

**Manual for using the Quick setup wizard with UNIFREM drives**  
Firmware version 3.07x and higher



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# 1 Quick setup wizard

## 1.1 Using the quick setup wizard with VONSCH UNIFREM

UNIFREM converters are equipped with the quick setup wizard since the firmware version 3.000. This setup wizard is used to speed up the initial configuration and reliable startup of the motor. The purpose of this wizard is not to replace the need of final adjustment and tuning of the converter, it has to be done manually.

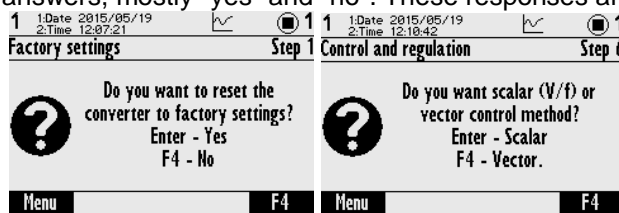
**This quick setup wizard can only be used with the control panel UNIPANEL, firmware version 2.061 or higher.**

### 1.1.1 Working with the wizard

The quick setup wizard offers several type of screens, which differ with the behaviour and type of user-machine interaction.

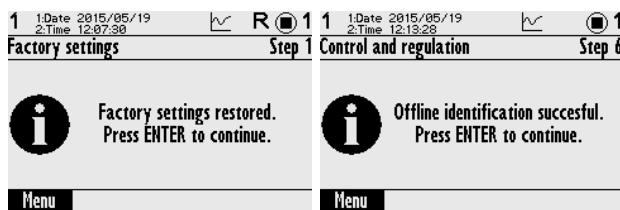
#### Question

Screen type "question" is used for asking the user a question that can be answered by two possible answers, mostly "yes" and "no". These responses are associated with the "Enter" key and "F4" key.



#### Information

Screen type "information" informs the user about the result of an action, whether it was successful or not.



#### Command list

Screen type "command list" displays a list of several commands, from which the user can choose one. After selecting one, this screen closes.



## Parameter list

Screen type "parameter list" shows several parameters that can be freely modified in any order. This screen can be exited using the "F3" key.

Motor		Control and regulation	
Nom. power	1100W	V/f Type	-
Nom. voltage	400.0V	Starting voltage	3.90%
Nom. current	2.80A	End voltage	100.0%
Nom. frequenc..	50.0Hz	Frequency shift	5.0Hz
Nom. revolutio..	1450ot/min	V/f exponent	1.50
Menu	>>	Help	

## Parameter change

The screen "parameter change" prompts to modify single parameter. After changing and pressing "ENTER" key, new value is saved and this screen is closed.

IRCT pulses	
1024	(0÷40000)
Menu	Calib. Help

## Waiting

Screen "waiting" is used for pending completion of the action. It may wait for user interaction (e.g. start command), or wait to complete some actions in the inverter.

Control and regulation	Directions and encoder
For starting the identification, please, run the START command.	Test of motor direction in progress. Please, wait until the drive stops. Press ENTER to continue.
Menu	Menu

### 1.1.2 Steps of the quick setup wizard

The wizard consists of several steps:

1. **Factory settings**  
This step asks about reset of the converter to factory settings.
2. **MOTOR**  
Motor nameplate data, using of sine filters, motor cooling.
3. **Application macros**  
Allows to choose from five different application macros for different applications.
4. **Command macros**  
Allows to choose from sever different command macros for different applications.
5. **Directions and encoder**  
In this step the correct direction of rotation of the motor and encoder are determined.
6. **Control and regulation**
7. In this step the selection of a scalar or vector control and basic control parameters are set. Also parameter identification can be performed.
8. **Basic parameters**  
Setting the basic control parameters like max. current, max. voltage, switching frequency and frequency control (acceleration, deceleration and frequency range).
9. **Finish**  
Exit the wizard and return to the main menu, where additional settings can be done.

Below in the form of a flow chart, individual steps of setting the converter by wizard can be found. Blocks marked **black** are questions/options or parameters that user can choose. Blocks marked **red** are internal conditions and states, according to the state of the converter, such as used command macro, or the success/failure of performed identification.

