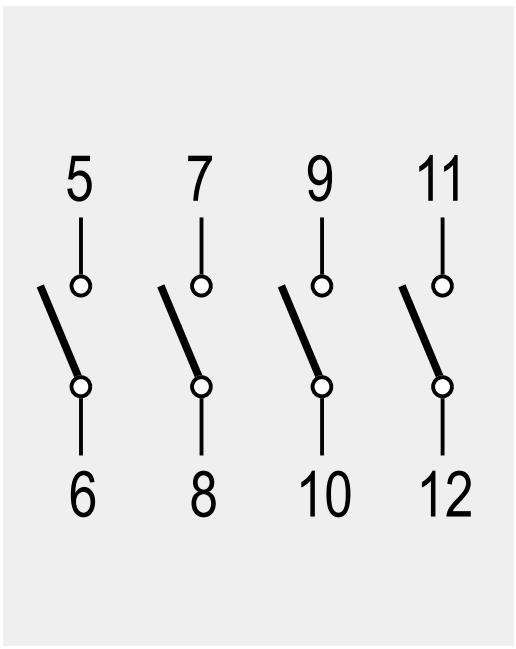
Kraus & Naimer



Switch Wiring Diagrams

POCKETBOOK

Kraus & Naimer

Switch Wiring Diagrams
POCKETBOOK

This pocketbook has been compiled to assist our customers in the selection of our most commonly used cam switches. It contains Kraus & Naimer standard contact arrangements for C-, CA-, CG- and CH-series cam switches.

For details on special or non-standard switches, please contact our local sales office.

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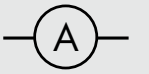
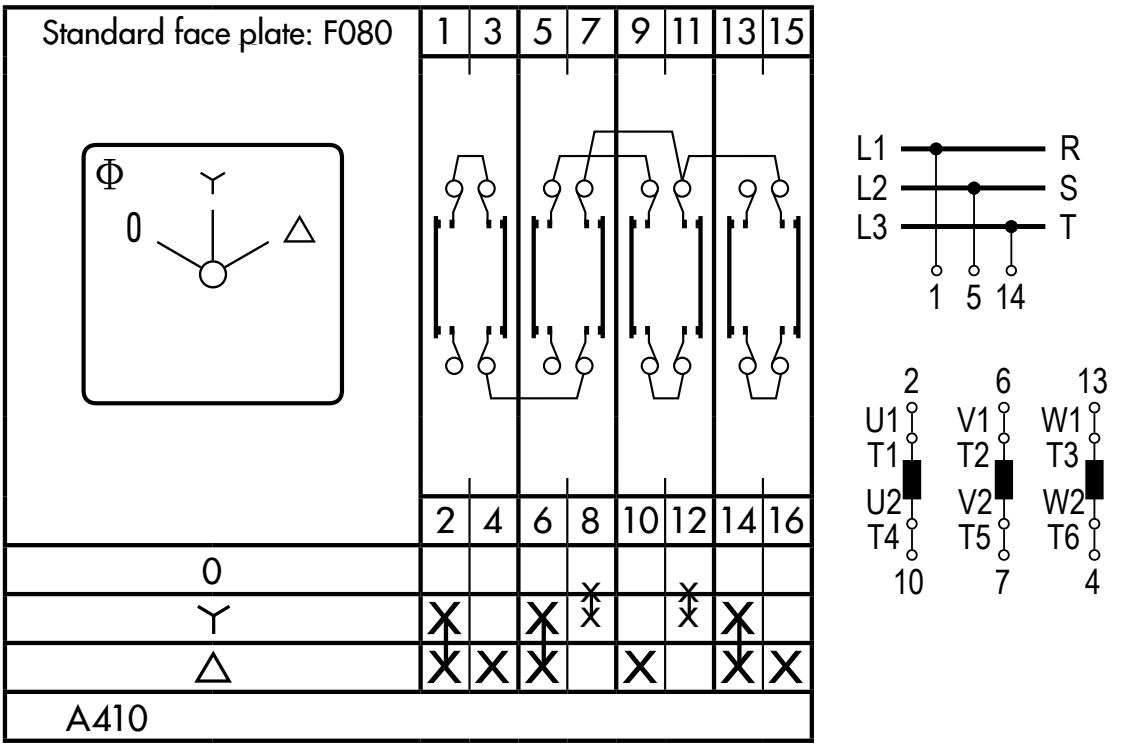
* with slip clutch

Caption

Contactor or Relay	
Thermal Relay	
Motor	
Coil / Inductance	
Ammeter	
Voltmeter	
Earth / Ground	
NO-contact	
NC-contact	
Motor - star circuit	
Motor - delta circuit	
Motor - double star circuit	

Connection Details

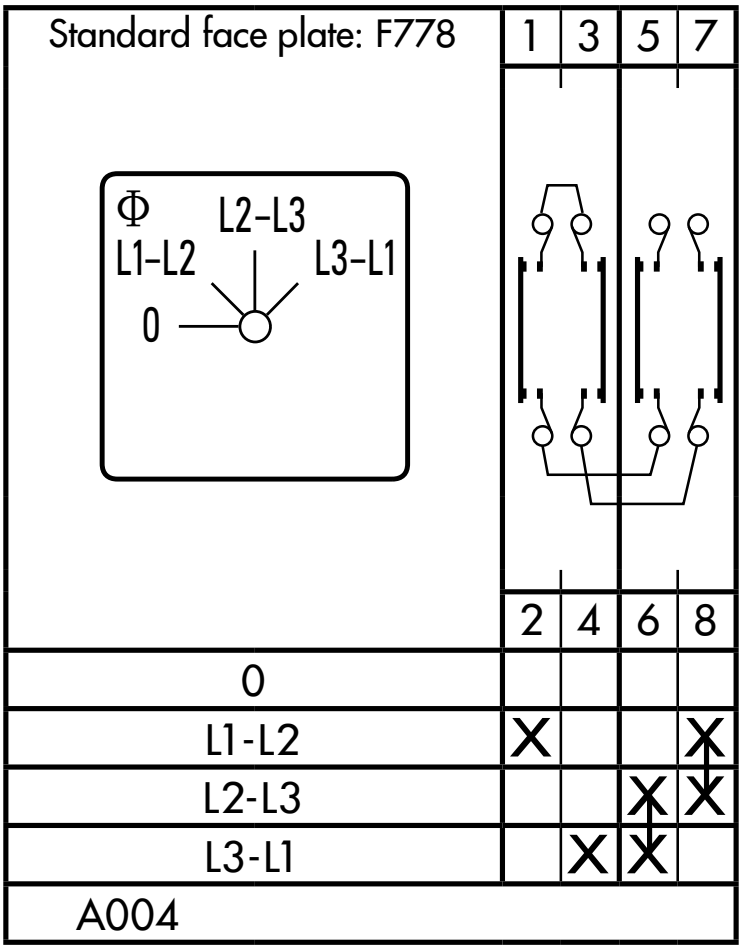
The information is presented with either a switch chart only or a switch chart and connection diagrams when appropriate.

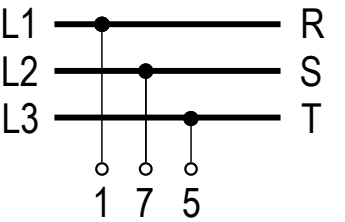


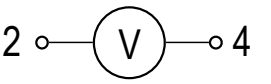
A410 Star-Delta Switch

The large image shows the switch chart. A cross in a column indicates that the contact above it is closed, when the switch is in the position as indicated to the left of the cross. For example, contact 3/4 closes in the delta position. A vertical line between 2 or more crosses indicate that the contact remains closed while the switch moves from one position to the next. The images on the right show the wiring connections for both the supply and load. For example, L1 connects to switch terminal 1 while U1 or T1 connects to terminal 2.

Voltmeter switches

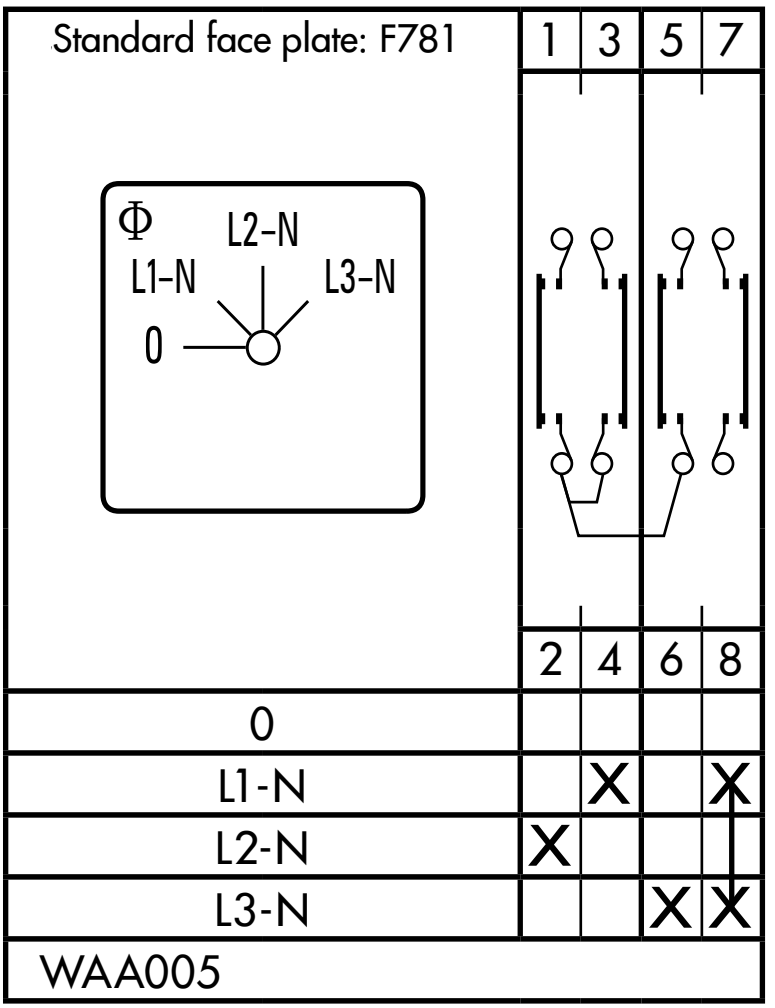


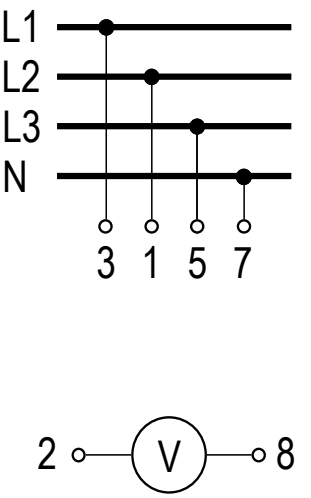




A004 Voltmeter Switch
3 phase 3 wire

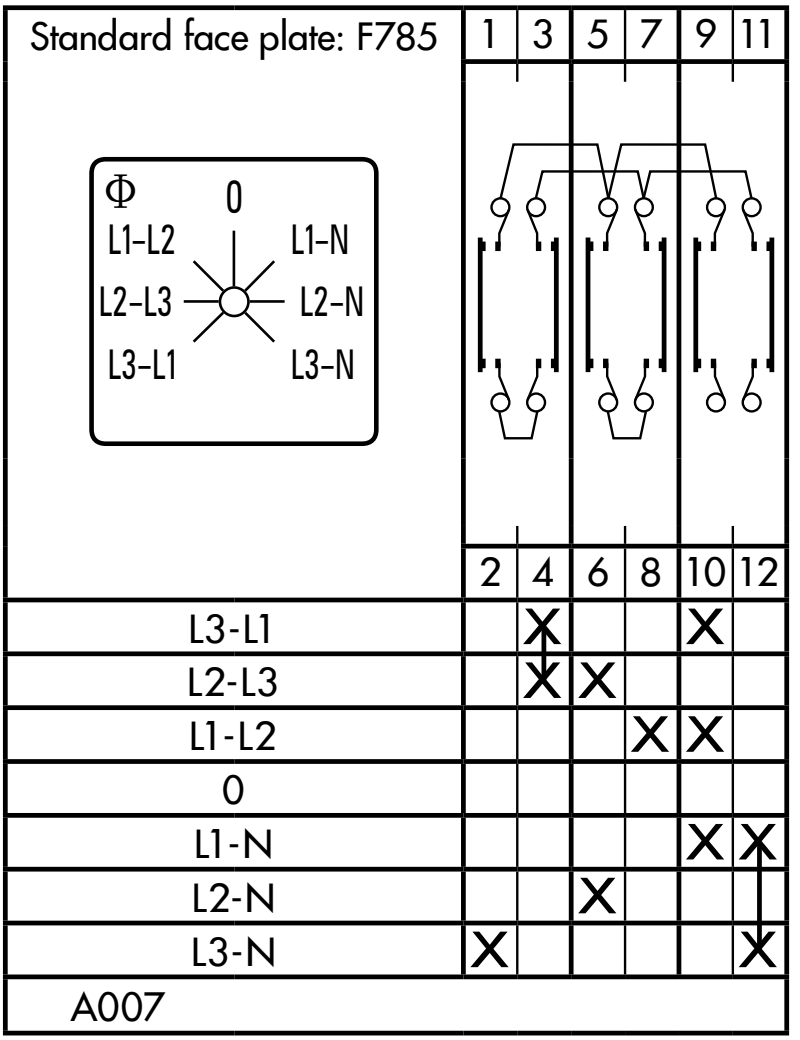
Voltmeter switches

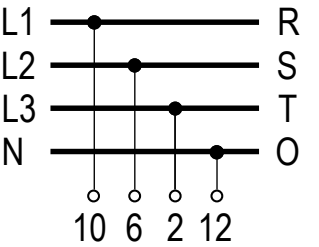


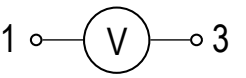


WAA005 Voltmeter Switch
(formerly A005) 3 phase to neutral

Voltmeter switches



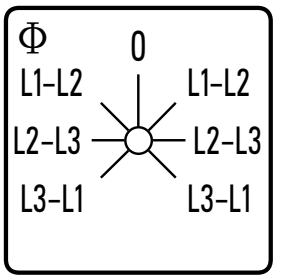


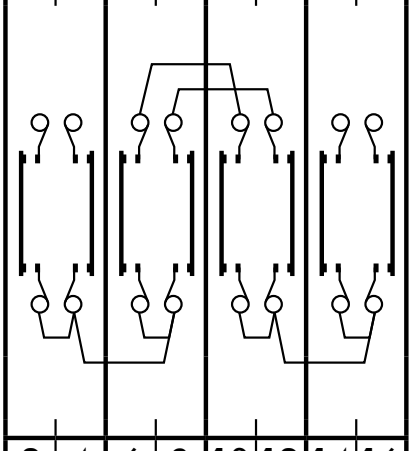


A007 Voltmeter Switch
3 phase to neutral

Voltmeter switches

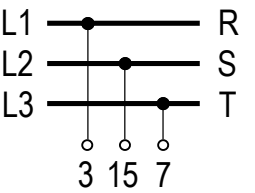
Standard face plate: F788

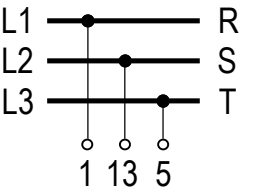


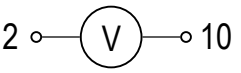


	1	3	5	7	9	11	13	15
	2	4	6	8	10	12	14	16
L3-L1		X				X		
L2-L3				X				X
L1-L2		X						X
0								
L1-L2	X						X	
L2-L3			X				X	
L3-L1	X				X			

WAA008

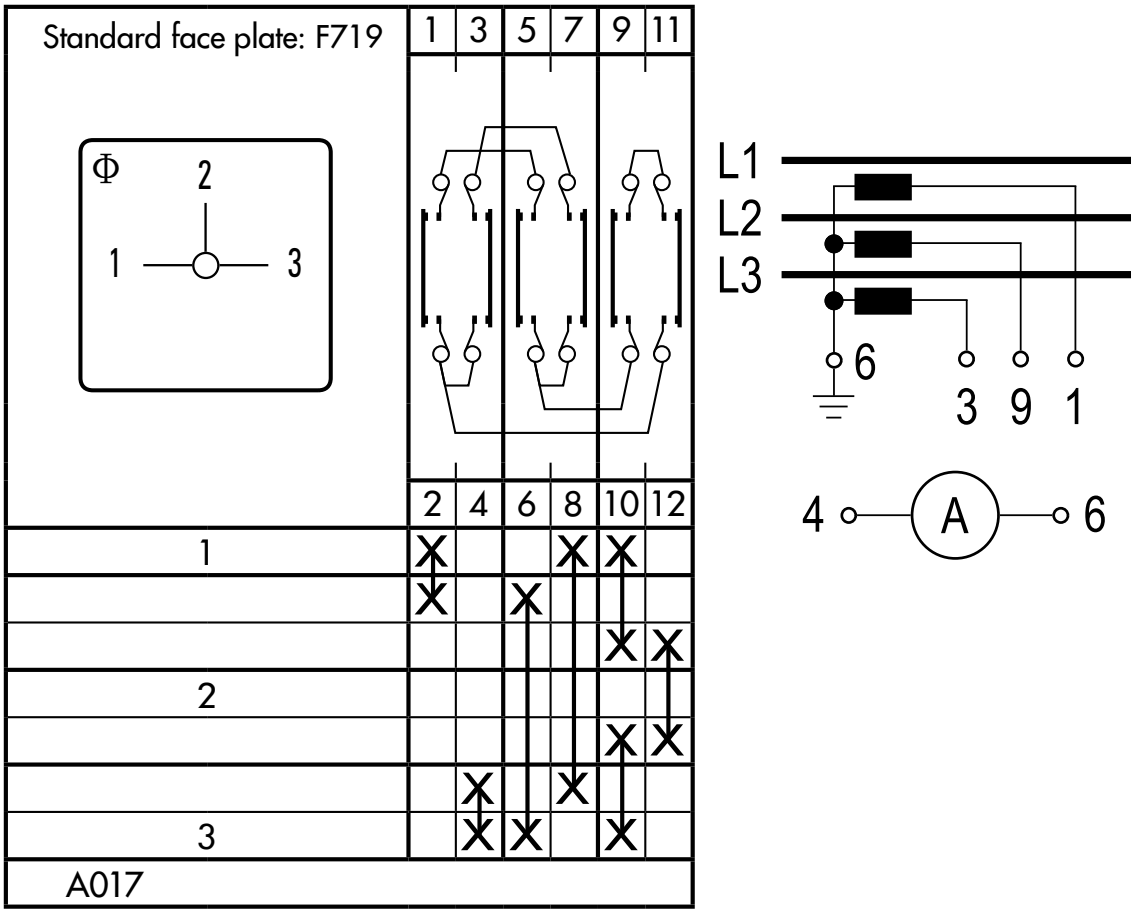






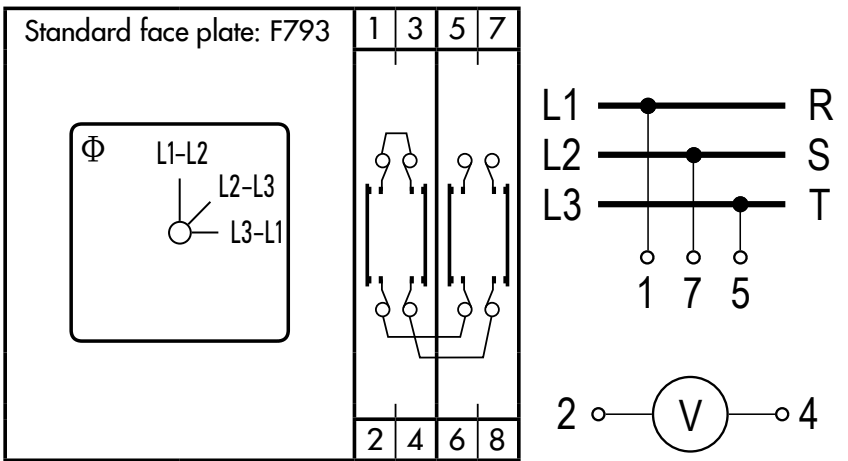
WAA008 Voltmeter Switch
(formerly A008) 2 separate 3 phase

