DIODE AND THYRISTOR CIRCUITS (DIN 41761)

FEATURES

The purpose of this publication is to use a standardized nomenclature for the different diode and thyristor stacks, because of the large diversity of possible circuits that can lead into application errors, with an elevated subsequent cost.
The nomenclature is based on DIN 41761 rule, and it's referred to the most common circuits.

APPLICATION CIRCUITS

The application circuit is vital for the calculating values and the element choice to get an appropriated stack , it seems obvious, but it's not surprising to see, for example, two 3-phase rectifiers with wye connection used as a six-phase rectifier, without considering the performance differences of the semiconductor and the transformer used between the two circuits.
To avoid these errors, you must properly specify the predicted circuit in order to calculate the current, voltage and dissipation values of the devices. Any change in the final application must be consulted and studied carefully to avoid unpleasant surprises.
Please, find below the most standard diodes and standard circuits.

OLD NOMENCLATURE

We recommend to have a look in the table below which compares the two nomenclatures, the old one and the current one. The old nomenclature can lead to misunderstood because it doesn't consider the rectifiers working parameters. However, in some applications you can see the old nomenclature for some diode rectifier stacks families, but never for thyristor stacks.

OLD NOMENCLATURE EQUIVALENCES	
Old	**Actual**
E	M1U
M	M2UK
B	B2U
S	M3UK
DB	B6U
DS	M6UK
DSS	M3.2UK

Many times the letter "K" (cathode) is omitted, and this means that the rectifier's output is positive with respect to the transformer connection (typical situation), and if the output is negative then the letter "A" (anode) it's used.
This distinction didn't exist in the old nomenclature and it's not useful when the rectifier supplies both polarities (single phase and three-phase full bridge), and when there's a single diode or thyristor (single half wave rectifier), where the final polarity depends on the external connection.

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APPLICATION CIRCUITS ACCORDING TO DIN 41761

Topology	Description	DIODES	THYRISTORS
B2C	Single-phase controlled bridge		4
B2CF	Single-phase controlled bridge + freewheeling diode	1	4
B2HA	Single-phase controlled bridge	2	2
B2HAF	Single-phase controlled bridge + freewheeling diode	3	2
B2HK	Single-phase controlled bridge	2	2
B2HKF	Single-phase controlled bridge + freewheeling diode	3	2
B2HZ	Branch-controlled single phase bridge	2	2
B2U	Single-phase bridge	4	
B6C	Three-phase controlled bridge		6
B6CF	Three-phase controlled bridge + freewheeling diode	1	6
B6HA	Three-phase half-controlled bridge	3	3
B6HAF	Three-phase half-controlled bridge + freewheeling diode	4	3
B6HK	Three-phase half-controlled bridge	3	3
B6HKF	Three-phase half-controlled bridge + freewheeling diode	4	3
B6U	Three-phase bridge	6	
M1C	Single-phase half-wave controlled bridge		1
M1U	Single-phase half-wave bridge	1	
M2CA	Single-phase controlled bridge (center tap, common negative)		2
M2CK	Single-phase controlled bridge (center tap, common positive)		2
M2UA	Single-phase bridge (center tap, common negative)	2	
MAUK	Single-phase bridge (center tap, common positive)	2	
M3CA	Three-phase controlled bridge (center tap, common negative)		3
M3CK	Three-phase controlled bridge (center tap, common positive)		3
M3UA	Three-phase bridge (center tap, common negative)	3	
M3UK	Three-phase bridge (center tap, common positive)	3	
M3.2CA	Six-phase controlled bridge + comp. coil (common negative)		6
M3.2CK	Six-phase controlled bridge + comp. coil (common positive)		6
M3.2UA	Six-phase bridge + comp. coil (common negative)	6	
M3.2UK	Six-phase bridge + comp. coil (common positive)	6	
M6CA	Six-phase controlled bridge (common negative)		6
M6CK	Six-phase controlled bridge (common positive)		6
M6UA	Six-phase bridge (common negative)	6	
M6UK	Six-phase bridgel (common positive)	6	
L1C	Thyristor-thyristor connection (rectifier branch)		1
L1HA	Thyristor-diode connection (rectifier branch)	1	1
L1HK	Diode-thyristor connection (rectifier branch)	1	1
L1U	Diode-diode connection (rectifier branch)	2	
W1C	Single phase full controlled AC regulator		2
W1K	Single phase half controlled AC regulator	1	1
W3C	Three-phase full controlled AC regulator		6
W3H	Three-phase half controlled AC regulator	3	3
W3.2C	Three-phase AC regulator (2 phases with antiparallel thyristors)		4
W3.2H	Three-phase AC regulator (2 phases antiparallel thyristor-diode)	2	2

