OPERATING MANUAL
FREQUENCY INVERTER GOLIATH-60/90-V

FUNCTIONS
START-UP INSTRUCTIONS

KW Aufzugstechnik GmbH Frequency Inverter GOLIATH-60

VERSION V114E   14.06.2008

KW AUFZUGSTECHNIK GmbH
Zimmersmühlenweg 69
D-61440 Oberursel

Tel.   +49 (0) 6171-9895-0
Fax. +49 (0) 6171-9895-19
Int.   www.kw-aufzugstechnik.de
Mail. verkauf@kw-aufzugstechnik.de

Hotline Inverter Tel. +49 (0) 6171-9895-11 / -15

Inhalt

1. System Describtion

1.1   GUARANTEE

By this consumer guarantee KW Aufzugstechnik GmbH guarantees the product to be free from defects in material and workmanship for a one (2) year from the time of its original purchase.

Conditions

This guarantee will not reimburse nor cover damage resulting from adaptations or adjustments which may be made to the product, without the prior written consent of KW Aufzugstechnik GmbH, in order to conform to the national or local technical or safety standards in force in any country other than the ones for which the product was originally designed and manufactured.

This guarantee will not apply if the type or serial number on the product has been altered, deleted or made illegible.

This guarantee covers none of the following:
- Periodic maintenance and repair or replacement of parts due to normal wear and tear;
- Any adaptation or changes to moify the product from its normal purpose as described in the instruction manual, without the prior written consent of KW Aufzugstechnik GmbH;
- Transport costs, home service transport costs and all risks of transport relating directly or indirectly to the guaranteeof the product;
- Damage resulting from:
    o Misuse, including but not limitted to (a) failure to use the product for its normal purpurse or in accordance with KW Aufzugstechnik GmbH's instructions on the proper use and maintenance, and (b) installation or use of the product in a manner inconsistent with the technical or safety standardsin force in the country where it is used and (c) improper or incorrect installation of software.
    o Repair done by non authorized service stations or dealers, or the customer himself;
    o Accidents, lighting, water, fire, improver ventilation or any cause beyond the control of KW Aufzugstechnik GmbH;
    o Defects of the system into which this product incorporated.

This guarantee does not affect the consumer's statutory rights under applicable national laws in force, nor the consumer's rights against the dealer arising from their sales / purchase contract.

1.2 SAFETY CONDITIONS

IN GENERAL

Running the frequency inverter without casing is forbidden, because of the high voltage in there. If you do runing without casing, there could be personal damage.

Only skilled workers can do working at the frequency inverter system GOLIATH-60.
It must be consider the following national and local safety conditions and laws:
DIN VDE0100 , DIN VDE 0110 , IEC 364, IEC 664.

USE OF THE FREQUENCY INVERTER GOLIATH-60

The frequency inverters Goliath-60 are devices for the use in elevators. Other using is forbitten without the prior written consent of KW Aufzugstechnik GmbH.
The following laws must be considered, when you are build in the inverter:

2   EG- Guideline 89/392/EWG (Machine-Guideline) .
3   EN 60204.
4   Lowpower Guideline 73/23/EWG
5   EMV- Guideline (89/336/EWG)
6   prEN 50178/DIN VDE 0160.
7   EN 60439-1/DIN VDE 0660 Part 500
8   EN 60146/DIN VDE 0558.

Transport and Mounting

The transport of the frequency inverter must be very carefully organized. Please do not touch electronical parts and terminals. They could be destroyed by the hand voltage of a person!
If you want to connect the frequency inverter, you don't have to open the casing. All terminals are out there. Please pay attention at the place above and under the inverter. It is nessary for cooling.

Service

Basicly only Spareparts from KW Aufzugstechnik GmbH are allowed to use in Goliath-60 inverts. The fans have a lifetime of 20.000 hours.
If there is a great dirt on the isolated ways and the cooler, it must be put away in every service-time.
The cleaning is only allowed with halogenfree cleaners .

1.3 SERVICE CONDITIONS

ELECTRICAL TERMINALS

Working at the frequency inverter with power voltage is forbidden.
After switching of the inverter from the power voltage, there is enough dangerious voltage, because of the capacitors. Please do not touch them!
The minimal time after switching off the inverter and opening the casing is 5 minutes.
The electrical mounting can do only by skilled workers, which know national laws, like
The „VDE-Vorschriften".
Notices are in the operating manuel for the right EMV-mounting. To make a good EMV-mounting , you must use tek Inputfilter of the GOLIATH-60.
Please take a look on the dimension of the power wires and fuses.

POWER VOLTAGE CONDITIONS

The frequency inverter Goliath-60 needs no neutral wire and is used for the den 4-phase Running. The type of the power voltage is a TT net, or a TT net with earth connect of the neutral wire.

RUNNING CONDITIONS

All elevators with frequency inverters must have safety devices to be enough the national and local law, like the european Law EN81.
The casing of the frequency inverter must be closed. The input-filter must be used and correctly fixed.
After switching of the inverter from the power voltage, there is enough dangerious voltage, because of the capacitors. Please do not touch them!
The minimal time after switching off the inverter and opening the casing is 5 minutes.

1) The concept of the frequency inverter GOLIATH-60 allows, that there is a fault in the inverter, all relays, like READY, BRAKE and DRIVE are deactiv, Then the mechanical brake can close.
2) If there is a controler fault, or there is no direction input, the DC-Power of the IGBT-modules is switched off aud the output relay brake is deactiv.
3) If there is a fault of the digital encoder input, or there is difference in the speed above 10%, the car is stopped.
4) If the temperature is too high, the frequency inverter is switch off.
5) The start current of the frequency inverter is the 1.7 of the nominal current.
6) You can do 240 drives per hour. The temperature border is 45 ^{o}C in the casing.
7) There must be a place of 100mm above and under the casing of the frequency inverter.
8) If you have an old machine, you have to look on two points:
   a) The isolation class of old machine.
   b) Old machines need more current to start it. The 1.7 nominal current could be not enough for the old motor. So you must choose a bigger frequency inverter.

1.4 EG-Konformitätserklärung
EC-Declaration of Conformity

$$CE$$

Anwendungsbereich	EG-Richtlinie 89/336 EWG Elektromagnetische Verträglichkeit
field of application	EC-Guidelines 89/336 EWG Electromagnetic compatible
Hersteller	KW Aufzugstechnik GmbH
Produzent	Zimmersmühlenweg 69
	61440 Oberursel
Produktart	Frequenz Umrichter
product category	Frequency Inverter
Modell	Goliath 60
model	

Prüfgrundlagen
basis of type examination

DIN EN 50081 Teil 1 Elektromagnetische Verträglichkeit Fachgrundnorm Störaussendung im Wohnbereich, Geschäfts und Gewerbebereich

DIN EN 50081 Part1 Electromagnetic compatible Branch base standard disturbance transmitter in to residential district, Premises and Commercial district

DIN EN 55011 Störungen im hochfrequenten Bereich. Klasse B Wohnräume

DIN EN 55011 Disturbance in to High frequency area. class B residential district

DIN EN 50082 Teil 1 und 2 Elektromagnetische Verträglichkeit Fachgrundnorm Störfestigkeit im Industriebereich

DIN EN 50082 Part 1 and 2 Electromagnetic compatible Branch base standard disturbance transmitter in to industrial area

IEC 801-2 entspricht VDE 0843 Elektrostatische Entladung ESD

IEC 801-2 conform to VDE 0843 Electrostatical unload ESD

IEC 804-1 entspricht prEN 55024 Teil 4 Burst Test an Signal und Steuerleitung

IEC 804-1 conform to prEN 55024 part 4 Burst check by signal and controlwire

IEC 804-1 entspricht prEN 55024 Teil 4 Burst Test an Wechselstrom Versorgungsleitungen

IEC 804-1 conform to prEN 55024 part 4 Burst test by alternating current supply line

Dipl. Ing. Hans-Werner Walbert   Oberursel, den 01.05.2000

1.5 Frequenzumrichter GOLIATH-60 – Interne und Externe Varianten

	GOLIATH-90 V INTERN Frequency-inverter for elevatorsfor high comfort. The power classes are from **12A** to 26**A nominal current**, at a 1,7- overload-factor. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion. The very compact casing with a bright of 154mm, is for mounting in the lift-controller casing. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).
	GOLIATH-60 INTERN Frequency-inverter for elevatorsfor high comfort. The power classes are from **32A** to **62A nominal current**, at a 1,7- overload-factor. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion. The very compact casing with a deepth 200mm, which allows a mounting in every lift-controller casing. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).The clock-frequency is always noiseless 16 kHz.
	GOLIATH-60 TITAN INTERN Frequency-inverter for elevatorsfor high comfort. The power classes are from 8**2A** to **142A nominal current**, at a 1,7- overload-factor. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion. The very compact casing with a deepth 200mm, which allows a mounting in every lift-controller casing. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).
	GOLIATH-60 EXTERN At the extern Goliath-60, the line-filter, main- and brake-contactor are integrated with low noice All wires you need, like mainpower-wire, motor-& brakeresistor-wire, controller-wire are in the kit, as a plug-in solution. The power classes are from **32A** to **62A nominal current**, at a 1,7- overload-factor. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).The clock-frequency is always noiseless 16 kHz.

1.6 SUPPORTED MACHINES AND MOTORS

Pole Switchable Asynchron-motors, which used without regulation or voltage-regulated	**Astor** **Bruncken** **MAN** **Stahl** **Haushahn** **Schindler** **OTIS** **Bauer** **Hammelsbeck** **Kasper** **Loher** **Kaiser**	
Asynchrone Normal- or Planet Gear Machines, Asynchrone High-Pole-Gearless	**ThyssenKrupp** **ZIEHL-ABEGG** **Cobianci** **Montanari** **Sassi** **SICOR** **Wittur**	**TW 45, 63, 130, 160, 263** **DAF 330** **ZAF xxx** **xxx** **M xxx** **Leo, …** **xxx** **xxx**
Synchrone Planet Gears with RESOLVER	**ALPHA Getriebebau**	**ECD100 / 200 / 300** **EPM100 / 300 / 500**
Synchrone Gearless with Absolutevalue Encoders	**ZIEHL-ABEGG** **ThyssenKrupp** **LAT** **Wittur – SAD** **Blocher / SwissTraction** **Montanari** **Xinda** **LAT** **Loher**	**ZETASYN SM-700 / 860** **ZETATOP SM 250/ 225 / 200** **DAF 210 / 270** **SC 300 / SC 400** **WSG 08 / WSG 19** **GA 41 / GA 42 / GA 52** **Z244 / Z246 / Z3xx** **MCG 150 / MDG 150 /** **Xxx** **xxx** **SVM 250.04 / SG07.3**

2.0 Anschlußbilder für Asynchron- und Synchronmaschinen

Electric Wireing Of A Synchronemachine

Lift-Crontroller

MainConductor Monitor

Lift-Controller		GOLIATH-60
+24V Dc		11
Ready		10
V3		39
V2		38
V1		37
V0		36
VReleve		35
Vins		34
Up		33
Down		32
0V GND		31
Shield		30

READY BRake

Drive

K7 A1 A2

K5 A1 A2

K3 A1 A2

13 12

15 14

Absolutevalue Encoder
SSi od. EnDat odSin/Cos
B22

D-SUB 15P ABS-Card

GOLIATH-60

K4 A2 A1

N

19 18

Motor-Contactor

L11 L12 L13 L1 L2

K3 1 2 3 4 5 6
K5 3 4

L1 L2 L3

U V W   PE

u v w   PE

B A PE PE A B

R22

R1 R3 R4 R2
K4

M1 u v w PE

BR

GL

N1
LS

K7 1 2 5 6
K7 21 22
K5 21 22
K3 21 22

LS Phase SafetyCircuit	
N1 Neutral Phase	
GL Rectifire Diodes	
BR Brakemagnet	
K4 Motor Contactor	
K7 Brake Contactor	
K3 Main Contactor	
K5 Main Contactor	
B22 AbsolutevalueEncoder	
R22 Brakeresistor	
M1 Synchronemachine	

2.1 CONTROL SIGNALS AND DRIVE CURVE
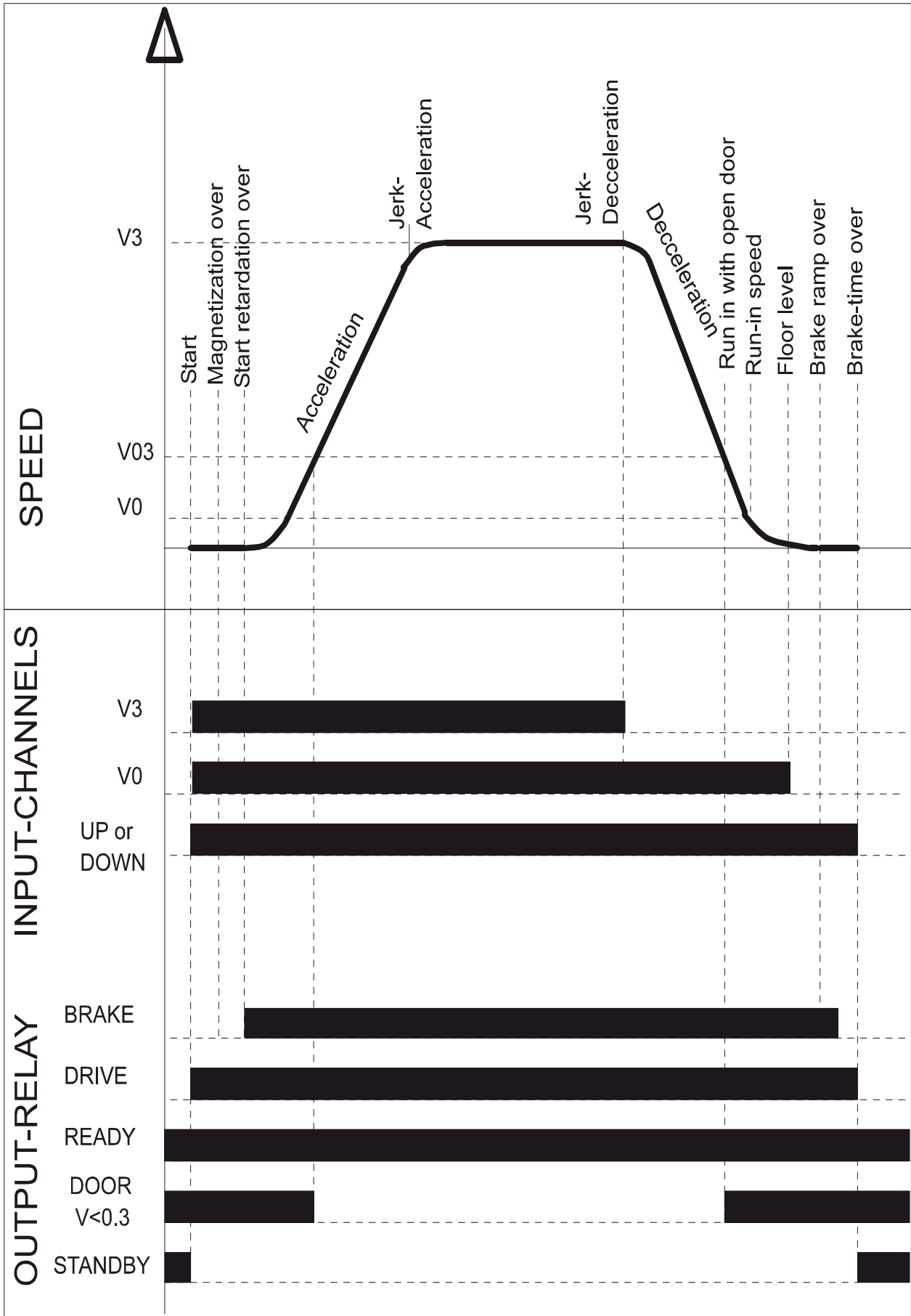
2.2 DETAILS ABOUT THE INTERFACES

Optional - Absolutwert Interface	Optional - Resolver Interface
Sub-D Stecker 15 polig	30 31 32 33 34 35 36
	REF - / REF + / Cosinus - / Cosinus + / Sinus - / Sinus + / Schirm-Shield