Ammeter switches

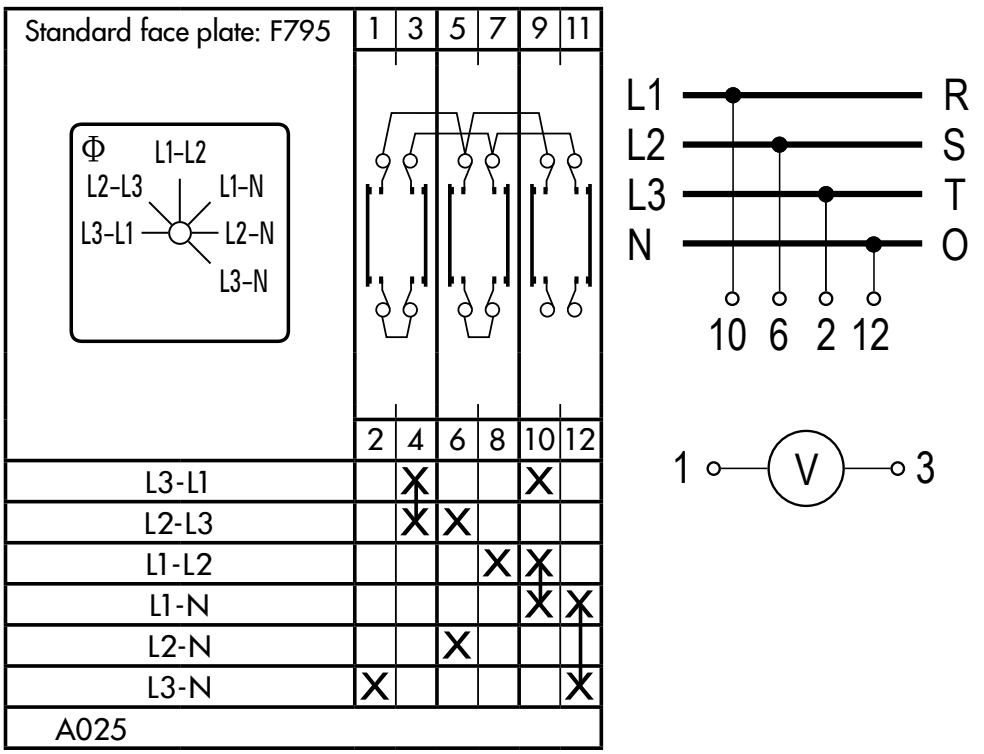


WAA017 Ammeter Switch
1 pole, 3 Current transformers

Voltmeter switches

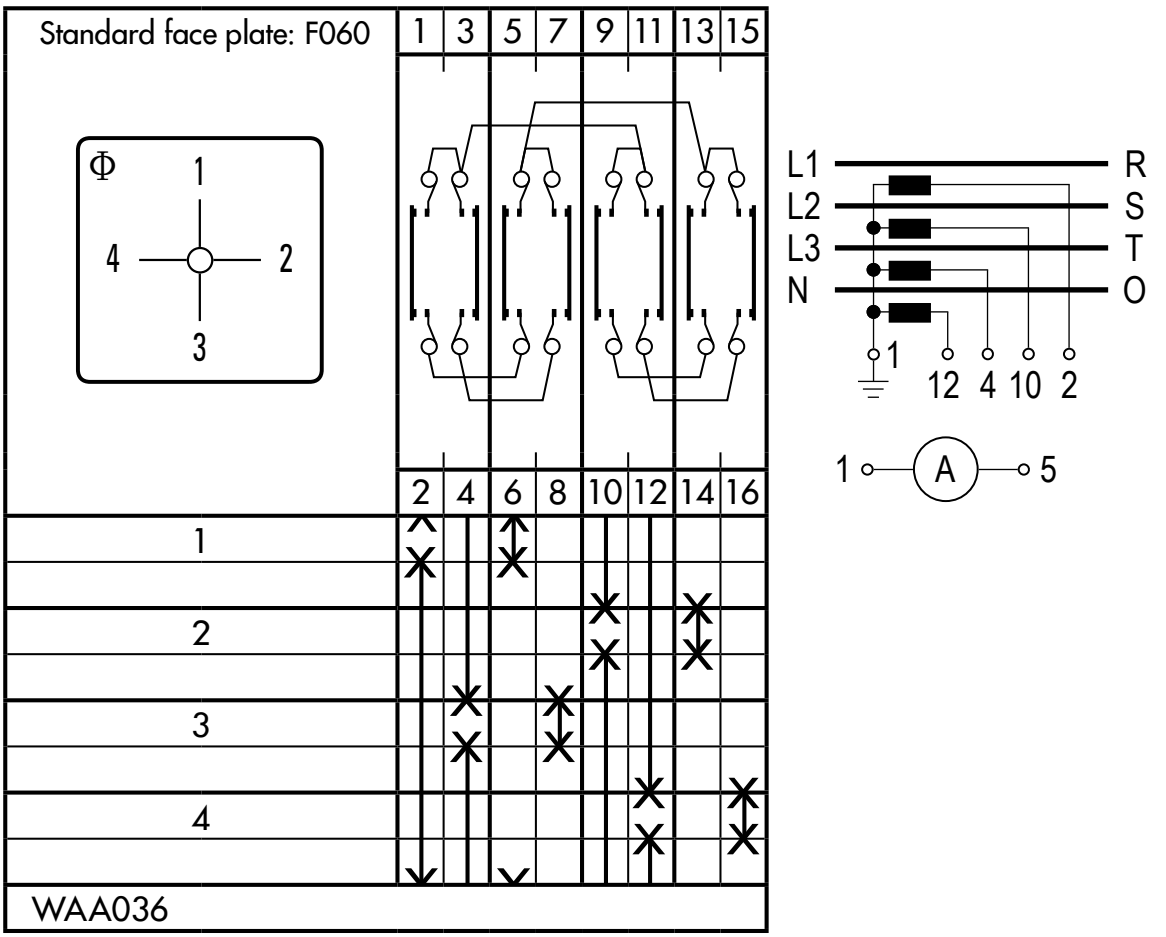


A023 Voltmeter Switch, 3 phase 3 wire



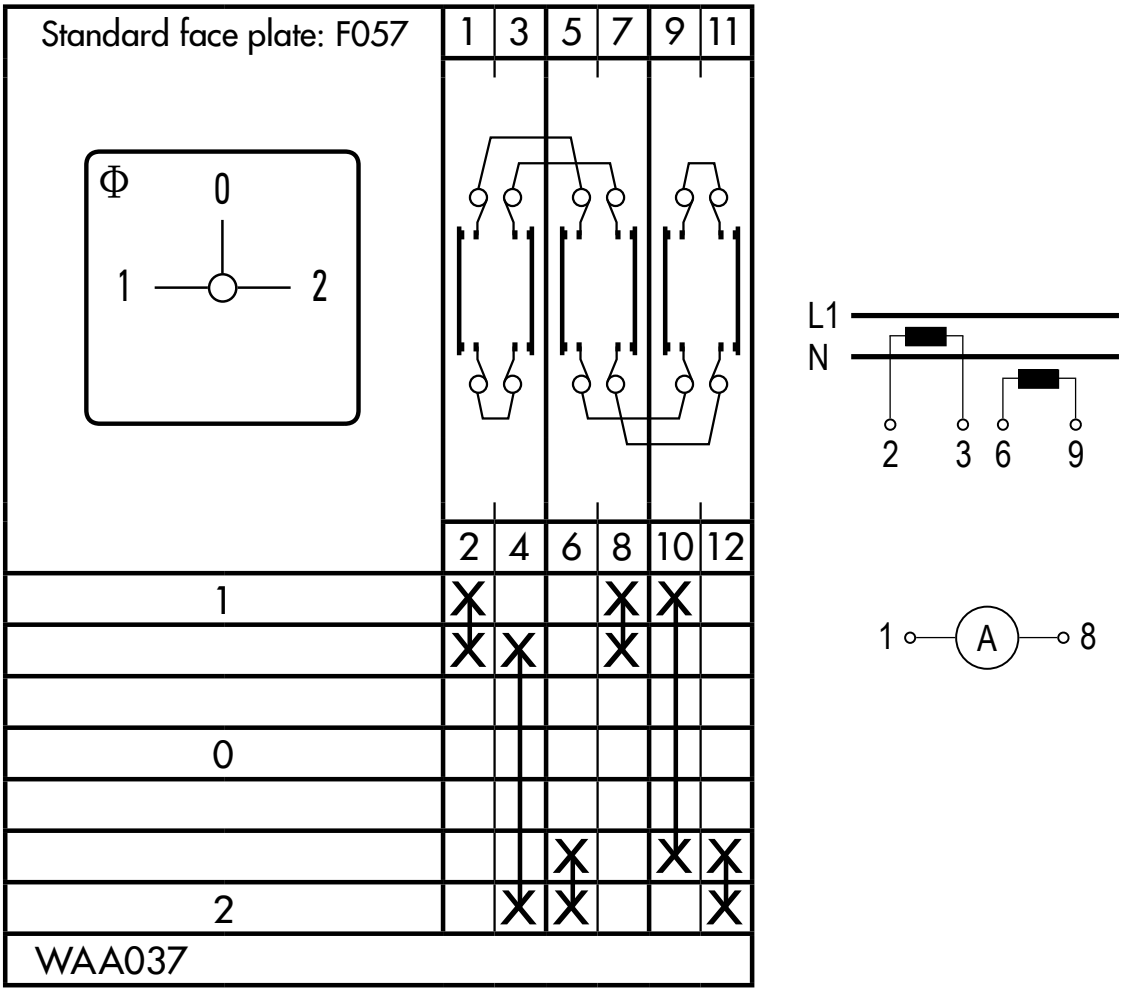
A025 Voltmeter Switch, 3 phase 3 wire,
3 phase to neutral

Ammeter switches



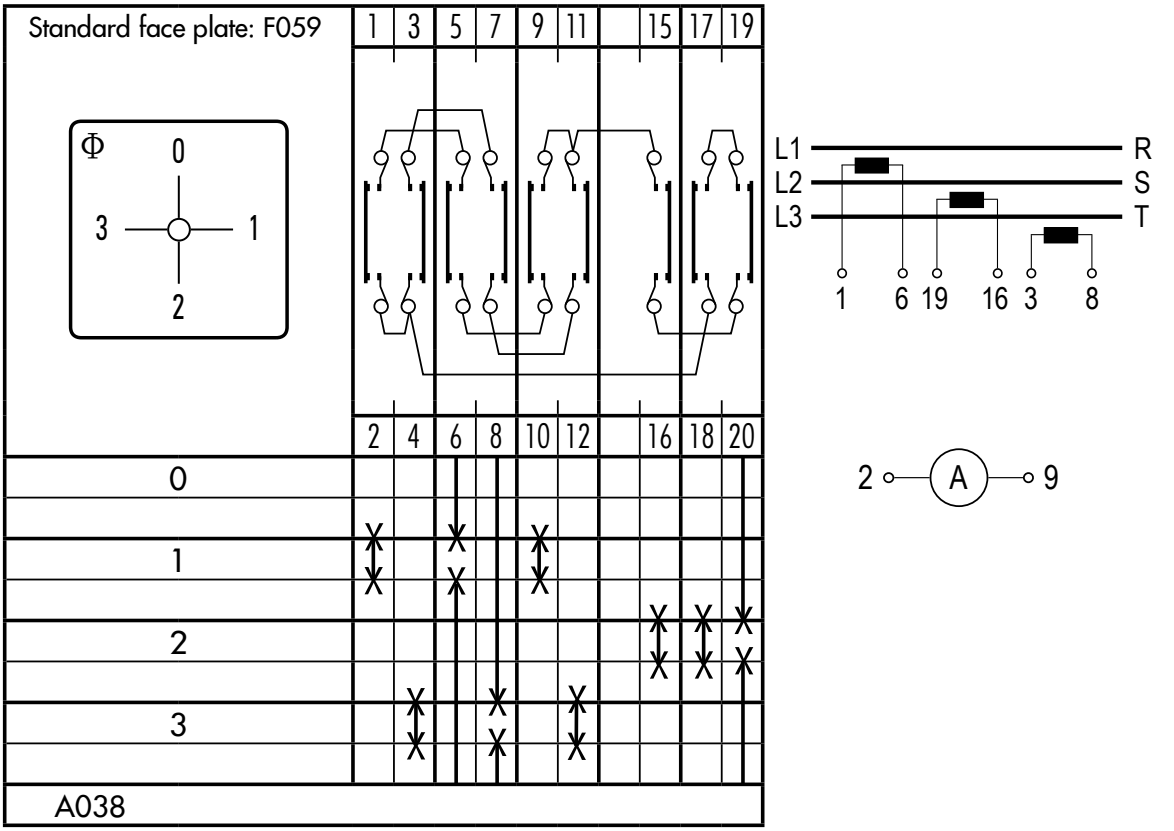
WAA036 Ammeter Switch
(formerly A036) 1 pole, 4 Current transformers

Ammeter switches

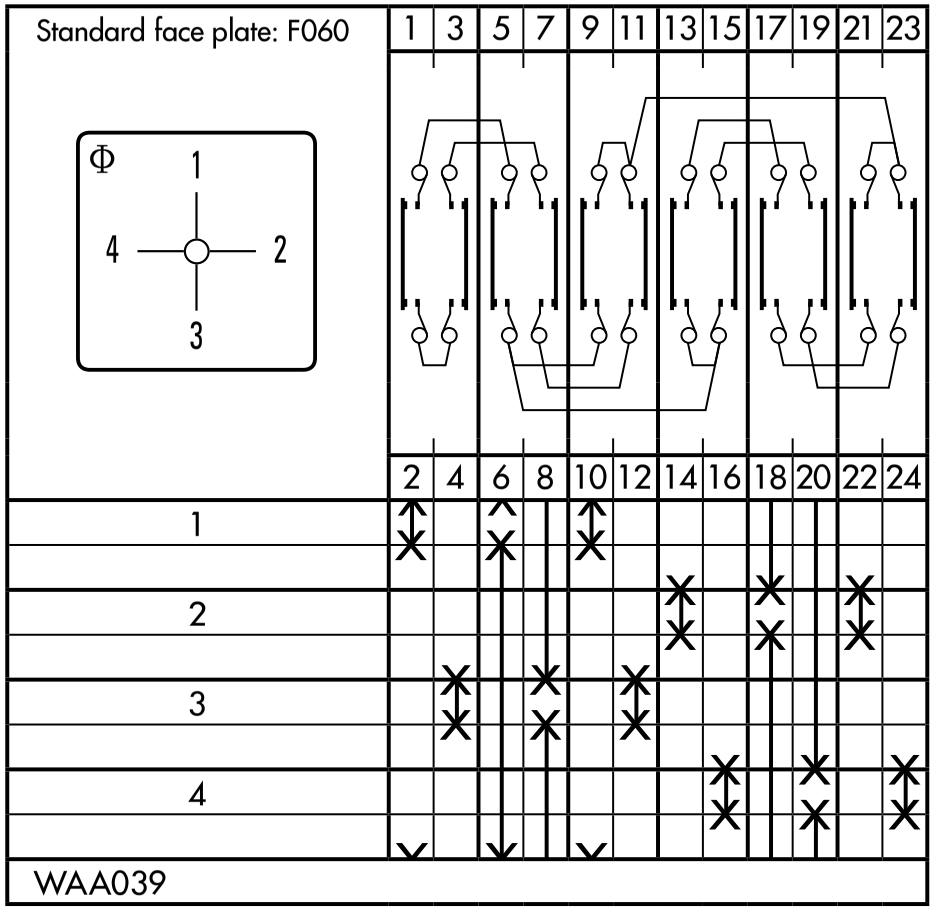


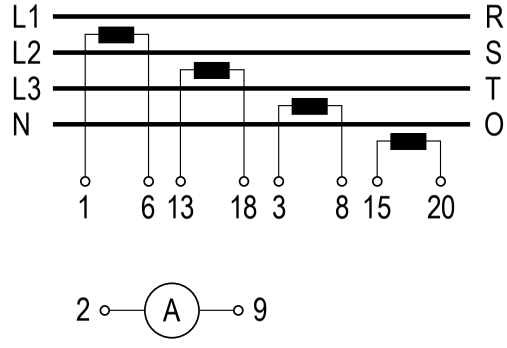
WAA037 Ammeter Switch
(formerly A037) 2 pole, 2 Current transformers

Ammeter switches



A038 Ammeter Switch
2 pole, 3 Current transformers

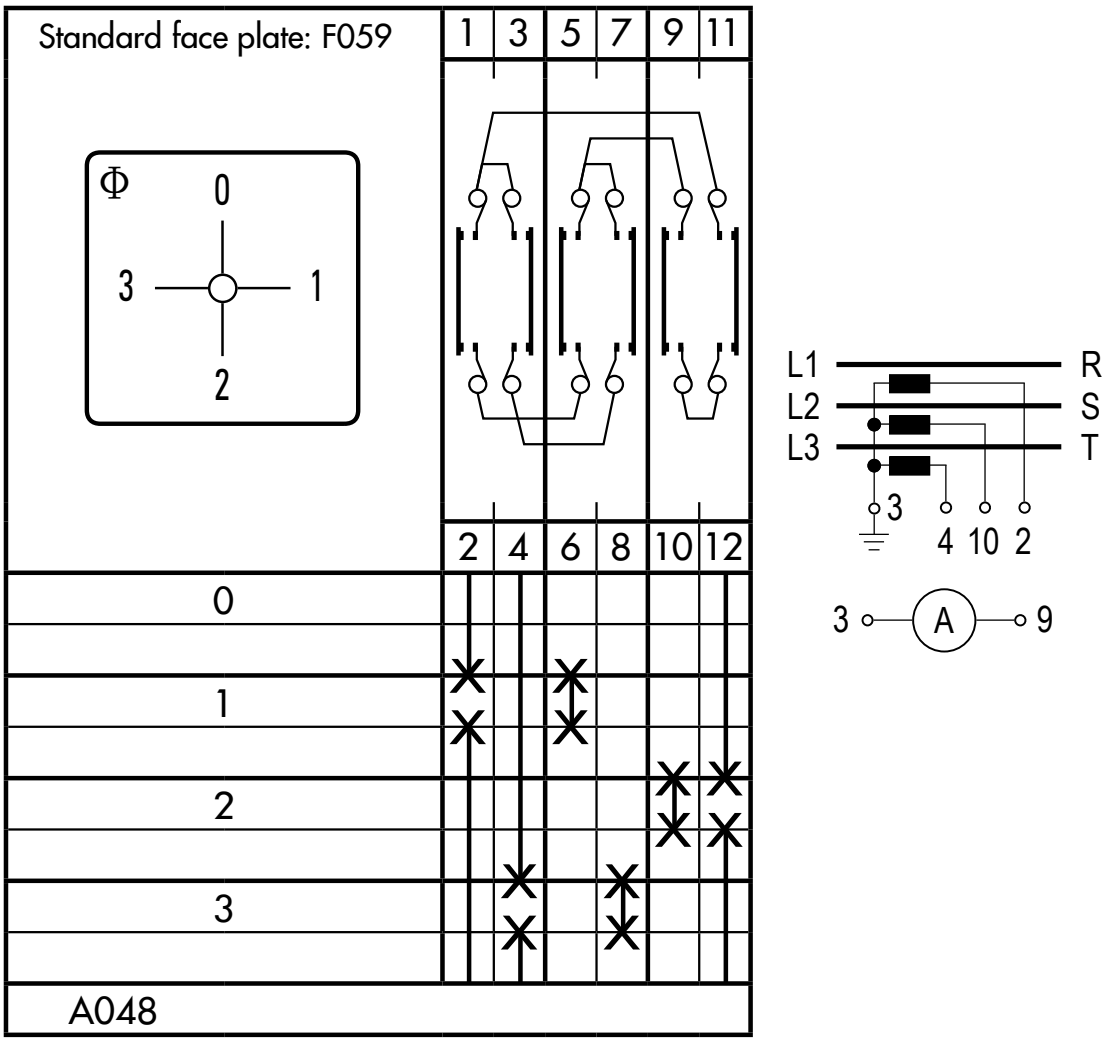




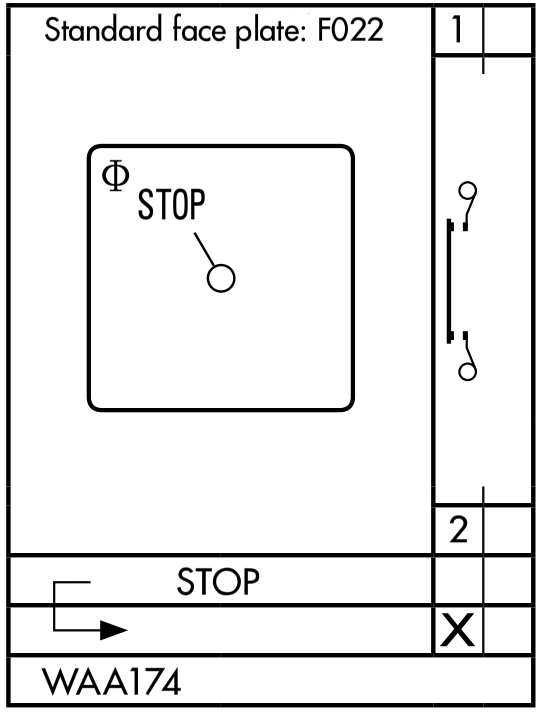
WAA039 Ammeter Switch

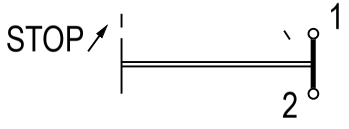
(formerly A039) 2 pole, 4 Current transformers

Ammeter switches

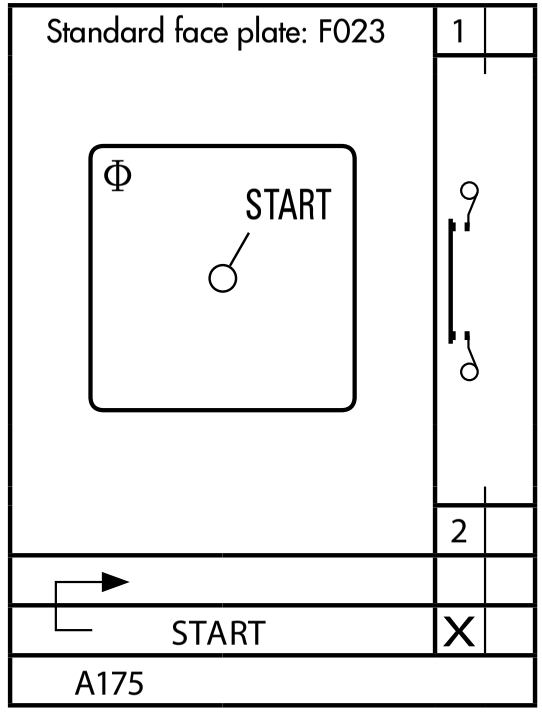


A048 Ammeter Switch
1 pole, 3 Current transformers

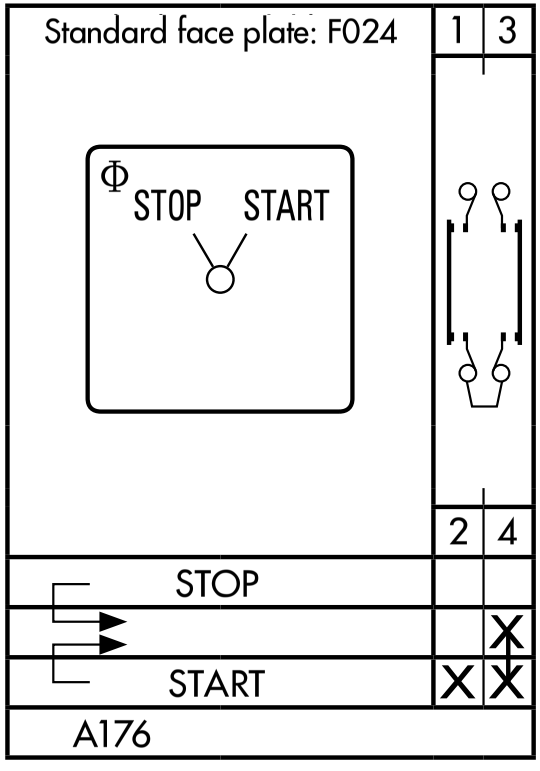


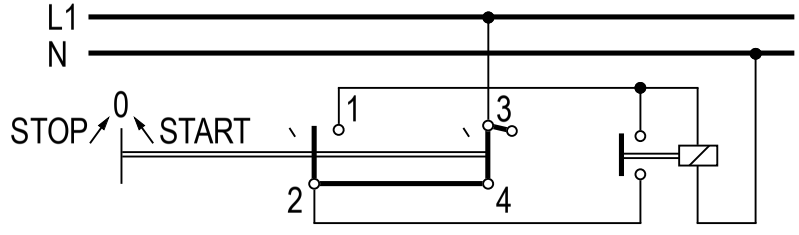


WAA174 Stop switch
(formerly A174) 1 pole



A175 Start switch
1 pole

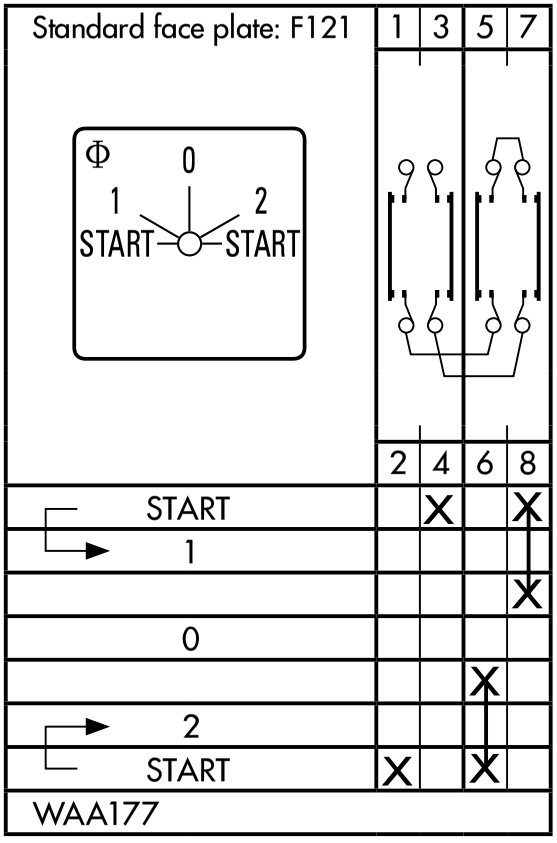


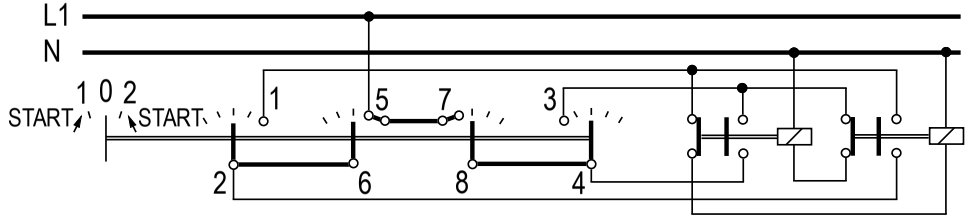


A176 Stop start switch

2 pole see page 31

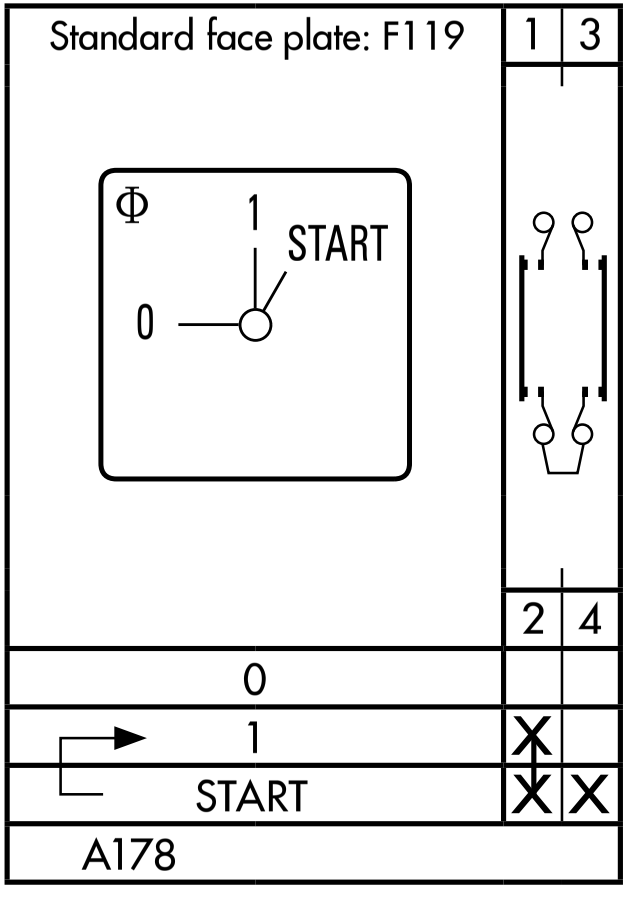
Electrically isolated contacts see page 86

