

2. Control Switches FS10

Application

Control switches FS10 with manual rotary drive are used for connecting auxiliary circuits, starting and controlling of motors.

The varieties of FS10 switches are substitutes for cam switches, used as meter selector switches, changeover switches, reversing switches, multi-speed switches.

Control switches of FS10 Series are compliant with standards:

- PN-EN 60947-3,
- PN-EN 60947-5-1,
- PN-EN 60947-1.

Construction

Cam control switches of FS10 Series have segment construction what allows designing bespoke functional assemblies.

FS10 control switches are made of a number of segments with contacts controlled by cams situated on a rotating shaft shifted manually with a knob. A segment in FS10 switch has two double break contacts shifted with two cams. The contact is open when the cam is raised what ensures superior contacting performance.

Switching angle is 60 degrees what produces 6 operating positions.

There are also 4-position connectors with 90 degree switching angle.



Mounting

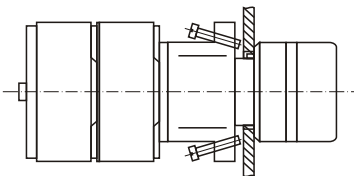


Fig.1. Board mounted, opening D22 or D30

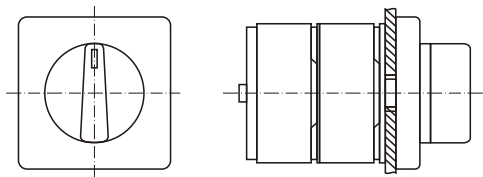


Fig.2. Connector with plate 48 x 48 mounted to the panel with screws

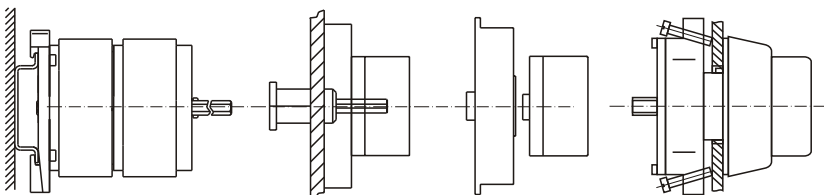


Fig.3. To base, snap-mounted on TS35 rail (S) and to base with screws

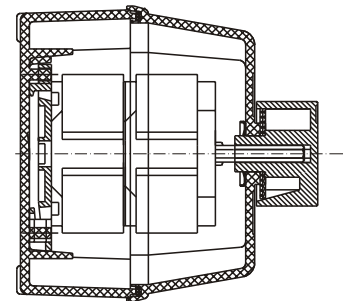
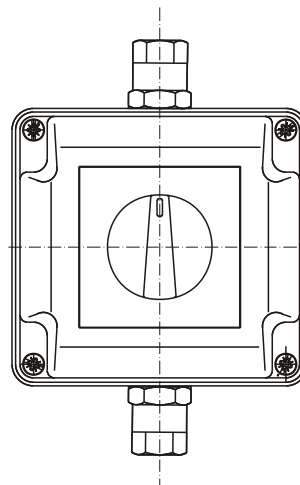
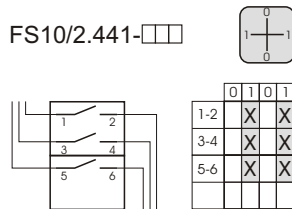
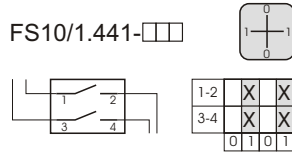
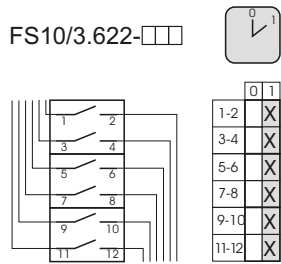
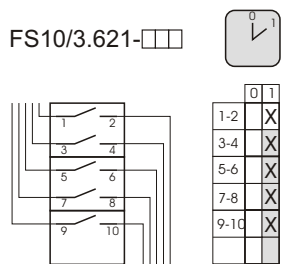
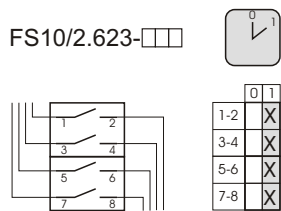
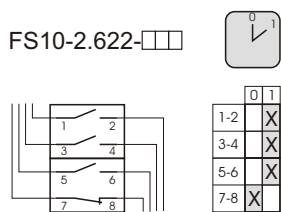
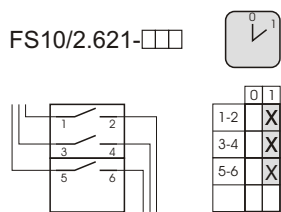
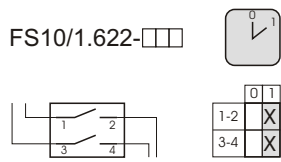
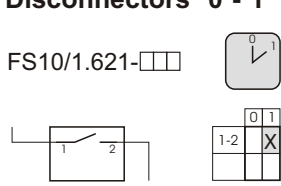


