☑ As an alternative criterion, we recommend to add a line reactor always the transformer that supplies the inverter has rated output higher than indicated in table below:

Inverter Model	Power of the Transformer [kVA]
1.6 A and 2.6 A/200-240 V	30 x rated apparent power of the inverter [kVA]
4 A/200-240 V	6 x rated apparent power of the inverter [kVA]
1.6 A, 2.6 A and 4.0 A/ 110-127 V	6 x rated apparent power of the inverter [kVA]
7.3 A/220-240 V	10 x rated apparent power of the inverter [kVA]
10.0 A/200-240 V	7.5 x rated apparent power of the inverter [kVA]
15.2 A/200-240 V	4 x rated apparent power of the inverter [kVa]

Note: The value for the rated apparent power can be obtained in section 9.1 of this manual.

Table 8.2 *- Alternative criteria for use of line reactor - Maximum values of the transformer power*

8.3 LOAD REACTOR

The use of a three-phase load reactor, with an approximate 2 % voltage drop, adds an inductance at the inverter output to the motor. This decreases the dV/dt (voltage rising rate) of the pulses generated at the inverter output. This practice reduces the voltage spikes on the motor windings and the leakage currents that may be generated when long cables between inverter and motor (as a function of the "transmission line" effect) are used.
WEG Motor with voltages up to 460 V, no use of load reactor is required, since the insulation of the motor wires support the operation bi the CFW-10. If the cables between inverter and motor are longer than 100 m (330 ft), the cable capacitance to ground increases. In this case it is also recommended to use a load reactor.

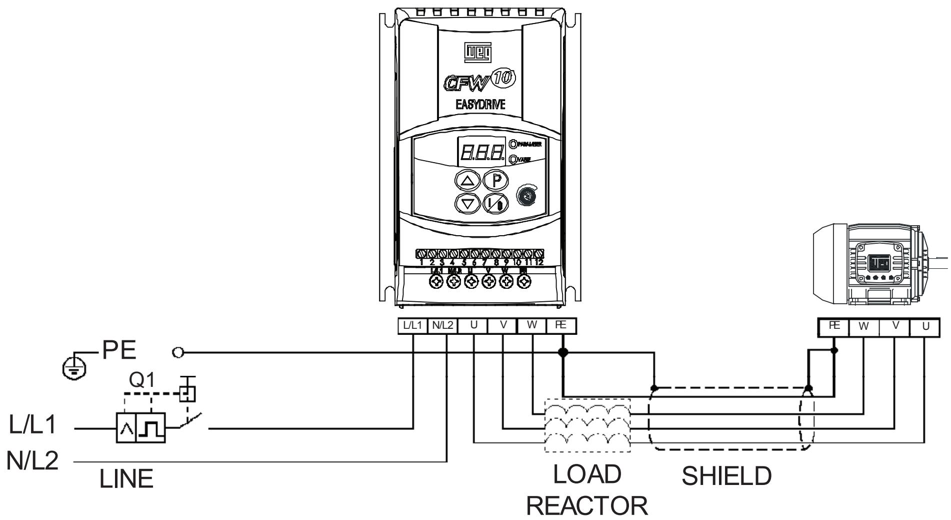

Figure 8.3 *- Load Reactor Connection*

8.4 RHEOSTATIC BRAKING

The rheostatic braking is used when short deceleration times are required or when high inertia loads are driven.
For the correct braking resistor sizing the following application data shall be considered: deceleration time, load inertia, braking duty cycle, etc.

In any case, the RMS current capacity and the maximum peak current shall be respected.
The maximum peak current defines the minimum resistance value (ohms) of the braking resistor. Refer to table 8.3.
The DC Link voltage level at which the rheostatic braking is activated is the following:

CFW-10 200-240 V models: 366 Vdc
CFW-10 110-127 V models: 411 Vdc

8.4.1 Sizing

The braking torque that can be achieved through the application of frequency inverters, without using the rheostatic braking module, varies from 10 % to 35 % of the motor rated torque.
During the deceleration, the kinetic energy of the load is regenerated to the DC Link (intermediary circuitry). This regenerated energy charges the capacitors at the intermediary circuitry increasing the voltage level at the DC Link. In case this additional energy is not dissipated, an overvoltage error (E01) may occur disabling the inverter.
In order to have higher braking torques the rheostatic braking is applied. When using the rheostatic braking, the additional regenerated energy is dissipated in an external resistor. The braking resistor power is a function of the deceleration time, the load inertia and the resistive torque.
Use WIRE or RIBBON resistors in ceramic case with appropriated insulation voltage to withstand a high instantaneous power (respecting to the rated power).