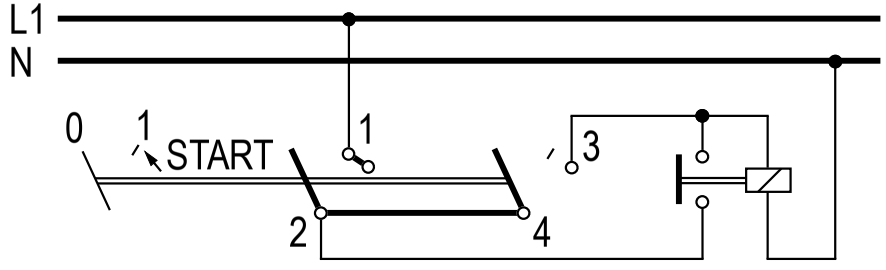




WAA177 Stop Start Switch for two units

(formerly A177) 2 pole, with spring return from start to run

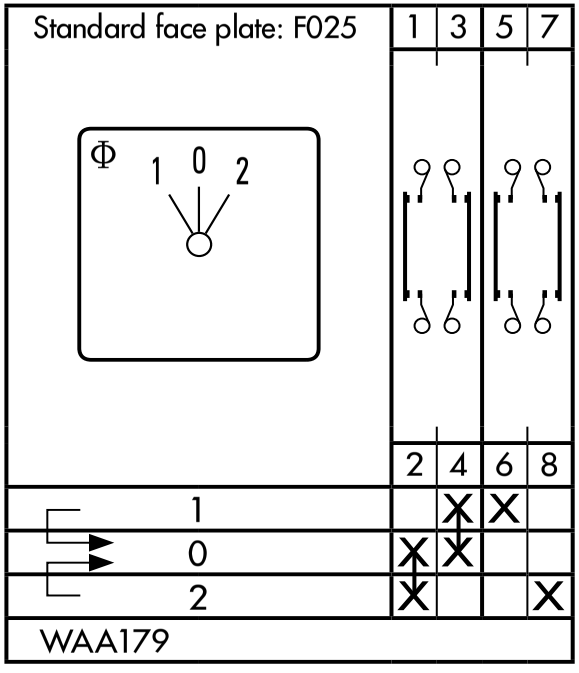


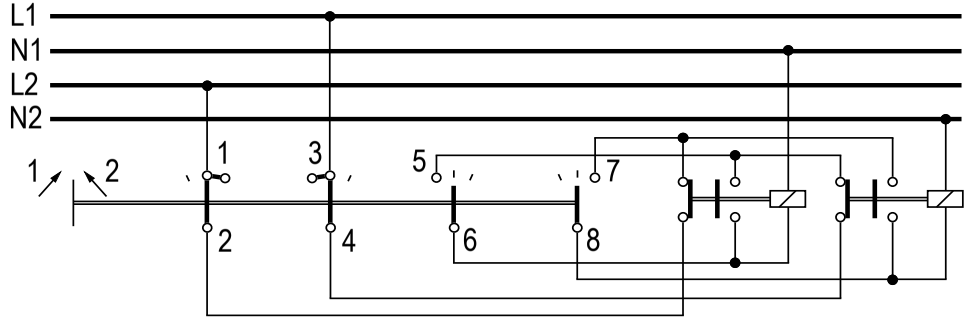


A178 Stop start switch

1 pole, with spring return from start to run

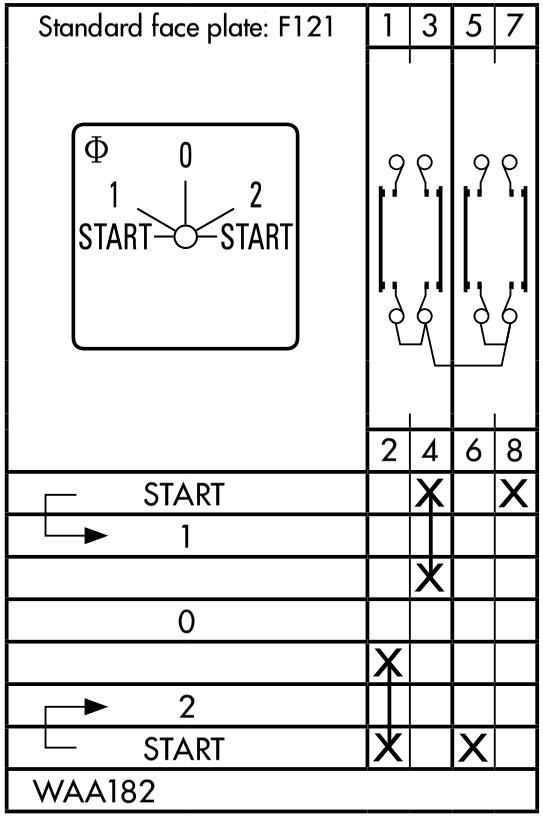
Electrically isolated contacts see page 86

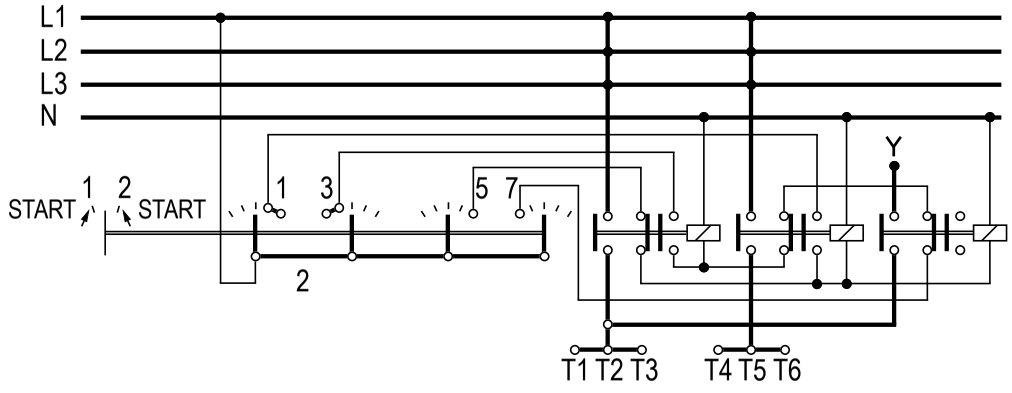




WAA179 Contactor control with spring return to „OFF“

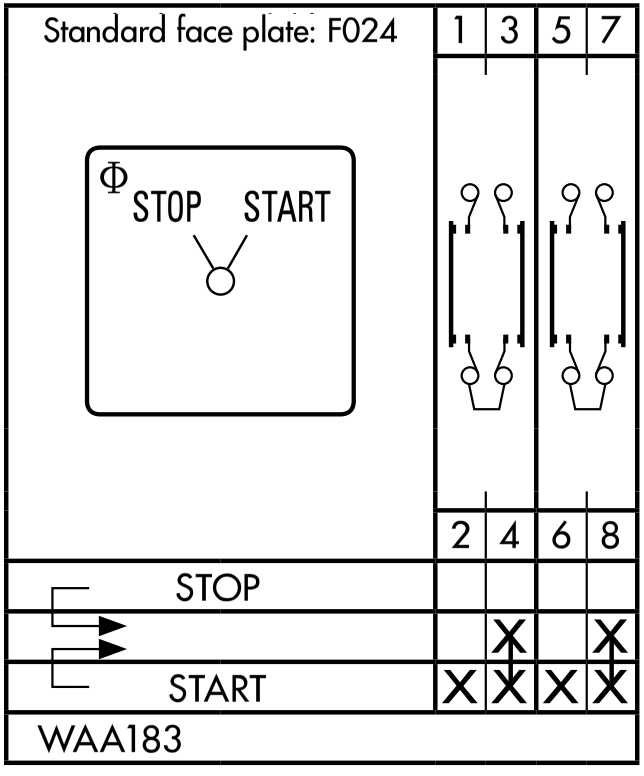
(formerly A179)

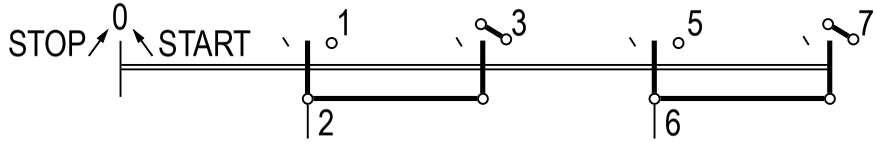




WAA182 Stop Start Switch

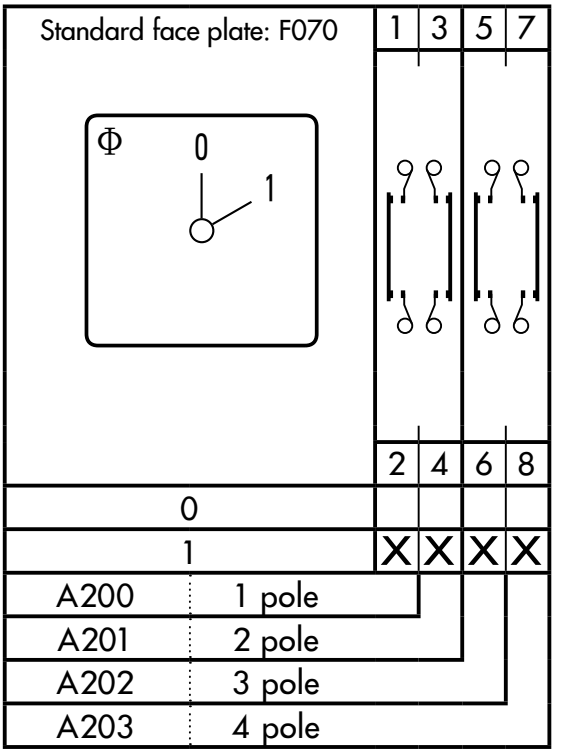
(formerly A182) with spring return to run with contactor interlock





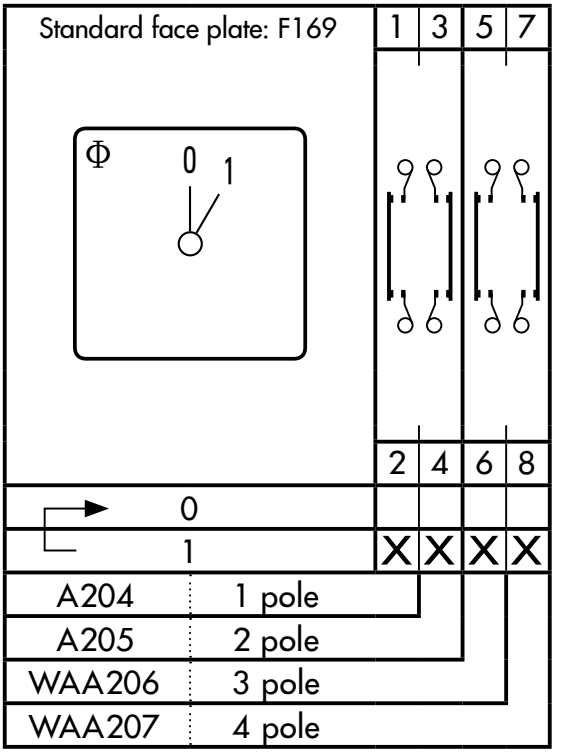
WAA183 Stop start switch
(formerly A183) 2 pole

ON/OFF Switches



A200 up to A203 ON/OFF Switches, 60° Switching

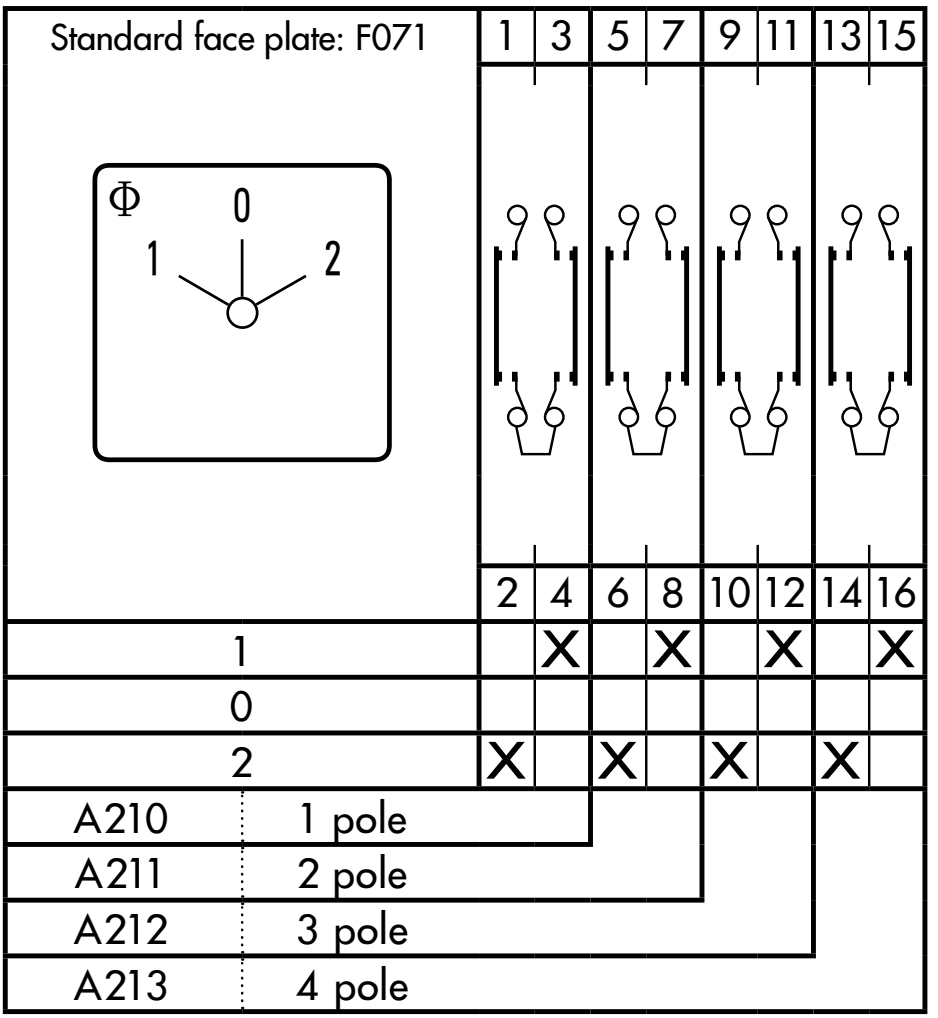
ON/OFF Switches 5- up to 12 pole
see page 56



A204 up to WAA207
(formerly A207)

ON/OFF Switches with spring return, 30° Switching

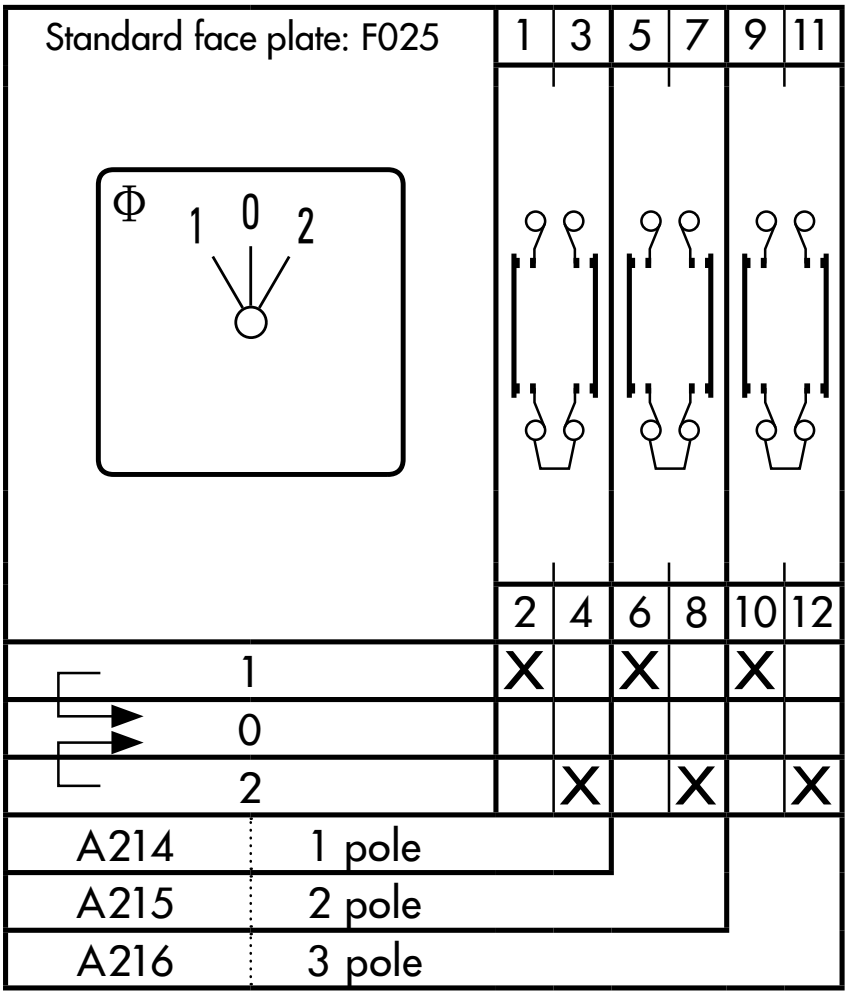
Double-throw Switches



A210 up to A213 Double-throw Switches, with „OFF“, 60° Switching

Electrically isolated contacts see page 81
Double-throw Switches with „OFF“, 5-8 pole see page 57

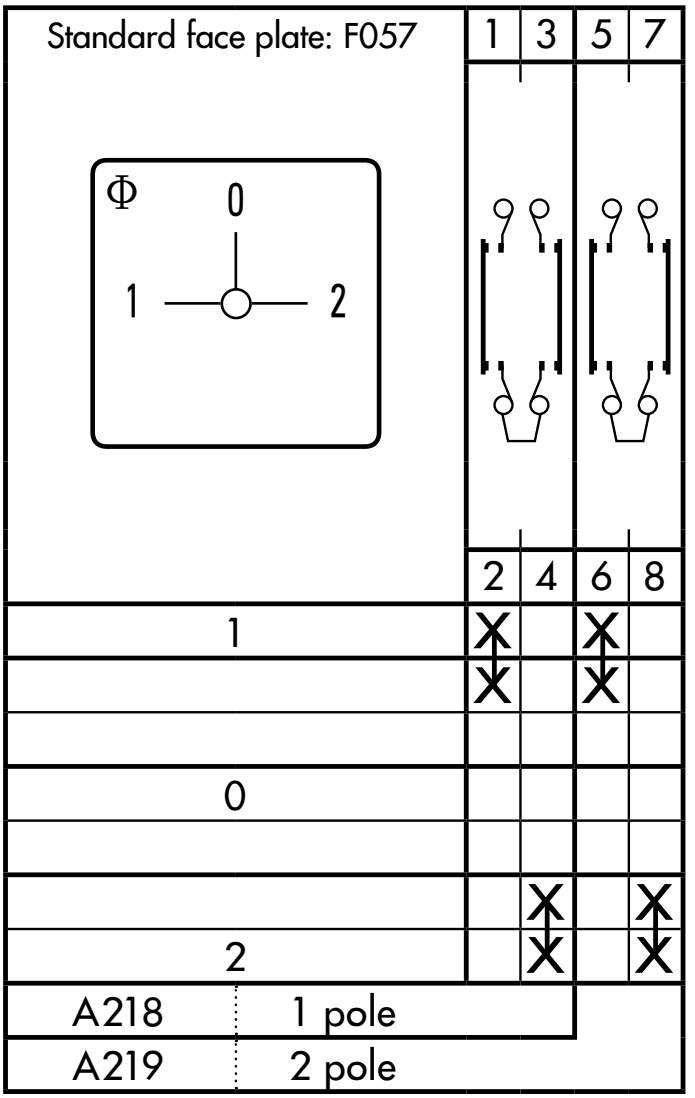
Double-throw Switches



A214 up to A216 Double-throw Switches with „OFF“ and with spring return to „OFF“, 30° Switching

Electrically isolated contacts see page 82

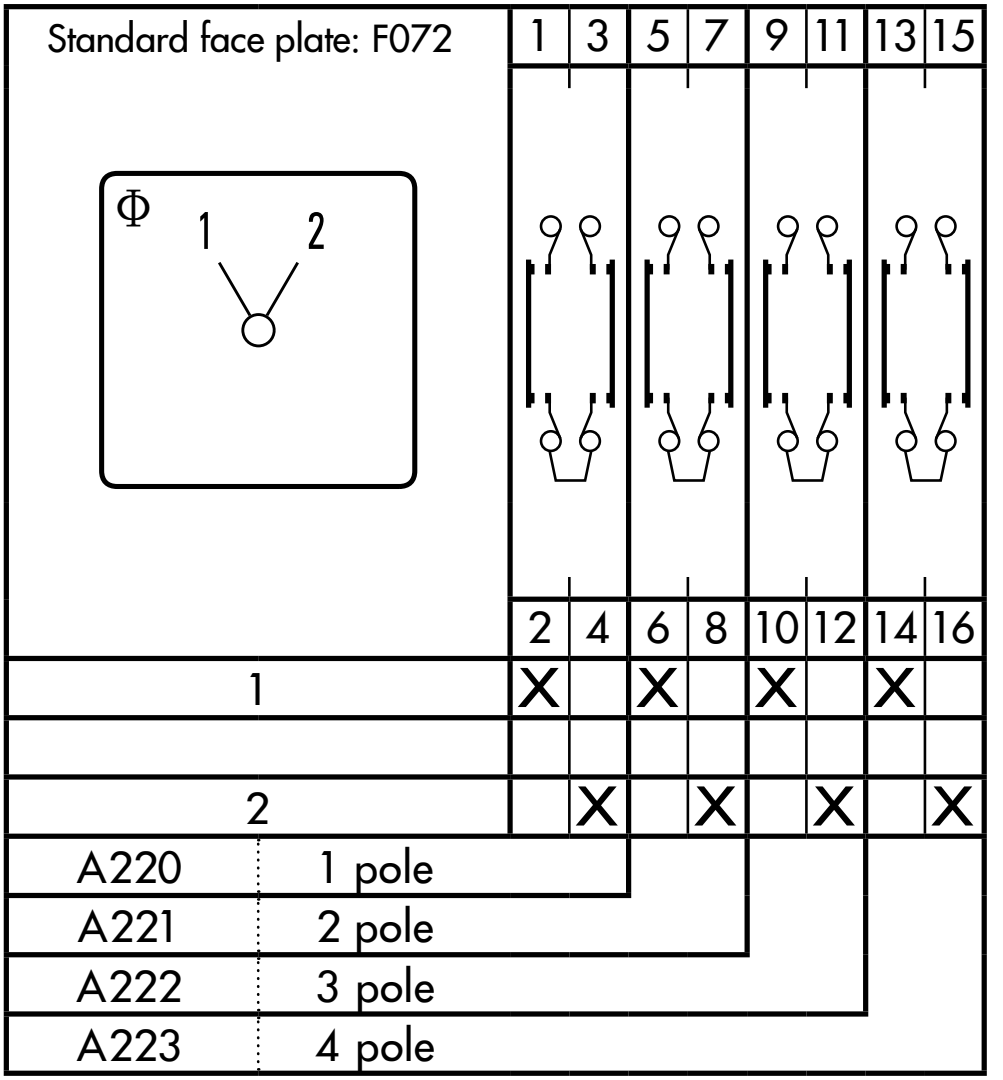
Double-throw Switches



A218, A219
Double-throw Switches with „OFF“, 90° Switching

For 3 & 4 pole options see pages 48 & 46 respectively

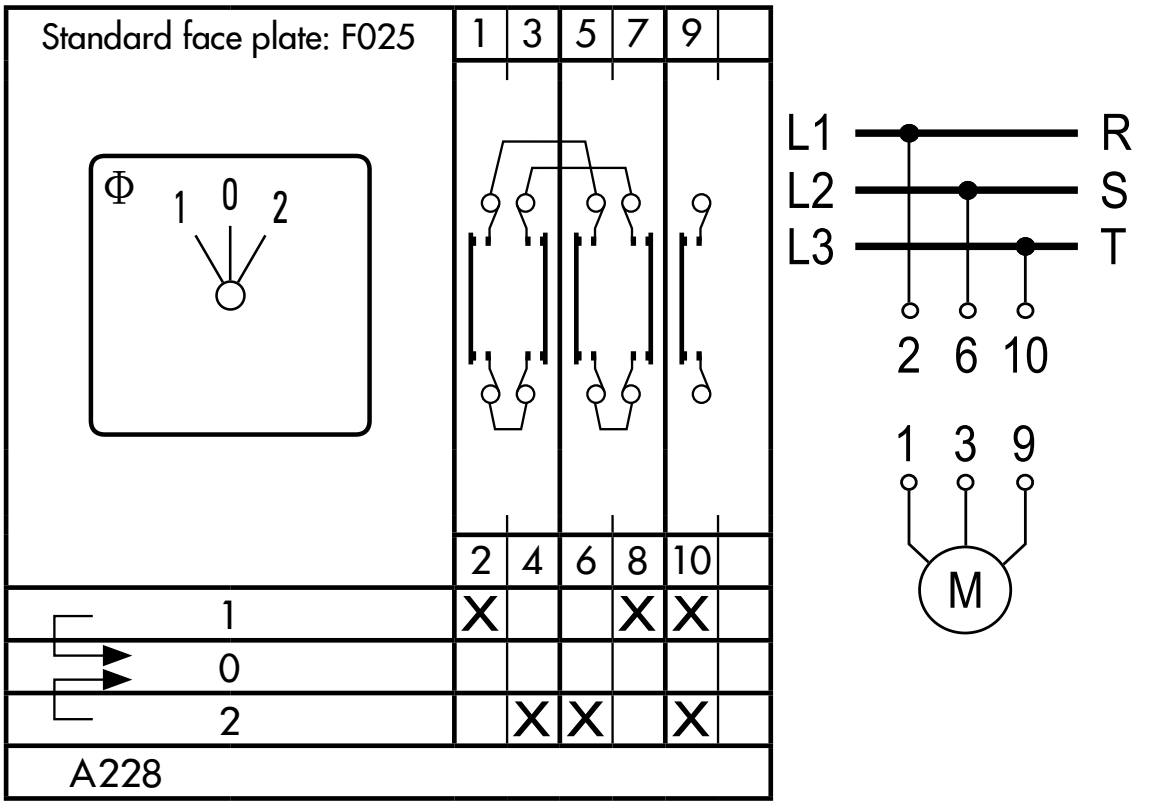
Double-throw Switches



A220 up to A223
Double-throw Switches without „OFF“, 60° Switching

Electrically isolated contacts see page 83
Double-throw Switches without „OFF“ 5-12 pole see page 58

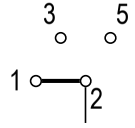
Motor Switches



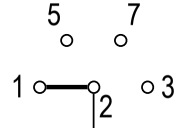
A228 Motor Reversing Switches
3 pole, with spring return to 0

Multi-step Switches 1 pole without „OFF"

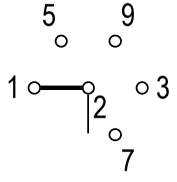
3 Step
A230 *



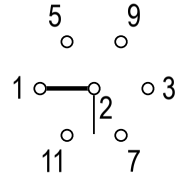
4 Step
A231 **



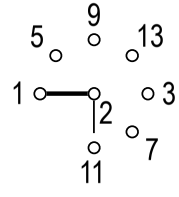
5 Step
A232



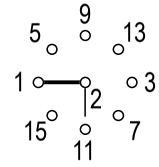
6 Step
A233



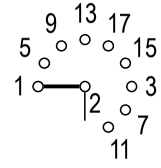
7 Step
WAA234 (formerly A234)