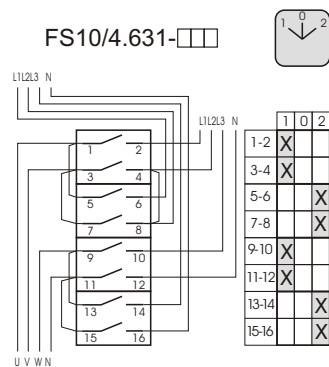
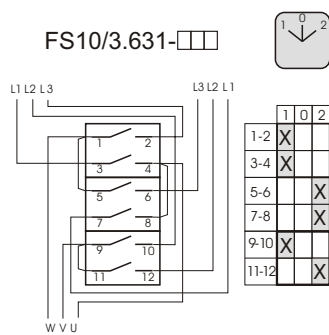
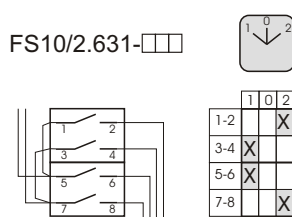
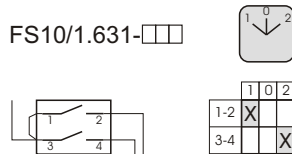
Fig.4. Switch in IP65 housing

Typical varieties of FS10 switches

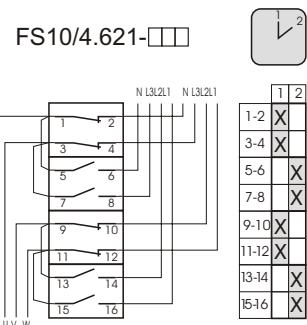
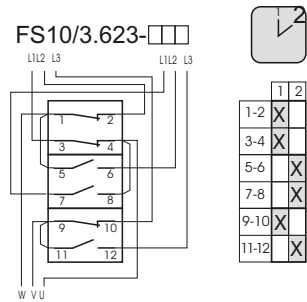
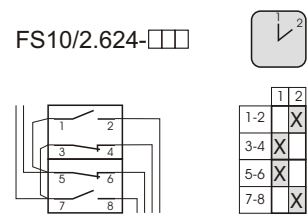
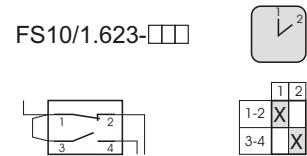
Disconnectors 0 - 1



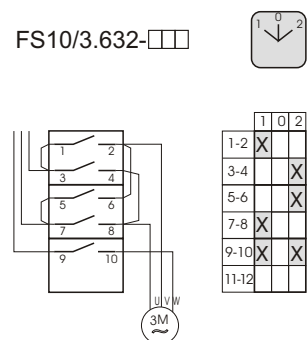
Changeover switches 1-0-2



Changeover switches 1-2 manual-auto

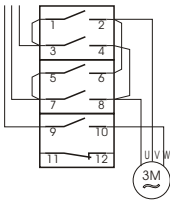


Reversing switches



Reversing switches

FS10/3.633-□□□

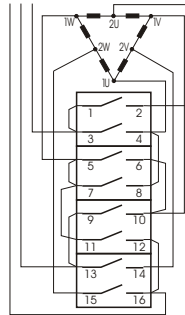


	1	0	2
1-2	X		
3-4			X
5-6			X
7-8	X		
9-10	X	X	
11-12	X		



Multi-speed switches

FS10/4.633-□□□

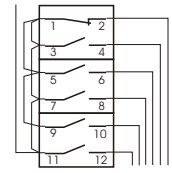


	0	Δ	Y
1-2	X		X
3-4	X		
5-6		X	
7-8		X	
9-10	X		
11-12	X		
13-14		X	X
15-16		X	X



Step switches cont.