Control -Voltage | **Relais-Ausgänge - Relays -Output** | **Inkrementalgeber - Encoder HTL-TTL** | **Digitale Eingänge - Digital Inputs Terminals or Sub-D** | **Anschluß HPG / RS232**

L1 L2 | 10 11 12 13 14 15 16 17 18 19 | 20 21 22 23 24 25 26 27 28 | 30 31 32 33 34 35 36 37 38 39

400V AC / 400V AC / READY / BREMSE BRAKE / FAHRT DRIVE / TÜR DOOR / Programm / Schirm-Shield / A / B / +15V DC / 0V DC / -15V DC / + 5V DC / A/ / B/ / Schirm-Shield / 0V DC / AB -DOWN / AUF - UP / Vinsp. / Vnach. / Vo / V1 / V2 / V3

Stromversorgung - Power supply

L11 L12 L13 PE

Klemmen - Terminals

Motoranschluß - Motor **Bremswider- stand- Resistor**

PE U V W PE A B

2.3 MAINS AND MOTOR CONNECTIONS / BRAKE RESISTOR

At the modernization of old elevator units, the old heavy emergency wheel of the motor should be replaced through a new light aluminium- or plastic wheel. The standart versin of the Goliath-60 frequency inverter needs an maim voltage of 400V AC (Tolerance +10% / -15%).

If you need other main voltages, please connect us. The electronic part of the converter needs a permanent control voltage, in order to avoid time delays at the start operation. Two main conductors are on the line side, which supply the power part of the converter.

The motor must be connected via a 4-core screened line. For reasons of electromagnetic compatibility, the screen must be connected to the mounting plate over a large surface in the control cabinet in the immediate vicinity of the frequency converter.

The motor cable should not exceed a maximum length of 25 meters. The brake resistor cable should be extremly short.

Nominal-Current (A)	Motor-Cable (mm^2)	Brakeresistor Resistor / Power	Brakeresistor-Cable (mm^2)
12	4*2,5	50 Ω / 1kW	3*1,5
22	4*4,0	30 Ω / 3kW	3*2,5
32	4*6,0	30 Ω / 3kW	3*2,5
42	4*10,0	15 Ω / 6kW	3*4,0
52	4*10,0	15 Ω / 6kW	3*4,0
62	4*16,0	15 Ω / 6kW	3*4,0
82	4*25,0	2 x 15 Ω parallel 6kW	3*4,0
102	4*35,0	2 x 15 Ω parallel 6kW	3*4,0
122	4*35,0	2 x 15 Ω parallel 6kW	3*4,0
142	4*50,0	2 x 15 Ω parallel 6kW	3*4,0

2.4 DIGITAL INPUTS

All control voltage inputs have optocouplers to isolate the controller. The external control voltage is 24V DC (smoothed). There is a 10 pin Phoenix terminal.

Terminal	Input	Function	Description
30	**Earth**	Shield	Shielding the input sihnals
31	**OV DC**	0V DC contol voltage	The 0V connection is potential-free
32	Up	Direction	TO START THE CONTROLLER, YOU NEED A DIRECTIONCOMMAND AND A RUN COMMAND. THE DIRECTION COMMAND MAY ONLY SWITCHED OFF, AFTER THE MAIN-CONTACTOR IS SWITCHED OFF.
33	Down	Direction	
34	Inspection speed Vinsp	10 to 1500 U/Min	The speed for inspection is separately adjustable. The run command for inspection speed and the direction command will be switched off together.
35	Readjusting speed Vn	0,5 to 100 U/Min	The readjusting speed is used for exactly positioning of the elevator cabin (high elongation of the ropes).
36	Run-in speed V0	1 to 100 U/Min	The run-in speed is switched off, when the destination floor is reached. The controller reduces the speed of the cabin, until there is no speed and then the mechanical brake is active.
37	First speed V1	10 to 3000 U/Min	You can select three speeds in order to reach different floors in the best way.
38	Second speed V2	10 to 3000 U/Min	You can select three speeds in order to reach different floors in the best way.
39	Third speed V3	10 to 3000 U/Min	You can select three speeds in order to reach different floors in the best way.

2.5 RELAY OUTPUTS

There are five relays for output functions. The nominal voltage is 24 V DC to 250 V AC at output power of 1000 mA.

Klemme	Relais-ausgang	Bedeutung	Funktionsbeschreibung
10 & 11	READY	Alert for the lift control	If the control voltageis high and there is no fault, the relay is switching on.
12 & 13	BRAKE	Acivate the brake conductor	The relay switches on with a delay of 0,5 s when a direction and a speed is active. If the motor has no rotation, or the direction order is switch off, then the brake relais is switch off too. The relay switches the brake conductor.
14 & 15	DRIVE	Acivate the main conductor	The relay switches on when a direction order and a speed order is active. If the motor has no rotation the relay switches on with a delay of 0,5 s.
16 & 17	DOOR	Acivate the run-in with open door	The relay is switched off, if the speed is above 0,3 m/s. The point of active switch is programmable. You can use the relay control the run-in operation with open door.
18 & 19	PROGRAM M	Freely program-mable relay:	Freely programmable relay. One of the following functions can be assigned to the relay: 1) **V<Vx** Speed threshold (adjustable from 0.2 to 4m/s); relay drops out when Vx is exceeded. 2) **controller temp** If the controller's heat sink becomes too hot, relay drops out. 3) **Short Circuit** If you has gearless maschines you must connect the motor wires (shortcut) by a contactor when you are openeing the brake by hand to avoid a very quick motion of the car. This relay-function can switch on the contactor. 4) **Standby** If the relay is switched on, the old drive is over and the inverter is ready for the next drive.

2.6 ENCODER INPUTS

For the speed measurement   you need a digital incremental encoder. For reason of electromagnetic compatibility, the screen is placed on the plug casing over a large surface both on the device side and on the encoder side. The maximum length should be 10 meters.
The digital encoder must be mounted directly at the motor to get the best results.
You can use digital inkremental encoder with HTL-supply (supply voltage 10 to 30V DC), also encoders with RS422-interface (supply voltage 5V DC). These encoders are connected at the terminals.

Examples for digital encoders:
- 10 to 30V DC HTL - level
- +15/0/-15 V DC HTL- LEVEL
- 10 to 24 V DC HTL - level
- 5V TTL -   level RS422
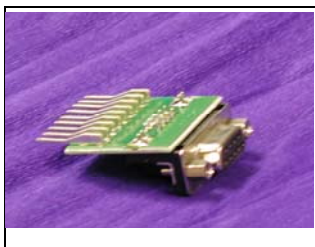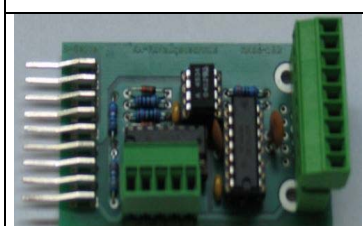
The maximum current should be 160mA.
The frequency converter can manage a encoder pulse number from 1024 to 4096. The exactly terminals are at the end of the page. There a two examples of the most used digtal incremental encoders in the following rows:

Terminal	Function	Encoder HTL 10 to 30 V DC HTL	Encoder TTL 5 V DC TTL
20	Shield	Shield	Shield
21	Channel A	A	A
22	Channel B	B	B
23	Voltage +15V DC	U_{supply}	
24	Voltage 0 V DC		GND
25	Voltage -15V DC	GND	
26	Voltage + 5V DC		U_{supply}
27	Channel A invert		A/
28	Channel B invert		B/

The following adaptcards for connecting the encoder are available:

	Adaptcard IMP-THYS For Thyssen 9-pole D-Sub TTL-Encoder , 4096 Pulses, Supply Voltage +5V DC
	Adaptcard MK66-101-Uni ... should be mounted at the encoder input. The encoder input is connected to a 9 pole terminal. At the side of the pcb, there is a 5-pole terminal for the shaft copy of the lift controller. The channels A and B are leaded over opto-cupplers.
	Adaptcard MK66-101-Thy ... ... should be mounted at the encoder input. The encoder input is connected to a 9-pole D-Sub fot Thyssen TTL-Encoders. At the side of the pcb, there is a 5-pole terminal for the shaft copy of the lift controller. The channels A and B are leaded over opto-cupplers.

2.7 Resolverinterface-INPUTS
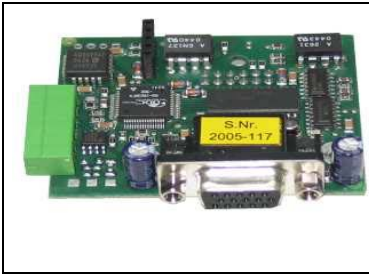
If you want to use synchrons-motors of the company Alpha Getriebebau, you have an resolver-device and you cannot use our digital encoder-inputs. The resolver is an analoge device, which builds sinus- and cosinuscurve. If you want to mount the resolver cable, you need the Resolvercard RES01. You must put it on the right side, above the serial interface of the GOLIAT-60 frequency inverter.
The wires of the resolvers are putting into the terminals of the resolvercard RES01 from left to right.

Terminal	Connection	Function
30	Ref -	Referenzspanung -
31	Ref +	Referenzspanung+
32	Cosinus -	Cosinussignal low
33	Cosinus +	Cosinussignal high
34	Sinus -	Sinussignal low
35	Sinus +	Sinussignal high
36	Schirm	PE = Erde

You can get the resolvercard RES01 also with a 15-pol-Sub-D HD Teminal. The Pin-Connection is:

Pin	Connection	Pin	Connection
1	n.c.	9	COS +
2	n.c.	10	REF +
3	SIN -	11	n.c.
4	COS -	12	n.c.
5	REF -	13	n.c.
6	n.c.	14	n.c.
7	n.c.	15	n.c.
8	SIN +	Shield	Earth

2.8 Absolutevalue-INPUTS

If you want to use synchrons-motors of the companies like Xinda, Loher, Ziehl Abegg, Montanari, Thyssen, or all the others …you need an absolutevaluecard and you cannot use our digital encoder-inputs. The absolutevaluecard ABS01 is a device, which builds sinus- and cosinuscurve If you want to mount the incremental cable, you need the absolutevaluecard ABS01. You must put it on the right side, above the serial interface of the GOLIAT-60 frequency inverter.

Absolutevalueinterface with **SSI-Interface** and 1 Vss-Sin/Cos-Incrementalchannels:

PinTerm	Connecting	Pin/Term	Connecting
1	DATA +(Datachannel)	9	CLK – (Clockchannel)
2	DATA -(Datachannel)	10	CLK + (Clockchannel)
3	N.c. or +5V Sensor	11	N.c. or 0V Sensor
4	+5V DC	12	A + (Sin-Incrementalchannel)
5	OV GND	13	A - (Sin-Incrementalchannel
6	N.c.	14	B - (Cos-Incrementalchannel)
7	B+ (Cos-Incrementalchannel)	15	n.c.
8	N.c.	Shield / 16	Earth

Absolutevalueinterface with **EnDat-Interface** and 1 Vss-Sin/Cos-Incrementalchannels:

PinTerm	Connecting	Pin/Term	Connecting
1	DATA +(Datachannell)	9	CLK – (Clockchannel)
2	DATA -(Datachannel)	10	CLK + (Clockchannel)
3	N.c. or +5V Sensor	11	N.c. or 0V Sensor
4	+5V DC	12	A + (Sin-Incrementalchannel)
5	OV GND	13	A - (Sin-Incrementalchannel)
6	N.c.	14	B - (Cos-Incrementalchannel)
7	B+ (Cos-Incrementalchannel)	15	n.c.
8	N.c.	Shield / 16	Earth

Absolutevalueinterface with **Hiperface-Interface** and 1 Vss-Sin/Cos-Incrementalchannels:

Pin/Term	Connecting	Pin/Term	Connecting
1	DATA +(Parameterchannel)	9	N.c.
2	DATA -(Parameterchannel)	10	N.c.
3	N.c. or +5V Sensor	11	N.c. or 0V Sensor
4	N.c.	12	A + (Sin-Incrementalchannel)
5	OV GND	13	A - (Sin-Incrementalchannel)
6	+12V DC	14	B - (Cos-Incrementalchannel)
7	B+ (Cos-Incrementalchannel)	15	n.c.
8	N.c.	Shield / 16	Earth

Absolutevalueinterface with **Sin / Cos-Interface** and 1 Vss-Sin/Cos-Incrementalchannels:

Pin/Term	Connecting	Pin/Term	Connecting
1	N.c.	9	N.c.
2	N.c.	10	N.c.
3	D - (Cos-Commuting)	11	D + (Cos-Commuting)
4	+5V DC	12	A + (Sin-Incrementalchannel)
5	OV GND	13	A - (Sin-Incrementalchannel)
6	N.c.	14	B - (Cos-Incrementalchannel)
7	B+ (Cos-Incrementalchannel)	15	C + (Sin-Commuting)
8	C - (Sin-Commuting)	Shield	Earth

	Absolutevalue Adapts Adapts for the following machines are available: - Thyssen DAF / SC EnDAT ECN 113 - SAD WSG EnDAT ECN 1313 - Xinda Sin / Cos - Xinda EnDAT ECN 413 - Monitor Sin / Cos ECN 1585 - Blocher GA41 / GA42 SSI - Xinda EnDAT ERN 487
	Extention **-Cable for the Absolutevalue-Inputs** The following lengths of cables are available: Extention Absolutevalue Cable 5m Extention Absolutevalue Cable 10m Extention Absolutevalue Cable 15m Extention Absolutevalue Cable 20m Extention Absolutevalue Cable 25m Extention Absolutevalue Cable 30m

2.9 SERIAL INTERFACE RS232

With serial interface (RS 232, Sub-D-terminal) you can change the parameters and look at the actual values of the motor. There are two different possibilities to choose:
You can use the serial interface to connect the **hand-program-device HPG60**. This device has a keyboard and four rows LCD display and allows you to change all parameters. It shows the actual valuas of the motor and has a fault memory with an deep of 20 messages. Above the h**and-program-device HPG60** is a lot of interested informations in the following chapters.

