

ПАКЕТНЫЕ ПЕРЕКЛЮЧАТЕЛИ СЕРИИ ПП53

ТУ3424-053-05758109-2010



Переключатели ПП53 предназначены для работы в качестве переключателей цепей управления и распределения электроэнергии, вводных выключателей, для управления электродвигателями. Применяются в промышленном оборудовании производственных предприятий, на транспорте.

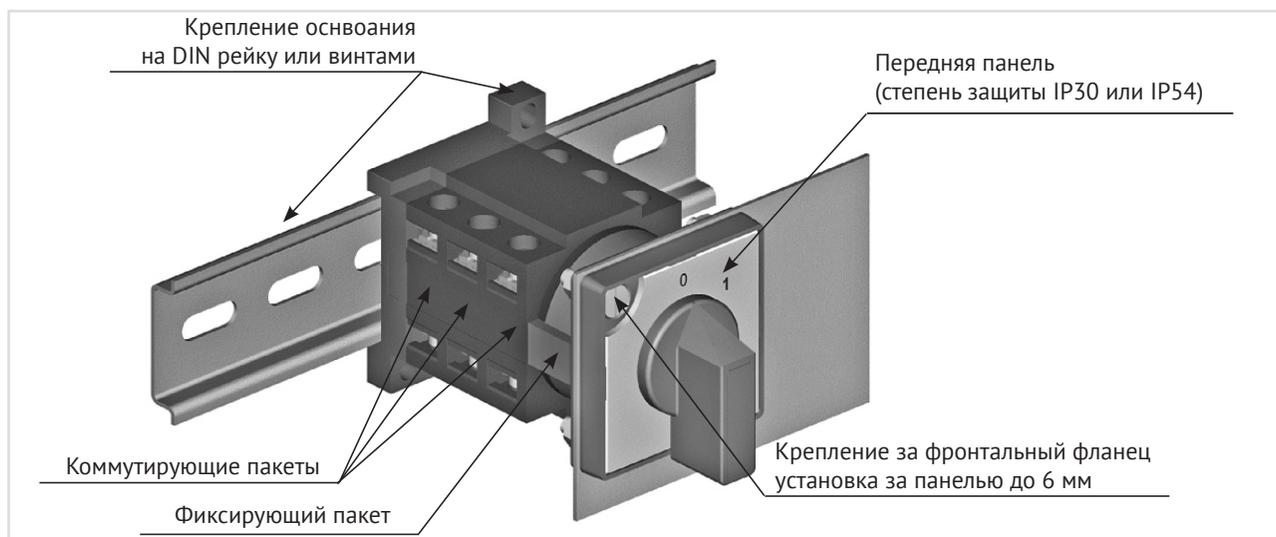
Технические характеристики:

- Номинальный ток - 16,25А.
- Номинальное напряжение - 660 В переменного тока частотой 50 и 60 Гц.
- Номинальное напряжение - 440 В постоянного тока.
- Варианты исполнения: переключатель; аварийный выключатель.



Переключатели представляют собой наборную конструкцию, собранную на квадратном стержне идентичных по конструкции коммутирующих пакетов (от 1 шт. до 12 шт.), фиксирующего пакета (или самовозврата), передней панели, основания и ручки, стянутых шпильками и гайками. Стержень от продольных смещений удерживается упорной шайбой. Поворот ручки переключателя приводит во вращение стержень, а вместе с ним и кулачки коммутирующих пакетов, обеспечивающих размыкание или замыкание контактов.

В зависимости от диаграммы коммутационных положений в переключателях применяются кулачки коммутирующего и фиксирующего пакетов с различной конфигурацией. Переключатели изготавливаются по схемам, указанным в заказе предприятия потребителя и могут отличаться от стандартных типовых схем.



Технические характеристики

ПАРАМЕТРЫ		ПП53-16	ПП53-25
Номинальный ток I_n (условный тепловой ток на открытом воздухе) I_{th}	A	16	25
Номинальное напряжение изоляции U_i	B	690	690
Электрическая изоляция переключателей выдерживает без пробоя и перекрытия между токоведущими частями, а также между токоведущими частями в течение 1 мин напряжение переменного тока (действующее значение) частотой 50 Гц	кВ	2,5	2,5
Номинальное рабочее напряжение U_e – переменный ток частотой 50 и 60 Гц – постоянный ток	B	660 440	660 440
Номинальный кратковременно допустимый ток (в течение 1с), I_{cw}	A	192	300
Номинальная наибольшая включающая способность I_{cm} (максимальное пиковое значение ожидаемого тока)	A	271	423

Общие сведения

Переключатели ПП53 предназначены для работы в качестве переключателей цепей управления и распределения электрической энергии, вводных выключателей, для управления электродвигателями, коммутирующие электрические цепи током до 25 А напряжением до 660 В переменного тока частотой 50 и 60 Гц и до 440 В постоянного тока. Переключатели соответствуют требованиям ГОСТ Р 50030.1 ГОСТ Р 50030.3, ГОСТ Р 50030.5.1.

2.1 Переключатели изготавливаются в исполнениях, определяемых сочетанием следующих признаков:

2.1.1 по виду конструктивного исполнения:

- переключатель;
- аварийный выключатель

2.1.2 по виду крепления и места установки:

- за фронтальный фланец, установка за панелью толщиной до 6 мм;
- за фронтальный фланец, установка за панелью толщиной до 15 мм;
- крепление основания винтами, установка на панели внутри шкафа;
- крепление основания на din-рейку, установка на панели внутри шкафа;
- крепление за оболочку

2.1.3 по числу коммутационных положений - до 12;

2.1.4 по числу коммутационных цепей - до 24;

2.1.5 по способу фиксации коммутационных положений

- с самовозвратом;
- без самовозврата, с фиксацией коммутационных положений через 30°, 45°, 60° и 90°

Технические данные и характеристики

1.1 Номинальные напряжения переключателей – 660 В переменного тока частоты 50 и 60 Гц и 440 В постоянного тока.

1.2 Номинальный ток переключателей (условный тепловой ток I_{th} на открытом воздухе) – 16А и 25 А.

1.3 Категории основного применения переключателей - AC-21 А и AC-22А. Допускается применение переключателей в категориях AC-1 А, AC-2А, AC-3А, AC-20А, AC-23А, AC-22А, DC-1 В, DC-2В, DC-3В, DC-20А, DC-21 В, DC-22В.

1.4 Переключатели работают в следующих режимах:

- а) продолжительном;
- б) повторно-кратковременном с коэффициентом нагружения 40-60% и максимальным числом циклов оперирования до 600 в час.

1.5 Зажим вывода переключателя обеспечивает бескольцовое присоединение двух медных или алюминиевых проводников сечением до 4,0 мм².

1.6 Характеристики:

1.6.1 Число циклов коммутационной износостойкости – 0,1 млн. циклов ВО для категорий применения AC-21, AC-22, DC-21.

1.6.2 Число циклов механической износостойкости – 3,0 млн. циклов переключений.

1.6.3. Переключатели неремонтопригодны.

1.6.4 Механические факторы внешней среды – по группе условий эксплуатации М3 и М7 ГОСТ 17516.1.

1.6.5 Рабочее положение переключателей в пространстве – любое.

1.6.6 Срок службы – 10 лет.

1.6.7 Гарантийный срок службы 2 года со дня ввода переключателя в эксплуатацию.

2.1.6 по наличию специальных устройств:

- без специальных устройств;
- с устройством для запираания (установка навесных замков в количестве до 3-х с диаметром скобы замка до 5 мм);

2.1.7 по степени защиты:

- IP 30 или IP 54 со стороны передней панели и IP 20 со стороны присоединительных контактов по ГОСТ 14254;

2.1.8 по климатическому исполнению и категории размещения:

- УХЛ2 по ГОСТ 15150;
- УХЛ3 по ГОСТ 15150.

Комплектность

В комплект поставки входит:

- переключатели в количестве, согласно заказу;
- руководство по монтажу и эксплуатации и этикетка с электрической схемой и диаграммой его работы.



Структура условного обозначения

Переключатель пакетный кулачковый ПП53- X_1X_2 - X_3 - $X_4X_5X_6$ - X_7 -УХЛХ₈-КЭАЗ

Переключатель пакетный кулачковый	– Тип изделия
ПП53	– Обозначение серии
X_1X_2	– Цифра, указывающая величину номинального тока 16 - 16А; 25- 25А
X_3	– Цифра, указывающая вид конструктивного исполнения: 1 - переключатель; 3 - аварийный выключатель
$X_4X_5X_6$	– Условный номер электрической схемы и диаграммы переключения
X_7	– Цифра, указывающая условное обозначение исполнения по виду крепления: 1 - за фронтальный фланец, установка за панелью толщиной до 6 мм; 2 - за фронтальный фланец, установка за панелью толщиной до 15 мм; 3 - установка на панели внутри шкафа, крепление основания винтами; 4 - установка на панели внутри шкафа, крепление основания на din-рейку; 5 - крепление за оболочку.
УХЛХ ₈	– Климатическое исполнение и категория размещения по ГОСТ 15150: УХЛ2 или УХЛ3
КЭАЗ	– Торговая марка

Пример записи заказа. В заказе необходимо указать наименование и типоразмер переключателя согласно структуре условного обозначения.

Пример записи обозначения переключателя на номинальный ток 16 А, с электрической схемой №080; для установки за панелью толщиной до 6 мм с креплением за фронтальный фланец, климатического исполнения УХЛ3 при его заказе и в документации другого изделия:

Переключатель пакетный кулачковый ПП53-16-1-080-1-УХЛ3-КЭАЗ

Пример записи обозначения переключателя на номинальный ток 25А, с электрической схемой №002, для установки за панелью толщиной до 6 мм с креплением за фронтальный фланец, климатического исполнения УХЛ2 (степень защиты со стороны передней панели IP54 по ГОСТ 14254) при его заказе и в документации другого изделия:

Переключатель пакетный кулачковый ПП53-25-1-002-1-УХЛ2-КЭАЗ

Также для заказа вы можете указать номер схемы, для которой необходим аналог (4G, ПК, ПКУЗ, УП, МКФ, МКВ, ПМОВ, ПМОФ, ПКУ2, ПВП, ОМ, ОН, КПУ, ПВ, GN, ТМ, ТО и т.д.), либо заполните бланк заказа на нашем сайте www.keaz.ru.

Пример записи обозначения аварийного выключателя на номинальный ток 25 А, с электрической схемой № 006, для установки на панели внутри шкафа, с креплением основания на din-рейку, климатического исполнения УХЛ3 при его заказе и в документации другого изделия:

Переключатель пакетный кулачковый ПП53-25-3-006-4-УХЛ3-КЭАЗ

Пример записи обозначения переключателя на номинальный ток 16А, с электрической схемой №002, креплением за оболочку, климатического исполнения УХЛ2 (степень защиты оболочки IP54 по ГОСТ 14254) при его заказе

и в документации другого изделия:

Переключатель пакетный кулачковый ПП53-16-1-002-5-УХЛ2-КЭАЗ

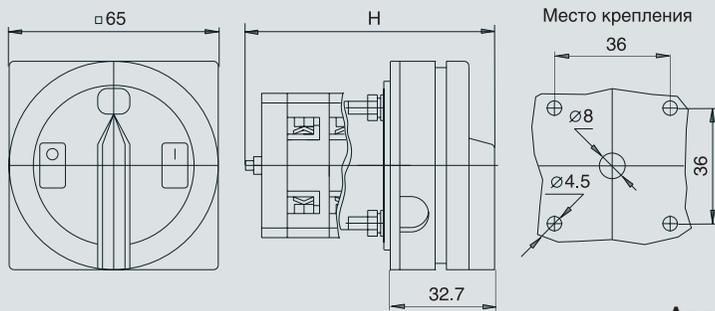


Вместо стандартной (белой) панели переключателя может быть установлена бесцветная (прозрачная), позволяющая помещать под нее лист, с нанесенными на него нестандартными наименованиями коммутационных положений переключателя и информацию об объекте управления.



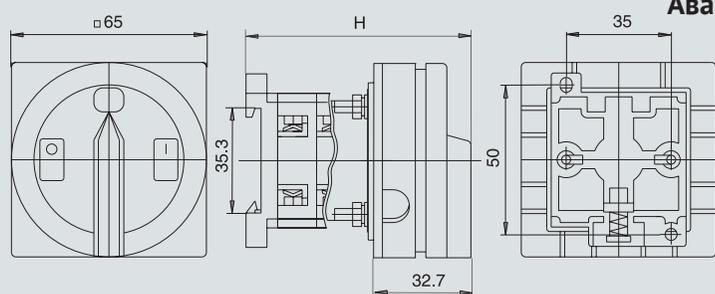
Габаритные, установочные, присоединительные размеры и масса

Аварийный выключатель, вид крепления 1, 2



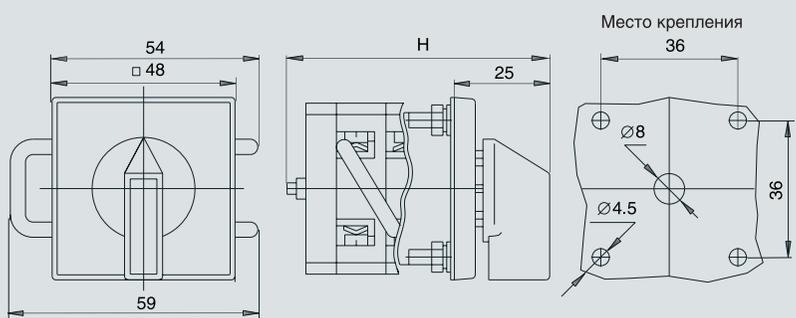
Условное обозначение исполнения по виду крепления	H, мм	Количество контактов	Масса, кг не более
1	91	3	0,16
		4	0,17
2	100	3	0,17
		4	0,18

Аварийный выключатель, вид крепления 3, 4



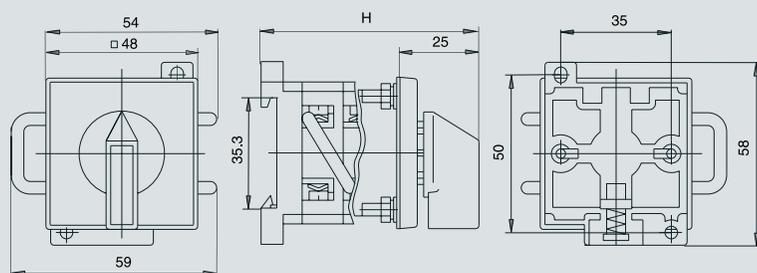
Условное обозначение исполнения по виду крепления	H, мм	Количество контактов	Масса, кг не более
3	92	3	0,16
		4	0,17
4	92	3	0,17
		4	0,18

Пакетный выключатель, вид крепления 1, 2



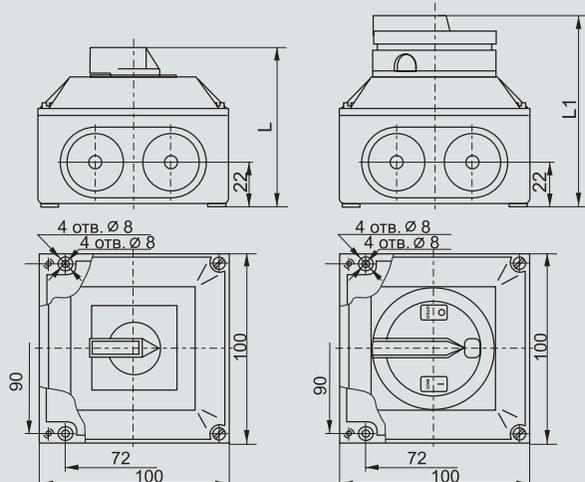
Количество коммутирующих пакетов	Условное обозначение исполнения по виду крепления	H, мм	Масса, кг не более
1	1	68	0,11
	2	77	0,12
2	1	81	0,15
	2	90	0,16
3	1	94	0,21
	2	103	0,22
4	1	107	0,24
	2	116	0,25
5	1	120	0,29
	2	129	0,30
6	1	133	0,33
	2	142	0,34
12	1	211	0,50
	2	220	0,51

Пакетный выключатель, вид крепления 3, 4



Количество коммутирующих пакетов	Условное обозначение исполнения по виду крепления	H, мм	Масса, кг не более
1	3	69	0,11
	4		0,12
2	3	82	0,15
	4		0,16
3	3	95	0,21
	4		0,22
4	3	108	0,24
	4		0,25
5	3	121	0,29
	4		0,30
6	3	134	0,33
	4		0,34
12	3	212	0,50
	4		0,51

Пакетный выключатель, вид крепления 3, 4



Количество коммутирующих пакетов	Переключатель L (мм)	Аварийный выключатель L1 (мм)
2	90	106
4	116	132

Электрические схемы и диаграммы переключений

1. Расположение коммутирующих пакетов на схемах снизу вверх соответствует их положению на изделии от наблюдателя кустановочной плоскости;
2. В буквенно-цифровой маркировке приняты следующие обозначения: L1, L2, L3 - фазы сети; N - нейтраль сети; W1(2), U1(2), V1(2) - обозначение фаз обмоток электродвигателя (1 - начало обмотки, 2 - конец обмотки) либо фаз других нагрузок;
3. Внизу диаграммы переключений приведены:
 - «←» - самовозврат в предыдущее коммутационное положение;
 - 0,1,2,3... - номера стандартных коммутационных положений;
4. На лицевой панели переключения приведена маркировка с обозначением стандартных коммутационных положений:
 - 0,1,2,3... - номера стандартных коммутационных положений;
 - - знаки Y и Δ - переключения переключателя для соединения обмоток электродвигателя в «звезду» либо в «треугольник»;
 - - 220 V, 380 V - величина напряжения сети;
 - «Пуск» или «Стоп» - кратковременное замыкание или размыкание контактов (в переключателях с самовозвратом).
5. В пунктирных рамках для пояснения функционального назначения переключателя приведены элементы схем, не относящиеся к схеме переключателя.

Схемы и диаграммы переключений

Схема 001

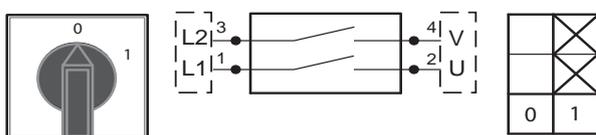


Схема 002

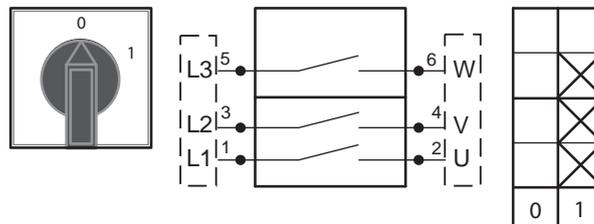


Схема 003

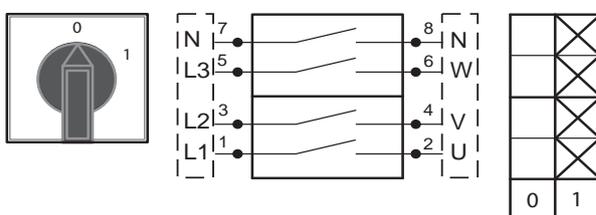


Схема 004

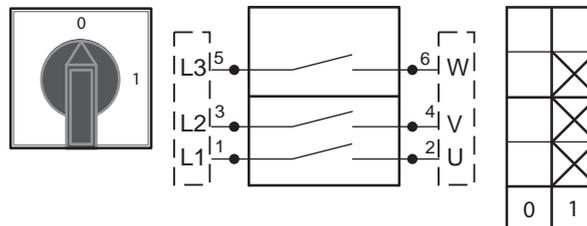


Схема 005

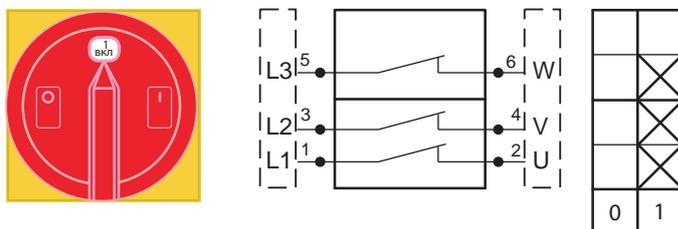


Схема 006

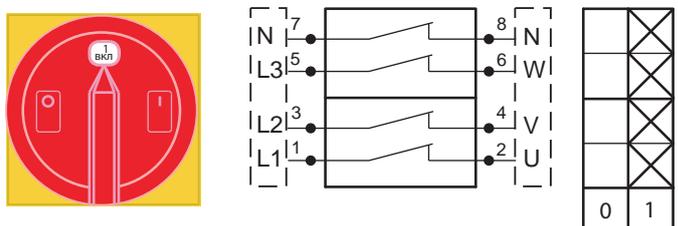


Схема 007

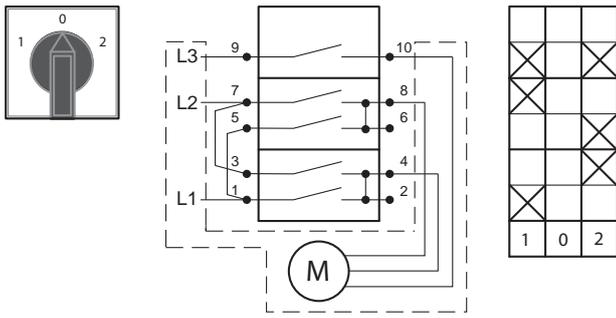


Схема 008

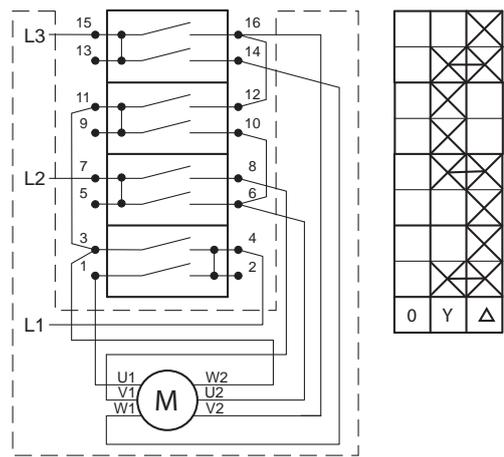


Схема 009

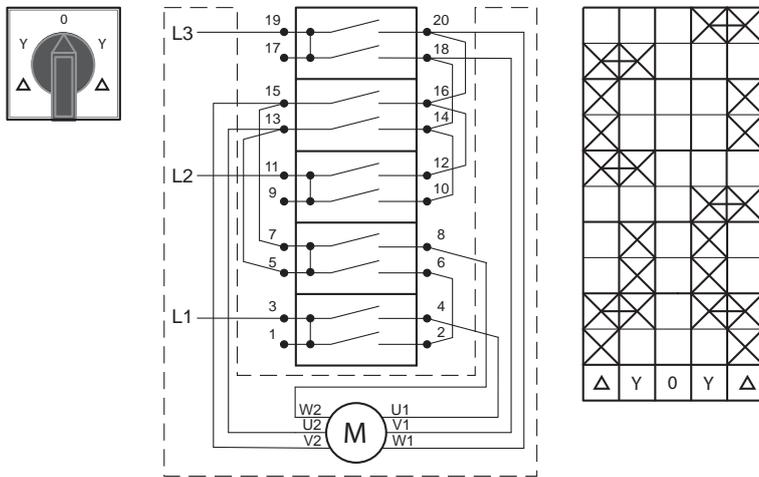


Схема 010

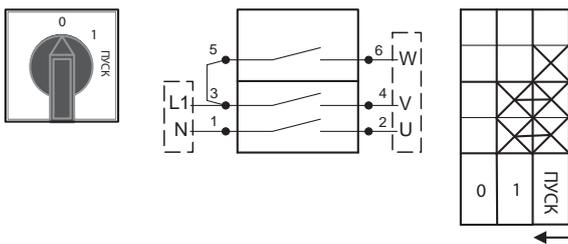


Схема 011

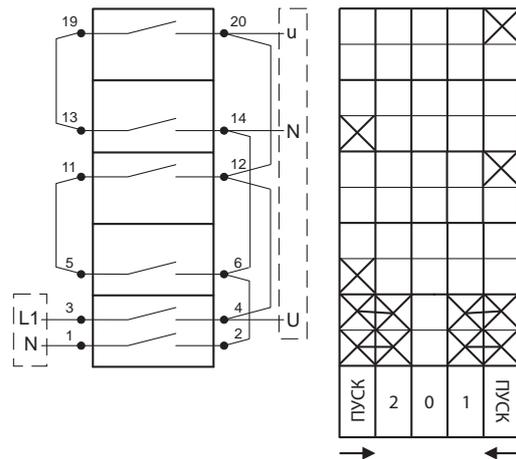


Схема 012

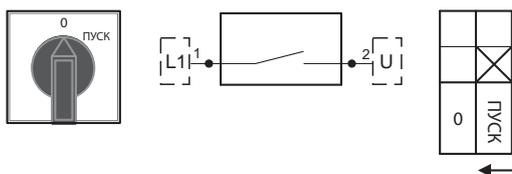


Схема 022

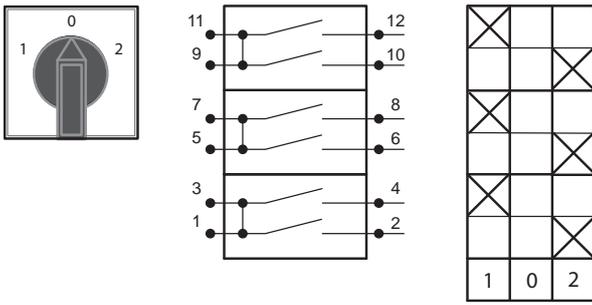


Схема 023

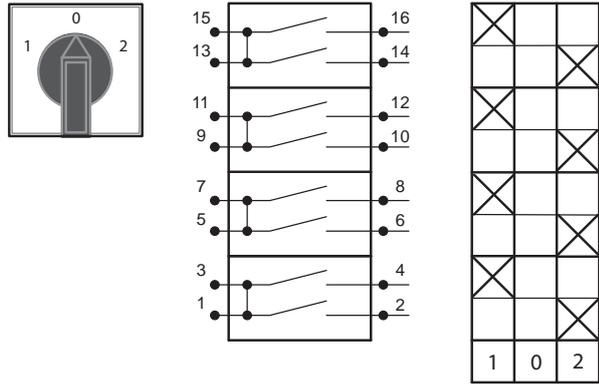


Схема 024

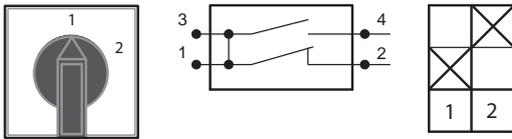


Схема 025

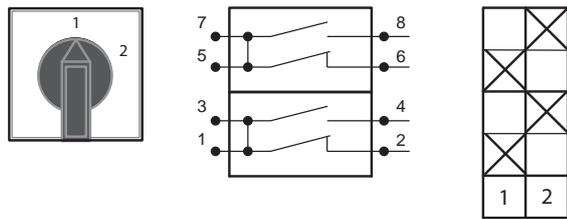


Схема 026

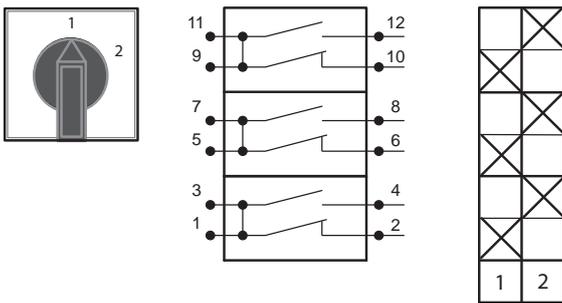


Схема 027

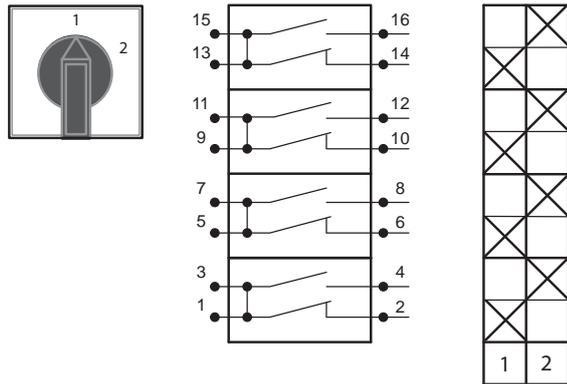


Схема 028

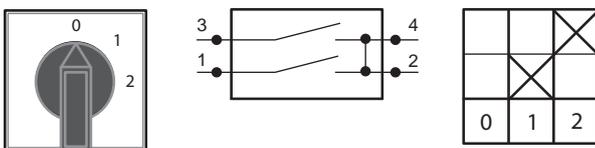


Схема 029

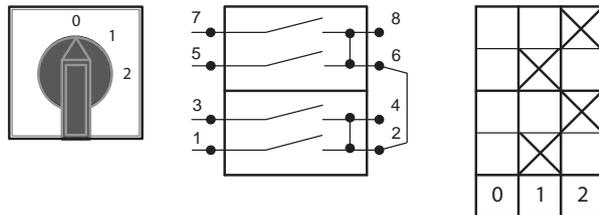


Схема 030

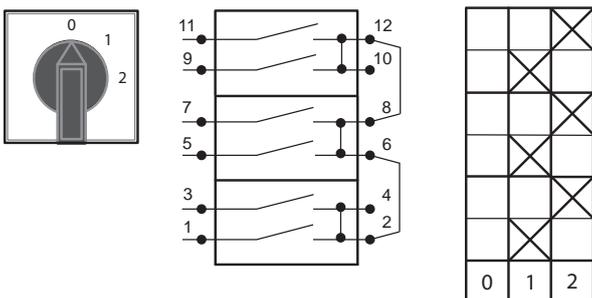


Схема 031

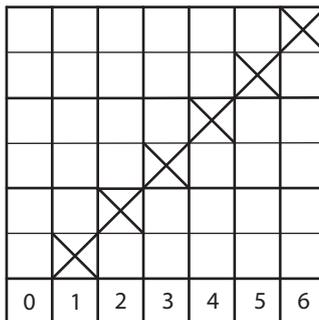
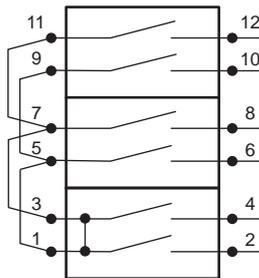
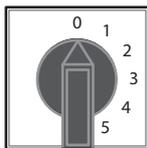


