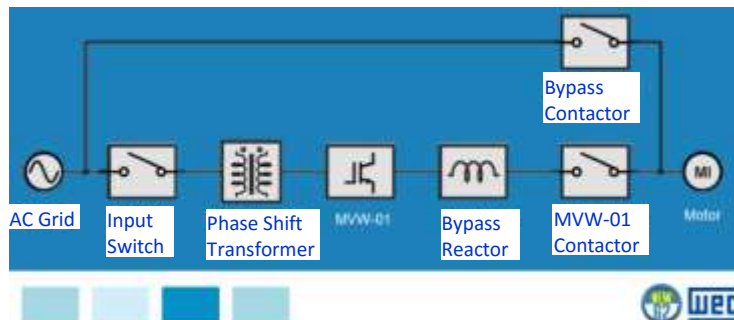


## WEG Synchronous Transfer Function

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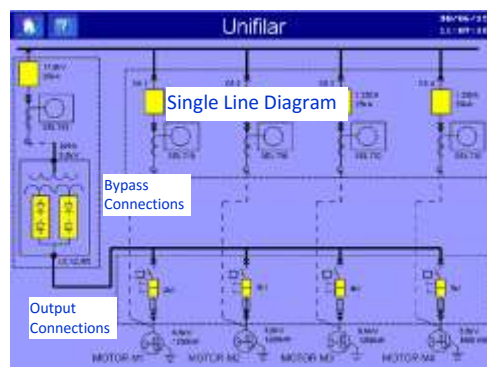
For industrial applications where speed variation is not required during operation, "**WEG Synchronous Transfer**" function (also known as Synchronous Bypass) allows the motor to smoothly accelerate up to the rated operating frequency and WEG Medium Voltage Variable Frequency Drive, MVW-01, automatically transfers the motor connections to the power grid. With this operation, any adverse effects of electrical and mechanical stresses caused by a direct on line start can be eliminated.



**Figure 01:** Control Block Diagram of Synchronous Transfer with WEG Synchronous Bypass.

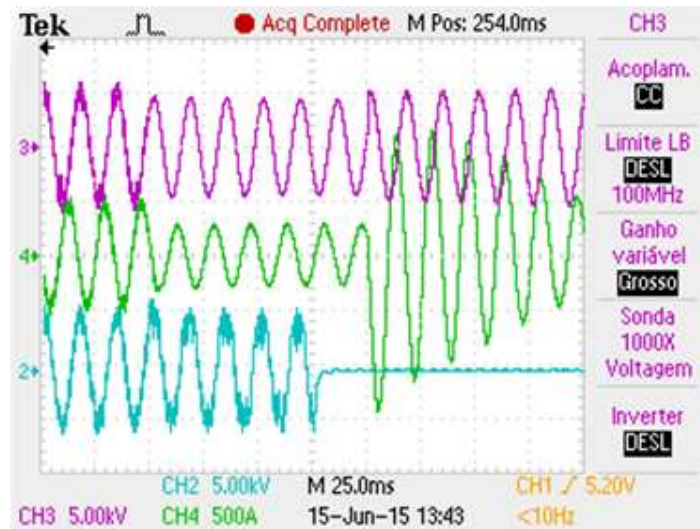
At synchronous transfer, MVW-01 guarantees that by using its control algorithm, the switching is done in phase and at the same frequency (GRID / MVW-01 / MOTOR). A bypass reactor must be used to protect MVW-01 from overcurrent at the time of closing the bypass contactor.

During synchronous transfer process, MVW-01 accelerates the motor to its rated speed, synchronizes the voltage imposed to the motor with the input grid voltage and performs the transfer to the grid. To allow the transfer to occur correctly and to limit its impact on the motor and on MVW-01, a set of parameters is carefully set up in order to guarantee phase synchronism and minimum variation of RMS voltage values between MVW-01 and the grid.



**Figure 02:** Touch screen HMI window - Multi-motor drive + WEG Synchronous Transfer (for four motors).

Initial, voltage applied to the motor is via MVW-01, (blue color trace in figure 3), then the bypass contactor is closed in phase with the voltage and the frequency of the grid (MVW-01 and grid voltage applied simultaneously to the motor) and finally MVW-01, sends a command to open the output contactor, and the motor is then fed from the grid via bypass contactor (pink color trace in figure 3).



**Figure 03:** Voltage and Current Applied to the Motor – WEG Synchronous Transfer System.  
(Green Curve = Current of the Motor, Blue Curve = MVW-01 Output Voltage to Motor, Pink Curve = Grid Voltage to Motor).

For **WEG Synchronous Transfer** control, it is possible to configure the system hardware of the MVW-01 to start "N" electrical motors, which involves using **Medium Voltage Bypass** Switchgears and Medium Voltage Output Switchgears, also manufactured by WEG Automation (electrical interlocking of all the switchgear is always managed by MVW-01, which guarantees complete operational safety of the system).

