Frequency inverters

1~ Fcontrol, universal controller with display and bypass main switch

The Fcontrol frequency inverters provide special advantages. Fcontrols have an all pole effective sine filter integrated which provides sinusoidal output voltage that is comparable with the standard mains. That means the frequency inverter enables reliable, demand-oriented and energy-saving control of asynchronous motors (external rotor motors, IEC standard motors) without having to take measures into consideration required by standard frequency inverters.

The advantages provided by the Fcontrol frequency inverter are:
- Operation without shielded motor feed lines
- The line length is not restricted by Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No risk to motors (they do not have to be frequency inverter compatible) since they are supplied with sinusoidal voltage that corresponds to the line voltage.

The benefits are especially advantageous in plants in which motors or fans are operated in parallel on a frequency inverter. Motors connected in parallel often means long cable lengths which is no problem with the Fcontrol. On top of that, unshielded cables can be used.

The Fcontrol universal devices are ideal for the following applications: refrigeration, air conditioning, agriculture, general air supply and ventilation tasks, clean room technology.
Fast commissioning for typical applications in the stated sectors by selecting pre-programmed operating modes possible.

Input for sensors or speed settings through

0-10V — Setting of the desired speed through device or by external default, e.g. 0…10 V

0-30 0-50 bar — Connecting pressure sensors (refrigeration), e.g. type MBG.. sensors, measuring range 0...30 bar, 0...50 bar

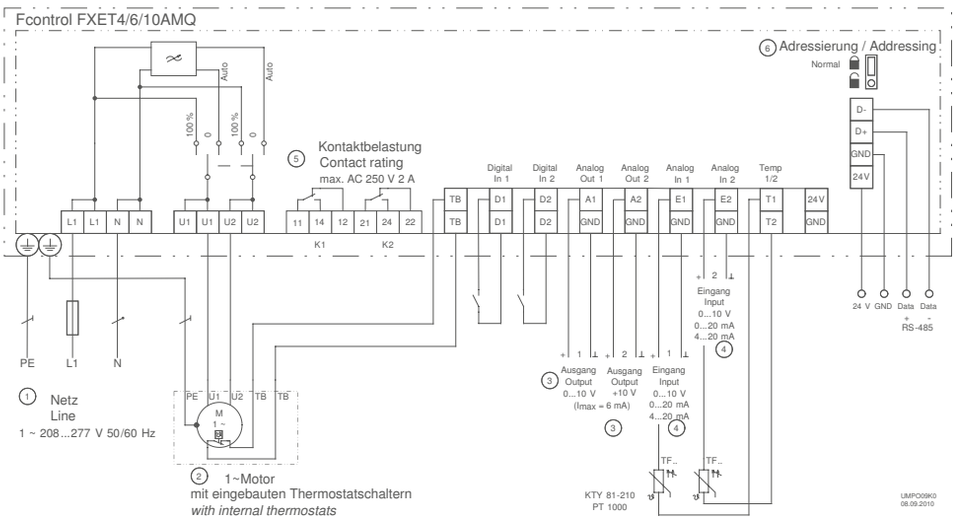
°C — Connection of thermistors, e. g. sensors type TF.. e. g. active sensor type MTG..

△Pa — Connecting differential pressure sensors (air conditioning), e.g. type MPG.. sensors, measuring range 0...6000 Pa, acquisition of volume flows up to 65000 m³/h

m / s — Connecting air velocity sensors, e.g. type MAL.. sensors, measuring range 0...1 m/s, 0...10 m/s

CO_2 % °C — Connecting additional sensors, e.g. combination sensors, CO_2, sensor signal 0...10 V / 0...20 mA / 4...20 mA

Connection diagram



① Line
② 1~ Motor with integrated thermostats
③ Output
④ Input
⑤ Contact rating
⑥ Addressing

Standard conformity

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment/properties

Integrated all-pole effective sine filter
Phase to phase and phase to PE conductor. Thus sinusoidal output voltage. Frequency inverter typical measures such as shielded motor cables are not necessary**.**

Integrated PFC (Power Factor Controller)
Active power factor adaptation for sinusoidal current consumption. Therefore low line feedback.