Схема 032

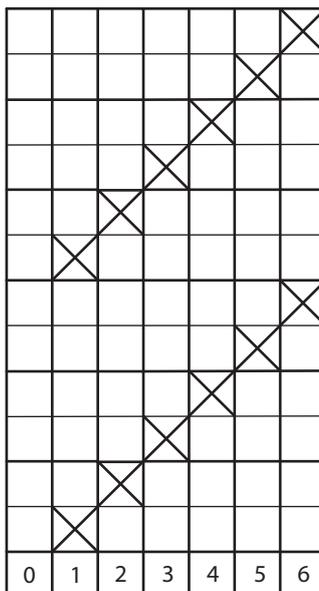
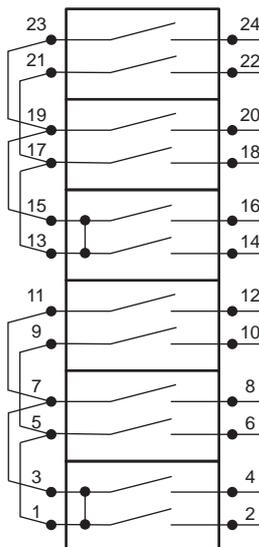
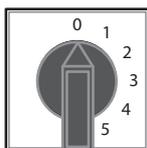


Схема 033

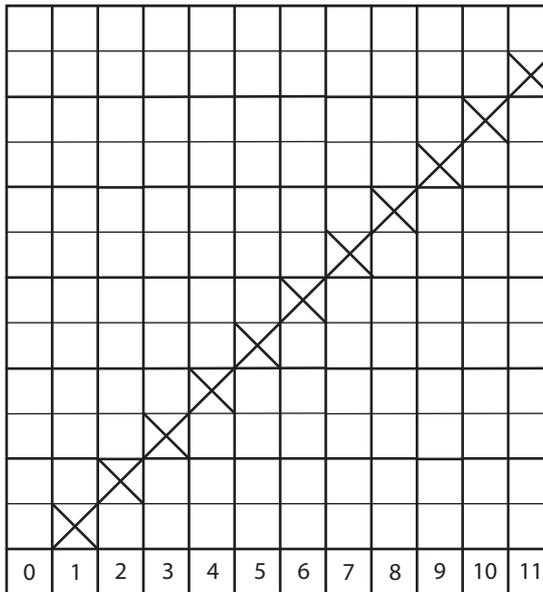
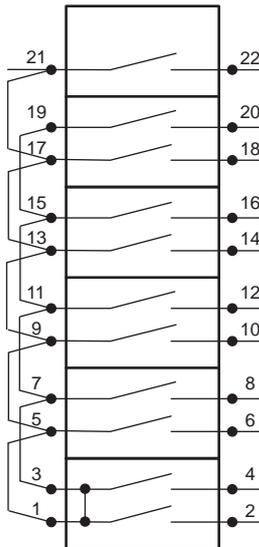
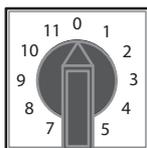


Схема 034

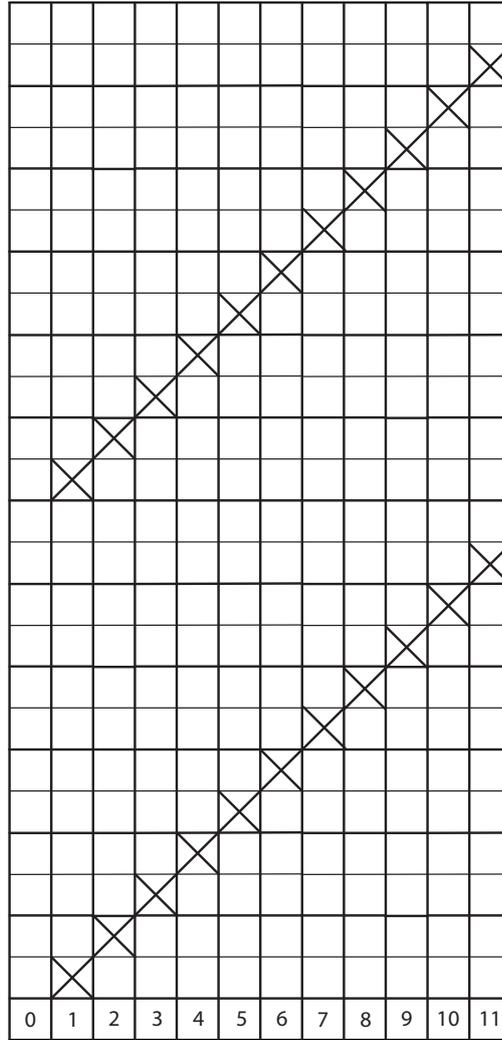
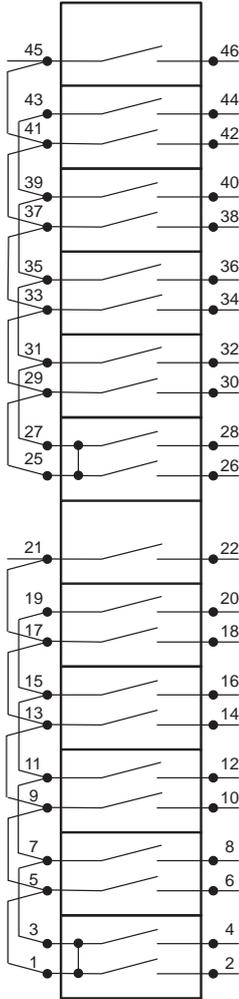
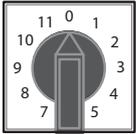


Схема 035

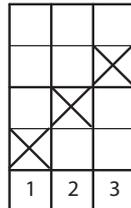
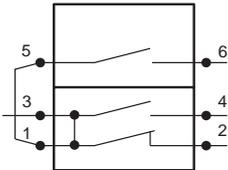
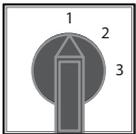


Схема 036

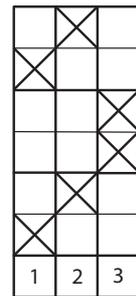
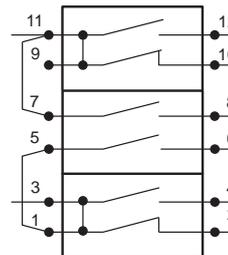
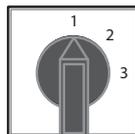


Схема 037

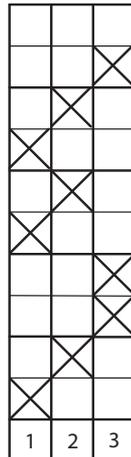
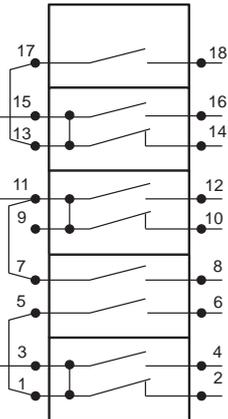
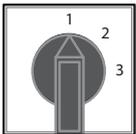


Схема 038

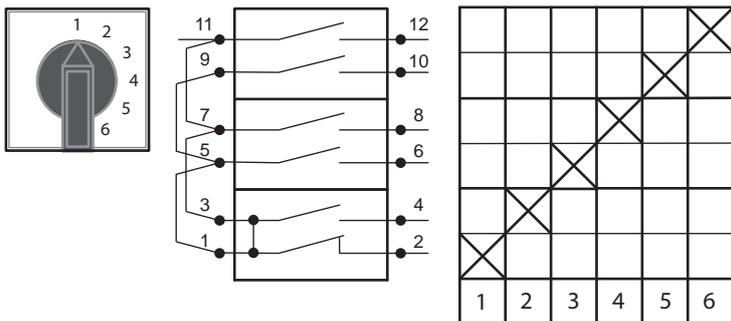


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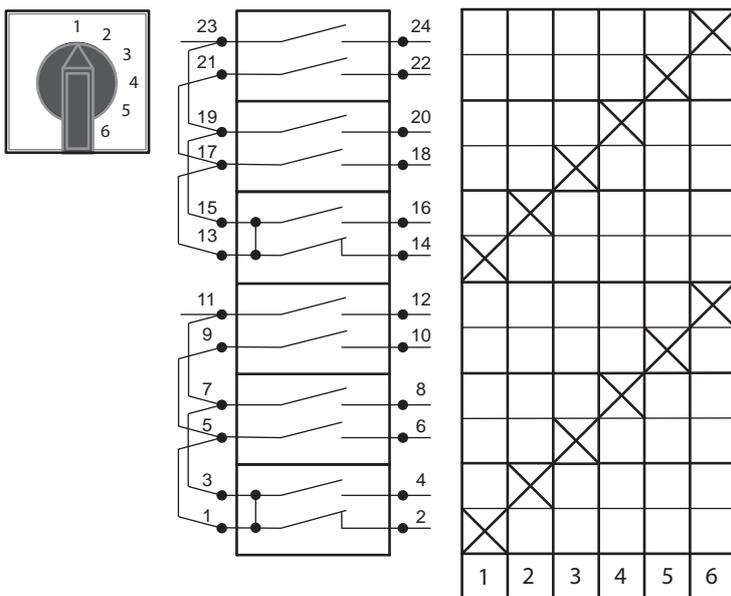


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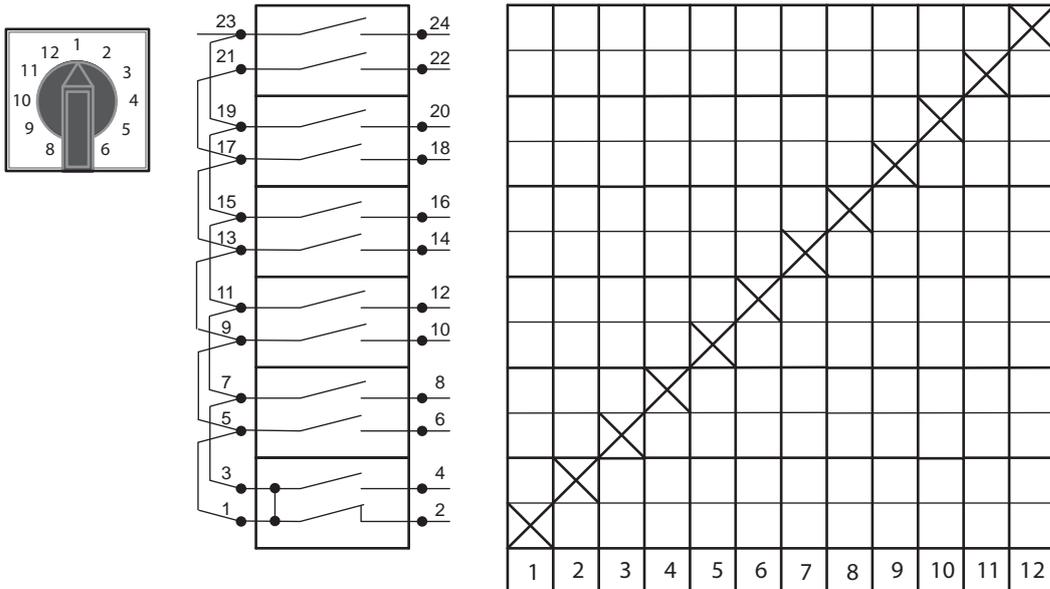


Схема 041

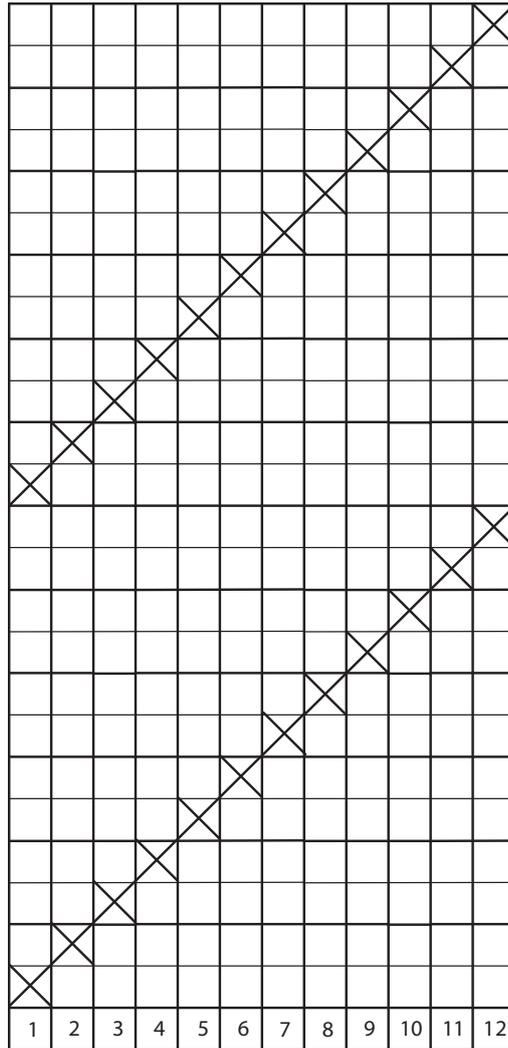
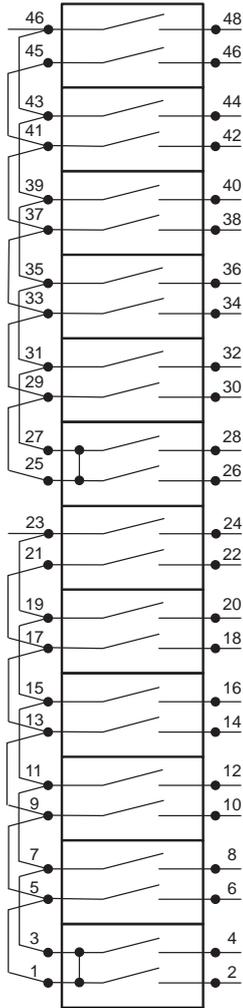


Схема 043

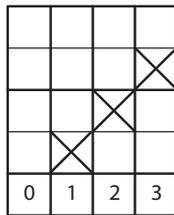
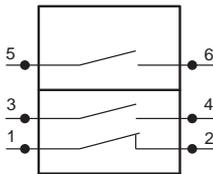
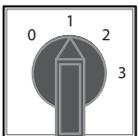


Схема 044

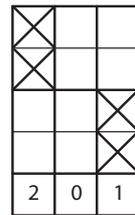
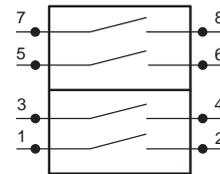
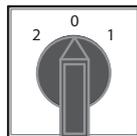


Схема 045

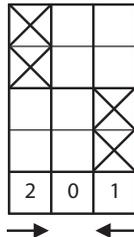
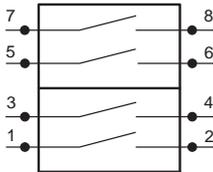
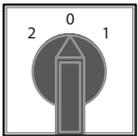


Схема 046

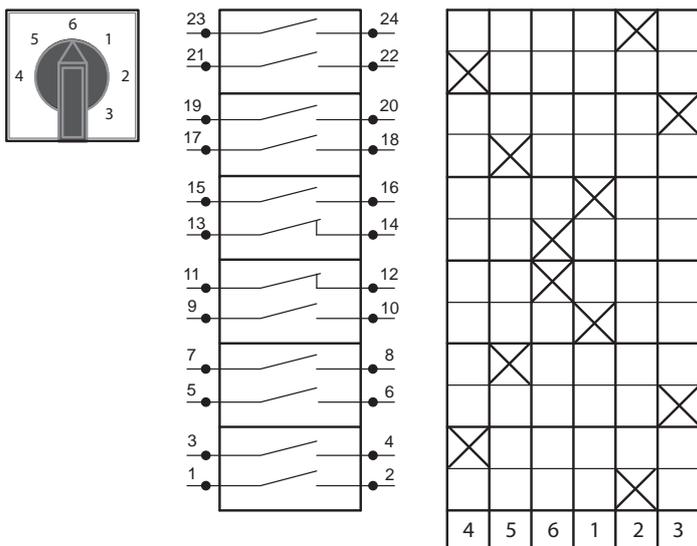


Схема 047

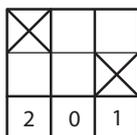
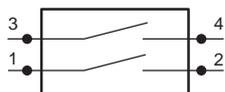
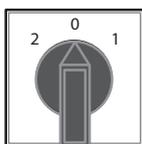


Схема 049

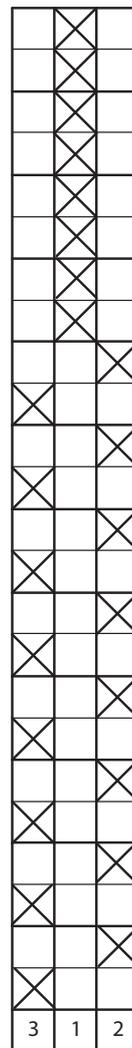
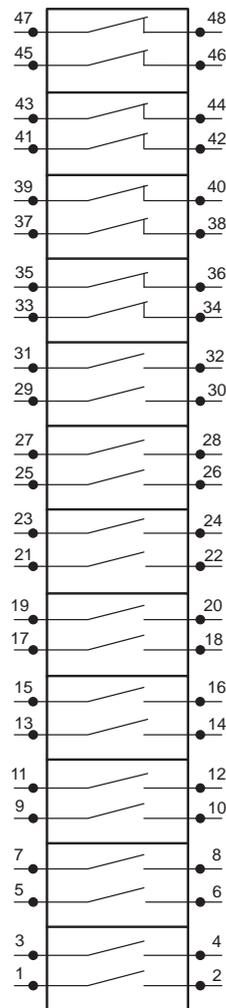
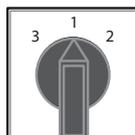


Схема 048

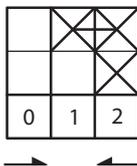
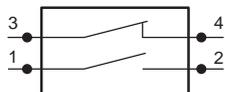
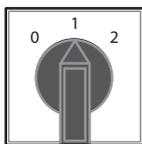


Схема 050

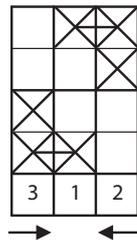
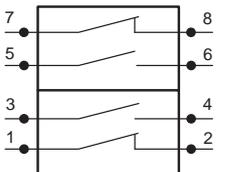
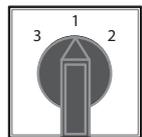


Схема 051

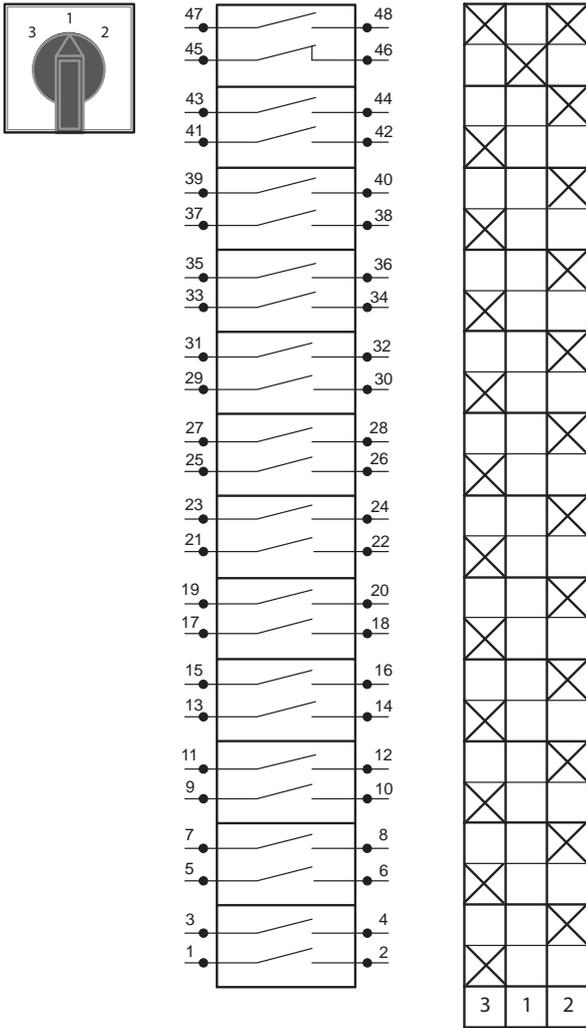


Схема 052

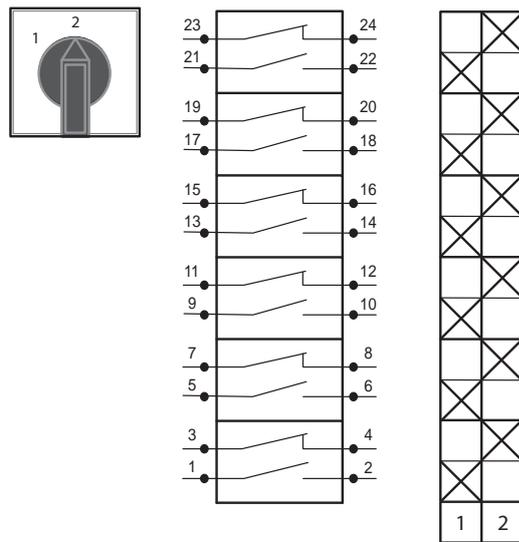


Схема 053

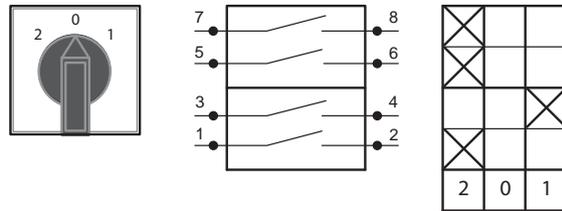


Схема 054

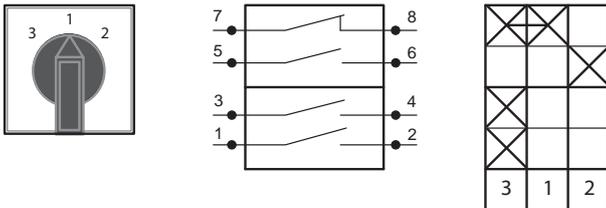


Схема 055

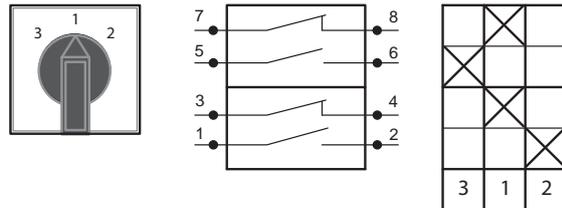


Схема 056

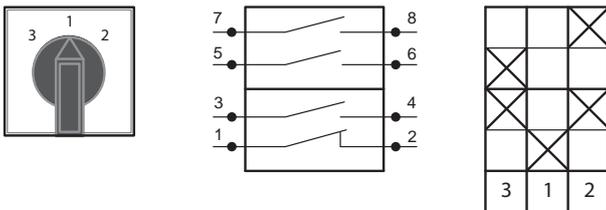


Схема 057

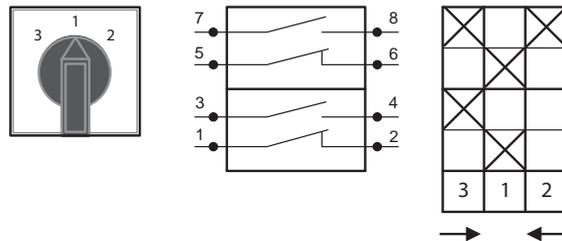


Схема 058

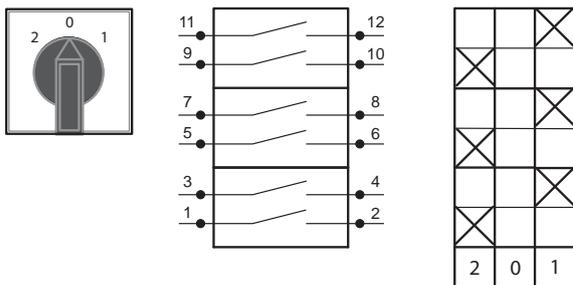


Схема 059

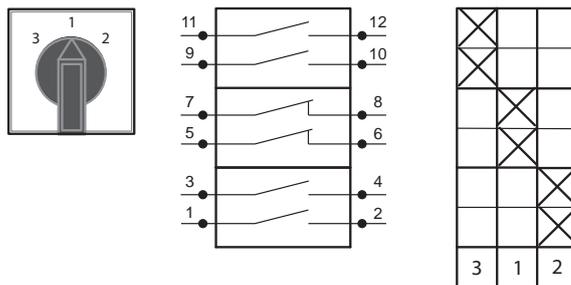


Схема 060

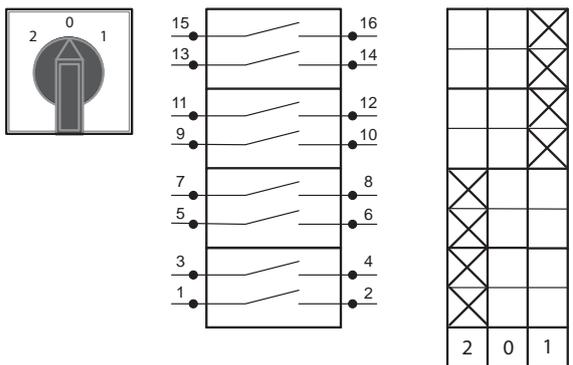


Схема 061

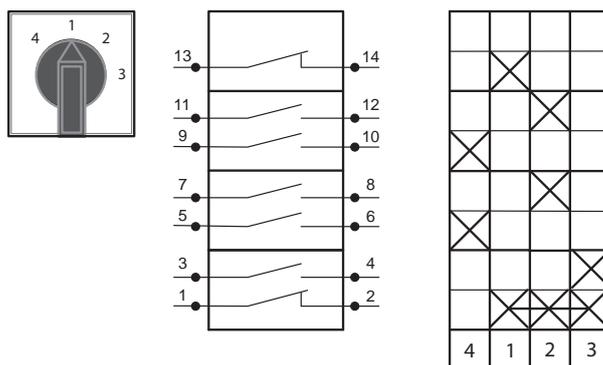


Схема 062

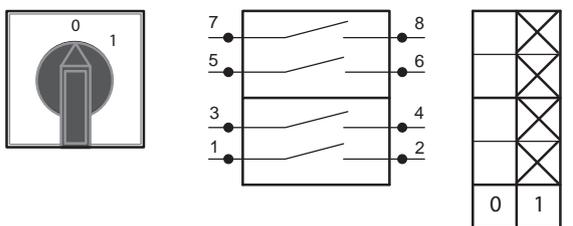


Схема 063

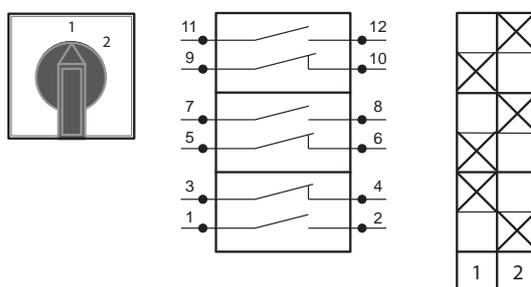


Схема 064

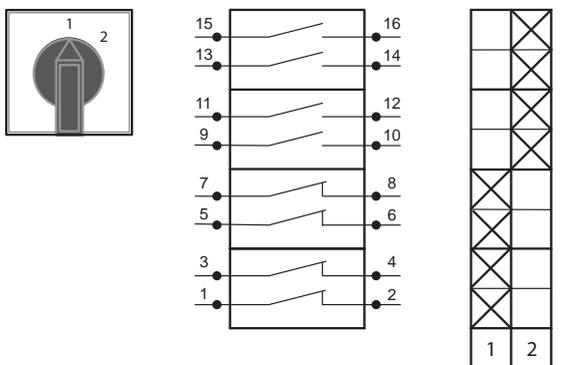


Схема 065

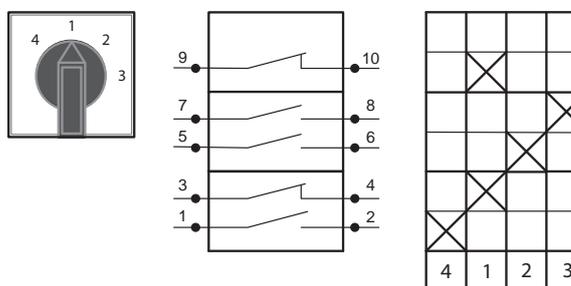


Схема 070

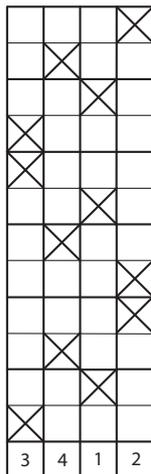
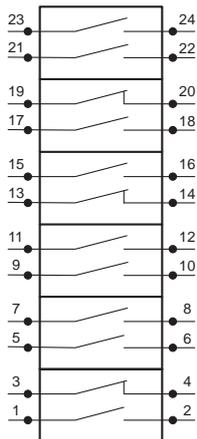
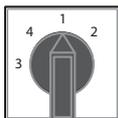


