

Operation Manual

drive  [®]
tron
frequency changer

FU0XX

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2) Introduction

`drivetron' frequency changer are employed for the infinitely variable speed control from threephase asynchronous motors. They are drive components for various machines and facilities. Before starting it you have to regard the operation manual from the manufacturer. To reach a optimum drive function the frequency changer are manifold digital parameterizable. All necessary adjustments are made by the manufacturer. You are not allowed to change the adjustments because faulty functions or drive defects can be the consequences. The accessory electro installations are not allowed to be changed as well. Changes can have the consequences that the accessory CE - guidelines for electromagnetic tolerance cannot be observed.

The following specification gives some information how to identify errors and for the professional replacement of the edition F0XX.

***** Safety information *****

Out of personal safety reasons the installation works as well as the connecting or the pulling off the parameterization machine with an open cabinet are just allowed to be made with a disconnected power source.

The intermediate circuit electrolytic capacitor conducts the voltage within 2 minutes after the disconnection of the power input source. This time must be waited until you can open the cabinet.

During the installation of the protective conductor the guidelines for devices with raised leakage current (>1,5mA) have to be observed.

3) Specifications

3.1 Common information about FU0XX and FU1XX

input voltage:	230V -15% +10%, 50/60Hz
output voltage:	3 x 0..1xUNetz
fan-out current overload capacity:	150%, 200% to 20ms, #1
motor frequency:	1..250Hz
frequency stability:	0,2% from setting
operation temperature:	-10..+45<@176>C
relative atmospheric humidity:	<< 90%
dimensions:	H x B x T = 200x 60 x 110
analogous drive voltage S1:	+0..5V, +0..10V or +0..20mA
digital drive voltage AUS:	+0..1,5V
digital drive voltage EIN:	+5..32V
digital output voltage extern:	~12V
digital output current max.:	100mA

#1:

With sufficient cooling the 1,5-time overload capacity can be used in continuous operation. The short term double overload capacity serves for the cushion from load surges and for the use from big sudden accelerations.

3.2 Fuse machine list:

The production of safety fuse elements is an indication that some operation sectors have been exceeded.

The improper replacement of fuse elements can lead to damages in the frequency changer. Please just replace fuse elements with the declared values.

Frequency changer of the edition FU0XX are equipped with safety fuse elements in the size 5 x 20.

Type/rated power		SI 1
FU001	110W	2AF
FU0018	180W	2AF
FU002	250W	3,15AF
FU003	370W	4AF
FU003/005	370W	4AF
FU005	550W	5AF
FU005/007	550W	5AF
FU007	750W	6,3AF
FU007/011	750W	6,3AF
FU011	1100W	8AF
FU011/015	1100W	8AF
FU011/022	1100W	10AF

4) Analogous and digital drive input and output

4.1 Analogous drive input

The analogous input S1 serves for the primary election of the motor r.p.m. (revolutions per minute) which can be adjusted dependent on the digital parameterization within the bounds of 1..500Hz. The analogous input S2 and S3 on frequency changer of the edition FU0XX are switched to internal trimming potentiometer and they are not accessible by connection terminals. Through trimming potentiometers the digital parametered acceleration within the bounds of 4..250Hz/s as well as the current limit within the bounds of 50%..150% can be overmodulated.

For S1 counts: 0V corresponds to the primary adjusted minimum frequency, +5V corresponds to the primary adjusted maximum frequency. Dependent on the carrying out the input sectors 10V, +24V or +20mA are also possible.

You may also use an potential distributor potentiometer (10kR) for the r.p.m. precondition on S1 instead of an external voltage. For the drive through the potentiometer you can use the reference voltage from the terminal 0V and terminal +5V. The flexible lines of the potentiometer >20cm shall be laid protected. You can use the +5V-connection for the supply of the digital inputs by potential-free contacts as well. Therefore it must be guaranteed that no strange voltage is transmitted to the +5V-terminal. The supply from foreign consumers between 0V and +5V of the frequency changer is not permissible.

