UNIFREM 400

110 - 630 kW

UNIFREM 400 is the last generation of frequency converters family. These converters are designed for motors rated from 110kW to 630kW and supply voltage of 400 V. All UNIFREM converters allow vector control - speed or torque and high performance scalar (V/f) control with slip compensation and many other features. They are designed to solve any drive problem in the most cutting-edge applications. The family is specific by its user-friendly settings and control, users are guided by the graphic control panel (UNIPANEL). The last generation of power electronics (SEMiX,SEMIKRON SkiiP®) has been used for minimiza- tion of losses. Grid disturbance is kept to a minimum.

Features and advantages of UNIFREM 400

High resistance against failures

UNIFREM standardly includes protection against overvoltage, undervoltage, current overloading of converter, short circuit between input phases and overheating. Input and output phase loss is detected as well. Overheating of motor is suppressed by calculating the heat integral of the motor. Dimensioning of power electronics is made with respect to long durability of the device.

Minimal disturbance to the supply power grid

Built-in three phase input commutation chokes are lowering the harmonic distortion (EN 61800-3). Standard using of noise suppressing filters ensures minimal disturbance to the power grid (EN 61000-6-4).

Minimal losses

Using of 3rd generation of SEMIKRON SkiiP® power electronics has lowered and minimalized converter losses and power grid disturbance.

Smaller dimensions

By using power optimized heat sink together with improved heat-transfer-targeted placement of power components smaller dimensions have been achieved.

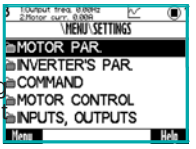
High reliability

Besides the newest power electronics components, last generation power capacitors with extended operating temperature and lifetime by 20% have been used. The cooling fans with high-quality bearings ensure longer lifetime and lower noise level.

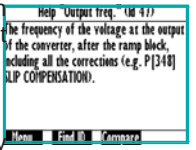
Software

- Vector control - using mechanical sensor or sensorless - torque, speed, position control
- Offline and online motor parameter identification
- Intelligent scalar V/f control (automatic V/f curve, slip compensation, resonance damping...)
- Extended system of position sensor feedback for improved speed and position control
- V/f control current limiting (motoring, regenerative)
- Kinetic backup of short supply power failures
- Flying start
- 3 brake modes (brake module, flux braking, dynamic stop)
- Programmable universal optimization (for example: minimization of power, maximization of torque...)
- Process PID controller (various action variables ...)
- Universal and fully configurable system of inputs and outputs
- User macros
- Communication protocols: CANopen, MODBUS, PROFIBUS
- 16 logic customizable blocks, (AND, OR, NAND, NOR, XOR, RS flip-flop)
- 16 numeric customizable blocks (addition, subtraction, multiplication, division...)
- 4 multifunctional proximity switches (track, direction, ...)
- Relay with adjustable on and off delay time
- Crane functions
- Parameter management, 4 sets of parameters, independent, switchable on the fly
- Events and faults history - Configurable history of faults, warnings and other events. Stores up to 1000 items (black box)

Control

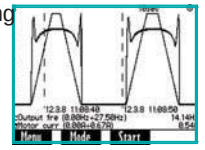


- Interactive communication with converter using UNIPANEL
- Hierarchical structure of parameters allows easier configuration and watching mutual dependencies among different parameters
- Access to the parameters, configuration and control is possible in several different independent ways (UNIPANEL, MODBUS RTU, PROFIBUS DP…)



Communication with the operator

- Inteligent user interface designed for easy configuration and reliable diagnostic using Unipanel.



User macros - preset configurations:

- for catalogue types of motors
- for standard schemas of control (manual control, PID, ...)
- for basic kinds of load control (crane - lifting, pump, fan, conveyor...)

VONSCH Drive Studio

Application for configuration, diagnostics and archivation of settings to PC. It allows: firmware upgrading, process diagnostic "black box" data. Diagnostics of faults, events, providing help to the operator to solve the problems and avoid the next ones.