If you have a PC notebook, you have the possibility to connect this device with the frequency converter. We are devellopping a PC-software, which allows you to change parameters like the hand-programm-device HPG60. The PC software offers a lot of teachnical fearures.

2.10 LIFTBUS INTERFACE FOR Thyssen-, Consul-, KW-Liftbus AND DCP3

The type LB of the Goliath frequency-inverter (Intern and Extern) has a 9 pole D-Sub-terminal, at which you can directly connect the Consul- aund the KW-Liftbus. The interfaceadaptercard BI60-101 has three possibel terminals for connecting the Liftbusses.

A) D-Sub 9 polig for connecting to the mit der Goliath-60 frequency inverter.
B) Flatwire terminal 8 poles for the Thyssen-Liftbus.
C) RJ-45 Terminal fot the KW-Liftbus and the DCP3-Protokoll.
D) Screwterminal 3,5mm 4 poles for the KW-Liftbus and the DCP3-Protokoll. The Pin-names are:

A   = Channal A
B   = Channel B
GND = Ground 0V DC
PE   = Earth for shielded wires

In the menue „**LIFTBUS**" you can choose the connecting-protokoll, which you want.

2.11 ACCU-EVACUATION-UNIT FOR A EVACUATION DRIVE TO THE MAIN FLOOR

There two different evacuation-units available:

1.) EVA-60 The EVA-60 unit has an accu-set, which generate a supply voltage of 120V DC. There are also three USV-units to supply the Lift-controller, the car-light and the door-engine. It is possible to make an evacuation drive over 6 floors. With the EVA-60 Unit will be support synchrone- and asynchrone motors.

2.) The EVA-60-Light Unit is a very strong USV-Unit, which allows the evacuation drive to the next floor.

3. PARAMETER DESCRIPTION
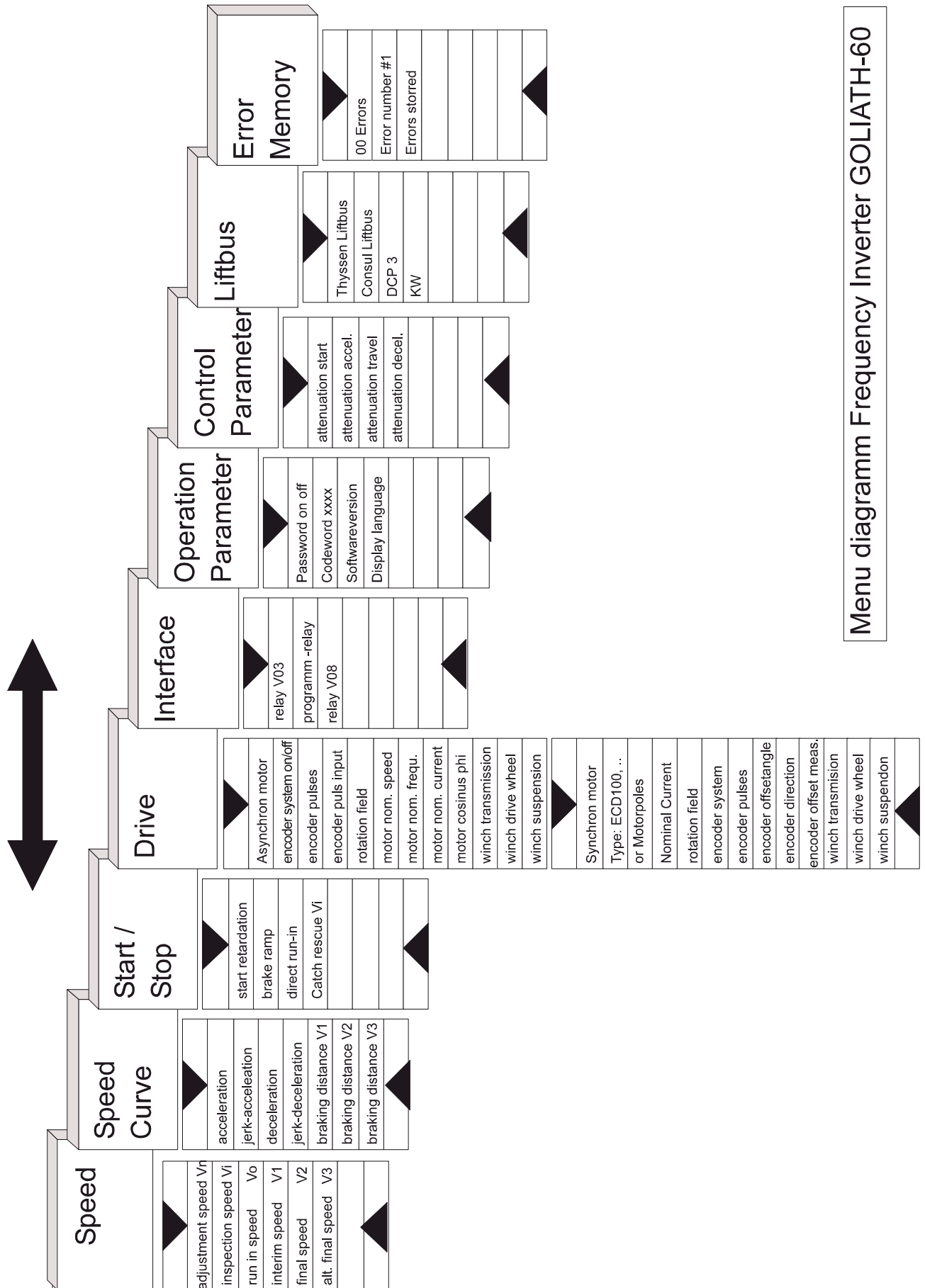
Menu diagramm Frequency Inverter GOLIATH-60

Speed
- adjustment speed Vn
- inspection speed Vi
- run in speed Vo
- interim speed V1
- final speed V2
- alt. final speed V3

Speed Curve
- acceleration
- jerk-acceleation
- deceleration
- jerk-deceleration
- braking distance V1
- braking distance V2
- braking distance V3

Start / Stop
- start retardation
- brake ramp
- direct run-in
- Catch rescue Vi

Drive

Asynchron motor
- encoder system on/off
- encoder pulses
- encoder puls input
- rotation field
- motor nom. speed
- motor nom. frequ.
- motor nom. current
- motor cosinus phi
- winch transmission
- winch drive wheel
- winch suspension

Synchron motor
- Type: ECD100,.. or Motorpoles
- Nominal Current
- rotation field
- encoder system
- encoder pulses
- encoder offsetangle
- encoder direction
- encoder offset meas.
- winch transmision
- winch drive wheel
- winch suspendon

Interface
- relay V03
- programm -relay
- relay V08

Operation Parameter
- Password on off
- Codeword xxxx
- Softwareversion
- Display language

Control Parameter
- attenuation start
- attenuation accel.
- attenuation travel
- attenuation decel.

Liftbus
- Thyssen Liftbus
- Consul Liftbus
- DCP 3
- KW

Error Memory
- 00 Errors
- Error number #1
- Errors storred

3.1 BASIC MENU OPERATION / HAND-HELD-UNIT HPG-60

The Hand-held Programming Unit HPG-60 is the universal programming tool for the entire control system. It is equipped with 6 keys, a four-lined LCD-display, one red LED, and a 9-pole RS232-Interface. Through the HPG-60, all parameters can be displayed and changed. Current actions of the control system are displayed though permanent status indicators. The accumulated fault events can be read out from the fault memory. Inquiries can also be initiated through this unit.

The serial cable which is supplied with the unit, has to be connected with the 9-pole interface socket of the HPG-60, and the corresponding socket of the Inverter. If the access authorization of the HPG-60 is accepted by the CPU, the display will show

<div align="center">

KW Aufzugstechnik
Goliath 60
Menu

</div>

The six keys are separated in two groups. The four red keys are working as a two-axis control, i.e. the upper and the lower key are used to scroll through the menue. There are eight main menues, between which you can change by using the keys „left arrow" and „right arrow". The right and the left red buttons will select the individual parameters. The values of the parameters appear on the right side.

The yellow keys are used if parameters are to be changed. The upper yellow key will increase the parameter value, through the lower yellow key the parameter value is reduced.After adjustment, the parameter value will flash on the display. The right, red key (ENTER) must be pressed to store the new setting. In case that the new value is to be disregarded, the left red key must be pressed (ESCAPE). The current key allocation is displayed on the fourth line of the display.Parameters can only be changed in standstill condition, and only if no command has been entered. Mistakes are indicated by flashing of the display.

The display is composed as follows:

1.line	menu	e.g.	SPEED
2.line	menu-value	e.g.	Leveling speed V0 0,10m/s
3.line	Actual value	e.g.	I2 > current: 22,0 A
4.line	Function of pushbuttons, errors e.g.		0 -> V2 0,10m/s

3.2 Menu ACTUAL VALUES

Speed curve: (4th row Display HPH60)	
	The actual operational state is shown at any time
	0->V2 Acceleration from 0 to max. velocity V2
	V2 constant travel with V2
	V2->0 Deceleration from V2 to floor entry velocity V0
	V0 Floor entry velocity V0
	V0->0 Deceleration from floor entry velocity V0 to 0
A1 > Commands (3rd row in Display HPG60)	
	Centred in the 4th row the commands issued by the control are shown, e.g. ▲ 0 2 (i.e. UP, V2, V0).
A2 > Relays	
	In the right of the 4th row the actual state of the six output relays are shown:
	R Relay-ready powered
	B Relay-brake powered
	F Relay travelpowered
	T Relay V<03 door release powered
	P programmable relay powered
A3 > Current	
	Actual value of motor phase current in A.
A4 > Voltage	
	Actual value of motor terminal voltage in V.
A5 > DC-Voltage	
	Actual value of DC-Bus voltage in V.
A6 > Engine Speed	
	Actual value of motor speed in rpm.
A7 > Frequency	
	Actual value of motor frequency in Hz.
A8 > Slip Frequency	
	Actual value of rotor slip in Hz.
A9 > Temperature	
	Actual value of cooling device temperature in C.
A10 > Drives	
	Actual value of the travels
A11 > D C (Drive Time Counter)	
	Actual value of the Drive Time Counter
A12 > M C (Main Power Counter)	
	Actual value of the Main Power Counter (time under power supply)

3.3 Menu SPEED

Adjustment speed Vn	
	Adjustment speed, variable from 0.5 to 100r.p.m. Is set so that the lift stops in level position after adjustment (only command Vn). Is used in the case of considerable rope elongation after which the cabin is no longer level after unloading. Requires an additional level flag that is shorter than that of V1.
Inspection speed Vi	
	Inspection speed, variable from 10 to 1500r.p.m. Set as required for inspection runs on the cabin roof and for returning the lift to its starting
Run-in speed V0	
	Run-in speed, variable from 1 to 100r.p.m. Set so that the lift stops level: If it stops too soon, V0 must be increased; if the cabin moves too far, V0 must be decreased.
Interim speed V1	
	Interim speed, variable from 10 to 3000r.p.m. Is only used when there are different braking distances in the well, i.e. when the distances from the floor switch (=deceleration point) to the levelling switch vary. After calibration of the V1 braking distance it is advisable to set V1 as high as possible; caution: BRAKING PATH V1
Final speed V2	
	Final speed, variable from 10 to 3000r.p.m.
Alt. Final speed V3	
	Final speed, variable from 10 to 3000r.p.m.

