals or on the outgoing cable. The connections between the switching elements and the connections 3,5/6,8/9,11 and 12,14 are made at the factory and must be specified on the order as per the example below:

Example with connection diagram –

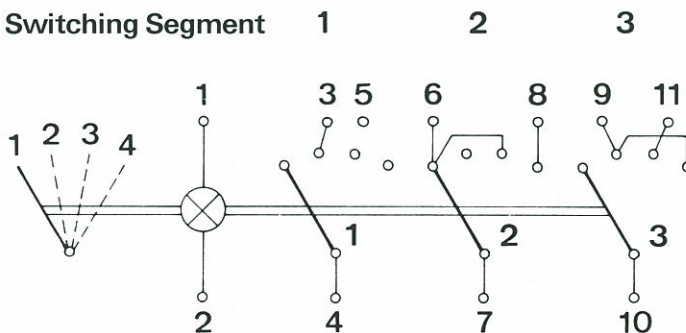
A combination switch with

- Lamp, 24 Volt
 - 4 positions (steps)
 - 3 switching elements with bridges
 - Knob with yellow coloured strip
 - AMP plug-in connections (also usable as soldering connections)
- is to be ordered.

Ordering Code wording:

LQ4K3g24 P

Connections to be as per the following diagram:



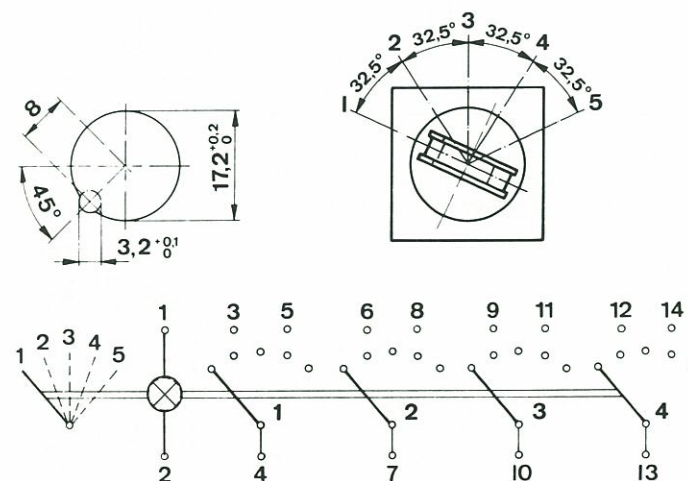
It would also be sufficient to send us your existing switch diagram.

On the model with output cable (Type ..K) always remember to specify the cable length.

Switches with 5 Positions –

Type LQ5K...

The five positions of this switch are located symmetrically about the vertical centre line, i.e. the third position is in the vertical position of the banner. The rotation range comprises 4 × 32.5 degrees or 130 degrees from position 1 to position 5.



Colours of the connecting conductors to DIN 47100

1 White	6 Pink	11 Grey-Pink
2 Brown	7 Blue	12 Blue-Red
3 Green	8 Red	13 White-Green
4 Yellow	9 Black	14 Green-Brown
5 Grey	10 Violet	

Universal Rotary Switches Rotary Push Button Switches Position Indicator Switches

Series
Type
Type

Q
LQT
QM

Rotary Push Button Switches –

Types LQT

Construction of the rotary switches is the same as for the type Q described overleaf. It is provided with only one defined position and returns every time from both of the final positions to the left and the right by spring tension to the home position. It is used mostly to initiate control commands, i.e. rotated left an OFF impulse is given and rotated right an ON impulse.

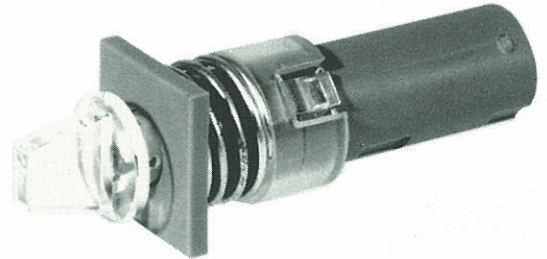
If equipped with a signal lamp, it can be used to monitor execution of a given order, e.g.:

The rotary switch can be equipped with a maximum of four switch elements.

The rotary switch can be equipped with a maximum of four switch elements.

