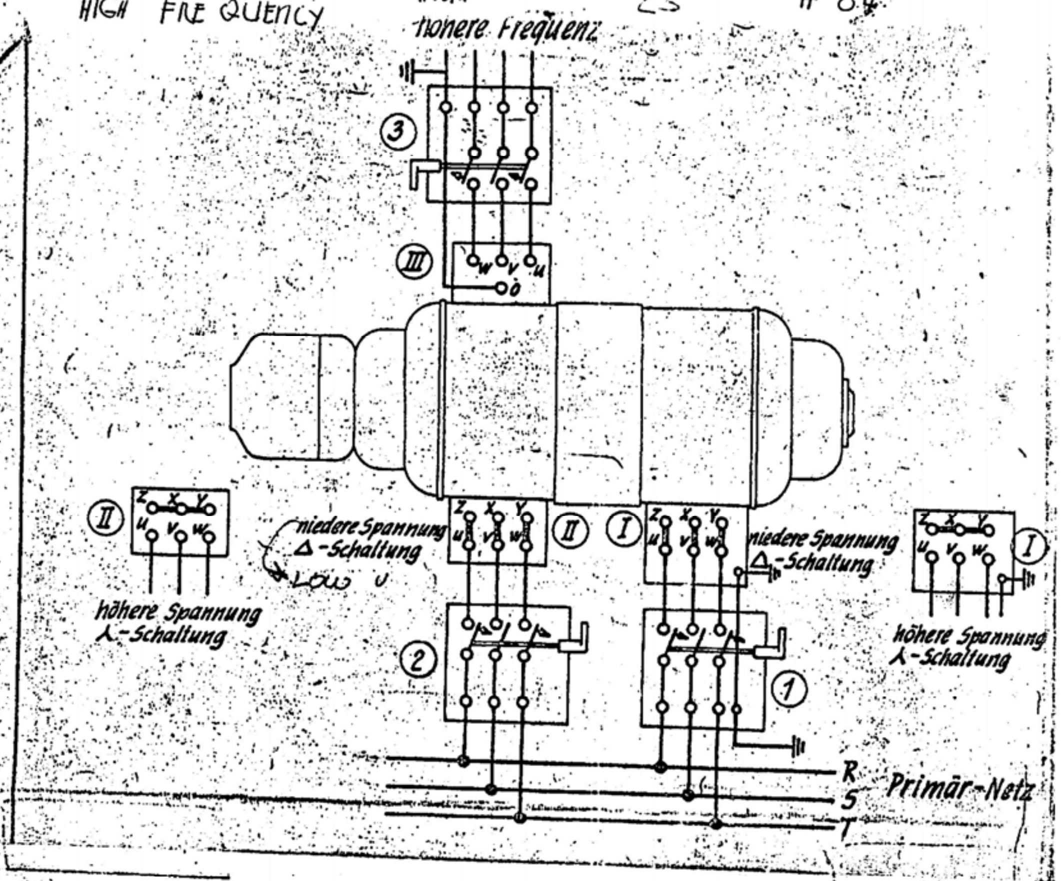
HIGH FREQUENCY 23 # 84



OPERATING PROCEDURE

1.) Switch on switch 1.
2.) Mark direction of rotation with chalk,
3.) Switch off switch 1 and wait for rotor to come to a stop.
4.) Shortcircuit terminals UVW on the High Frequency outlet (Terminal block 111) with a wire having a diameter of not less than 1.5 m.m.
5.) Switch on switch 2 (Generator excitation). The rotor must now turn in the opposite direction as determined in paragraph 2 above. If this is not the case, swop two of the connections on the supply end of switch 2.
6.) Switch off switch 2.
7.) Remove the shortcircuit connection from the HF Terminal block 111.

5-367a

Blatt 1

Schaltschema [illegible] Inbetriebsetzungsvorschrift
für [illegible] Type PUv 192/191 [illegible]
[illegible]

THE UNIT IS NOW READY FOR USE

To operate switch on in the following sequence

1.) Switch 1 (Drive motor)

2.) Switch 2 (Generator excitation)

3.) Switch 3 if fitted. (HF outlet)

It is recommended, that suitable overload protection switches are fitted to the supply line of the drive motor and generator excitation. The correct switches can be determined from the information given on the metal plates stating the relevant voltage and current values. On the HF side, only protection switches of the bi-metal type may be used as magnetic types are not suitable for the voltage and cycle rating.

