

These operating instructions apply to

Netter static, variable frequency converter

NetterVibrotron[®] SRF



Important note:

Before use of the static frequency converters series SRF read this operating instruction carefully and store afterwards.

Netter GmbH does not assume liability for damage to property and persons if the product has been technically modified or if the notes and regulations of these operating instructions have not been observed.

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Scope of delivery:



Check the packaging for possible signs of transport damage. In the event of damage to the packaging, check that the contents are complete and undamaged. If there is any damage, inform the shipping agent. Compare the scope of the delivery with the delivery note.

1 General notes

Netter Vibrotron® SRF comply with the regulation concerning the electromagnetic compatibility 2004/108/EC and the low voltage regulation 2006/95/EC. Standards DIN EN ISO 12100 part 1 and part 2, DIN EN 60529 and EN 60034-1 are especially complied with.

The rules and regulations of the local electrical engineering associations (e.g. VDE, OEVE, SEV etc.) apply. The installation work and the operation of the unit are to be carried out taking into account the usual accident prevention regulations. The operator (operating company) is responsible for the proper condition of the unit. Electrical machinery and fixed electrical equipment are to be inspected with regard to their proper condition by an electrician at least once every 4 years. Connection cables with plugs and device connection cables are to be inspected with regard to their proper condition by

an electrician at least once every 6 months.

Netter machines and cabinets are built in accordance with VDE 0100 and VDE 0113.







The “safety of machines” and the “electrical apparatus of machines” are summarised in VDE 0113 (DIN EN 60204-1).

VDE 0100 is the German standard for the “construction of high-voltage equipment up to 1.000 Volts” (DIN 57100).

The frequency converter is a power electronics electrical equipment within the meaning of VDE 0160.

VDE 0550 serves as the basis for the selection of the transformers.

In these operating instructions the following information and danger symbols are used.

	Notes on important processes		Warning of dangerous electrical voltage
	Important note on processes to be especially observed		Disconnect unit from mains supply, pull out the mains plug
	Warning of a danger source		Environmental waste disposal

2 Technical data

	SRF 1-			SRF 2-							
	007/4,8	011/6,9	022/11	007/2,3	015/4,1	022/5,5	040/9,5	055/14,3	075/17	110/27,7	150/33
Power input:	1~ 200V – 15%... 240V + 10%			3~ 380V – 15%...500V + 10%, 3 phase, N + PE							
Mains frequency:	50Hz – 5%...60Hz + 5%										
Fuse:	10 A			16 A				32 A			
Output voltage:	Max. 3~ voltage in accordance with supply voltage										
Output frequency:	0... to max. frequency depending on type of vibrator										
Constant nominal current (A):	4,80	6,90	11,00	2,30	4,10	5,50	9,50	14,70	17,00	27,70	33,00
Motor nominal output (kW):	0,75	1,10	2,20	0,75	1,50	2,20	4,00	5,50	7,50	11,00	15,00
Ambient temperature:	In operation 0...40°C										
Operation time:	About 10% (depending on the configuration of the unit)										
Analogue inputs:	3 x configurable: +/- 10V, 0...+10V, 0...20mA										
Analogue output:	1 x configurable: 0...+10V, 0...20mA										
Logic inputs:	6 x configurable: supply internal or external 24V										
Communication:	Modbus and CANopen are built into the converter										
Ramp up time:	0,1...999,9 sec.										
Ramp down time:	0,1...999,9 sec.										
Safety:	Earth protected against short circuit										
Type of protection:	IP 54										
Dimensions (WxHxD):	300x400x200			400x500x250				600x600x300			



The mains voltage and mains frequency must match the nominal voltage and nominal frequency shown on the type plate.
± 5% voltage variations or ± 2% frequency variations are permitted.

3 Design and function

The static frequency converters series SRF are used for speed control of the electric external vibrators series NEG / NEH.

Special applications require frequencies that cannot be achieved with normal multipole external vibrators.

The special feature of these frequency converters is to be found in their robust and uncomplicated structure.

The fully equipped units are intended for fitting on walls.

Low-loss power electronics permit operation with input voltages with high tolerances.

These frequency converters produce constant three-phase voltages with frequencies of 0,5 Hz to 120 Hz and therefore permit rotation speeds of 30 to 7.200 revolutions per minute with a two-pole NEG / NEH. So the rotation speed may be easily set without problems.

The permitted temperature range lies between 0°C and +40°C.

4 Safety



**Changes to the unit may affect the characteristics or destroy it and cause rejection of any claims.
The non-compliance with these operating instructions also leads to the rejection of any claims.**



Before installation and start-up it is essential to read the concise instructions for the frequency converter completely and carefully. Strict observance of these instructions is to be ensured by the operating company. The non-compliance leads to the rejection of any claims.



The mains voltage and mains frequency must match the nominal voltage and nominal frequency shown on the type plate.
 $\pm 5\%$ voltage variations or $\pm 2\%$ frequency variations are permitted.

Electrical components powered with electrical voltage when the main switch is turned off, are marked with a special sticker.

In the event of failure to note specially marked areas there is a potential “risk to life” or “risk of injury.”

In these areas, only maintenance staff may carry out maintenance work. Maintenance staff must work only in accordance with the relevant safety measures.