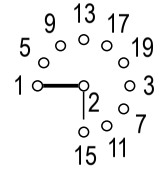
8 Step
WAA235 (formerly A235)



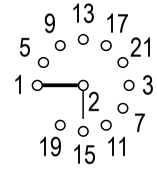
9 Step
WAA236 (formerly A236)



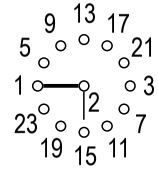
10 Step
WAA237 (formerly A237)



11 Step
WAA238 (formerly A238)



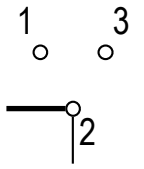
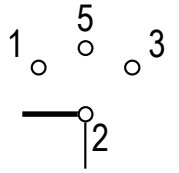
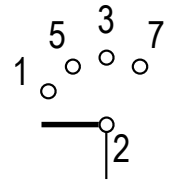
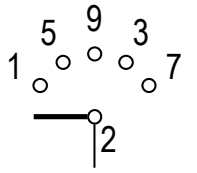
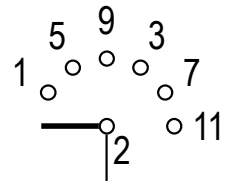
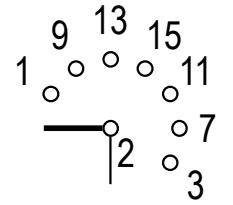
12 Step
WAA239 (formerly A239)



Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

and electrically isolated contacts see *Page 84 resp. **Page 85

Multi-step Switches 1 pole with „OFF“

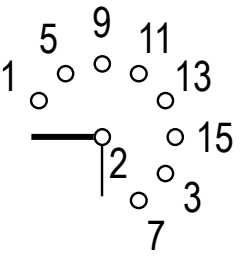
2 Step	A240	
3 Step	A241	
4 Step	A242	
5 Step	A243	
6 Step	A244	
7 Step	WAA245 (formerly A245)	

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

Multi-step Switches 1 pole with „OFF“

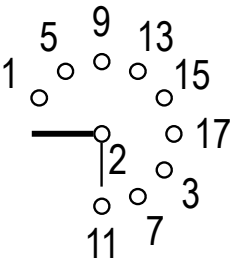
8 Step

WAA246
(formerly A246)



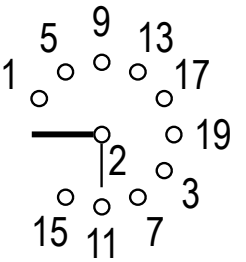
9 Step

WAA247
(formerly A247)



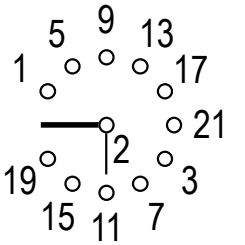
10 Step

WAA248
(formerly A248)



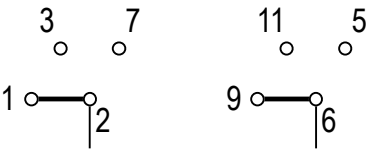
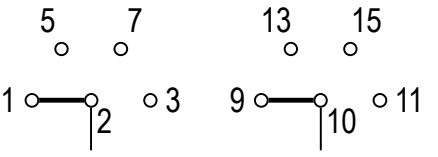
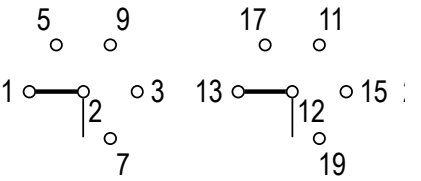
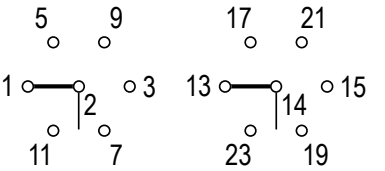
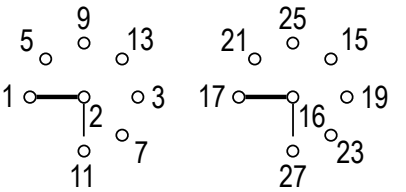
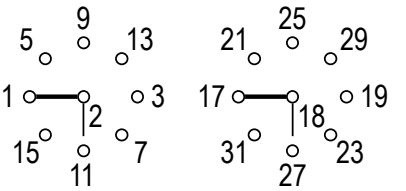
11 Step

WAA249
(formerly A249)



Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

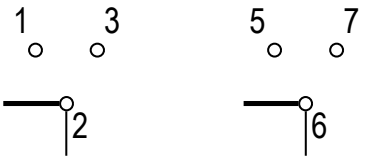
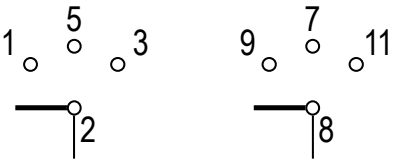
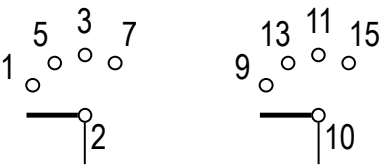
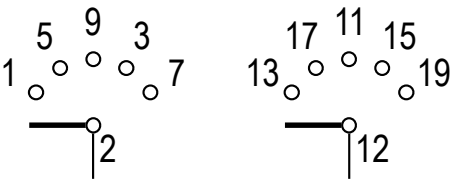
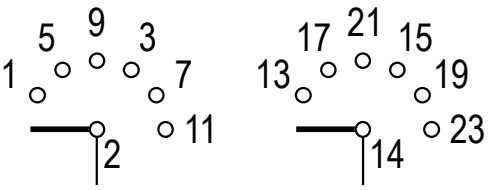
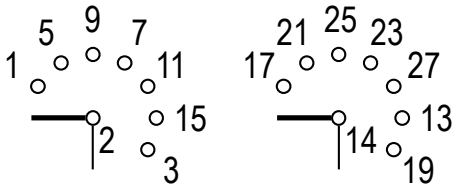
Multi-step Switches 2 pole without „OFF“

3 Step	A250*	
4 Step	A251**	
5 Step	A252	
6 Step	WAA253 (formerly A253)	
7 Step	WAA254 (formerly A254)	
8 Step	WAA255 (formerly A255)	

Electrically isolated contacts see *Page 84 resp. **Page 85

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

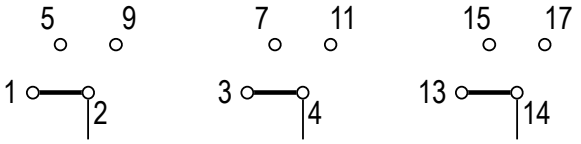
Multi-step Switches 2 pole with „OFF“

2 Step	A260	
3 Step	A261	
4 Step	WAA262 (formerly A262)	
5 Step	WAA263 (formerly A263)	
6 Step	WAA264 (formerly A264)	
7 Step	WAA265 (formerly A265)	

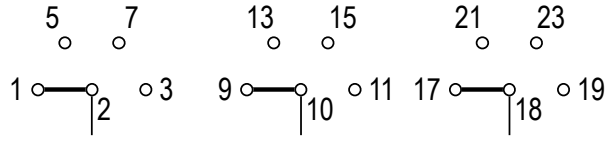
Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

Multi-step Switches 3 pole without „OFF“

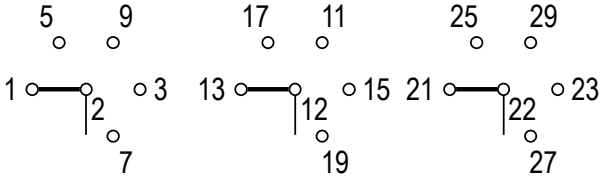
3 Step
A270



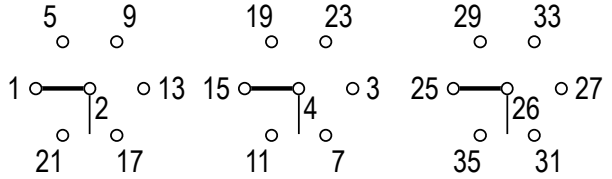
4 Step
A271



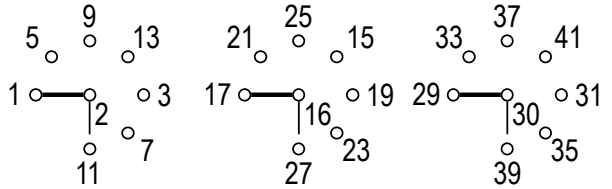
5 Step
WAA272
(formerly A272)



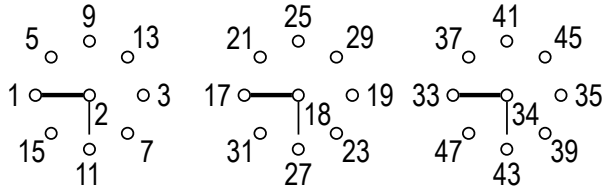
6 Step
WAA273
(formerly A273)



7 Step
WAA274
(formerly A274)



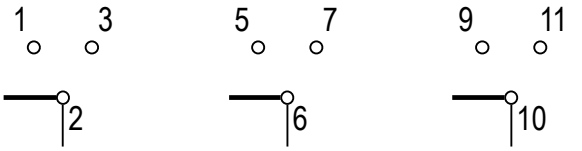
8 Step
WAA275
(formerly A275)



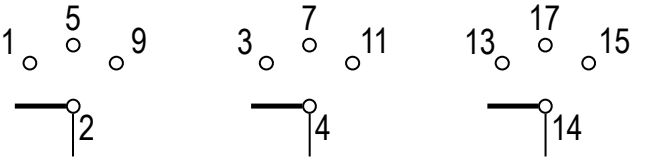
Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

Multi-step Switches 3 pole with „OFF“

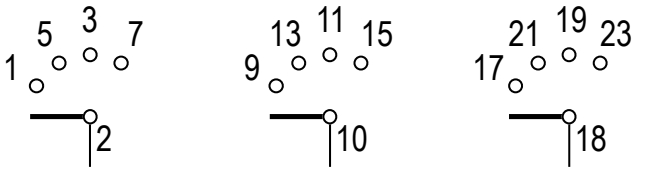
2 Step
A280



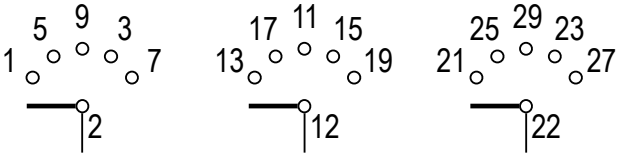
3 Step
A281



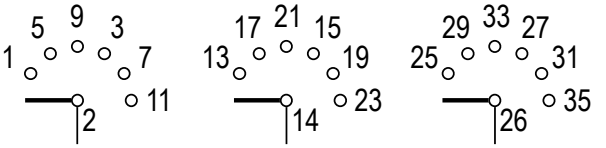
4 Step
WAA282
(formerly A282)



5 Step
WAA283
(formerly A283)

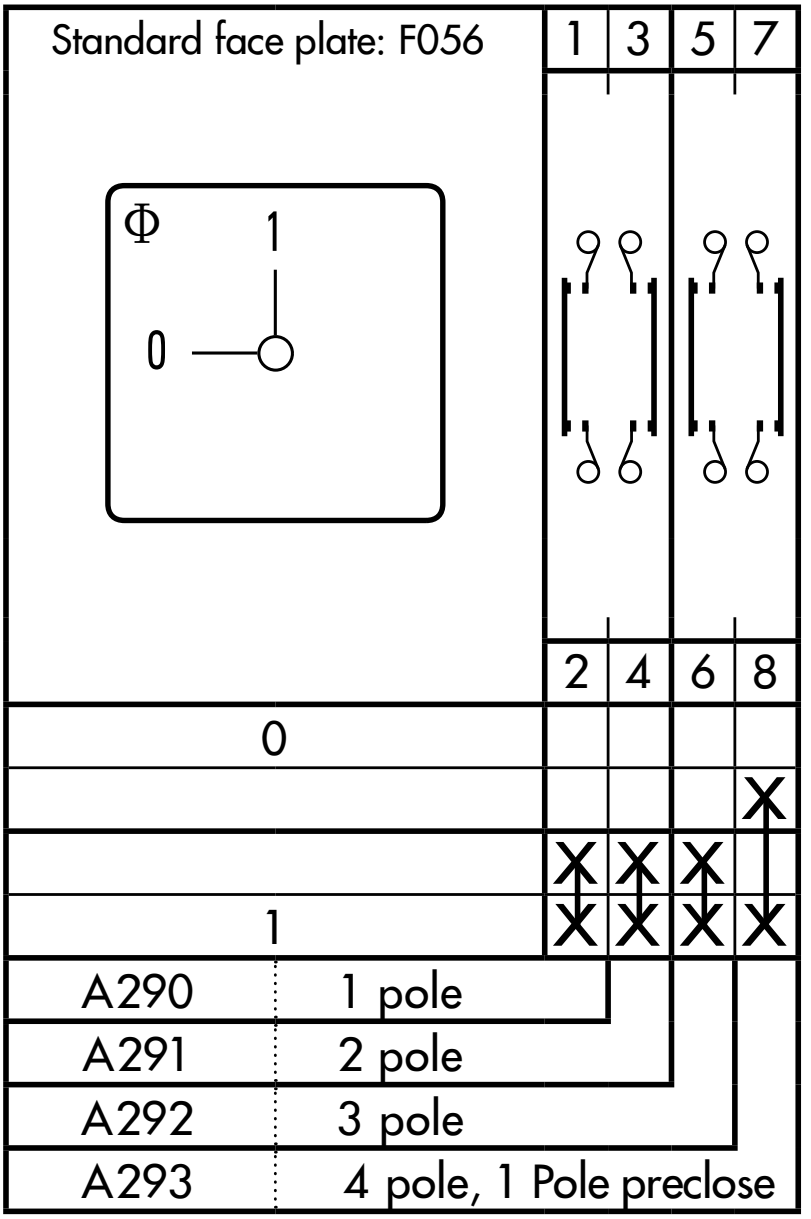


6 Step
WAA284
(formerly A284)



Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

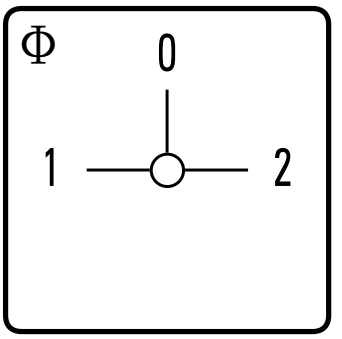
ON/OFF Switches

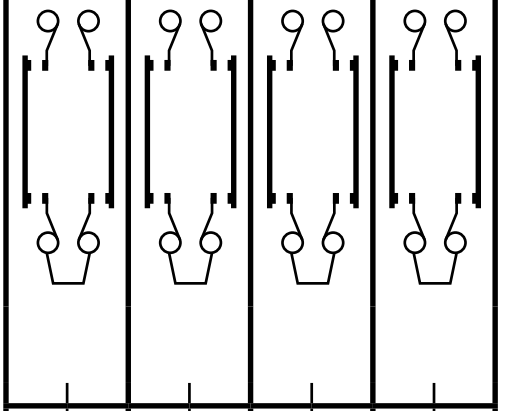


A290 up to A293
ON/OFF Switches 90° Switching

Double-throw Switches

Standard face plate: F057



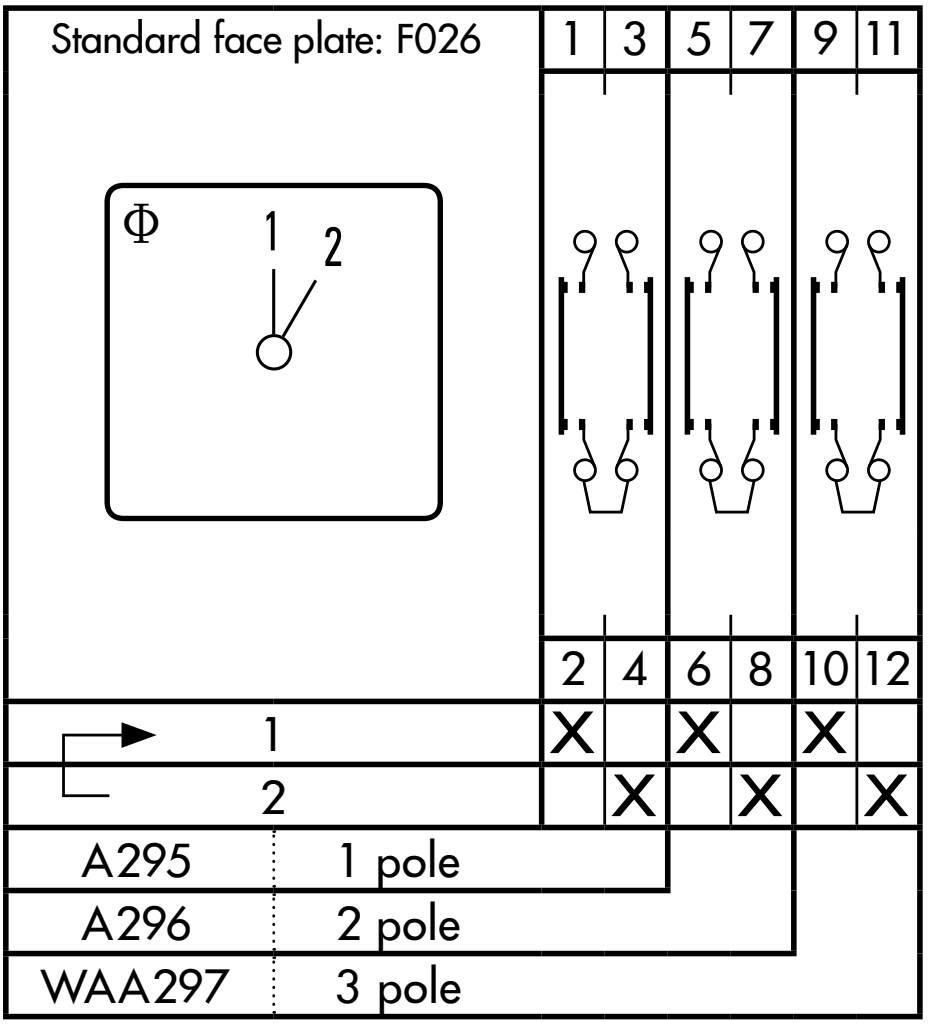


	2	4	6	8	10	12	14	16
1	X		X		X		X	
	X		X		X			
							X	
0								
								X
		X		X		X		
2		X		X		X		X

WAA294 4 pole, 1 Pole preclose

WAA294 Double-throw Switch with „OFF“,
(formerly A294) 90° Switching

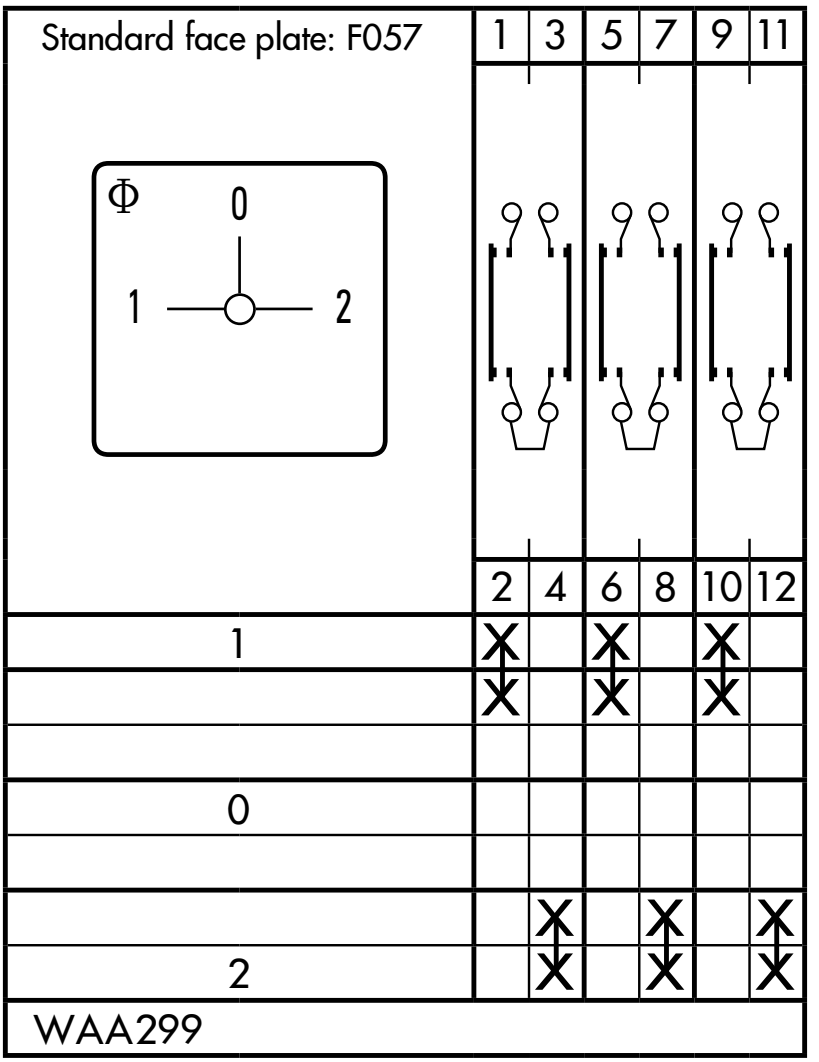
Double-throw Switches



A295* up to WAA297 (formerly A297)
Double-throw Switches without „OFF“,
with spring return, 30° Switching

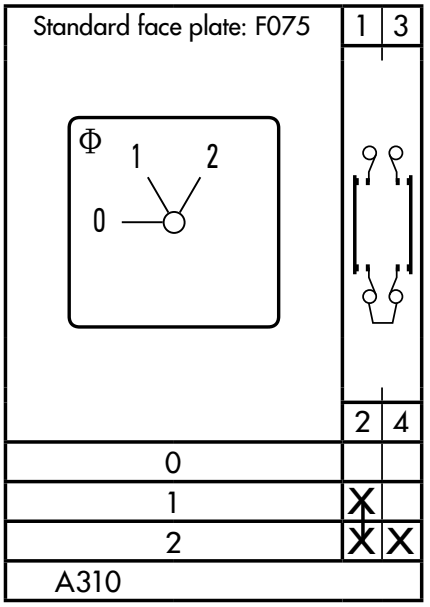
*Electrically isolated contacts see page 86

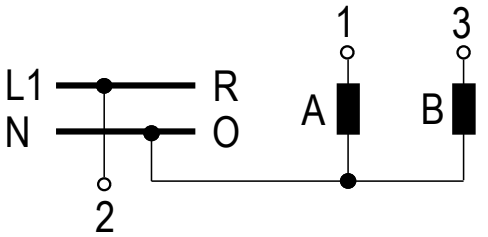
Double-throw Switches



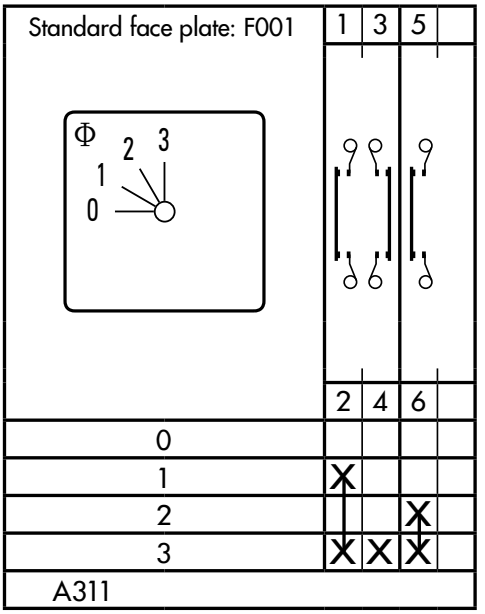
WAA299 Double-throw Switch with „OFF“
(formerly A299) 90° Switching, 3 pole

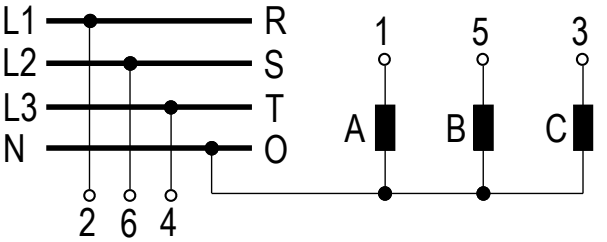
General Application Switches





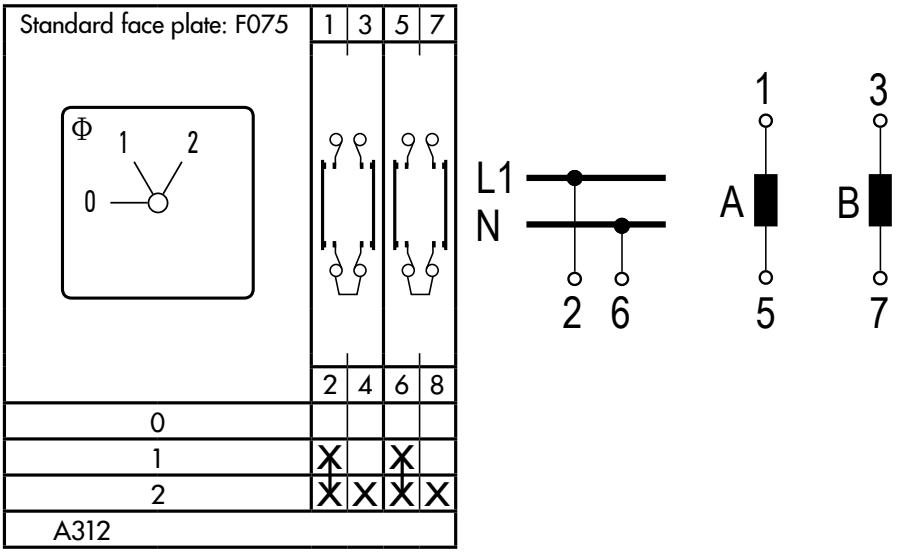
A310 General Application Switch
2 Gang, 1 pole
0, A, A+B