FS10/3.661-□□□



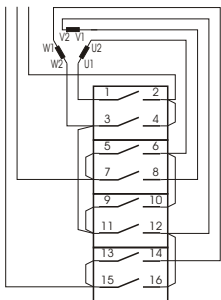
	1	2	3	4	5	6
1-2	X					
3-4		X				
5-6			X			
7-8				X		
9-10					X	
11-12						X



Star-Delta switches

0-Y-Δ

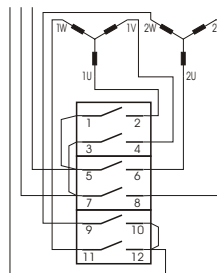
FS10/4.632-□□□



	0	Y	Δ
1-2	X	X	
3-4			X
5-6			X
7-8	X	X	
9-10	X		
11-12	X		
13-14	X	X	
15-16			X



FS10/3.634-□□□

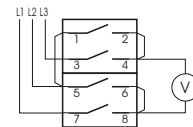


	0	Y	Δ
1-2	X		
3-4	X		
5-6		X	
7-8		X	
9-10	X		
11-12	X		



Voltmeter switches

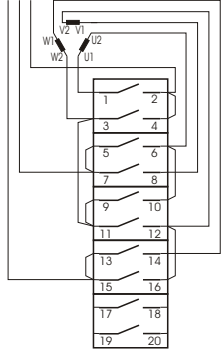
FS10/2.642-□□□



	0	U ₁₂	U ₂₃	U ₃₁
1-2	X			
3-4		X	X	
5-6		X		
7-8	X	X		



FS10/5.631-□□□

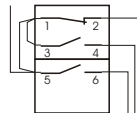


	0	Y	Δ
1-2	X	X	
3-4			X
5-6			X
7-8	X	X	
9-10	X		
11-12	X		
13-14	X	X	
15-16			X
17-18	X		
19-20	X	X	



Step switches

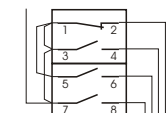
FS10/2.632-□□□



	1	2	3
1-2	X		
3-4		X	
5-6			X
7-8			



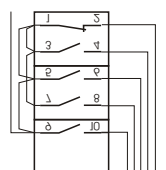
FS10/2.641-□□□



	1	2	3	4
1-2	X			
3-4		X		
5-6			X	
7-8				X



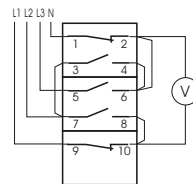
FS10/3.651-□□□



	1	2	3	4	5
1-2	X				
3-4		X			
5-6			X		
7-8				X	
9-10					X



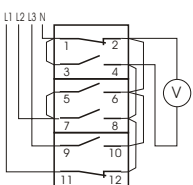
FS10/3.641-□□□



	U ₁₂	U ₂₃	U ₃₁	U ₂₁	U ₃₂	U ₁₃
1-2	X					
3-4		X				
5-6			X	X		
7-8				X		
9-10	X	X			X	



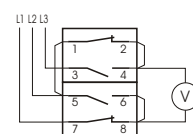
FS10/3.662-□□□



	U ₁₂	U ₂₃	U ₃₁	U ₂₁	U ₃₂	U ₁₃
1-2	X	X				
3-4			X			
5-6				X	X	
7-8				X		
9-10			X	X	X	
11-12	X	X				X