The operator must monitor the condition of the unit with the greatest care. It is mandatory to observe the protection measures. If there is damage to or if there are faults with the unit, these are to be repaired in the correct manner.



The operators may only operate the unit i.e. the operator has no authority to open the cabinet or to work on the vibrators. In the event of technical problems, the maintenance staff must be consulted.

Incorrect work on or modifications to the electrical or mechanical presets of these units may lead to consequential damage, which is both expensive and likely to lead to long machine downtimes. The guarantee is invalidated. The consequences are to be borne by the party to blame.

The prescribed safety procedures must be strictly observed.

The unit may only be operated if all connection cables are connected and there is/are no damage or faults.

5 Transport and storage



Check the packaging for possible signs of transport damage. In the event of damage to the packaging, check that the contents are complete and undamaged. If there is any damage, inform the shipping agent.

The units are packed ready for installation. The type plate is in the SRF. When transporting the SRF ensure that the SRF is not subjected to any major impacts or vibrations which might damage the unit.

The unit should be stored in a dry, clean environment.

If the SRF has to be kept in storage for a lengthy period (up to max. two years), the temperature in the storage area must not be below +5°C or over +40°C and the relative air humidity must not exceed 60%.

The cabinet and the vibrators are only to be moved with the aid of the eye bolts provided for this purpose. The appropriate lifting gear is the usual equipment such as blocks and tackles or cranes. To move heavy weights, suitable steel cables or lifting straps that are of adequate dimensions for these weights are to be used. The cabinet and the vibrators are to be handled with great care during transportation.

The cabinet and the vibrators must not be stored in the open air. In the event of storage of the components in the open air, the electrical components (in the cabinet and the vibrators) are not protected against corrosion.

6 Installation



During installation it is essential to observe the safety instructions in Section 4 and the accident prevention regulations!
The unit must be installed in accordance with the local, established regulations (e.g. VDE regulations).



Before installation and startup it is essential to read the brief instructions for the frequency converter thoroughly and carefully. The operating company should ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.



ATTENTION:

Electrical installation of the SRF is only to be carried out by authorised experts.
The cabinet door must not be opened while the unit is live!
Experts must work only with insulated tools that are appropriate to the job.
Accessories that ensure correct operation and safety must have a form of protection suited to the specific purpose.



When working on the SRF, it must be safely disconnected from the electrical mains. You should proceed as follows:

1. Switch off SRF
2. Secure against switching on again
3. Confirm that the unit is not live

Main switch with padlock



The mains voltage and mains frequency must match the nominal voltage and nominal frequency shown on the type plate.
 $\pm 5\%$ voltage variations or $\pm 2\%$ frequency variations are permitted.



During operation of the SRF the compliance with the EMC regulation must be ensured.



During installation, a suitable power supply cable should be used. Cables and earth wires are to be connected in accordance with the regulations.
The electrical cables are to be laid with care. Here one should ensure that the cables are not worn through by vibrating parts.
There should be a check at regular intervals (as a rule every six months) to see that the electrical cables and their plugs are in perfect condition.
Any faults discovered are to be corrected immediately.
Protect the cable from high temperatures, lubricants and sharp edges.

7 Start-up/operation



When starting up the SRF, the rules and regulations of the local electrical engineering associations (e.g. VDE) and the established accident prevention regulations are to be observed.



Before installation and start-up read the concise instructions for the frequency converter completely and carefully. The operator must ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.

The following points regarding the unit, which has had its power switched off, are to be checked by an expert:

- Check the mains voltage. For standard units of type series SRF the following applies: 230/400V +10%, -15%, 50 Hz / 60 Hz.
- The cables must be undamaged and must be laid in accordance with the established regulations and standards (e.g. VDE, OEVE, SEV etc.).
- Remove mechanical blocks (e.g. transportation clamps, brakes etc.).
- Any faults that might have occurred are to be correctly repaired immediately.
- In the event of major faults with the unit, the firm of Netter should be informed. Intervention of any nature may only be made with our express consent.
- **Interventions or changes in the settings of the frequency converter without the consent of *NetterVibration* will cause the rejection of any guarantee.**
- Work on the cabinet and on the electrical equipment is only to be carried out by an expert.
- In addition, the established regulations of the CENELEC members (e.g. VDE) apply.
- One should ensure that the unit is in perfect electrical condition.
- Protective measures on the unit, unit earthing.
- The internal temperature of the cabinet must not be below 0°C or above 40°C. Relative air humidity should not exceed 80%.
- The shielded data cables (or marked cables) must be laid in a separate conduit or pipe (separate from the power cables). If this is not possible, the data cables must be laid in ordinary steel pipes that must be earthed.



Switching on the unit: Main switch “ON”



The main switch (dial) has a low voltage actuator and must first be unlocked.

The control unit becomes live upon connection to the electricity supply and switching on the main switch.

The bootup process of the control unit will be activated. Upon completion of the bootup process, (depending on the settings of the start parameters), functions are already being performed. All parts of the unit may now become live.