3.4 Menu SPEED CURVE

Acceleration	
	Ramp from 0 to Vmax, variable from 10% to 200% or 0.1 to 2.0 m/s²
Jerk-acceleration	
	Transition from 0 to acceleration phase and transition from acceleration phase to Vmax, adjustable from 10% to 200% or in 0.1 to 2.0m/s³. 0.1m/s³ corresponds to a soft run out and 2.0m/s³ to a hard run out
Deceleration	
	Ramp from Vmax to V0. Adjustment range: From 10% to 200% or 0.1 to 2.0m/s².
Jerk-deceleration	
	Transition from Vmax to the deceleration phase and from the deceleration phase to V0, adjustable from 10% to 200% or in 0.1 to 2.0m/s³. First set to 1m/s³, then after calibration of the V1/V2/V3 braking distance, adjust according to sensations during a run
Braking distance V1: -off- -on- -learning-	
	Scanning of braking distance for short stops (shorter distance from the floor switch to the levelling switch than on a long run). Is driven at V1 speed. The controller decelerates immediately upon reaching the floor switch and creeps for a relatively long time to the levelling switch. The controller calculates the optimum deceleration on the basis of the braking distance from the floor switch to the levelling switch. If the V1 run is repeated, the lift will pass the deceleration point (floor switch) and continue running up to the calculated deceleration point. The duration of the run-in speed V0 is thus minimised to around 0.3 s.
Braking distance V2: -off- -on- -learning-	
	Braking distance scanning for long stops with speed V2. The same applies here as in the preceding section
Braking distance V3: -off- -on- -learning-	
	Braking distance scanning for long stops with speed V3. The same applies here as in the preceding section

3.5 Menu START / STOP

Start retardation	
	Starting delay, variable from 0 to 1000 ms. If the motor works against the mechanical brake due to the contactor and control system delay times, the controller start can be delayed until the mechanical brake has been reliably released. The value for asynchrone-motors is ~ 150ms. For synchrone-motors you should increase the value on ~ 400ms.
Brake ramp	
	End deceleration from V0 to zero. Ramp over levelling flag. If you feel a small jerk during the end deceleration, reduce the value. Variable from 1% to 100% or 0.01 to 1.00m/s². The braking ramp can also be used to adjust the halting accuracy
Direct run-in	
	Direct run-in. On: Deceleration time V0 is reduced to 0sec. The condition for this function is that you have done the learning-drive with the brake-distance.
Catch-rescue Vi	
	With this option the motorcurrent is increased to twice of the nominal current at startup with Vi. So You can pull out the elevator in between 10 attempts, if the security claw has locked the car.

3.6 Menu DRIVE

Asynchron Motor / Synchron Motor -> Asynchron Motor
Encoder System On/Off
With this option you can activate the operation of the controller without a tacho-generator (not available at time of printing).
Encoder pulses
Enter the number of pulses of the digital tacho-generator per resolution. Possible entries: 1,000 to 30,000 pulses / resolution
Encoder pulse input
In case of message „DIRECTION WRONG", change from [A-B] to [B-A]. This function is corresponding to the exchange of the tacho input leads A and B
Rotation field
If motor runs into wrong direction (e. g. down with signal „UP"), use this function to change the direction of the rotation field. This corresponds to the exchange of the leads U and V
Nominal speed
See the motor rating plate for the nominal speed value. If the name plate gives a value of 1,000 or 1,500, consult the motor supplier, because the data given are for the synchronous speed instead of the nominal speed!
Nominal frequency
Nominal motor frequency. See the motor name plate for the correct value
Nominal current
See the motor name plate for the correct nominal current for the motor.
Cosine ρ
See the motor name plate for the cosine ρ value
Winch transmission
Enter the gear ratio. See the gearbox rating plate for the correct value.
Winch drive wheel
Enter drive pulley diameter in (mm).
Winch suspension
Enter rope suspension (e.g. 1:1, 2:1 … 8 :1).

Asynchron Motor / Synchron Motor -> Synchron Motor
MOTOR TYPE: Alpha ECD100 - EPM 100 – EPM 200 - EPM 300 - EPM 500
Ziehl Abegg ZETADYN SM700 – ZETADYN SM850
Montanari   MDD150 - MCG150
THYSSEN   DAF 210
Enter the motor-type of the motor you want to use or the number ot motorpoles
Nominal current
See the motor rating plate for the correct nominal current for the motor
Rotation field
If motor runs into wrong direction (e. g. down with signal „UP"), use this function to change the direction of the rotation field.
Encoder system
Enter the encoder-type of the motor you want to use. Possible entries: (Resolver / SSI / EnDat / Hiperface / Sin-Cos-Encoder)
Encoder pulses
Enter the number of pulses of the digital tacho-generator per resolution. Possible entries: 512 / 1024 / 2048 / 4096 pulses / resolution
Encoder- Offsetangle
The fault-parameter depend on the type of the motor. But you can choose an angle from 0 to 360 degrees.
Encoder- Direction
In case of message „DIRECTION WRONG", or there is no motion, change from [A-B] to [B-A]. This function is corresponding to the exchange of the tacho input leads A and B
Encoder- offset measure
In case of there is no value of encoder-offsetangle you must make a measurement with this function. Attention, you must put off the ropes of the winch drive wheel.
Winch transmission
Enter the gear ratio. See the gearbox rating plate for the correct value.
Winch drive wheel
Enter drive pulley diameter in (mm).
Winch suspension
Enter rope suspension (e.g. 1:1 2 :1 or 4:1).

3.7 Menu INTERFACE

Relay V<03	
	Speed threshold V<0.3 m/s. For locking during run-in with open door. Closes when value falls below the adjustable threshold
Program-Relay	
	Freely programmable relay. One of the following functions can be assigned to the relay: 1) **V<Vx** Speed threshold (adjustable from 0.2 to 4m/s); relay drops out when Vx is exceeded. 2) **controller temp** If the controller's heat sink becomes too hot, relay drops out. 3) **Short Circuit** If you has gearless maschines you must connect the motor wires (shortcut) by a contactor when you are openeing the brake by hand to avoid a very quick motion of the car. This relay-function can switch on the contactor. 4) **Standby** If the relay is switched on, the old drive is over and the inverter is ready for the next drive.
Relay V<08	
	Speed threshold V<0.8 m/s.

3.8 Menu-OPERATING PARAMETER

Password	
	You can choose your own Code-number
Software version	
	Display the version number of the software and the controller type.
Display-language	
	You can choose between the several language versions for the menu display.

3.9 Menu LIFTBUS

LIFTBUS	
	At the inverters of type LB you can choose between several lift-protokolls. (Thyssen Liftbus, Consul-Liftbus, KW-Liftbus, DCP 3)

3.10 Menu CONTROL PARAMETER

Attenuation Start	
	Adjustment range from 0 to 100%. If vibrations occur during starting (motor vibrations, noise from motor), this value can be increased.
Attenuation acceleration	
	Adjustment range from 0 to 100%. If vibrations occur during acceleration, this value can be increased. Recommendation: 0%.
Attenuation travel	
	Adjustment range from 0 to 100%. If vibrations occur during constant running, this value can be increased. Recommendation: 0%.
Attenuation deceleration	
	Adjustment range from 0 to 100%. If rope vibrations occur during deceleration, usually during run-in, due to unattenuated bearings, this value can be increased. Recommendation: 0%

3.10 Menu ERROR MEMORY

Error number and description of the errors	
ERROR 01	IPM – Overcurrent because of a shortcut or wrong motorparameter
ERROR 02	Overcurrent-U because of wrong motorparameters
ERROR 03	Overcurrent-V because of wrong motorparameters
ERROR 04	Overcurrent-U because of wrong motorparameters
ERROR 05	Dissipator temperature too high - Inverter is overloaded or ambient temperature is to high
ERROR 06	Interim circuit voltage is too high - Brake resistor is not connected or damaged
ERROR 07	Interim circuit voltage is too low – mains voltage too low
ERROR 08	Drive-contactor not activated during start or at least one phase of the main supply is missing
ERROR 09	Drive-contactor not activated during travel or at least one phase of the main supply is missing
ERROR 10	Release "Direction UP" and "Direction DOWN" has disappeared during run or before end of braking
ERROR 11	Release "Direction UP" and "Direction DOWN" are applied simultaneously.
ERROR 12	Wrong direction – Change encoder input A/B or digital encoder does not
ERROR 13	Variance – Inverter is overloaded or wrong motor/encoder parameters
ERROR 14	No pulses from encoder – check the encoder wiring, check the mechanical brake
ERROR 15	Interim precharge – Earth fault at the brake resistor wires or mains
ERROR 16	Release "Direction UP" and "Direction DOWN" change during run

4. FIRST ACTIVATION OF THE ELEVATOR INSTALLTION

4.0 DESCRIPTION HAND-HELD PROGRAMMING UNIT HPG-60

The Hand-held Programming Unit HPG-60 is the universal programming tool for the entire control system. It is equipped with 6 keys, a four-lined LCD-display, one red LED, and a 9-pole RS232-Interface. Through the HPG-60, all parameters can be displayed and changed. Current actions of the control system are displayed though permanent status indicators. The accumulated fault events can be read out from the fault memory. Inquiries can also be initiated through this unit.

The serial cable which is supplied with the unit, has to be connected with the 9-pole interface socket of the HPG-60, and the corresponding socket of the Inverter. If the access authorization of the HPG-60 is accepted by the CPU, the display will show

KW Aufzugstechnik

The six keys are separated in two groups. The four red keys are working as a two-axis control, i.e. the upper and the lower key are used to scroll through the menue. There are eight main menues, between which you can change by using the keys „left arrow" and „right arrow". The right and the left red buttons will select the individual parameters. The values of the parameters appear on the right side.

The yellow keys are used if parameters are to be changed. The upper yellow key will increase the parameter value, through the lower yellow key the parameter value is reduced.After adjustment, the parameter value will flash on the display. The right, red key (ENTER) must be pressed to store the new setting. In case that the new value is to be disregarded, the left red key must be pressed (ESCAPE). The current key allocation is displayed on the fourth line of the display.Parameters can only be changed in standstill condition, and only if no command has been entered. Mistakes are indicated by flashing of the display.

The display is composed as follows:

1.line	menu	e.g.	SPEED
2.line	menu-value	e.g.	Leveling speed V0 0,10m/s
3.line	Actual value	e.g.	I2 > current: 22,0 A
4.line	Function of pushbuttons, errors e.g.		0 -> V2 0,10m/s

The Software for the Frequency-inverter Goliath-60 is still in preparing. In future it will give the possibilty to put parameters by the PC.

4.1 FIRST STEP – SYNCHRONE MACHINE TYPE Alpha ECD100-200-300, EPM100, 300, 500

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

Also for the resolver-wire is the right connection very important. The resolver direction can be only changed by the software parameter.

It is very important to connect the shield of the wire, because the resolver is an analog device. The company alpha getriebebau has a lot of good resolver-wires, which you only have to put into the 15-pole HD-Sub terminal of the resolver-card.

	ECD 100	ECD 200	ECD 300
DRIVE	Synchronmachine	Synchronmachine	Synchronmachine
Menu	Yes	Yes	Yes
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	12		
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Encoder-System	Resolver	Resolver	Resolver
Encoder-pulses	1024	1024	1024
Offset-angle	30 Degree	Degree	Degree
Encoder-direction	Right	Right	Right
Offset-measure	You don't have to do it	You don't have to do it	You don't have to do it
Start-retardation	400 ms	400 ms	400 ms
Start-1-Drehzlrg- P **Start-1-Drehzlr- I** **Start-1Drehzlr- P- I**	8000 200 400 ms	8000 200 400 ms	8000 200 400 ms
Start Lageregler-P **Start Lageregler- I** **Start Lageregl. P-I**	6000 100 350 ms	6000 100 350 ms	6000 100 350 ms
Drehzahlregler- P **Drehzahlregler- I**			
Stromreg. max.- P **Stromreg. max.- I**			
Dynamik Stromreg			
PT1-Zeit			
PT-1-EIN/AUS			

	EPM 100	EPM 300	EPM 500
DRIVE	Synchronmachine	Synchronmachine	Synchronmachine
Menu	Yes	Yes	Yes
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	18	18	12
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Encoder-System	Resolver	Resolver	Resolver
Encoder-pulses	1024	1024	1024
Offset-angle	0 Degree	180 Degree	30 Degree
Encoder-direction	Right	Right	Right
Offset-measure	You don't have to do it	You don't have to do it	You don't have to do it
Start-retardation	400 ms	400 ms	400 ms
Start-1-Drehzlrg- P **Start-1-Drehzlr- I** **Start-1Drehzlr- P- I**	8000 200 400 ms	8000 200 400 ms	8000 200 400 ms
Start Lageregler-P **Start Lageregler- I** **Start Lageregl. P-I**	6000 100 350 ms	6000 100 350 ms	6000 100 350 ms
Drehzahlregler- P **Drehzahlregler- I**			
Stromreg. max.- P **Stromreg. max.- I**			
Dynamik Stromreg			
PT1-Zeit			
PT-1-EIN/AUS			

4.2 FIRST STEP – SYNCHRONE MACHINE TYPE Montanari MDG150, MCG 150,

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

The pins of the wire must be connected to 15 pole D-Sub-terminal with the solder iron. You can see the important pins in the last row down there. Another possibility is the use of absolutvalue-Adaptcard **ABS-Adapt**, which allows to connect the pins with the screw-driver.