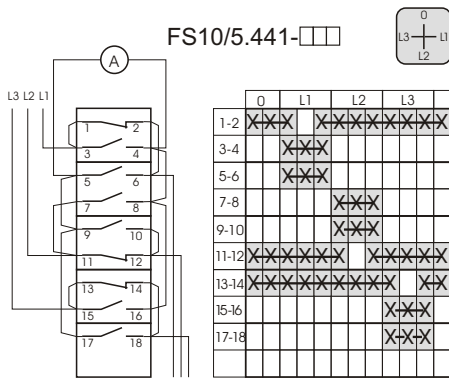
FS10/2.633-□□□



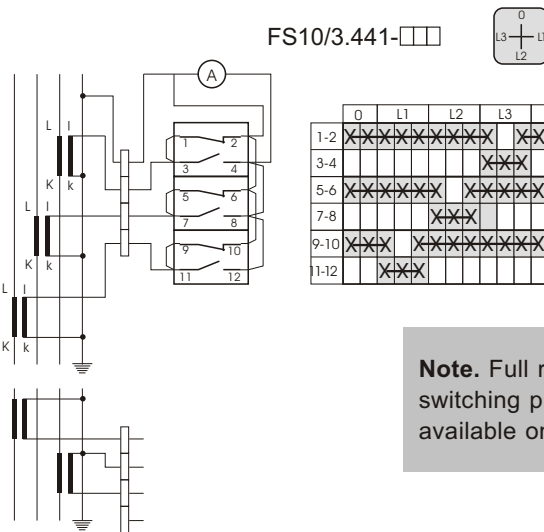
	U ₁₂	U ₂₃	U ₃₁
1-2	X		
3-4		X	X
5-6		X	
7-8	X	X	



Ammeter selector
- direct

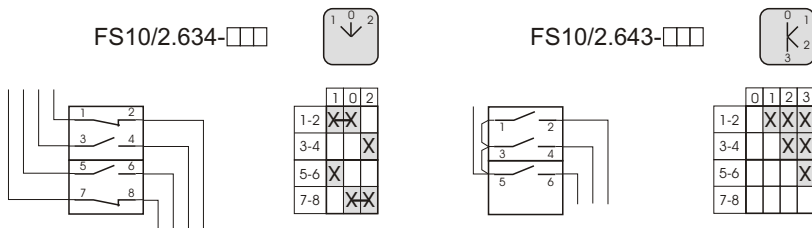


- indirect (via transformers)



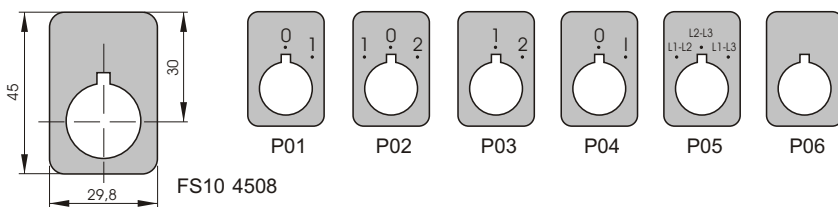
Note. Full range of switching programs is available on CD-ROM.

Control switches

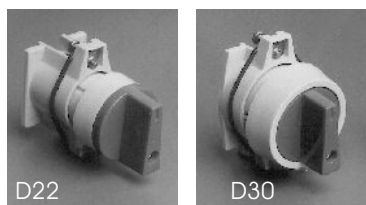


Accessories. Product range and markings.

Legend plates for D22 openings



Intermediate drive mounted on the panel in D22 or D30 openings



FS10 1403 R01 FS10 1404 R01

Knob mounted directly on FS10 switch shaft



FS10 1405 R01

Shaft extension



FS10 1807 R01

Ordering

While ordering a standard FS10 switch, specify its type with assembly code and mounting code, for example:

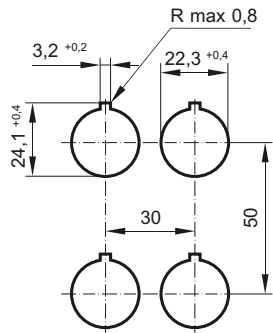
1. Disconnecter 0-I, 3-way, assembly 2.621- mounted in panel opening D22 (Fig. 5):
SWITCH FS10/2.621-D22

2. Inter wire voltmeter selector (L1-L2; L2-L3; L1-L3), assembly 2.633-, mounted to the base under the panel (S), with D30 drive mounted in the panel opening.
SWITCH FS10/2.633-S30

While ordering a type not listed in the catalogue, specify the switching program (as in the catalogue), and mounting method (Fig. 1..4).

Dimensions

Opening D22



Opening D30

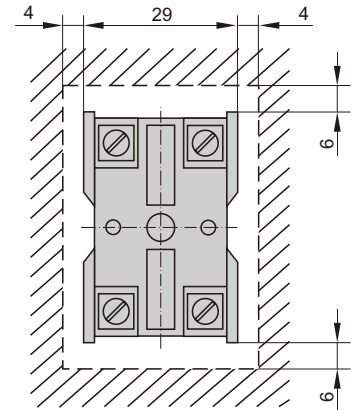
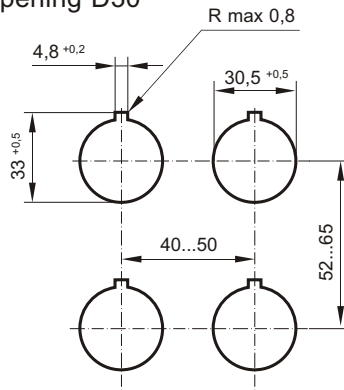
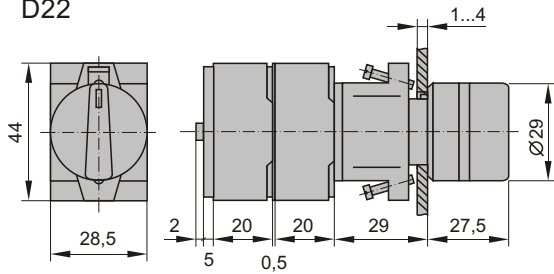