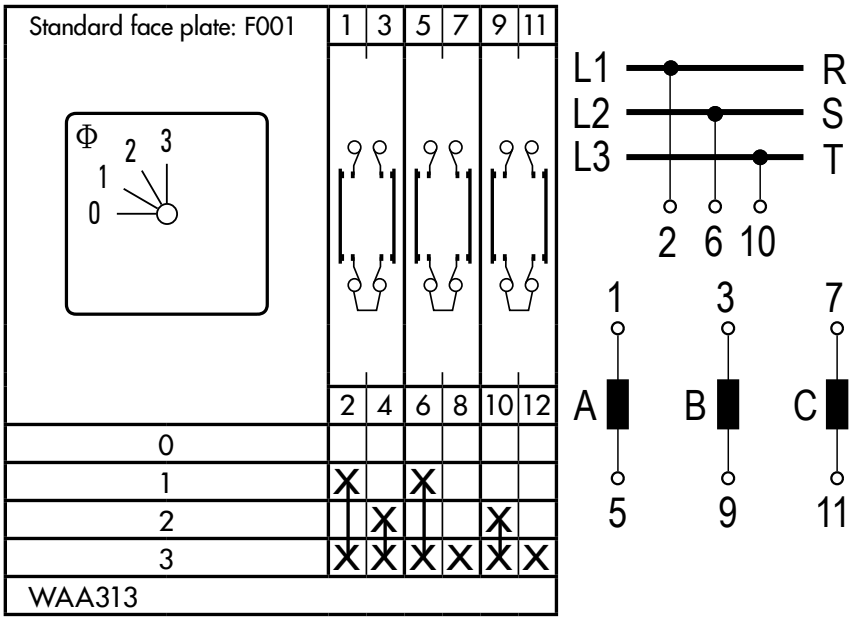


A311 General Application Switch
3 Gang, 1 pole
0, A, A+B, A+B+C

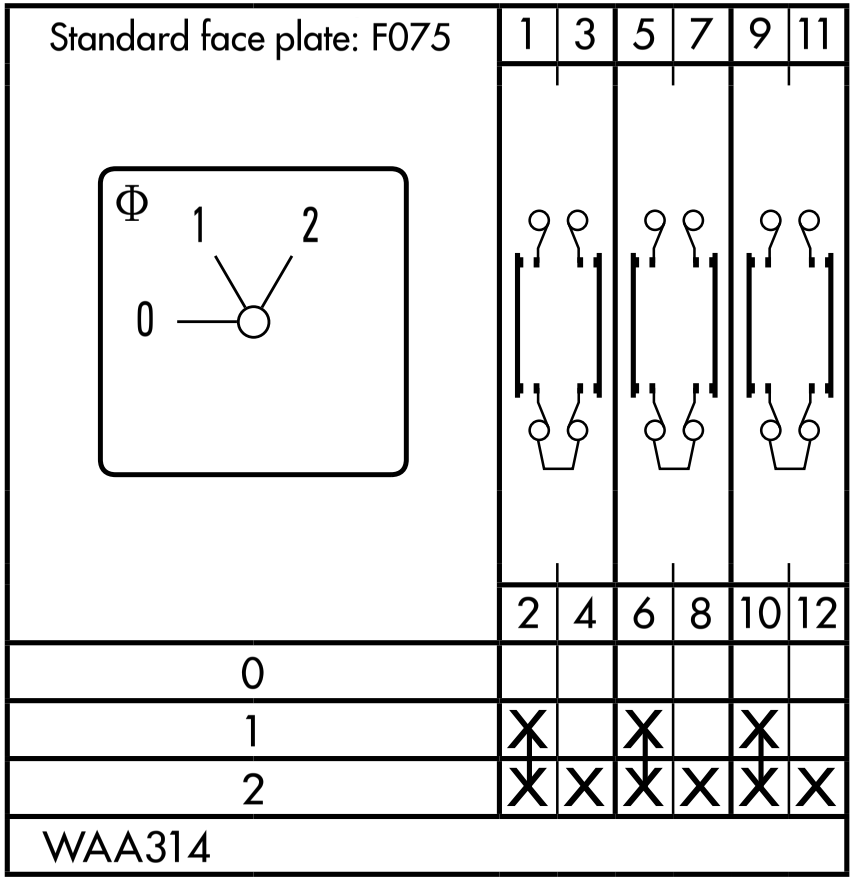
General Application Switches

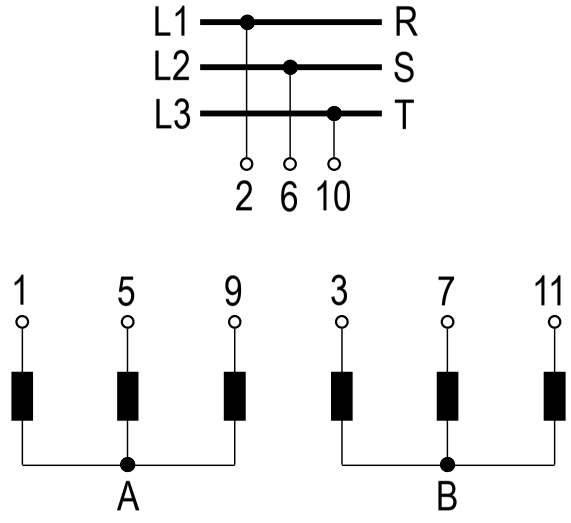


A312 General Application Switch
2 Gang, 2 pole
0, A, A+B



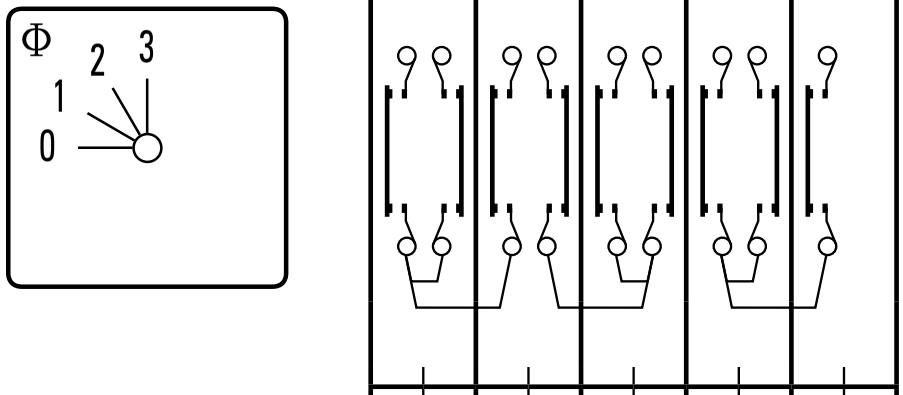
WAA313 General Application Switch
(formerly A313) 3 Gang, 2 pole
0, A, A+B, A+B+C

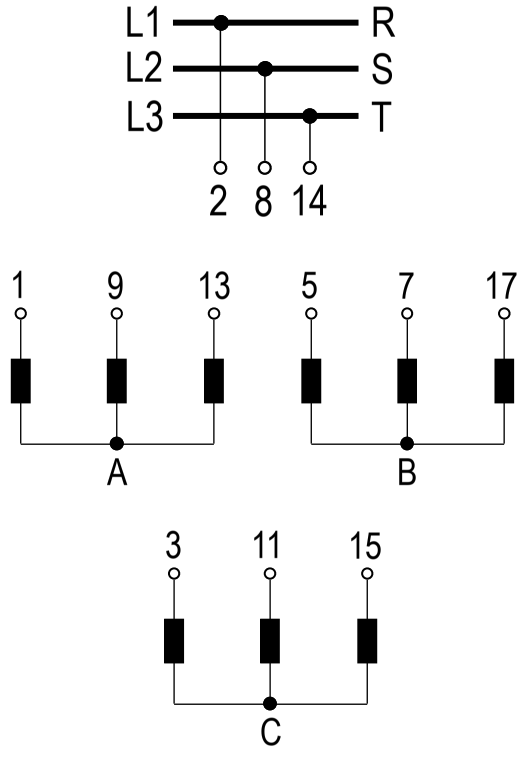




WAA314 General Application Switch
(formerly A314) 2 Gang, 3 pole
0, A, A+B

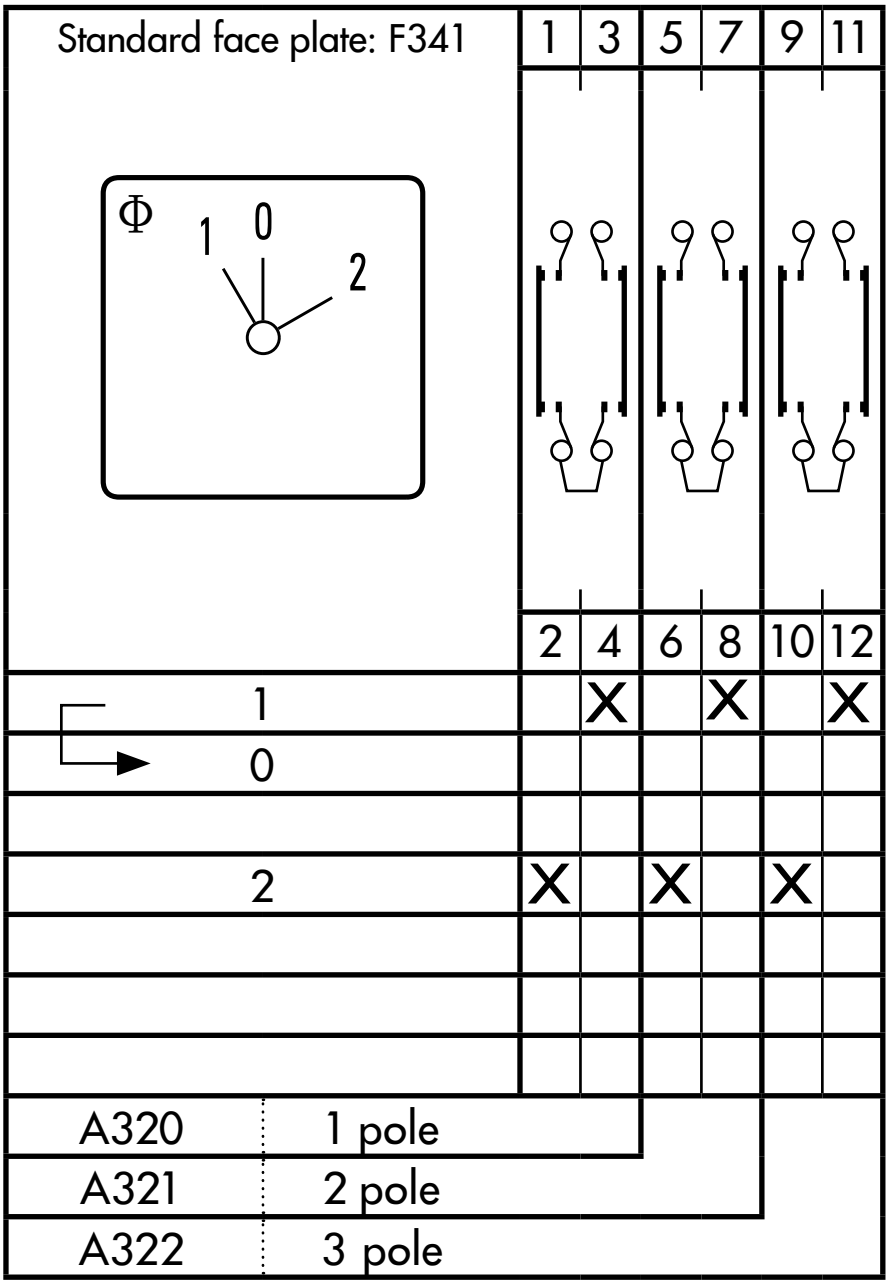
Standard face plate: F001	1	3	5	7	9	11	13	15	17	
	2	4	6	8	10	12	14	16	18	
0										
1	X				X		X			
2			X	X					X	
3	X	X	X	X	X	X	X	X	X	
WAA315										





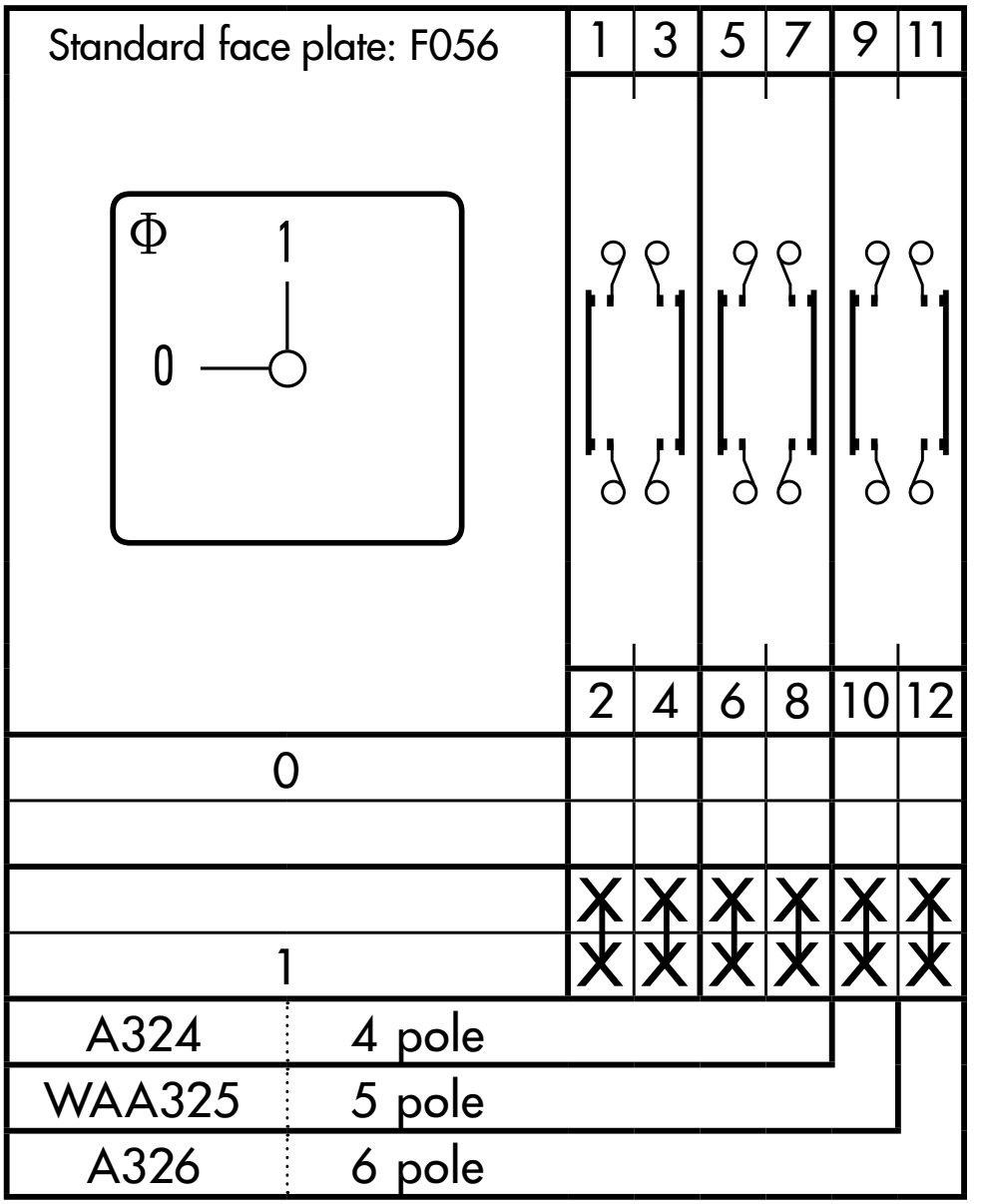
WAA315 General Application Switch
(formerly A315) 3 Gang, 3 pole
0, A, A+B, A+B+C

Double-throw Switches

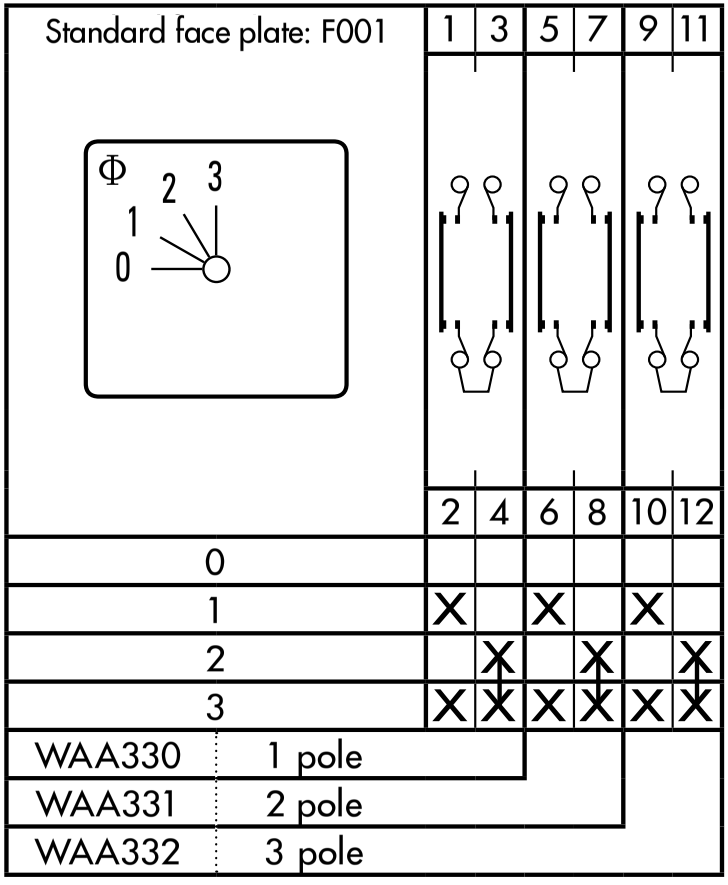


A320 up to A322
Double-throw Switches with „OFF“ with spring return from left to center

ON/OFF Switches

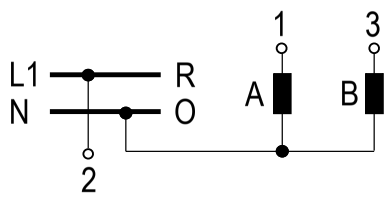


A324 up to A326
ON/OFF Switches, 90° Switching

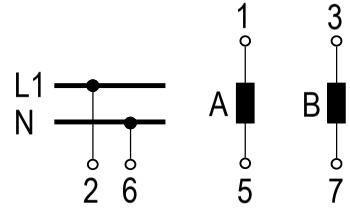


	1	3	5	7	9	11
	2	4	6	8	10	12
0						
1	X		X		X	
2		X		X		X
3	X	X	X	X	X	X

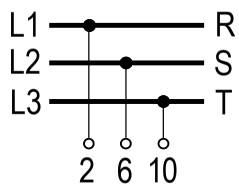
WAA330	1 pole
WAA331	2 pole
WAA332	3 pole



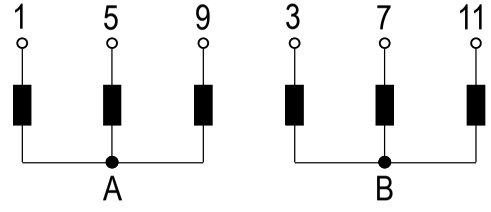
1 pole



2 pole



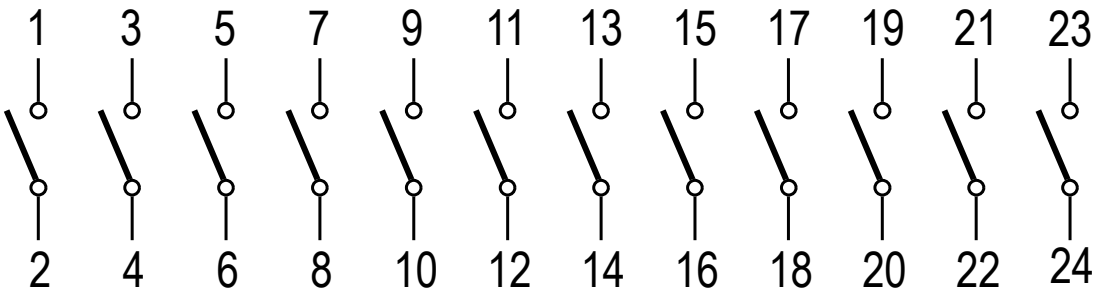
3 pole



WAA330 up to WAA332 2 Gang Series Switching

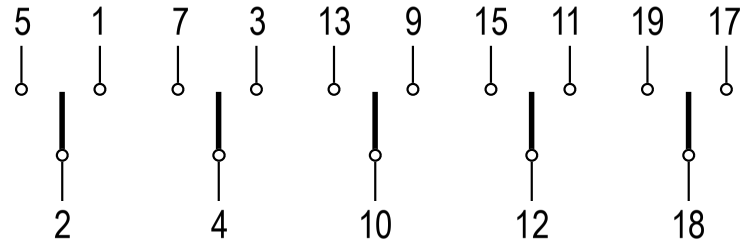
(formerly A330 up to A332) 0,A,B,A+B

ON/OFF Switches

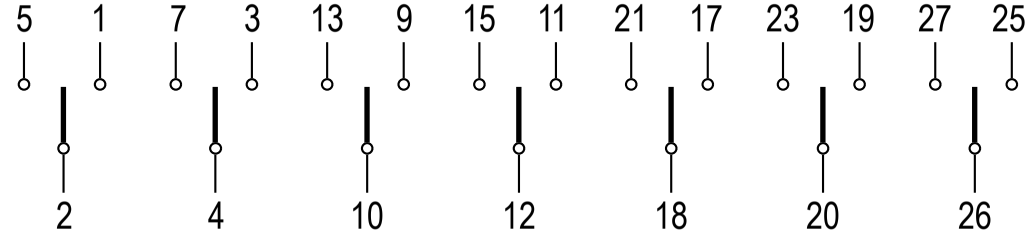


WAA341 (formerly A341)	5 pole
A342	6 pole
A343	7 pole
A344	8 pole
WAA345 (formerly A345)	9 pole
A346	10 pole
WAA347 (formerly A347)	11 pole
A348	12 pole

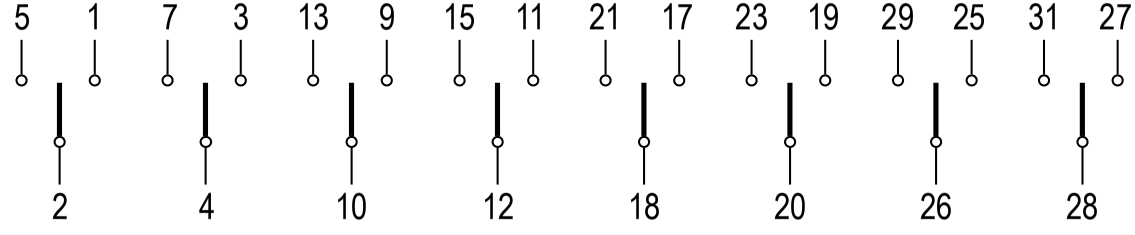
ON/OFF Switches, 60° Switching



5 pole



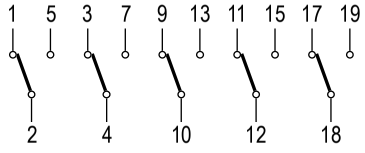
6 and 7 pole



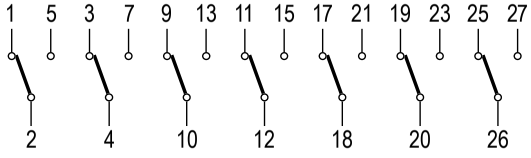
8 pole

Double-throw Switches with „OFF“ 60° Switching

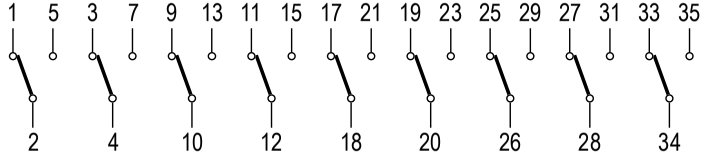
A361 5 pole
A362 6 pole
WAA363 (formerly A363) 7 pole
WAA364 (formerly A364) 8 pole