Signals	CS-Terminalr Motor	PIN-Cable	PIN / Terminal ABS-Card
DATA +	**D**	**46**	**1**
DATA -	**H**	**47**	**2**
OV GND	**F**	**44**	**5**
+12V DC	**E**	**45**	**6**
B + (Cos-Spur)	**B**	**42**	**7**
A + (Sin-Spur)	**A**	**40**	**12**
A - (Sin-Referenz)	**G**	**41**	**13**
B - (Cos-Referenz)	**C**	**43**	**14**
Earth	**Shield**	**Shield**	**16 / Casing**

	MDG 150	**MCG 150**	**MG 250**
DRIVE	Synchronmachine	Synchronmachine	Synchronmachine
Menu	Yes	Yes	Yes
Nomina-ICurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	16 A
Motor-pole		20	20
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Encoder-System	Hiperface	Hiperface	Sin/Cos
Encoder-pulses	1024	1024	2048
Offset-angle	**Offset-measure**	**Offset-measure**	**Offset-measure**
Encoder-direction	Right	Right	
Offset-measure	Before mounting the ropes	Before mounting the ropes	Before mounting the ropes
Start-retardation			700 ms
Start-1-Drehzlrg- P **Start-1-Drehzlr- I** **Start-1Drehzlr- P- I**			8000 100 200 ms
Start Lageregler-P **Start Lageregler- I** **Start Lageregl. P-I**			4000 600 500 ms
Drehzahlregler- P **Drehzahlregler- I**			11.200 250
Stromreg. max.- P **Stromreg. max.- I**			
Dynamik Stromreg			
PT1-Zeit			270ms
PT-1-EIN/AUS			

4.3 FIRST STEP – SYNCHRONE MACHINE TYPE **SwissTraction GA41, 42, 52 Z2xx, Z3xx**

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

	GA 41	GA 42	GA 52
DRIVE	Synchronmachine	Synchronmachine	Synchronmachine
Menu	No, Number of Motor Poles	No, Number of Motor Poles	No, Number of Motor Poles
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	24	24	
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Drive-Wheel	320, 400mm	480, 520, 600, 680mm	320, 400, 500, 600mm
Encoder-System	SSI, or **EnDat-Encoder**	SSI, or **EnDat-Encoder**	**SSI or EnDat-Encoder**
Adapter	No, KW-Cable from SwissTr.	No No, KW-Cable from SwissTr.	No, KW-Cable from SwissTr.
Encoder-pulses	2048	2048	2048
Offset-angle			
Encoder-direction	Right	Right	Right
Offset-measure	On the machine!	On the machine!	On the machine!
Start-retardation	650ms	650ms	650ms
Start-1-Drehzlrg- P	8000	8000	8000
Start-1-Drehzlr- I	100	100	100
Start-1Drehzlr- P- I	200ms	200ms	200ms
Start Lageregler-P	7000	7000	7000
Start Lageregler- I	600	600	600
Start Lageregl. P-I	500ms	500ms	500ms
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1000	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

	Z 241	Z 244	Z 326
DRIVE	Synchronmachine	Synchronmachine	Synchronmachine
Menu	No, Number of Motor Poles	No, Number of Motor Poles	No, Number of Motor Poles
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole			
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Drive-Wheel	320, 400mm	210, 240, 320mm	210, 240, 320mm
Encoder-System	**EnDat-Encoder**	**EnDat-Encoder**	**EnDat-Encoder**
Adapter	No, KW-Cable from SwissTr.	No No, KW-Cable from SwissTr.	No, KW-Cable from SwissTr.
Encoder-pulses	2048	2048	2048
Offset-angle			
Encoder-direction	Right	Right	Right
Offset-measure	On the machine!	On the machine!	On the machine!
Start-retardation	650ms	650ms	650ms
Start-1-Drehzlrg- P	8000	8000	8000
Start-1-Drehzlr- I	100	100	100
Start-1Drehzlr- P- I	200ms	200ms	200ms
Start Lageregler-P	10000	10000	10000
Start Lageregler- I	600	600	600
Start Lageregl. P-I	450ms	450ms	450ms
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1000	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

4.4 FIRST STEP – SYNCHRONE MACHINE TYPE Ziehl Abegg SM700, 860, 250, 225, 200

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

	Zetasyn SM 700	Zetasyn SM 860	Zetatop SM 250
DRIVE	Synchronemachine	Synchronemachine	Synchronemachine
Menu	Zetasyn SM700	Zetasyn SM850	No, Number of Motor Poles
Nomina-lCurrent	Motor	plate, motorpapers	Motor-plate, motorpapers
Motor-pole	30	20	
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Drive-Wheel	320, 400mm	480, 520, 600, 680mm	320, 400, 500, 600mm
Encoder-System	SSI, or **EnDat-Encoder**	SSI, or **EnDat-Encoder**	**EnDat-Encoder**
Adapter	No	No	N0
Encoder-pulses	2048	2048	2048
Offset-angle	0 Degree	0 Degree	0 Degree
Encoder-direction	Left	Left	Left
Offset-measure	Only after Encoder Change	Only after Encoder Change	Only after Encoder Change
Start-retardation	600ms	600ms	1000ms
Start-1-Drehzlrg- P	8000	8000	8000
Start-1-Drehzlr- I	200	200	100
Start-1Drehzlr- P- I	200ms	200ms	200ms
Start Lageregler-P	4000	4000	7000
Start Lageregler- I	600	600	1200
Start Lageregl. P-I	500ms	500ms	950
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1000	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

	Zetatop SM 225	Zetatop SM 200.20/30B	Zetatop SM 200.15B
DRIVE	Synchronemachine	Synchronemachine	Synchronemachine
Menu	No, Number of Motor Poles	No, Number of Motor Poles	No, Number of Motor Poles
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	20		
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Drive-Wheel	320, 400, 500, 600mm	210, 240, 320mm	210, 240, 320mm
Encoder-System	**EnDat-Encoder**	**EnDat-Encoder**	**EnDat-Encoder**
Adapter	N0	N0	N0
Encoder-pulses	2048	2048	2048
Offset-angle	0 Degree	0 Degree	0 Degree
Encoder-direction	Left	Left	Left
Offset-measure	Only after Encoder Change	Only after Encoder Change	Only after Encoder Change
Start-retardation	700ms	700ms	700ms
Start-1-Drehzlrg- P	8000	8000	8000
Start-1-Drehzlr- I	80	80	80
Start-1Drehzlr- P- I	200ms	200ms	200ms
Start Lageregler-P	7000	7000	7000
Start Lageregler- I	750	750	750
Start Lageregl. P-I	550ms	550ms	550ms
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1500	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

4.5 FIRST STEP – SYNCHRONE MACHINE TYPE Thyssen DAF 210 –270, SC 300-400

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter! The absolutevaluecable from Thyssen needs an adaptcable to use it with the 15 pole D-sub-terminal of the absolutevaluecard. Only the old asynchrone Gearless DAF 330 needs nothing!

	Thyssen DAF 210	**Thyssen DAF 270**	**Thyssen DAF 330**
DRIVE	Synchronemachine	Synchronemachine	Asynchronmaschine
Menu	No, Number of Motor Poles	No, Number of Motor Poles	
Nomina-ICurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	16	20	
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Encoder-System	**EnDat-Encoder**	**EnDat-Encoder**	TTL Encoder
Adapter	Yes	Yes	No
Encoder-pulses	2048	2048	16358
Offset-angle	0 Degree	0 Degree	0 Degree
Encoder-direction	Left	Left	Left
Offset-measure	Only after Encoder Change	Only after Encoder Change	-------------
Start-retardation	600ms	600ms	600ms
Start-1-Drehzlrg- P	4000	4000	8000
Start-1-Drehzlr- I	200	200	100
Start-1Drehzlr- P- I	400ms	400ms	200ms
Start Lageregler-P	15000	15000	10000
Start Lageregler- I	600	600	650
Start Lageregl. P-I	400ms	400ms	550ms
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1000	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

	Thyssen SC 300	**Thyssen SC 400**	
DRIVE	Synchronemachine	Synchronemachine	
Menu	No, Number of Motor Poles	No, Number of Motor Poles	
Nomina-ICurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	
Motor-pole	20	20	
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	
Encoder-System	**EnDat-Encoder**	**EnDat-Encoder**	
Adapter	Yes	Yes	
Encoder-pulses	2048	2048	
Offset-angle	0 Degree	0 Degree	
Encoder-direction	Left	Left	
Offset-measure	Only after Encoder Change	Only after Encoder Change	
Start-retardation	600ms	900ms	
Start-1-Drehzlrg- P	8000	8000	
Start-1-Drehzlr- I	100	100	
Start-1Drehzlr- P- I	200ms	200ms	
Start Lageregler-P	10000	10000	
Start Lageregler- I	650	800	
Start Lageregl. P-I	550ms	650ms	
Drehzahlregler- P	8000	8000	
Drehzahlregler- I	100	100	
Stromreg. max.- P	24000	24000	
Stromreg. max.- I	1000	1500	
Dynamik Stromreg	60%	60%	
PT1-Zeit	400ms	400ms	
PT-1-EIN/AUS	EIN	EIN	

4. FIRST STEP – SYNCHRONE MACHINE TYPE Wittur-SAD WSG 08 / 19

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

The absolutevaluecable KEB F4 from SAD needs an adaptcable to use it with the 15 pole D-sub-terminal of the absolutevaluecard.

	SAD WSG 08.3	SAD WSG 19.2	SAD WSG 19.4
DRIVE	Synchronemachine	Synchronemachine	Synchronemachine
Menu	No, Number of Motor Poles	No, Number of Motor Poles	No, Number of Motor Poles
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole	20	20	20
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel	Right or left, position of the driving wheel
Encoder-System	**EnDat-Encoder**	**EnDat-Encoder**	**EnDat-Encoder**
Adapter	Yes	Yes	Yes
Encoder-pulses	2048	2048	2048
Offset-angle	**Offset-measure**	**Offset-measure**	**Offset-measure**
Encoder-direction	Right or left, position of the Encoder	Right or left, position of the Encoder	Right or left, position of the Encoder
Offset-measure	Before mounting the ropes	Before mounting the ropes	Before mounting the ropes
Start-retardation	550ms	550ms	550ms
Start-1-Drehzlrg- P	8000	8000	8000
Start-1-Drehzlr- I	100	100	100
Start-1Drehzlr- P- I	200ms	200ms	200ms
Start Lageregler-P	7000	7000	7000
Start Lageregler- I	500	500	500
Start Lageregl. P-I	450ms	450ms	450ms
Drehzahlregler- P	8000	8000	8000
Drehzahlregler- I	100	100	100
Stromreg. max.- P	24000	24000	24000
Stromreg. max.- I	1000	1000	1000
Dynamik Stromreg	60%	60%	60%
PT1-Zeit	400ms	400ms	400ms
PT-1-EIN/AUS	EIN	EIN	EIN

4.7 FIRST STEP – SYNCHRONE MACHINE TYPE SIN/COS-Geber Typ ERN 1387, like Xinda, Bejing Motor Factory, Loher SVM & SG

First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the cole U of the motor, the phase V must connected with the cole V of the motor, a.s.o. . The rotation field of the motor can be only changed by the software parameter!

The pins of the wire must be connected to 15 pole D-Sub-terminal with the solder iron. You can see the important pins in the last row down there. Another possibility is the use of absolutvalue-Adaptcard **ABS-Adapt**, which allows to connect the pins with the screw-driver.

Signals	12-pole PCB-Terminal ERN1387	15-pole D-Sub Female ERN1387		PIN / Terminal ABS-Card
+ 5V DC	**2a**	**1**	bn/gr	**4**
OV GND	**1a**	**2**	we/gr	**5**
B+ (Cos-Inkrementalspur)	**5b**	**6**	gries	**7**
C - (Sin-Kommutierung)	**4a**	**12**	black	**8**
A + (Sin-Inkrementalspur)	**6b**	**3**	brown	**12**
A - (Sin-Inkrementalspur	**6a**	**4**	green	**13**
B - (Cos-Inkrementalspur)	**5a**	**7**	rosa	**14**
C + (Sin-Kommutierung)	**4b**	**10**	red	**15**
Erde	**Shield/Casing**	**Schirm/Gehäuse**		**16 / Casing**

Typ	Xinda	Loher SVM250.4
DRIVE	Synchronemachine	Synchronemachine
MENU	No, Number of Motor Poles	No, Number of Motor Poles
Nomina-lCurrent	Motor-plate, motorpapers	Motor-plate, motorpapers
Motor-pole		18 Pole
Rotation-field	Right or left, position of the driving wheel	Right or left, position of the driving wheel

Encoder-System	SIN/COS or EnDat Encoder	SIN/COS or EnDat Encoder
Encoder-pulses	2048	2048
Offset-angle	Offset-measure	Offset-measure
Encoder-direction	Right or left, position of the Encoder	Right or left, position of the Encoder
Offset-measure	Before mounting the ropes	Before mounting the ropes
Start-retardation	700ms	600ms
Start-1-Drehzlrg- P	8000	8000
Start-1-Drehzlr- I	100	100
Start-1Drehzlr- P- I	200ms	200ms
Start Lageregler-P	7000	7000
Start Lageregler- I	700	650
Start Lageregl. P-I	600ms	550ms
Drehzahlregler- P	8000	8000
Drehzahlregler- I	100	100
Stromreg. max.- P	24000	24000
Stromreg. max.- I	1000	1000
Dynamik Stromreg	60%	60%
PT1-Zeit	400ms	400ms
PT-1-EIN/AUS	EIN	EIN

4.8 PERFORMING A MEASUREMENT-DRIVE TO GET THE OFFSET ANGLE

Step A) Activation before the offset-measure starts

1.) If the manufactor of the synchronemachine has noticed the offset-angle on the machine, e.g. the companies Ziehl-Abegg & Thyssen have 0 degree, you don't have to make a offset-measurement
2.) Please check the encoder-pining. If you have any douts, please look at page 17 and telephone with the manufactor of the machine !
3.) It is not allowed that the ropes are on the driving wheel!
4.) The motor- and the brakeresistotcable must be connected. First law for synchrone motors, is that you have to connect the machine with the motor-wire in the right way. The phase U must connected with the pole U of the motor, the phase V must connected with the pole V of the motor, a.s.o.
5.) In the **DRIVE menu**, there must be all parameters put in from the motor-plate.
6.) Now increase the values for the parameter „Attenuation Start" and „Attenuation Acceleration" in the **Menu „CONTROL PARAMETER"** to 50 %
7.) The value of the parameter "**Nominal Current**" in the menu "DRIVE" must be reduced for the Offset-measure to **the half** of the real value of the motor-plate.

Step B) Start the offset-measure

1.) In the **Menu „DRIVE"** please switch the parameter "**Offset-Measure"** to "**ON**"
2.) Please consider the parameter **I3-Current** in the menu „**Actual Values**". The real current should be rise maximal to the value of the nominal current.
3.)**Now, please switch on the direction- and the speed-command:**
   (Vi or Vo with restore-mode).
    Attention! Only slow speed-commands are allowed!
   Please wait, until the motor has rotated and the main contactor have switched off.
   Now, the Offset-angle is generated!
4.) Please check with a Restore-Drive if the funktion is OK. .
5.) Now reduce the values for the parameter „Attenuation Start" and „Attenuation Acceleration" in the **Menu „CONTROL PARAMETER"** to 0 %.

Step C) Nominal current for standard travel

In the **Menu „DRIVE"**, under the parameter „**NOMINAL CURRENT**", must be put in the **real current** (Actual Values I3-Current), when the empty car is driving down in standard travel.

4.9 MOUNTING THE ENCODER SYSTEM

If you are using a new elevator-winch, normaly the encoder system is already mounted at the motor. A lot of motor companies have their own wire with connector.
For the asynchrone machines of the company Thyssen, we have adapts-cards to connect the 9-pole- or 15-pole-D-sub-connectors very quickly.

If you want to use the old elevator machine with an inverter, you have often the problem with the mounting of the encoder-system. A good possibility is the use of a connenting-screw in the shaft of the motor and a little encoder.