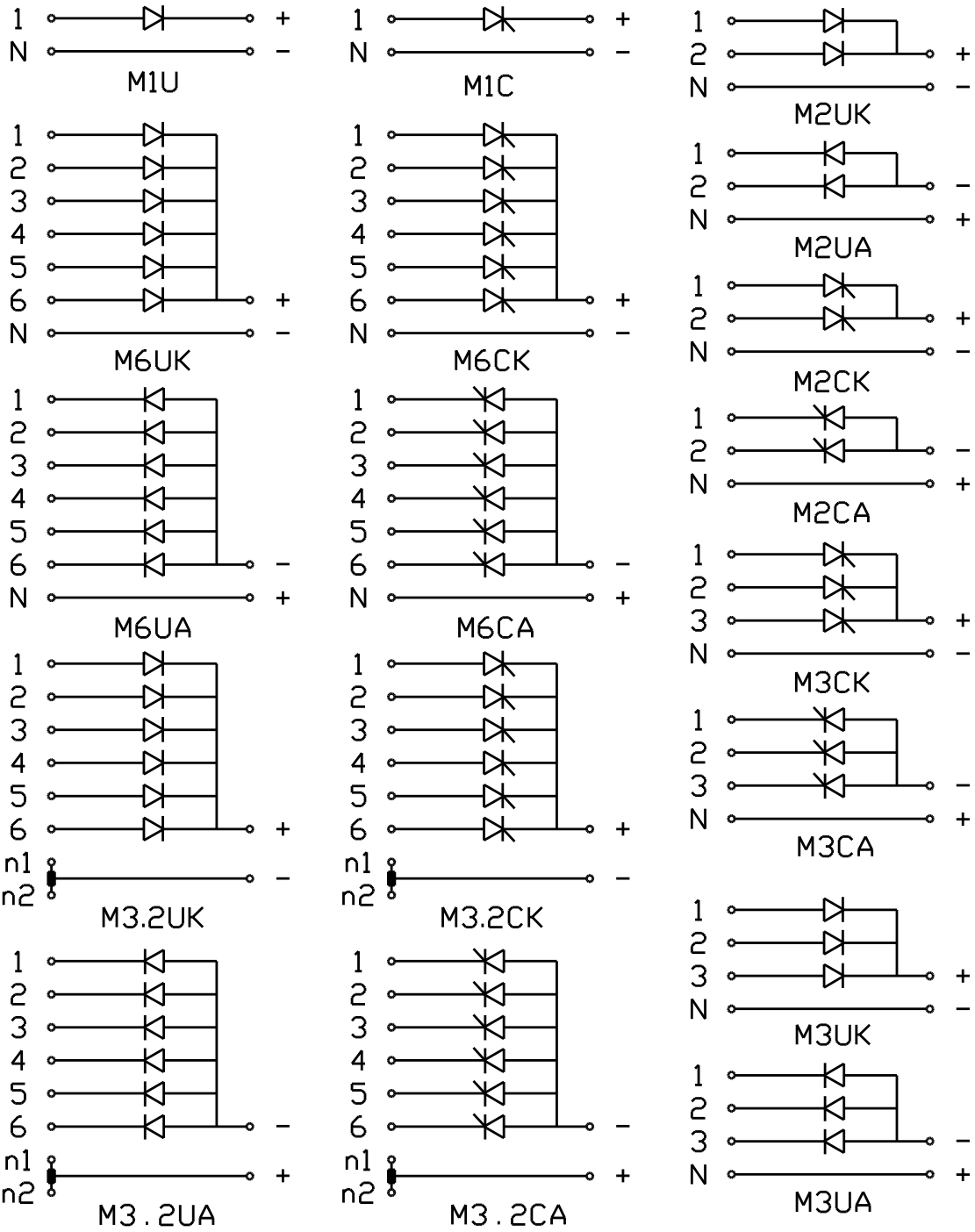
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APPLICATION SCHEMES ACCORDING TO DIN 41761

