



# Kraus & Naimer

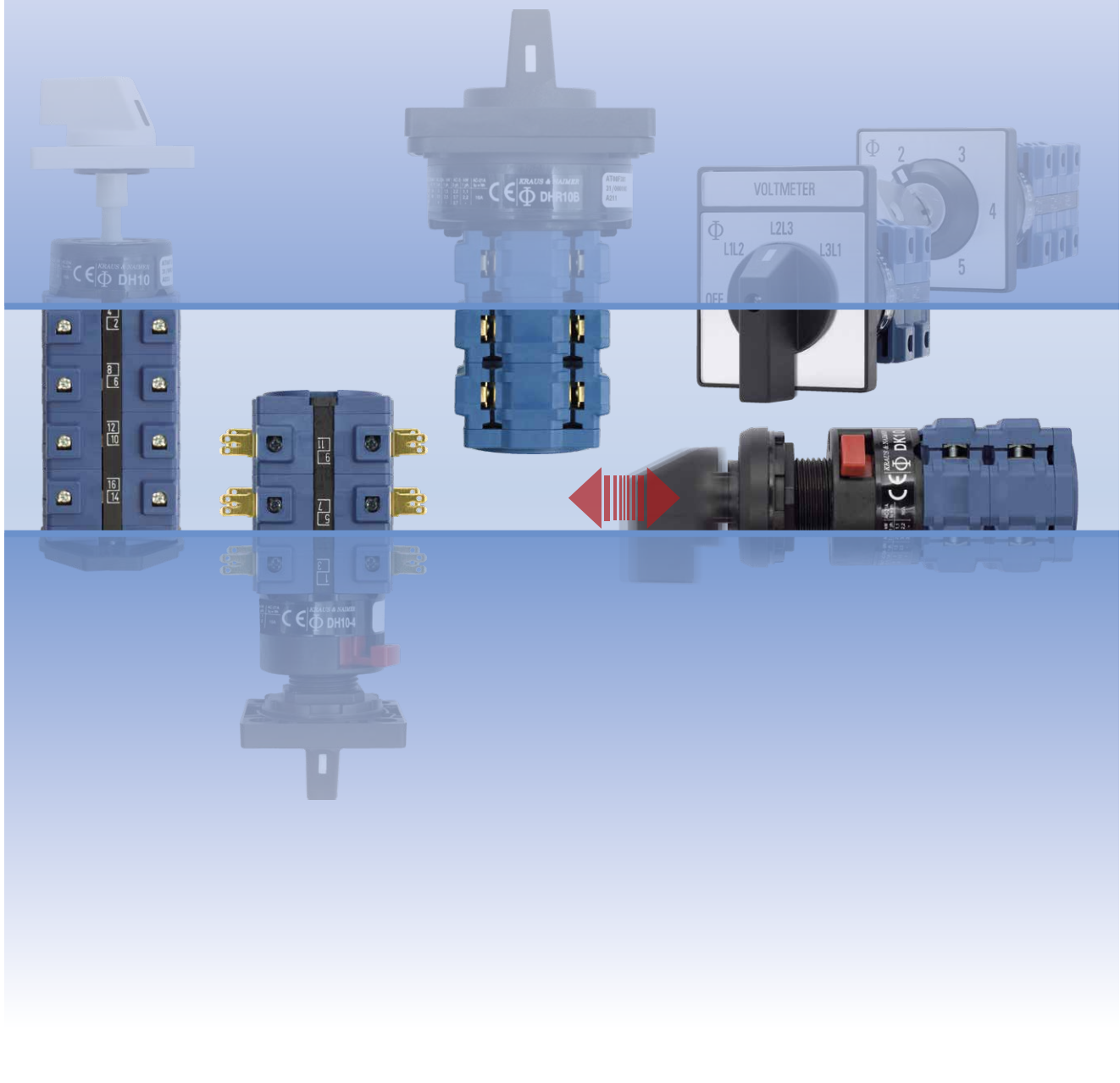
BLUE LINE switchgear

since 1907

## Catalog 130 Control Switches for Special Application

02/2018

DH, DHR, DK and DKR type up to 16 A



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# Kraus & Naimer

The development of the Blue Line rotary switch, contactor and motor starter product ranges is based on more than hundred years experience by Kraus & Naimer in the design and manufacture of electrical switchgear. Kraus & Naimer pioneered the introduction of the cam operated rotary switch and continues to be recognized as the world leader in that product field.

## BLUE LINE

Blue Line products are protected by numerous patents throughout the industrial world. They are built to national and international standards and designed to withstand adverse temperatures and climates.

Blue Line products are accepted and universally recognized for their quality and workmanship. They are supported by a worldwide sales and service organization.

The Kraus & Naimer Registered Trademark



WORLDWIDE SYMBOL  
FOR QUALITY SWITCHGEAR

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Disconnectors and Main Switches acc. to IEC 60947-3 see Catalog 500

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## Construction Data

Cam switches of the DH, DHR, DK and DKR series are designed for universal applications and may ideally be used for control switches, instrumentation switches and circuit interrupters. Different contact designs, contact materials and terminals allow their use in electronic circuitry as well as in aggressive environments in accordance with IEC 60947-3, EN 60947-3 and VDE 0660 part 107.

Fully enclosed contact chambers provide optimum protection from dust and other contaminants.

The stage is the basis for all switches and can be supplied with a maximum of 2 contacts. The terminals are accessible from the side. All switches in this series are supplied with open terminals and are finger-proof according to EN 50274,

VDE 0660 part 514 and DGVV V3. Captive plus-minus terminal screws and integrated screwdriver guides facilitate wiring. Alternatively, the switches of the DH and DK series can be supplied with integrated quick connect terminals. Each quick connect terminal may accept either one 6.3 mm or two 2.8 mm quick connect lugs.

For connection with ring type terminals the DHR and DKR series of switches are available. These switches are supplied with large open terminals, which allow for connection without the need of removing the screws.

### 2 Contact Systems

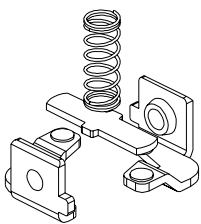


Fig. 1

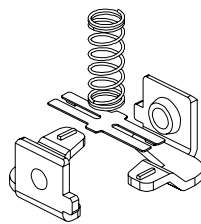
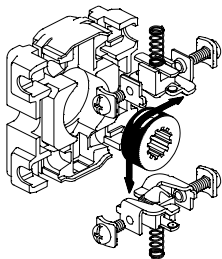


Fig. 2

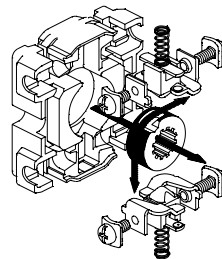
A rigid double-break bridge with silver alloy contacts (DH10, DHR10, DK10, DKR10, DH10B) provides high making and breaking capabilities for regular control applications. (Fig. 1)

Self-cleaning H-bridges with a cross-wire contact system are used for electronic and low voltage range applications. They are available with either silver contacts (DH12, DHR12, DK12, DKR12, DH12B, DHR12B) or gold-plated contacts (DH11, DHR11, DK11, DH11B, DHR11B). This contact system offers maximum contact security, low resistance and virtually chatter free switching. (Fig. 2)

### 2 Methods of Contact Operation



Turning

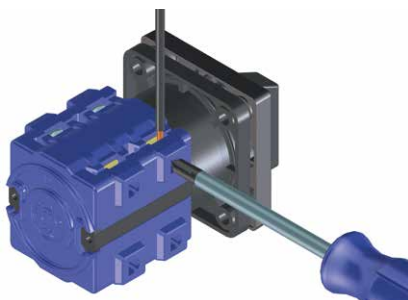


Turning and Pushing

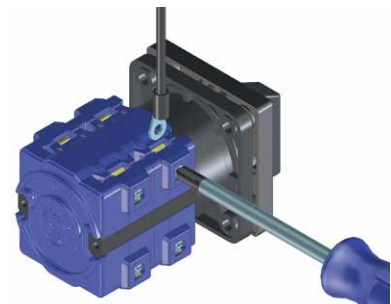
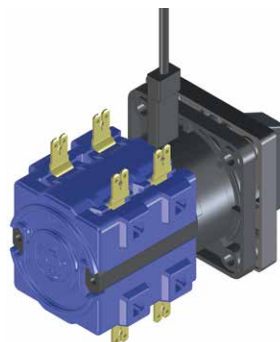
The contacts of the switches of the DH and DHR series can be manually operated by turning and the DK and DKR series by turning and/or pushing. This versatility of handle movement permits a countless variety of contact arrangements. Special pre-select programs enable the operator to rotate the handle to any one of up to 12 positions, while bypassing contact operation in all intermediate positions. Momentary contact operation for a pre-selected position occurs only when the handle is depressed. Releasing the handle returns switch operation to the normal plane.

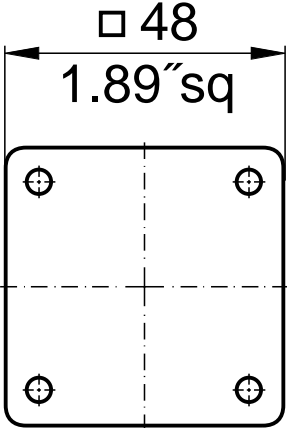
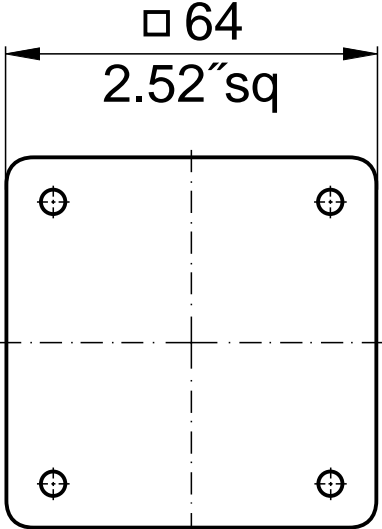
Type	Size	Possible Switching Angles	Max. No. of Stages
DH10-DHR12	S0	30°, 45°, 60°, 90°	12
DK10-DKR12	S0	30°, 60°, 90°	9
DH10B-DHR12B	S1	30°, 45°, 60°, 90°	12

### DH and DK-series



### DHR and DKR-series



Switch Size	Type	According to IEC/EN 60947-3 and VDE 0660 part 107			
		Operational Voltage <sup>1</sup> min.-max. $U_e$	Thermal Current $I_u/I_{th}$	Operational Current $I_e$ 220 V-240 V AC-15	
		V	A	A	
<p><b>S0</b></p> 	<p><b>DH10</b> <b>DH11</b> <b>DH12</b> <b>DHR10</b> <b>DHR11</b> <b>DHR12</b></p>	<p>20-690 1<sup>2</sup>-600 6-600 20-690 1<sup>2</sup>-600 6-600</p>	<p>16 6 6 16 6 6</p>	<p>5 - - 5 - -</p>	
	Operation by turning				
	Operation by turning/pushing				
	<p><b>DK10</b> <b>DK11</b> <b>DK12</b> <b>DKR12</b></p>	<p>20-690 1<sup>2</sup>-600 6-600 6-600</p>	<p>16 6 6 6</p>	<p>5 - - -</p>	
	<p><b>S1</b></p> 	<p><b>DH10B</b> <b>DH11B</b> <b>DH12B</b> <b>DHR11B</b> <b>DHR12B</b></p>	<p>20-690 1<sup>2</sup>-600 6-600 1<sup>2</sup>-600 6-600</p>	<p>16 6 6 6 6</p>	<p>5 - - - -</p>
		Operation by turning			
		For further technical details, refer to pages 40 and 41. To furnish with gold contacts and quick connects, refer to page 6.			

<sup>1</sup>Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. <sup>2</sup>Values for lower voltages on request.

## How to order

Disconnectors and Main Switches according to IEC 60947-3 see Catalog 500

Three types of data (shown below) are required for ordering Blue Line cam-operated switches. Code numbers for ordering are shown in this catalog.

### 1. Type of Switch

The type of switch required may be easily selected by referring to the table on page 5 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 40 and 41. Variations of contacts and terminals are shown below.

### 2. Switch Function

The code numbers for standard switches shown on pages 8-30 indicate the switch function, escutcheon plate, handle and any optional extras.

Additional coding to modify type and color of handle and escutcheon plate is explained below.

### 3. Type of Mounting

Types of mounting are shown on pages 31-35. Catalog **101** describes enclosures and optional extras.

Specify the mounting code to indicate required mounting.

**DH10**

**A202-600**

**VE**

## Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts <sup>1</sup>	DH10-1, DK10-1
-4	with integrated quick connects	DH10-4, DH11-4, DH12-4, DK10-4, DK12-4, DH11B-4, DH12B-4

<sup>1</sup>Technical data on request.