Fig.5 Opening spacings for mounting FS10 switches

Fig.6 Min. distance from conducting parts

D22



D30

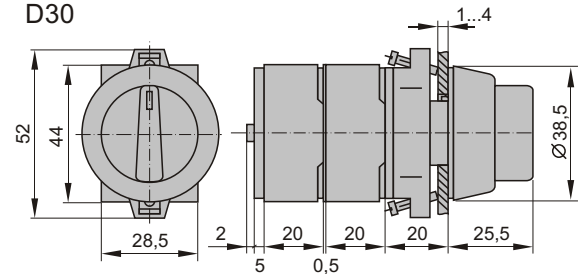


Fig.7 FS10 switches mounted in standard openings

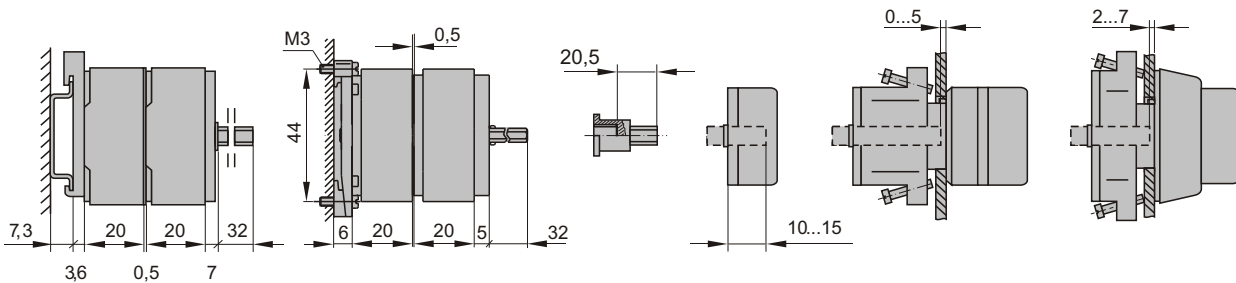


Fig.8 FS10 switches mounted to the base under the panel

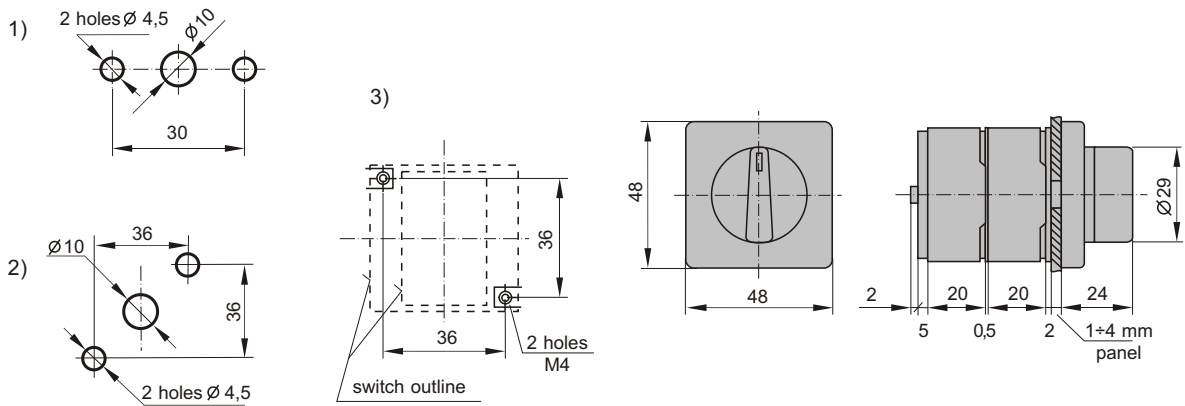


Fig.9 FS10 switches with plate 48x48 - mounting variants 1), 2), 3).