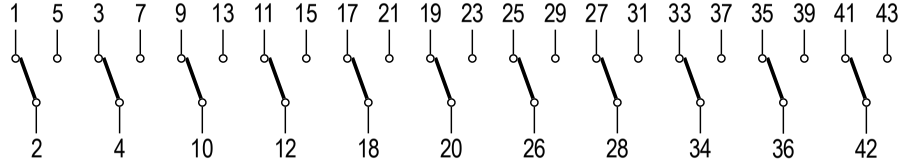
5 pole



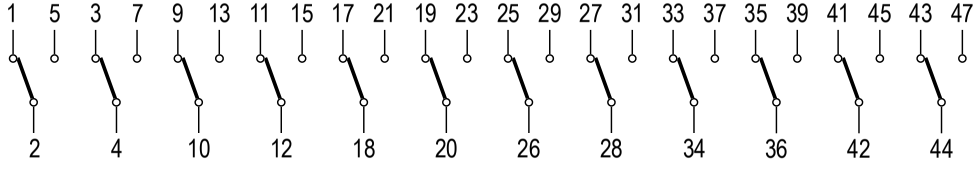
6- and 7 pole



8- and 9 pole



10- and 11 pole

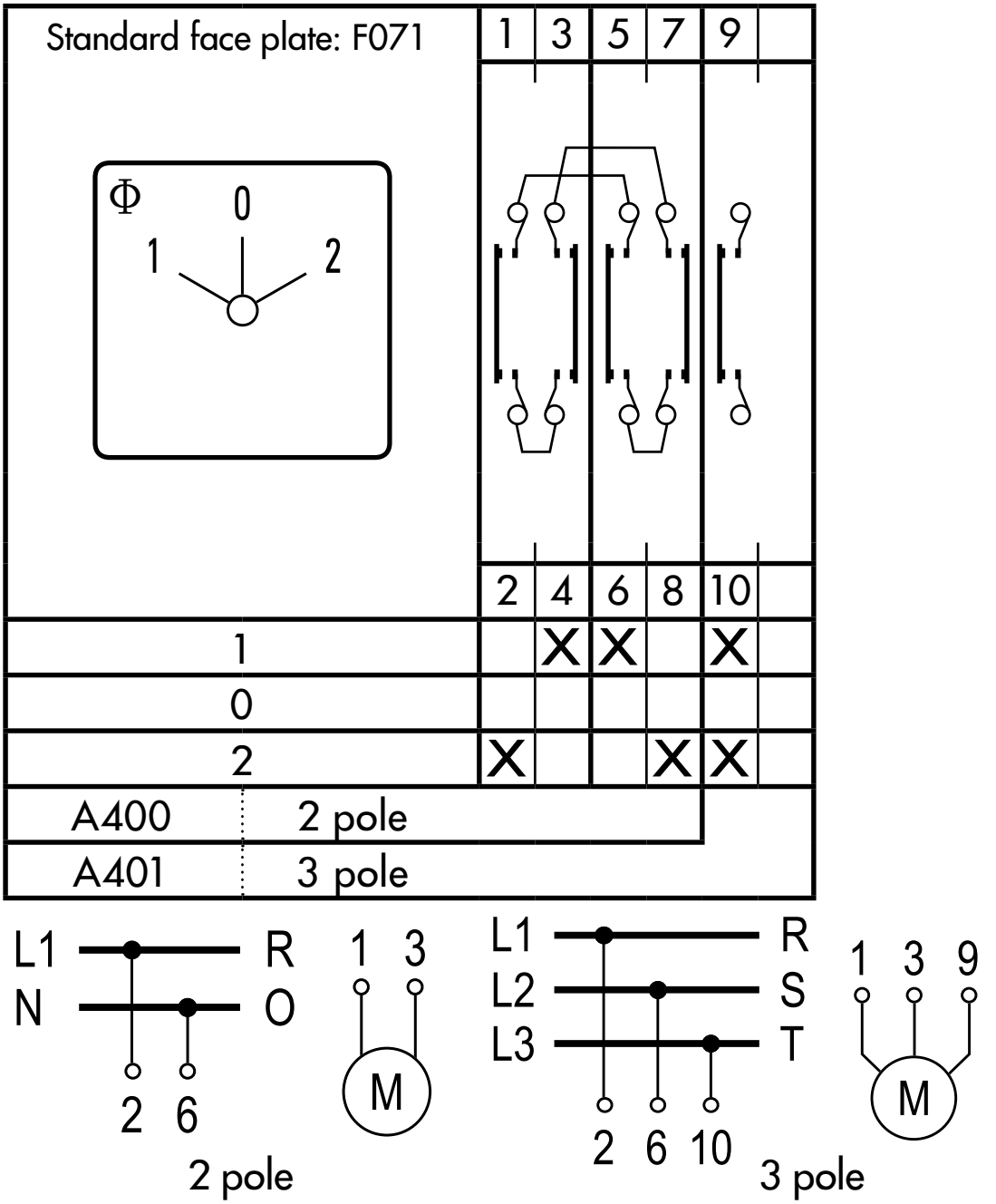


12 pole

Double-throw Switches without „OFF“, 60° Switching

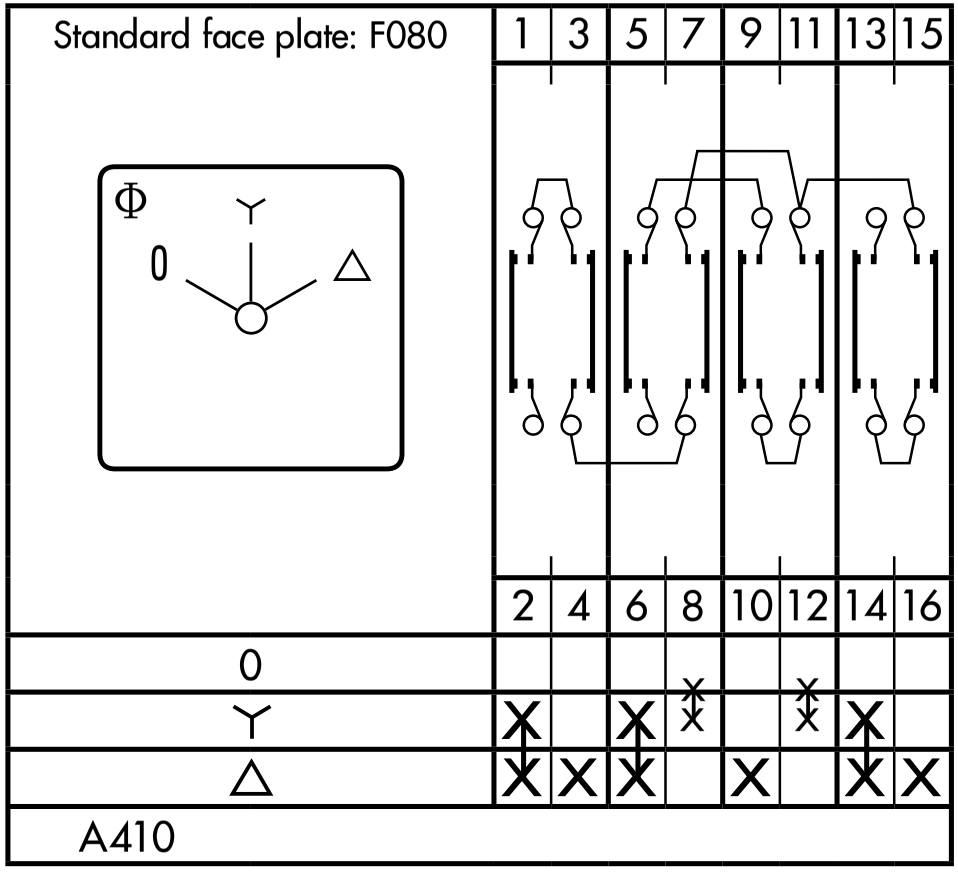
A369 5 pole	A371 7 pole	WAA373 9 pole (formerlyA373)	WAA375 11 pole (formerlyA375)
A370 6 pole	A372 8 pole	WAA374 10 pole (formerlyA374)	WAA376 12 pole (formerlyA376)

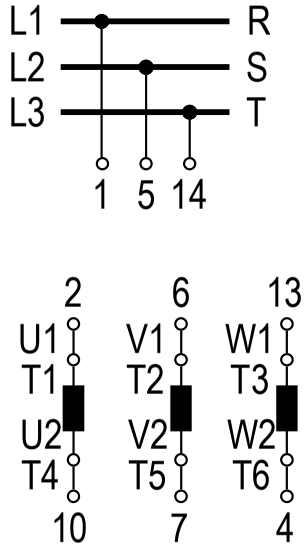
Motor Switches



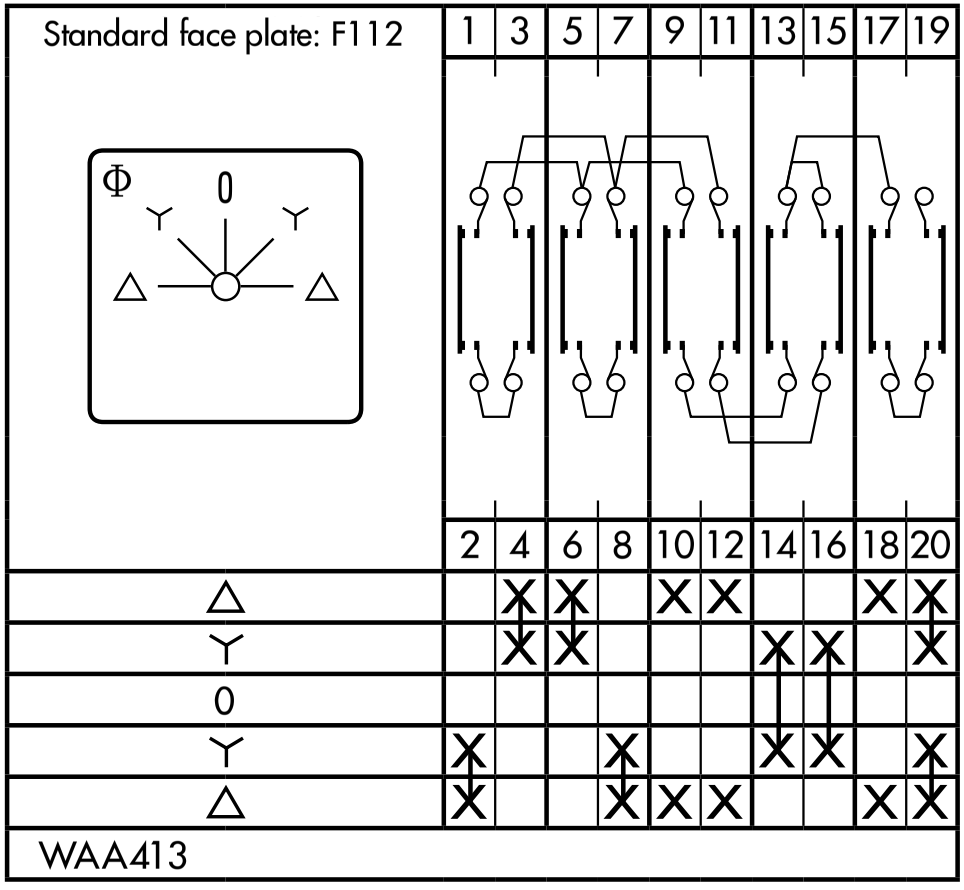
A400, A401 Motor Reversing Switches

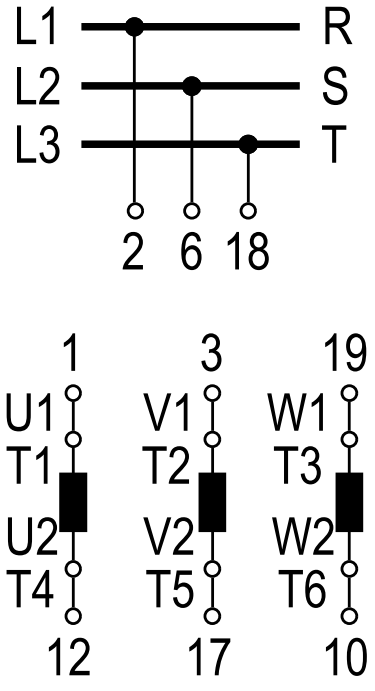
With spring return to „OFF“ see page 37



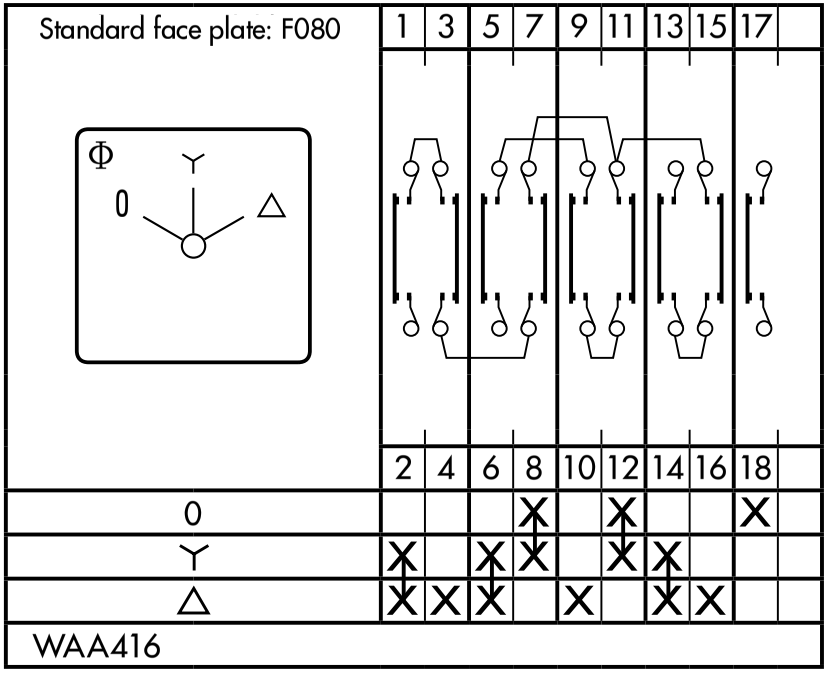


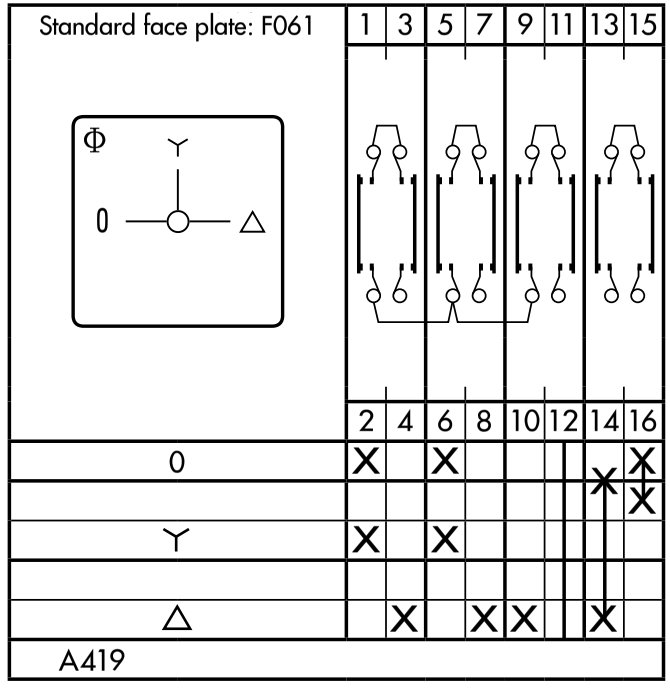
A410 Star-delta Switch





WAA413 Star-delta Switch
(formerly A413) Reversing



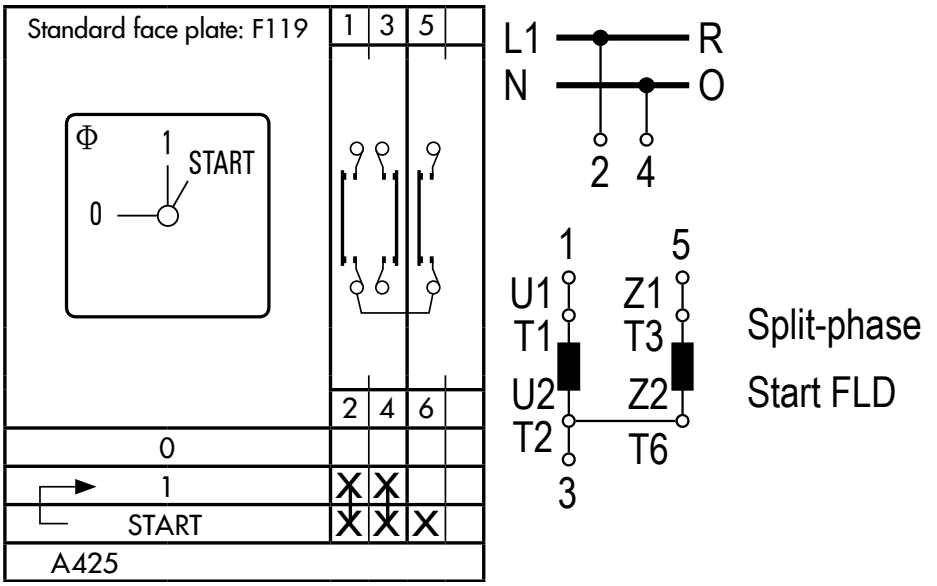


Star-delta Switches

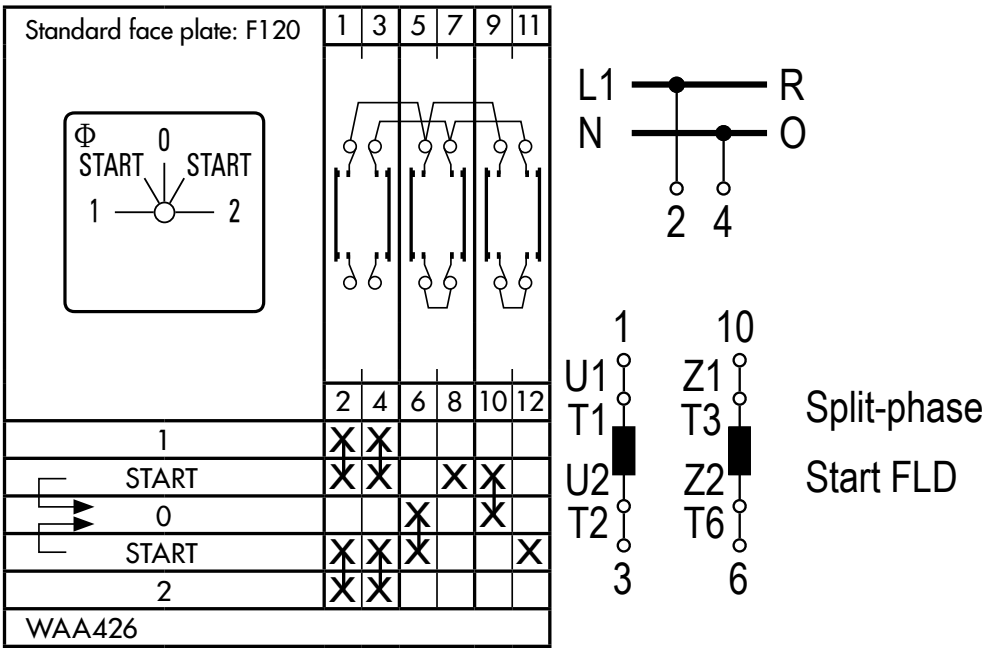
WAA416 (formerly A416) With auxiliary contact, closed in „OFF“ position

A419 For use with reversing contactors

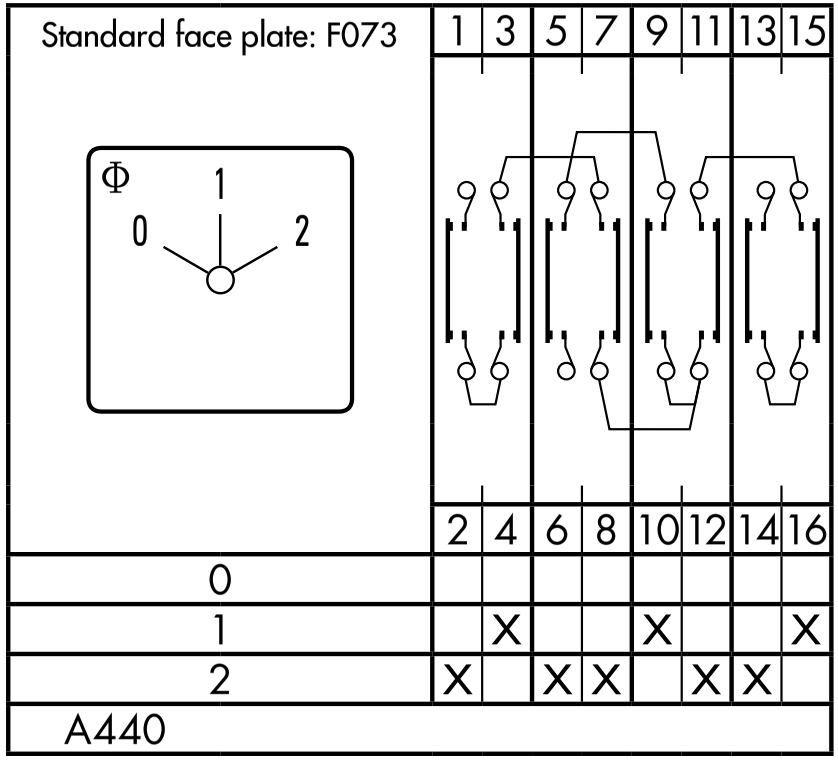
Motor Switches

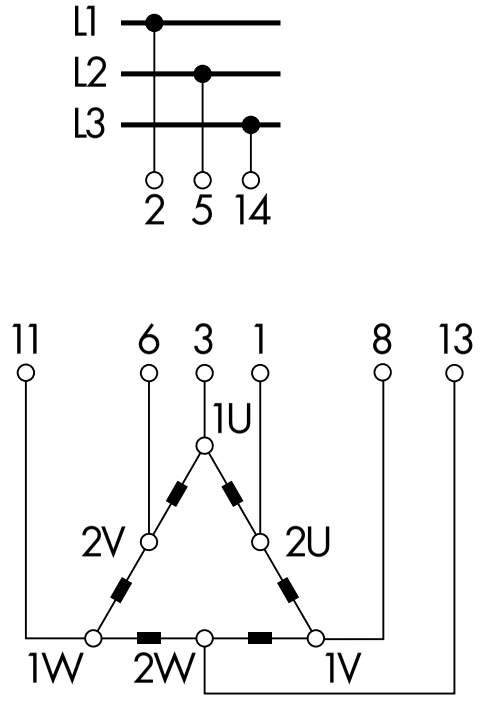


A425 Start and Run Switch
Split-phase start



WAA426 Start and Run Switch
(formerly A426) Split-phase start reversing

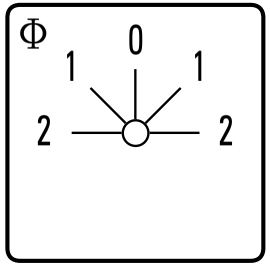




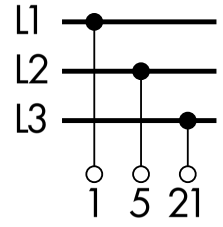
A440 2 speed, single winding
0 - AΔ -AΥ
A441 AΔ - 0 - AΥ

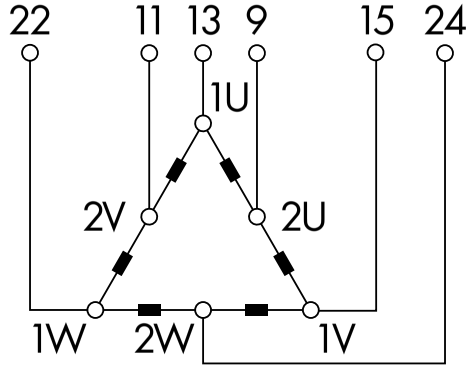
without „OFF“ see page 69

Standard face plate: F105

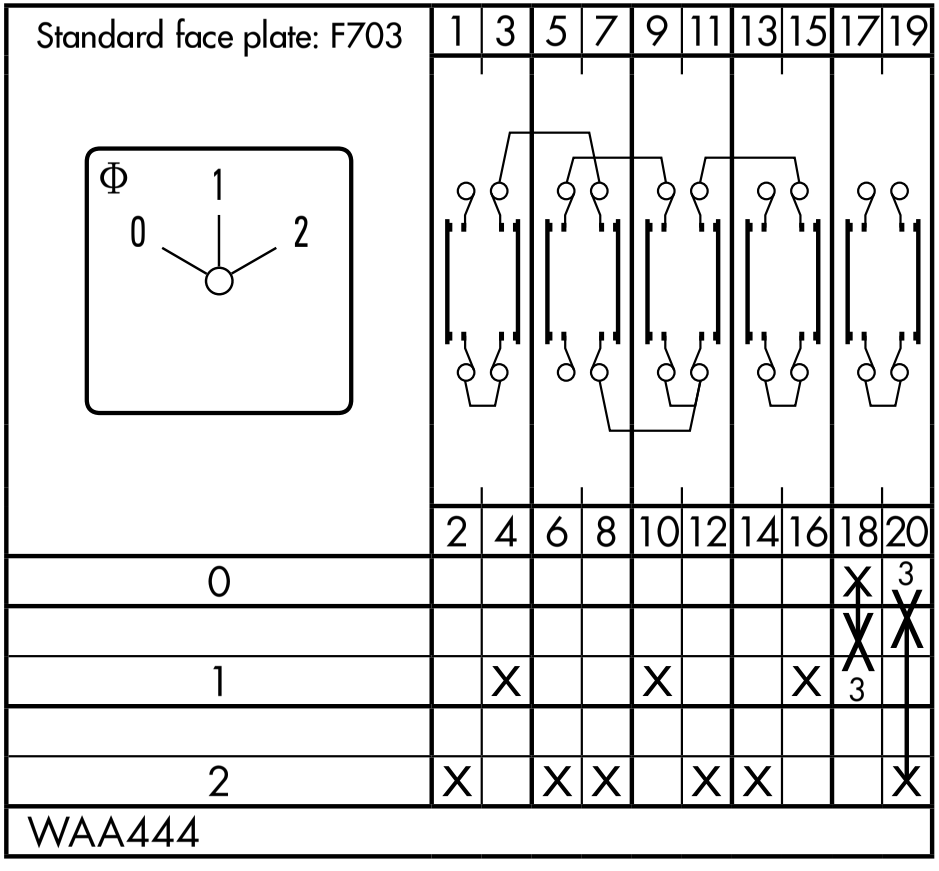


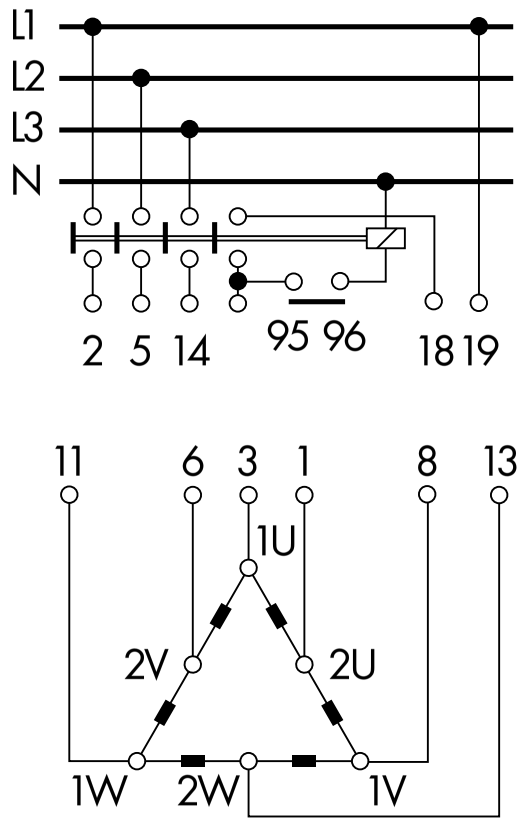
	1	3	5	7	9	11	13	15	17	19	21	23
	2	4	6	8	10	12	14	16	18	20	22	24
2		X	X		X	X			X	X		X
1		X	X				X	X			X	
0												
1	X			X			X	X			X	
2	X			X	X	X			X	X		X
A442												





