# Liquid-cooled components

# Our three cooling variants

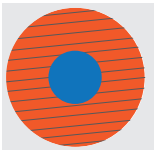
Indirect cooling with heat sink:
This version the heat sinks are integrated into the components and directly fixed to the heat sources in order to enable a higher degree of efficiency. This design is particularly efficient at higher power levels.

Schematic diagram of **indirect cooling**
- Cooling block
- Winding
- Core

Indirect cooling with coldplate:
In this version a heat sink is attached externally to cool it. This is a more economical method for low power levels and smaller components.

Schematic diagram of **Coldplate**
- Cooling block
- Winding
- Core

Direct cooling with waveguides:
In addition to it's standard indirect cooling method REO now offers the direct cooling method, which enhances cooling efficiency even more. The direct cooling uses waveguides, which includes the conductive material as well as the cooling fluid (water/glycol). The use of this method provides optimal cooling.

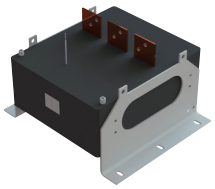


Schematic diagram of direct cooling
- Cooling liquid
- Conductive material

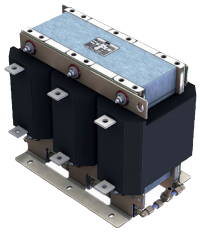
# Liquid-cooled chokes

## Advantages

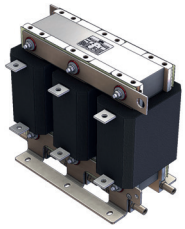
- Low surface temperature
- Increased life time
- Size reduction



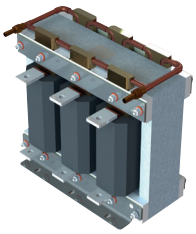
CNW MD 806



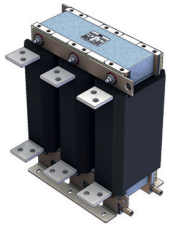
CNW MD 953



CNW MD 903



CNW MD 835



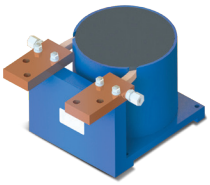
CNW MD 854


NNT MD 953

CNW MD 854

CNW MD 903

CNW MD 933



NTT LD-DH 100

## Technical data

| Liquid-cooled chokes* | | | | | | |
|---|---|---|---|---|---|---|
| **Type** | **Product group** | **Rated current** | **Voltage** | **Design** | **Protection** | **Cooling type** |
| **CNW MD 806** | Dv/dt Choke | 100 - 1200 A | 500 - 800 V | Encapsulation | IP00 | Indirect cooling |
| **CNW MD 953** | Mains choke | 200 - 1200 A | 3x400 V (3x690 V) | Partial Encapsulation | IP00 | Indirect cooling |
| **CNW MD 903** | Mains choke | 200 - 1200 A | 3x400 V (3x690 V) | Partial Encapsulation | IP00 | Indirect cooling |
| **CNW MD 835** | 5-Limb Motor choke | 450 - 700 A | 3x500 V | Partial Encapsulation | IP00 | Indirect cooling |
| **CNW MD 854** | Motor choke | 200 - 1200 A | 3x400 V (3x690 V) | Partial Encapsulation | IP00 | Indirect cooling |
| **NNT MD 953** | Mains choke | 200 - 1200 A | 3x400 V (3x690 V) | Encapsulation | IP00 | Indirect cooling |
| **CNW MD 854** | Motor choke | 6 - 70 A | 500 V | Encapsulation | IP 20 - IP 65 | Cold Plate |
| **CNW MD 903** | Mains choke | 6 - 70 A | 500 V | Encapsulation | IP 20 - IP 65 | Cold Plate |
| **CNW MD 933** | Sinusoidal filter | 6 - 70 A | 500 V | Encapsulation | IP 20 - IP 65 | Cold Plate |
| **NTT LD-DH 100** | Snubberchoke | 500 - 2500 A | bis 3000 V | Encapsulation | IP00 | Direct cooling |

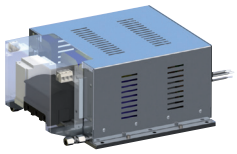
*All products are not in stock

# Liquid-cooled filter/ combinations

## Advantages

- Low surface temperature
- Use of cooling surfaces possible by the customer
- Size reduction

CNW MD 458



CNW C 329

## Technical data

| Liquid-cooled filter/ combinations* | | | | | | |
|---|---|---|---|---|---|---|
| **Type** | **Product group** | **Rated current** | **Voltage** | **Design** | **Protection** | **Cooling type** |
| **CNW MD 458** | Mains filter | 3 - 64 A | 480 V | Housing | IP20 | Indirect cooling |
| **CNW C 329** | Liquid-cooled Combination | 10 - 180 A | 500 V | Housing | IP42 | Indirect cooling |

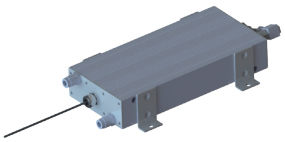


*All products are not in stock

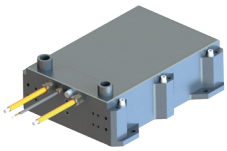
# Liquid-cooled resistors

## Advantages

- Minimierung der Baugröße bis zu 80%
- Hohe Effizienz
- Geräuscharmut



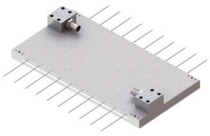
**BW D 158**



**BW D 330**

**NTT RD 158**


**R D 169**



**R D 330**

**REOLOAD 300**

## Technical data

| Liquid-cooled resistors* | | | | | | |
|---|---|---|---|---|---|---|
| **Type** | **Product group** | **Power** | **Voltage** | **Design** | **Protection** | **Cooling type** |
| **BW D 158** | Braking resistor | 1 - 60 kW | 1000 V | - | up to IP65 | Indirect cooling |
| **BW D 330** | Braking resistor | 15 - 60 kW | 800 V | - | up to IP69K | Indirect cooling |
| **NTT RD 158** | Railway applica-tion | 2,6 kW | 4200 V | - | up to IP65 | Indirect cooling |
| **R D 169** | Loading resistor | 4 - 6 kW | 690 V | - | IP00 | Indirect cooling |
| **R D 330** | Loading resistor | 30 -160 kW | 500 V | - | IP20 | Indirect cooling |
| **REOLOAD 300** | Resistive loads | up to 400 kW | 400 - 1000 V | Switch cabinet | IP20 - IP54 | Indirect cooling |

*All products are not in stock

## Notes

## Notes

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