Схема 071

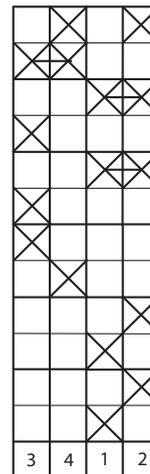
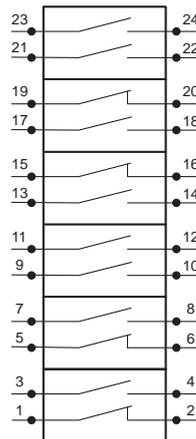
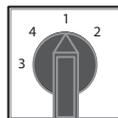


Схема 072

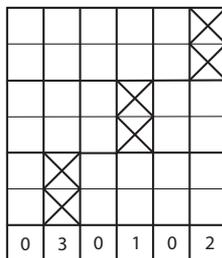
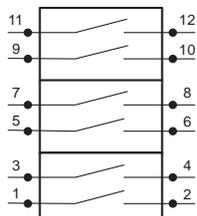
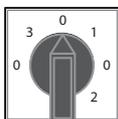


Схема 074

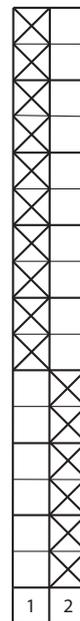
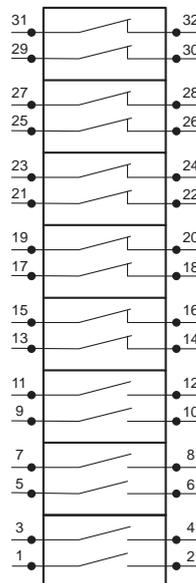
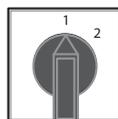


Схема 076

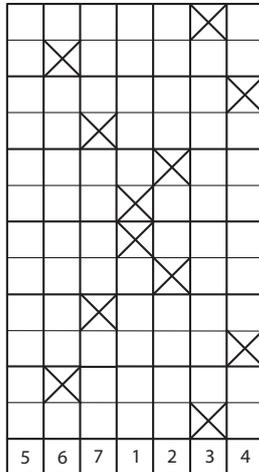
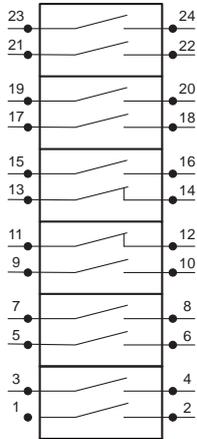
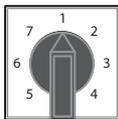


Схема 077

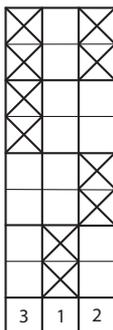
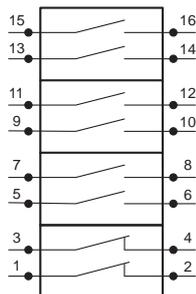
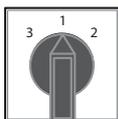


Схема 079

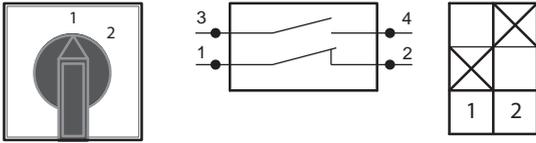


Схема 080

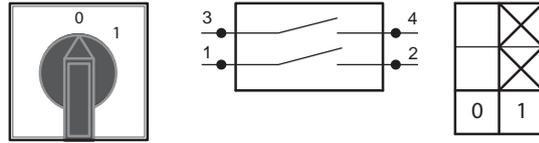


Схема 081

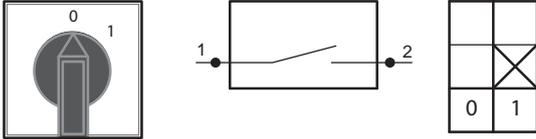


Схема 082

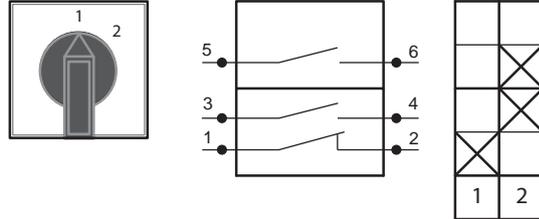


Схема 083

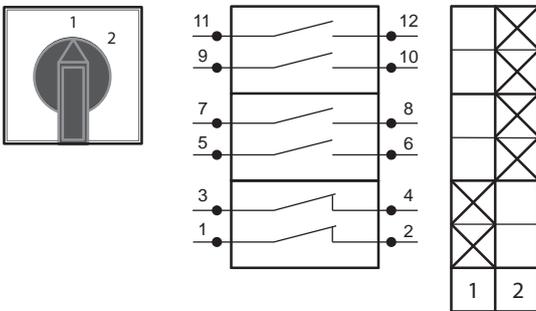


Схема 084

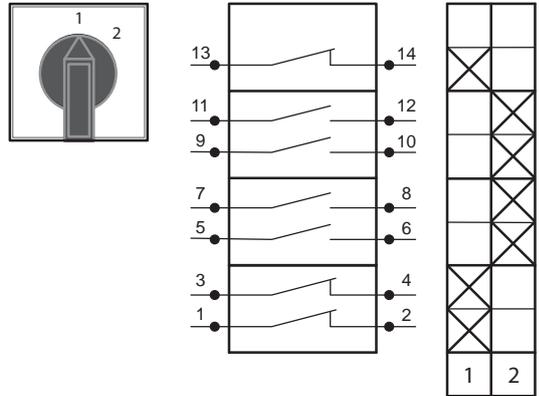


Схема 085

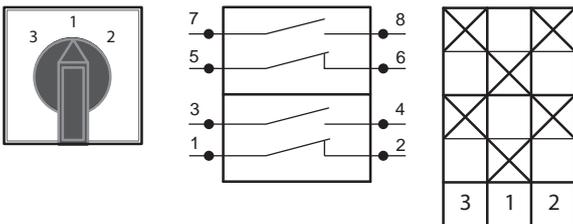


Схема 086

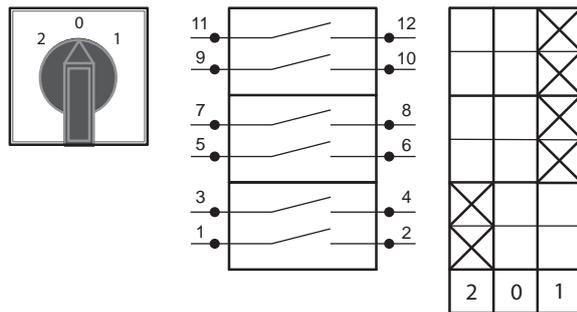


Схема 087

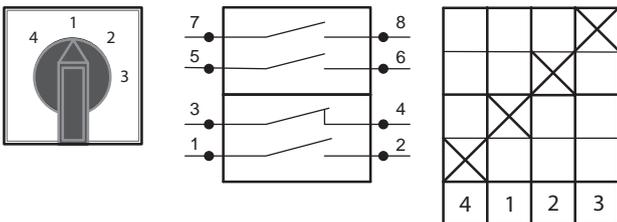


Схема 088

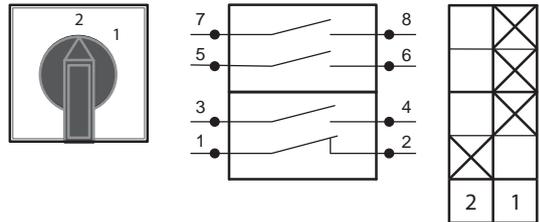


Схема 089

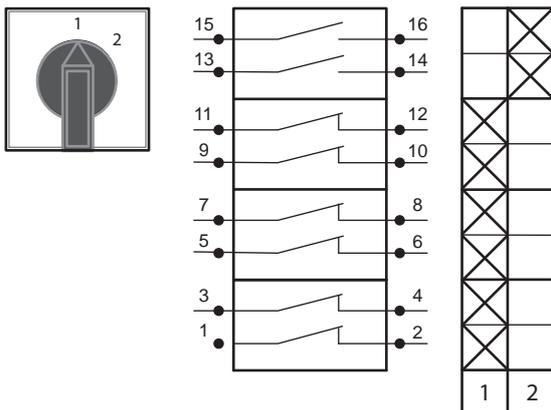


Схема 093

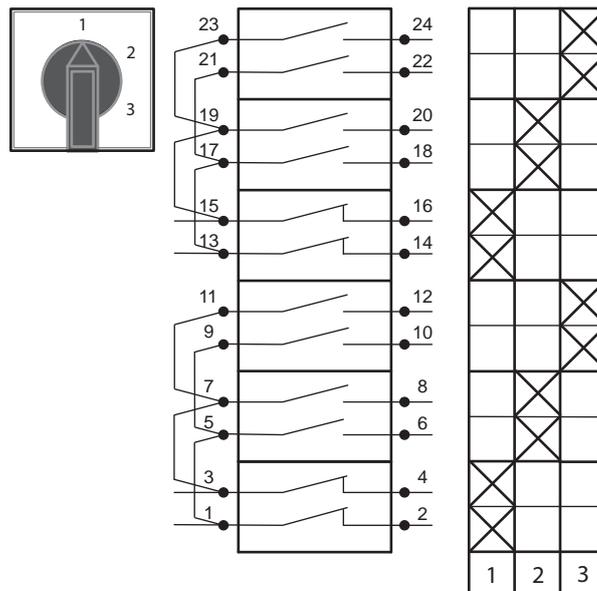


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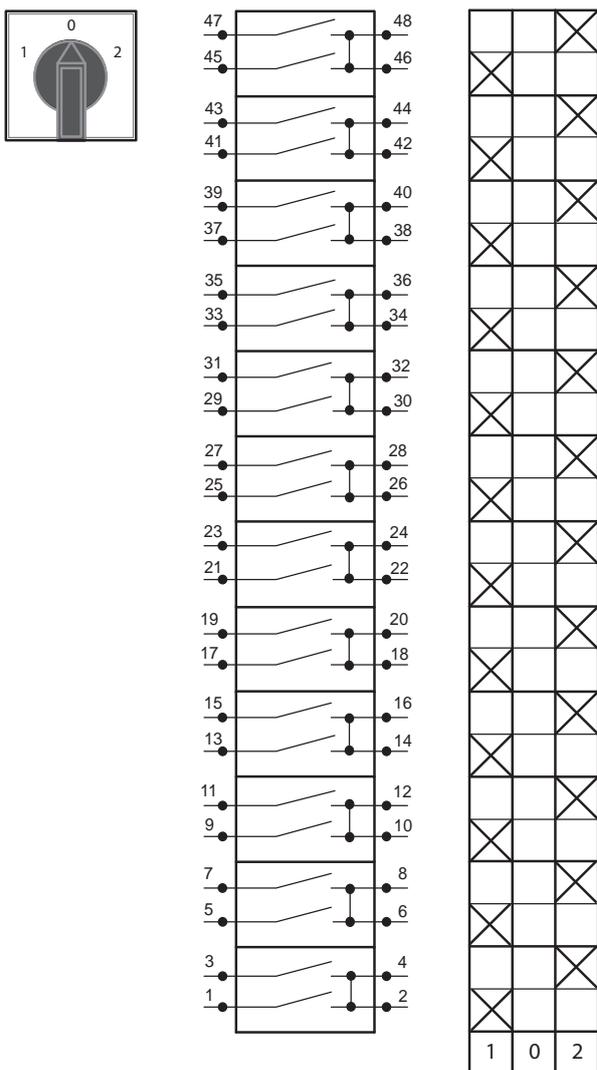


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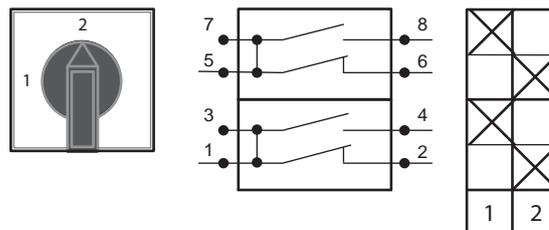


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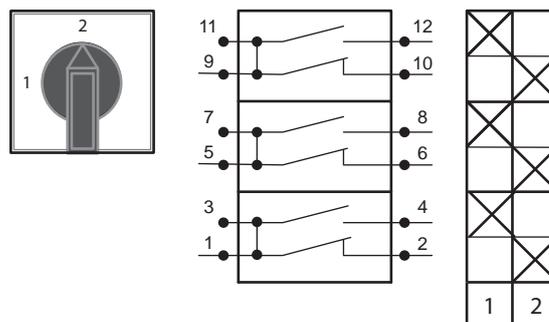


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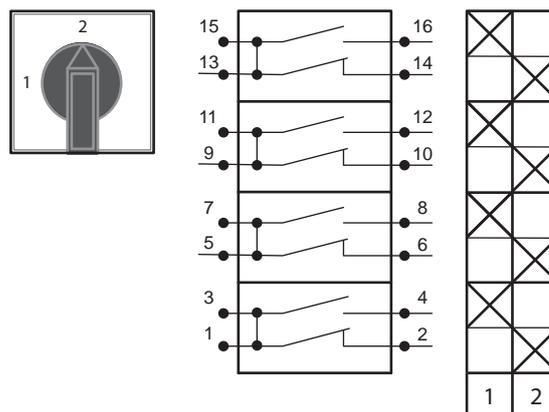


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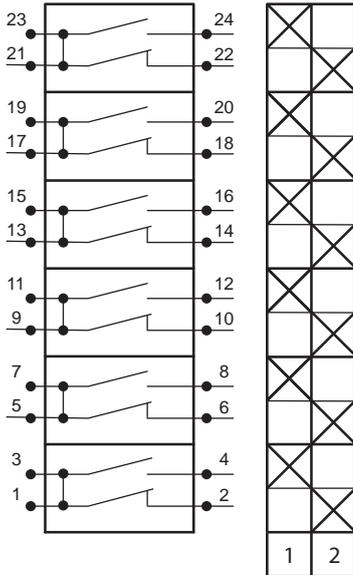
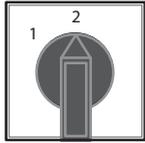


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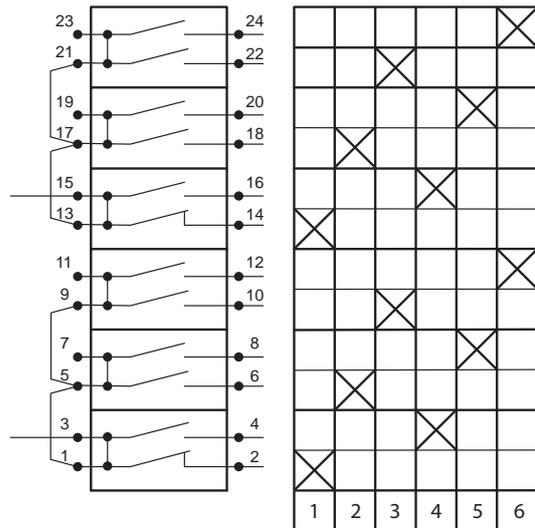
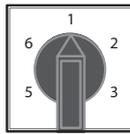


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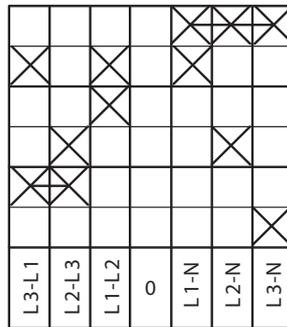
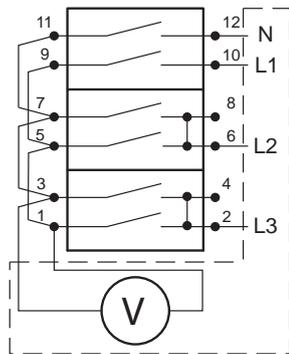
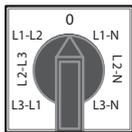


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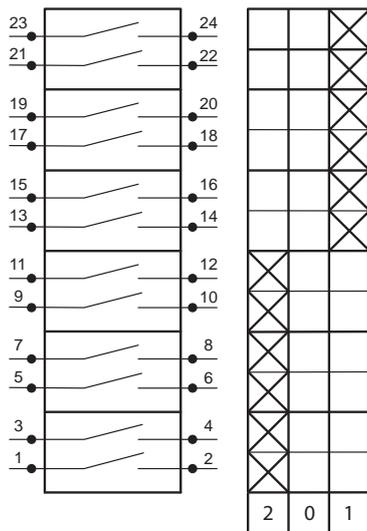
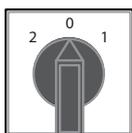


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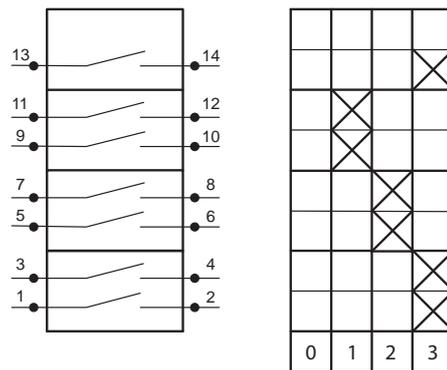
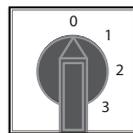


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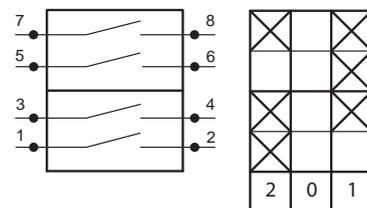
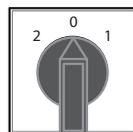


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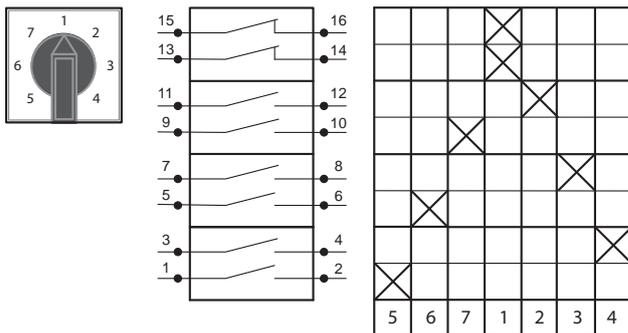


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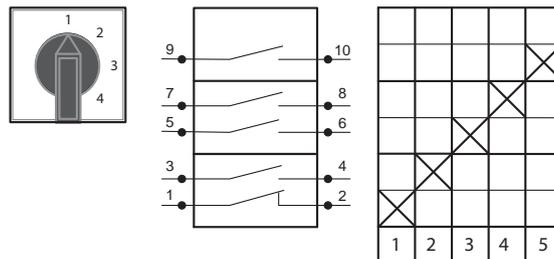


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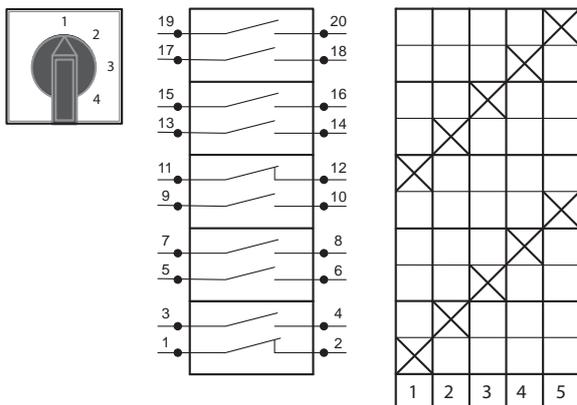


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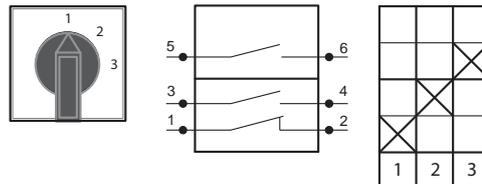


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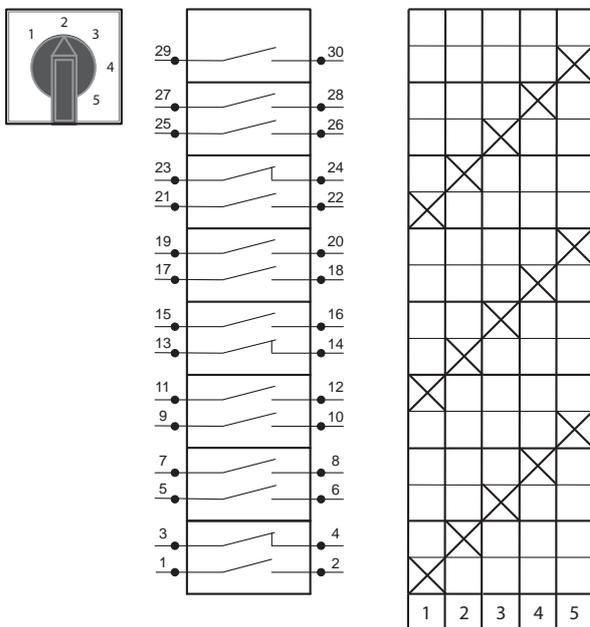


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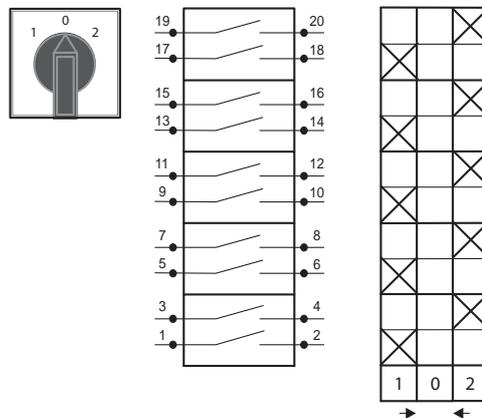


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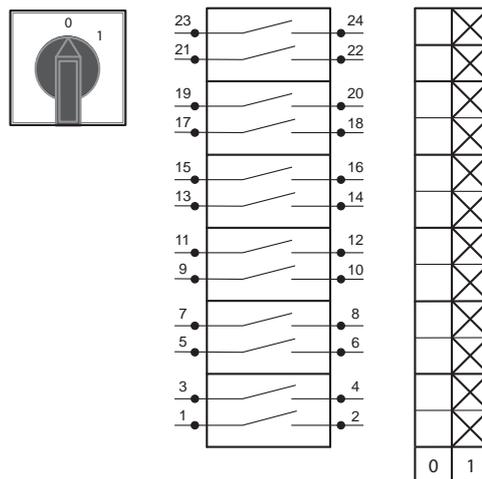


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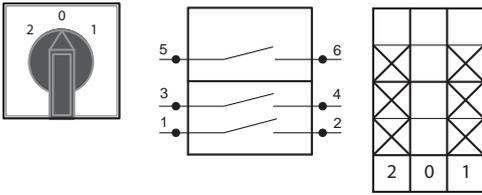


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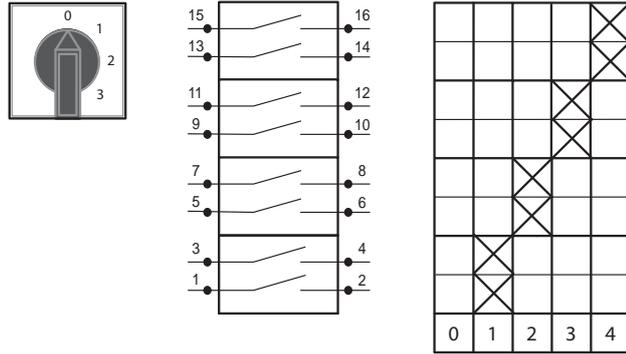


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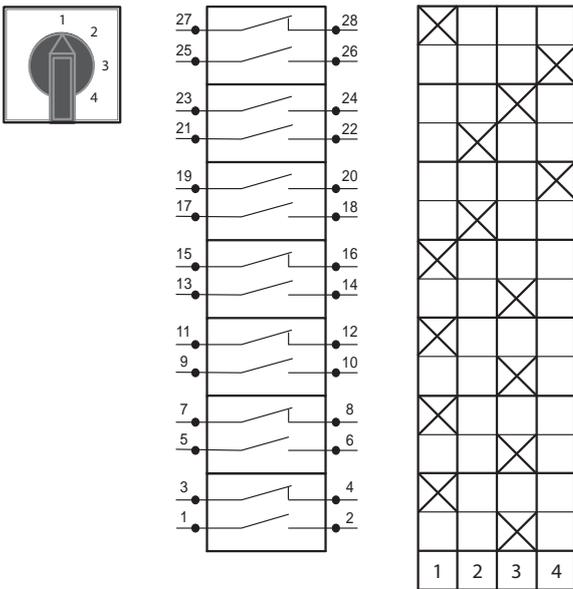


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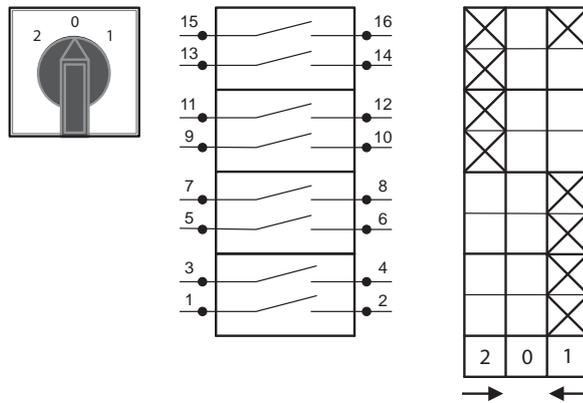


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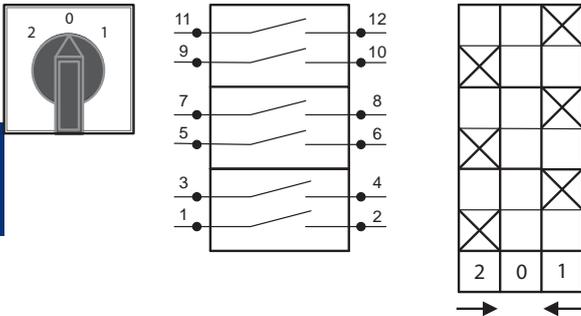


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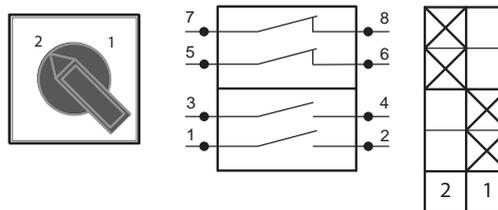


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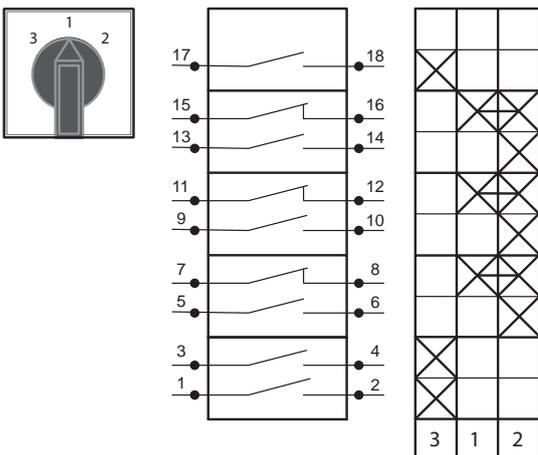


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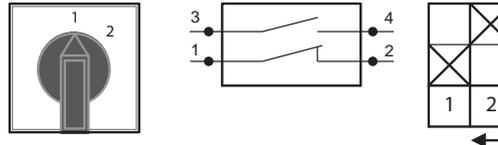


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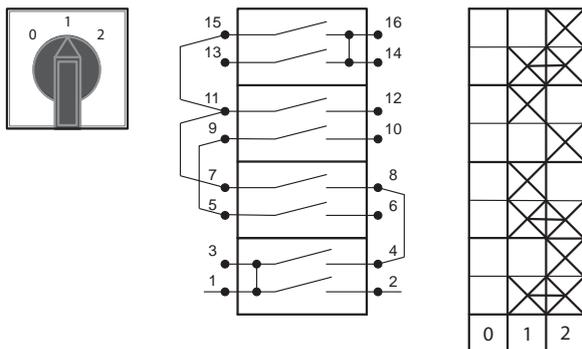


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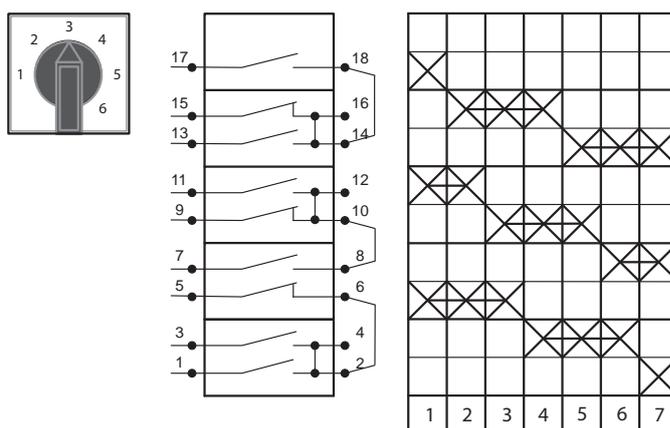