### 1.1.3 Setting the motor data, application and command macro

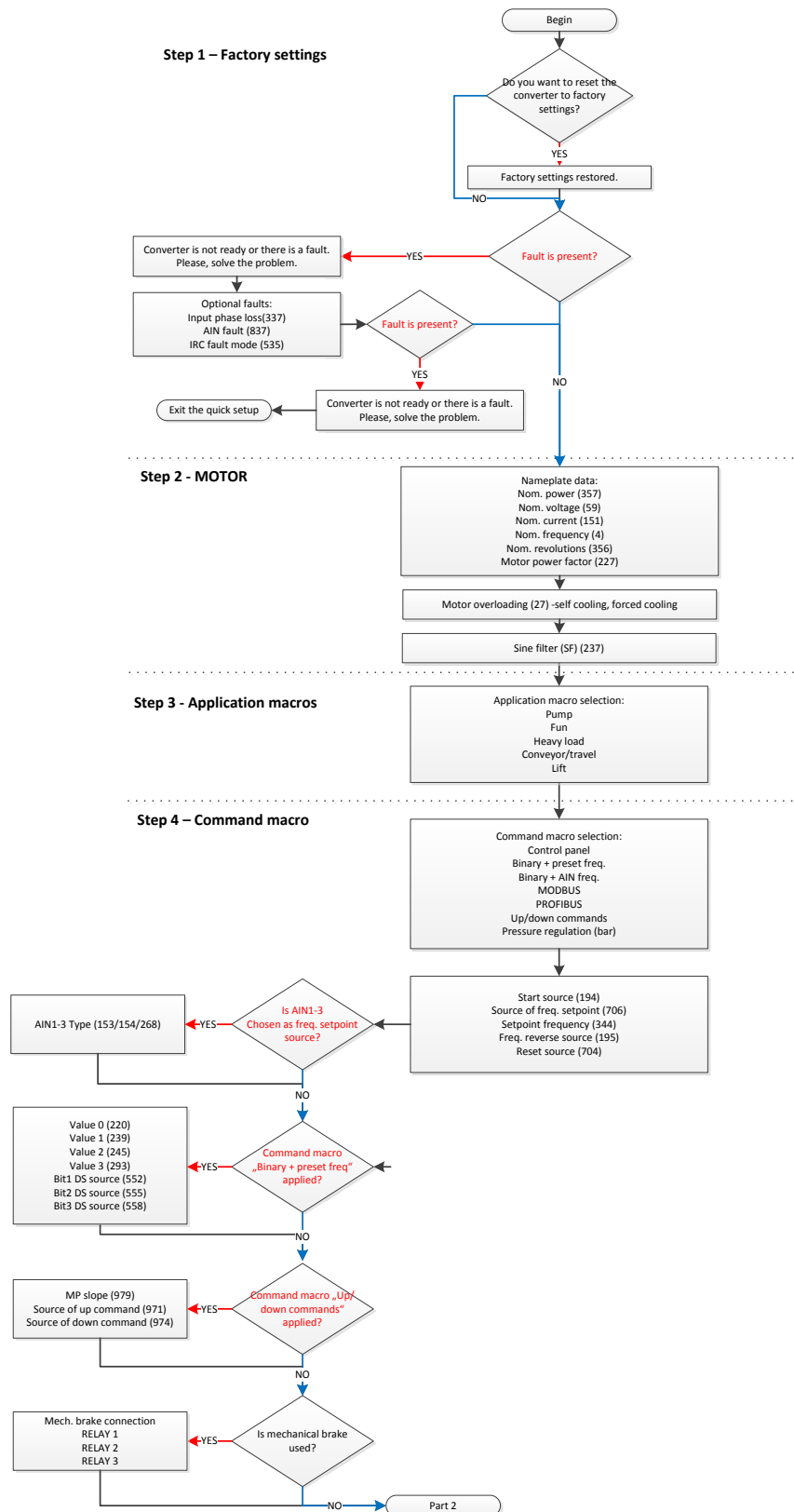


Figure 1 – First part of the wizard, Basic motor settings, application and command macro

The first step offers the possibility to reset the converter to factory settings. This action is useful when the inverter was used in the past and its current setting is unknown or untrustworthy.