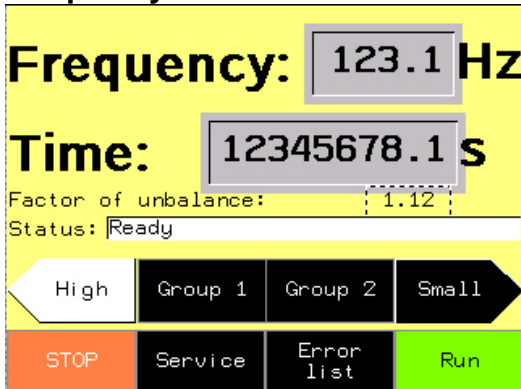
This is not critical for the machine but all safety measures should be active (e.g. all covers closed etc.).

After completion of the bootup process (booting/loading), the start screen is displayed.



After the start screen, the Frequency/Time sensor screen is displayed.
As an option, the Hz/s sensor screen will be displayed.

Frequency / Time



Optional display



Display		
Frequency:		[Hz]
Time:		[s]
Factor of unbalance: optional		0 - 10
Status:		Status messages
Function keys		Description
High optional		Change of rotation direction, high torque
Small optional		Change of rotation direction, low torque
Group 1 optional		Selection of Group 1 or Group 2
	STOP	Stop
	Service	Customer password Netter password
	Error list	Error is displayed
	Run	Time is running

Changing the desired frequency:

Setting the desired frequency, touch the up or down field
The frequency can be changed before or after the vibration process.
The frequency set is displayed in the Frequency field.

Changing the desired shaking time:

Setting the desired time, touch the Time field.
If no time function is required, the time should be set to 0.

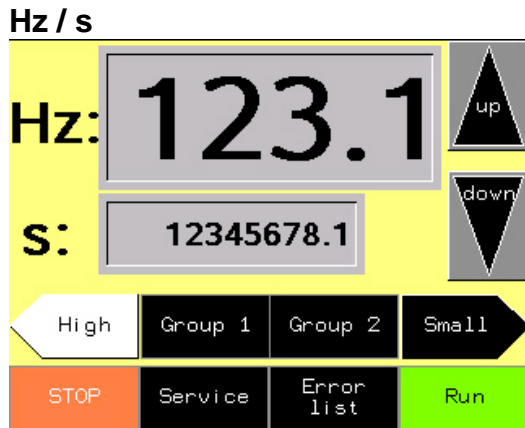
Starting the vibrators:

Switch on the vibrators, touch the Start field.

Stopping the vibrators:

Manually: Touch the Stop field.
Automatically: After a preset time

After the start screen, the Hz / s sensor screen is displayed.
 The Frequency/Time sensor screen is optionally displayed.



Optional display



Display		
Frequency:		[Hz]
Time:		[s]
Function keys	Description	
		Manual setting of the frequency
		Manual setting of the frequency
	optional	Change of rotation direction, high torque
	optional	Change of rotation direction, low torque
	optional	Selection of Group 1 or Group 2
		Stop
		Customer password Netter password
		Error is displayed
		Time is running

Changing the desired frequency:

Setting the desired frequency, touch the up or down field
 The frequency can be changed before or after the vibration process.
 The frequency set is displayed in the Frequency field.

Changing the desired shaking time:

Setting the desired time, touch the Time field.
 If no time function is required, the time should be set to 0.

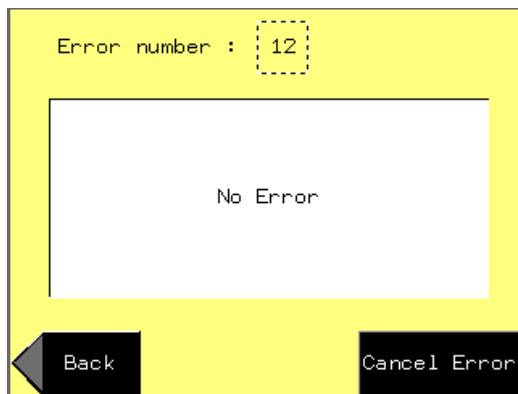
Starting the vibrators:

Switch on the vibrators, touch the Start field.

Stopping the vibrators:

Manually: Touch the Stop field.
 Automatically: After a preset time

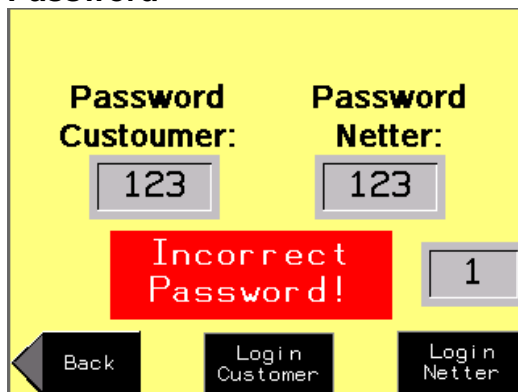
Error



Display	
Error number:	0 - 73
Error messages	
Function keys	Description
	Back to the Frequency / Time screen optionally Hz: / s
	Error message is deleted

Error number and error messages are displayed

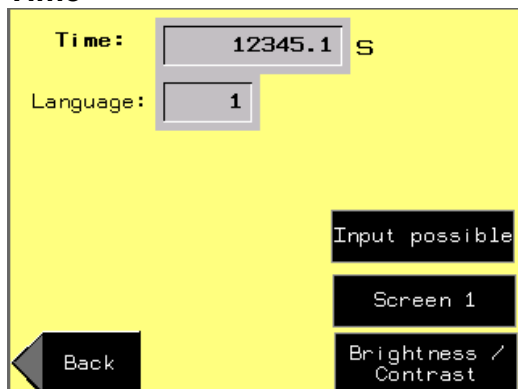
Password



Display	
Customer password:	Login
Netter password:	
	0 = delete
Function keys	Description
	No access
	Back to the Frequency / Time screen optionally Hz: / s:
	11880 Time screen is displayed
	Netter Vibration Service area