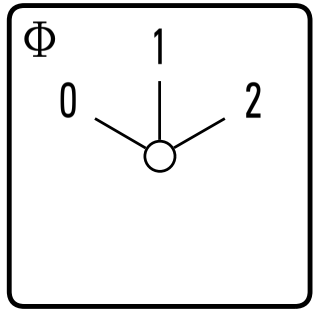
A442 2 speed, single winding with reverse
AΥΥ - AΔ - 0 - AΔ - AΥΥ

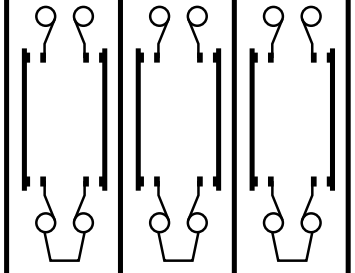


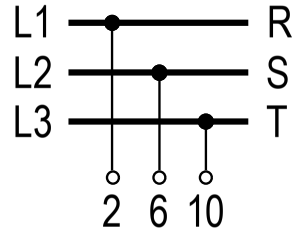


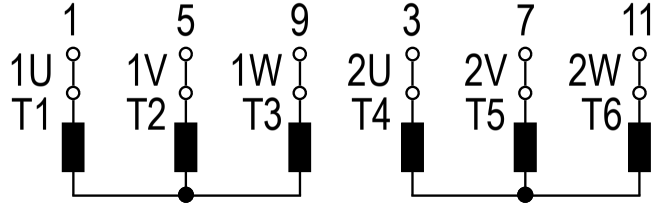
WAA444 Motor Control Switch
(formerly A444) For use with reversing contactors

Standard face plate: F703	1	3	5	7	9	11
	2	4	6	8	10	12
0						
1	X		X		X	
2		X		X		X
WAA451						



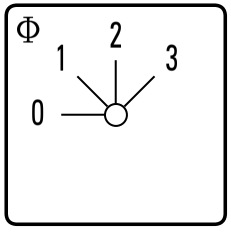


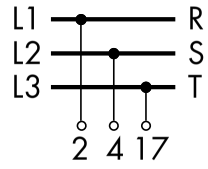


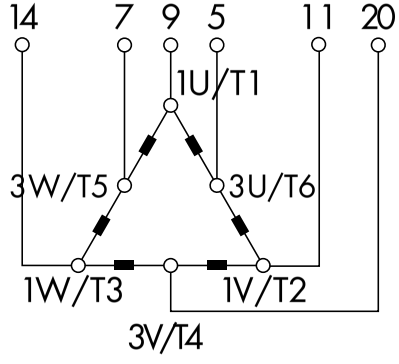


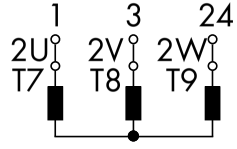
WAA451 Motor Control Switch
(formerly A451) 2 speed, 2 winding
0 - A - B, Y or Δ

Standard face plate: F109	1	3	5	7	9	11	13	15	17	19		23
	2	4	6	8	10	12	14	16	18	20		24
0												
1					X	X			X			
2	X	X										X
3			X	X			X	X		X		
WAA457												





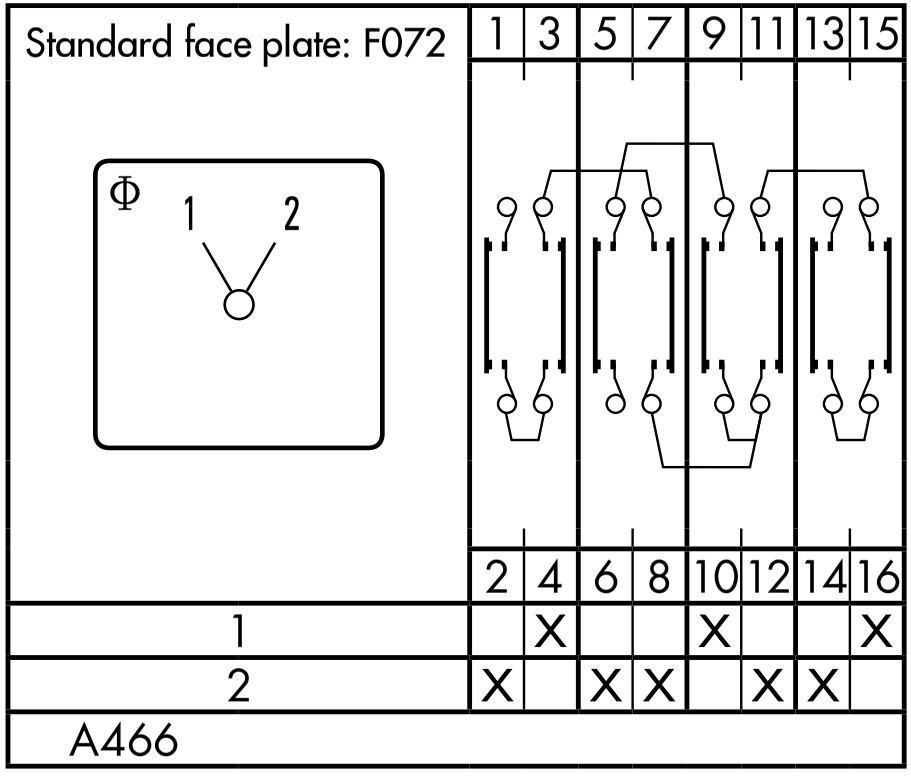


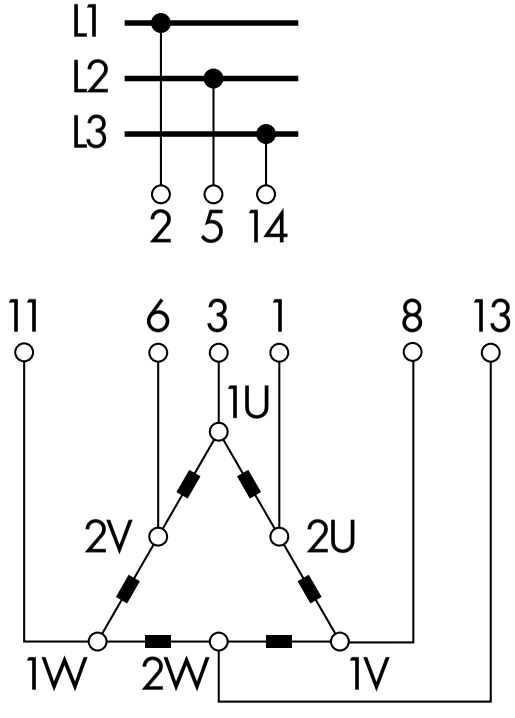


WAA457 Motor Control Switch

(formerly A457) 3 speed, 2 winding

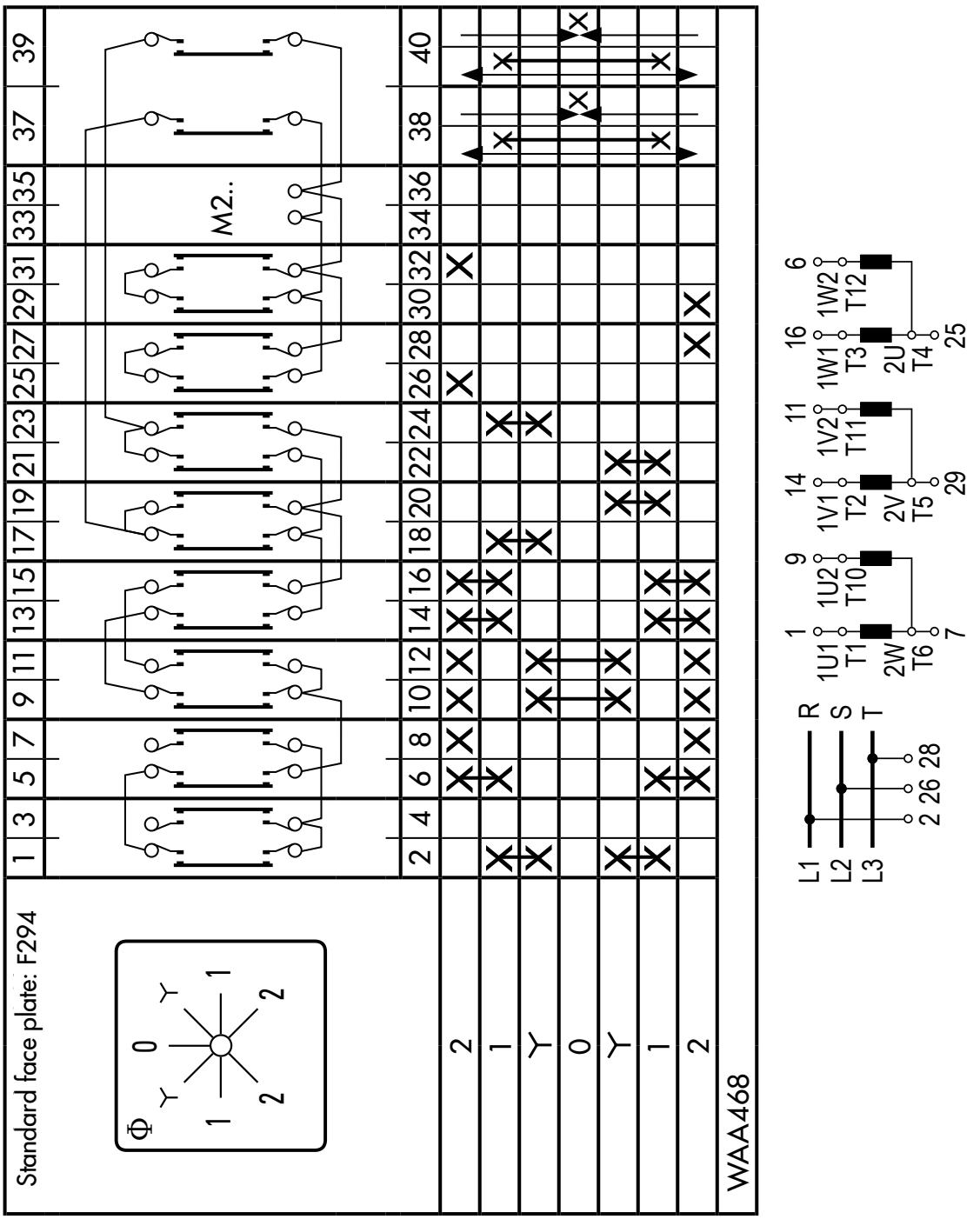
0 - A△ - BY - AYY





A466 2 speed, single winding without „OFF“
A△ - AⲨ

Motor Switches



WAA468 Motor Control Switch
(formerly A468) 2 speed reversing for 2 way operation
with slip clutch for „OFF“ load use

Multi-step Switches 4 pole without „OFF“

3 Step A476

4 Step A477

5 Step WAA478
(formerly A478)

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

Multi-step Switches 4 pole with „OFF“

2 Step

WAA480
(formerly A480)

3 Step

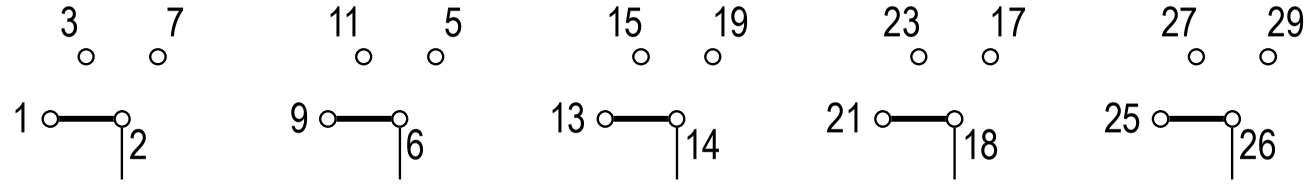
WAA481
(formerly A481)

4 Step

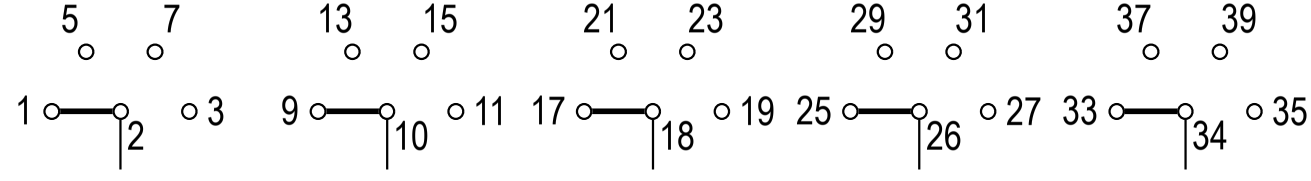
WAA482
(formerly A482)

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

Multi-step Switches 5 pole without „OFF"



3 Step WAA484
(formerly A484)



4 Step WAA485
(formerly A485)

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate.

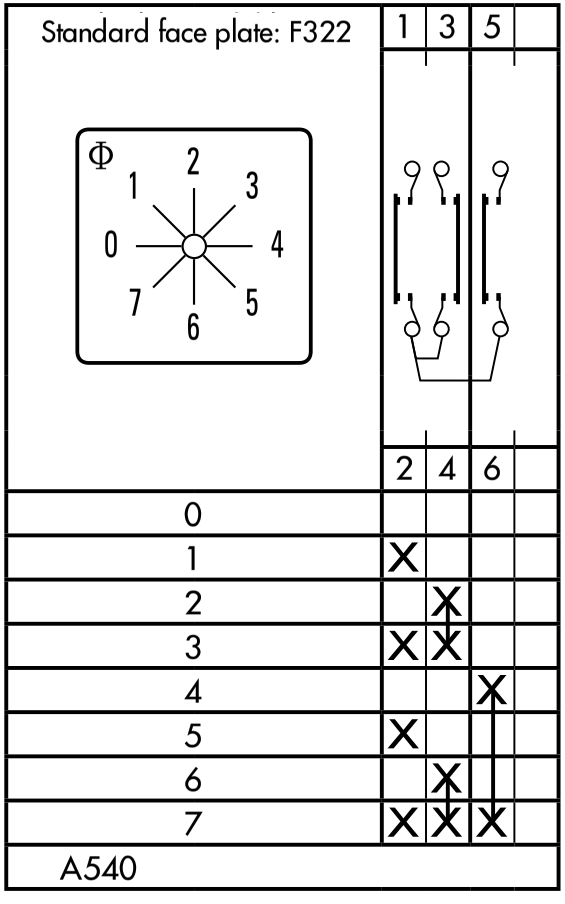
Multi-step Switches 5 pole with „OFF“

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate

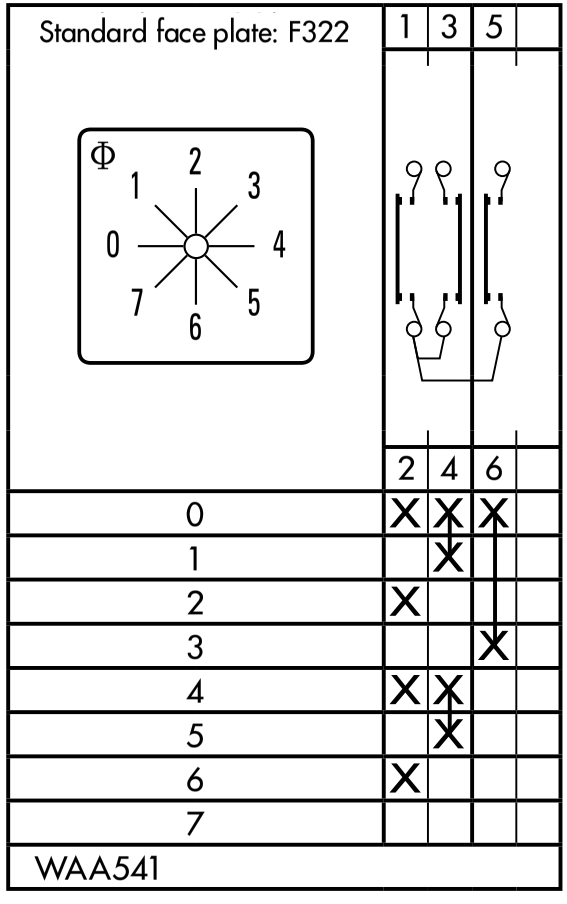
Multi-step Switches 6 pole

Numbers shown at the connection points on the above diagrams, correspond to the terminal numbers on the switch. The position of connection points correspond to the positions indicated on the face plate

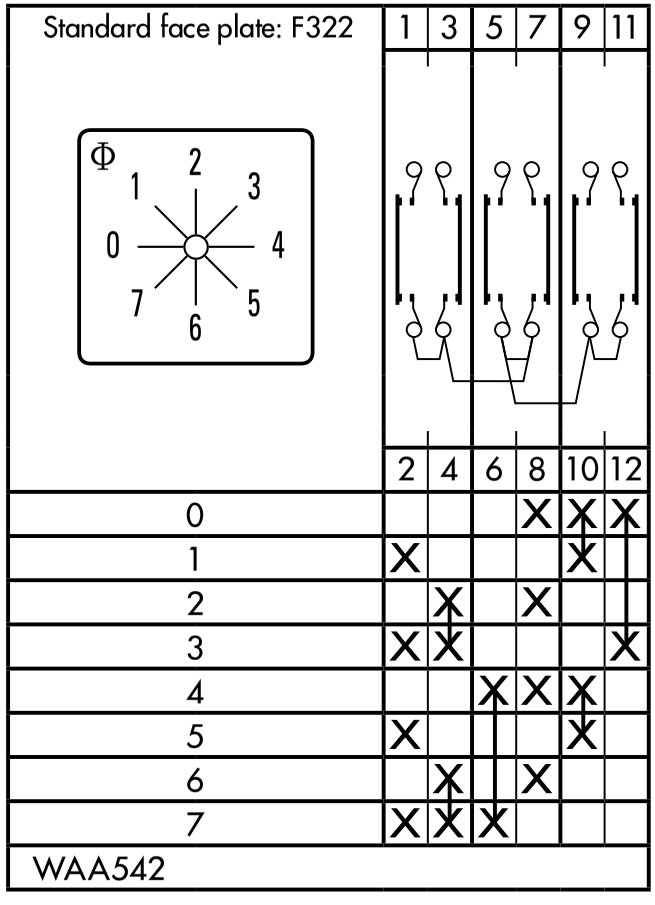
Coding Switches/Binary Code



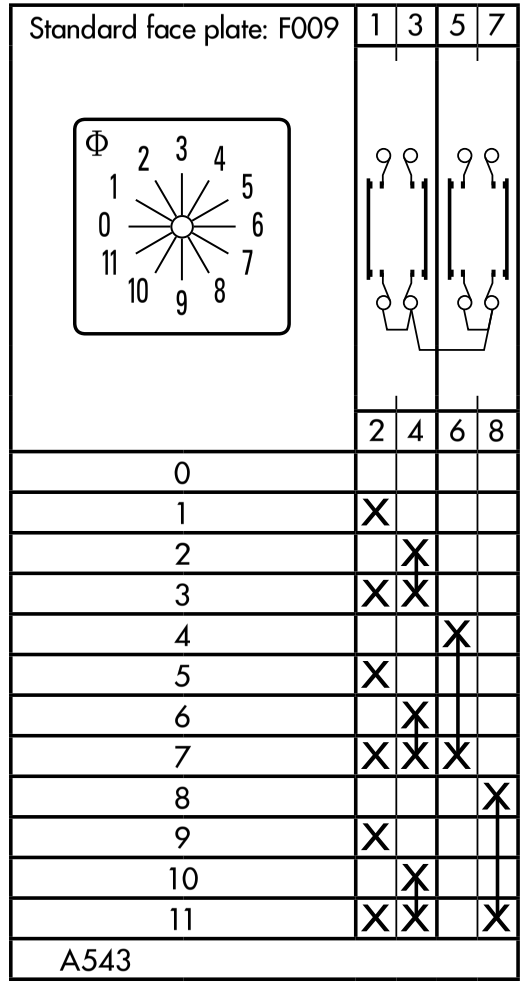
A540 0-7



WAA541 0-7+complement
(formerly A541)

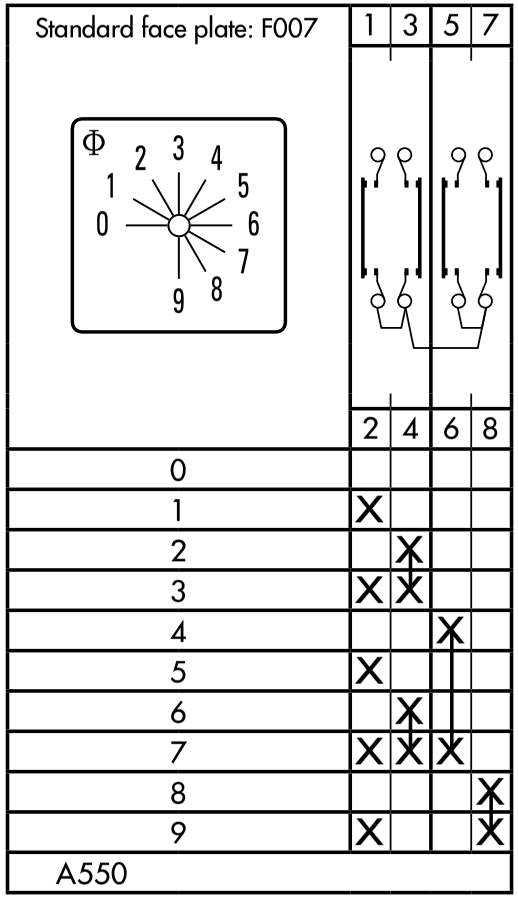


WAA542 0-7+complement
(formerly A542)