## Handles, Escutcheon Plates and Optional Extras

The handles for standard switches shown on pages 8-30 are suitable for mounting units with four hole panel mounting. Alternative types of handles available are illustrated on pages 31-35.

When a handle, escutcheon plate or optional extra is required but not covered by the dash number, the code number for the selected component should be entered separately. A comprehensive range of available standard escutcheon plates is illustrated on pages 36-38. Non-standard or special escutcheon plate engravings are available at extra cost. The large number of optional extras and enclosures is covered in Catalog **101**.

## Switch Size

DH, DHR, DK and DKR switches are available in sizes S0 and S1. These size codes indicate the dimension of the mounting, the escutcheon plate and the handle, as well as the size of optional devices and enclosures. Page 5 lists these sizes and the various switch types they include.

# How to order

## Ordering of Special Switches and Escutcheon Plates

When ordering special switches and special escutcheon plates, we recommend the use of our ordering form as shown in this example.

Contacts may be operated in 2 plains. Consequently, each contact has two columns in which the required contact function is to be indicated. The shaded column indicates function of the contact with depressed handle. This means that the switch handle may be depressed in each switching position. Rotation of the handle is possible only in the depressed position.

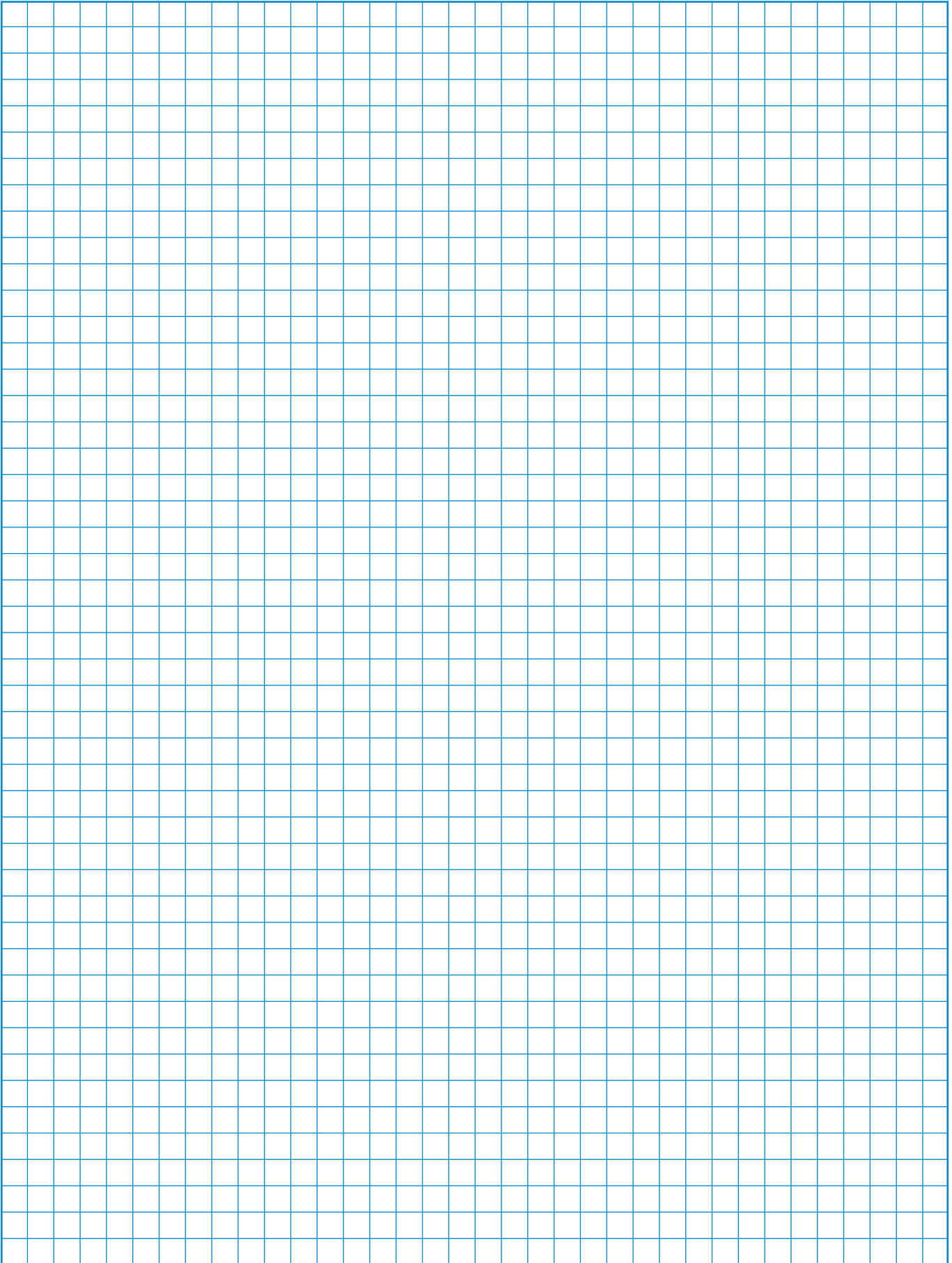
Contacts 1-2, 3-4, 11-12 and 5-6, 7-8, 9-10 close in position 1 or 3. Depressing the handle will not change the contact function. In position 1 or 3 contact 13-14 is closed. This contact opens if the handle is depressed.

		D		CODE NO.	
POSITIONS					
X	1	1	X	X	X
X	2	2			X
X	3	3	X	X	X
	4	4			
	5	5			
	6	6			
	7	7			
	8	8			
	9	9			
	10	10			
	11	11			
	12	12			
TYPE OF MOUNTING	FT2	OPTIONAL EXTRAS		JUMPERS 1 ○ 3 ○ 4 ○ 2 ○ 2 ○ 5 ○ 7 ○ 8 ○ 6 ○ 3 ○ 9 ○ 11 ○ 12 ○ 10 ○ 4 ○ 13 ○ 15 ○ 16 ○ 14 ○ 5 ○ 17 ○ 19 ○ 20 ○ 18 ○ 6 ○ 21 ○ 23 ○ 24 ○ 22 ○ 7 ○ 25 ○ 27 ○ 28 ○ 26 ○ 8 ○ 29 ○ 31 ○ 32 ○ 30 ○ 9 ○ 33 ○ 35 ○ 36 ○ 34 ○	
ESCUTCH. PL.					
HANDLE, COLOR	G 251				
LATCH. MECH.					
STOP					
CAMS					
NO. OF STAGES		SIG.		DATE	
1 POLE	2 POLE			COMPANY	

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Order forms are available on request.

**Notes:**



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# Switch Function and Configuration




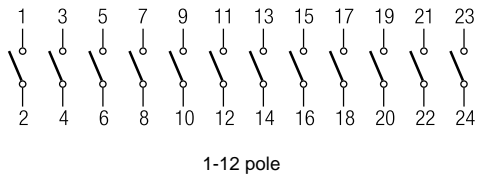






















# DH, DHR Switches

Turn to operate

Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			




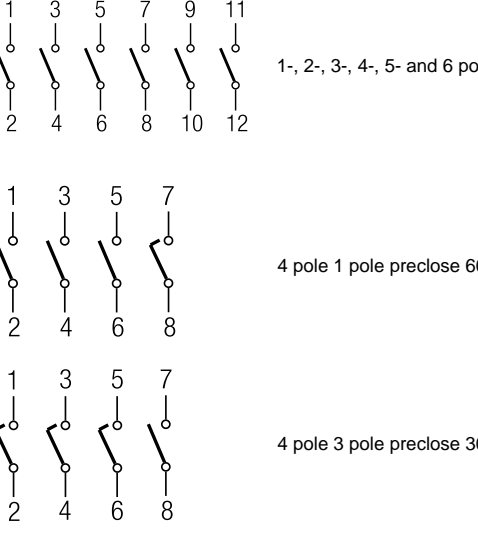

















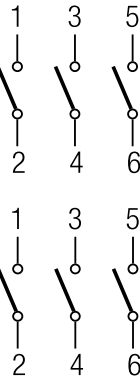

## ON/OFF Switches with 60° Switching

[Dimensions p. 46](#)











1 pole	 <p>F070</p>			A200	1	
2 pole				A201	1	
3 pole				A202	2	
4 pole				A203	2	
5 pole				WAA341	3	
6 pole				A342	3	
7 pole				A343	4	
8 pole				A344	4	
9 pole				WAA345	5	
10 pole				A346	5	
11 pole				WAA347	6	
12 pole				A348	6	

## ON/OFF Switches with 90° Switching

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1 pole contacts	 <p>F056</p>			A290	1	
2 pole preclose 30°				A291	1	
3 pole				A292	2	
4 pole				A324	2	
4 pole 1 pole preclose 60°				A293	2	
4 pole 3 pole preclose 30°				WAA327	2	
5 pole contacts			WAA325	3		
6 pole preclose 30°			A326	3		
3 pole 360° rotation	 <p>F062</p>			WAA208	2	
3 pole for foot operation				WAA386	2	




























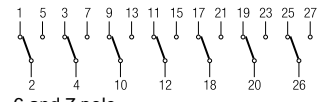
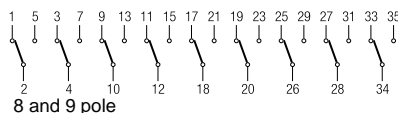
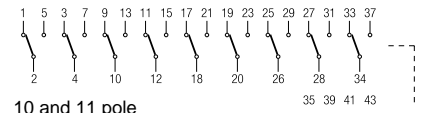
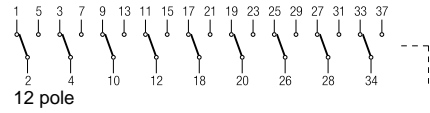
## ON/OFF Switches with Spring Return to „OFF“ 30° Switching

1 pole	 <p>F153</p>			A204	1	
2 pole				A205	1	
3 pole				WAA206	2	
4 pole				WAA207	2	








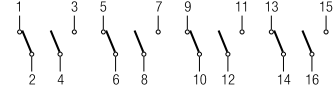




Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			

Double-throw Switches without „OFF“ 60° Switching






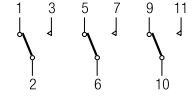
[Dimensions p. 46](#)

1 pole	 <p>F072</p>	           	           	<p>A220 A221 A222 A223 A369 A370 A371 A372 WAA373 WAA374 WAA375 WAA376</p>	<p>1 2 3 4 5 6 7 8 9 10 11 12</p>	 <p>1-4 pole</p>  <p>5 pole</p>  <p>6 and 7 pole</p>  <p>8 and 9 pole</p>  <p>10 and 11 pole</p>  <p>12 pole</p>
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Double-throw Switches without „OFF“ with electrically isolated contacts

1 pole	 <p>F072</p>	  	  	<p>A720 A721 A722 A723</p>	<p>1 2 3 4</p>	 <p>1-4 pole</p>
2 pole						
3 pole						
4 pole						
1 pole with spring return	 <p>F026</p>			<p>A795</p>	<p>1</p>	 <p>1 pole with spring return</p>




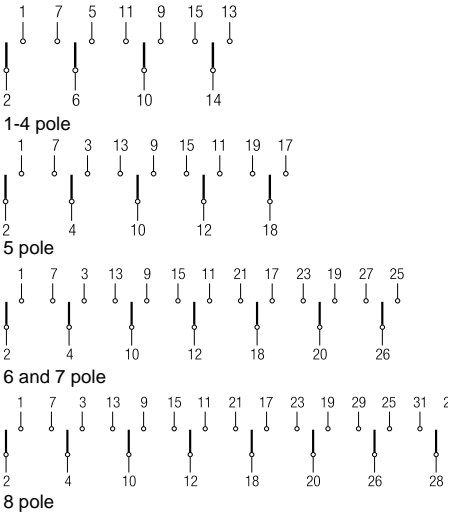
Double-throw Switches with Spring Return to Center

1 pole	 <p>F026</p>	 	 	<p>A295 A296 WAA297</p>	<p>1 2 3</p>	 <p>1-3 pole</p>
2 pole						
3 pole						

Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			




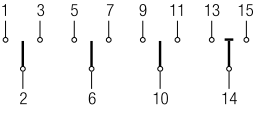
Double-throw Switches with Center „OFF“ 60° Switching

[Dimensions p. 46](#)




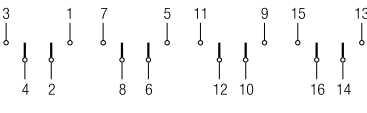




1 pole	 <p>F071</p>			A210	1	
2 pole				A211	2	
3 pole				A212	3	
4 pole				A213	4	
5 pole				A361	5	
6 pole				A362	6	
7 pole				WAA363	7	
8 pole				WAA364	8	