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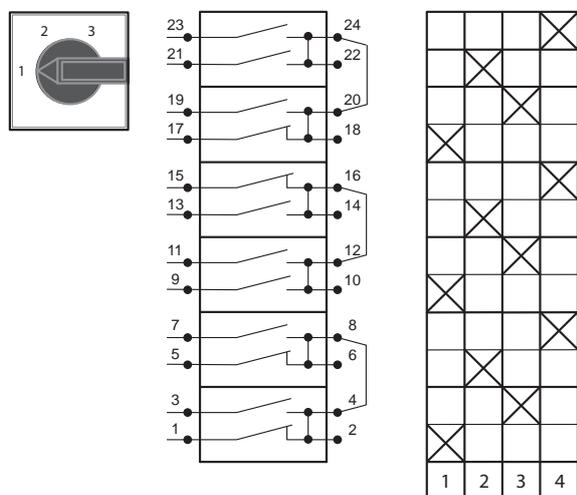


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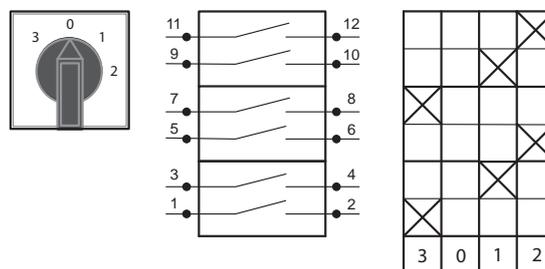


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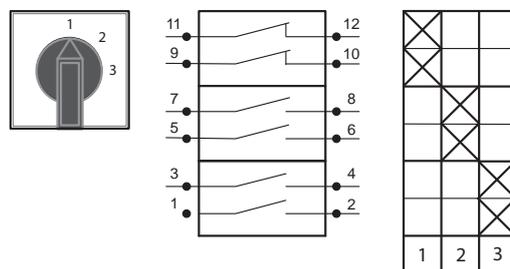


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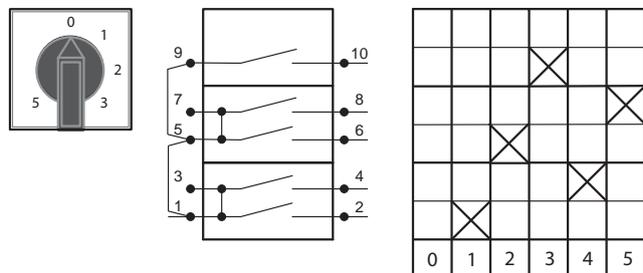


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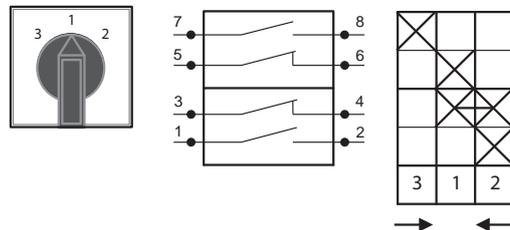


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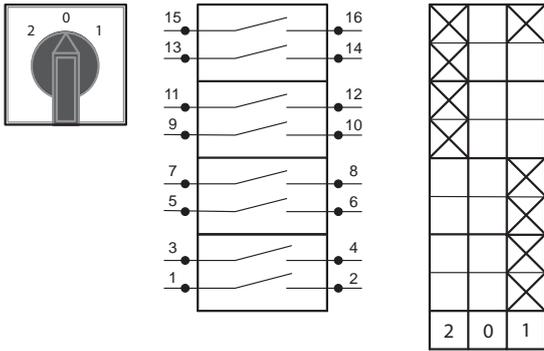


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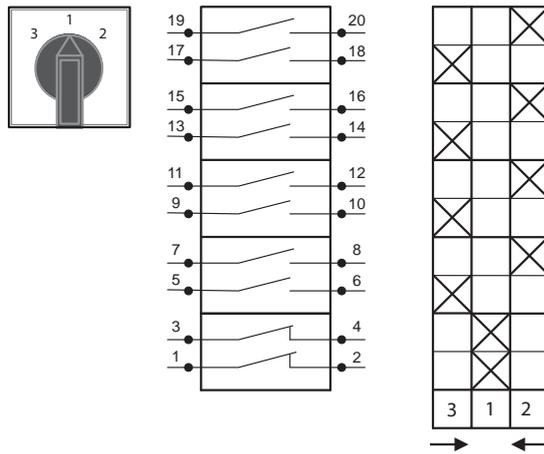


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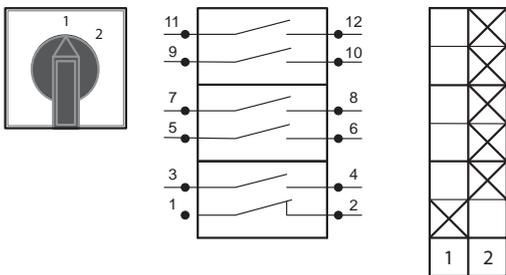


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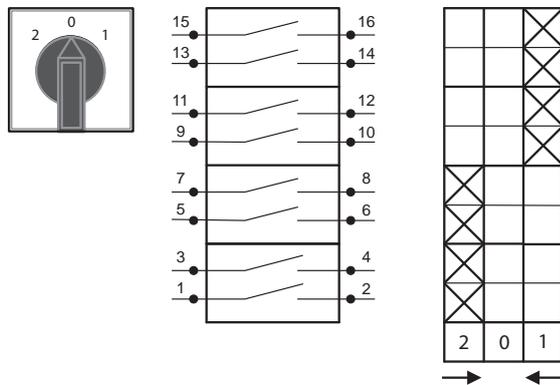


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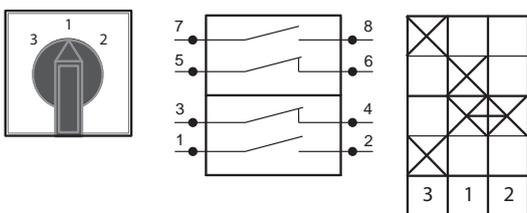


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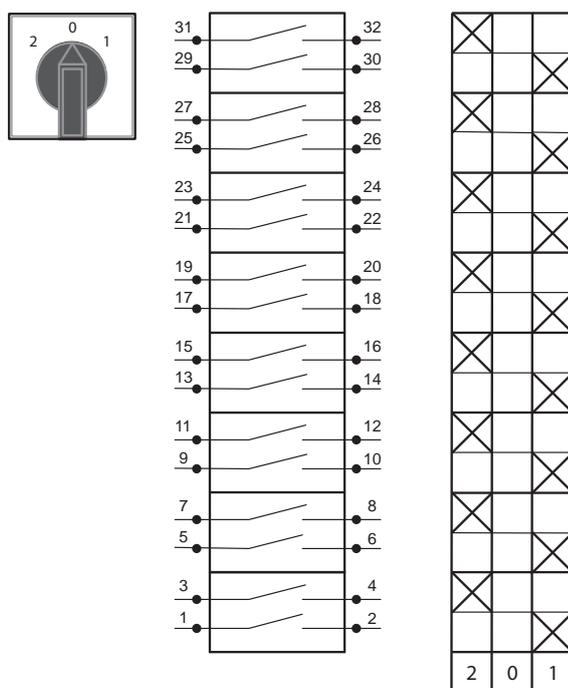


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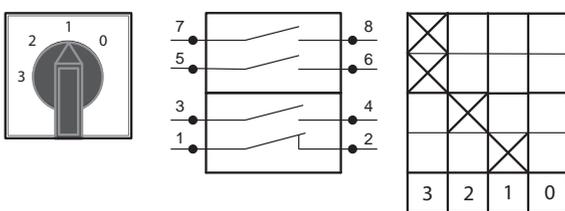


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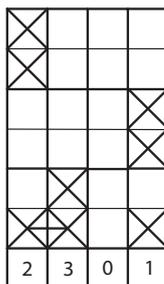
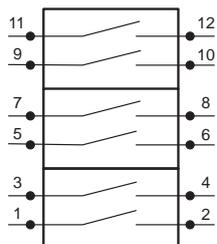
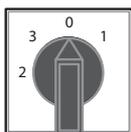


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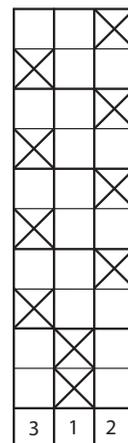
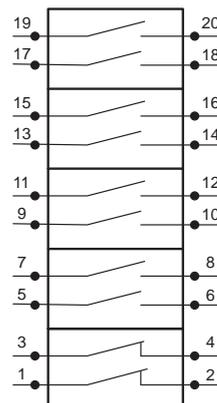
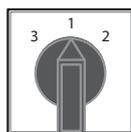


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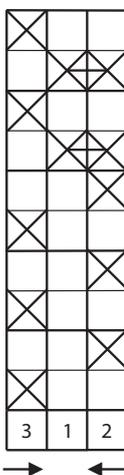
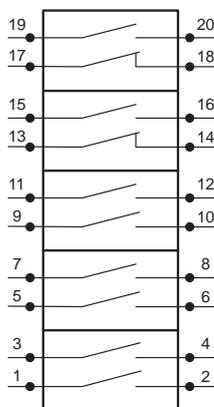
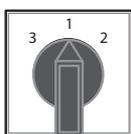


Схема 139

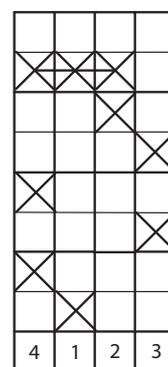
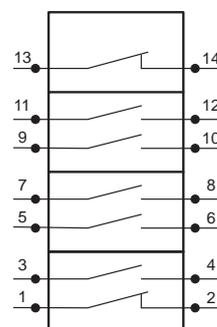
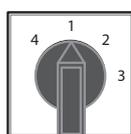


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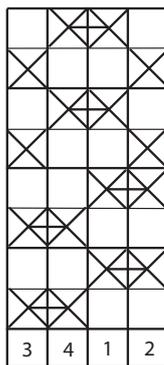
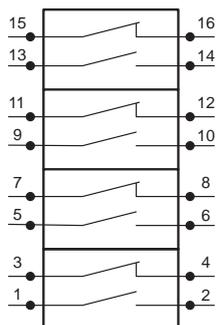
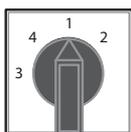


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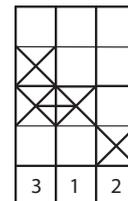
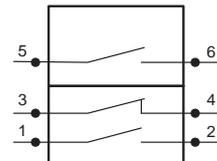
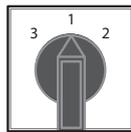


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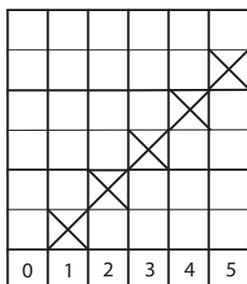
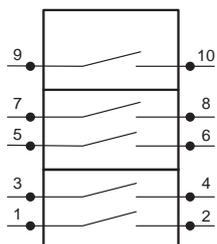
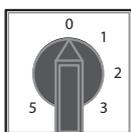


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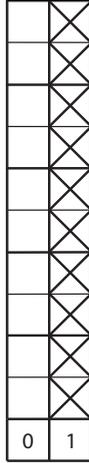
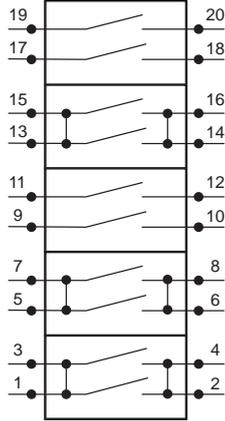
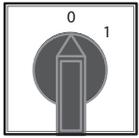


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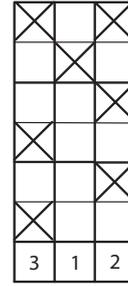
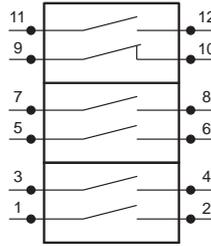
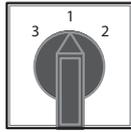


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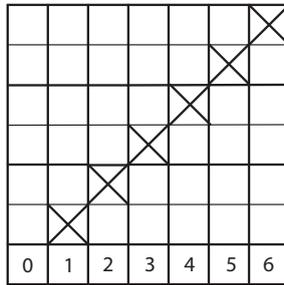
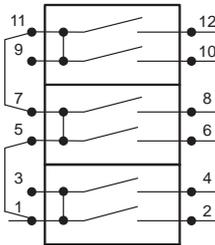
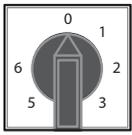


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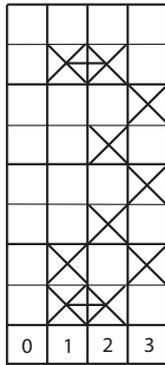
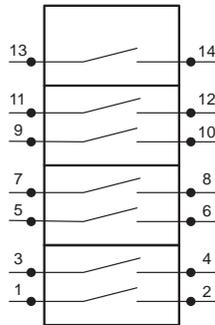
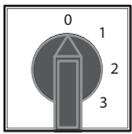


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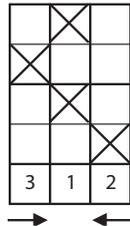
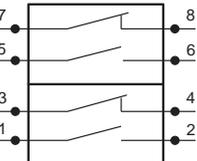
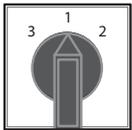


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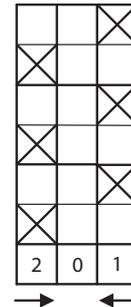
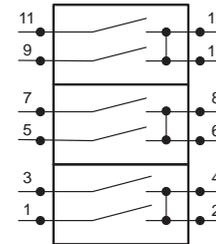
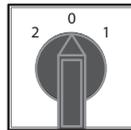


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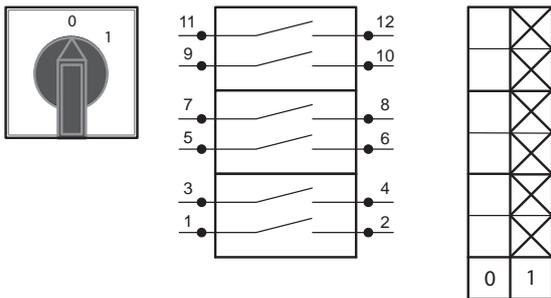


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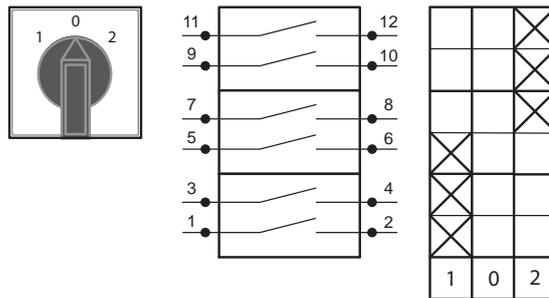


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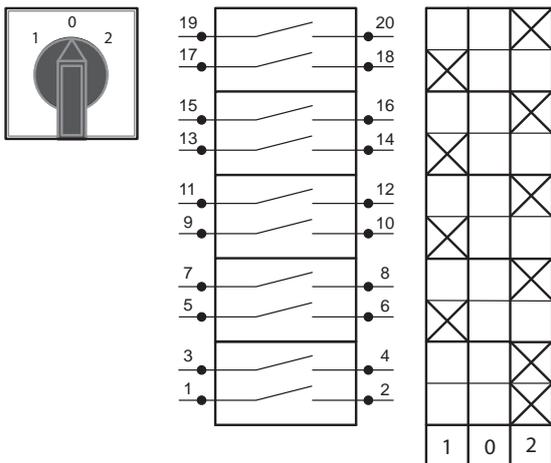


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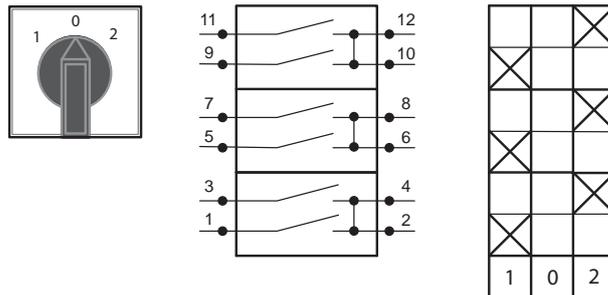


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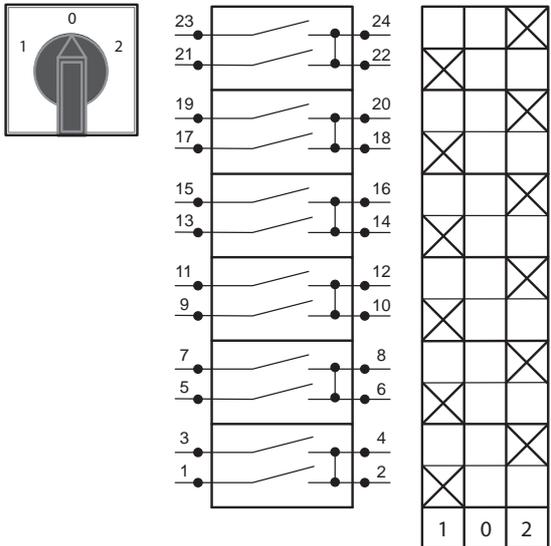


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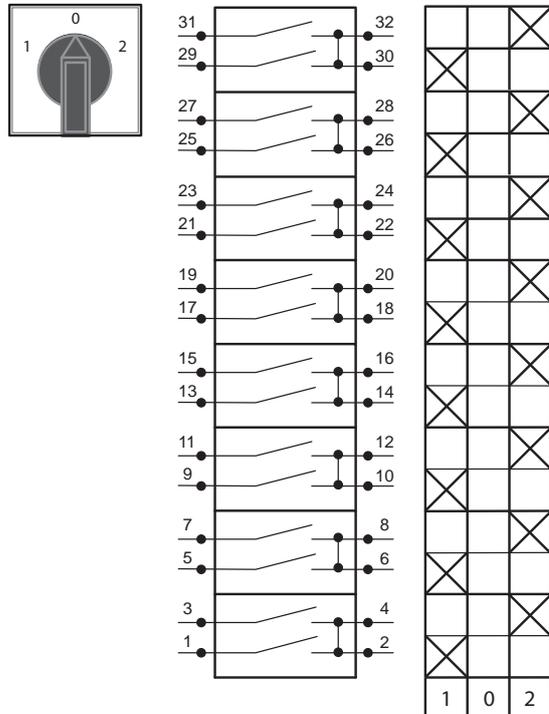


Схема 155

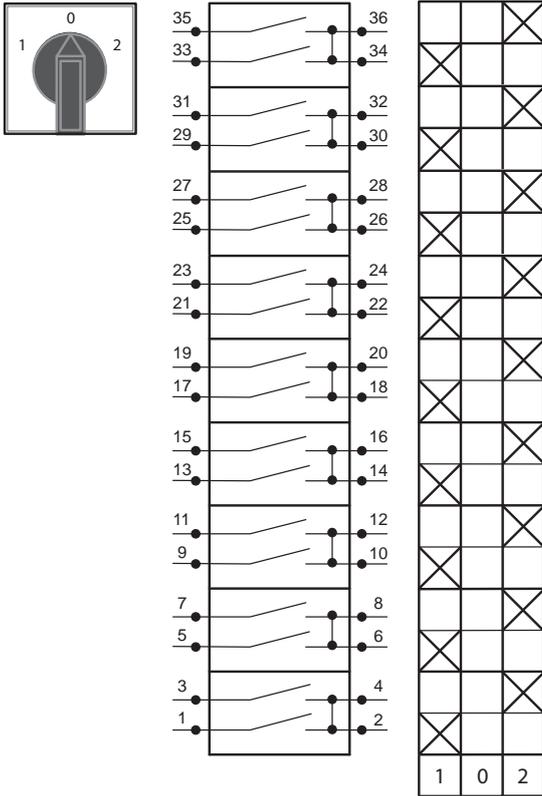


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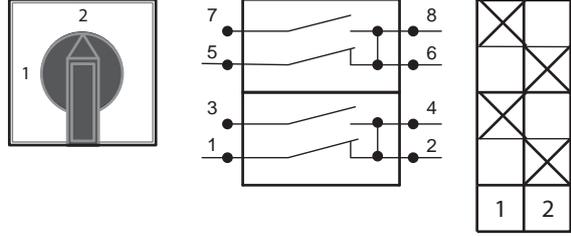


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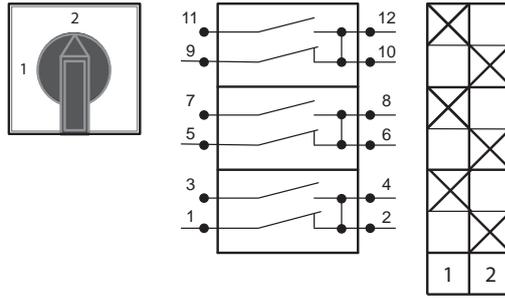


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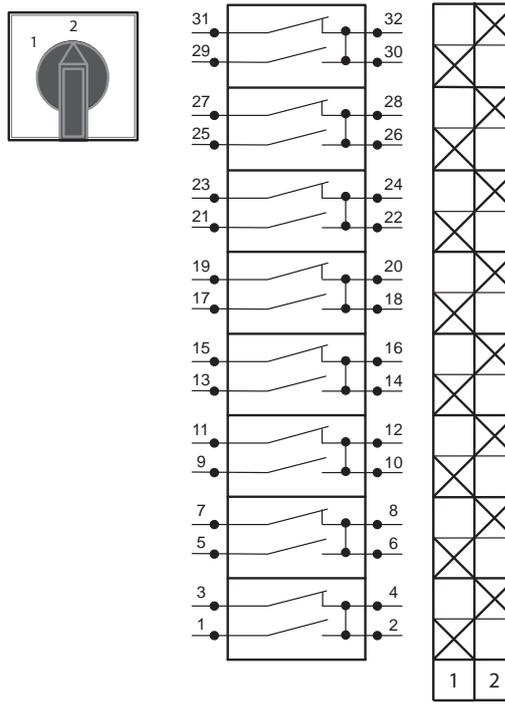


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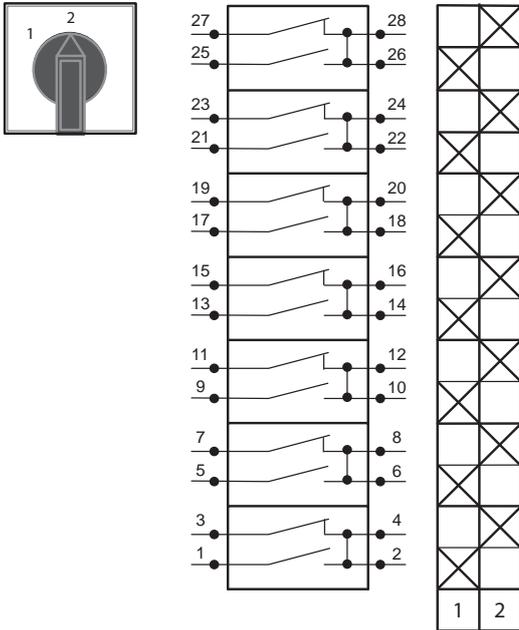


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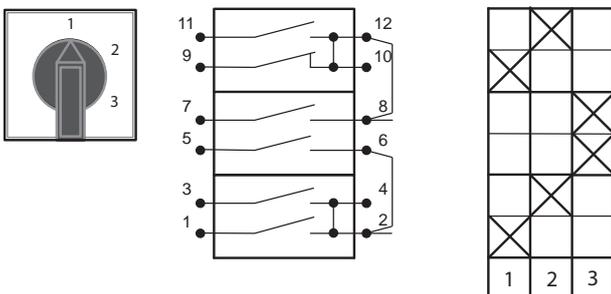


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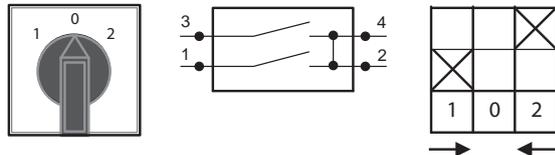


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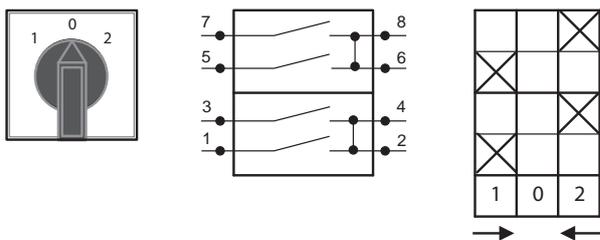


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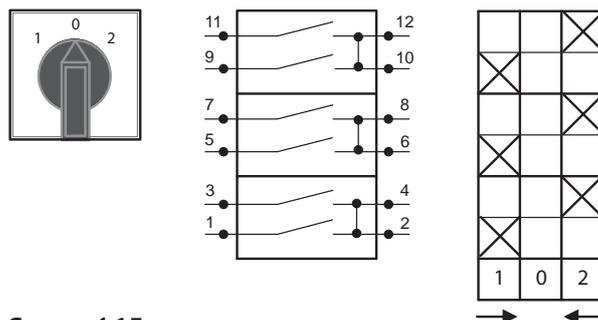


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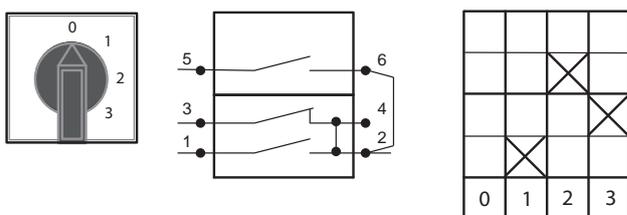


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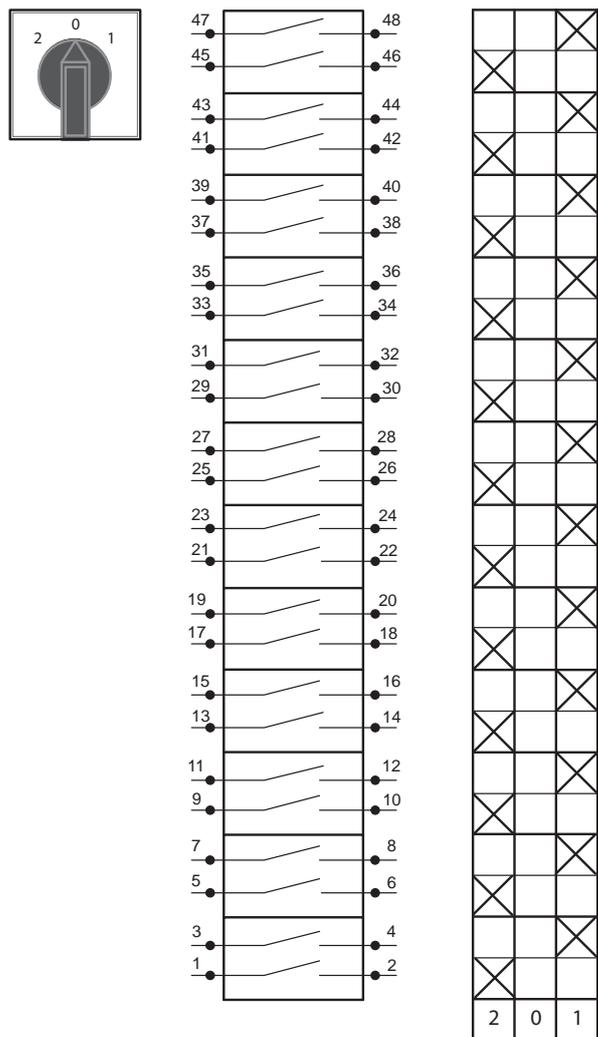


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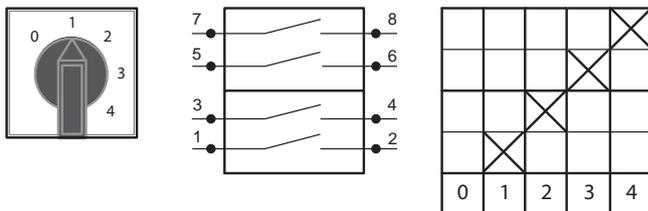


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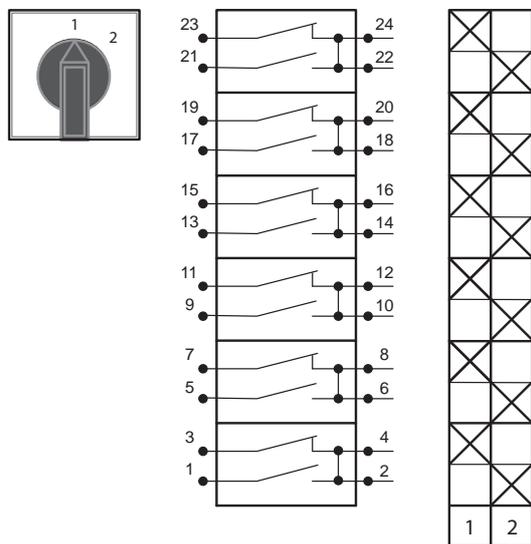