Integrated main switch with bypass function
Switch positions: Auto (for control mode), 0 and 100 % (100 % means that the integrated device electronics are bypassed, the applied line voltage is switched to the output).

LC multifunction display with clear text display:
Different menu languages are selectable

Simple commissioning by operating modes:
Typical operating modes, e.g. for air conditioning, refrigeration or ventilation technology can be selected.

Simple programmability:
Typical settings can be made easily: e.g. setting of a minimum speed, limitation of the maximum speed, inversions and limits. Setting, e.g. for multistep mode

2 analog inputs for sensors or setting signals:
Analog input E1 and E2: Setting by operating modes or manually programmable, e.g. 0-10 V, 0-20 mA, 4-20 mA
analog input E2: programmable, e.g. comparison with sensor 1, difference to sensor 1, average value formation, setpoint setting, setpoint adaptation (e.g. outside temperature-dependent)

2 digital inputs D1 and D2:
Programmable, e.g. enable, setpoint switchover 1 or 2, switchover control or manual mode, switchover E1 or E2, control function reversal, output limitation, display of external fault, reset, direction of rotation reversal

1 analog output A1:
Setting by operating modes or manually programmable, e.g. output signal proportional to modulation, output signal proportional to input signal, invertible, 10 V constant voltage, group control

2 digital outputs (relays) K1 and K2:
Setting by operating modes or manually programmable, e.g. operating indication, fault indication, limits, external fault at digital output, activation of external devices, e.g. heating, shutters, group control fans, etc.

Integrated motor protection function:
Connection possibility for thermostats TB

Interface RS485 MODBUS RTU:
Integration into bus system

Set protection / memory for settings:
Activation of set protection against unauthorised access, restoration of made settings

Event memory:
Querying of occurred events, operating times, etc.

Fcontrol, universal controller with display and bypass main switch
1~ 208...277V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
FXET4AMQ	308134	230	4	35	16	65	55	IP54	3.40	240 x 284 x 132
FXET6AMQ	308157		6	40	16	103	55		5.70	250 x 302 x 212
FXET10AMQ	308136		10	50	16	187	55		6.80	250 x 302 x 212

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Frequency inverters

1~ Fcontrol, temperature controller with display and bypass main switch

The 1~ Fcontrol frequency inverters with all-pole effective sine filter are available in the version as a temperature control unit. A TFR type temperature sensor (room temperature sensor IP54) is contained in the scope of supply. The frequency inverters control asynchronous motors (external rotor motors, IEC standard motors) gently, requirement-based and energy saving.

Advantages achieved by Fcontrol frequency inverters are:
- High energy saving
- Operation without shielded motor cables
- The cable length is not limited by the Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No danger to motors (these must not be suitable for frequency inverters) because they are supplied with sinusoidal voltage according to the mains voltage.

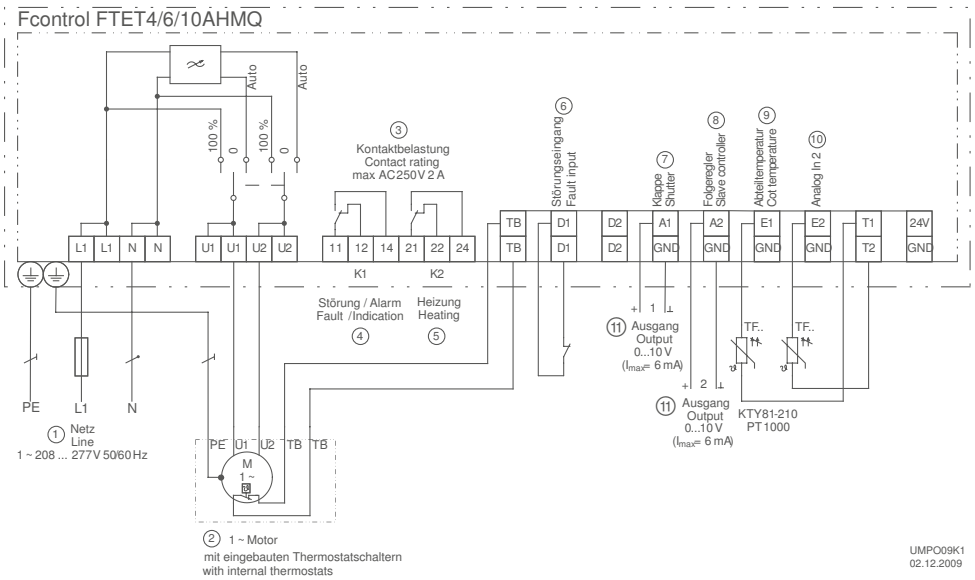
The 1~ Fcontrol temperature control units are especially suitable for the following applications: Agriculture, general ventilation tasks. Fast commissioning is possible by presetting the devices including the integrated inputs and outputs.