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


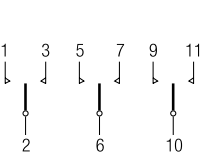



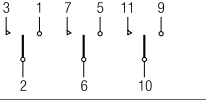
Double-throw Switches with Center „OFF“ 90° Switching

1 pole contacts	 <p>F057</p>			A218	1		1-4 pole
2 pole preclose 30°				A219	2		
3 pole				WAA299	3		
4 pole 1 pole preclose 60°				WAA294	4		

Double-throw Switches with Center „OFF“ and electrically isolated contacts

1 pole	 <p>F071</p>			A710	1		1-4 pole
2 pole				A711	2		
3 pole				A712	3		
4 pole				A713	4		
1 pole with spring return to center	 <p>F025</p>			A714	1		1 and 2 pole
2 pole to center				A715	2		














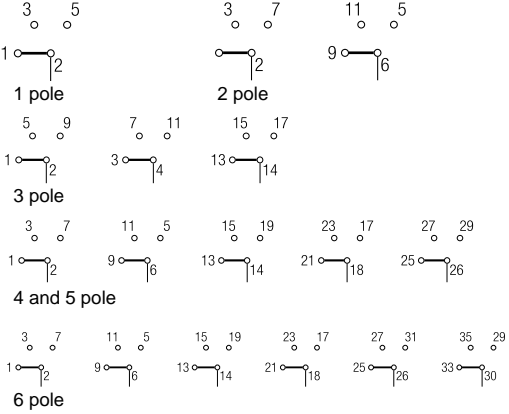













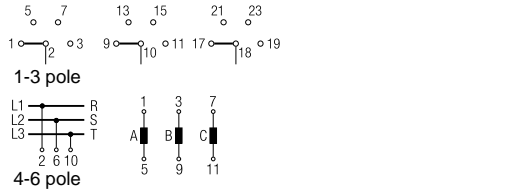









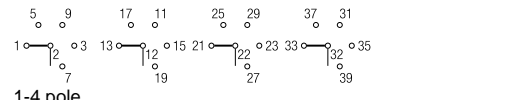







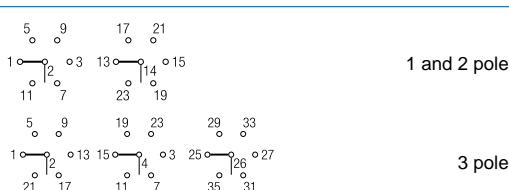







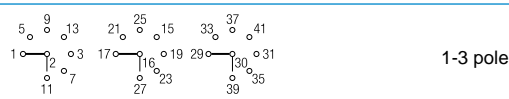







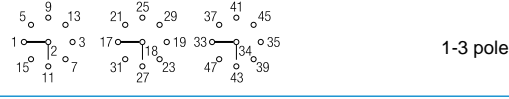







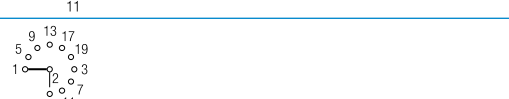



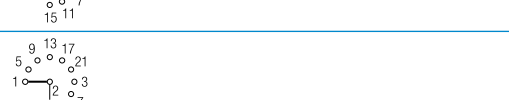




Double-throw Switches with Spring Return to Center

1 pole with spring return to center	 <p>F025</p>			A214	1		1-3 pole
2 pole				A215	2		
3 pole				A216	3		
1 pole with spring return from left to center	 <p>F261</p>			A320	1		1-3 pole
2 pole				A321	2		
3 pole				A322	3		

Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			

## Multi-step Switches without „OFF“




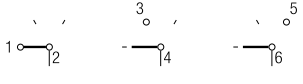


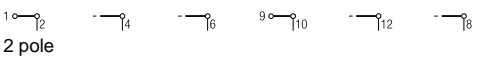



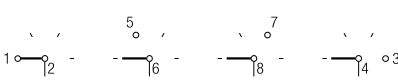


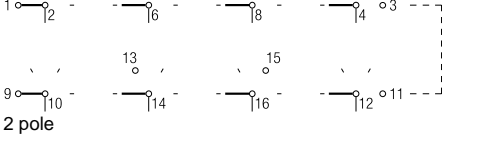
[Dimensions p. 46](#)

1 pole 3 Step 2 pole 3 pole 4 pole 5 pole 6 pole	 F076	     	     	A230 A250 A270 A476 WAA484 WAA489	2 3 5 6 8 9	
1 pole 4 Step 2 pole 3 pole 4 pole 5 pole 6 pole	 F077	     	     	A231 A251 A271 A477 WAA485 WAA490	2 4 6 8 10 12	
1 pole 5 Step 2 pole 3 pole 4 pole	 F078	   	   	A232 A252 WAA272 WAA478	3 5 8 10	
1 pole 6 Step 2 pole 3 pole	 F079	  	  	A233 WAA253 WAA273	3 6 9	
1 pole 7 Step 2 pole 3 pole	 F110	  	  	WAA234 WAA254 WAA274	4 7 11	
1 pole 8 Step 2 pole 3 pole	 F111	  	  	WAA235 WAA255 WAA275	4 8 12	
1 pole 9 Step	 F010			WAA236	5	
1 pole 10 Step	 F011			WAA237	5	
1 pole 11 Step	 F012			WAA238	6	
1 pole 12 Step	 F013			WAA239	6	




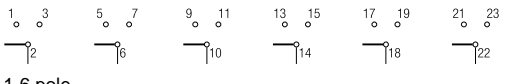
























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Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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**Multi-step Switches without „OFF“ with electrically isolated contacts** [Dimensions p. 46](#)

1 pole 3 Step	 F076			A730	2	 1 pole
2 pole				A750	3	 2 pole
1 pole 4 Step	 F077			A731	2	 1 pole
2 pole				A751	4	 2 pole










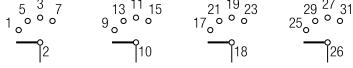







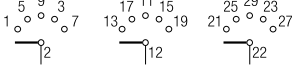







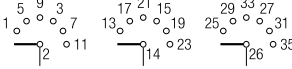





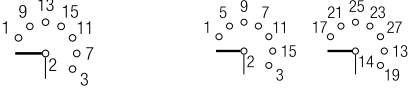



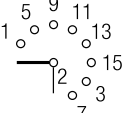



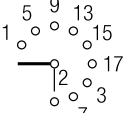



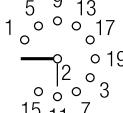



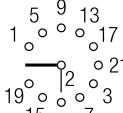
**Multi-step Switches with „OFF“**

1 pole 2 Step	 F075			A240	1	 1-6 pole
2 pole				A260	2	
3 pole				A280	3	
4 pole				WAA480	4	
5 pole				WAA486	5	
6 pole				WAA491	6	
1 pole 3 Step	 F109			A241	2	 1 and 2 pole
2 pole				A261	3	
3 pole				A281	5	
4 pole				A481	6	
4 pole				WAA487	8	
5 pole						

Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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Multi-step Switches with „OFF“

[Dimensions p. 46](#)








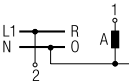
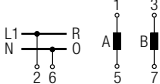
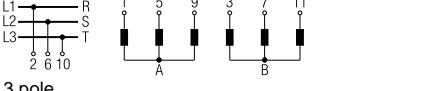







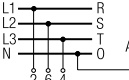
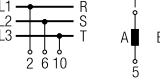
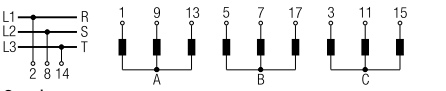







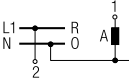
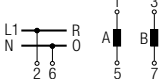
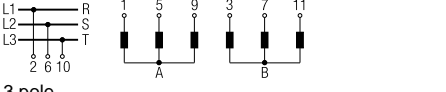



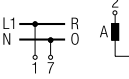
1 pole 4 Step 2 pole 3 pole 4 pole	 F002	   	   	A242 WAA262 WAA282 WAA482	2 4 6 8	 1-4 pole
1 pole 5 Step 2 pole 3 pole	 F003	  	  	A243 WAA263 WAA283	3 5 8	 1-3 pole
1 pole 6 Step 2 pole 3 pole	 F004	  	  	A244 WAA264 WAA284	3 6 9	 1-3 pole
1 pole 7 Step 2 pole	 F005	 	 	WAA245 WAA265	4 7	 1 pole 2 pole
1 pole 8 Step	 F006			WAA246	4	
1 pole 9 Step	 F007			WAA247	5	
1 pole 10 Step	 F008			WAA248	5	
1 pole 11 Step	 F009			WAA249	6	

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Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			

## General Application Switches








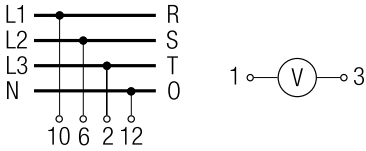
[Dimensions p. 46](#)

1 pole 2 Gang 2 pole Switching sequence: 3 pole 0, A, A+B	 <p>F075</p>	  	  	<b>A310</b> <b>A312</b> <b>WAA314</b>	1 2 3	 <p>1 pole</p>  <p>2 pole</p>  <p>3 pole</p>
1 pole 3 Gang 2 pole Switching sequence: 3 pole 0, A, A+B, A+B+C	 <p>F001</p>	  	  	<b>A311</b> <b>WAA313</b> <b>WAA315</b>	2 3 5	 <p>1 pole</p>  <p>2 pole</p>  <p>3 pole</p>
1 pole 2 Gang 2 pole Series switching 3 pole Switching sequence: 0, A, B, A+B	 <p>F001</p>	  	  	<b>WAA330</b> <b>WAA331</b> <b>WAA332</b>	1 2 3	 <p>1 pole</p>  <p>2 pole</p>  <p>3 pole</p>
2 pole 2 Gang Series-parallel Switching  Switching sequence: 0, A+B series, A, A+B parallel	 <p>F001</p>			<b>WAA339</b>	2	

Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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**Voltmeter Switches without „OFF“**

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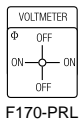
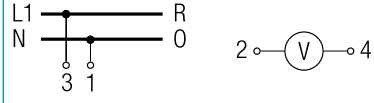
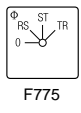
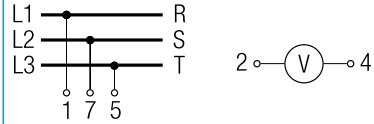
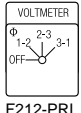
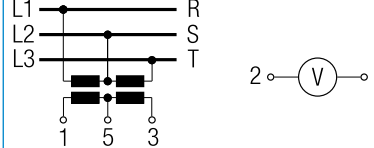
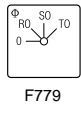
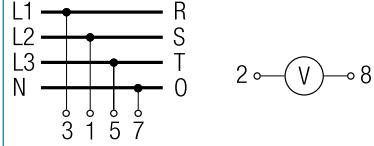
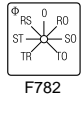


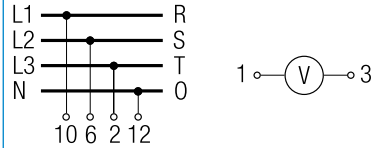
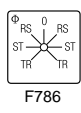


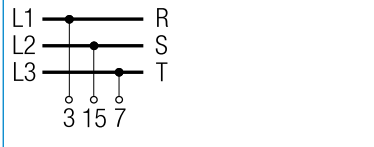
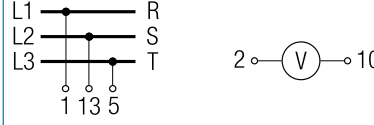
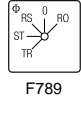


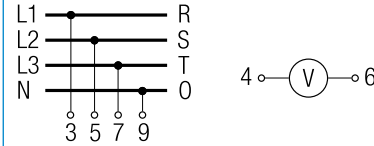
3 phase 3 wire				A023	2	
3 phase 3 wire 3 phase to phase and phase to neutral				A025	3	



Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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### Voltmeter Switches with „OFF“

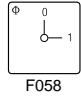


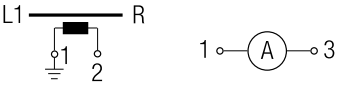
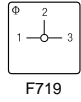


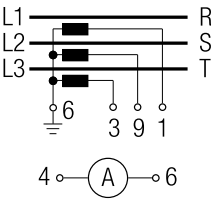
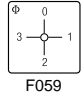


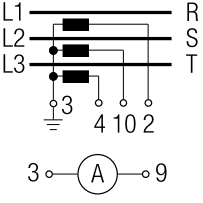
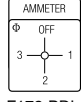


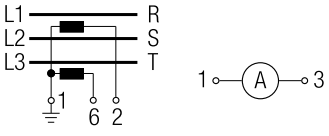



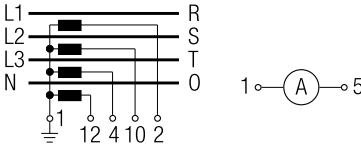

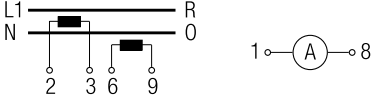
[Dimensions p. 46](#)