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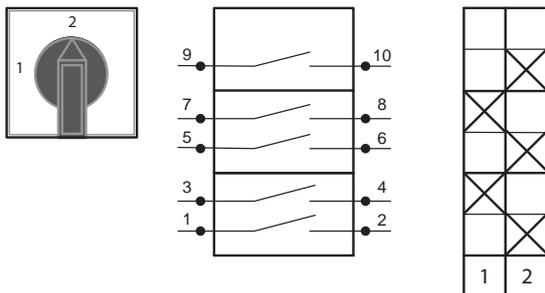


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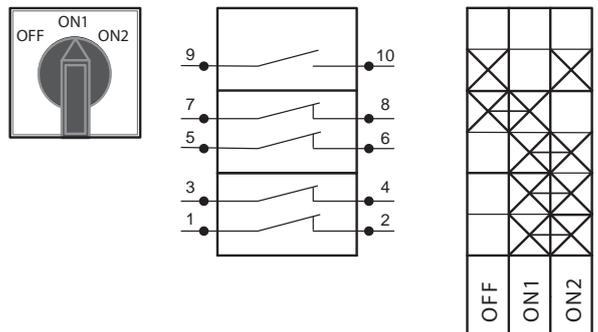


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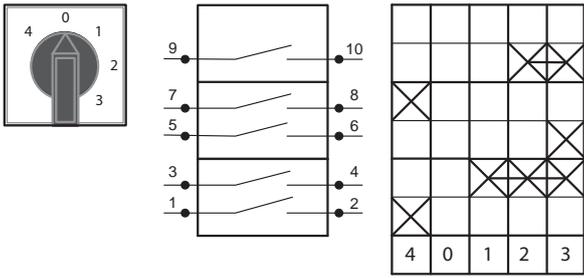


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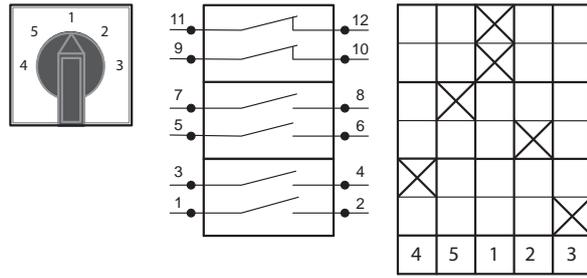


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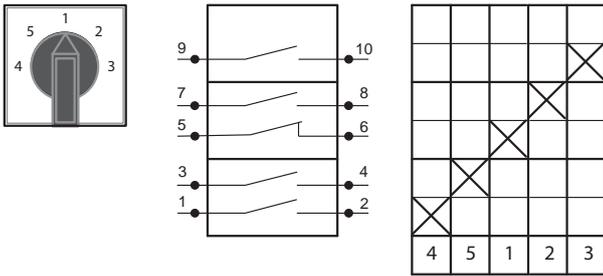


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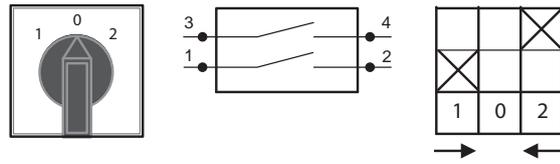


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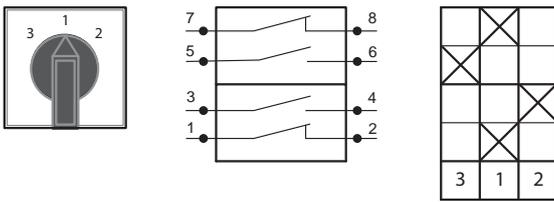


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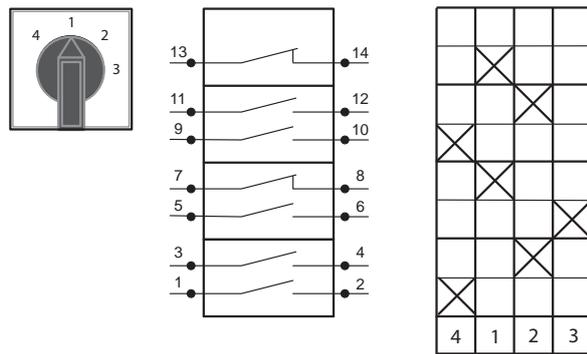


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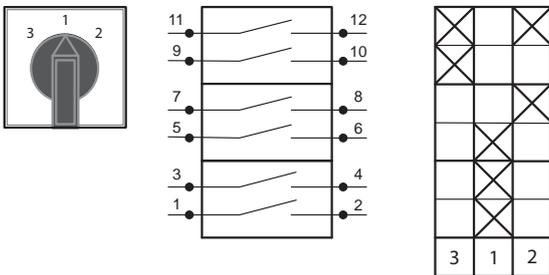


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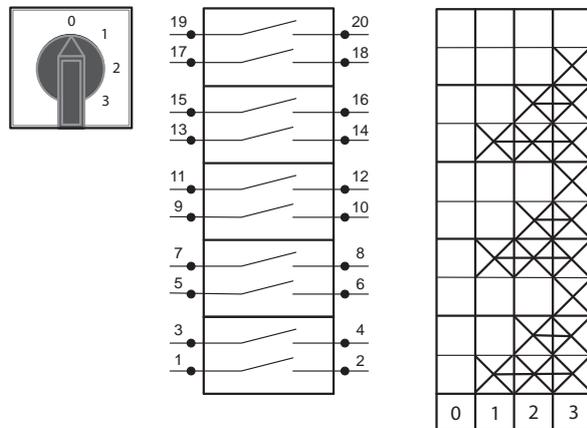


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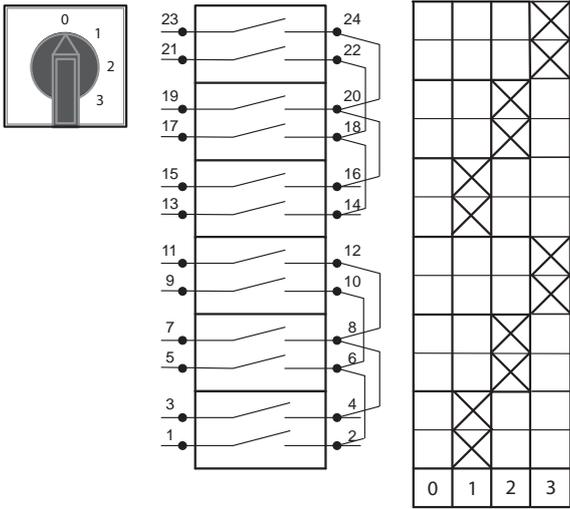


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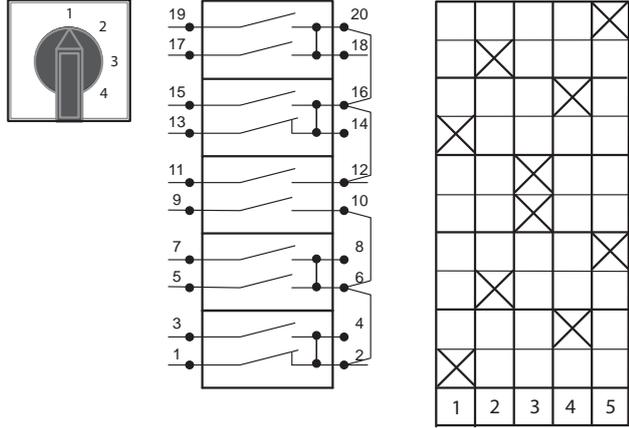


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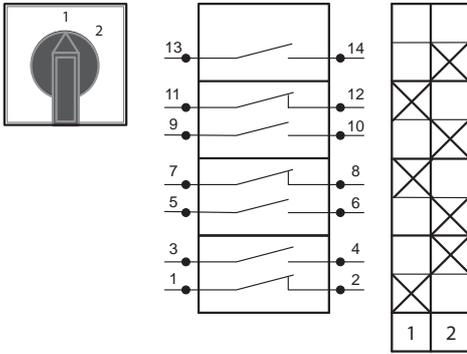


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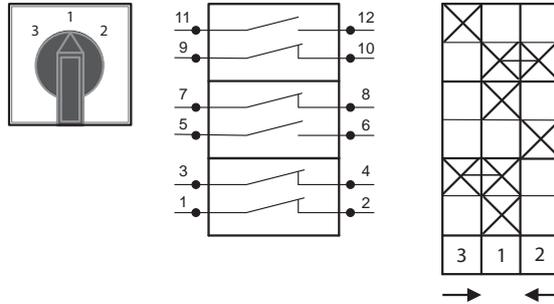


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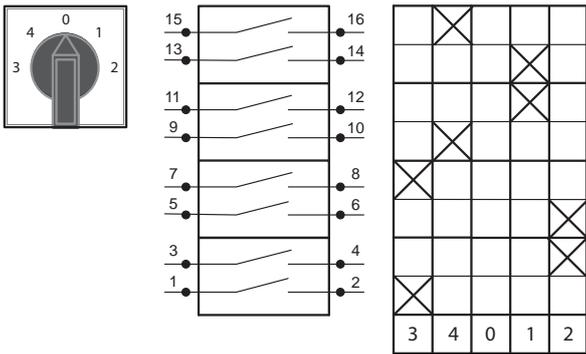


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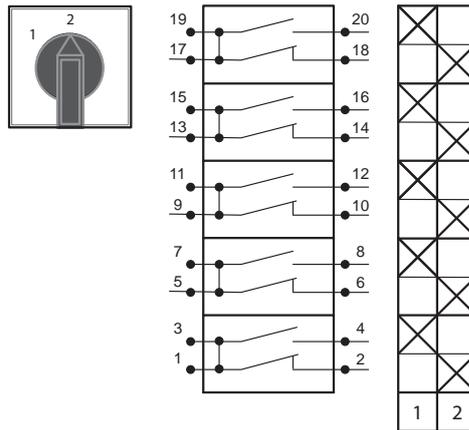


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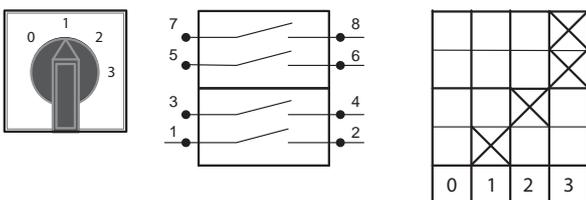


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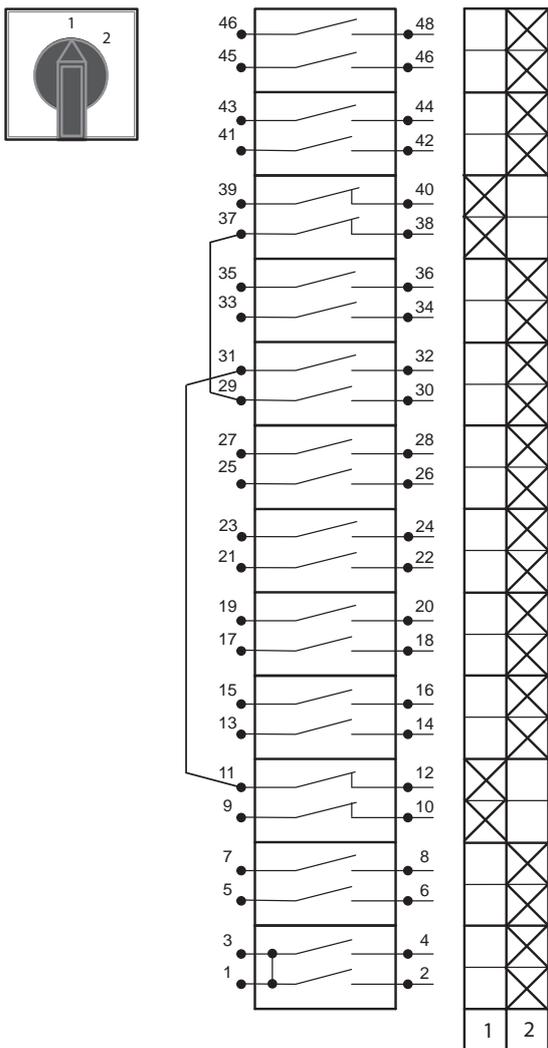


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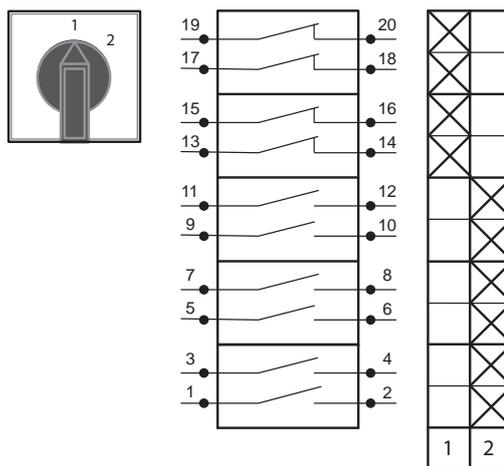


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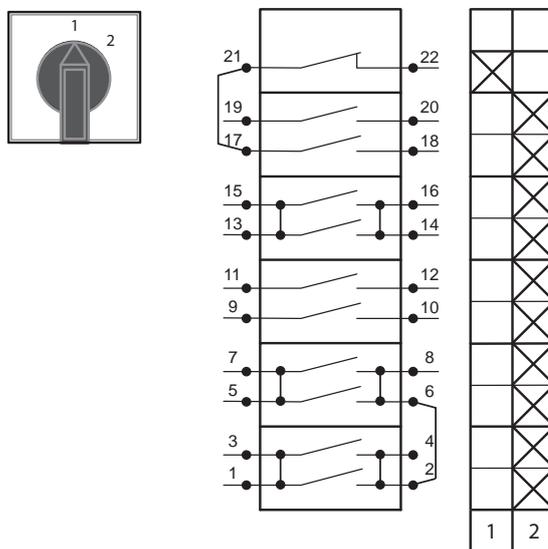


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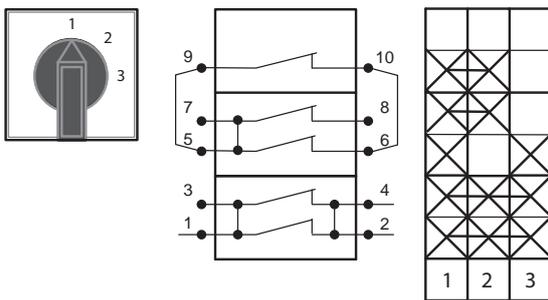


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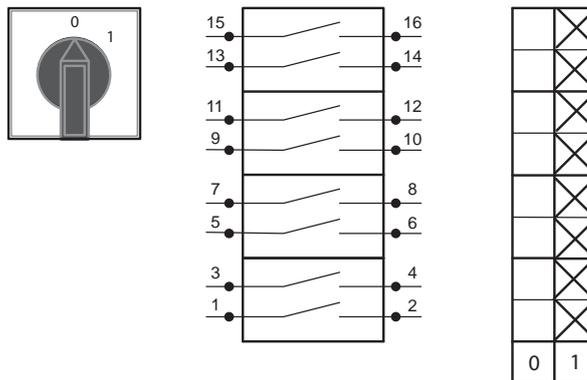


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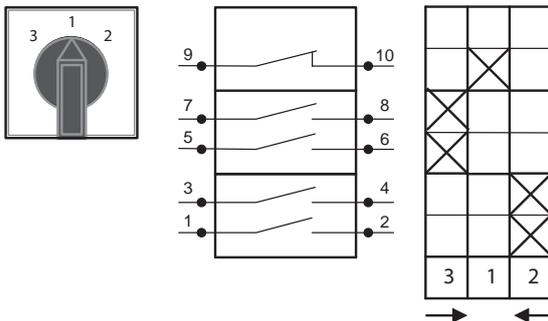


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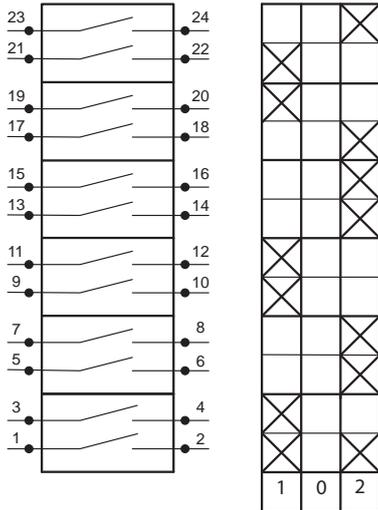
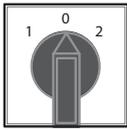


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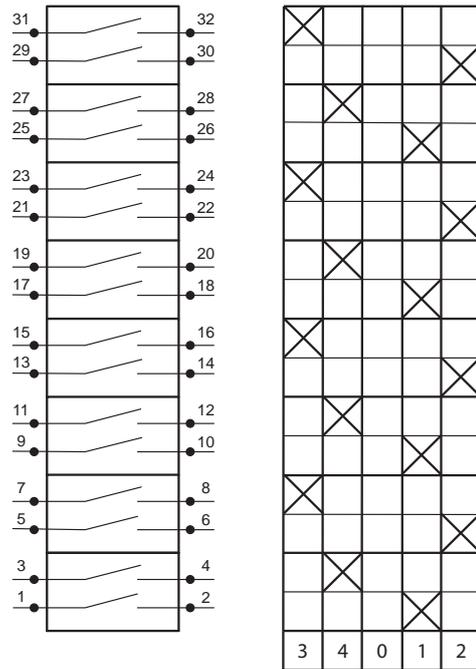
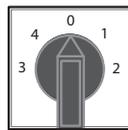


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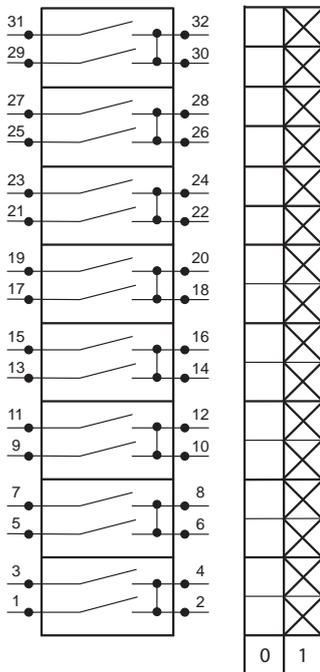
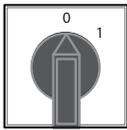


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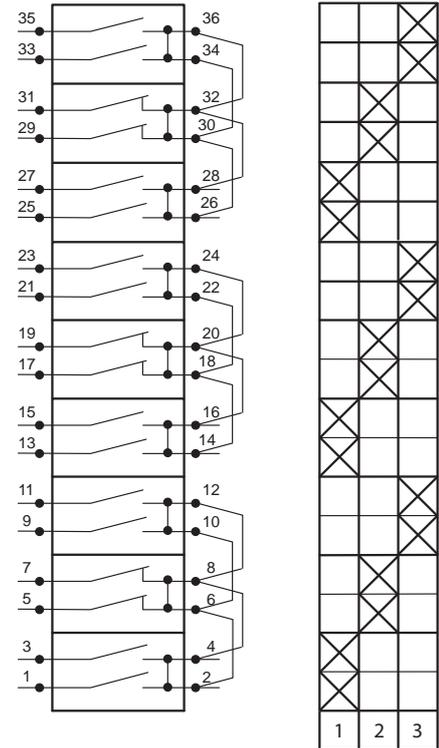
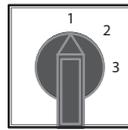


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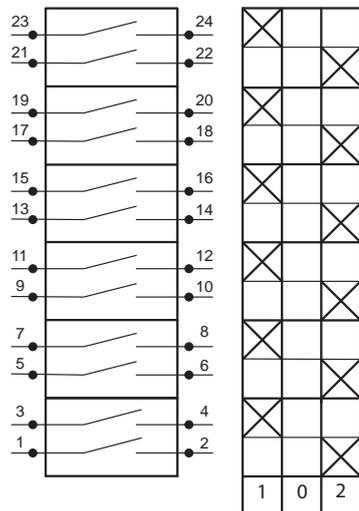
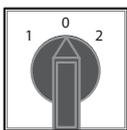


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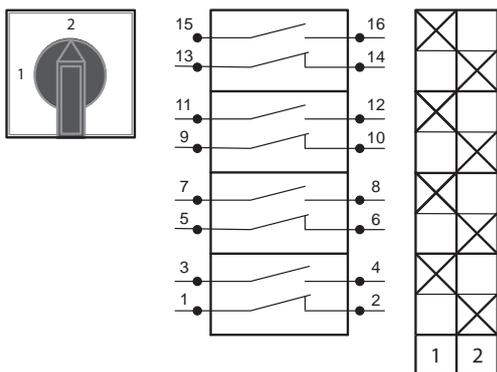


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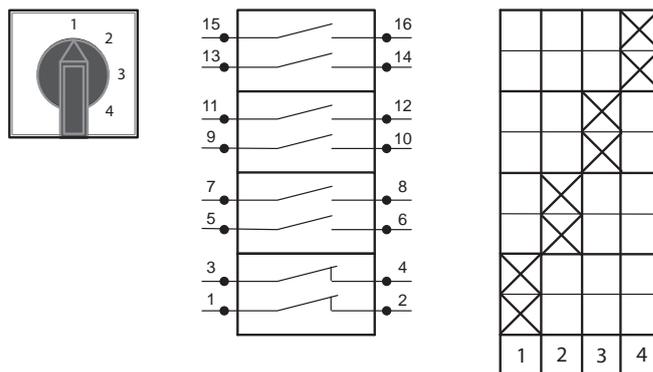


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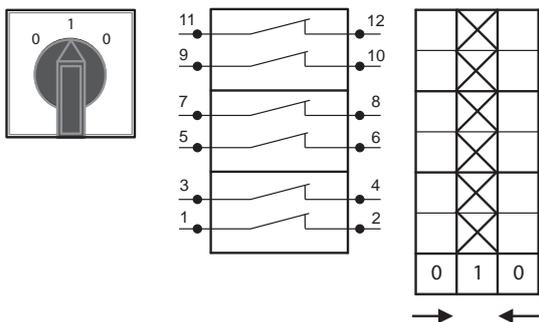


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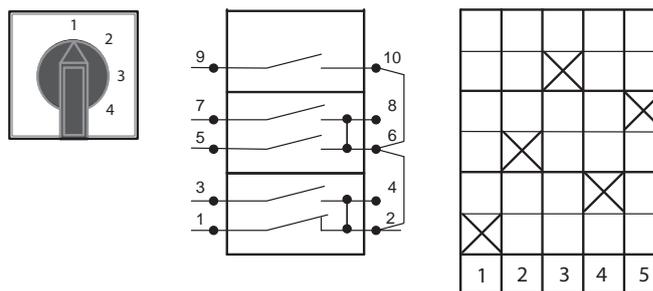


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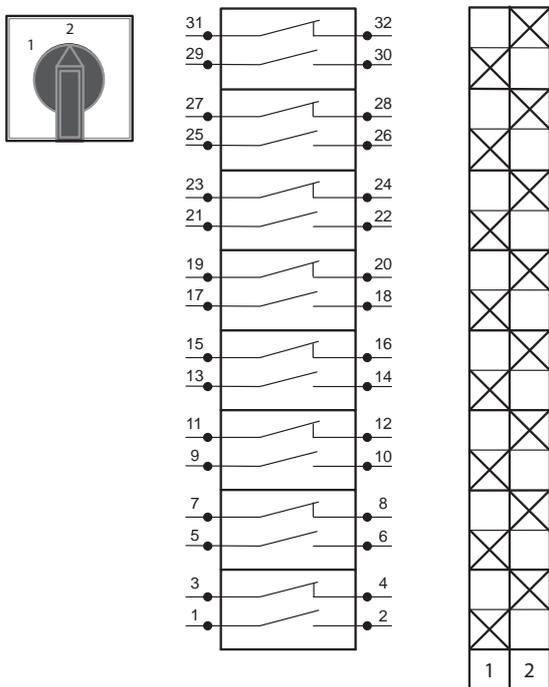


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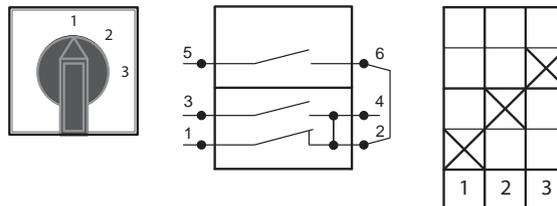


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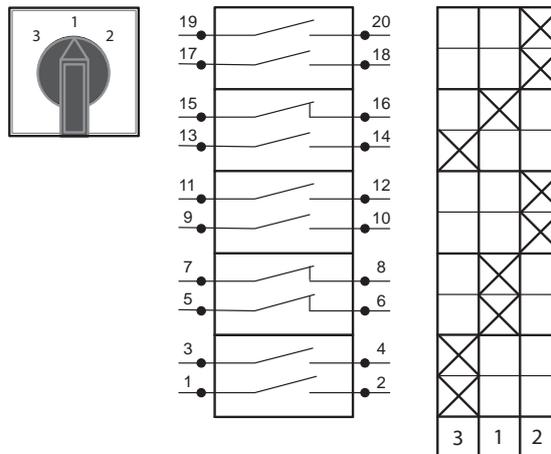


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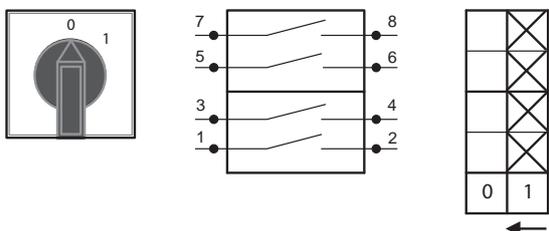


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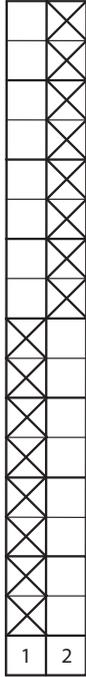
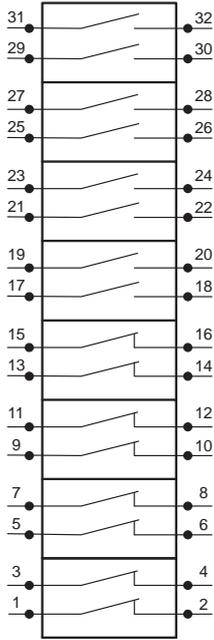
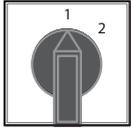


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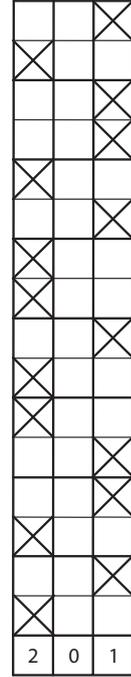
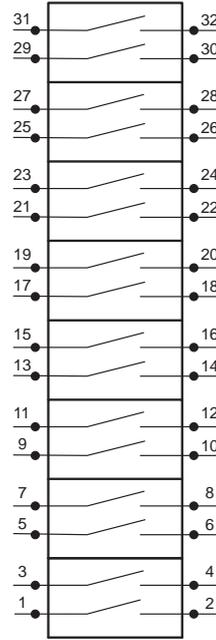
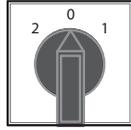


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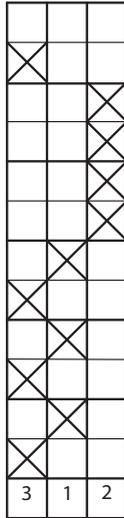
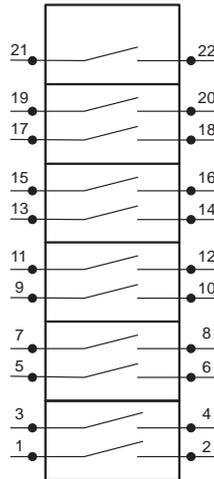
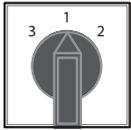


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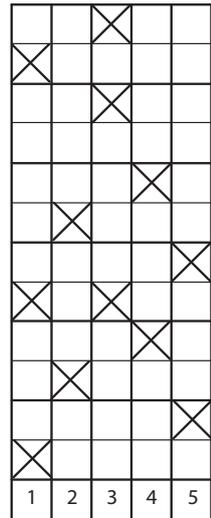
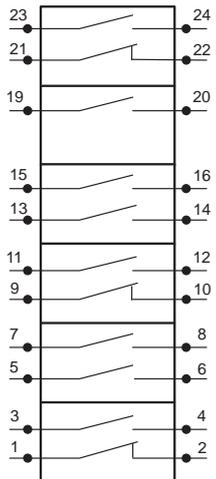
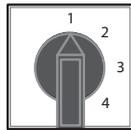


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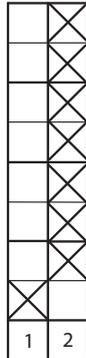
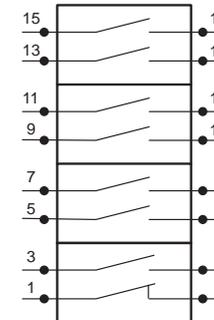
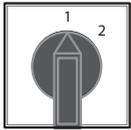