In the second step, the converter asks for motor nameplate data. After selecting the power, the nearest motor macro is applied, which preconfigures some system parameters.

When changing power, motor voltage or power factor, the system automatically recalculates the nominal motor current to estimated value from the power equation. This automatic preset is suitable for estimating the nominal current in the case where it is not available, e.g. the motor is physically inaccessible or rewound and nameplate data do not match. After you manually change the nominal current value, this value will not be recalculated anymore.

### Motor overloading [27]

This parameter is used to preset the motor temperature model. When selecting the "Self-cooling", converter uses thermal model considering its own cooling system, where the cooling effect increases with speed. In case of using "Forced cooling" thermal model considers the forced cooling, the effect is constant. The option "Not evaluated" is recommended where the thermal model should not be evaluated, e.g. when the motor is well cooled or there is another thermal protection. Setting the External Thermal Protection is out of scope of the wizard, it can be set up later.

### Sine filter [237]

Is there a sine filter connected between the converter and the motor?

#### 1.1.4 Application macros

UNIFREM offers 5 application macros. They are used to preset some of the essential parameters required for the application. Complete list of these parameters can be found in Table 1 below. The preset value does not need to be suitable for all variants of the application, however it is very simple to change it as needed.

ID	Parameter	Pump	Fan	Heavy load	Conveyor/travel	Lift
23	Operation mode	Variable load	Variable load	Constant load	Constant load	Constant load
347	V/f Type	-	Starting Torque controller	Starting Torque controller	Starting Torque controller	-
91	V/f exponent	1,5	1,5	1	1	1
98	Frequency shift	5Hz	5Hz	10Hz	10Hz	15Hz
352	Max. current controller	Motoric	Motoric, High dynamic	Motoric, High dynamic	-	-
5	Max. mot. current	Nom. current (ID151)	Nom. current (ID151)	Max. inv. current (service)	Max. inv. current (service)	Max. inv. current (service)
549	Max. regen. current	Max. mot. current (ID5)	Max. mot. current (ID5)	Max. mot. current (ID5)	Max. mot. current (ID5)	Max. mot. current (ID5)
110	Min. frequency	20	20	0	0	0
111	Max. frequency	Nom. frequency (ID4)	Nom. frequency (ID4)	Nom. frequency (ID4)	Nom. frequency (ID4)	Nom. frequency (ID4)
116	Ramp-up 1 time	20	60	15	10	5
119	Ramp-down 1 time	20	60	15	10	5
807	Quick reverse	100%	100%	100%	30%	100%
766	Power restriction (PR)	inverter overload cooler temperature motor overload	inverter overload cooler temperature motor overload	inverter overload cooler temperature motor overload	-	-
748	Kinetic backup (KB)	Turned on	Turned on	Turned off	Turned off	Turned off
374	Flying start	Turned off	Normal	Turned off	Turned off	Turned off
346	Brake module	Turned off	Turned off	Turned off	Turned on	Turned off
195	Freq. reverse source	No reverse	No reverse	no change	no change	no change
163	STC Current	90% of mot. curr. (ID155)	90% of mot. curr. (ID155)	90% of mot. curr. (ID155)	120% of mot. curr. (ID155)	120% of mot. curr. (ID155)
513	Resonance damping	Turned on	Turned on	Turned off	Turned off	Turned off

Table 1 – Application macros

## 1.1.5 Command macros

UNIFREM offers 7 command macros. They are used to preset some of the typical parameters as the start source, source of frequency setpoint. Complete list of these parameters can be found in Table 2 below. The preset value does not need to be suitable for all variants, however it is very simple to change it as needed.