It is advisable to check the condition of the brushes and slip rings periodically in order to ensure continuity of operation. The bearings are pre lubricated and require servicing every 3,000 hours of operation.

S-367a

Schaltschema und Inbetriebnahme für [illegible] Type [illegible]

180/L/180 M

O P E R A T I N G I N S T R U C T I O N S

THREE -PHASE FREQUENCY CONVERTERS

These instructions should preferably be fixed somewhere near the Converter so that they are always handy if any queries should arise. When enquiring or ordering spares, it is essential to quote the following designation Numbers of the Converter in question.

- Manufacturer's type number (stamped on name plate)
- Bosch Order Number (stamped on the narrow additional plate)

1. INSTALLATION

The Converter is to be installed in a clean, well ventilated and dry place. Contamination caused by metal grinding dust should be avoided as far as possible, therefore the Changer is preferably mounted on a wall bracket above the workshop floor, rather than placed directly on the ground. The smaller type Frequency Changers are provided with rubber blocks on the feet and do not require any other resilient fixing elements; for the larger types however, it is recommended that some elastic material e.g. rubber cork etc., is placed underneath the mounting feet.

Please note, in order to avoid unnecessary stress to the converter housing the fixing screws must not be tightened excessively.

2. GENERAL DESCRIPTION

The Frequency Converter basically consists of a 3-phase induction motor and an asynchronous generator, normally incorporated in a common housing. The motor is connected to the 50 cycles 3-phase mains supply and drives the Generator at the required speed for the Frequency conversion. The Generator is excited by its stator field which is also energised by the 3-phase mains supply. The output current of increased frequency is induced in the rotor of the generator and is led to the output terminals through slip rings and brushes.

3. WIRING DIAGRAMS

Fig. 1

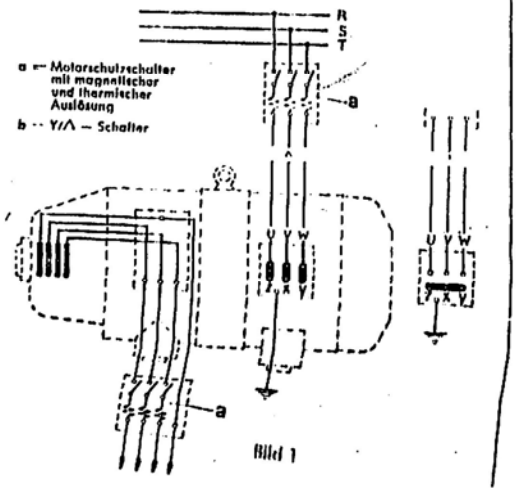
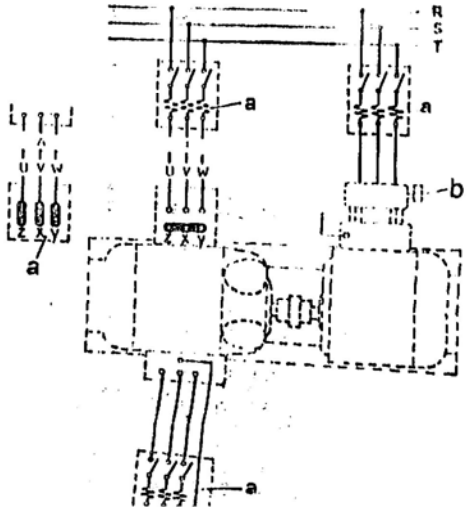


Fig. 2



a = Motor Protection Switch with magnetic and thermal release
b = Star-delta Starter Switch
c = Protector for 200 or 300 cycles, if possible with magnetic tripping.

Diagram Fig. 1 represents the wiring diagram of an enclosed type Frequency Changer with surface cooling. The winding ends of both driving motor and exciter field of the generator are internally connected to a common terminal board. This type of converter features only two terminal boxes, one for input off the mains supply and the other one for the H.F. output.

The input switch can be either a direct switch or a star-delta switch but in any case the switch must incorporate a suitable motor protection switch provided with magnetic and thermal release, which is capable of handling the motor current plus exciter current of the appropriate Converter. The question whether to employ a direct of a star-delta switch depends on maximum permissible direct starting current specified by the local Electricity Board.

Details of Motor Protection Switches are given at the end of the next paragraph.