4.2 Digital inputs

All digital inputs can be operated with an internal voltage of +5V or with an external voltage of +5..+32V; in this case $0..+1,5V = AUS$ and $+5..+32V = EIN$. The reference potential of external voltage sources which are not connected with earth potential can be connected with the 0V-terminal of the frequency changer. If great potential leaps are expected between earth potential (PE) of the frequency changer and PE of the control voltage, you have to lay a potential compensation line.

4.3 Input functions of the digital frequency changer inputs

a) Input VOR:

Motor will be turned on in forward direction.

b) Input RÜCK:

Motor will be turned on in backward direction.

c) Input VOR and RÜCK at the same time:

Same function as **VOR** and **RÜCK = AUS**; it will be used the second parameterizable delaying ramp and the motor will be stopped by the direct voltage in a standstill. The stopping direct voltage is separately parameterizable.

d) Input RFR:

Release of the power outage stage. If the input is turned off, there is no voltage on the motor. The inputs VOR and RÜCK are ineffective. When you switch it off during the motor drive is working then will follow a non-slow down run-out of the motor.

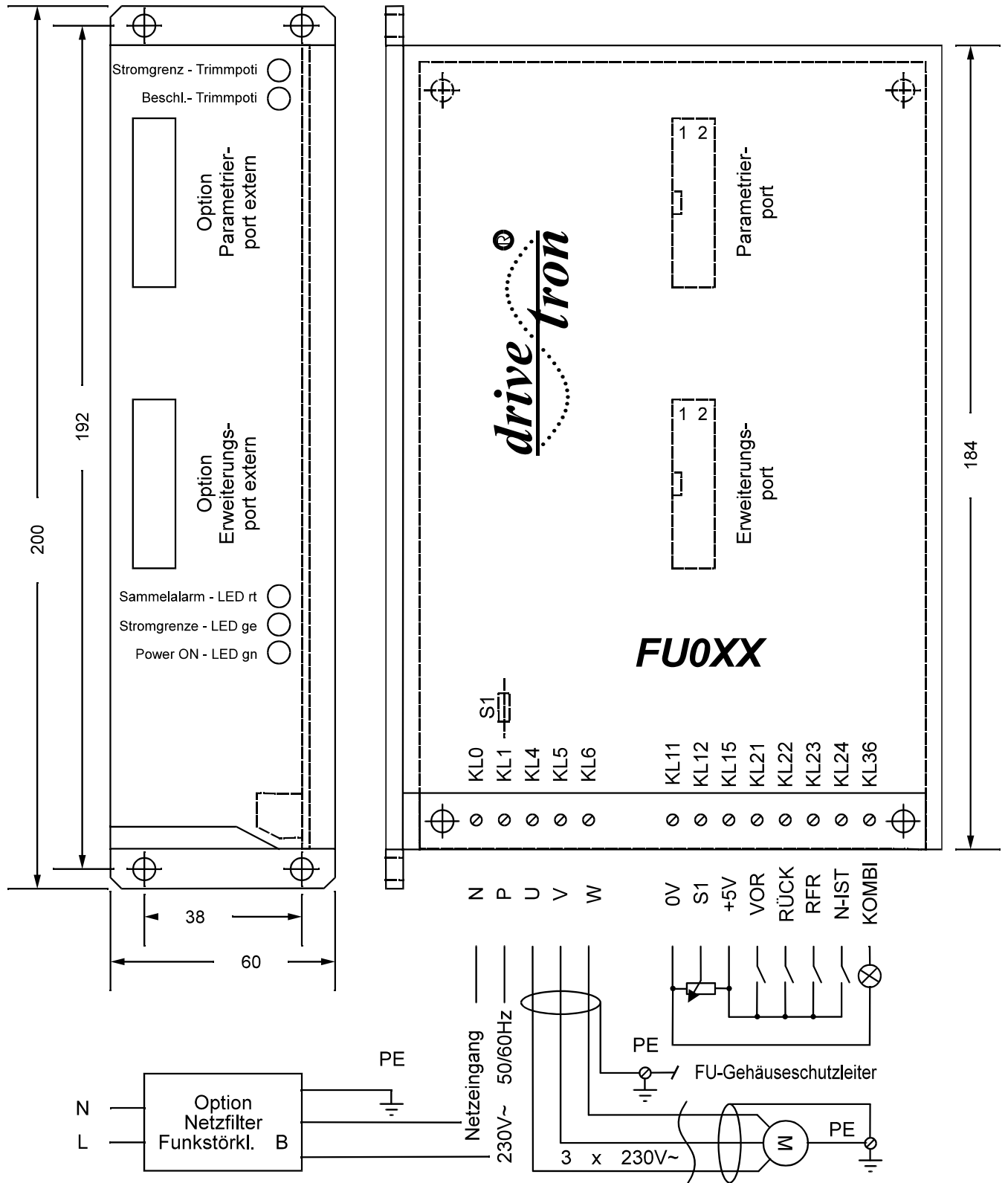
e) Input N-IST:

For drives with constant r.p.m. there can be made a cheap compensation by leading an actual impulse frequency back.

The impulse length which is led back has to lie in the sector between min.1ms and max.1s. The recognition and the evaluation will happen automatically with an average reaction time. This relates to 1 impulse/revolution for a two-terminal motor. For other r.p.m.'s, there is a terminal divisor factor about 1..120 adjustable.

In many cases there can be replaced an expensive reluctance - or synchronous motor by an asynchronous motor because of the slip compensation.

5) Connecting availability table



6) Error identification / error elimination

`drivetron' frequency changer got extensive device protection functions. If a breakdown arises, the motor voltages U,V,W will be cut off (this does not apply to adjustable motor current restrictions).

Dependent on the type of the error, it will follow a new starting procedure after the error run-out pause or the frequency changer will stay turned off. The defect state will be indicated in any case by a red generic alarm-LED. Furthermore the kind of the defect will be represented by a single report of the defect which will just be indicated optional. The means of the operation- and defect indications are:

a) IN GOOD WORKING CONDITION, LED green

The LED flashes as soon as the input main voltage is set on. If it stays dark, you have to check the input main voltage as well as the safety fuse elements. Fuse elements pursuant to point 3.2), fuse machine list.

b) CURRENT RESTRICTION, LED amber

This will start pursuant parameter number 9 at 50..150% of the motor current with a time constant about 50ms. The motor frequency and the voltage will be postponed till the adjusted current limit will be fallen short of. This function is not going to sound the generic alarm.

c) FALSE CURRENT, LED red or input KOMBI

Indicator for a motor current which is too high. When the motor current rises to circa the double of the rated current, the motor voltage will be turned off then. The function will sound the generic alarm. It just can be cancelled by the turn off and the turn on of the power supply or by the combination VOR = EIN, RÜCK = EIN and RFR = AUS .

Causes could be: a big motor peak current consumption because of a motor blockade, end of the winding short circuit in the motor winding, the start acceleration is too big, motor with a too big rated output, short circuit or ground to earth of the motor flexible line. Please check first your installation on short circuit or on ground to earth. The heavy short circuits which are caused by yourself can lead to a destruction of the power outage stage in case of repetition.

d) OVERHEATED TEMPERATURE or output KOMBI

Indicator for an overheated temperature of the power outage stage. The monitoring of the temperature is just included in frequency changer with the option 'temperature-monitoring'. The temperature limit is about 70°C on the bottom of the frequency changer. This function will turn off the motor voltage. After the temperature dropped it will follow a new motor start. The function will sound the generic alarm.

Causes could be: operation with a high temperature of the environment, operation at the upper power limit with insufficient heat diversion, temperature accumulation because of the installation in a closed cabinet.

Remedies are for example: installations with heat diversion or air-conditioning of the cabinets if the temperature of the environment is about >45°C. Please regard especially for frequency changer without 'temperature-monitoring' the maximum temperature of about 70°C; this temperature has to be taken on the outside of the frequency changer bottom at the warmest point.