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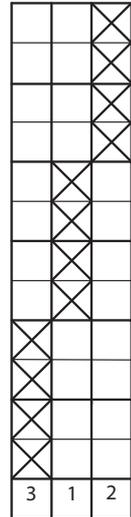
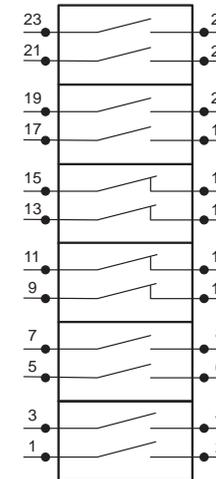
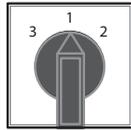


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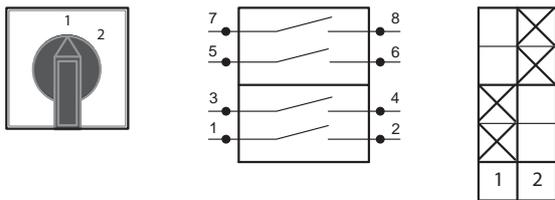


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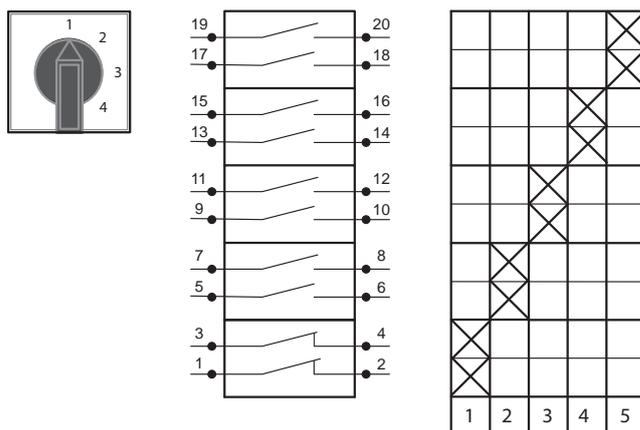


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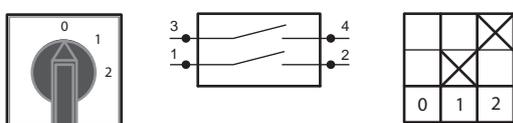


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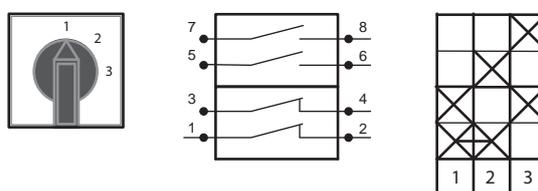


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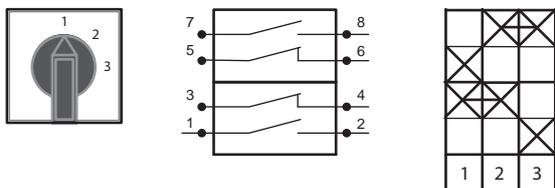


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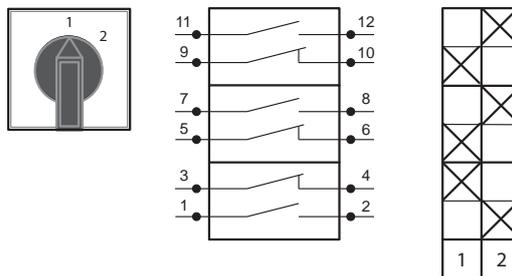


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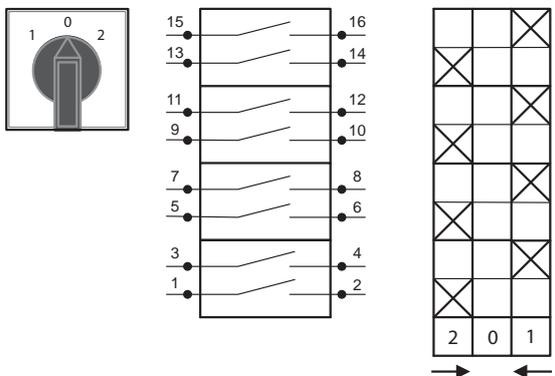


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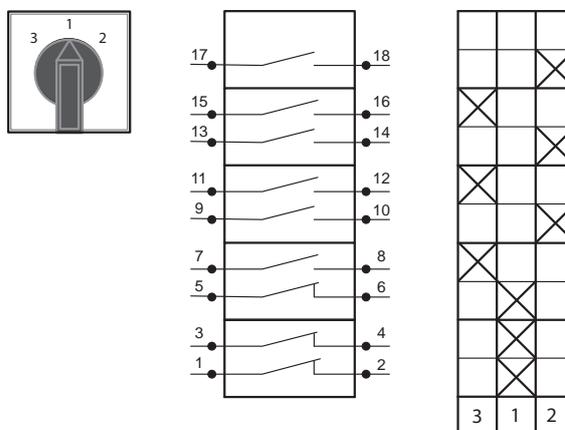


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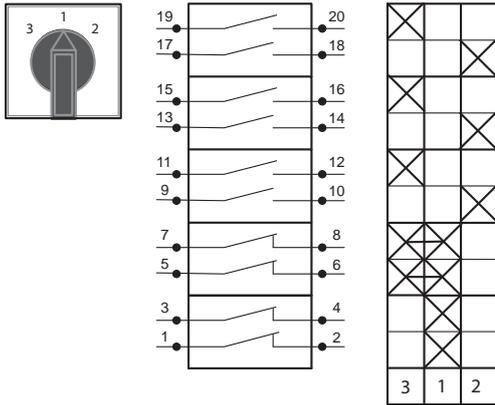


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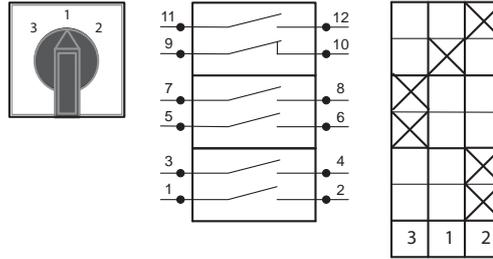


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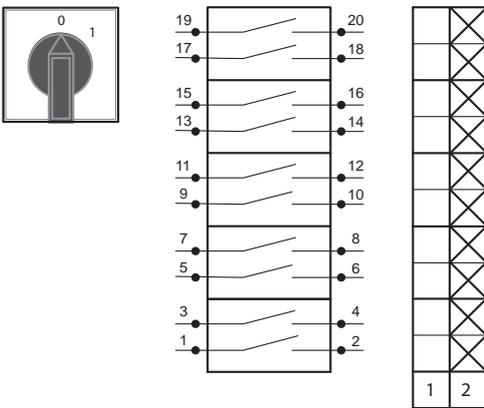


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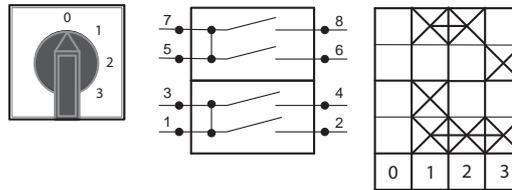


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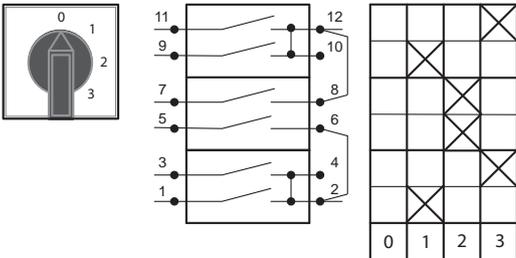


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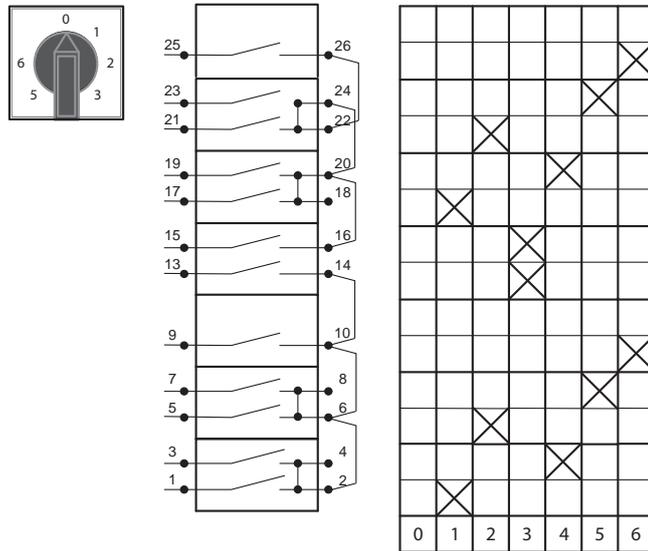


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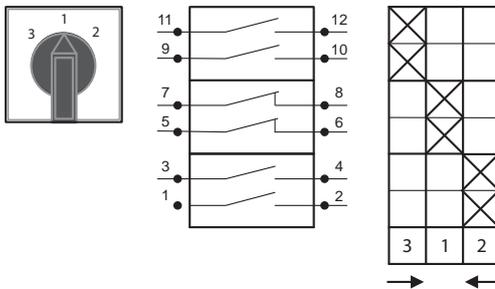


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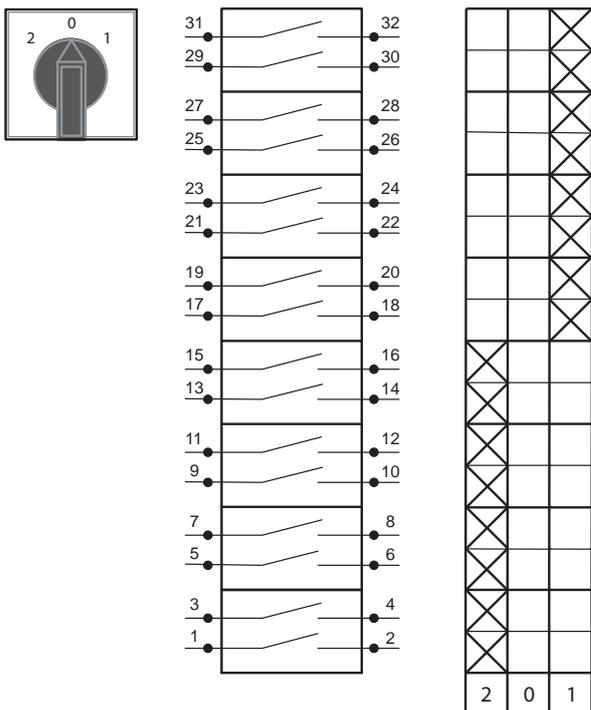


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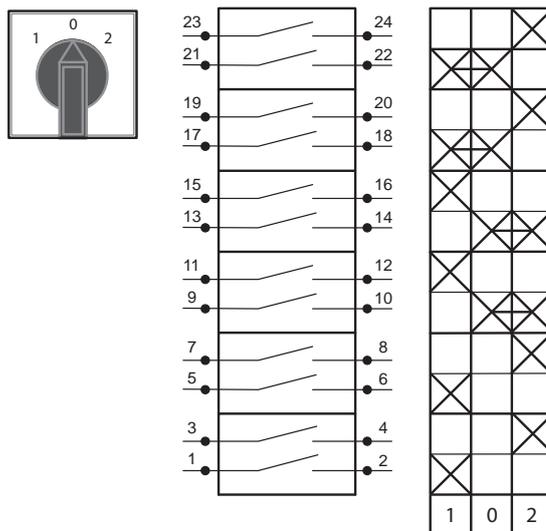


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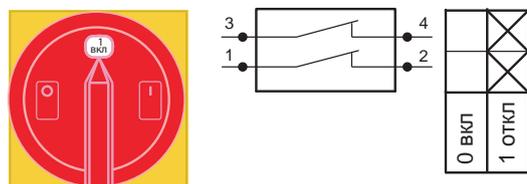


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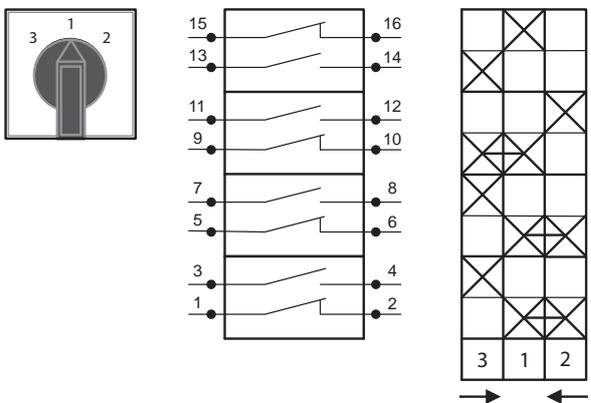


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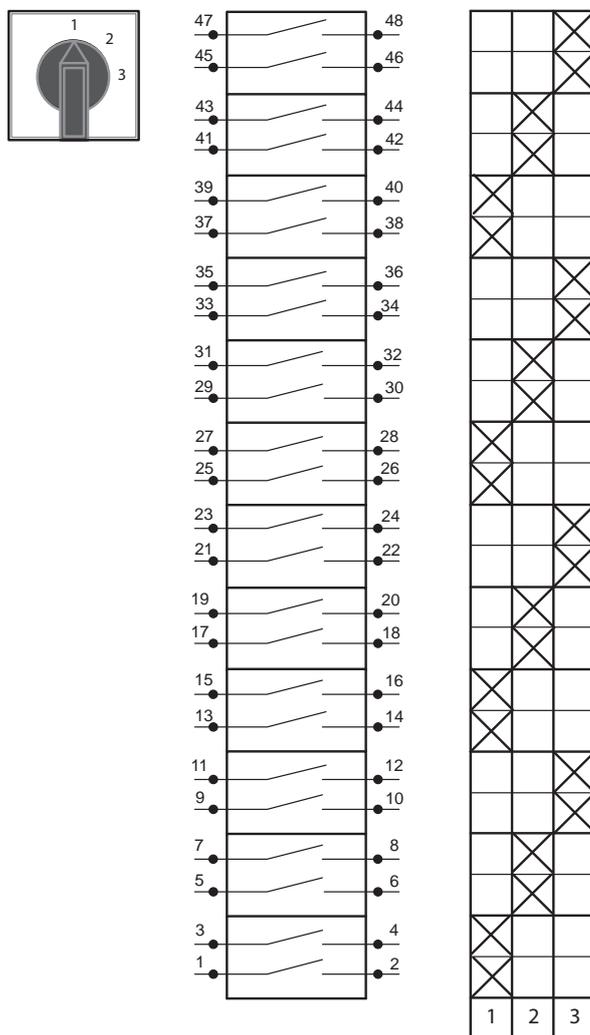


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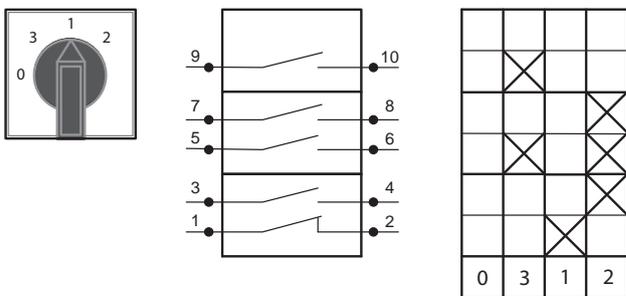


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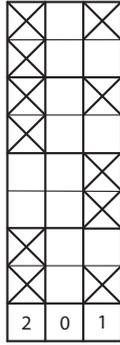
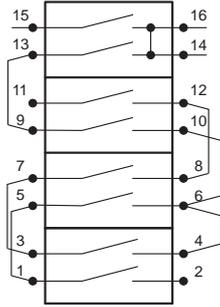
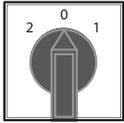


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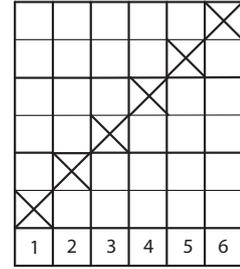
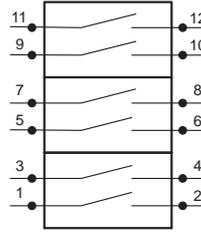
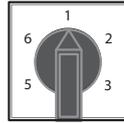


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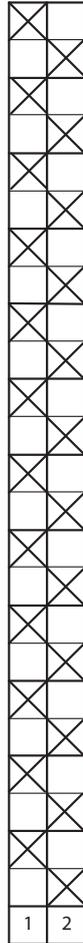
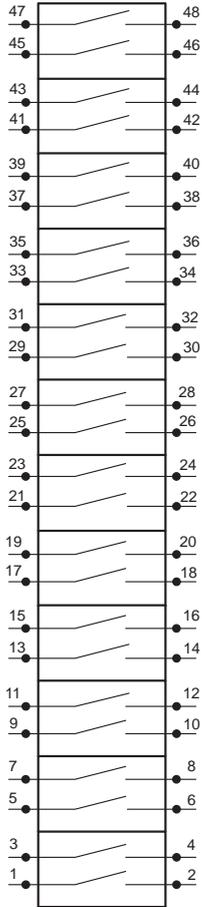
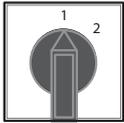


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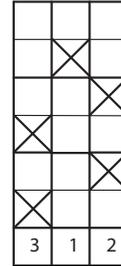
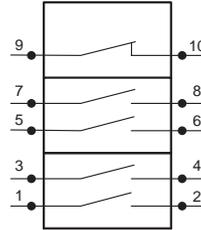
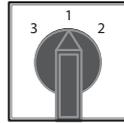


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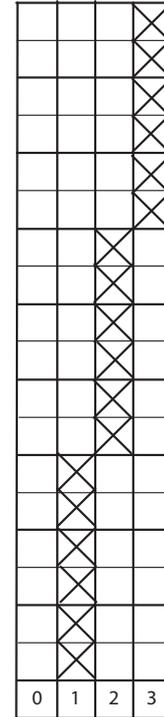
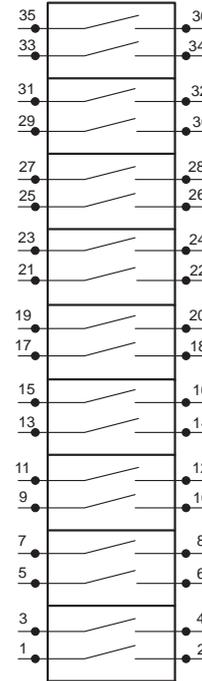
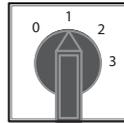


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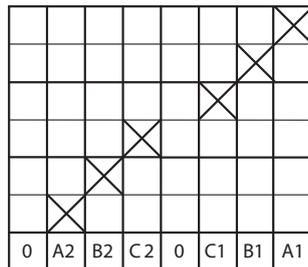
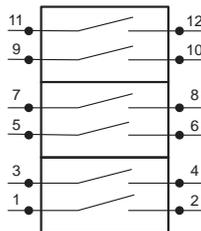
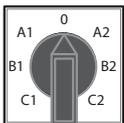


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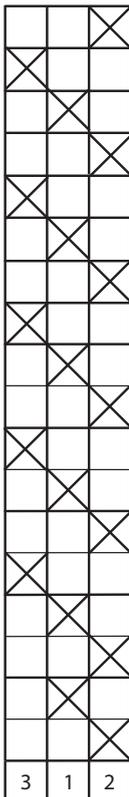
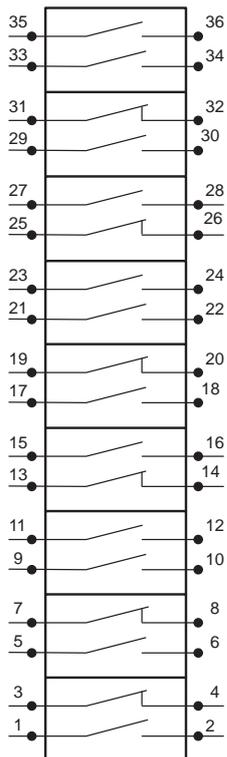
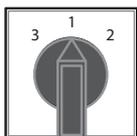


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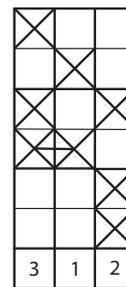
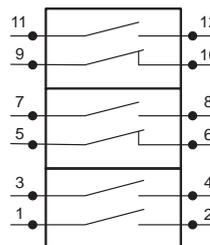
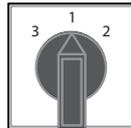


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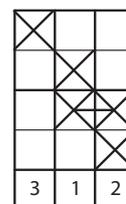
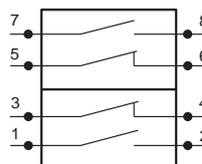
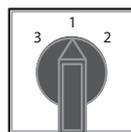


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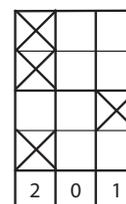
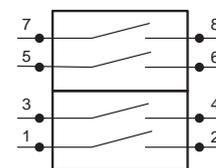
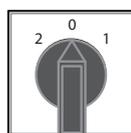


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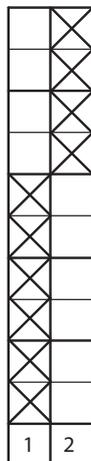
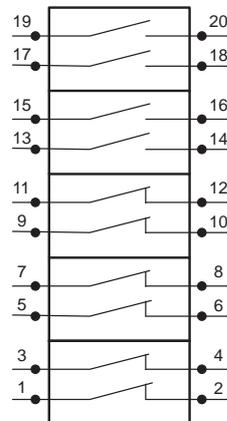
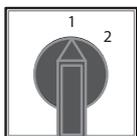


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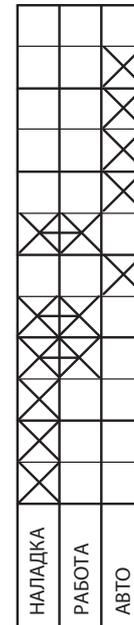
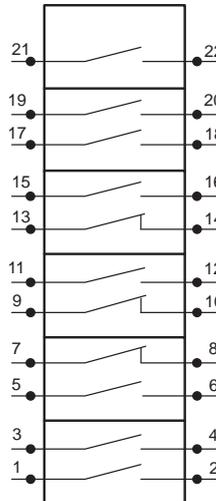
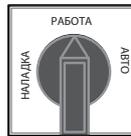


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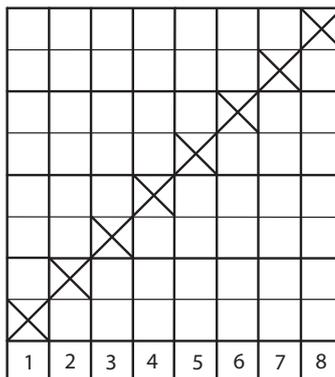
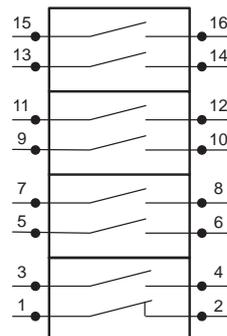
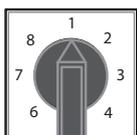


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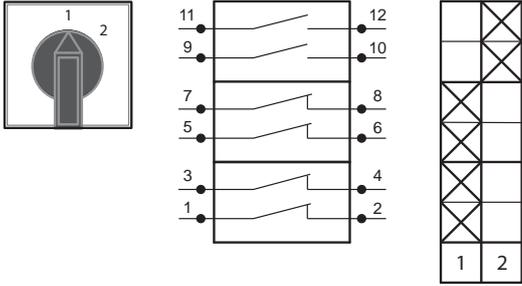


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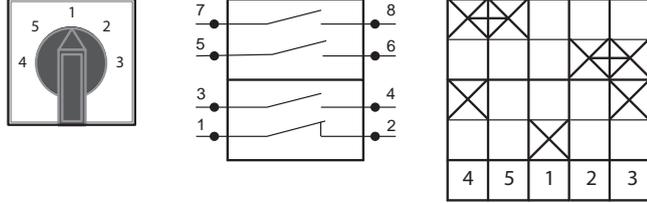


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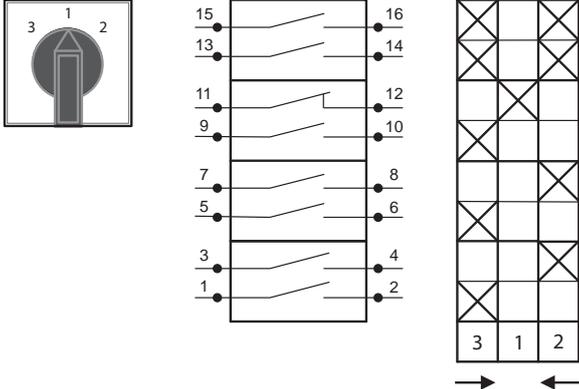


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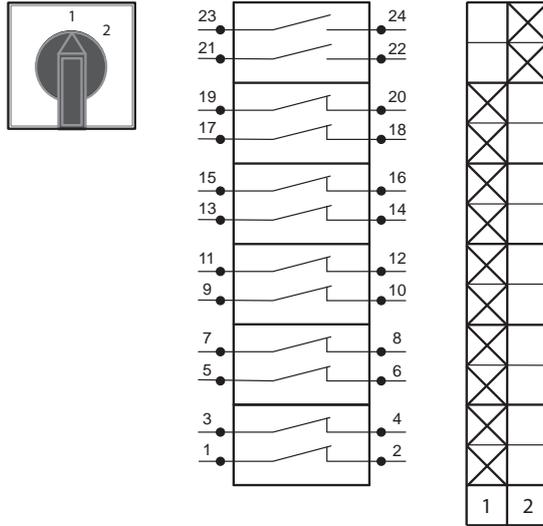


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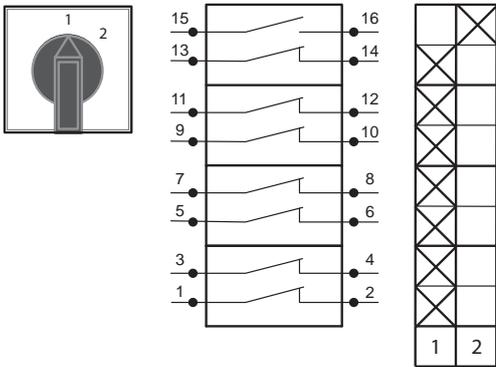


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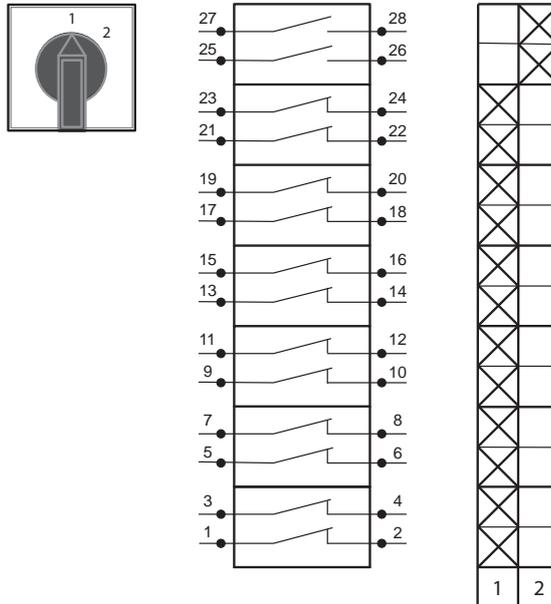


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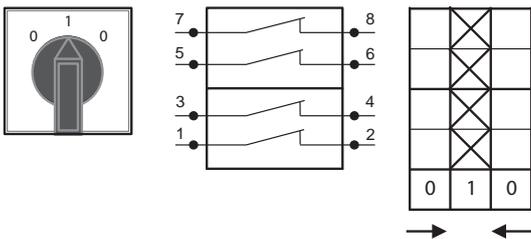


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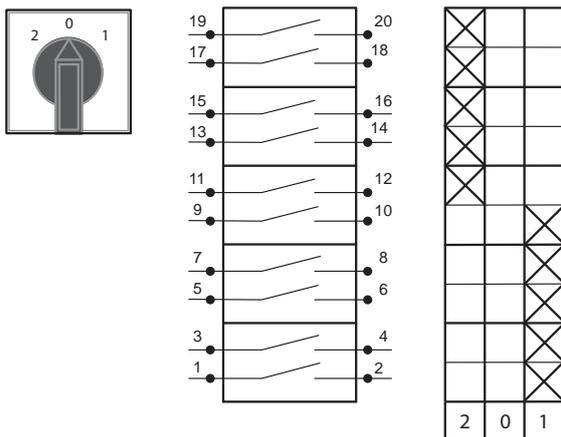


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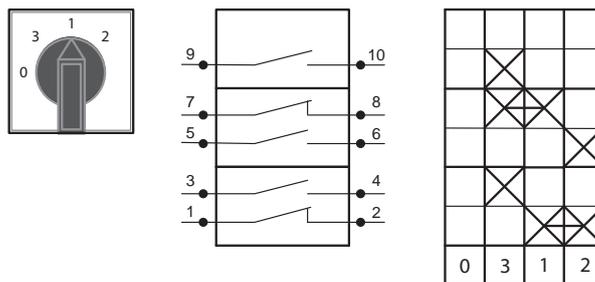


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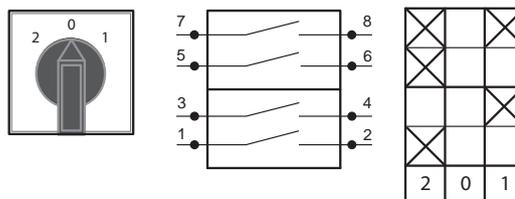