Fig. 2 shows the wiring diagram of a Converter with independent terminal boxes for Motor and Generator excitation. As indicated in the diagram, both input circuits should be independently pro= tected by suitable motor protection switches with thermal and magnetic tripping. To prevent heavy starting current surges in the mains, the motor should be started by a star-delta switch; the exciter field however, can be switched On by a direct-On- switch. The converter is to be connected to the output network by means of a 3-phase switch. In order to protect the generator from short circuits and heavy overloadings, the H.F. output side should be sufficiently protected either by fuses or a protection switch. For this application it is recommended that a protector with thermal release only be employed, as this system is not influenced by the increased frequency. In the event of using a protector with magnetic and thermal release, the magnetic tripping element must be designed to match the appropriate output frequency (200 or 300 c/s).

4. CONNECTING TO THE MAINS

a) Converter according to Wiring Diagram Fig. 1

Check existing mains voltage with the voltage stated on the type plate of the converter.
(Our Converters are generally wound for 420 volts input in delta connection.)

The links in the input terminal box are to be arranged in the manner specified on the type plate. (Normally delta connection for 420V.) The above operation is only necessary if the converter is operated by a direct switch. In the case of using a star-delta starting switch, the links are to be left out as the appropriate connections are performed by the switch.

The earth connection is to be carried out according to the local regulations.

3/...

Overload protectors are to be adjusted to the nominal current ratings specified on the type plate.
Please note: On Converters according to Wiring Diagram Fig. 1 the nominal current rating to be adjusted consists of the total of motor current plus exciter current. The nominal exciter current is signified on the type plate by the abbreviation "Err".

Check that all terminal screws are securely tightened.

b) Converters according to Wiring Diagram Fig. 2

Compare existing mains voltage with the voltage stated on type plate of the Converter. (Our Converters are usually wound for 420V input in delta connection.)

The motor terminals are to be connected to the star-delta switch.

Arrange the links in the exciter terminal box to establish the delta or star connection requested on the type plate. (For 420V the links are usually connected in delta as shown in the wiring diagram.)

The earth connection is to be carried out according to the local regulations.

All overload protectors are to be adjusted to the nominal current ratings specified on the type plate.

Check input and output voltages of the converter.
Please note, if the output voltage should read only half the nominal rating, it is an indication that the exciter field is rotating in the wrong direction. To rectify this, two of three input leads on the exciter terminal box are to be interchanged.

Providing the output voltage is now correct, the Converter is ready for operation.

Check that all terminal screws are well tightened.

5. STARTING PROCEDURE

1. Make sure that output switch is opened (Converter must not be started under load.)
2. Switch-On motor switch.
3. Switch-On exciter switch
4. Switch-On H.F. output switch

6. SWITCHING OFF PROCEDURE

Is performed in the reverse order to the starting procedure.

7. MAINTENANCE

a) Bearings

The antifriction bearing of a new Changer are provided with

Sufficient grease for the first 2500-3000 operating hours - this equals one and a half years at eight hours a day. After that time the bearing must be washed thoroughly in petrol or benzol (do not use kerosene) until they are com= pletely free from grease and metal dust. After washing they are to be dried and immediately regreased to prevent rusting.

Please note:

When regreasing the bearings only two-thirds of the space available is to be filled with grease; excessive filling will result in the bearings running hot. As lubricant for this purpose we recommend BOSCH Grease Ft 1 v 26 or Shell-Alvania II (drip point 160 to 180°C.)

b) Brushes and Slip Rings

The state of the Brushes and slip rings should be checked at least every 1000 operating hours - 6 months at 8 hours a day.
Brushes should be replaced before they are excessively worn.

In order to facilitate proper conduction, new brushes should be adapted in the following way:

Put a strip of emery cloth around the slip rings with the rough side against the brushes and pull the emery cloth in the direction of rotation until the brushes are adapted to the shape of the sliprings.

The slip rings must show a bright, clean surface. If neces= sary they are to be cleaned or polished with fine emery paper. If slip rings show scorching marks, the cause should be traced by a qualified electrician and then eliminated. (The marks should then be removed by polishing or turning on the lathe.)

c) Winding Temperature

The winding of the driving motor conforms with Insulation Class "B" (temperature increase 80°C.)
The generator windings are designed to meet Class "E" (75°C temperature increase.)
These ratings are based on 40°C ambient temperature according to VDE 0530/7.55.