Input for sensors or speed settings through

°C

Connecting temperature sensors,
sensor for input 1, type TFR included in scope of supply
Sensor for input 2, optional

Connection diagram



① Line
② 1~ Motor with integrated thermostats
③ Contact rating
④ Fault/Alarm
⑤ Heating
⑥ Fault input
⑦ Shutter
⑧ Slave controlle
⑨ Compartment temperaturer
⑩ Analogue In 2
⑪ Output

Equipment/properties

Integrated all-pole effective sine filter
Phase to phase and phase to PE conductor. Thus sinusoidal output voltage. Frequency inverter-typical measures such as shielded motor cables are not necessary.

Integrated PFC (Power Factor Controller)
Active power factor adaptation for sinusoidal current consumption. Therefore low line feedback.

Integrated main switch with bypass function
Switch positions: Auto (for control operation), 0 and 100 % (100 % means that the integrated device electronics are bypassed, the applied mains voltage is switched to the output)

LC multifunction display with clear text display
Different menu languages can be selected

Easy to program
Setpoint range 0-40 °C. Setting of a minimum speed, limiting of the maximum speed. Alarm on exceeding or dropping below measured temperature values. Second control circuit with separate settings for 0-10 V output, e.g. control of a ventilation damper, etc. Separate adjustability of relay K2, for controlling a heater for example.

2 analogue inputs for temperature sensors
A TFR room temperature sensor in IP54 is included in the scope of supply. A second sensor, for example for measuring the supply air temperature, can be connected optionally.

1 digital input
Input D1 switch an external fault

2 digital outputs (relays) K1 and K2
Relay K1: Fault message relay, overtemperature or undertemperature alarm. Relay K2: Control of a heater, e.g.

Integrated motor protection function
Connection possibility for thermostat “TB”

Memory for settings
Restore saved settings

Event memory
For minimum and maximum temperature values, alarms

Fcontrol, temperature controller with display and bypass main switch
1~ 208...277V 50/60Hz

Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
		V	A	°C	A	W	°C		kg	mm
FTET4AHMQ	308131	230	4	35	16	65	55	IP54	3.40	240 x 284 x 132
FTET6AHMQ	308132		6	40	16	103	55		5.70	250 x 302 x 212
FTET10AH-MQ	308133		10	50	16	187	55		6.80	250 x 302 x 212

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

Frequency inverters

1~ Fcontrol, speed controller optional with bypass main switch

The 1~ Fcontrol frequency inverters with all-pole effective sine filter are available in the version as speed controllers. There is an optional version with integrated main switch (Auto – 0 – 100%).

The speed setting can be made by a master control by 0 – 10 V, e.g. by a ZIEHL-ABEGG control module of the UNIcon series. The speed can also be set manually by connecting a potentiometer. Two-stage operation with adjustable speeds is possible optionally. The frequency inverters control asynchronous motors (external rotor motors, IEC standard motors) gently, requirement-based and energy saving.

Advantages achieved by Fcontrol frequency inverters are:
- High energy saving
- Operation without shielded motor cables
- The cable length is not limited by the Fcontrol
- Operation without electromagnetic motor noises (ideal for noise sensitive areas)
- No danger to motors (these must not be suitable for frequency inverters) because they are supplied with sinusoidal voltage according to the mains voltage.