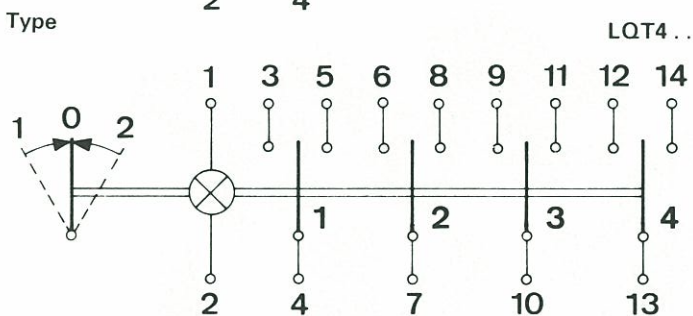
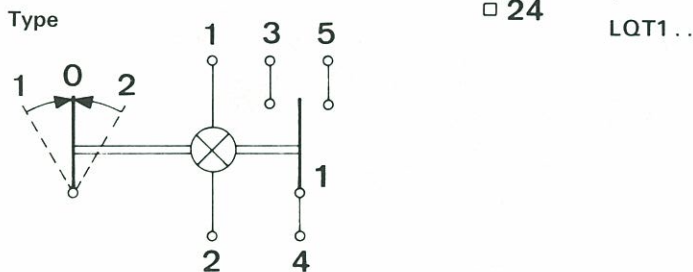
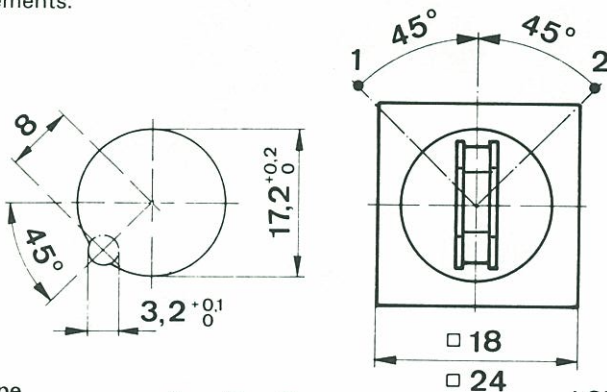
Position Indicator switches –

Type QM



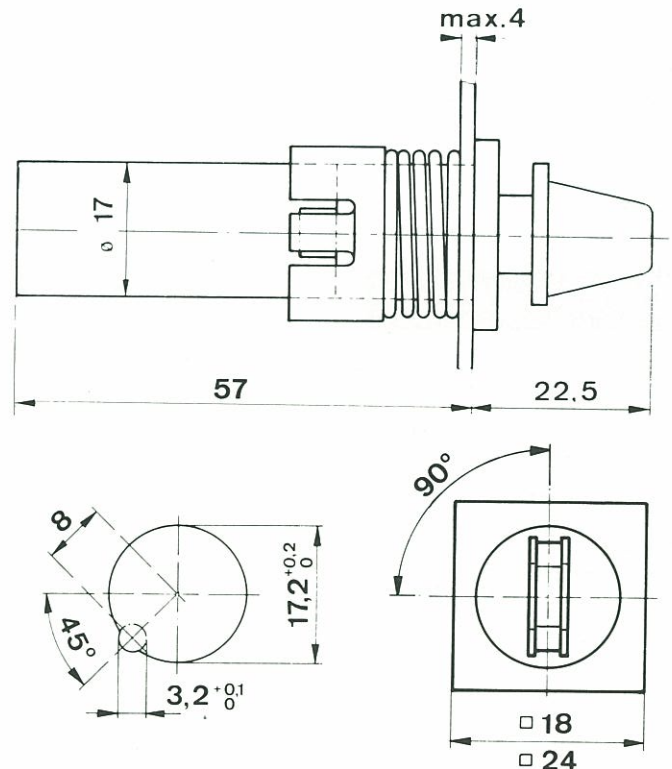
This model is not a switch since it has no contacts. The position indicator is simply a dummy and just aids the operator by the optical indication of a positive switching or working condition. It is turned manually to the required position in accordance with observation of a conditional change, or on a remote signal, without initiating any further function.

Since it also has no signal lamp, it cannot be used as a remote indicator unit.



Type Designation –

1st Position:	Basic type	=	LQT
2nd Position:	Number of switching elements	=	1, 2, 3, or 4
3rd Position:	Couloured strip on knob	none =	o
	Red = r	White = w	Green = v
	Yellow = g	Blue = b	Black = s
4th Position:	Lamp Voltage	6, 12, 24, 36, 48 or 60 V	
5th Position:	With standard cable 2 m	=	K
	(longer cable on request)		
6th Position:	With plug-in connections 2.8×0.5	=	P



For further technical data please refer to pages 2 and 3.