When the client password is entered, the Time screen is displayed

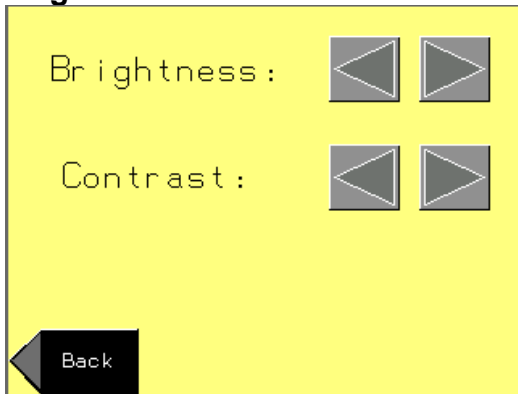
Time



Display	
Time:	Time setting [s]
Function keys	Description
	Frequency/Time screen released or blocked
	Frequency/Time screen or Hz/s screen is displayed
	Edit brightness and contrast screen
	The password screen is displayed

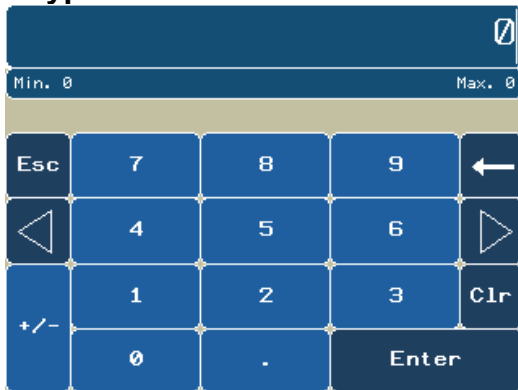
When you touch the Time field, the keypad is displayed.

Brightness /Contrast



Display	
Brightness:	
Contrast:	
Function keys	
	Description Light / dark More / less contrast
	The Time screen is displayed

Keypad



Display	
	Input value (cursor)
	Minimum and maximum values are displayed
Function keys	
	Quit input field
	Jump one number back
	Jump one number forward
	Delete one number to the left
	Delete input field
	Confirm input