2 pole 360° rotation				WAA002	2	
3 phase 3 wire				A004		
				WAA011		
3 phase to neutral				WAA005		
3 phase to phase and 3 phase to neutral				A007	3	
2 separate 3 phase with center „OFF“				WAA008	4	
						
3 phase and 1 phase to neutral				WAA010	3	

Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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**Ammeter Switches**

[Dimensions p. 46](#)

Single pole with one current transformer	 F058			WAA046	1	
Single pole with 3 current transformers without „OFF“	 F719			WAA017	3	
Single pole with 3 current transformers with „OFF“ 360° rotation	 F059			A048	3	
Single pole with 2 current transformers (3 readings)	 F172-PRL			WAA021	2	
Single pole with 4 current transformers	 F060			WAA036	4	
2 pole 2 current transformers	 F057			WAA037	3	

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# Switch Function and Configuration

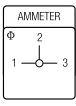


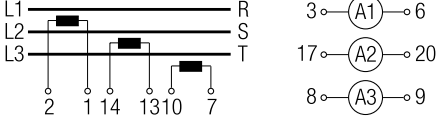



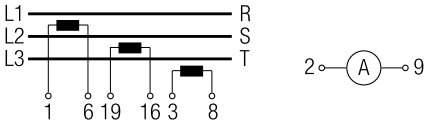




# DH, DHR Switches

Turn to operate

Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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## Ammeter Switches

[Dimensions p. 46](#)




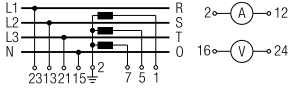



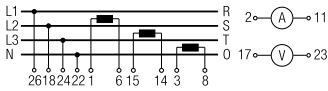



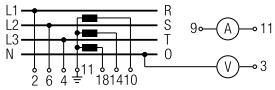




2 pole 3 current transformers	 <p>F181-PRL</p>			WAA019	5	
	 <p>F059</p>			A038	5	
2 pole 4 current transformer	 <p>F060</p>			WAA039	6	

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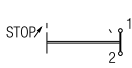



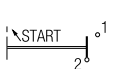



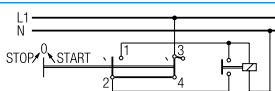



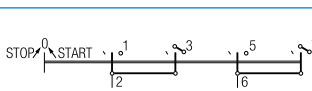







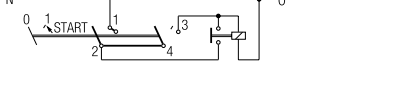



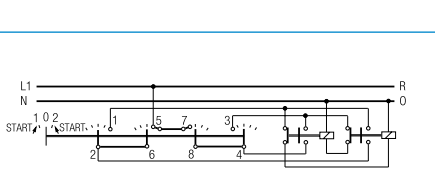




Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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## Volt-ammeter Switches

[Dimensions p. 46](#)

3 phase - phase to phase 3 current	 F101			WAA027	6	
	 F077			WAA028	7	
3 phase voltage 3 phase current 4 wire	 F174-PRL			WAA033	5	
3 phase voltage 3 phase current 3 wire	 F174-PRL			WAA035	5	




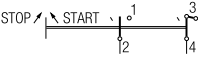



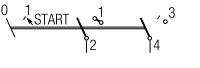



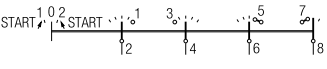



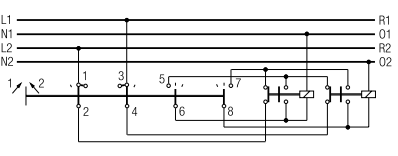



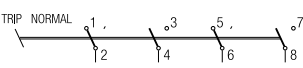
## Control Switches

Stop switch	 F022			WAA174	1	
Start switch	 F023			A175	1	
Stop start switch single pole	 F024			A176	1	
Stop start switch 2 pole	 F024			WAA183	2	
Stop start switch with spring return from start to run	 F119			A178	1	
Stop start switch with spring return to run for 2 units	 F121			WAA177	2	
Stop start switch with spring return to run with contactor interlock contactors for 2 units	 F121			WAA182	2	
Motor voltage control switch	 F144-PRL			WAA150	2	




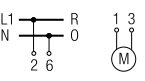



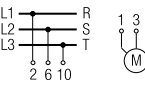



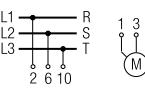



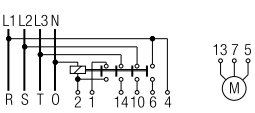
Function	Escutch. Plate	Type/Handle	Code	Stages	Connection Diagram
		DH10- DH10B- DHR12 DHR12B			

## Control Switches with electrically isolated contacts

[Dimensions p. 46](#)

Stop start switch single pole	 F024			A789	1	
Stop start switch with spring return to 1	 F119			A791	1	
Stop start switch with spring return to run for 2 units	 F121			WAA790	2	
Contactor control with spring return to „OFF“	 F025			WAA179	2	
Circuit breaker control	 F143-PRL			WAA537	2	

## Motor Reversing Switches

2 pole	 F071			A400	2	
3 pole	 F071			A401	3	
3 pole with spring return to „OFF“	 F025			A228	3	
3 pole for use with reversing contactors	 F121			WAA402	4	

Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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## Star-delta Switches

[Dimensions p. 46](#)

Normalausführung				A410	4	
2 Drehrichtungen				WAA413	5	
Mit Verriegelungskontakt geschlossen in 0				WAA416	5	
Für Schützsteuerung				A419	4	




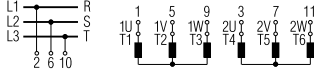



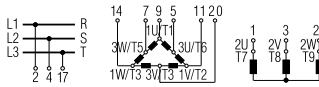
## Motor Control Switches

2 speed single winding				A440	4	
2 speed single winding without „OFF“				A466	4	
2 speed single winding with center „OFF“				A441	4	
2 speed single winding reversing				A442	6	
2 speed single winding for use with contactors				WAA444	5	




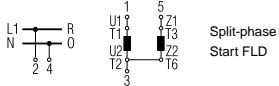



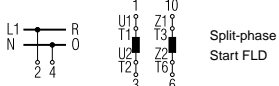



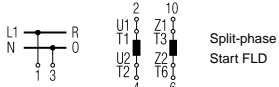
Function	Escutch. Plate	Type/Handle DH10- DH10B- DHR12 DHR12B	Code	Stages	Connection Diagram
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## Motor Control Switches

[Dimensions p. 46](#)

2 speed 2 winding 0-A-B $\Upsilon$ or $\Delta$	 F073			WAA451	3	
3 speed 2 winding 0-A $\Delta$ -B $\Upsilon$ -A $\Upsilon\Upsilon$	 F109			WAA457	6	



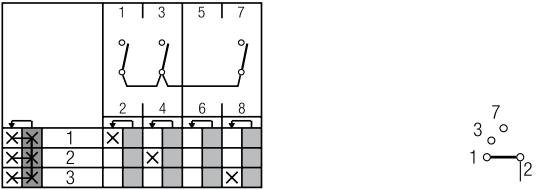


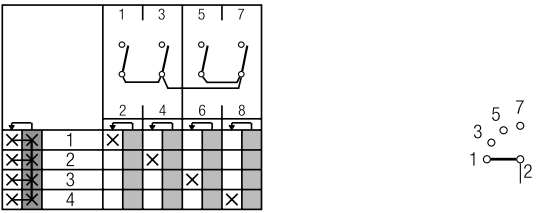


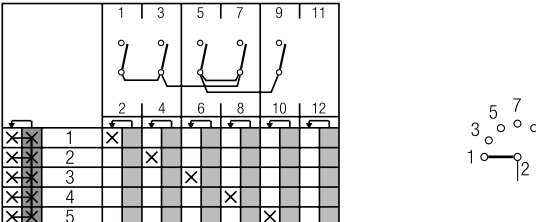


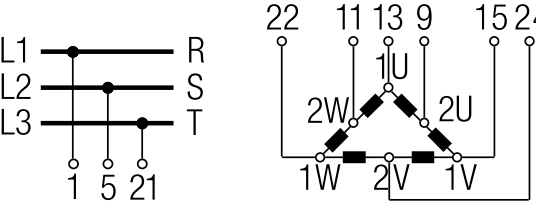


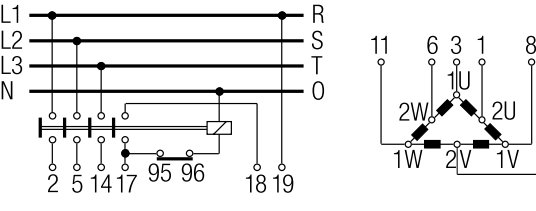


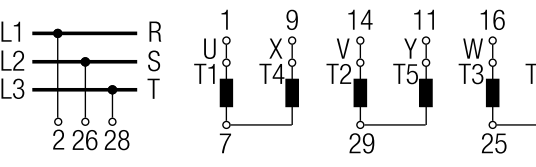
## Start and Run Switches

Split-phase start	 F119			A425	2	
Split-phase start reversing	 F120			WAA426	3	
Split-phase reversing, auto cut-out of start field winding	 F104			WAA622	3	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Multi-step Switches without „OFF“

[Dimensions p. 46](#)

1 pole 3 Step	 F161		WAA830	2	
1 pole 4 Step	 F052		WAA831	2	
1 pole 5 Step	 F055		WAA832	3	
1 pole 6 Step	 F138		WAA833	3	
1 pole 7 Step	 F135		WAA834	4	
1 pole 8 Step	 F136		WAA835	4	



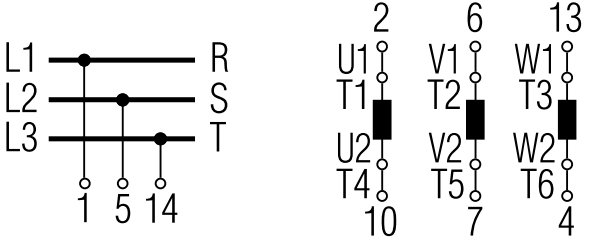


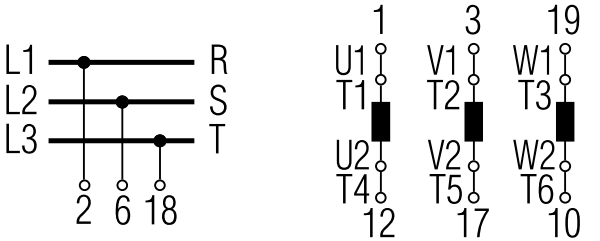


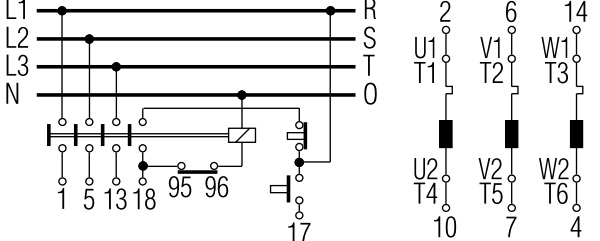


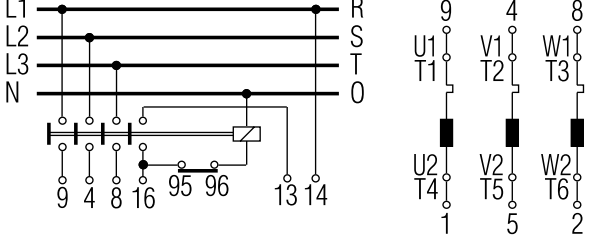
Rotation only in pushed position. Contacts are closed only in normal position. Therefore, one or more positions of a multi-step switch can be passed without contact operation.



Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Multi-step Switches without „OFF“

*Dimensions p. 46*



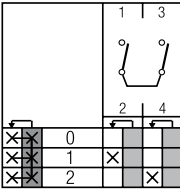



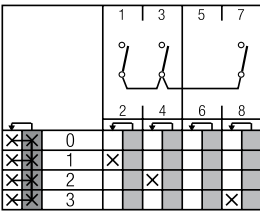



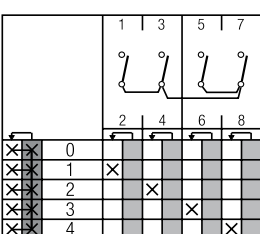



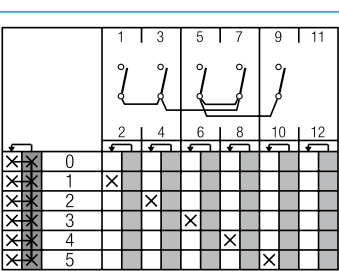



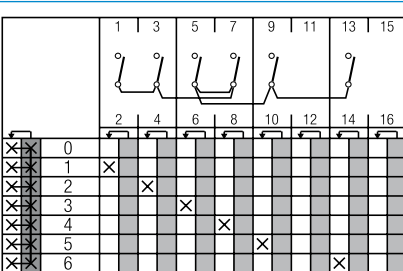
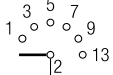


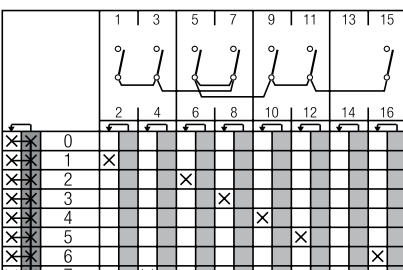
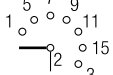
1 pole 9 Step	 F010		WAA836	5	 <p>Diagram showing three main lines (L1, L2, L3) connected to terminals R, S, T. Below them are terminals 1, 5, 14. To the right, three switch assemblies are shown: U1/T1, V1/T2, W1/T3. Each assembly has two terminals: U2/T4, V2/T5, W2/T6. Further right are terminals 2, 6, 13 and 10, 7, 4.</p>
1 pole 10 Step	 F011		WAA837	5	 <p>Diagram showing three main lines (L1, L2, L3) connected to terminals R, S, T. Below them are terminals 2, 6, 18. To the right, three switch assemblies are shown: U1/T1, V1/T2, W1/T3. Each assembly has two terminals: U2/T4, V2/T5, W2/T6. Further right are terminals 1, 3, 19 and 12, 17, 10.</p>
1 pole 11 Step	 F012		WAA838	6	 <p>Diagram showing three main lines (L1, L2, L3) and a neutral line (N). Below them are terminals 1, 5, 13, 18, 95, 96, 17. To the right, three switch assemblies are shown: U1/T1, V1/T2, W1/T3. Each assembly has two terminals: U2/T4, V2/T5, W2/T6. Further right are terminals 2, 6, 14 and 10, 7, 4.</p>
1 pole 12 Step	 F013		WAA839	6	 <p>Diagram showing three main lines (L1, L2, L3) and a neutral line (N). Below them are terminals 9, 4, 8, 16, 95, 96, 13, 14. To the right, three switch assemblies are shown: U1/T1, V1/T2, W1/T3. Each assembly has two terminals: U2/T4, V2/T5, W2/T6. Further right are terminals 9, 4, 8 and 1, 5, 2.</p>

Rotation only in pushed position. Contacts are closed only in normal position. Therefore, one or more positions of a multi-step switch can be passed without contact operation.

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Multi-step Switches with „OFF“

[Dimensions p. 46](#)



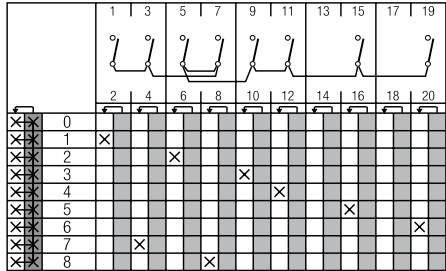


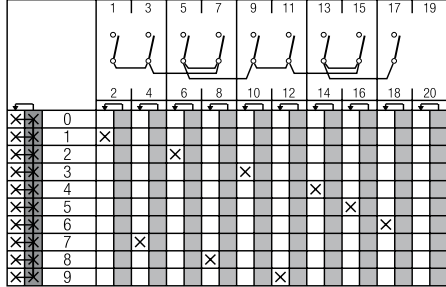


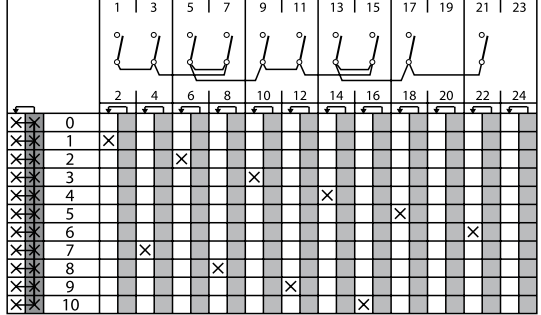


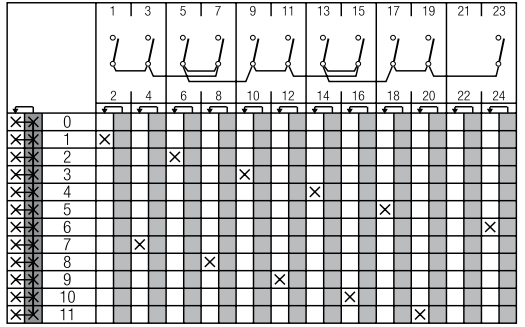
1 pole 2 Step	 F053		WAA840	1	 
1 pole 3 Step	 F001		WAA841	2	 
1 pole 4 Step	 F002		WAA842	2	 
1 pole 5 Step	 F003		WAA843	3	 
1 pole 6 Step	 F004		WAA844	4	 
1 pole 7 Step	 F005		WAA845	4	 

Rotation only in pushed position. Contacts are closed only in normal position. Therefore, one or more positions of a multi-step switch can be passed without contact operation.

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Multi-step Switches with „OFF“

*Dimensions p. 46*



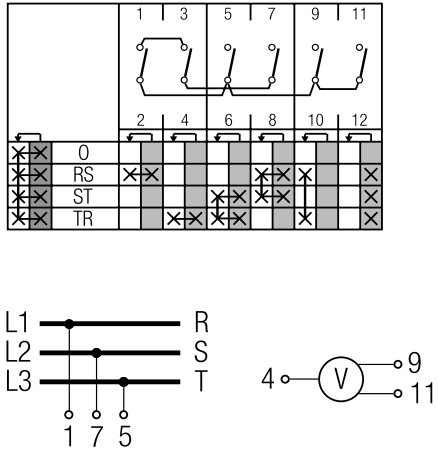


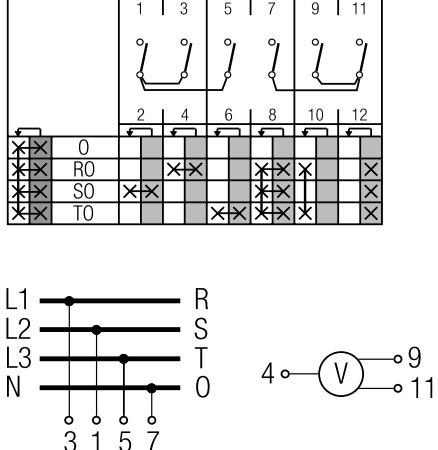


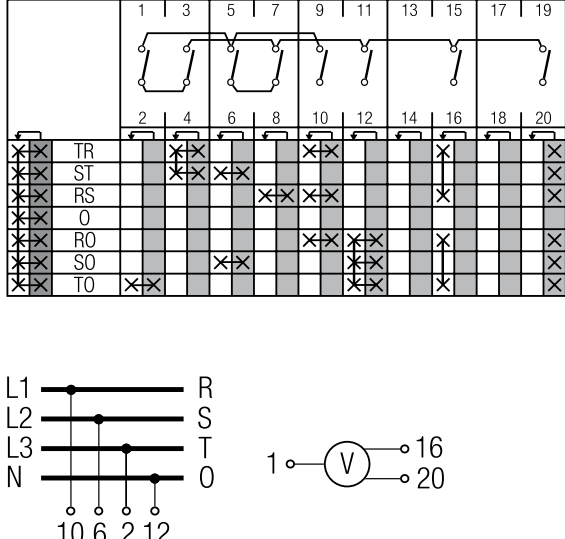
1 pole 8 Step	 F006		WAA846	4	
1 pole 9 Step	 F009		WAA847	5	
1 pole 10 Step	 F008		WAA848	5	
1 pole 11 Step	 F009		WAA849	6	

Rotation only in pushed position. Contacts are closed only in normal position. Therefore, one or more positions of a multi-step switch can be passed without contact operation.

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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### Voltmeter Switches with „OFF“

[Dimensions p. 46](#)

<p>For 2 measuring ranges by additional NO and NC contacts operated by pushing handle</p>	 <p>F019</p>		<p>WAA804</p>	<p>3</p>	
<p>For 2 measuring ranges by additional NO and NC contacts operated by pushing handle</p>	 <p>F018</p>		<p>WAA805</p>	<p>3</p>	
<p>For 2 measuring ranges by additional NO and NC contacts operated by pushing handle</p>	 <p>F020</p>		<p>WAA807</p>	<p>5</p>	

# Switch Function and Configuration



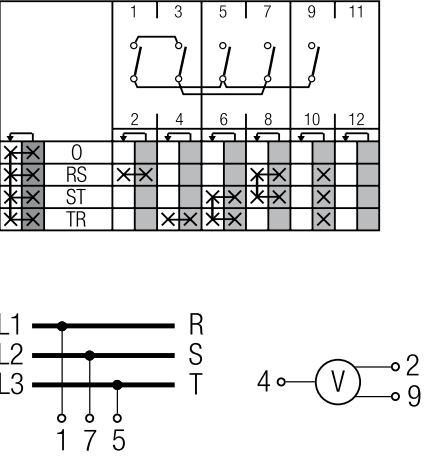


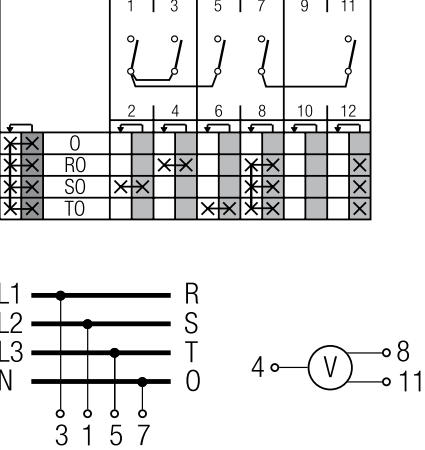


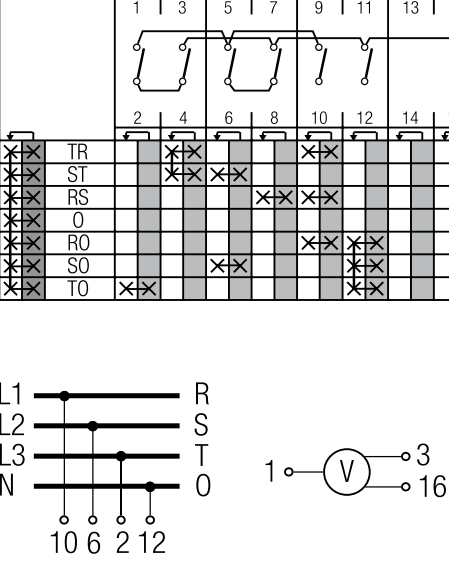
# DK, DKR Switches

Push to turn

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Voltmeter Switches with „OFF“



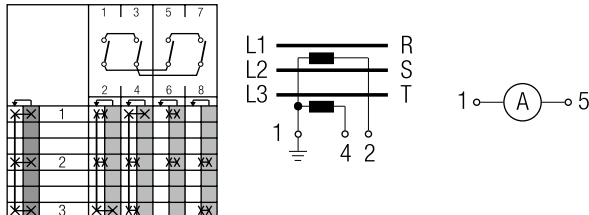
[Dimensions p. 46](#)

<p>(as A804) for 2 measuring ranges by additional NO contact operated by pushing handle</p>	 <p>F019</p>		<p>WAA814</p>	<p>3</p>	
<p>(as A805) for 2 measuring ranges by additional NO contact operated by pushing handle</p>	 <p>F018</p>		<p>WAA815</p>	<p>3</p>	
<p>(as A807) for 2 measuring ranges by additional NO contact operated by pushing handle</p>	 <p>F020</p>		<p>WAA817</p>	<p>4</p>	