CFW-10 Model	V_{max} (Maximum Resistor Voltage)	Maximum Braking Current	P_{max} (Resistor Peak Power)	Maximum RMS Braking Current	P_{rms} (Resistor Maximum Power)	Recommended Resistor	Recommended Wiring
SINGLE-PHASE							
1.6 A / 200-240 V	Braking not available						
2.6 A / 200-240 V	Braking not available						
4.0 A / 200-240 V	Braking not available						
7.3 A / 200-240 V	410 V	11 A	4.3 kW	10 A	3.9 kW	39 (ohms)	2.5 mm² / 14 AWG
10.0 A / 200-240 V	410 V	11 A	4.3 kW	10 A	4.3 kW	39 (ohms)	2.5 mm² / 14 AWG
1.6 A / 110-127 V	Braking not available						
2.6 A / 110-127 V	Braking not available						
4.0 A / 110-127 V	460 V	12 A	5.4 kW	5 A	2.2 kW	39 (ohms)	2.5 mm² / 14 AWG

Table 8.3 *- Recommended braking resistors*

CFW-10 Model	V_{max} (Maximum Resistor Voltage)	Maximum Braking Current	P_{max} (Resistor Peak Power)	Maximum RMS Braking Current	P_{rms} (Resistor Maximum Power)	Recommended Resistor	Recommended Wiring
THREE-PHASE							
1.6 A / 200-240 V	Braking not available						
2.6 A / 200-240 V							
4.0 A / 200-240 V							
7.3 A / 200-240 V							
10.0 A / 200-240 V	410 V	11 A	4.3 kW	10 A	4.3 kW	39 (ohms)	2.5 mm² / 14 AWG
15.2 A / 200-240 V	410 V	11 A	4.3 kW	10 A	4.3 kW	39 (ohms)	2.5 mm² / 14 AWG

***Table 8.3 (cont.)** - Recommended braking resistors*

NOTE!

Data presented in table 8.3 were calculated for the maximum power admissible for the frequency converter. For smaller braking power, another resistor can be used according to the application.

8.4.2 Installation

- ☑ Connect the braking resistor between the +UD and BR power terminals (Refer to Section 3.2.1 and fig. 3.6);
- ☑ Make this connection with a twisted pair. Run this cable separately from any signal or control wire. Size the cable cross section according to the application, considering the maximum and RMS current;
- ☑ If the braking resistor is installed inside the inverter panel, the additional heat dissipated by the resistor shall be considered when defining the panel ventilation.

DANGER!

The internal braking circuitry of the inverter as well as the braking resistor may be damaged if they are not properly sized and/or if the input power supply exceeds the maximum admissible value. In this case, the only guaranteed method to avoid burning the resistor and to eliminate the risk of fire is the installation of a thermal overload relay in series with the resistor and/or the installation of a thermostat on the resistor body, wiring it in a way to disconnect the inverter power supply in case of overload, as shown below:

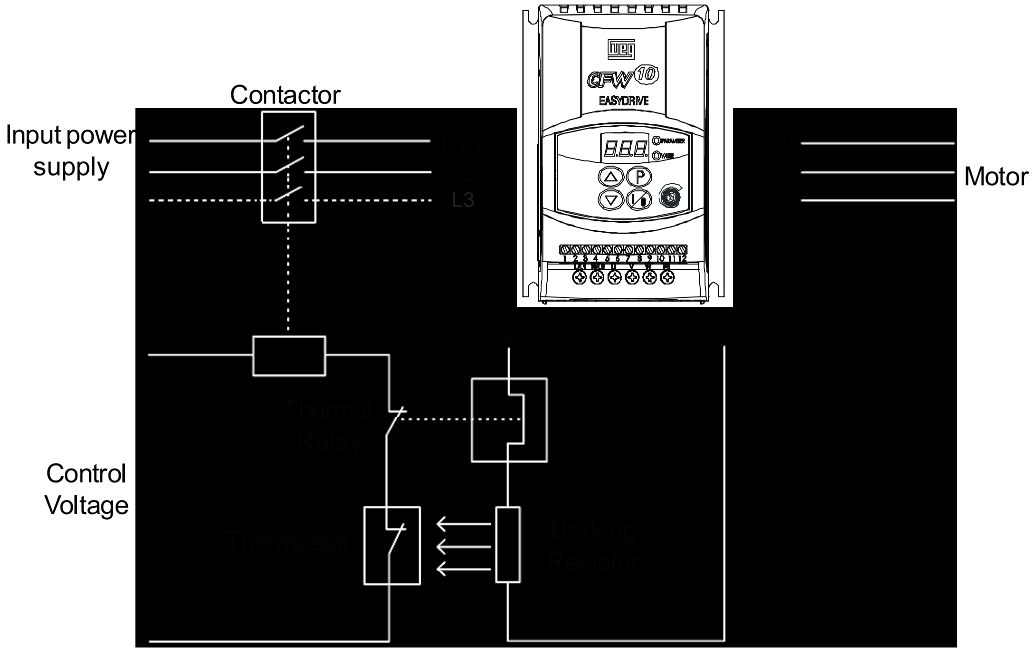

Figure 8.4 *- Braking resistor connection (only for the models 7.3 and 10.0 A/200-240 V and 4.0 A/110-127 V single-phase and 10.0 A and 15.2 A/200-240 V three-phase)*