Error messages

0	0	Kein Fehler	No Error	Pas d'erreur
1	1	Reserviert	Reserviert	Reserviert
2	2	(EEF1) Fehler EEPROM HMI	(EEF1) ERROR EEPROM HMI	(EEF1) Erreur EEPROM HMI
3	3	(CFF) Inkorrekte Konfiguration	(CFF) Configuration fault	(CFF) défaut configuration
4	4	(CFI) Fehlerhafte Konfiguration	(CFI) Configuration fault via serial link	(CFI) défaut configuration par liaison série
5	5	(SLF1) Modbus Kom Fehler	(SLF1) Modbus fault	(SLF1) interruption de communication sur bus Modbus
6	6	(ILF) Interner Fehler	(ILF) Internal fault	(ILF) défaut Interne
7	7	(CrF) Fehler Kommunikation	(CrF)	(CrF)
8	8	(EPF1) Externer Fehler über LI	(EPF1) External fault over LI	(EPF1) défaut externe > LI
9	9	(OCF) Überstrom	(OCF) Overcurrent	(OCF) surintensité
10	10	(CrF1) Fehler Ladung DC-BUS	(CrF1) Capacitor load circuit	(CrF1) circuit de chargw des condensateurs
11	11	(SPF) Fehler Drehzahlrückm	(SPF)	(SPF)
12	12	(AnF) Drehzahl Abweichung	(AnF)	(AnF)
13	13	(LFF2) AI2 Verlust 4-20 mA	(LFF2) AI2 loss of 4-20 mA	(LFF2) AI2 perte 4-20 mA
14	14	(PF1) Fehler PTC 1	(PF1)	(PF1)
15	15	(OIF1) Übertemperatur PTC1	(OIF1)	(OIF1)
16	16	(OHF) Übertemp Umrichter	(OHF) Drive-Converter overheated	(OHF) surcharge variateur
17	17	(OLF) Überlast Motor	(OLF) Motor overload	(OLF) surcharge moteur
18	18	(Obf) Überbremsung	(Obf) Overvoltage during deceleration	(Obf) surtension en décélération
19	19	(OSF) Überspannung Netz	(OSF) Overvoltage	(OSF) surtension
20	20	(OPF1) Verlust 1 Motorphase	(OPF1)	(OPF1)
21	21	(PHF) Verlust Netzphase	(PHF) Line phase failure	(PHF) coupure phase réseau
22	22	(USF) Unterspannung	(USF) Undervoltage	(USF) sous-tension
23	23	(SCF1) Kurzschluss Motor	(SCF1) Motor short-circuit	(SCF1) court-circuit moeteur
24	24	(SOF) Überdrehzahl	(SOF) Overspeed	(SOF) survitesse
25	25	(tnF) Motormessung	(tnF) Auto-tuning fault	(tnF) erreur autoréglage
26	26	(InF1) Falscher Umrichtertyp	(InF1) Internal fault	(InF1) défaut Interne
27	27	(InF2) Inkomp Leistungskarte	(InF2) Internal fault	(InF2) défaut Interne
28	28	(InF3) Int Serielle Verbindung	(InF3) Internal fault	(InF3) défaut Interne
29	29	(InF4) Int Fabrikationsfehler	(InF4) Internal fault	(InF4) défaut Interne
30	30	(EEF2) Fehler EEPROM HMI	(EEF2) ERROR EEPROM HMI	(EEF2) Erreur EEPROM HMI
31	31	(SCF2) Impedanter Kurzschluss	(SCF2) Motor short-circuit	(SCF2) court-circuit moeteur
32	32	(SCF3) Erdschluss	(SCF3) Motor short-circuit	(SCF3) court-circuit moeteur
33	33	(OPF2) Verlust Motorphasen	(OPF2)	(OPF2)
34	34	(COF) Fehler CANopen	(COF) CANopen fault	(COF) défaut CANopen
35	35	(bLF) Bremssteuerung	(bLF) Brake sequence	(bLF) séquence de frein
36	36	Reserviert	Reserviert	Reserviert
37	37	(InF7) Int Init Fehler Hard	(InF7)	(InF7)
38	38	(EPF2) Externer Fehler Komm	(EPF2)	(EPF2)
39	39	(APF) Fehler Applikation	(APF)	(APF)
40	40	(InF8) Interne SPGS Versorgung	(InF8)	(InF8)
41	41	(brF) Rückmeldung Bremse	(brF)	(brF)
42	42	(SLF2) Powersuite Kom Fehler	(SLF2)	(SLF2)
43	43	(ECF) Mech Verb Encoder	(ECF)	(ECF)
44	44	(SSF) Lim Strom Drehmoment	(SSF)	(SSF)
45	45	(SLF3) HIm Kom Fehler	(SLF3)	(SLF3)
46	46	(PrF) Fehler PWR	(PrF)	(PrF)
47	47	(PF2) Fehler PTC 2	(PF2)	(PF2)
48	48	(OIF2) Übertemperatur PTC 2	(OIF2)	(OIF2)
49	49	(PIFL) LI6=PTC Fühler	(PIFL)	(PIFL)
50	50	(OIFL) LI6=PTC Übertemperatur	(OIFL)	(OIFL)
51	51	(InF9) Intern Strom Messung	(InF9)	(InF9)
52	52	(InFA) Kurzschluss Int. Spgvers.	(InFA)	(InFA)
53	53	(InFb) Interner PTC Fühler	(InFb)	(InFb)
54	54	(JF) Übertemperatur IGBT	(JF)	(JF)
55	55	(SCF4) Kurzschluss IGBT	(SCF4)	(SCF4)
56	56	(SCF5) Kurzschluss Lad DC BUS	(SCF5)	(SCF5)
57	57	(SrF) Drehm. Time Out	(SrF)	(SrF)
58	58	(FCF1) Motorschutz	(FCF1)	(FCF1)
59	59	(FCF2) Motorschutz	(FCF2)	(FCF2)
60	60	(InFC) Interne Zeitmessung	(InFC)	(InFC)
61	61	(AI2F) Eingang AI2	(AI2F)	(AI2F)
62	62	(EnF) Encoder	(EnF)	(EnF)
63	63	(CrF2) Thyr. Soft Ladung	(CrF2)	(CrF2)
64	64	(LCF) Netzschutz	(LCF)	(LCF)
65	65	(bUF) Kurzschluss Bremsseinheit	(bUF)	(bUF)
66	66	Reserviert	Reserviert	Reserviert
67	67	(HdF) Entsättigung IGBT	(HdF)	(HdF)
68	68	(InF6) Interne Option	(InF6)	(InF6)
69	69	(InFE) Fehler Mikroproz	(InFE)	(InFE)
70	70	(bOF) Überlast Brems Widerst	(bOF)	(bOF)
71	71	(LFF3) AI3 Verlust 4-20 mA	(LFF3)	(LFF3)
72	72	(LFF4) AI4 Verlust 4-20 mA	(LFF4)	(LFF4)
73	73	(HCF) Karten Paarung	(HCF)	(HCF)

8 Service / Maintenance

The maintenance of the vibration drives and the control unit is of great importance to the operator. Observing the maintenance intervals increases the availability of the equipment to a maximum.

In the case of faults with an electrical cause, we (**NetterVibration**) specify that the problem be dealt with by an electrician.

An electrician within the meaning of the accident prevention regulations is deemed to be a person who can assess the work entrusted to him and recognise possible hazards on the basis of his technical training, knowledge and experience and knowledge of the relevant regulations.

Intervention of any nature must only occur with the express consent of **NetterVibration**.