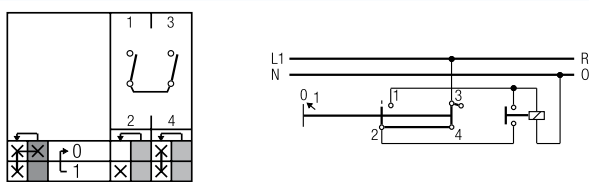


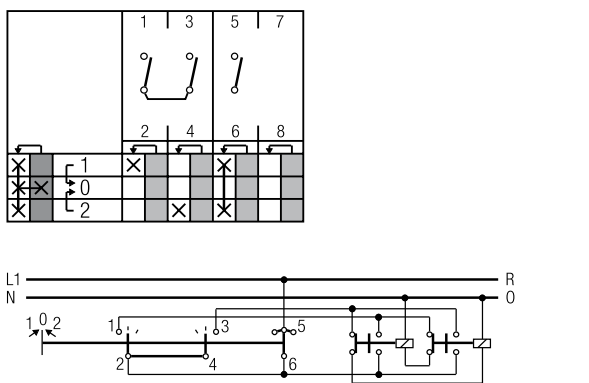


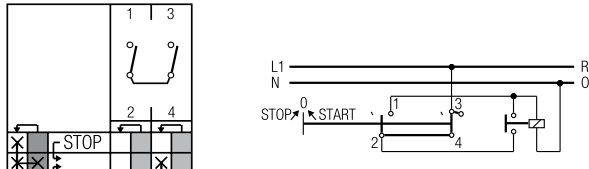


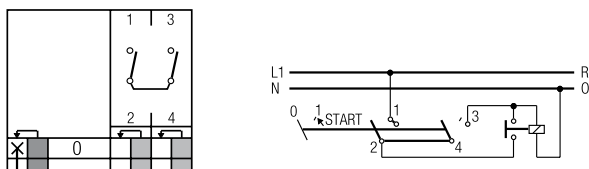
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Ammeter Switches




[Dimensions p. 46](#)

Single pole with 2 current transformers (3 readings)	 <p>F719</p>		WAA021	2	
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## Steuerschalter





Control switch for contactor control, closing by rotating, tripping by pushing in „OFF“ position	 <p>F169</p>		WAA874	1	
Control switch for 2 NO and 1 NC contacts	 <p>F025</p>		WAA875	2	
Control switch 1pole with additional emergency cut-out by pushing in „OFF“ position	 <p>F024</p>		WAA876	1	
Control switch stop start switch with spring return from start to position 1, with additional emergency cut-out by pushing in position 1	 <p>F119</p>		WAA878	1	

Two or Four Hole Panel Mounting	Terminals rotated 90°	Code	DH.. DHR..	DH..B DHR..B	DK.. DKR..
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 <p><b>Panel mounting</b></p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 66/67/69k</p> <p>Two hole panel mounting, Protection IP 66/67/69k</p>	<p>●</p> <p>●</p> <p>●</p>	<p>E E-V</p> <p>EF EF-V</p> <p>E22 E22-V</p>	<p>●</p> <p>●</p> <p>●</p>	<p>●</p> <p>●</p> <p>●</p>	<p>●</p>
 <p><b>Panel mounting using larger escutcheon plate and handle and with heavy duty latching</b></p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 66/67/69k</p>	<p>●</p> <p>●</p>	<p>EG</p> <p>EGF</p>	<p>●</p> <p>●</p>	<p>●</p> <p>●</p>	<p>●</p>
 <p><b>Panel and base mounting</b></p> <p>Four hole mounting, Protection IP 40</p> <p>Four hole mounting, Protection IP 66/67/69k</p>	<p>●</p> <p>●</p>	<p>ER</p> <p>ERF</p>	<p>●</p> <p>●</p>	<p>●</p> <p>●</p>	<p>●</p>

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Four Hole Panel Mounting	Code	DH.. DHR..	DH..B DHR..B
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 <p><b>Panel mounting with heavy duty latching and metal shaft</b></p> <p>Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size 0</p>	KN2	●	
 <p>Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size 1</p>	KN1	●	●
 <p>Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size 1 and 6 mm square metal shaft</p>	KD1	●	●
 <p><b>Panel mounting with protective cover</b></p> <p>Four hole panel mounting Protection front IP 40 rear IP 30</p>	EC	●	●
<p>Four hole panel mounting with additional shaft seal Protection front IP 40 rear IP 30</p>	ED	●	●

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Single Hole Mounting	Terminals rotated 90°	Code	DH.. DHR..	DK.. DKR..
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**With locking nut and shaft seal**



Without escutcheon plate,  
Protection IP 66/67/69k



FT1  
FT1-V

mm  
22  
22

mm  
22  
22



With square escutcheon plate,  
Protection IP 66/67/69k



FT2  
FT2-V

22  
22

22  
22

With size S1 square escutcheon plate and  
heavy duty latching, Protection IP 66/67/69k



FH3  
FH3-V

22  
22

22  
22



With rectangular escutcheon plate,  
Protection IP 66/67/69k



FT6  
FT6-V

22  
22

22  
22

With size S1 rectangular escutcheon plate and  
heavy duty latching, Protection IP 66/67/69k



FH4  
FH4-V

22  
22

22  
22








Mounting key for locking nut

S00 T170 09



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Base Mounting	Terminals rotated 90°	Code	DH.. DHR..	DH..B DHR..B
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	<p><b>Base mounting</b></p> <p>Base mounting - four hole, Protection IP 40</p> <p>For four hole base mounting and with integrated simplified door clutch, Protection IP 65</p> <p>For two hole base mounting, Protection IP 40</p>	<p>●</p> <p>●</p> <p>●</p>	<p>VE</p> <p>VE-V</p> <p>VF</p> <p>VF-V</p> <p>VE22</p> <p>VE22V</p>	<p>●</p> <p>●</p> <p>●</p> <p>●</p> <p>●</p> <p>●</p>	<p>●</p> <p>●</p> <p></p> <p></p> <p></p> <p></p>
	<p>For two hole base mounting and with integrated simplified door clutch, Protection IP 65</p>	<p>●</p>	<p>VF22</p> <p>VF22V</p>	<p>●</p> <p>●</p>	<p></p> <p></p>
	<p>Snap-on base mounting for track EN 60715</p> <p><sup>1</sup>Protection IP 40 <sup>2</sup>Protection IP 60/69k</p>		<p>VE1</p>	<p>●<sup>1</sup></p>	<p>●<sup>2</sup></p>
	<p>Snap-on base mounting for track EN 60715 with rectangular escutcheon plate for 45 mm standard knock-out, Protection IP 40</p>		<p>VE2</p>	<p>●</p>	
	<p>Snap-on base mounting for track EN 60715. Both the escutcheon plate for 45 mm standard knock-out and the handle are adjustable in height. Protection IP 40</p>		<p>VE21</p>	<p>●</p>	

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Mounting Plates for Plaster Depth Boxes acc. to DIN 49073 and ÖNORM E8608	Code	DH.. DHR..
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	<p>Plaster depth trim, Protection IP40</p>	<p>UE1</p>	<p>●</p>
	<p>With light, Protection IP40</p> <p>With facility for light addition, Protection IP40</p>	<p>UE2</p> <p>UE3</p>	<p>●</p> <p>●</p>

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# Escutcheon Plates



Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is then embossed with hot-foil backing. The escutcheon plate frame is an essential part of the switch and serves as a bearing surface for the handle. If the switch is to be mounted without an escutcheon plate we would recommend for size S1 the handle bearing plate T100-04.

## Standard Letterings Available

(Over 500 standard letterings, special letterings upon request.)

### 30° switching


### 45° switching


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# Face plates

## 60° switching

F707	F708	F708	F709	F713	F719	F719	SYNCHROSCOPE	F723	F724	F724	F726	F726	F730	F730	F731	F731	F732	F732	F735	F735	F736	F736
F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737	F737

## 90° switching

F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506	F506

## Miscellaneous

F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119	F119

<sup>1</sup>INTERRUPTEUR PRINCIPAL, OUVERTURE EN POSITION 0 <sup>2</sup>INTERRUPTORE GENERALE, APRIRE SOLO CON MANIGLIA SU 0 <sup>3</sup>INTERRUPTOR PRINCIPAL, ABRIR ARMARIO SOLO EN POS. "0"

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# Handles

Type	Color	Code	Size	
			S0	S1












Type	Color	Code	Size	
			S0	S1

<p>R-Handle</p> 	black red	G001 G002	● ● ● ●	● ● ● ●
<p>F-Handle</p> 	black red	G221 G222	● ● ● ●	● ● ● ●
<p>S-Handle</p>  <p>S0      S1</p>	black red	G301 G302	● ● ● ●	● ● ● ●
<p>P-Handle</p>  <p>S0      S1</p>	black red	G211 G212	● ● ● ●	● ● ● ●
<p>O-Handle</p> 	black red	G321 G322	— —	● ● ● ●

<p>I-Handle</p> 	black red	G251 G252	● ● ● ●	● ● ● ●
<p>B-Handle</p> 	black red	G521 G522	● ● ● ●	● ● ● ●
<p>L-Handle</p> 	black red	G501 G502	— —	● ● ● ●
<p>K-Handle</p> 	black red	G411 G412	— —	● ● ● ●

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Country	Authority	Mark or Standard	DH10 DK10 DH10B	DHR10	DH11 DK11 DH11B	DHR11 DHR11B	DH12 DK12 DH12B	DHR12 DKR12 DHR12B
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USA	Underwriters Laboratories		●	●	●	●	●	●
		or 	●	●	●	●	●	●
Canada	Canadian Standards Association		●	●	●	●	●	●
		or 	●	●	●	●	●	●
Switzerland	Schweizerischer Elektrotechnischer Verein		+	+	+	+	+	+
Denmark	Danmarks Elektriske Materielkontrol		+	+	+	+	+	+
Norway	Norges Elektriske Materielkontrol		+	+	+	+	+	+
Sweden	Svenska Elektriska Materielkontrollanstalten		+	+	+	+	+	+
Finland	Sähkötar-kastuskeskus		+	+	+	+	+	+
Austria	Österreichischer Verband für Elektrotechnik		+	+	+	+	+	+
Federal Republic of Germany	Verband Deutscher Elektrotechniker	VDE 0660 <sup>1</sup>	+	+	+	+	+	+
Great Britain	British Standards Institution	BS EN 60947 <sup>1</sup>	+	+	+	+	+	+
International Electrical Commission (IEC)	Recommendation	IEC 60947 <sup>2</sup>	+	+	+	+	+	+
Russia Belarus Kazakhstan	Eurasian Conformity		●	+	●	+	●	+

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- Switch approved
- + Switch conforms to requirements

<sup>1</sup>Industrial switchgear is not required to bear a symbol but must conform to requirements. By referring to the specific specification on the product the manufacturer implies that these requirements have been met.

<sup>2</sup>IEC does not operate an approval scheme.

<b>Selection Data</b>	DH10	DHR10
	DK10	
	DH10B	

<b>Rated Insulation Voltage <math>U_e</math></b>	IEC 60947-3 <sup>1</sup> , EN 60947-3 <sup>1</sup> VDE 0660 part 107 <sup>1</sup> North America Min. operational voltage	V V V	690 600 20	690 600 20		
<b>Rated Impulse Withstand Voltage <math>U_{imp}</math><sup>1</sup></b>		kV	6	6		
<b>Rated Thermal Current <math>I_u/I_{th}</math></b>	IEC 60947-3, EN 60947-3 VDE 0660 part 107 North America	A A	16 15	16 15		
<b>Rated Operational Current <math>I_e</math></b>						
AC-21A	Switching of resistive loads, including moderate overloads	IEC 60947-3, EN 60947-3 VDE 0660 part 107	A	16	16	
AC-15	Switching of control devices, contactors, valves etc.	IEC 60947-5-1, EN 60947-5-1 VDE 0660 part 200	110 V-240 V 380 V-440 V	A	5 3	5 3
Pilot Duty	North America	Heavy	VAC	600	600	
Ampere Rating	Resistive or low inductive loads	North America	A	15	15	
<b>Short Circuit Protection</b>						
Max. fuse size		(gG-characteristic)	A	16	16	
Rated short-time withstand current		(1s-current)	A	120	120	
<b>Rated Utilization Category</b>	IEC 60947-3, EN 60947-3 VDE 0660 part 107					
AC-3	Direct-on-line starting, star-delta starting	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	2,2 3,7 3,7 3,7	2,2 3,7 3,7 3,7
		1 phase 2 pole	110 V-120 V 220 V-240 V 380 V-440 V	kW	0,37 1,1 2,2	0,37 1,1 2,2
AC-23A	Frequent switching of motors or other high inductive loads	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	3 5,5 5,5 4	3 5,5 5,5 4
		1 phase 2 pole	110 V-120 V 220 V-240 V 380 V-440 V	kW	0,55 1,5 2,5	0,55 1,5 2,5
<b>Ratings</b>	North America					
	Standard motor load DOL-Rating (similar AC-3)	3 phase 3 pole	110 V-120 V 220 V-240 V 440 V-600 V	HP	0,75 1,5 3	0,75 1,5 3
		1 phase 2 pole	110 V-120 V 220 V-277 V 440 V-600 V	HP	0,25 0,5 1	0,25 0,5 1
<b>Max. Permissible Wire Gage</b> - Use copper wire only						
	Single-core or stranded wire		mm <sup>2</sup> AWG	2x2,5 2x12	- -	
	Flexible wire (sleeving in accordance with DIN 46228) Flexible AWG wires (without sleeve)		mm <sup>2</sup> AWG	2x2,5(1,5) 2x14	- -	
	Connection with insulated ring and fork type terminals		mm	-	≥3,2	
	Internal diameter		mm	-	≤7,4	
	External diameter		mm	6,3	-	
	Connection with quick connect terminations					
<b>Min. Ambient Temperature of Stages</b>					-25 °C (valid only without optional extra)	
<b>Max. Ambient Temperature of Stages</b> <sup>2, 3</sup>		open at 100 % $I_u/I_{th}$ enclosed at 100 % $I_{the}$			55 °C during 24 hours with peaks up to 60 °C 35 °C during 24 hours with peaks up to 40 °C	

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<sup>1</sup>Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request.  
<sup>2</sup>For electromagnetic optional extras see additional data in Catalog 101. <sup>3</sup>Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).