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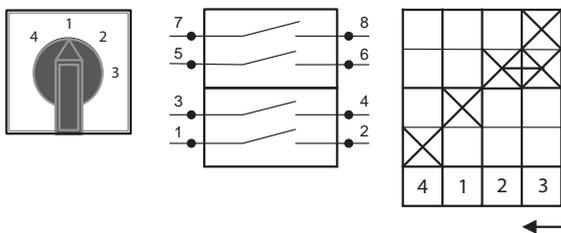


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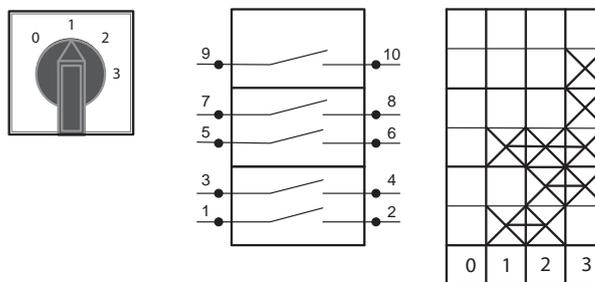


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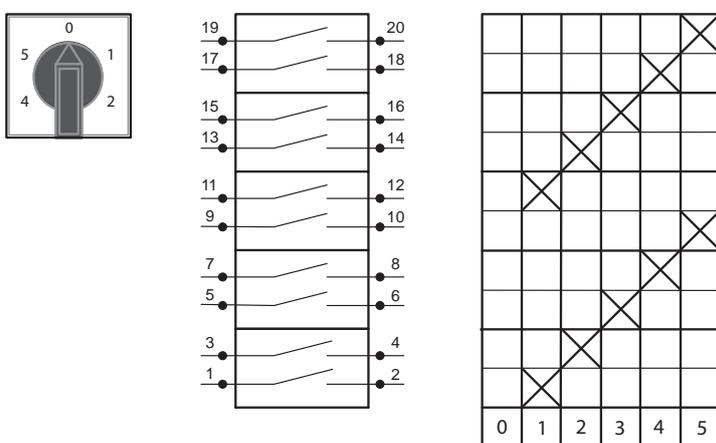


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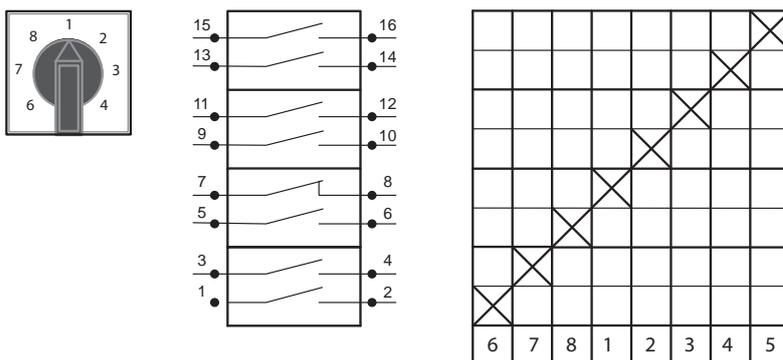


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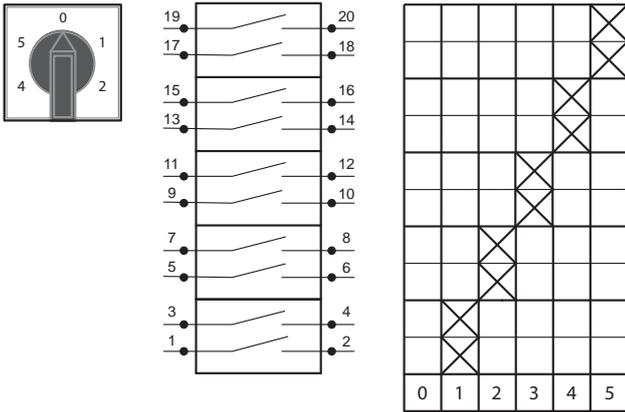


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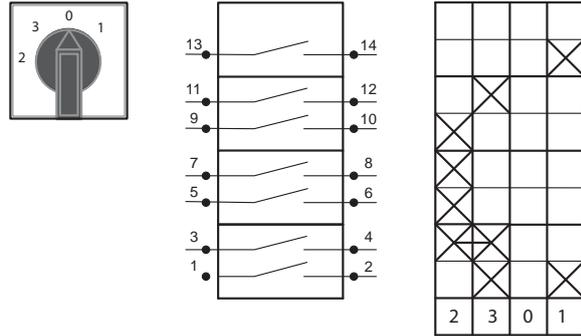


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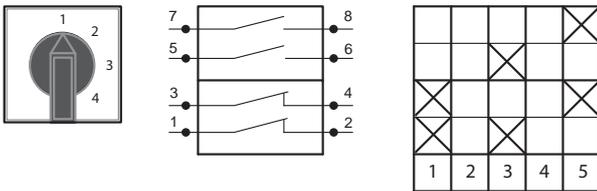


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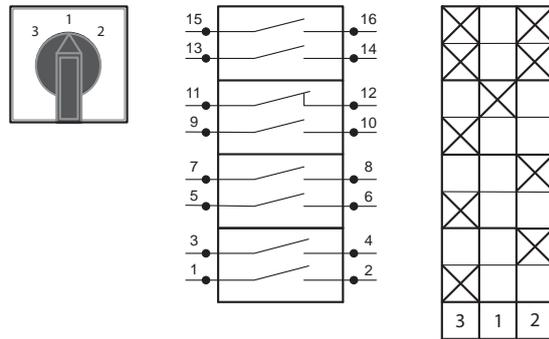


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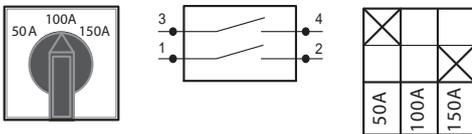


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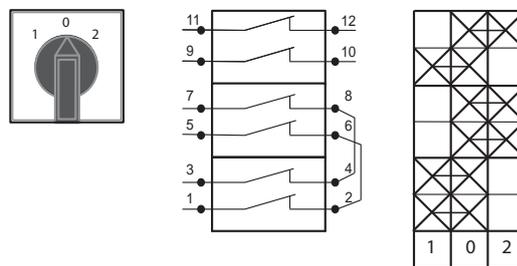


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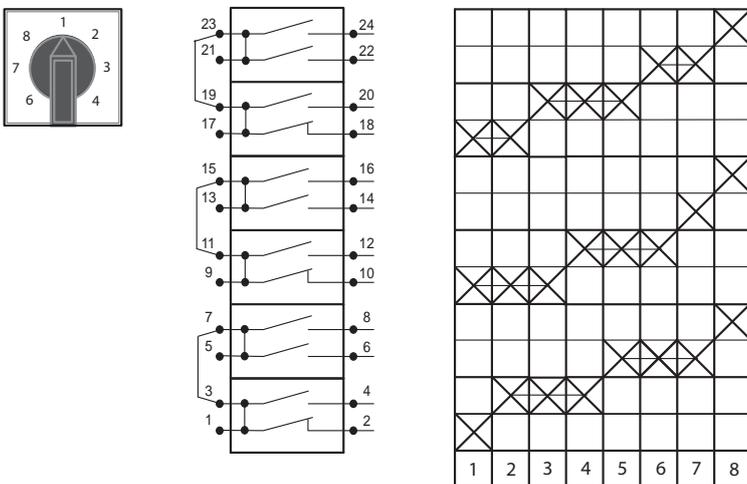


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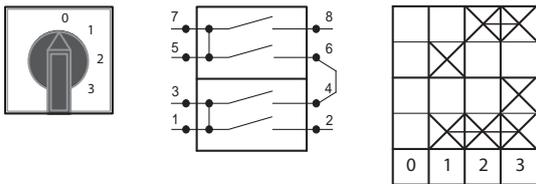


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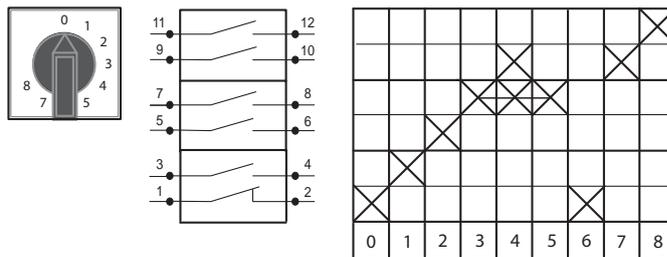


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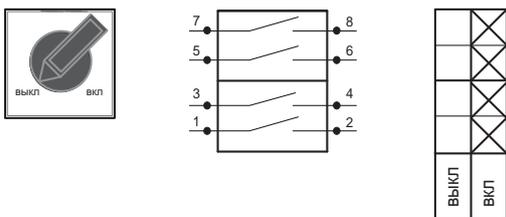


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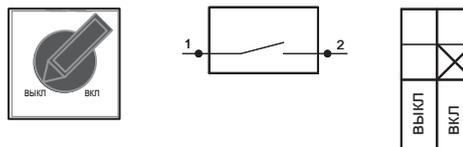


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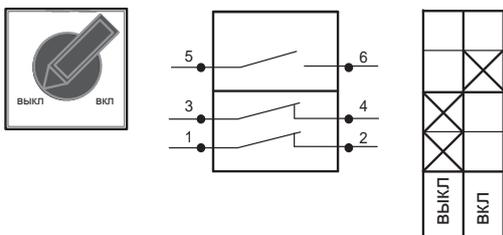


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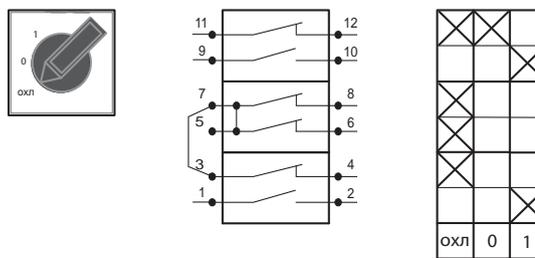


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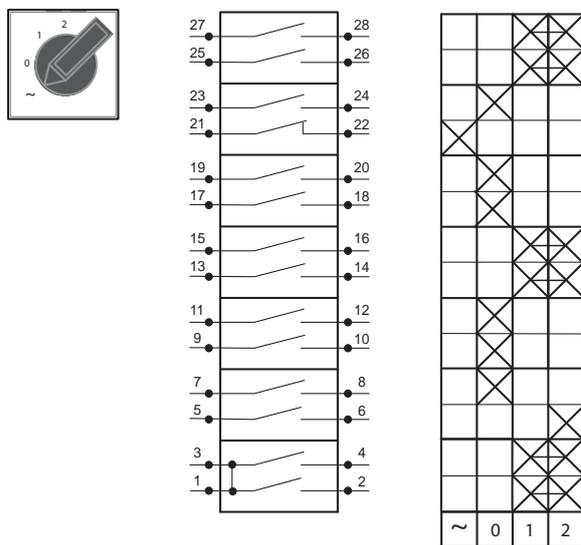


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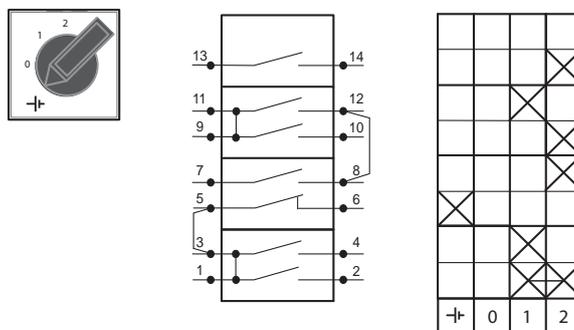


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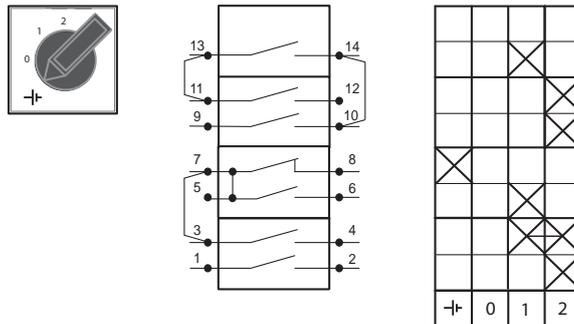


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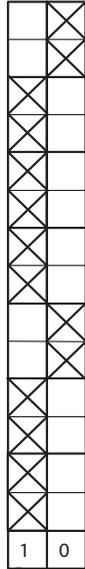
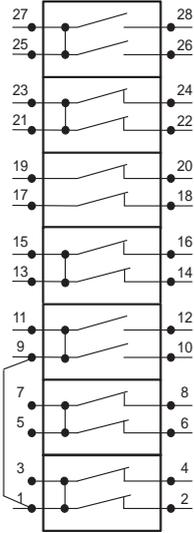
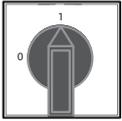


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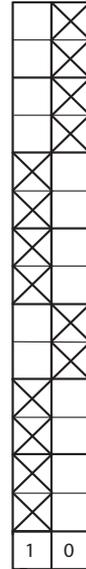
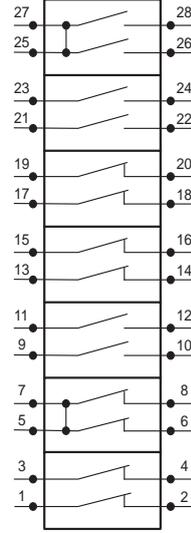
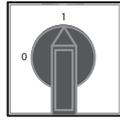


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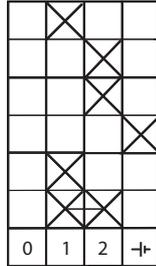
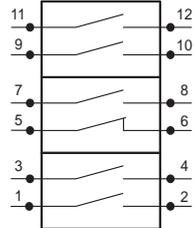
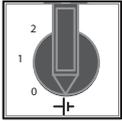


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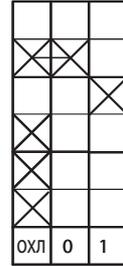
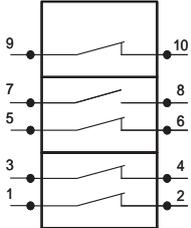
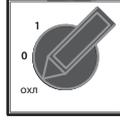


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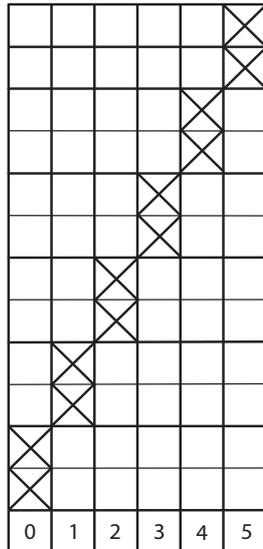
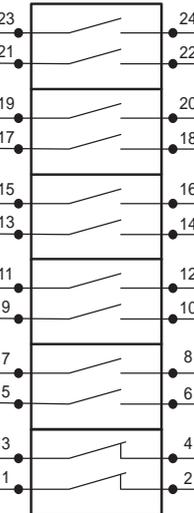
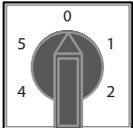


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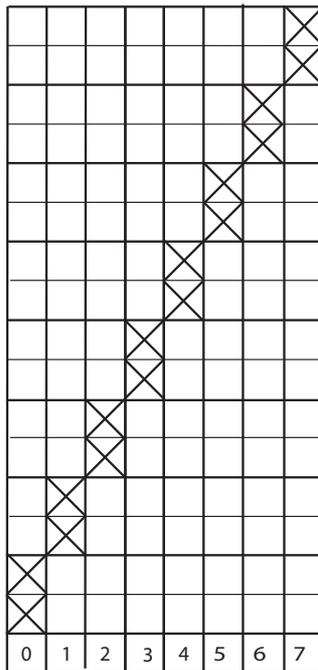
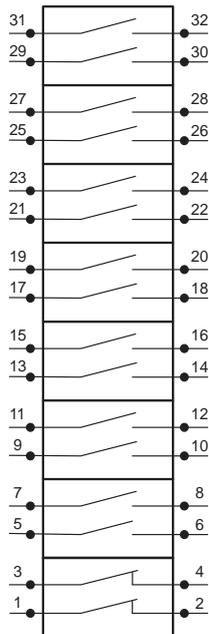
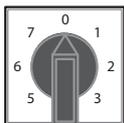


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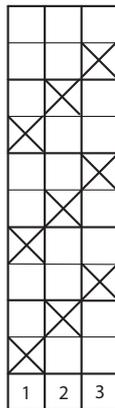
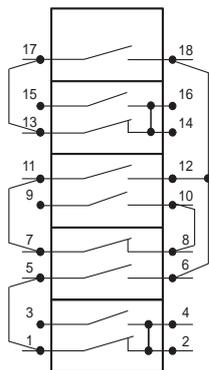
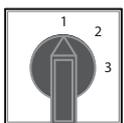


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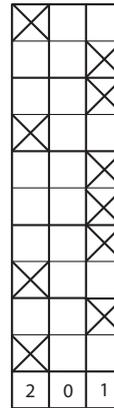
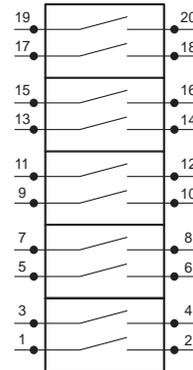
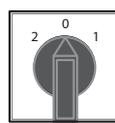


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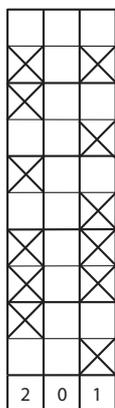
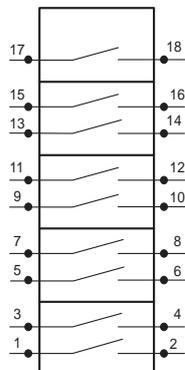


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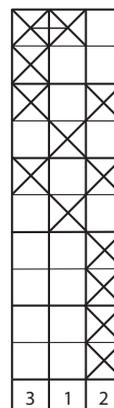
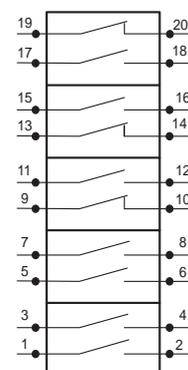
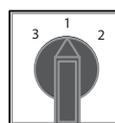


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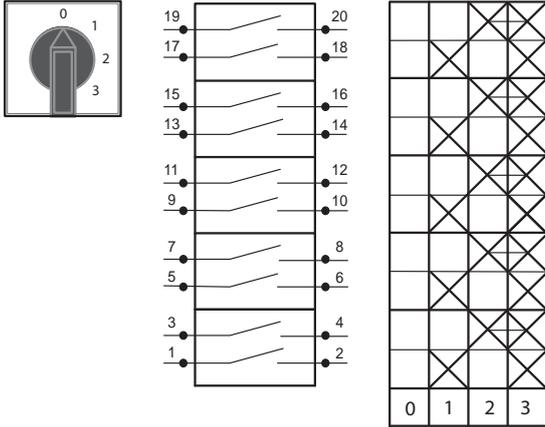


Схема 370

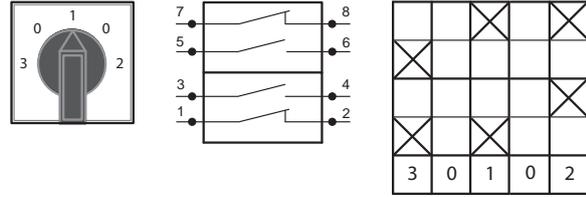


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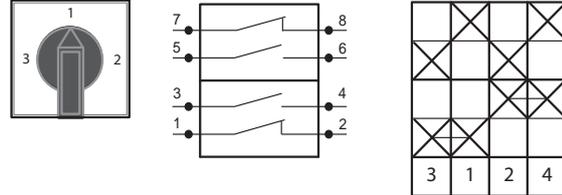


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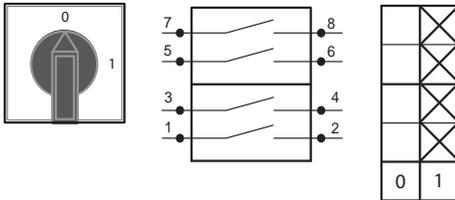


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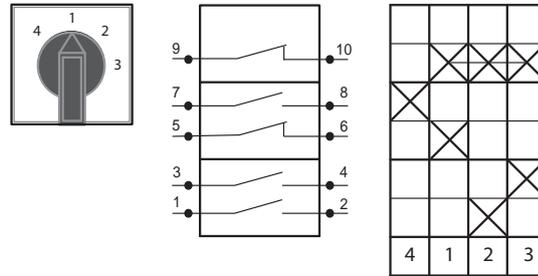


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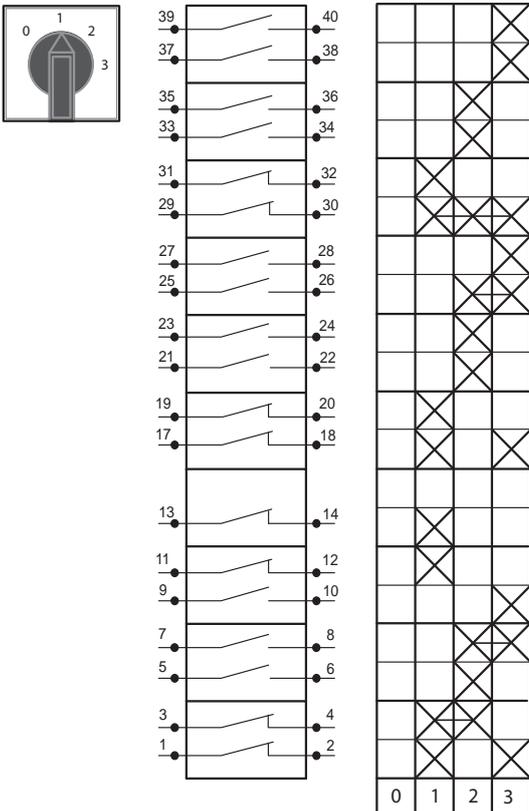


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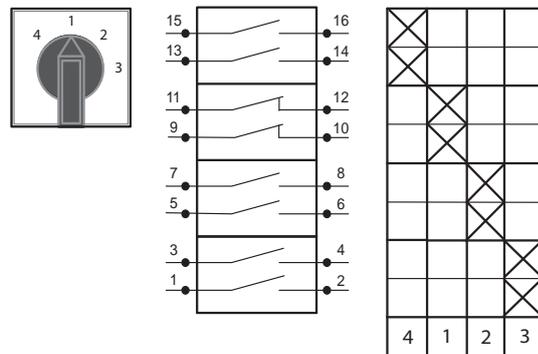


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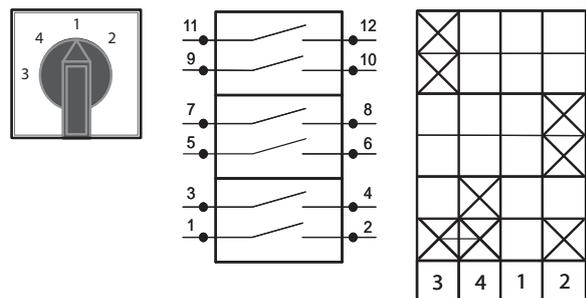


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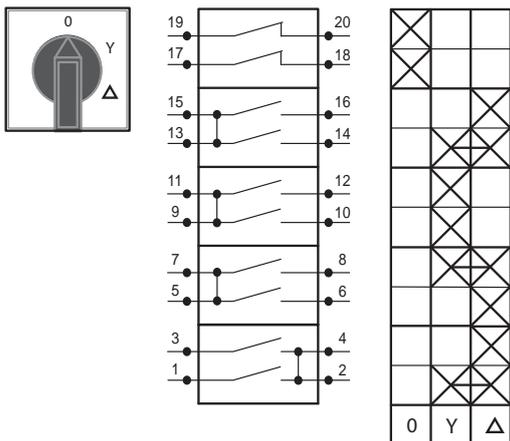


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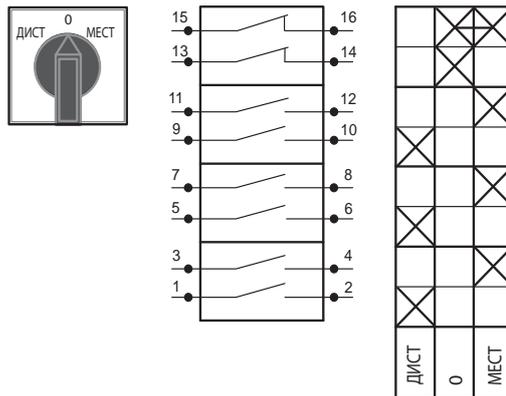


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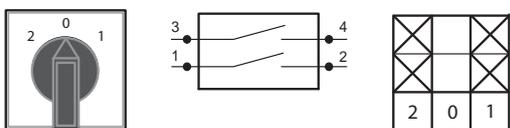


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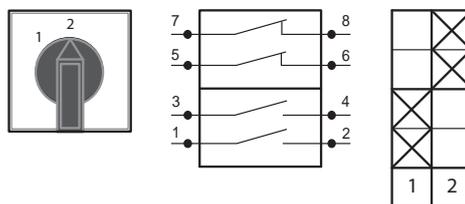


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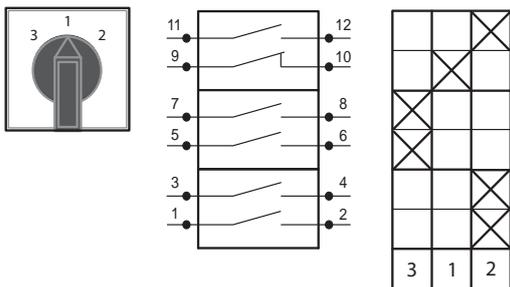


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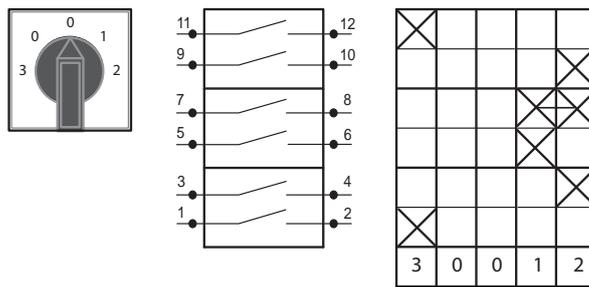


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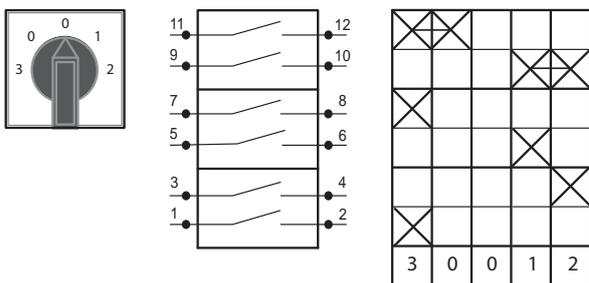


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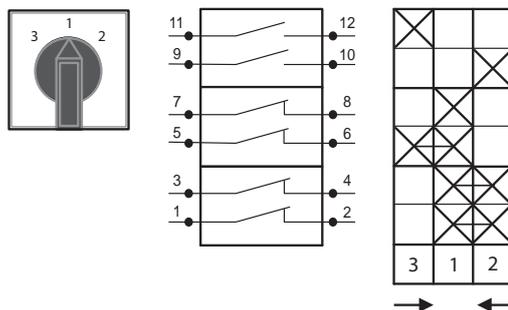


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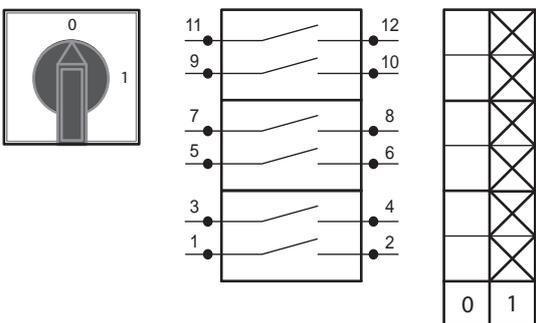


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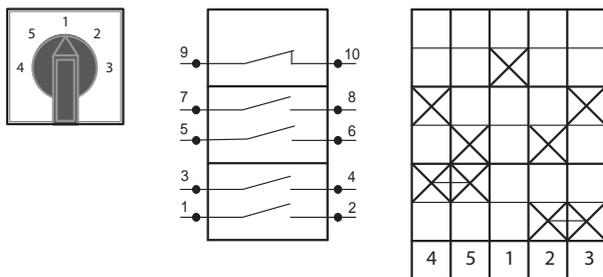


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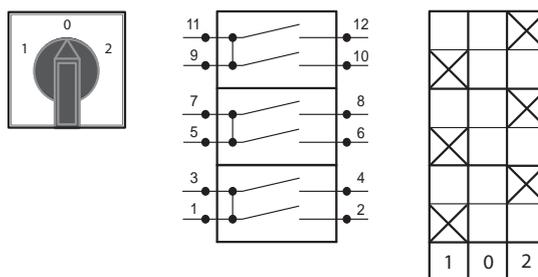


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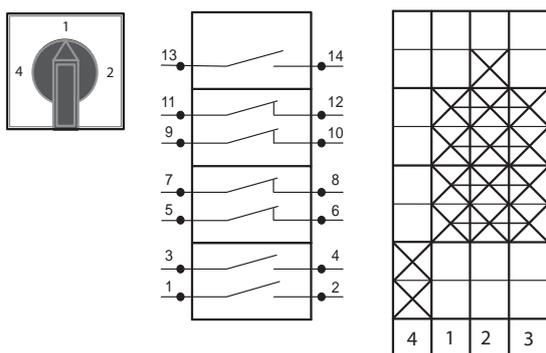