Ensuring that the unit is not live before starting the work and securing this condition for the duration of the work is done whilst observing the following five safety rules, which must always be applied:

1. **Switch off**
2. **Secure against switching on again**
3. **Check that there is no voltage**
4. **Earth and short circuit**
5. **Cover or isolate any neighbouring voltage parts**

Main switch with padlock

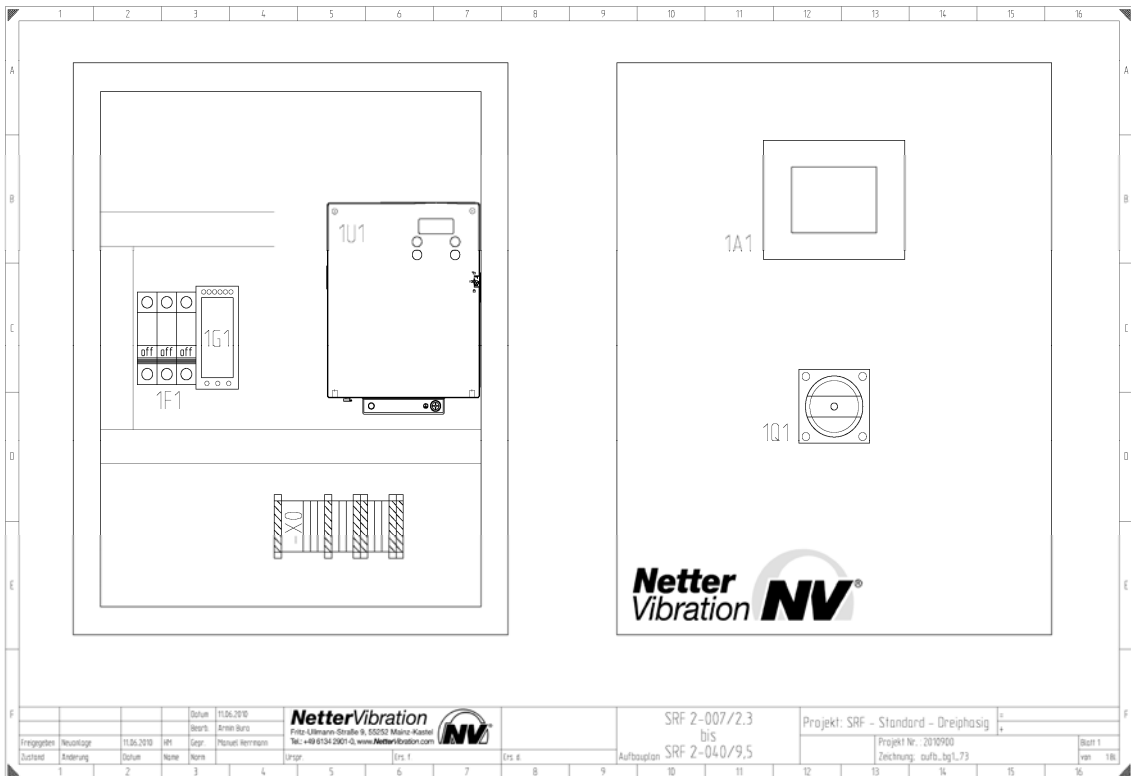
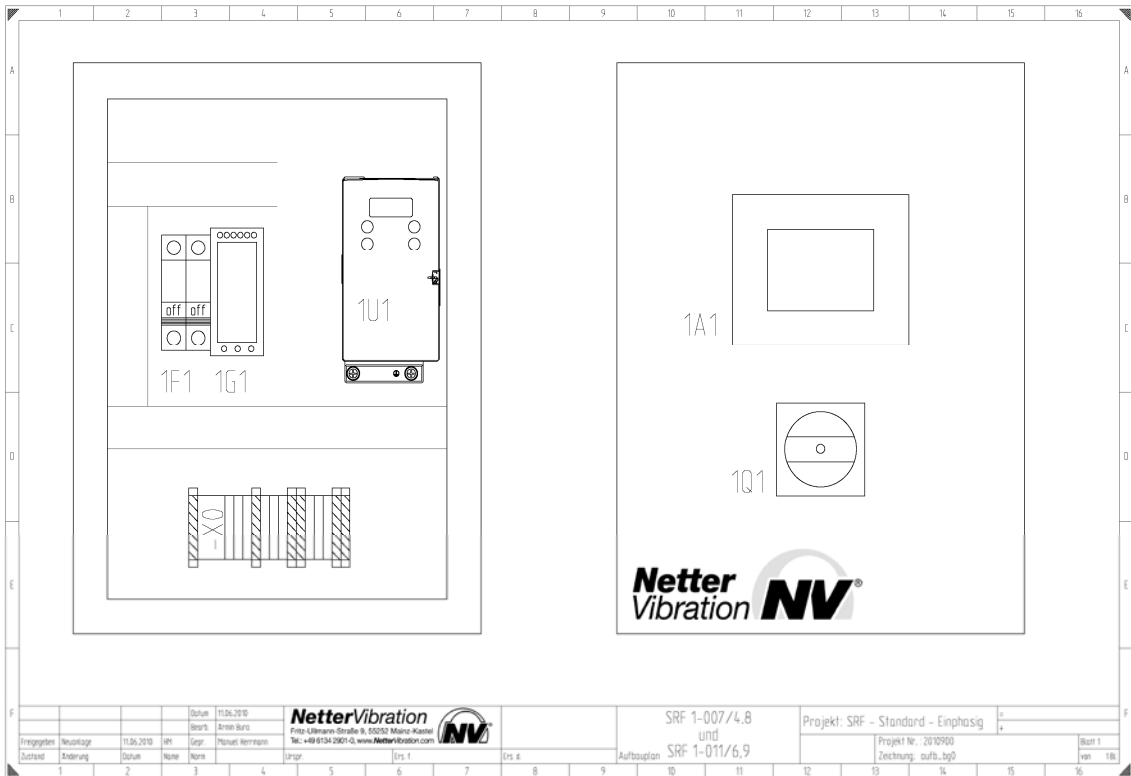


