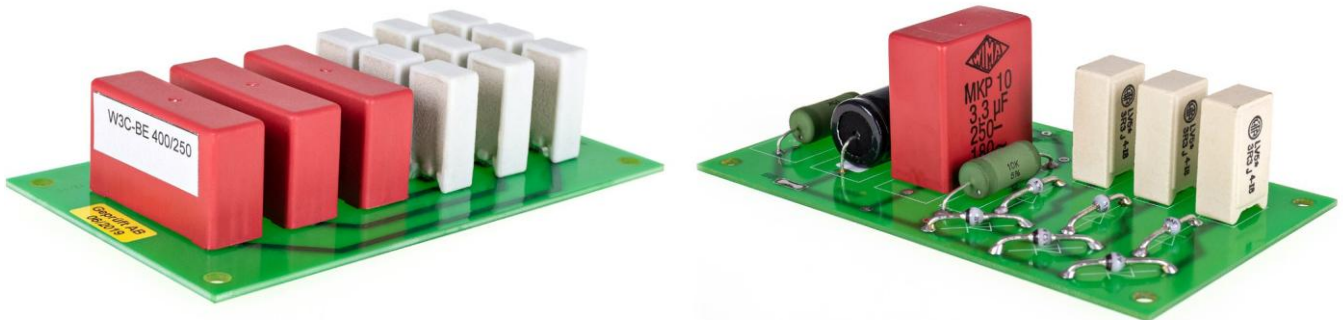


# Datasheet Circuitry



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## 1. Description

Thyristors and diodes must be protected against overvoltages, as voltage spikes in the microsecond range can destroy power semiconductors (PS).

Overvoltages may be caused by the inertia behavior of the semiconductors, switching operations in the supply network or power source, and even by the system design itself for example, when the supply transformer is switched off.

## 2. W3C-BE Circuit Configuration

Antiparallel thyristors are used in three-phase controllers and 3-phase switches (burst-firing control). The RC combination is designed to allow operation with inductive loads ( $\cos \Phi > 0.86$ ) using thyristors that support a permissible voltage slew rate of  $> 400 \text{ V}/\mu\text{s}$  and a safety factor of  $U_{\text{DRM}} / U_{\text{Netz}} > 2.5$ .

The W3C-BE configuration can also be used as a TSE circuit for three individual thyristors. As a general rule, the W3C-BE circuit should be placed close to the power semiconductors.

## 3. B6C-BE Circuit Configuration

The circuit configuration serves to suppress commutation overvoltages and, above all, to limit overvoltages during disconnection of an unloaded converter transformer. It is connected on the input side of the rectifier assembly to be protected. For thyristor assemblies, this circuit is absolutely essential; for diode assemblies, it is also required if no-load disconnection is possible.

The components of the circuit are designed so that the same selection criteria apply to the thyristors as for the W3C-BE configuration. The following no-load currents of the converter transformer are used as a basis:

$P_T$ [kVA]	3	10	100	200	500	1000	2000
$I_o$ [%]	5	3	2,7	2,5	2	1,6	1,5

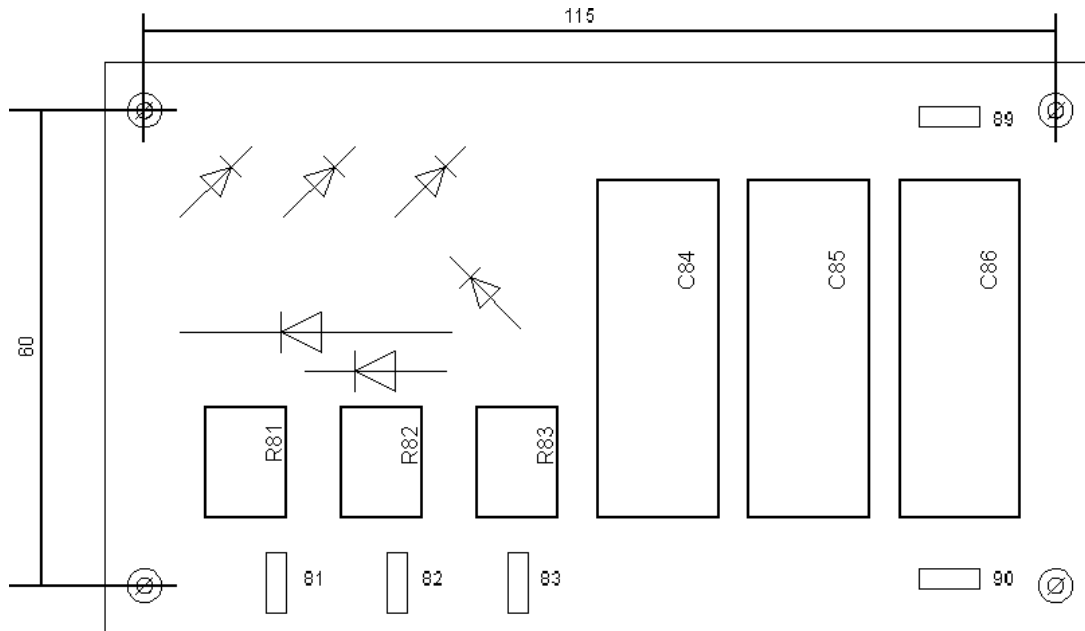
and assumed that approximately 50% of the stored no-load energy is dissipated in the arc of the main contactor.

During testing and commissioning of a rectifier system, multiple no-load shutdowns should be performed, and the resulting overvoltage should be measured. For example, a fast-acting switch with arc suppression may generate overvoltages that require an extended protection circuit configuration.

We are happy to assist you in selecting the appropriate circuit configuration for your customer's system.

### 4. Documentation

#### W3C-BE Circuit Configuration



#### B6C-BE Circuit Configuration