The mountingset of the SOLUTION-Encodersystem has the following components: - SOLUTION-Encoder with 10 meter wire and plug for GOLIATH-60 inverters. - Metal-screwstick with the exact Mxx screw. - Holder, constructed as a Z-spring with 3 pieces of M3 screws.	
The encoder is tested inside of the company. Please handle it very carefully! The holder avoids a motion of the encoder during the motor is running. The encoder should not mounted very hard with motor-casing. The Z-spring helps to reach a flexible fixing with the motor-casing.	
Please pull away the plastic-holder and fix the metalholder at the encoder with the three screws.	
Please fix the screwsick into the drill hole of the shaft of the motor. All screwsticks are proofed inside of the company. Please avoid to hit with any tools at the surface of the screwstick!	
Pull very carefully the encoder only with your hand, without any tool, on the screwstick and fix the mounting. After that please fix the metalholder with the casing of the machine. The encoder should not move with the machine, but the fixing must not so hard that vibrations make damages inside of the encoder!	

4.10 LOOK OVER THE INSTALLATION

Before the first activation of motion, you must check the electrical installation:

Point	Description	OK ?
1.1	All terminals and wires are connected to the motor, lift controller and encoder ?	
1.2	The shields of the motorwire and the Brake-resistor-wire are connected on both ends?	
1.3	You must use a shield wire for the encoder. The shield of the encoder is connected on both ends?	
1.4	You must compare the technical facts of the frequency inverter with the following points: **Power supply** **Motorpower / Motor nominal current** **Controller voltage**	
1.5	You have installed a brake-resistor with the right Power fact?	
1.6	The main-fuses are higher than the nominal current?	
1.7	If you are using a FI-Switch the maximum current against earth should be 30 mA?	
1.8	The casing of the frequency-inverter is closed?	

4.11 INPUT OF PARAMETERS

A special remark should be given to the menu "engine/gear" the data of the pulse generator, the motor and the gearbox according to their name plates must be entered. To optimise the function of the software motor model, the exact values are to be inserted.
After this adjustments, the separate velocities are to be entered in the menu Speed and than the Speed curve is to be adjusted. It must be observed, that in the first step, the acceleration and deceleration should be adjusted to a mean value of 50% only, to consider the actual state of the installation, for the elevator is used with the base frame only or that the counter-weight is not completely filled up, leading to slippage of the rope over the drive wheel.
Succeeding the data for Start / Stop and the additional functions may be entered.
While entering the data, the sequence of the menus is to be observed. It is essential, that the data in the menu engine/gear are entered first, otherwise data in the other menu may be overwritten!

4.12 ENCODER CHECK

The encoder is a very important member of the regulation. Before you do the first travel, you should check the encoder very carefully.
For this, you need two men. One person put in the HPG-60 into serial plug RS232 and look in the menu actaul Values und the parameter speed. The other person is opening the mech. Brake for a very short time.
On the HPG-60 the speed must increase for a short time and then, after brake is close it has the value zero.

4.13 ACTIVATION IN RESTORE   / INSPECTION MODE

Before performing the first travel, please re-check the following:

1) Are the parameters in engine/gear matching the data of the device's nameplates installed?
2) Is the parameter inspection speed containing a sense full value?

3) If the inspection drive initiates the error messages "Direction wrong" or "Difference Demand/actual too high", check if the holding brake is activated and if it has opened.

4) Please check, if the encoder is fixed at the motor shaft.

5) If the brake is working, the motor rotation direction may be inversed. That case, swap two motor wires or invert the rotation direction of the motor in the menu drive.

6) If the motor rotates in the wrong direction, when initiating a restore / inspection drive, the motor rotation direction is to be changed in the menu drive.

7) If the motor sounds noisy during the restore / inspection drive, check if the motor data are correct. Especially for planetary gear drives it is essential that e.g. the motor frequency is entered correctly.

4.14 START RETARDATION

The value for the start retardation at asynchrons motors should be ~ 150ms. If you have an synchrone motor, you should increase the value at ~ 400ms. If the motor starts wit a strong jerk or move in the wrong direction, please increase the value.

4.15 PERFORMING STANDARD TRAVEL

A good strategy for the first standard travel is, that the deceleration distance is longer than necessary. The cabin moves to the stop with lowest speed longer. This time with lowest speed could be optimised later by optimisation of the braking distances.

	Speed			
Deceleration	0,5 m/s	1,0m/s	1,6m/s	2,0 m/s
0,6 m/s^2	1,1m	1,3m	2,7m	3,7m
0,8 m/s^2	1,0m	1,2m	2,3m	3,0m
1,0 m/s^2	0,9m	1,2m	2,0m	2,5m
1,2 m/s^2	0,8m	1,1m	1,8m	2,2m
	Minimum Brake-way			

If a jerk occurs when the drive changes from acceleration to constant travel speed, this could be corrected by changing the jerk acceleration in the menu speed curve. The smaller the value, the smoother the transition.
The same applies to the transition from constant travel to deceleration. The speed curve could be configured smoother or harder within the menu speed curve by the parameter jerk deceleration.

4.16 CORRECTION OF THE STOP INACCURACIES

The stop accuracy for run-in to the stop depends on two parameters Run-In Speed V0 of menu Speed and Run-In Ramp of menu Start/Stop. All testing should be performed in the same stop.

Change of parameter Run-In Speed V0:

If the cabin stops too early, the Run-In Ramp is to be decreased in small steps, while it is to be increased, if the cabin overruns the stop. A good compromise is to be evaluated only by a combination of both parameters.
The next step is to run-in all stops of the installation from both directions. If inaccuracies occur, the Run-In Speed is to be increased if the cabin stops before reaching the levelled switch. If the cabin overruns the levelled, the Run-In Speed is to be decreased. Correct changes to the parameter Run-In Ramp.

Performing optimisation of braking distance:

For start with the configuration of the standard travel, we configured the cabin for a little longer run-in distance. This is optimised by the braking distance optimisation. The selection of the matching one out of the offered variants depends on the selected Final Speed.
In general the parameter braking distance for the used final speed V1, V2 or V3 is to be selected in the menu Speed Curve. The parameter Learn In Drive is to be set to "Yes".

After that, a standard travel is to be performed. After successful completion of the tracel, the parameter braking distance optimisation is set to ON. For all future travels the deceleration point of the controller is ignored and the reaction is delayed by an internal delay.
The Run-In travel distance is minimised.

4.17 CHANGING THE TRAVEL COMFORT

Caused by rope oscillations or other mechanical reasons, oscillations could occur in the cabin. Therefore the speed curve is separated into the four zones "Start", "Acceleration", "Travel" and Stop".
Each of this zone has its according attenuation parameter to compensate oscillations most effective.

4.18 DIRECT DRIVE IN

At the motion **Direct Drive In** there will be the speed V0 reduce to Zero. In the menu **Start / Stop** you will find the parameter Direct Drive In. This parameter you should be only activate, if you have a lift controller, who can calculate the brake point very quickly. The condition to activate the Direct Drive In function is that you have done before the learning drive for the brake distance with the right speed (look at 5.15 Performing optimisation of braking distance).

4.19 CATCH - RESCUE

The "Catch – Rescue" is located in the menu Start/Stop. For normal operation the motorphase current is limited to 1.7 times the nominal current.
For some situations this current is not enough to drive the cabin, i.e. after testing the catch. Therefore this parameter allows to increase the current to twice the nominal current, while this operation mode is limited by:

- To be used only with inspection speed
- Max. 10 On/Off transitions. After these 10 trials, the motor phase current is switched back to normal mode.
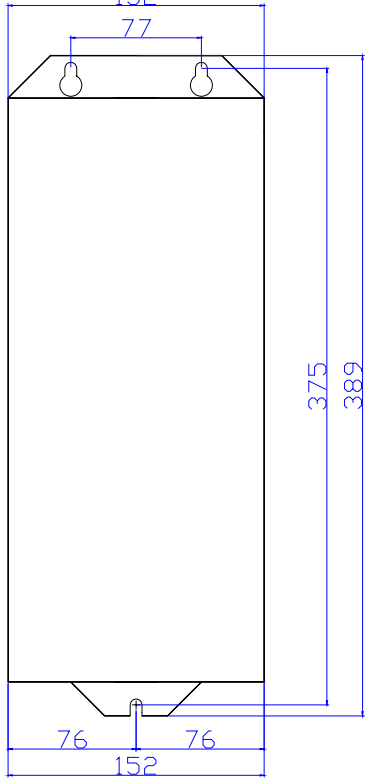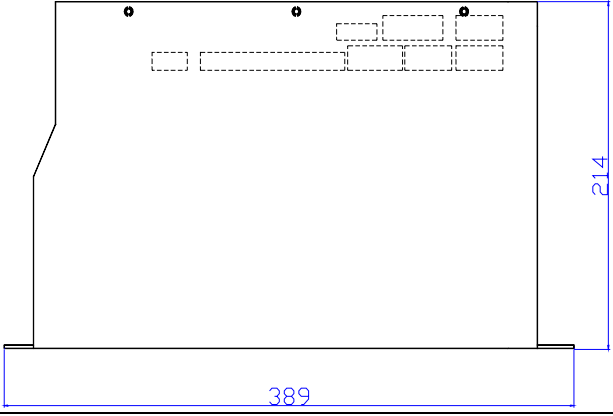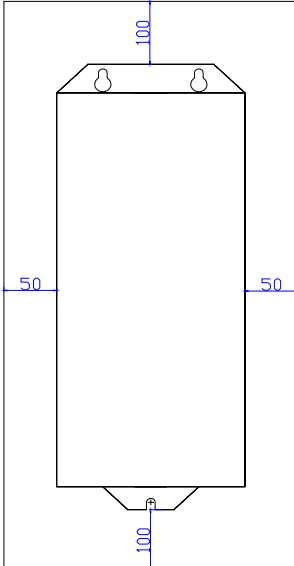
4.20 QUICK MAGNETIZATION

If you are use a good lift-controller (e.g. DAVID-2003 from KW) it is possible to reduce the time at the start. At the moment of the beginn of door closing, the order of the drive-direction is giving out to the inverter. The inverter is switching on the main contactors and it beginns to magnetize the motor.
After the door is closed, the elevator can start immediately. With this funktion, you can reduce the time between two drives about 1 – 2 seconds.

5. TECHNICAL DATA
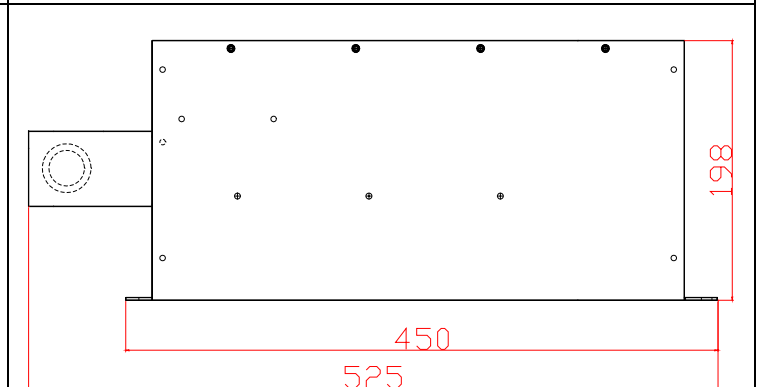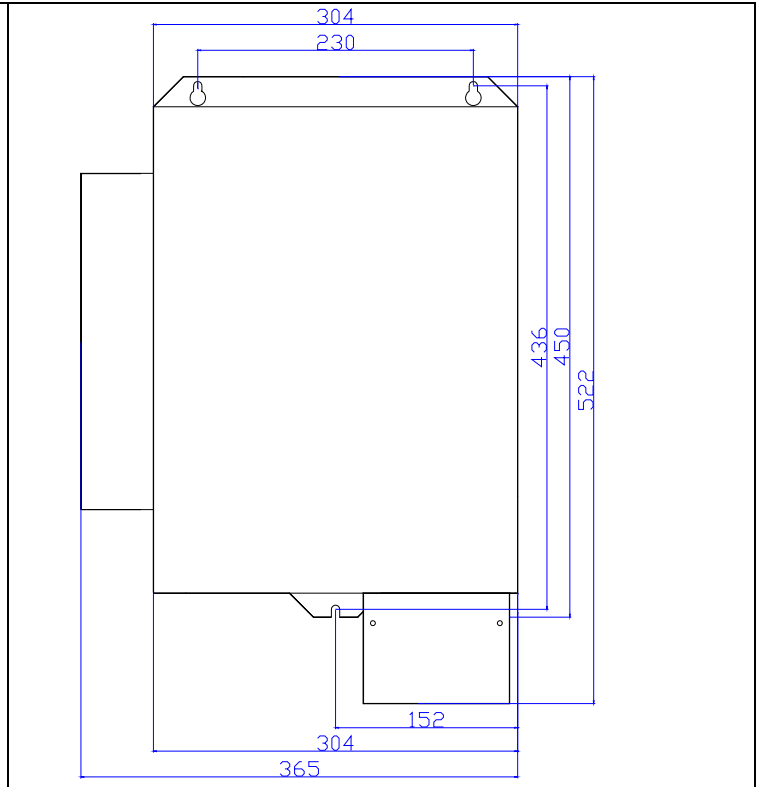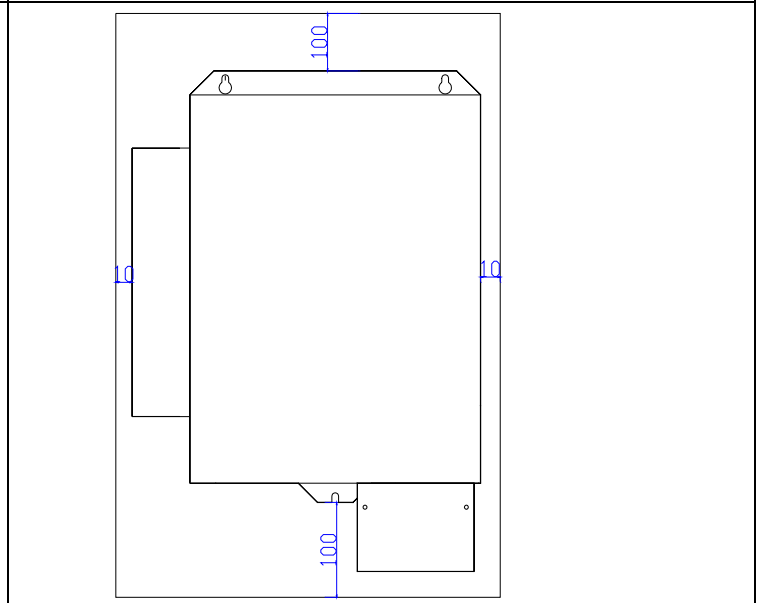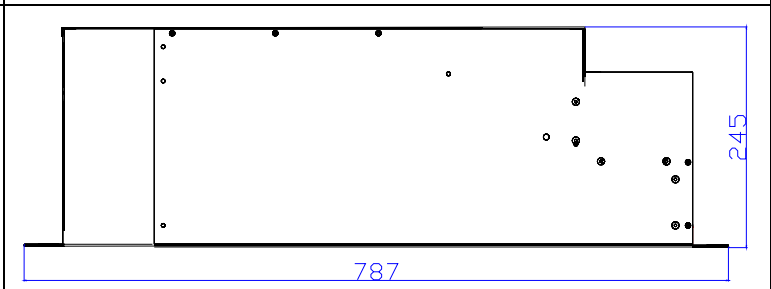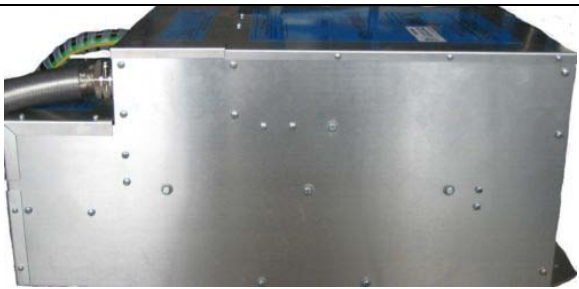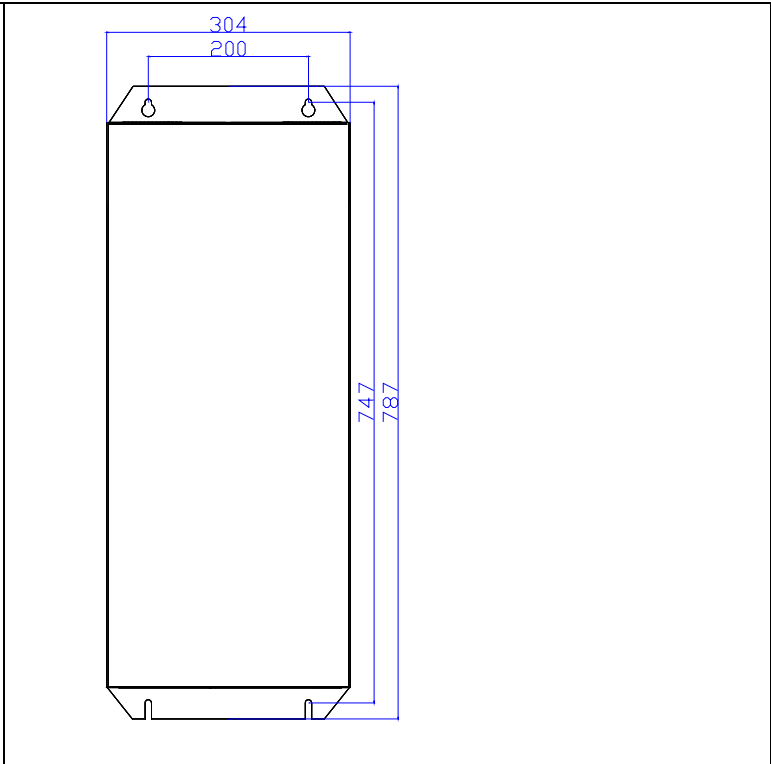## 5.1 CONSTRUCTION PICTURE Goliath-90-V - 12 to 26A NOMINAL CURRENT