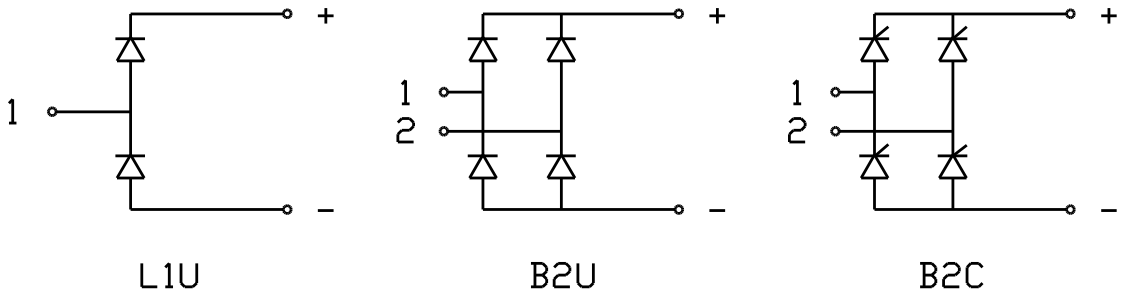


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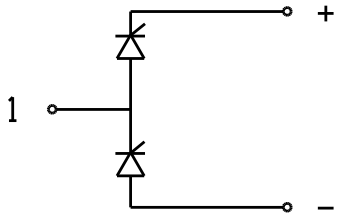
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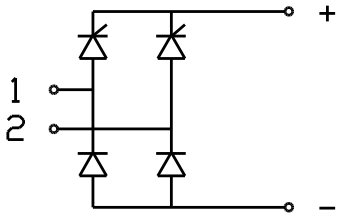
L1U