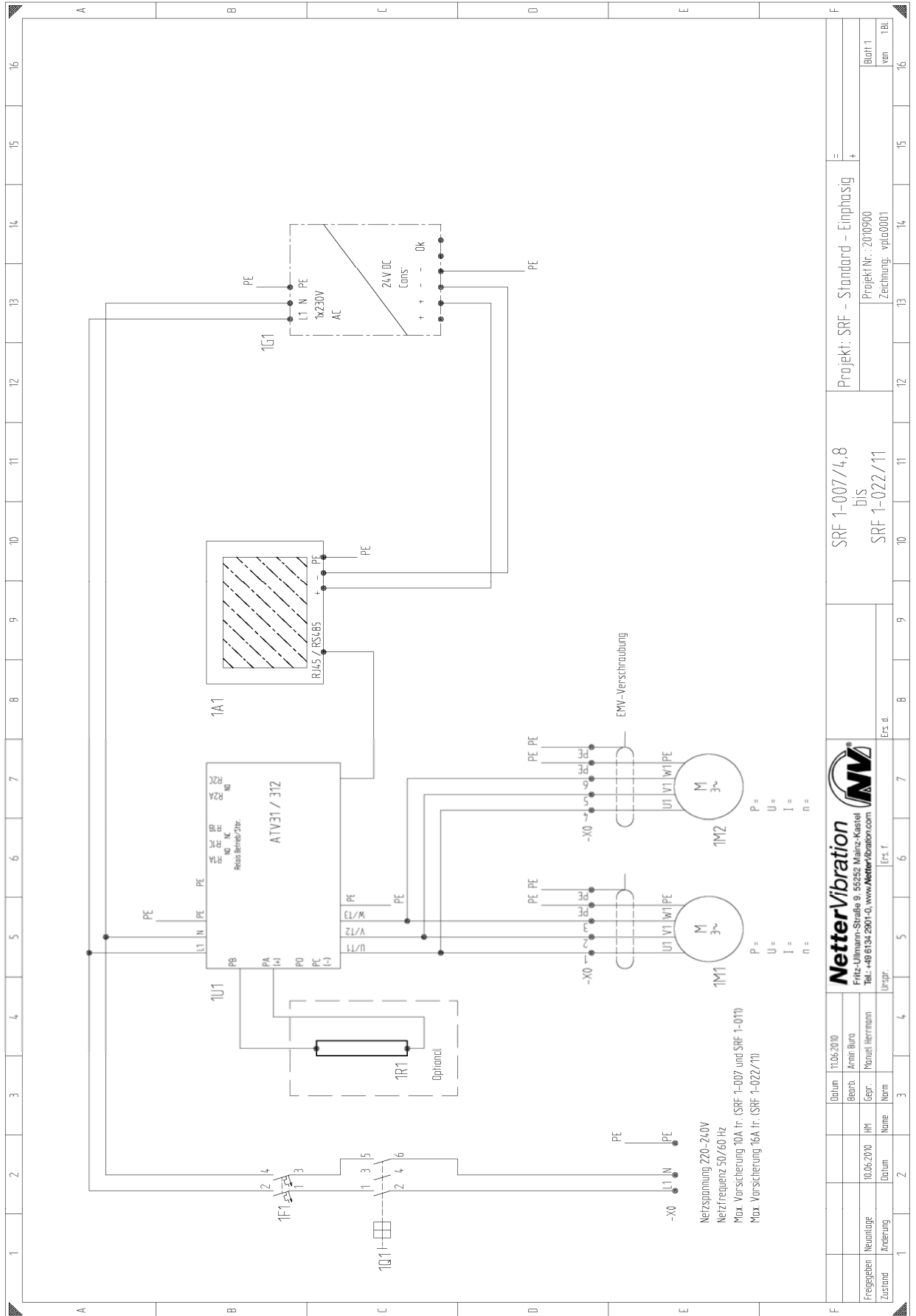
The following maintenance work is to be carried out regularly by authorised experts:

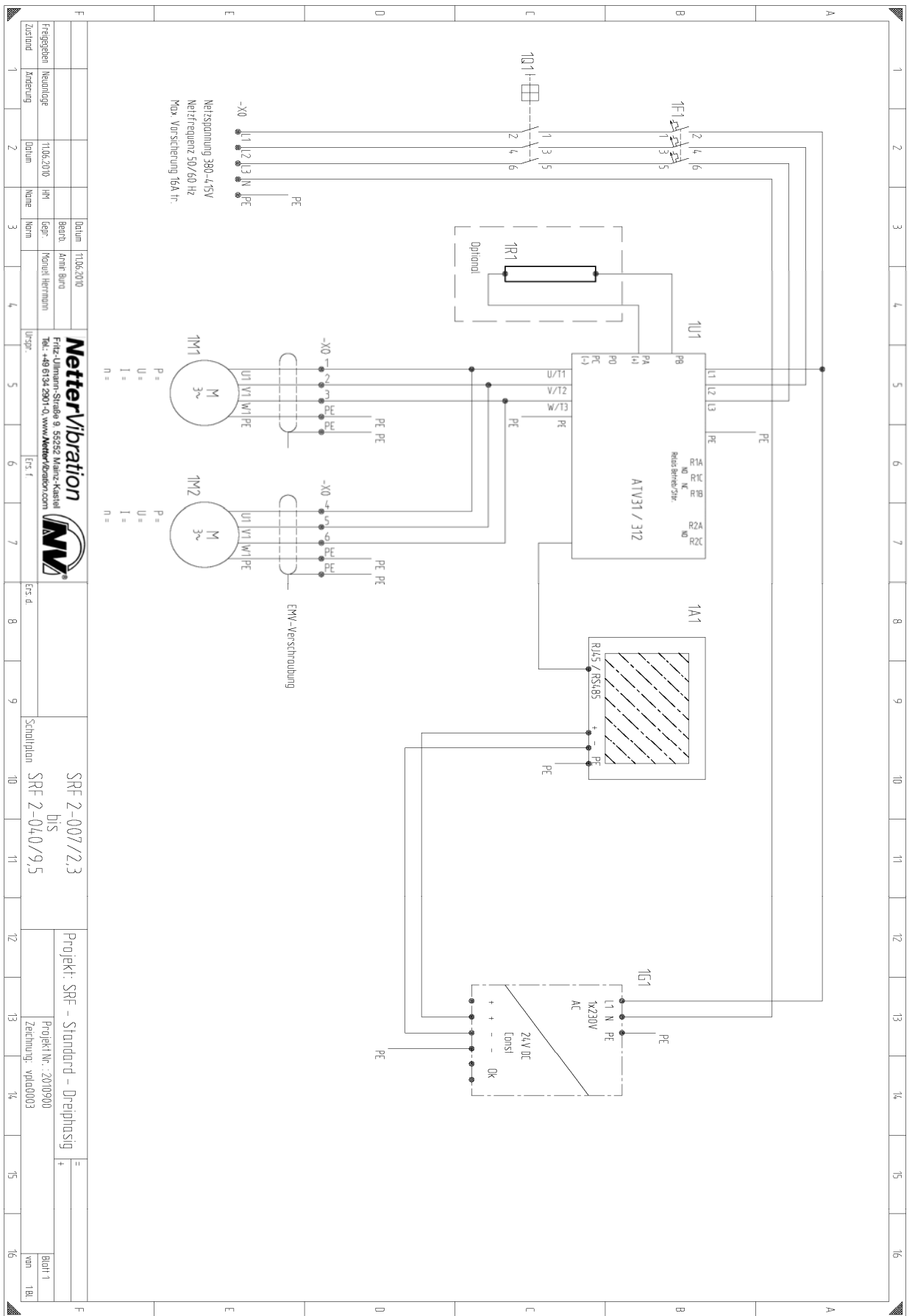
- a) Checking the screw connections
- b) Checking the cables from the cabinet to the vibrators

Any other maintenance and servicing work is to be carried out exclusively by *NetterVibration*.

When servicing the unit, observe the safety instructions in chapter 4.







9 Troubleshooting



It is essential to read these operating instructions and the concise instructions for the frequency converter completely and carefully before correcting faults. The operator must ensure strict observance of these instructions. Failure to observe them will lead to the invalidation of all rights.



In the case of faults with an electrical cause, we (**NetterVibration**) specify that the problem be dealt with by an electrician.

In the event of unauthorised intervention in the **NetterVibration** control unit, all guarantee rights will cease to exist.

Intervention of any kind must be agreed with **NetterVibration**.

Only people who have been trained by experts of **NetterVibration** are authorised to work on the control unit.

First of all, it is important to locate the symptoms of the fault, and then locate the cause of the arisen malfunction.

For supporting, the operator can use the plain text on the touch screen, the unit descriptions and the circuit diagram

Causes of faults might be:

1. Errors of operation
2. Electrical faults
3. Mechanical faults

Errors of operation can be eliminated by careful reading of the operating instructions.

10 Spare parts

Spare parts are classified into 2 groups:

- Spare parts with immediate availability
- Spare parts with a delivery period that is dependent on the third party supplier.

You will find a list of the parts used in the associated parts list.

Spare parts for the vibration drives must be fitted by a trained expert.

Special training is required with spare parts that have been specially manufactured for the client.

Electrical and mechanical faults may be identified and corrected with the aid of the circuit diagram or the relevant unit description. The faults with their possible causes and the support are listed in the unit descriptions.

A defective fuse may only be replaced by a fuse of the same type and amp rating. In the event of repeated blowing of a fuse, the relevant electrical circuit with this fuse should be checked with the circuit diagram.

The spare parts for the control unit and for the electrical installation must be fitted by an electrician. This electrician must be familiar with the protective measures.

The defective part must be replaced by one of the same type.

If units that contain a program have to be replaced, then **NetterVibration's** customer service department must be involved.

11 Appendix

11.1 Disposal

Depending on the material, the parts must be disposed of according to regulations.



All units may be disposed off through Netter GmbH.
The valid disposal prices are available on request.

11.2 Enclosures

Enclosure(s):



Further information available on request:

Leaflet no. 37, and more

Brief instructions on the frequency converter (optional)

Declaration of conformity (optional)

Leaflets