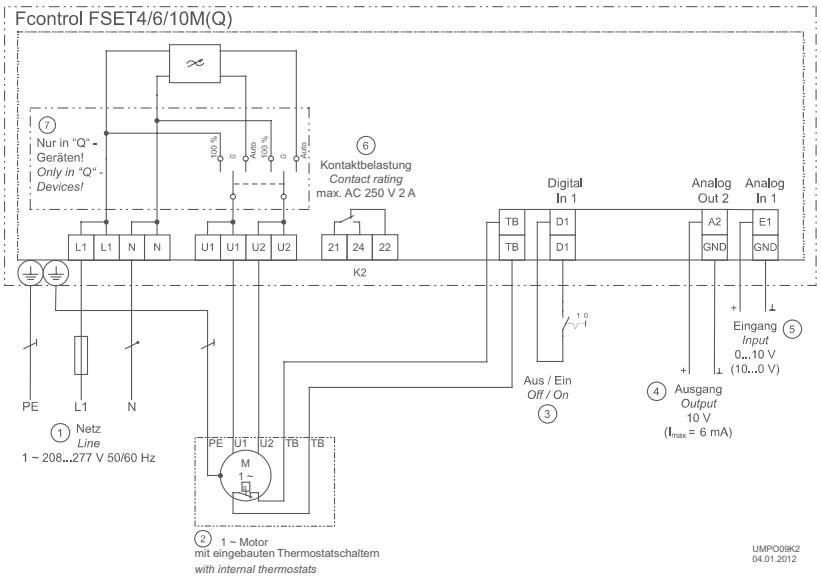
The 1~ Fcontrol speed controllers are universally suitable for many different applications: E.g. refrigerant technology, air conditioning, agriculture, general ventilation tasks, clean room technology.

Input for sensors or speed settings through

0-10V

Setting of the desired speed through device or by external default, e.g. 0...10 V

Connection diagram



① Line
② 1~ Motor with integrated thermostats
③ Off/On
④ Output
⑤ Input
⑥ Contact rating
⑦ Only in "Q"-Devices

Interference emission according to EN 61000-6-3 (domestic)
Interference immunity according to EN 61000-6-2 (industrial)

Equipment / Characteristics

Integrated all pole effective sine filter
Phase to phase and phase to grounded conductor thus producing sinusoidal output voltage. Typical measures for frequency inverters such as shielded motor feeder cables are not necessary.

Integrated PFC (Power Factor Controller)
Active power factor adaptation for sinusoidal current consumption, resulting in lower harmonic current emissions.

1 analogue input for speed preset
Input E1 for 0-10 V setpoint signal or 10-0 V depending on device version

1 digital input
Input D1 for enable (standby), for external reset (motor fault)

1 digital output (relay)
Floating change-over contact for error message

Integrated motor protection function
Connection facility for “”TB” thermostat”

Devices with integrated bypass main switch
Switch positions:
Auto (for speed control mode), 0 and 100% (100% = the integrated device electronics are bypassed, the applied line voltage is switched to the output)

Fcontrol as speed controller
1~ 208...277V 50/60Hz

Input	Type	Article no.	Rated voltage	Rated current	Rated temperature	Max. line fuse	Max. heat dissipation	Maximum ambient temperature	Protection class	Weight	Dimensions (W x H x D)
			V	A	°C	A	W	°C		kg	mm
0-10 V	FSET4M	308128	230	4	35	16	65	55	IP54	3.20	240 x 284 x 115
	FSET6M	308156		6	40	16	103	55		5.50	250 x 302 x 195.5
	FSET10M	308130		10	50	16	187	55		6.60	250 x 302 x 195.5
	FSET4MQ	308154		4	35	16	65	55		3.30	240 x 284 x 132
	FSET6MQ	308155		6	40	16	103	55		5.60	250 x 302 x 212
	FSET10MQ	308187		10	50	16	187	55		6.70	250 x 302 x 212
10-0 V	FSET4M	308158		4	35	16	65	55		3.20	240 x 284 x 115
	FSET6M	308159		6	40	16	103	55		5.50	250 x 302 x 195.5
	FSET10M	308160		10	50	16	187	55		6.60	250 x 302 x 195.5

Devices with a rated temperature below 55 °C can be used up to 55 °C with a reduction in performance.

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