### Recommended settings (default)

ID	Parameter	Control panel	Binary + preset freq.	Binary + AIN freq.	MODBUS	PROFIBUS	Up/down commands	Pressure req. (bar)
194	Start source	Control panel	BIN1, 2	BIN1, 2	MODBUS	PROFIBUS	BIN1	BIN1
706	Source of freq. setpoint	Control panel	Discrete setpoints	AIN1	MODBUS	PROFIBUS	Up/down commands	Process controller
195	Freq. reverse source	Control panel	BIN2	BIN2	Setpoint value	Setpoint value	Setpoint value	No reverse
Reverse is not changed for Fan or Pump								
<b>Discrete setpoints</b>								
576	Discrete setpoint switch	No change	Single	No change	No change	No change	No change	No change
220	Value 0	No change	8 Hz	No change	No change	No change	No change	No change
239	Value 1	No change	15 Hz	No change	No change	No change	No change	No change
245	Value 2	No change	30 Hz	No change	No change	No change	No change	No change
293	Value 3	No change	50 Hz	No change	No change	No change	No change	No change
552	Bit1 DS source	No change	BIN3	No change	No change	No change	No change	No change
555	Bit2 DS source	No change	BIN4	No change	No change	No change	No change	No change
558	Bit3 DS source	No change	BIN5	No change	No change	No change	No change	No change
<b>Up/down commands</b>								
978	UP/DOWN Type	No change	No change	No change	No change	No change	Type 1	No change
971	Source of up command	No change	No change	No change	No change	No change	BIN3	No change
974	Source of down command	No change	No change	No change	No change	No change	BIN4	No change

Table 2 – Command macros

As can be seen in the table, the recommended starting source for binary control is BIN1 and BIN2 where BIN1 represents running in the positive direction and BIN2 operation in the negative direction.

At preset speeds (often used by manipulators and cranes), switching between them is done by BIN3, BIN4 and BIN5 where BIN3 represents change to the second speed, BIN4 to the third speed, BIN5 to the fourth speed...

**All the key parameters can be changed during the wizard, usually in the next screen after selecting the command macro. Values in the table represent typical and recommended settings.**