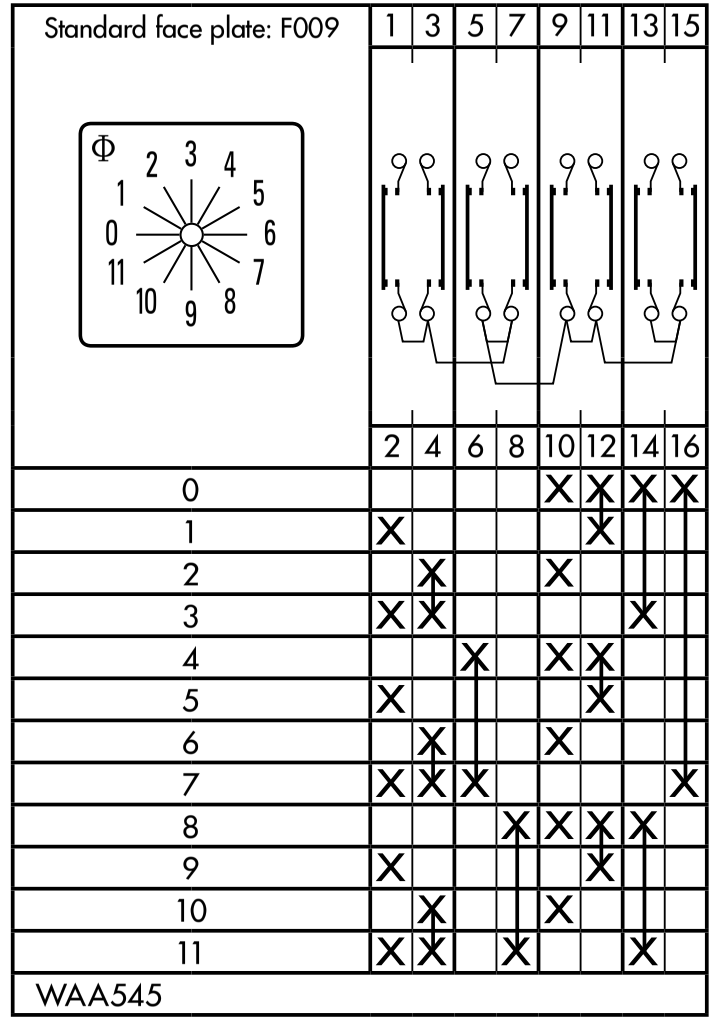


A543 0-11

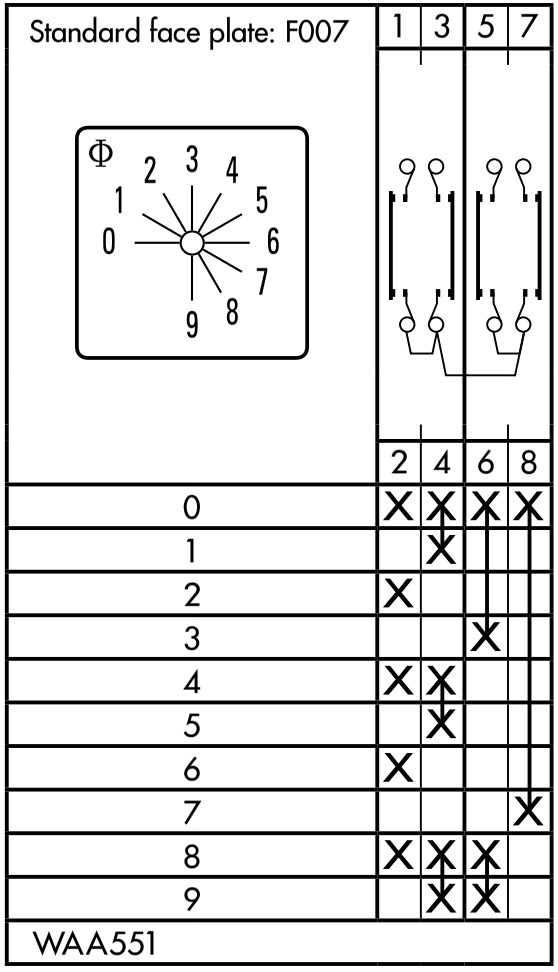
Coding Switches/Binary Code



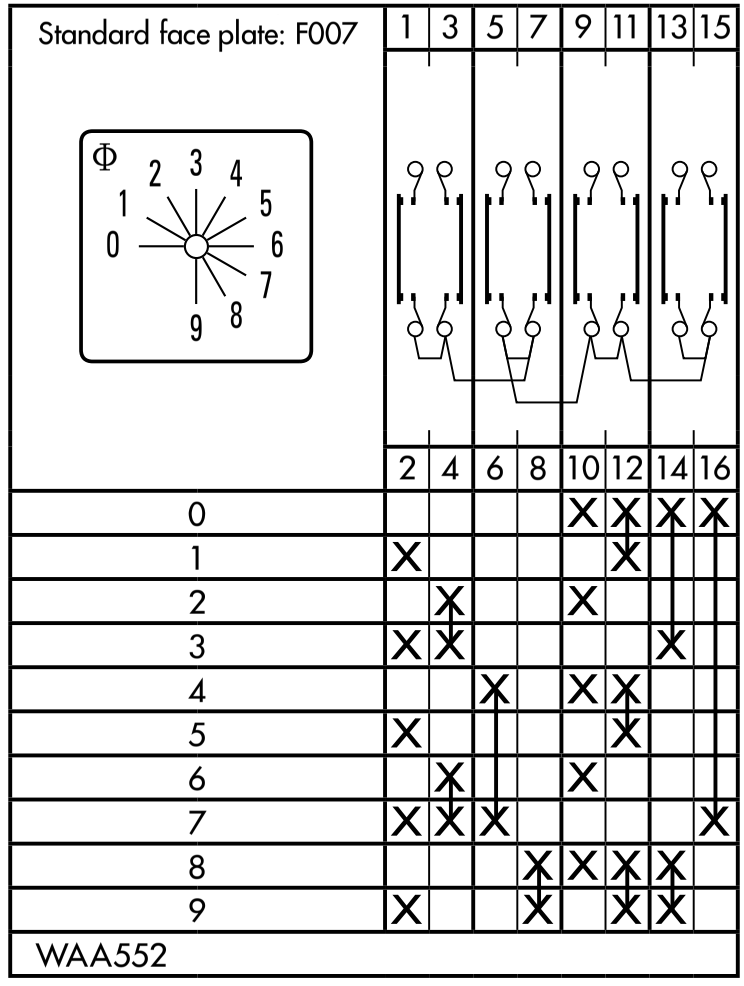
A550 0-9



WAA545 0-11+complement
(formerly A545)

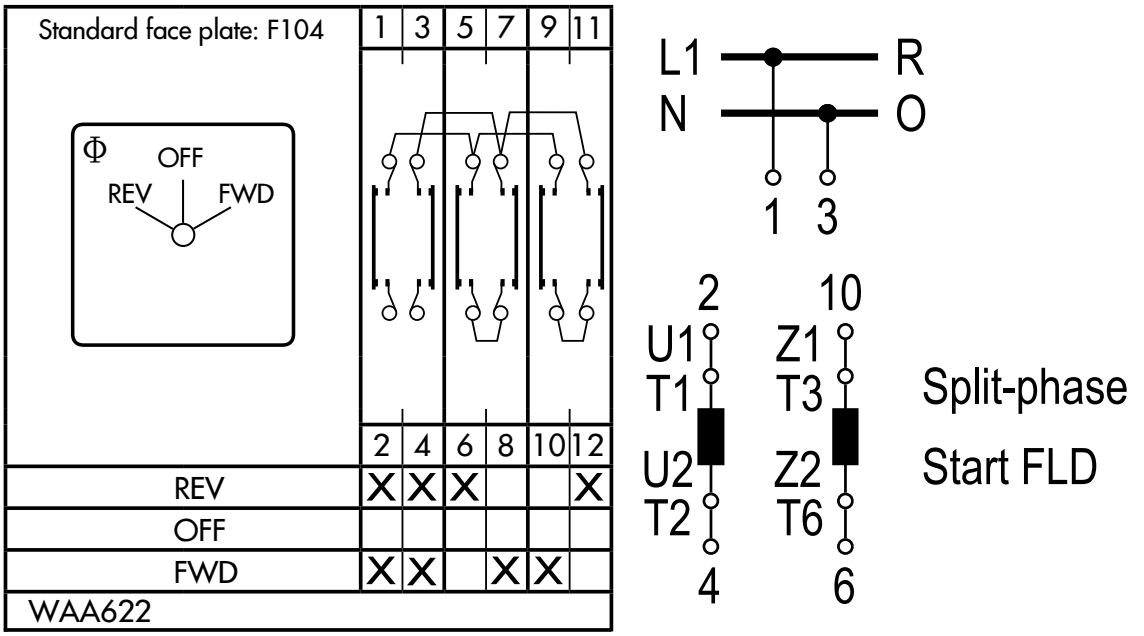


WAA551 0-9
(formerly A551)



WAA552 0-9+complement
(formerly A552)

Motor Switches

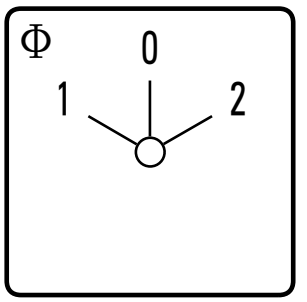


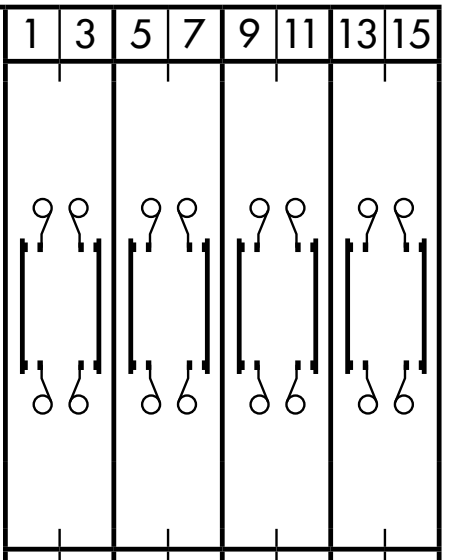
WAA622
(formerly A622)

Start and Run Switch
Split-phase reversing
auto cutout of start
field winding

Double-throw Switches with electrically isolated contacts

Standard face plate: F071



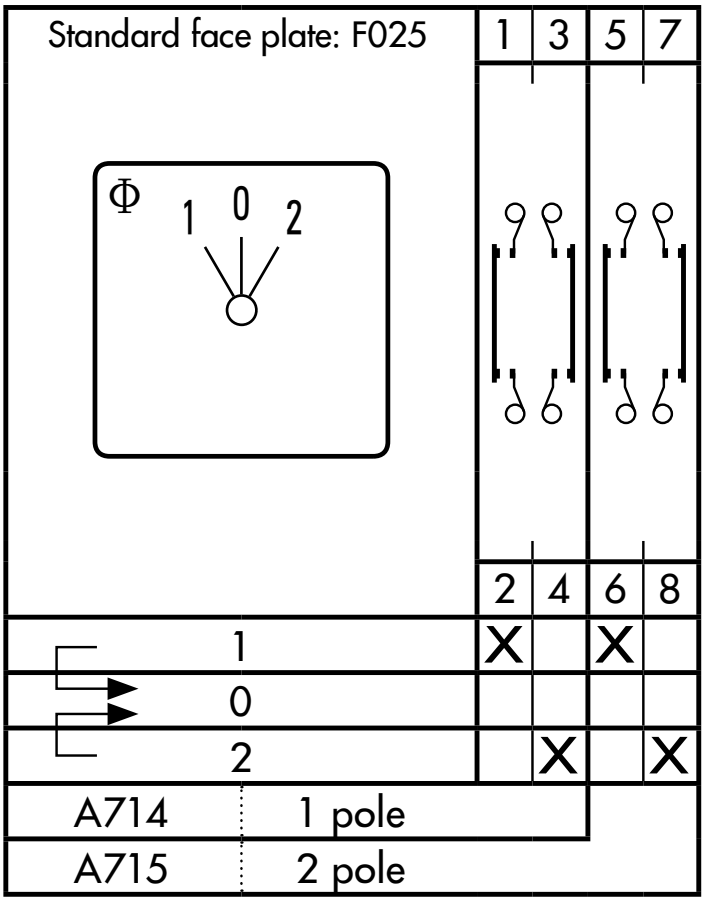


	1	3	5	7	9	11	13	15
	2	4	6	8	10	12	14	16
1		X		X		X		X
0								
2	X		X		X		X	

A710	1 pole
A711	2 pole
A712	3 pole
A713	4 pole

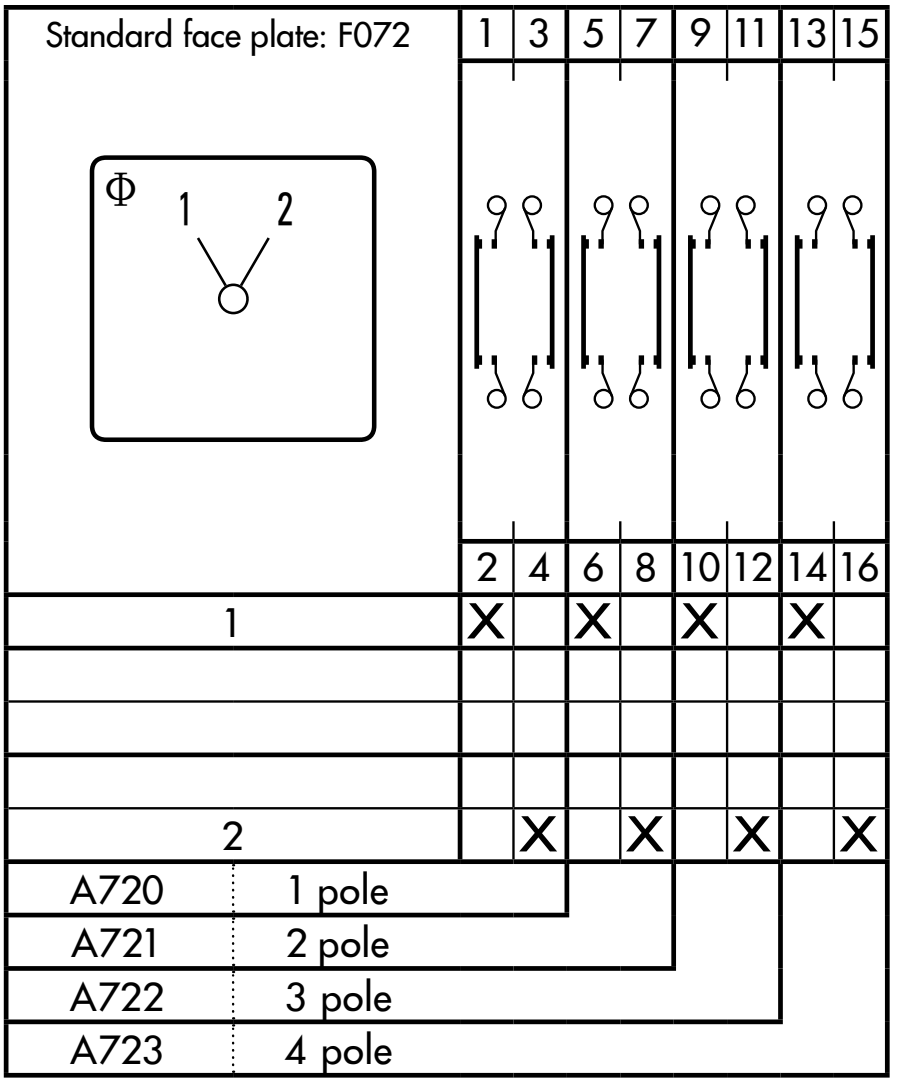
A710 up to A713 Double-throw Switch
with „OFF“, 60° Switching

Double-throw Switches with electrically isolated contacts



A714 up to A715 Double-throw Switch
with „OFF“with spring return
to center, 30° Switching

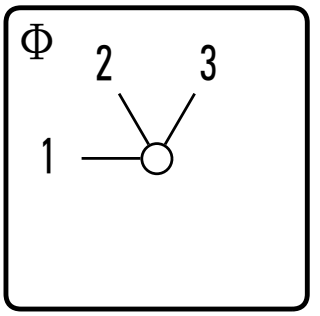
Double-throw Switches with electrically isolated contacts

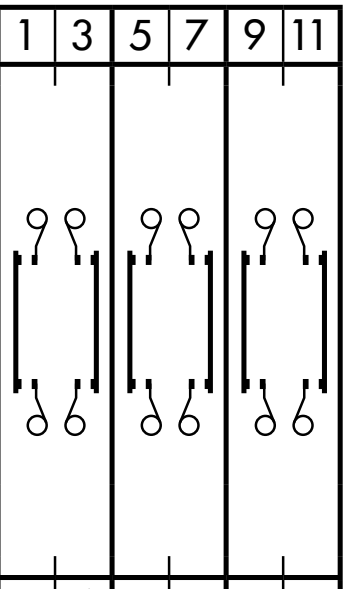


A720 up to A723
Double-throw Switch without „OFF“,
60° Switching

Multi-step Switch with electrically isolated contacts

Standard face plate: F076



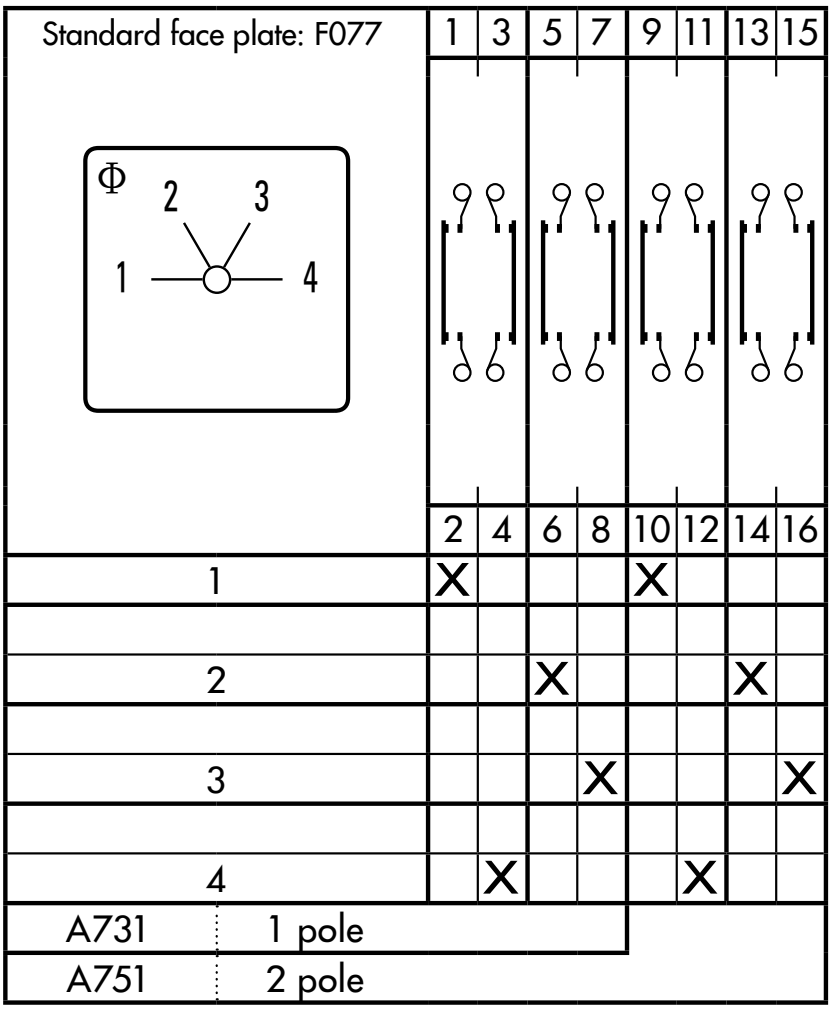


	1	3	5	7	9	11
	2	4	6	8	10	12
1	X				X	
2		X				X
3			X	X		

A730	1 pole
A750	2 pole

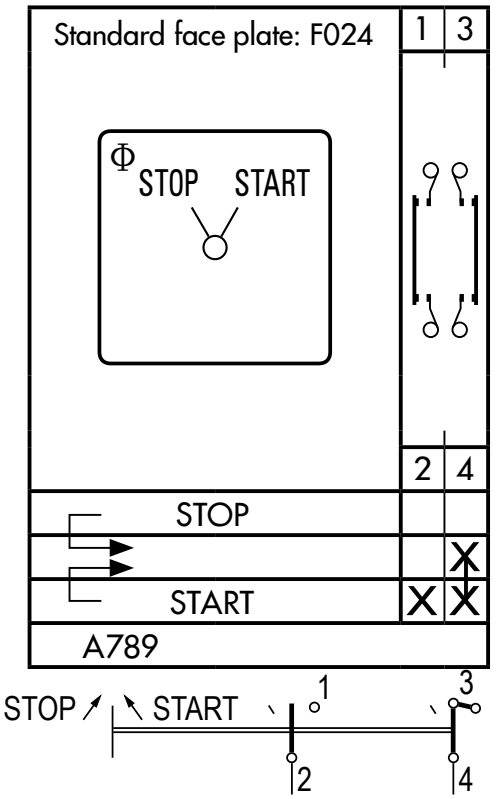
A730, A750
Multi-step Switch without „OFF“, 3 Positions

Multi-step Switch with electrically isolated contacts

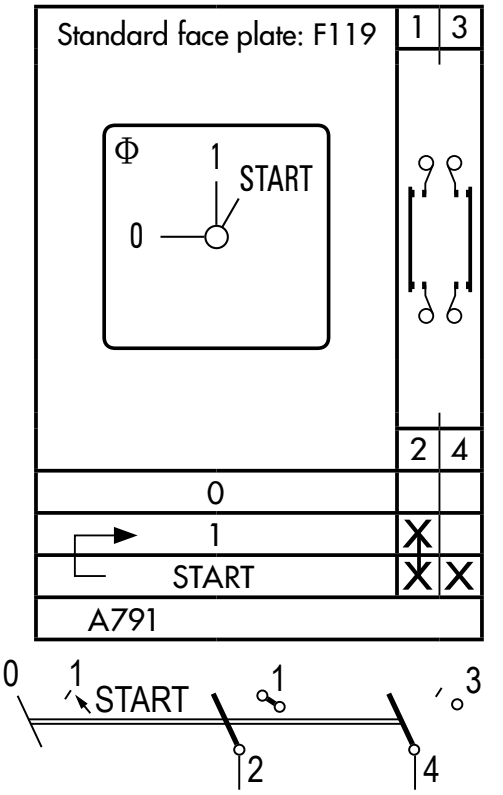


A731, A751
Multi-step Switch without „OFF“, 4 Positions

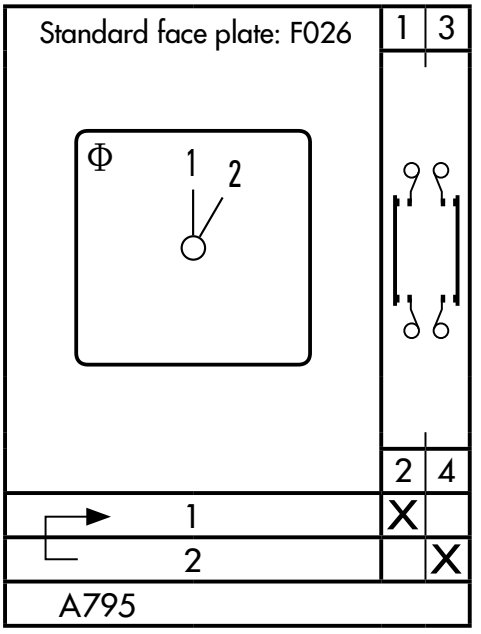
Control Switch with electrically isolated contacts



A789 Stop start switch

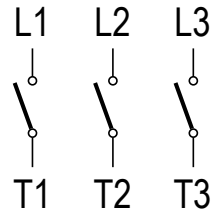


A791 Stop start switch with spring return from start to run

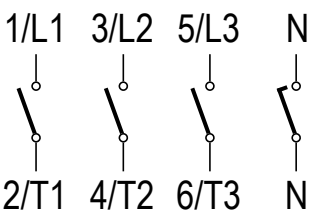


A795 Double-throw Switch without „OFF“, 1 pole with spring return

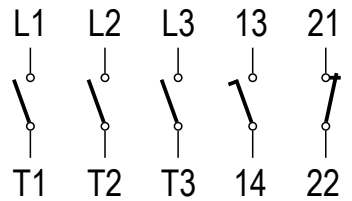
Main Switches of KG-, KH- and KF-series



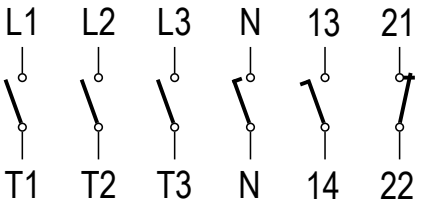
3 pole



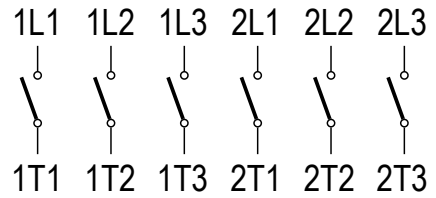
4 pole (3+N)



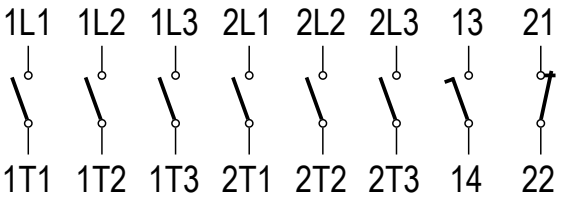
3 pole,1NO+1NC



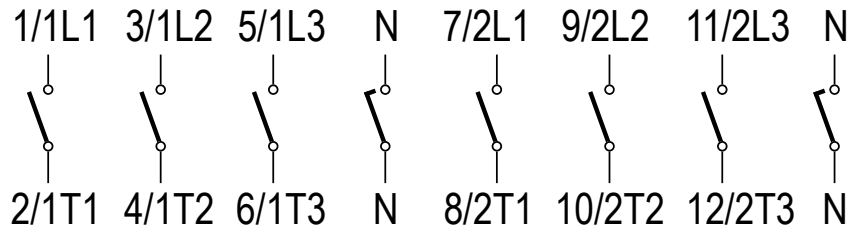
4 pole,1NO+1NC



6 pole

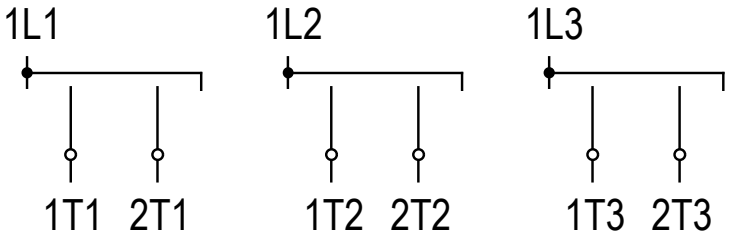


6 pole,1NO+1NC

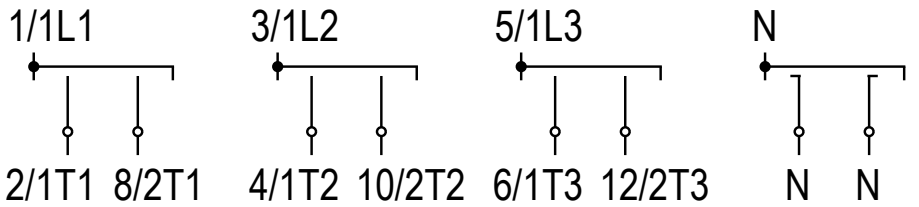


8 pole

Double-throw Switches with „OFF“ of KG-, KH- and KF-series



K900 3 pole



K950 4 pole

Notes

Notes

Notes

Switch Wiring Diagrams as App:

ANDROID APP ON Google play

Available on the iPhone App Store

Kraus & Naimer

www.krausnaimer.com