<b>Selection Data</b>	DH11	DHR11	DH12	DHR12
	DK11	DHR11B	DK12	DKR12
	DH11B		DH12B	DHR12B

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<b>Rated Insulation Voltage <math>U_e</math></b>	IEC 60947-3 <sup>1</sup> , EN 60947-3 <sup>1</sup> VDE 0660 part 107 <sup>1</sup>	V	600	600	600	600
	North America	V	600	600	600	600
	min. voltage	V	1 <sup>2</sup>	1 <sup>2</sup>	6	6
<b>Rated Impulse Withstand Voltage <math>U_{imp}</math></b>			on request			
<b>Rated Thermal Current <math>I_U/I_{th}</math></b>	IEC 60947-3, EN 60947-3 VDE 0660 part 107	A	6	6	6	6
	North America	A	6	6	6	6
<b>Rated Operational Current <math>I_e</math></b>  AC-21A Switching of resistive loads, including moderate overloads	IEC 60947-3, EN 60947-3 VDE 0660 part 107					
	North America					
	1 V/6 V	A	6/3	6/3	-/6	-/6
	12 V/24 V	A	2/1	2/1	6/5	6/5
	48 V/60 V	A	0,8/0,7	0,8/0,7	4/3,7	4/3,7
	110 V	A	0,4	0,4	3	3
	220 V-240 V	A	0,2	0,2	2	2
	380 V-400 V	A	0,13	0,13	1,3	1,3
	440 V/500 V	A	0,1/0,09	0,1/0,09	1/0,9	1/0,9
550 V/600 V	A	0,08/0,05	0,08/0,05	0,8/0,5	0,8/0,5	
<b>Short Circuit Protection</b>						
Max. fuse size	(glass-tube, quick)	A	6	6	6	6
Rated short-time withstand current(1s-current)		A	40	40	65	65
<b>DC Switching Capacity<sup>4</sup></b>  DC-21B Resistive load T ≤ 1 ms	IEC 60947-3, EN 60947-3 VDE 0660 part 107					
	North America					
	1 V/6 V	A	4/2,5	4/2,5	-/4	-/4
	12 V/24 V	A	1,5/0,8	1,5/0,8	3/2,2	3/2,2
	48 V/60 V	A	0,3/0,27	0,3/0,27	1,2/1	1,2/1
	110 V	A	0,2	0,2	0,6	0,6
	220 V-240 V	A	0,1	0,1	0,3	0,3
	380 V-400 V	A	0,06	0,06	0,2	0,2
	440 V/500 V	A	0,05/0,04	0,05/0,04	0,15/0,12	0,15/0,12
550 V/600 V	A	0,03/0,02	0,03/0,02	0,1/0,1	0,1/0,1	
<b>Max. Permissible Wire Gage - Use copper wire only</b>						
Single-core or stranded wire	mm <sup>2</sup>	2x2,5	-	2x2,5	-	
	AWG	2x12	-	2x12	-	
Flexible wire (sleeving in accordance to DIN 46228) Flexible AWG wires (without sleeve)	mm <sup>2</sup>	2x2,5(1,5)	-	2x2,5(1,5)	-	
	AWG	2x14	-	2x14	-	
Connection with insulated ring and fork type terminals	Internal diameter	mm	-	≥3,2	-	≥3,2
	External diameter	mm	-	≤7,4	-	≤7,4
	Connection with quick connect terminations	mm	6,3	-	6,3	-
<b>Min. Ambient Temperature of Stages<sup>3</sup></b> <b>Max. Ambient Temperature of Stages<sup>3, 5</sup></b>	open at 100 % $I_U/I_{th}$ enclosed at 100 % $I_{the}$		-25 °C (valid only without optional extra) 55 °C during 24 hours with peaks up to 60 °C 35 °C during 24 hours with peaks up to 40 °C			

<sup>1</sup>Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request.

<sup>2</sup>Values for lower voltages on request. <sup>3</sup>For electromagnetic optional extras see additional data in Catalog 101.

<sup>4</sup>Values for switches with spring return on request. <sup>5</sup>Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).

## Tightening torque of screws

Type	Tightening torque	
DH10	0,8 Nm	7 lb-in
DH10-1	0,8 Nm	7 lb-in
DH10B	0,8 Nm	7 lb-in
DH11	0,8 Nm	7 lb-in
DH11B	0,8 Nm	7 lb-in
DH12	0,8 Nm	7 lb-in
DH12B	0,8 Nm	7 lb-in
DHR10	0,8 Nm	7 lb-in
DHR11	0,8 Nm	7 lb-in
DHR11B	0,8 Nm	7 lb-in
DHR12	0,8 Nm	7 lb-in
DHR12B	0,8 Nm	7 lb-in
DK10	0,8 Nm	7 lb-in
DK10-1	0,8 Nm	7 lb-in
DK11	0,8 Nm	7 lb-in
DK12	0,8 Nm	7 lb-in
DKR12	0,8 Nm	7 lb-in

**Two or Four Hole Panel Mounting**

	DH10-DHR12 <sup>3</sup>	DK10-DKR12	DH10B-DHR12B
<b>A</b>	48 1.89	48 1.89	64 2.52
<b>B</b>	42 1.65	42 1.65	56 2.20
<b>C</b>	4 .16	4 .16	4 .16
<b>D1</b>	5 .20	5 .20	5 .20
<b>E</b>	8-19 .31-.75	15-19 .59-.75	10-22 .39-.87
<b>E22</b>	11-15 .43-.59	-	-
<b>EF</b>	15-19 .59-.75	-	19-22 .75-.87
<b>E</b>	30 1.17	-	-
<b>F</b>	36(48) 1.42(1.89)	-	48 1.89
<b>M<sup>2</sup></b>	5,5 .22	-	5,5 .22

<sup>2</sup>M, additional length for mounting ER, ERF only  
<sup>3</sup>Dimensions in ( ) for ER, ERF mounting plate only

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**EG**  
**EGF**

	DH10-DHR12
<b>A</b>	64 2.52
<b>B</b>	42 1.65
<b>C</b>	4 .16
<b>D1</b>	5 .20
<b>EG</b>	10-22 .31-.87
<b>EGF</b>	19-22 .75-.87
<b>E</b>	48 1.89
<b>M</b>	6,7 .26

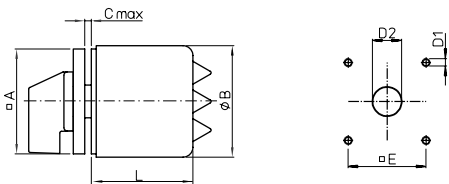
**KN1**  
**KD1**  
**KN2**

	KN2	DH10-DHR12	KN1	DH10-DHR12	DH10B-DHR12B
<b>A</b>	48 1.89	48 1.89	64 2.52	64 2.52	64 2.52
<b>B</b>	42 1.65	42 1.65	42 1.65	56 2.20	56 2.20
<b>C</b>	4 .16	4 .16	4 .16	4 .16	4 .16
<b>D1</b>	5 .20	5 .20	5 .20	5 .20	5 .20
<b>D2</b>	8-19 .31-.75	8-19 .31-.75	10-22 .31-.87	10-22 .31-.87	10-22 .31-.87
<b>E</b>	36 1.42	36 1.42	48 1.89	48 1.89	48 1.89
<b>M</b>	5,2 .20	5,2 .20	4,7 .19	12 .47	12 .47

<sup>1</sup>see page 46

**Four Hole Panel Mounting or Single Hole Mounting and Base Mounting**

**EC**  
**ED**

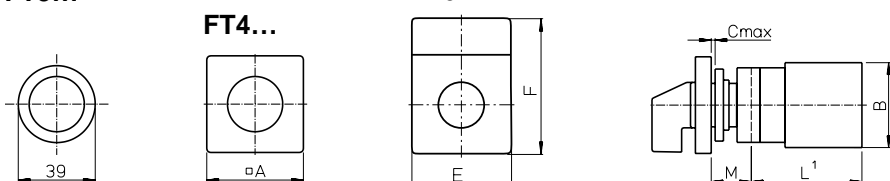


	DH10-DHR12	DH10B-DHR12B
Stages L	104	64
1	4.10	2.52
2	104	84
3	4.10	3.31
4	104	104
5	4.10	4.10
6	-	127
7	-	5.00
	-	139,5
	-	5.49
	-	164,5
	-	6.48
	-	177
	-	6.97

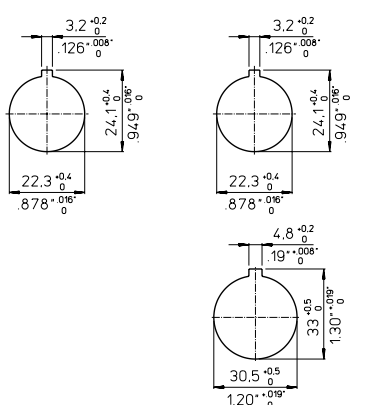
	DH10-DHR12	DH10B-DHR12B
A	64	64
B	2.52	2.52
C	68	68/88 <sup>1</sup>
D	2.68	2.68/3.46
E	4	4
F	.16	.16
G	4	4
H	.16	.16
I	5	5
J	.20	.20
K	10-22	10-22
L	.39-.87	.39-.87
M	19-22	19-22
N	.75-.87	.75-.87
O	48	48
P	1.89	1.89

<sup>1</sup> 1-3 ST B = 68 / 4-7 ST B = 88

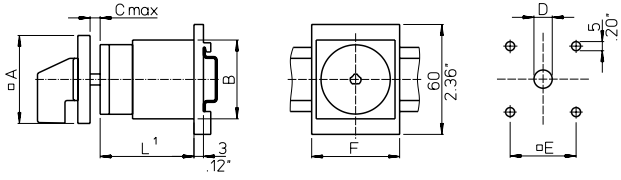
**FT1...**      **FH3...**      **FH4...**  
**FT3...**      **FT2...**      **FT6...**



	DH10-DHR12	DK10-DKR12
A/E	48	48
B	1.89	1.89
C	64	64
F	2.52	2.52
M	64	64
	2.52	2.52
	42	42
	1.65	1.65
	6	6
	.24	.24
	59	59
	2.32	2.32
	78.5	78.5
	3.09	3.09
	18.2	3.7
	.72	.15
	25.2	3.7
	.99	.15
	25.2	25.2
	.99	.99



**VE1**

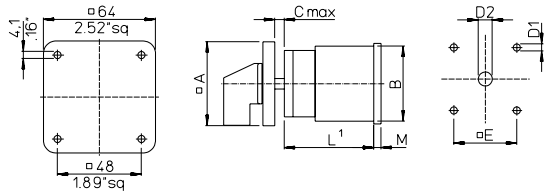


	DH10-DHR12	DH10B-DHR12B
A	48	64
B	1.89	2.52
C	42	56
D	1.65	2.20
E	10,5	13,5
F	.41	.53
G	8-15	10-15
H	.31-.59	.39-.59
I	36	48
J	1.42	1.89
K	48	70
L	1.89	2.76