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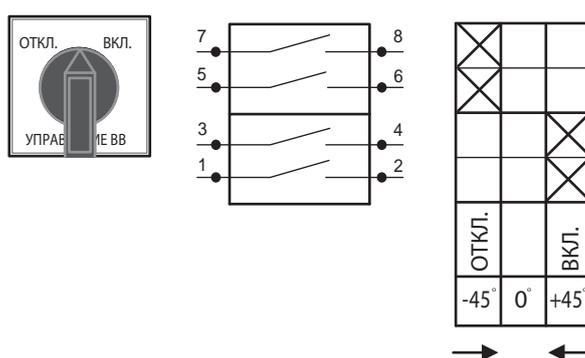


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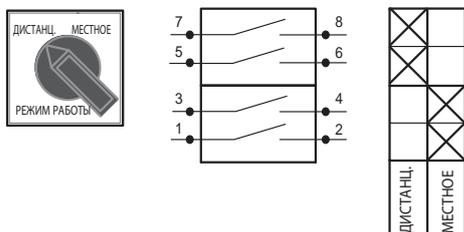


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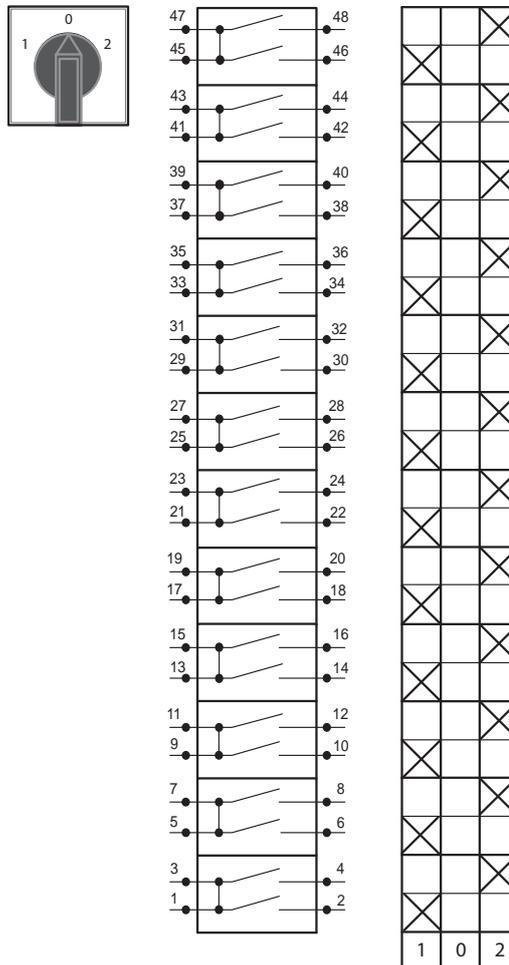


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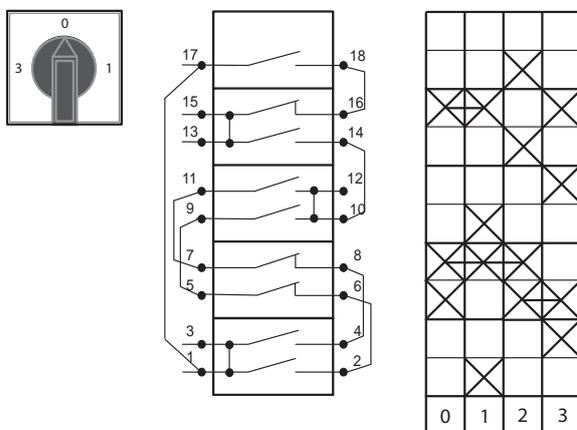


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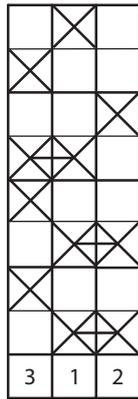
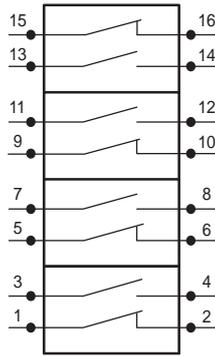
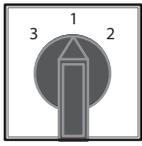


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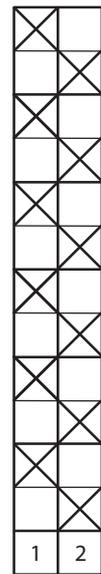
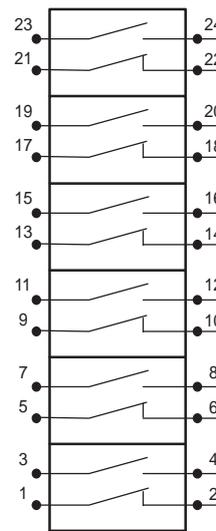
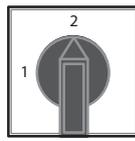


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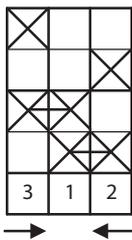
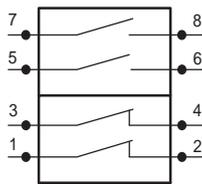
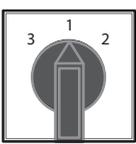


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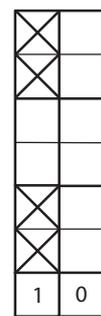
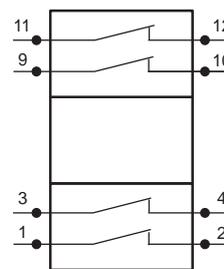
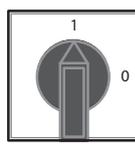


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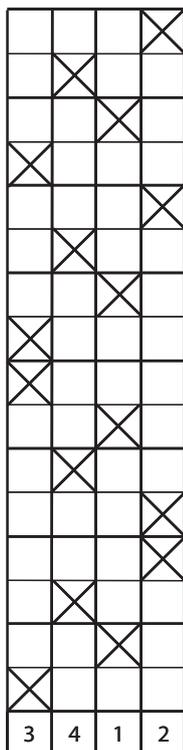
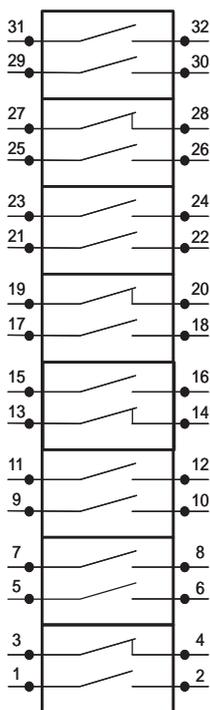
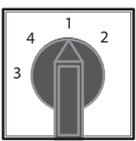


Схема 400

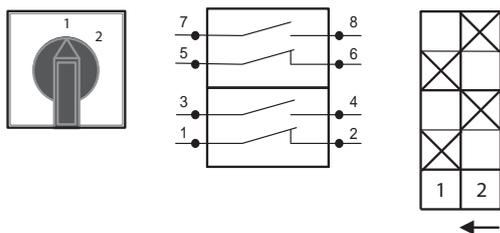


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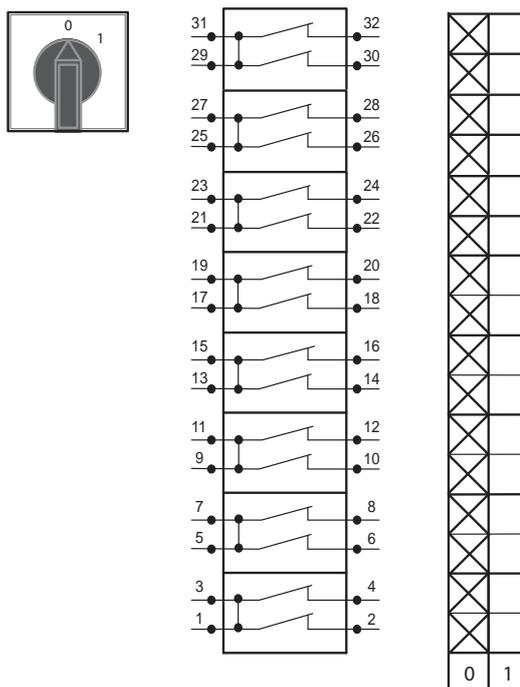


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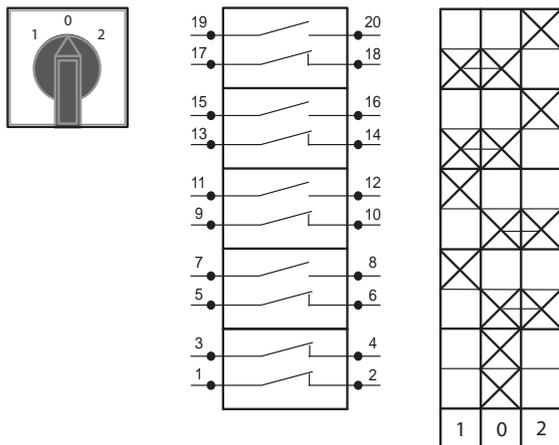


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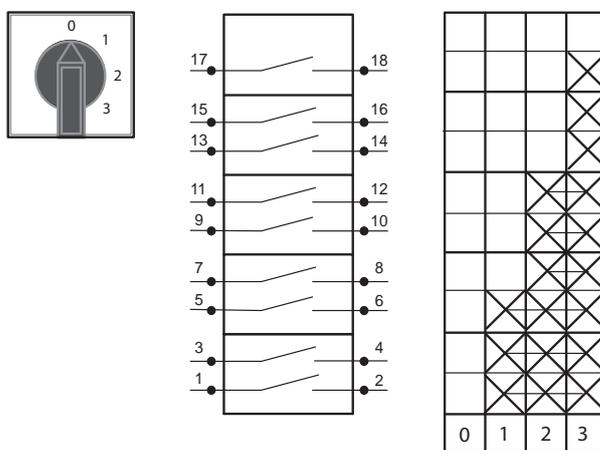


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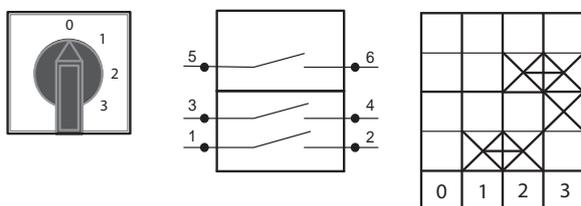


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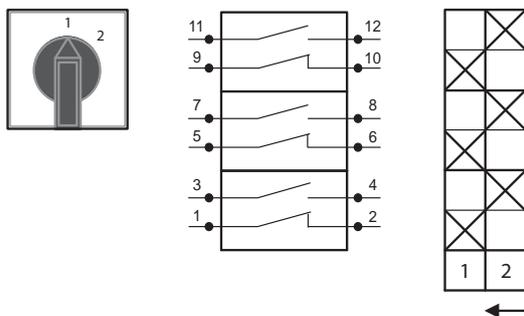


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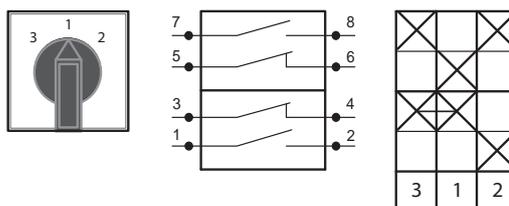


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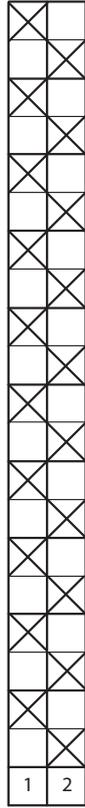
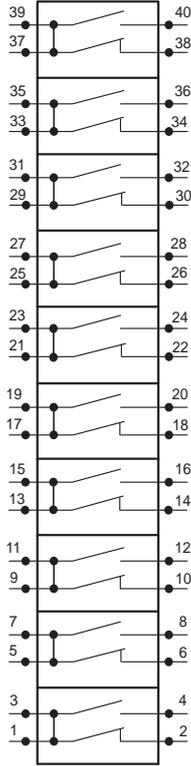
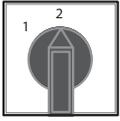


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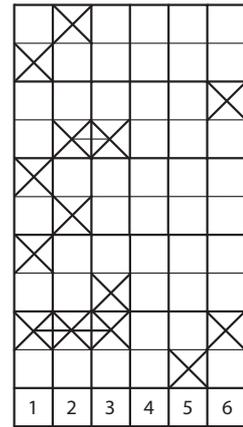
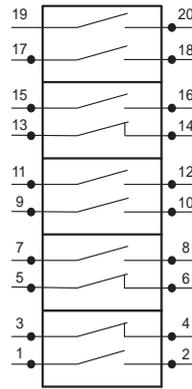
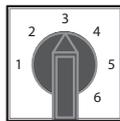


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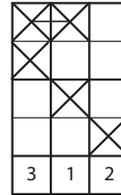
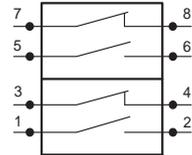
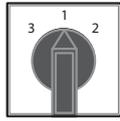


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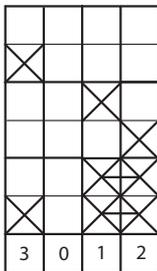
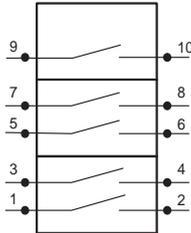
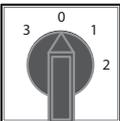


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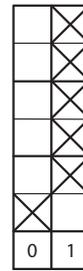
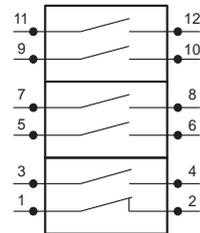
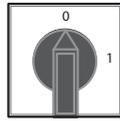


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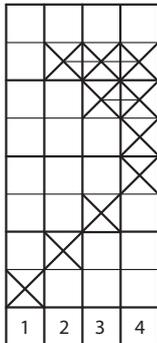
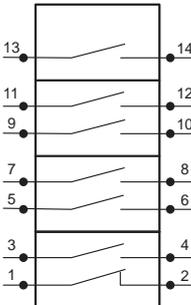
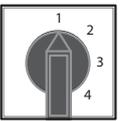


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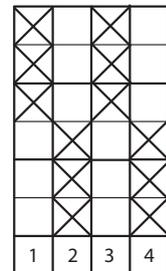
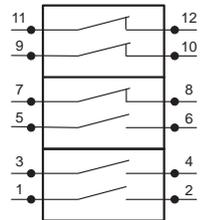
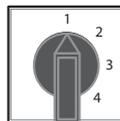


Схема 420

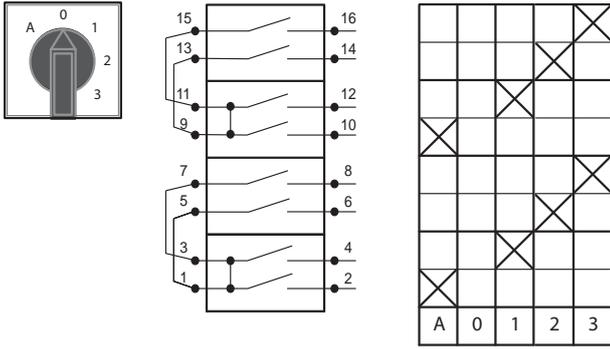


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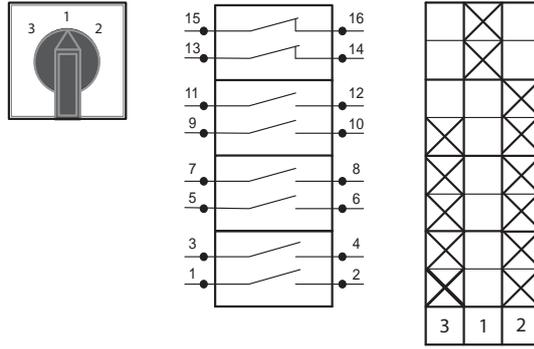


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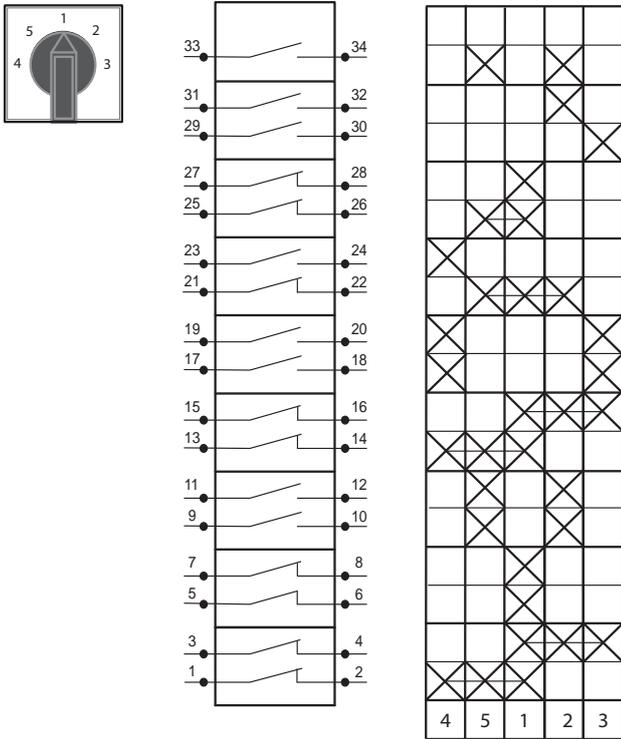


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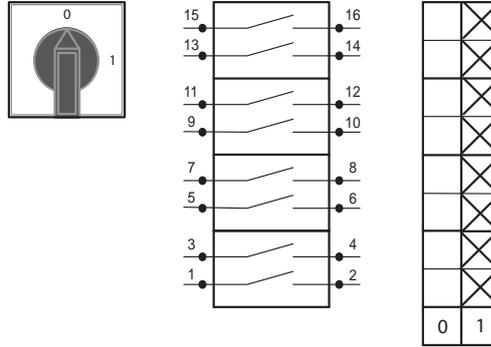


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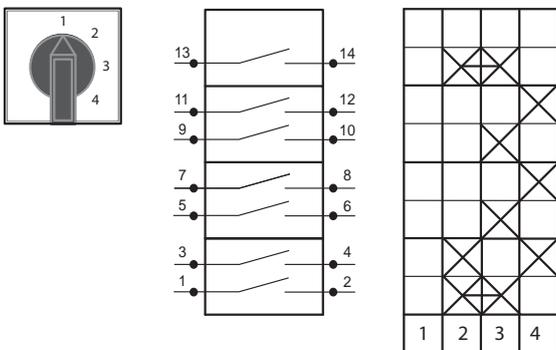


Схема 425

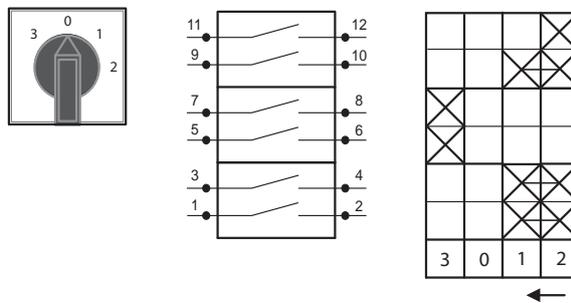


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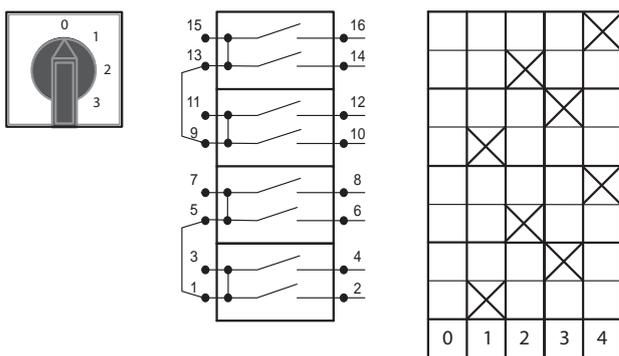


Схема 427

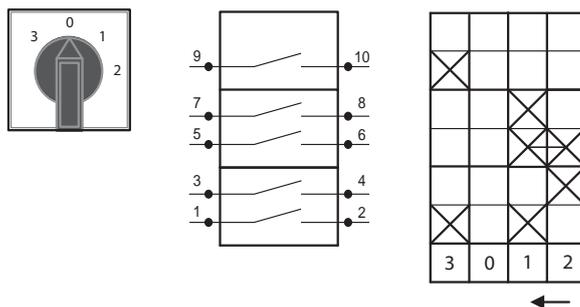


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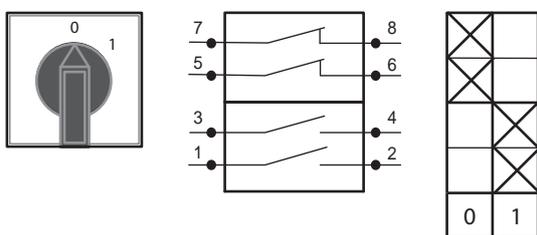


Схема 429

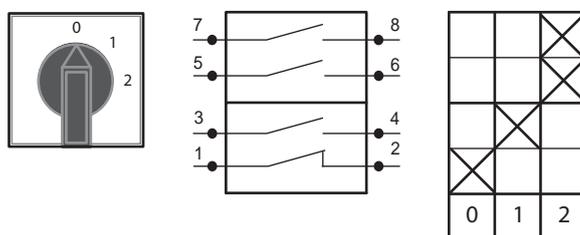


Схема 430

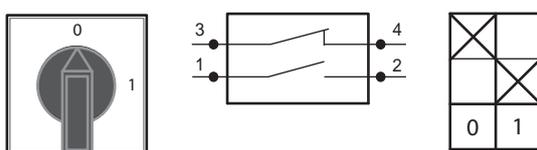


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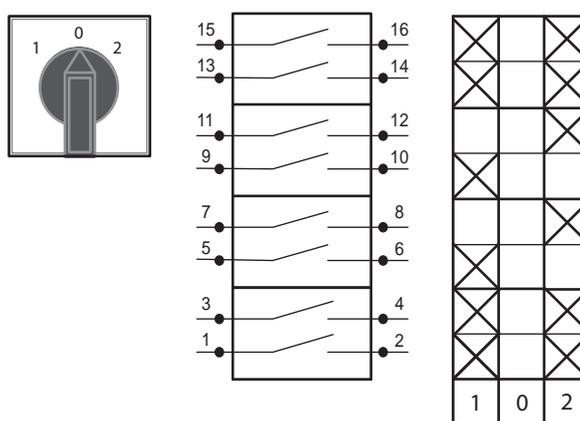


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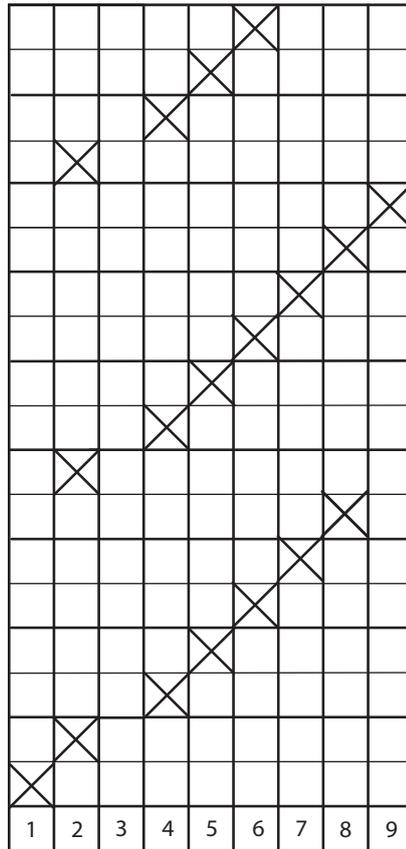
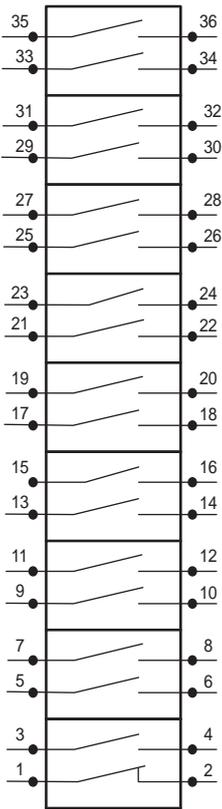
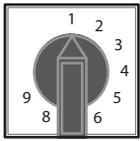


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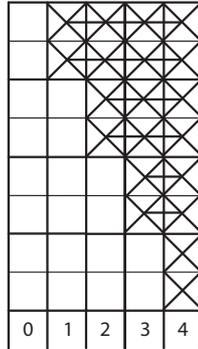
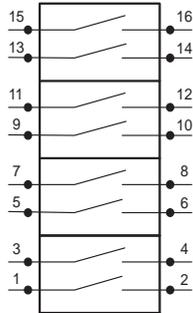
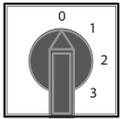


Схема 434

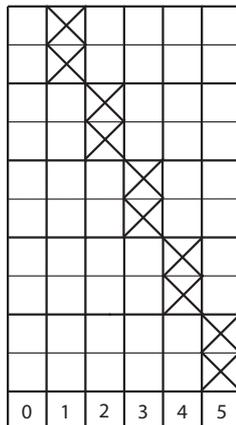
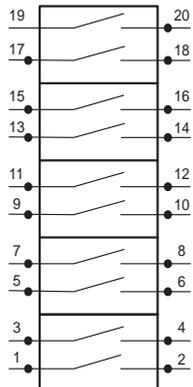
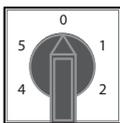


Схема 435

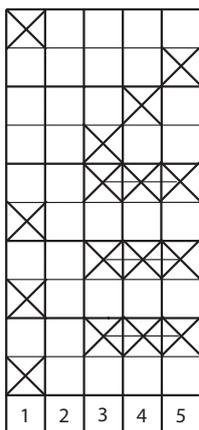
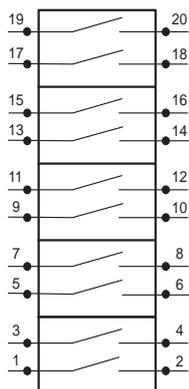
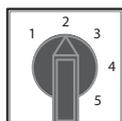


Схема 436

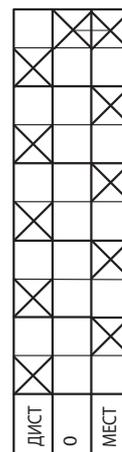
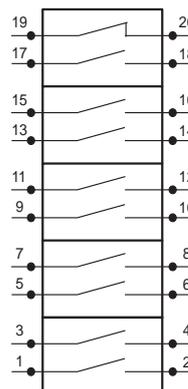
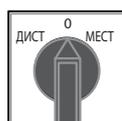


Схема 437

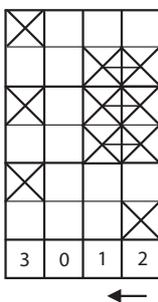
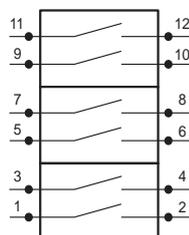
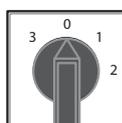


Схема 439

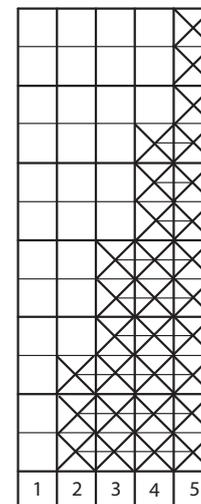
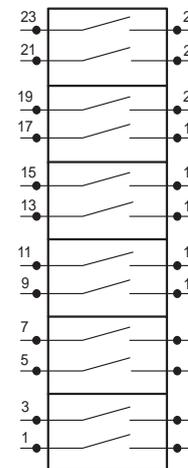
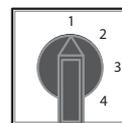


Схема 440

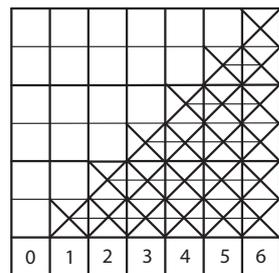
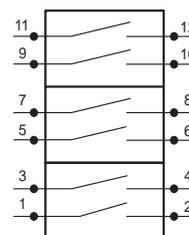
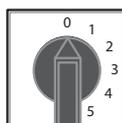


Схема 443

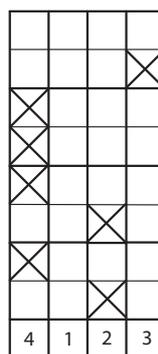
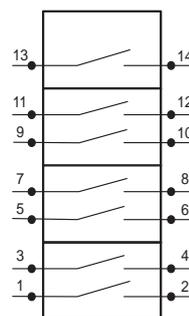
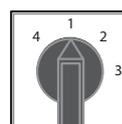
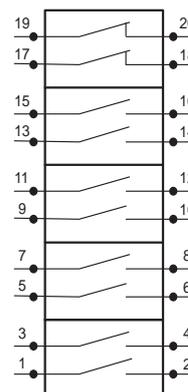
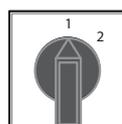


Схема 444



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