Controller Casing Mounting
1.) The fixing of the inverter must be done with three M6 Screws.
2.) The mounting of the inverter must be in the controller casing, with the main terminals at the bottom.
3.) The controller casing must have an air circulation. The minimal ways to other components is designd in the picture on the right side.
4.) The law of concerning electromagnetic compatibility (EMVG) must be considered, e.g. shielded motor-& brakeresistor-cable must be used. The shield must be connected on both sides!

5.2 CONSTRUCTION PICTURE Goliath-60 - 32 to 52A OMINAL CURRENT
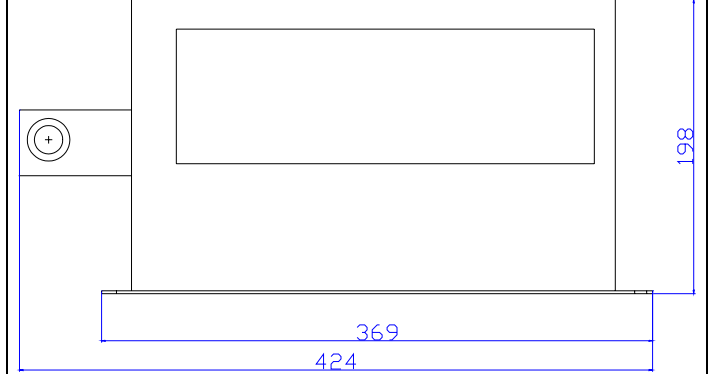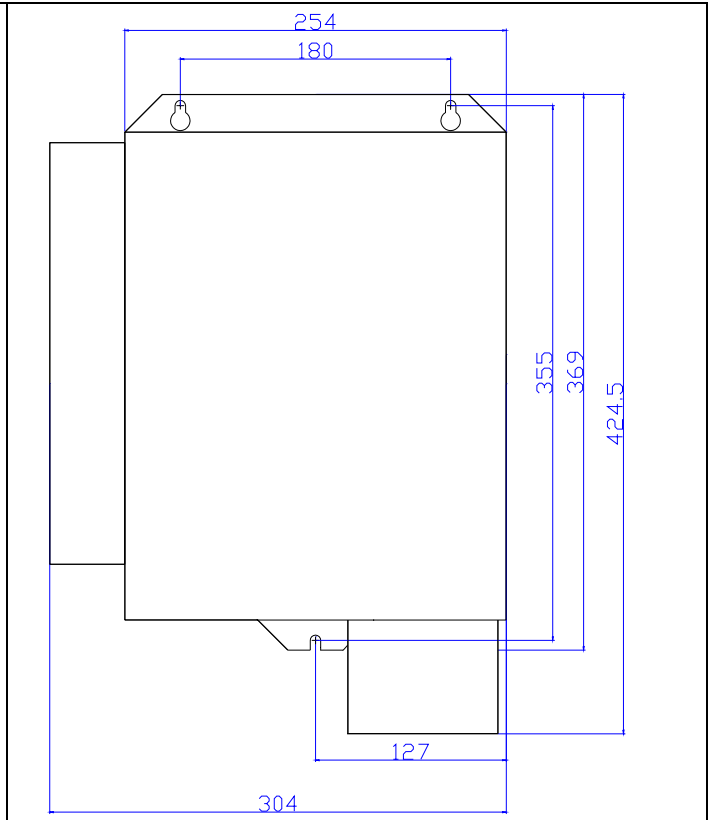
Controller Casing Mounting

1.) The fixing of the inverter must be done with three M6 Screws.
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3.) The controller casing must have an air circulation. The minimal ways to other components is designd in the picture on the right side.
4.) The law of concerning electromagnetic compatibility (EMVG) must be considered, e.g. shielded motor-& brakeresistor-cable must be used. The shield must be connected on both sides!
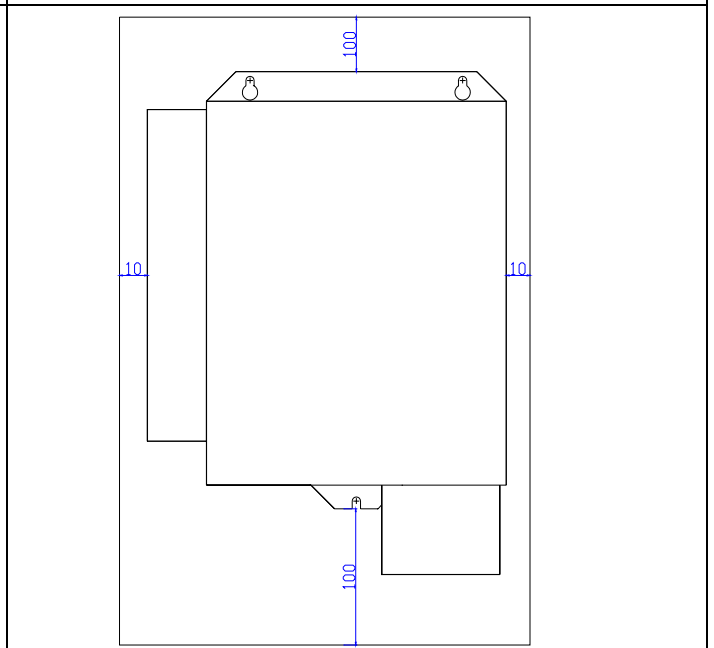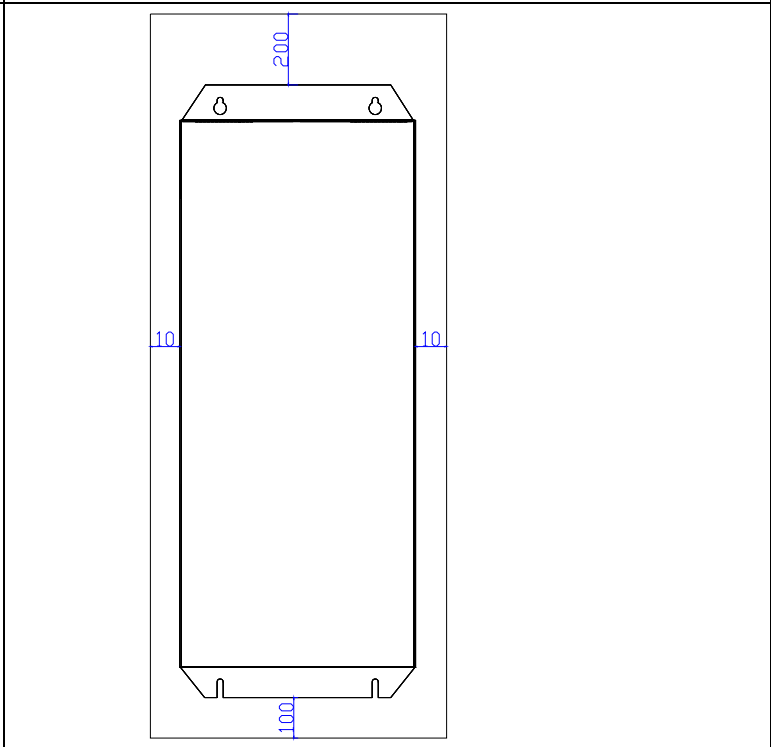
5.3 CONSTRUCTION PICTURE Goliath-60 - 62A NOMINAL CURRENT

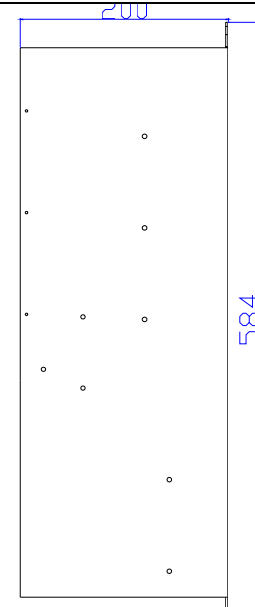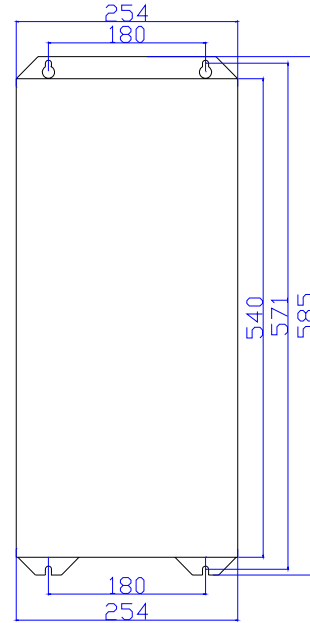**Controller Casing Mounting**
1.) The fixing of the inverter must be done with three M6 Screws.
2.) The mounting of the inverter must be in the controller casing, with the main terminals at the bottom.
3.) The controller casing must have an air circulation. The minimal ways to other components is designd in the picture on the right side.
4.) The law of concerning electromagnetic compatibility (EMVG) must be considered, e.g. shielded motor-& brakeresistor-cable must be used. The shield must be connected on both sides!

5.4 CONSTRUCTION PICTURE Goliath-60 TITAN - 82 bis 142A Nennstrom

Extern / Casing Mounting

1.) The fixing of the inverter must be done with four M6 Screws.
2.) The mounting of the inverter cant be in or out of the controller casing, with the main terminals at the bottom.
3.) The controller casing must have an air circulation. The minimal ways to other components is designd in the picture on the right side.
4.) The law of concerning electromagnetic compatibility (EMVG) must be considered, e.g. shielded motor-& brakeresistor-cable must be used. The shield must be connected on both sides!.