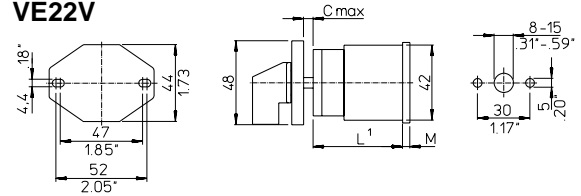
<sup>1</sup> see page 46

**Base Mounting**

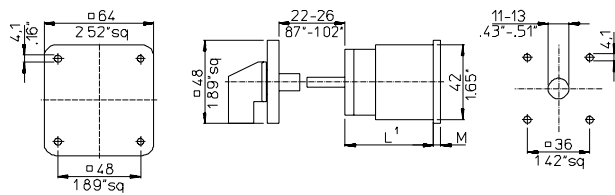
**VE  
VE-V**



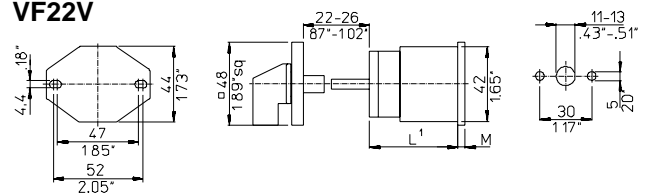
**VE22  
VE22V**



**VF  
VF-V**



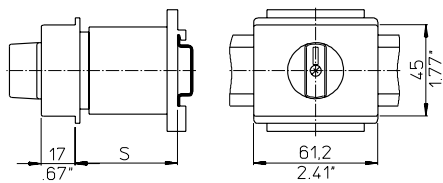
**VF22  
VF22V**



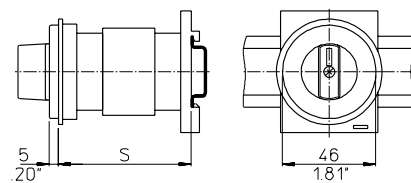
	DH10- DHR12	DH10B- DHR12B		DH10- DHR12	DH10B- DHR12B
<b>A</b>	48 1.89	64 2.52		36 1.42	48 1.89
<b>B</b>	42 1.65	56 2.20	<b>VE M</b>	3.2 .13	2.5 .10
<b>C</b>	10.5 .41	13.5 .53	<b>VE22 M</b>	1.9 .07	-
<b>D1</b>	5 .20	5 .20	<b>VF M</b>	3.2 .13	-
<b>D2</b>	8-19 .31-.75	10-22 .39-.87	<b>VF22 M</b>	1.9 .07	-

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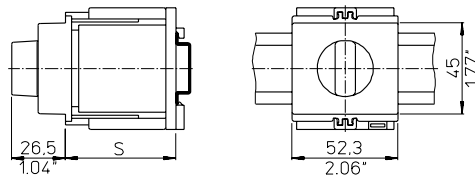
**VE2**



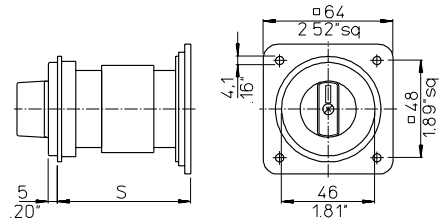
**VE3**



**VE21**



**VE4**

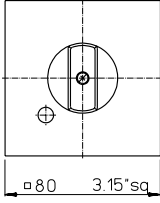


	<b>VE2</b> DH10- DHR12 Max. no. of stages	<b>VE3</b> DH10- DHR12 Max. no. of stages	<b>VE4</b> DH10- DHR12 Max. no. of stages	<b>S<sub>min.</sub></b>	<b>VE21</b> DH10- DHR12 No. of stages
<b>S = 46</b> 1.80	1	-	-	44 1.73	1
<b>S = 50</b> 1.97	1	1	1	54 2.13	2
<b>S = 61</b> 2.40	2	1	1	72 2.83	3
<b>S = 67</b> 2.64	2	2	2		
<b>S = 69</b> 2.70	2	2	2		

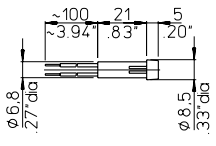
<sup>1</sup>see page 46

**Wall Mounting, Escutcheon Plates and Additional Length**

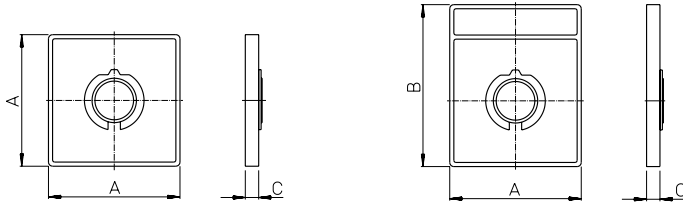
**UE1  
UE2  
UE3**



**Lamp**

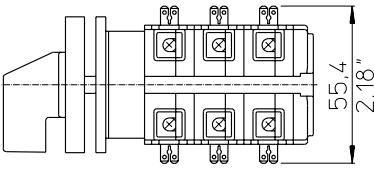


**Escutcheon plates for mounting E, EF, ER, ERF, EG, EGF, KN1, KD1, KN2, EC, ED, VE, VE1, VF**

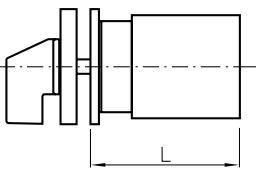


Size	A	B	C
<b>S0</b>	48 1.89	59 2.32	6,7 .26
<b>S1</b>	64 2.52	78 3.07	7,4 .29

**Quick connects for switches DH and DK (page 6)**



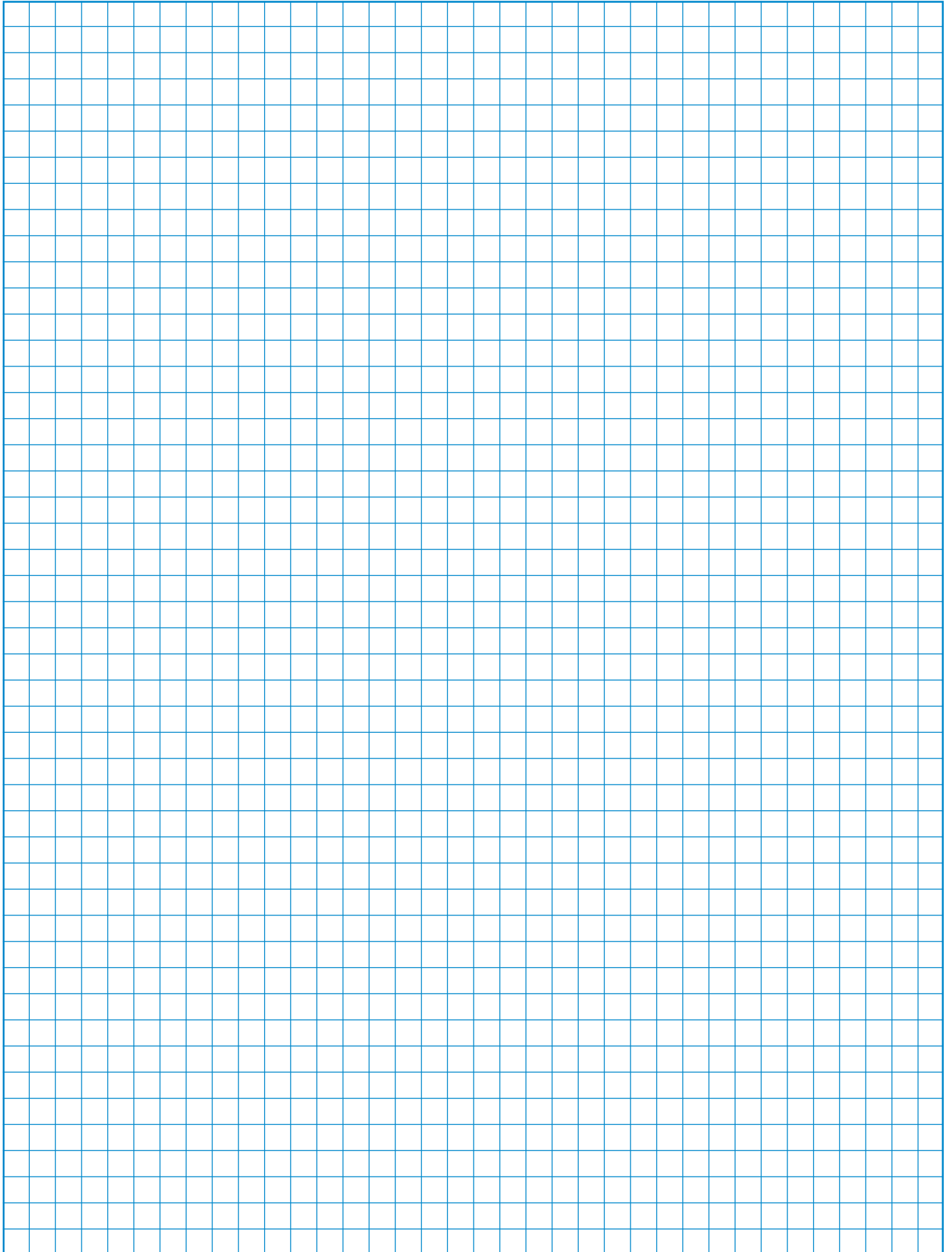
**Length L**



Stages	DH10 DH11 DH12	DHR10 DHR11 DHR12	DK10 DK11 DK12	DKR12	DH10B DH11B DH12B	DHR11B DHR12B
<b>1</b>	43,5 1,71	43,5 1,71	61 2,4	61 2,4	48,9 1,93	48,9 1,93
<b>2</b>	61 2,4	61 2,4	78,5 3,09	78,5 3,09	66,4 2,61	66,4 2,61
<b>3</b>	78,5 3,09	78,5 3,09	96 3,78	96 3,78	83,9 3,30	83,9 3,30
<b>4</b>	96 3,78	96 3,78	113,5 4,47	113,5 4,47	101,4 3,99	101,4 3,99
<b>5</b>	113,5 4,47	113,5 4,47	131 5,16	131 5,16	118,9 4,68	118,9 4,68
<b>6</b>	131 5,16	131 5,16	148,5 5,85	148,5 5,85	136,4 5,37	136,4 5,37
<b>7</b>	148,5 5,85	148,5 5,85	166 6,54	166 6,54	153,9 6,06	153,9 6,06
<b>8</b>	166 6,54	166 6,54	183,5 7,22	183,5 7,22	171,4 6,75	171,4 6,75
<b>9</b>	183,5 7,22	183,5 7,22	201 7,91	201 7,91	188,9 7,44	188,9 7,44
<b>10</b>	201 7,91	201 7,91	218,5 8,60	218,5 8,60	206,4 8,13	206,4 8,13
<b>11</b>	218,5 8,6	218,5 8,6	236 9,29	236 9,29	223,9 8,81	223,9 8,81
<b>12</b>	236 9,29	236 9,29	253,5 9,98	253,5 9,98	241,4 9,50	241,4 9,50

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**Notes:**



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# The Range of “Blue Line” Switchgear

Technical literature covering the following products is available on request.

	Catalog Number
<b>Main Switches and Main Switches with Emergency Function 16 A-315 A Maintenance Switches 20 A-315 A Switch Disconnectors 20 A-315 A</b> According to IEC 60947-3, EN 60947-3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113	<b>500</b>
<b>C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A</b> C, CA and CAD switches are designed for universal application. They are recommended for instrument, isolator, double-throw and motor control. L switches are designed for load and off-load applications. They are used to switch resistive or low inductive loads.	<b>100</b>
<b>Optional Extras and Enclosures</b> The complete product line, a large number of optional extras is available, including door interlocks, push-pull devices, cylinder and padlock attachments, control and indicator devices, AC motor drives, as well as enclosures, both insulated and metal.	<b>101</b>
<b>A and AD Switches 6 A-25 A</b> A and AD switches have 4 contacts in each switching stage. These switches provide an extensive range of switch functions and require a minimum mounting depth. Up to 24 switching positions are possible, with availability of 48 contacts per 12 stage switch column.	<b>110</b>
<b>CG, CH and CHR Switches 10 A-25 A</b> Ultra compact CG, CH and CHR switches are ideally suited for control and instrumentation applications. Switch terminals are “finger-proof” and conveniently accessible for wiring and are delivered open. All CG4 switches offer specially designed gold plated contacts or H-bridges with “cross-wire” contact systems, which facilitates their use in electronic circuitry and chemically aggressive environments.	<b>120</b>
<b>DH, DHR, DK and DKR Switches 6 A-16 A</b> DH, DHR, DK and DKR switches incorporate unique corrosion resistant contacts that permit operation on system voltage as low as 1 V. They have fully enclosed and protected contacts which can be operated either by rotary and/or lateral handle movement. D switches are used in calibration and semiconductor circuits. They are also used for relay and contactor control.	<b>130</b>
<b>X Switches 200 A-630 A</b> X switches can be applied for load, tap and gang switching duties. They incorporate 6 contacts in each switching stage. Their compact design provides a minimum length dimension for mounting purposes.	<b>140</b>
<b>KG Switches 20 A-315 A and KH and KHR Switches 16 A-80 A</b> KG, KH and KHR switches are excellent circuit interruptors. They have high through fault and fault making capacities and are especially designed for use as isolators and safety switches for machine tools, distribution panels and switchboards. KG ON/OFF switches offer unusually high dimensioned air and creepage distances between terminals which are designed for time saving “straight-line” wiring. ON/OFF switches are available with up to 8 poles and double-throw switches are available with up to 4 poles.	<b>150</b>
<b>Push Buttons and Pilot Lights, 22,5 mm Ø</b> A complete range of state-of-the-art push buttons and pilot lights represent an ideal combination of functional security and economical efficiency in a modular design.	<b>302</b>



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Kraus & Naimer

BLUE LINE switchgear



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