## 1.1.6 Directions and the encoder

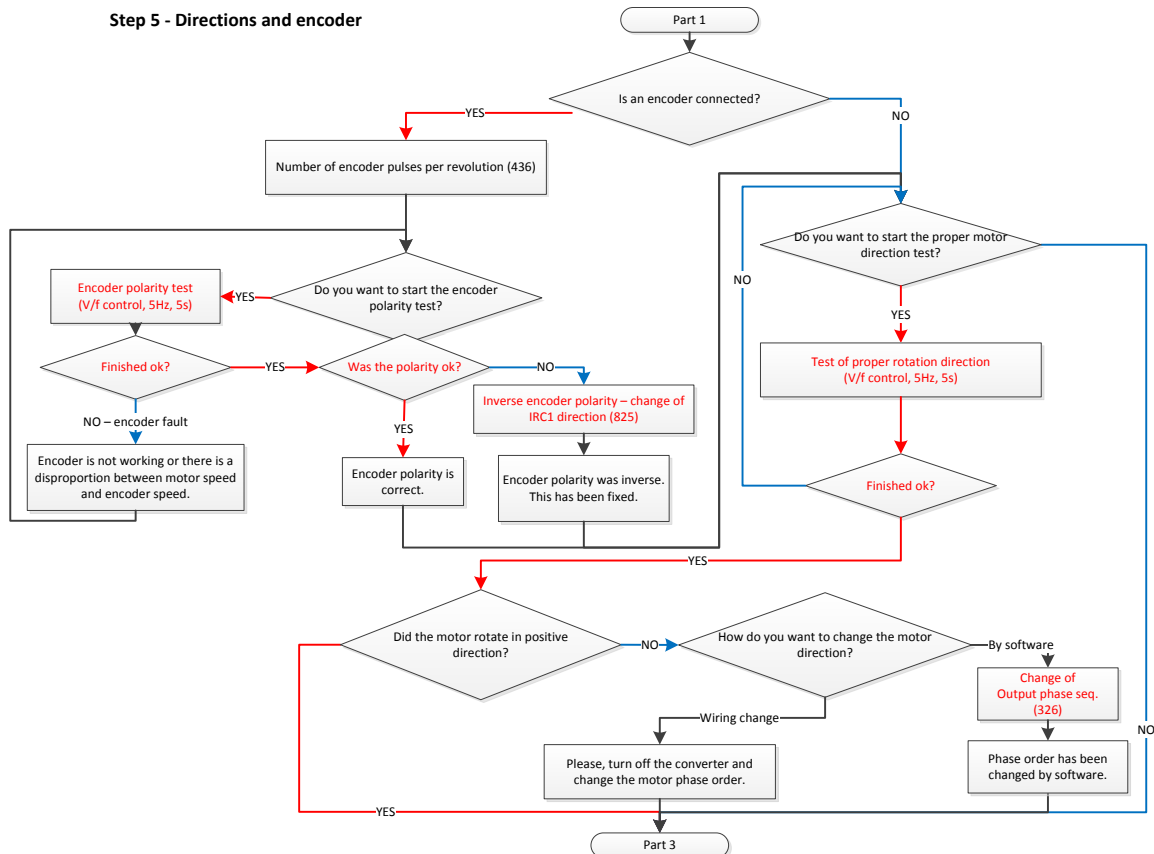


Figure 2 – Wizard part 2, encoder and proper directions of the motor

Step 5 is dedicated to the proper motor rotation direction and in case of using the encoder, its synchronization and proper direction as well. If the motor is rotating the wrong way, it is possible to change it by parameter or physically, by swapping two phases on the output terminal.

**Note:** when choosing the physical change of phase order, for safety reasons first turn off the inverter, wait two minutes and then change the phases.