B2U

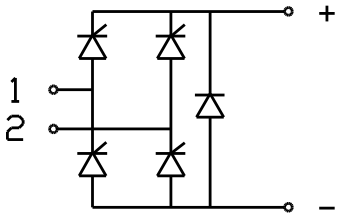
B2C



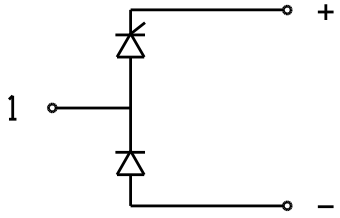
L1C



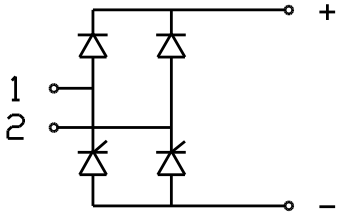
B2HK



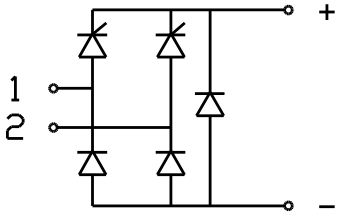
B2CF



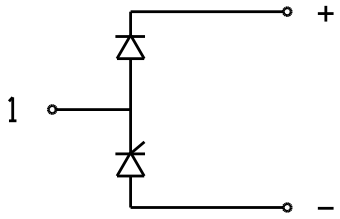
L1HK



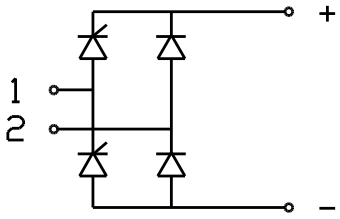
B2HA



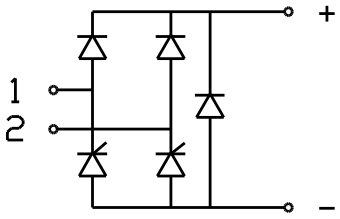
B2HKF



L1HA



B2HZ



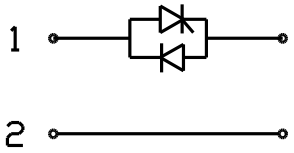
B2HAF

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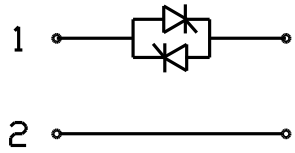
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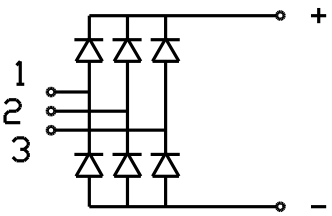
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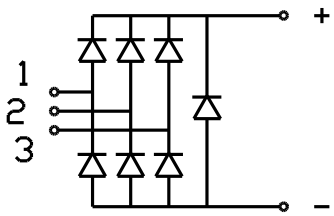
W1H



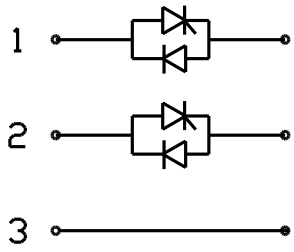
W1C



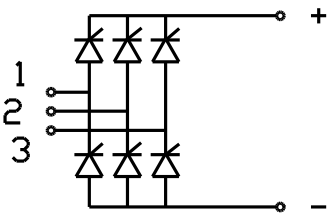
B6U



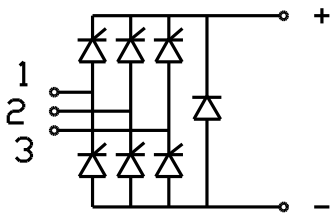
B6UF



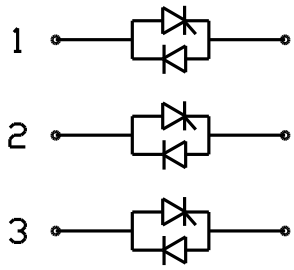
W3-2H



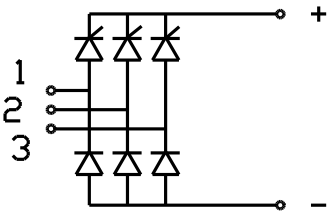
B6C



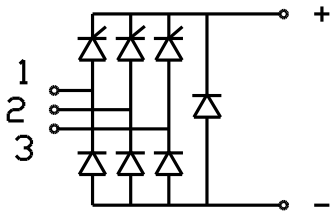
B6CF



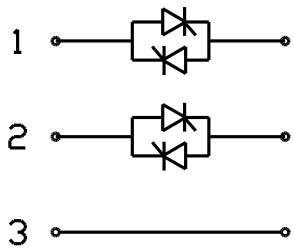
W3H



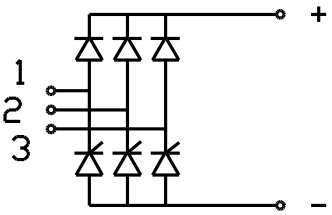
B6HK



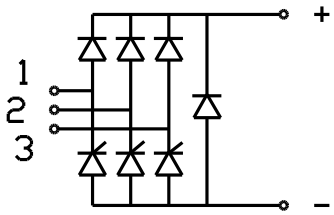
B6HKF



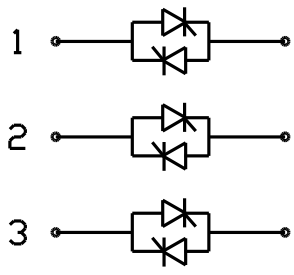
W3-2C



B6HA



B6HAF



W3C

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