Built-in features:

Three phase commutation choke

Minimization of high harmonic currents from the power grid. (EN 61800-3)

Noise suppresing filter

Eliminates disturbance to the power grid. (EN 61000-6-4)

Brake module

Electronics for brake resistor control used in regenerative mode of operation

Options

Motor (output) choke MT1
Required for long distances between the converter and the motor. The effect of cable capacity is eliminated by installation of motor choke or sine filter.

Sine filter SF1

Brake resistor BO1
Ensures dissipation of kinetic energy in the regenerative mode of motor operation.

PROFIBUS DP extension module
Connection to Profibus DP network, allowing maximum speed of 12Mbit/s.

Encoder extension module
Designed for connecting the 24V push-pull incremental encoder to frequency converter allowing high-performance control.

Manual control panel – UNIPANEL
UNIPANEL is universal handheld control device for all last generation products made by VONSCH.

TECHNICAL DATA

Variable load (pump, fan):	
P_{nom}	recommended maximum motor power connectable to the converter's output
I_{NQ}	nominal output current for variable load

Constant load:	
I_{NK}	nominal output current of the converter for constant load
I_{NK60}	nominal output current of the converter that is equaled 1,5 x I_{NK} for the duration of 60 s each 10 min
I_{NK2}	maximum output current of the converter that is equaled 1,75 x I_{NK} for the duration of 2 s each 15 s

Converter evaluates the overloading from the current. At the I_{NK60} current the overloading is generated in 60 s. By increasing the current the overloading time is reduced up to 2 s at I_{NK2}.

Type of the converter	M ~ variable load		M ~ constant load			
			Nominal values		Maximal values	
	Motor output rating P_{nom} [kW]	Nominal output current I_{NQ} [A]	Motor output rating P_{nom} [kW]	Nominal output current I_{NK} [A]	Maximum output current I_{NK60} [A]	Maximum. output current I_{NK2} [A]
UNIFREM 400 110	110	216	90	176	264	308
UNIFREM 400 132	132	260	110	216	324	378
UNIFREM 400 160	160	315	132	260	390	455
UNIFREM 400 200	200	390	160	315	472	551

Type of the converter	Motor output rating P_{nom} [kW]	Nominal output current of the converter I_{NQ} [A]
UNIFREM 400 250	250	490
UNIFREM 400 315	315	580
UNIFREM 400 400	400	710
UNIFREM 400 500	500	880
UNIFREM 400 630	630	1150

Type of the converter	height [mm]	width [mm]	depth [mm]
UNIFREM 400 110 ÷ 132	1125	430	330
UNIFREM 400 160 ÷ 200	1425	430	330
UNIFREM 400 250 ÷ 315	1800	1000	600
UNIFREM 400 400	1800	1200	600
UNIFREM 400 500 ÷ 630	2000	2000	800

Drives rated 250 kW or higher are determined for variable load only, or for constant load without overloading (maximum allowed permanent current overload 5% of In).

General technical data

Input voltage range:	3 x 380 - 415 V ± 10%
Input frequency:	47 to 63 Hz
Output voltage range:	3 x 0 to 100% of input voltage
Efficiency of the converter:	more than 98,5 %
Analog inputs:	4 programmable analog inputs (Options: 0 ÷ 20 mA , 4 ÷ 20 mA , 0 ÷ 10 V , 2 ÷ 10 V)
Digital inputs:	6 digital programmable inputs 1 digital safety input EN 13849-1 class 3 software adjusted control voltage (+24 V or 0V)
Digital outputs:	3 programmable relay outputs
Analog outputs:	3 analog programmable outputs 0 ÷ 20 mA or 4 ÷ 20 mA
Starting motor torque:	up to 200 % of rated torque (depends on the type of the motor)
Electronic protection against:	overcurrent, overvoltage, undervoltage, short circuit protection, ground fault protection, converter overtemperature, motor overtemperature
Cooling:	forced air cooling by built-in fan
Electromagnetic compatibility (EMC):	built-in RFI filter of category B according to EN 61000-6-4
Elimination of higher harmonic components of voltages and currents	built-in three phase choke lowers harmonic currents, extends lifetime of power capacitors, protects converter against voltage peaks EN 61800-3
Permissible ambient temperature during operation:	+1 °C to +40 °C (EN 50178)
Degree of protection:	IP 20 or up to IP55 (option)