The control algorithm of the **WEG Synchronous Transfer** also offers the option of controlled stopping of the motor. For stopping the motor, MVW-01 is connected synchronously to the system via output contactor, the voltage is equalized with the grid voltage and the bypass contactor receives a command to open. From here on MVW-01 controls the motor again, and stops it with controlled voltage and frequency.

All functions featured in the **Synchronous Transfer Function** provide to this application great flexibility and high intelligence both at Starting and Stopping of electric motors. This offers an alternative solution for customer needs, always resulting in significant savings on initial investments with equipment as well as on consumption of electricity. WEG Automation has good experience with these types of applications and strongly recommends such solutions.

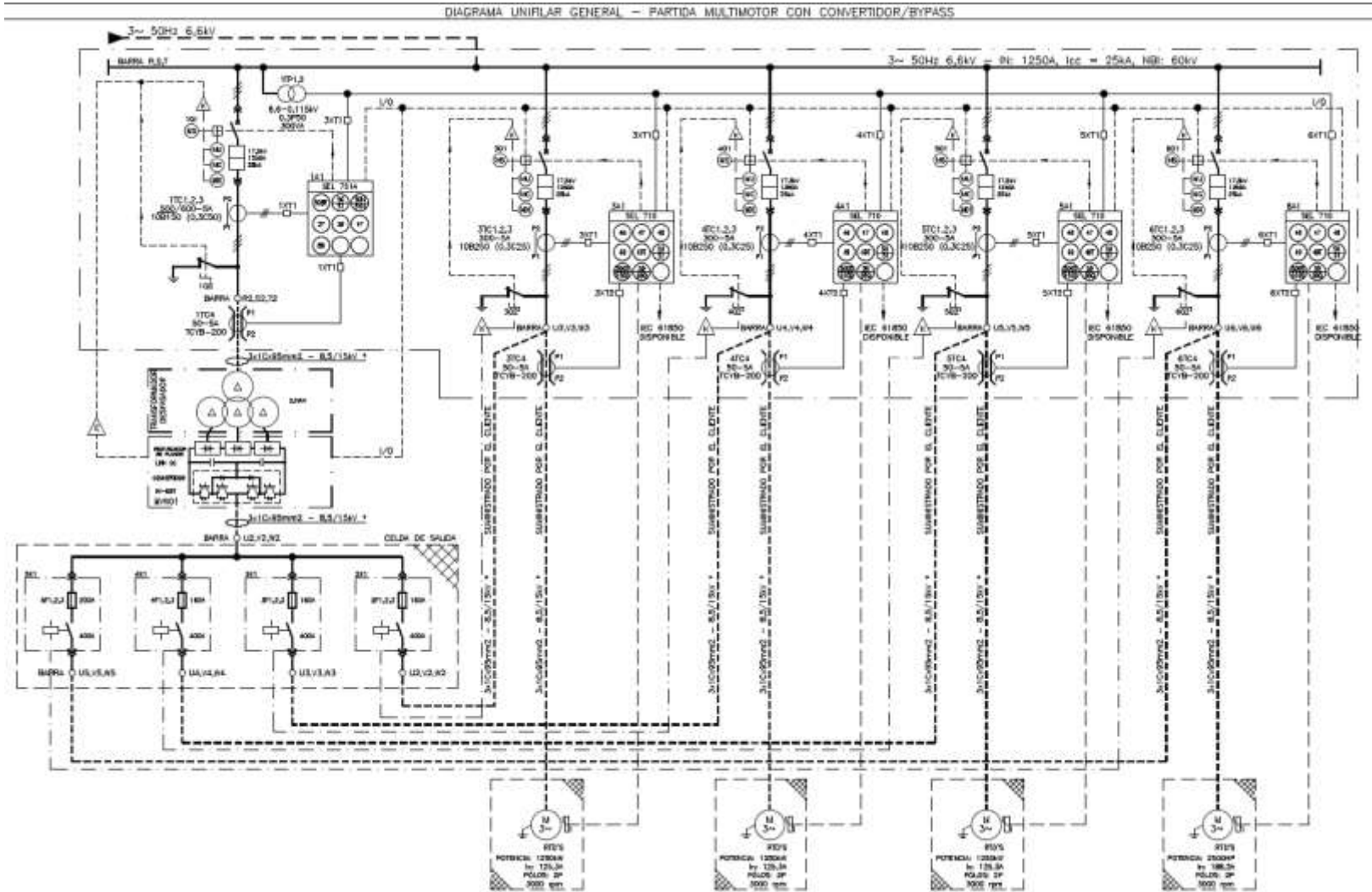


Figure 04: Electrical Diagram of the Multi-Motor Drive + WEG Synchronous Transfer System (four motors).