5.5 CONSTRUCTION PICTURE Goliath-60 EXTERN - 12 bis 52A Nennstrom

Extern / Casing Mounting

1.) The fixing of the inverter must be done with four M6 Screws.
2.) The mounting of the inverter cant be in or out of the controller casing, with the main terminals at the bottom.
3.) The controller casing must have an air circulation. The minimal ways to other components is designd in the picture on the right side.
4.) The law of concerning electromagnetic compatibility (EMVG) must be considered, e.g. shielded motor-& brakeresistor-cable must be used. The shield must be connected on both sides!.
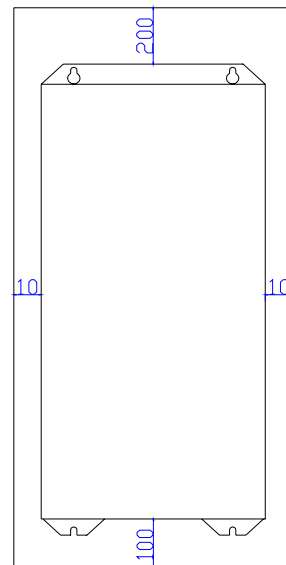
5.6 CONSTRUCTION PICTURE BRAKE RESISTORS

BRAKE RESISTOR BW-1KW

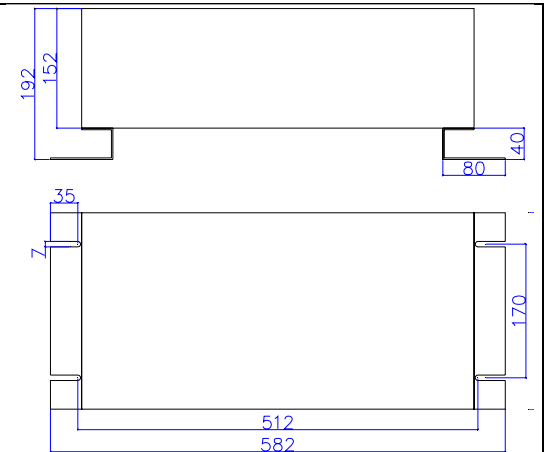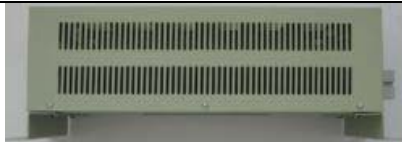|	
RESISTOR: 50 OHM POWER: 1 KW closed Aluminium-Profile casing with shielded brake-resistor cable For inverters with a nominal current to 16A.	

BRAKE RESISTOR BW-3KW

RESISTOR: 30 OHM POWER: 3 KW Coloured metal casing with plastic terminalcasing and shieldterminal. For inverters with a nominal current of 22A to 32A.		

BRAKE RESISTOR BW-6KW

Impendanz: 15 OHM Leistung: 6 KW Coloured metal casing with plastic terminalcasing and shieldterminal. For inverters with a nominal current of 42A to 142A.		
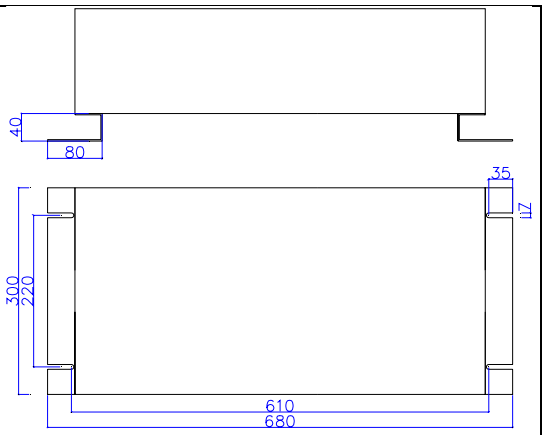
5.7 PARAMETER LIST

KW AUFZUGSTECHNIK GmbH	PARAMETERLIST V110E	DATE	
MENUPOINTS	**GOLIATH-60**	**VALUE**	**VALUE**
SPEED			
Adjustment speed VN (Rotation and m/s)		**0030 UpM**	
Inspection speed VI (Rotation and m/s)		**0330 UpM**	
Run-in speed V0 (Rotation and m/s)		**0070 UpM**	
Interim speed V1 (Rotation and m/s)		**1000 UpM**	
Final speed V2 (Rotation and m/s)		**1350 UpM**	
Alt.Final speed V3 (Rotation and m/s)		**1350 UpM**	
SPEED CURVE			
Acceleration (In % and m/s2)		**50 %**	
Jerk-acceleration (In % and m/s3)		**50 %**	
Decceleration (In % and m/s2)		**80 %**	
Jerk-Decceleration (In % and m/s3)		**100 %**	
Braking distance V1 (rotation and m/s)		**OFF**	
Braking distance V2 (rotation and m/s)		**OFF**	
Braking distance V3 (rotation and m/s)		**OFF**	
START / STOP			
Start retardation (When the brake opens in ms)		**150–400 ms**	
Brake-Ramp (V1 -> 0)		**10 %**	
Direct run-in (ON-OFF)		**OFF**	
Catch-rescue Vi (ON-OFF)		**OFF**	
DRIVE			
Asynchron machine	**Synchron machine**		
	Enginestype:(Alpha ECD100 / EPM100		
	/ EPM300 / EPM500 / Ziehl Abegg Zeta-		
	syn-SM700 / Zetasyn-SM850 / Zetatop225		
Encoder system (ON-OFF)	/ Montanari MDD150 / Thyssen DAF 210		
Encoder pulses (300 - 20000)	Nominal current (rating-plate)		
Encoder pulse input (A-B,B-A)	Rotation field (right-left)		
Rotation field (right-left)	Encoder-system (Resolver/ SSI/ EnDat/		
Nominal speed (name-plate)	/ Hyperface/ Sin-Cos)		
Nominal Frequency (name-plate)	Encoder pulses (512/ 1024/ 2048/ 4096)		
Nominal current (name-plate)	Encoder –Offsetangle (0^0 bis 359^0)		
Cosinus Phi (name-plate)	Encoder direction (Right-Left)		
	Encoder Offset-measure (ON-OFF)		
Winch transmission (1: xx)			
Winch drive wheel (xxxx mm)			
Winch suspension (1:1 to 8:1)			
INTERFACE			
Relay V03 (speed limit)		**0,30 m/s**	
Program-relay (limit V < V08 or inverter temperature)		**V < V08**	
Relais V08 (threshold, controller-temperature, Short circuit, stand by to drive)		**0,80 m/s**	
OPERATING PARAMETER			
Password		**number**	
Softwareversion		**0.33144**	
Display-language (german or english)		**english**	
CONTROL PARAMETER			
Attenuation Start (Against vibrations)		**0 %**	
Attenuation Acceleration (Against vibrations)		**0 %**	
Attenuation Travel (Against vibrations)		**0 %**	
Attenuation Deceleration (Against vibrations)		**0 %**	
LIFTBUS			
Liftbus (Thyssen-Liftbus, Consul-Liftbus, DCP3, KW)		**OFF**	
ERROR MEMORY			
Number of the faults			
Fault No. #1 - Faultr-xx: sentence No. of drives / Point of the speed curve			

5.8 TYPE DATA AND POWER CLASSES /ORDER NOTICE /ACCEESSORIES

Frequency-Inverter Type **GOLIATH-90V Intern** for Elevators:

	Technical Short-Descrebition: Frequency-inverter for elevatorsfor high comfort. The breadth of casing is 154mm. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion.The very compact casing with a deepth 200mm, which allows a mounting in every lift-controller casing. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).

Frequency-Inverter Type **GOLIATH-90V Intern**

Nominalcurrent	Overload	Type	Order-No.
12A	x 1,7	GOLIATH-90V/400V/12A Intern	1000661
16A	x 1,7	GOLIATH-90V/400V/16A Intern	1000662
22A	x 1,7	GOLIATH-90V/400V/22A Intern	1000663
26A	x 1,7	GOLIATH-90V/400V/26A Intern	1000664

Frequency-Inverter Type **GOLIATH-90V Intern LB** like above, with Liftbus-Interface

Nominalcurrent	Overload	Type	Order-No.
12A	x 1,7	GOLIATH-90V/400V/12A Intern LB	1000671
16A	x 1,7	GOLIATH-90V/400V/16A Intern LB	1000672
22A	x 1,7	GOLIATH-90V/400V/22A Intern LB	1000673
26A	x 1,7	GOLIATH-90V/400V/26A Intern LB	1000674

Frequency-Inverter Type **GOLIATH-60 Intern** for Elevators:

	Technical Short-Descrebition: Frequency-inverter for elevatorsfor high comfort. The power classes are from **12A** to **142A nominal current**, at a 1,7- overload-factor. For the catch-rescue you have the **2,0-** overload-factor for a few minutes tobring the car in motion.The very compact casing with a deepth 200mm, which allows a mounting in every lift-controller casing. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).

Frequency-Inverter Type **GOLIATH-60 Intern**

Nominalcurrent	Overload	Type	Order-No.
32A	x 1,7	GOLIATH-60/400V/32A Intern	1000803
42A	x 1,7	GOLIATH-60/400V/42A Intern	1000804
52A	x 1,7	GOLIATH-60/400V/52A Intern	1000805
62A	x 1,7	GOLIATH-60/400V/62A Intern	1000806
82A	x 1,7	GOLIATH-60/400V/82A Intern	1000807
102A	x 1,7	GOLIATH-60/400V/102A Intern	1000808
122A	x 1,7	GOLIATH-60/400V/122A Intern	1000809
142A	x 1,7	GOLIATH-60/400V/142A Intern	1000810

Frequency-Inverter Type **GOLIATH-60 Intern LB** like above, with Liftbus-Interface DCP-3

Nominalcurrent	Overload	Type	Order-No.
32A	x 1,7	GOLIATH-60/400V/32A Intern LB	1000703
42A	x 1,7	GOLIATH-60/400V/42A Intern LB	1000704
52A	x 1,7	GOLIATH-60/400V/52A Intern LB	1000705
62A	x 1,7	GOLIATH-60/400V/62A Intern LB	1000706
82A	x 1,7	GOLIATH-60/400V/82A Intern LB	1000707
102A	x 1,7	GOLIATH-60/400V/102A Intern LB	1000708
122A	x 1,7	GOLIATH-60/400V/122A Intern LB	1000709
142A	x 1,7	GOLIATH-60/400V/142A Intern LB	1000710

Frequency-Inverter Type **GOLIATH-60 Extern** for Elevators:

	The type of goliath-60 intern has now get a new big brother.
	The line-filter, main- and brake-contactor are integrated with low noice Optional you can put in a function-panel. All wires you need, like mainpower-wire, motor-& brakeresistor-wire, controller-wire are in the kit, as a plug-in solution.
	The power classes are from **12A** to **142A nominal current**, at a 1,7- overload-factor. There is only one inverter-casing with a deepth 200mm, which allows a mounting near the shaftdoor. Fully metal-encased central processing unit in accordance with Class B of the law concerning electromagnetic compatibility (EMVG).
	The main- and brake-contactor are integrated with low noice mountig. The standart brakeswitching in the 230V AC type. Optional there can be put in a 205V DC-switching, a 24V DC- & 12V DC-switching with maintenance-free clay battery and loader-unit. The frequency-controllers Goliath 60 can be driven with special Lift-otors and norm asynchron-motors. For a lot of synchronmotors are implemented in the software. The inverter read in the parameters automaticly. At other synchronmotors, you only have to put in the number of motorpols of the synchronmotor.

Frequency-Inverter Type **GOLIATH-60 Extern**

Nominalcurrent	Overload	Type		Order-No.
12A	x 1,7	GOLIATH-60/400V/12A	Extern	1000811
22A	x 1,7	GOLIATH-60/400V/22A	Extern	1000812
32A	x 1,7	GOLIATH-60/400V/32A	Extern	1000813
42A	x 1,7	GOLIATH-60/400V/42A	Extern	1000814
52A	x 1,7	GOLIATH-60/400V/52A	Extern	1000815
62A	x 1,7	GOLIATH-60/400V/62A	Extern	1000816

Frequency-Inverter Type **GOLIATH-60 Intern LB** like above, with Liftbus-Interface DCP-3

Nominalcurrent	Overload	Type		Order-No.
12A	x 1,7	GOLIATH-60/400V/12A	Extern LB	1000711
22A	x 1,7	GOLIATH-60/400V/22A	Extern LB	1000712
32A	x 1,7	GOLIATH-60/400V/32A	Extern LB	1000713
42A	x 1,7	GOLIATH-60/400V/42A	Extern LB	1000714
52A	x 1,7	GOLIATH-60/400V/52A	Extern LB	1000715
62A	x 1,7	GOLIATH-60/400V/62A	Extern LB	1000716

ACCEESSORIES:

Optional Regulation of a 207V DC – Brakeunit, **GL-60**,

Type	Order-No.
Díode-Circuit GL-60	1000867

Optional Brakecontactor for synchronious machines

Type	Order-No.
KS-60	1000870

Handprogrammingunit **HPG-60** for GOLIATH-60 with 2 m Connecting-wire:

Type)	Order-No.
HandprogrammingunitHPG-60	1000800

Connectingcards for the digital encoder at the GOLIATH-60::

Type		Order-No.
Thyssen-TW TTL 4096	IMP-THY	1000873
Thyssen DAF / SC EnDAT	ECN 113	1000601
SAD WSG EnDAT	ECN 1313	1000602
Xinda Sin / Cos		1000603
Xinda EnDAT	ECN 413	1000604
Monitor Sin / Cos	ECN 1585	1000605
Blocher GA41 / GA42 SSI		1000606
Xinda EnDAT	ERN 487	1000607
Uni-Adaptertkarte ABS	ABS-Adapt	1000910

Extention-wire for Absolute-encoder 15P D-Sub:

Type		Order-No
Extention-wire for Absolute-encoder	5m	1000610
Extention-wire for Absolute-encoder	10m	1000611
Extention-wire for Absolute-encoder	15m	1000612
Extention-wire for Absolute-encoder	20m	1000613
Extention-wire for Absolute-encoder	25m	1000614
Extention-wire for Absolute-encoder	30m	1000615

Motorcopycard MK66 to use the motor-pulses for the shaftcopy

Type		Order-No.
MK60 for Synchron- & Asychron	MK66-UNI	1000907
Like above, but with D-Sub-Thyssen	MK66-THY	1000908

Inkremental Mountingkit SOLUTION, Connectingsrew for M10, M12, M16 and M20 srew:

Type		Order-No.
Inkremental Mountingkit	SOLUTION M8-20	1000898-902

Resolvercard for Synchroniousmaschins (Type Alpha EPMxxx) for GOLIATH-60:

Type		Order-No.
Resolvercard	RES-01	1000875

Absolutevaluecards for SSI-, EnDat-, Hiperface- and Sinus / Cosinus-Encoders:

Type		Order-No.
Absolutevaluecards	ABS-01	1000876

Priceconditions: At the Factoy, without casing & tax

Orderadress : KW Aufzugstechnik GmbH
                Zimmersmühlenweg 69
                D-61440 Oberursel
                Tel.: +49 (0)6171-9895-0
                FAX: +49 (0)6171-9895-19
                Email: Verkauf@kw-aufzugstechnik.de

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