### 1.1.7 Control methods, parameter identification, dynamics of the drive

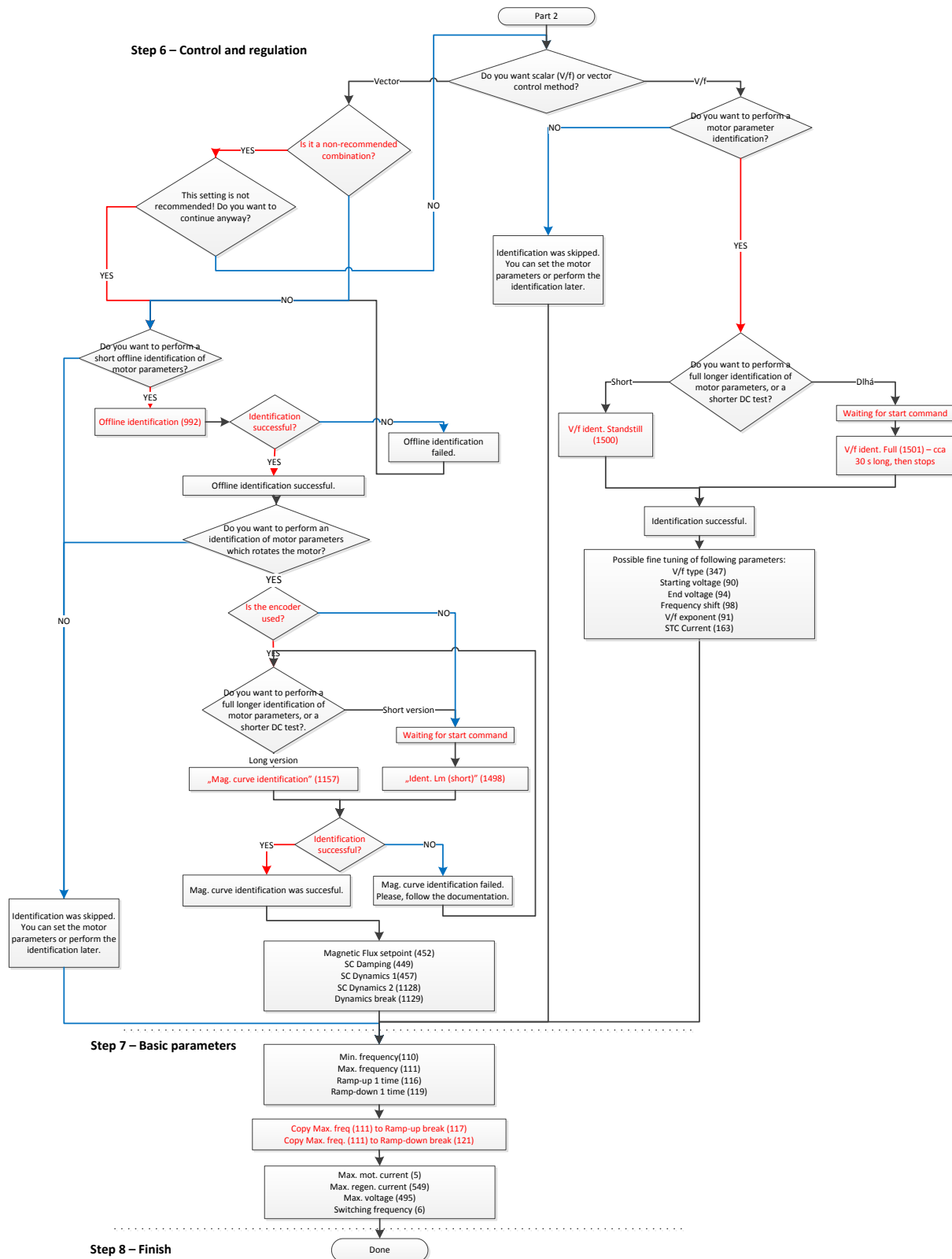


Figure 3 – Wizard part 3, Control and identification

In this part the wizard offers two control modes – vector and V/f (scalar).

### 1.1.7.1 Vector control

Vector control can be divided into open-loop control (without the encoder) and closed-loop control (with the encoder). This is defined by parameter *Motor control method* [451]. The wizard sets this parameter by the result of the question „Is an encoder connected? “.

Wizard can navigate the user through all the required identifications, such as „*Offline identification* [992]“, which is performed at zero speed, and one of two mutual inductance identifications (*Mag. curve identification* [1157] and *Ident. Lm (short)* [1498]), which require rotation of motor.

If required, it is possible to skip all the identifications, however, this option is strongly not recommended.

These identifications and the whole vector control are closer described in the document “Vector control of induction motors for VONSCH® UNIFREM drives”, which might be found at [www.vonsch.sk](http://www.vonsch.sk) in the Support section.

The wizard can only configure the speed control, position or torque control have to be configured and tuned manually.

### 1.1.7.2 V/f (scalar) control

V/f (scalar) control is still the preferred choice for most applications for its simplicity and robustness. Since the 3.000 firmware version, there are new identification modes for easy initial setup of the scalar control. If necessary, it is possible to skip them.

**V/f ident. full** - After entering the START command after 5-20 seconds, the motor accelerates to 25Hz, in the desired direction, then it stops automatically. The START command must be entered manually according to the actual settings. This identification responds to the STOP command, so you can always turn it off.

**V/f ident. standstill** – Identification will start immediately. Motor will not rotate, only the Stator resistance [345] and Starting voltage [90] will be set.

Wizard offers a choice between the longer identification (full) and shorter DC test (standstill).

**Recommendation:** If you are able to make the full identification, it is recommended to do so.

### 1.1.7.3 Drive dynamics (common for V/f and vector control)

After the control is set, the wizard offers setting the frequency ramps and voltage and current limits.

Parameters *Min. frequency* [110], *Max. frequency* [111], *Ramp-up 1 time* [116] and *Ramp-down 1 time* [118] determine the frequency range and dynamics - acceleration and deceleration.

Parameters as *Max. mot. current* [5] and *Max. regen. current* [549] define the limits of the motor current in different operating modes. The parameter *Max. voltage* [495] is used to change the maximum voltage on the motor if there is sufficient DC voltage. *Switching frequency* [6] is the frequency of PWM - transistor switching.

These parameters are further described in the “CONFIGURATION AND DIAGNOSTICS FOR UNIFREM FREQUENCY CONVERTERS” document”.

These parameters create the last screen of the wizard, it exits the wizard. Afterwards, the drive can be configured and tuned the standard way.