ANTRIEBSTECHNIK
tae

TA-U1...U280

Universal Antrieb / Universal Drive

Instruction and Operating Manual

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TA-U1...U280

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About This Instruction Manual

If you look for some definite topic you can use the table of contents at the beginning of these instruction and operation manual. In these instructions is a row of symbols which shall provide you with a fast orientation and show the importants.

This symbol stands for notes and useful informations which shall make the operation easier for you.

Note, disregard can damage or destruct the device.

Note, disregard means a danger for the operator.

2. Instructions of Safety

Before you put the device into operation, please read this instruction and operation manual completely. The operation should only be done by qualified personnel.
The precautions and warnings below must be observed at the operation of the device.

This product is constructed according to the rules of safety. Nevertheless there may be dangerous situations.

Use only functional devices. After safety mechanisms have been triggered, the cause must be found and the failure has to be fixed. Defects on the device can only be repaired by TAE or from TAE authorized qualified personal.

Safety equipment must not be bypassed or removed. More information about the provided safety and protection equipment may be found in Chapters 7 and 7.1.

2.1 Instructions and Rules

These guidelines for installation have been compiled with regard to the following standards:

EN 60204-1 (VDE 0113: 1992-1)	Electrical equipment for machines
EN 60529:1991 (VDE 0470 Part 1)	Protection by frame
DIN EN 50178 (VDE 0160-1994-11)	Electronic equipment to be used in electrical power installations
DIN VDE 0100	Erection of power installations with nominal voltage up to 1000 V
DIN VDE 0110	Dimensioning of clearances and creepage distances
DIN 40050	(IP-International Protections)
EN 61800-3	EMC Product standard of electrical power drive systems

2.2 Safety

As with any form of electrical equipment, there is always a risk involved in the handling of electrical machinery. The greatest care must always be exercised during installation and maintenance. It is recommended that service is performed by authorized personnel only.

Make sure that the unit and the motor is properly grounded in order to avoid electrical hazzards! Improper grounding will also cause damage to the electronic circuit and to the encoders of the motor! The common connection of the electronic circuit can be jumpered, connected to ground with 1MR or 100R.

Caution - Danger !

Disconnect unit from mains before making any repairs. Only when the BUSS-capacitors have discharged, (5 minutes after the device has been seperated from line, the unit may be opened and worked on).

2.3 Using Fault-Current-circuit-breaker (FI)

Fault-Current-circuit-breaker (FI) can not be used. The high leakage current could trigger or in case of a mistake destruct the FI switch. Please read the instructions for installation in Chapter 4.1.

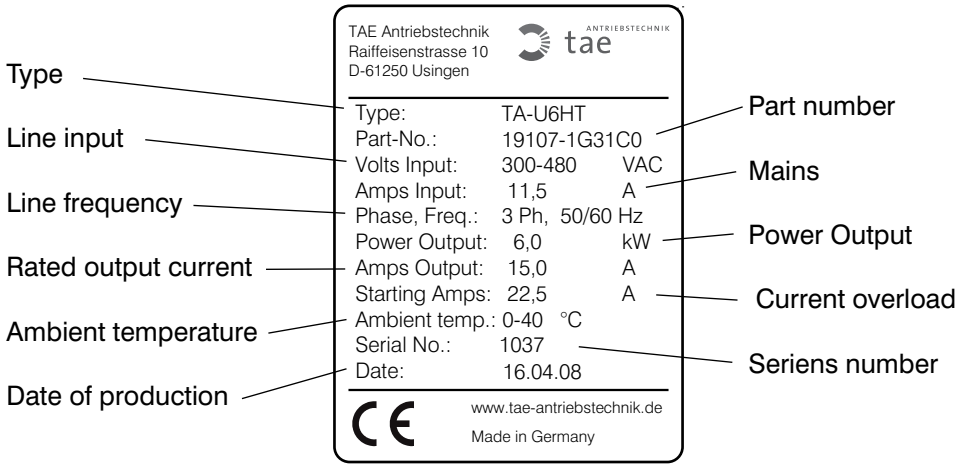
2. General

After production all devices are checked and are ran a 200 hours continuous test. Before delivering the devices are checked again. By this proceedure we want to ensure that only flaw less devices are delivered.

In normal case there are no failures expected if the drive has been adjusted correctly and the issues of the operating manual have been followed.

If, in spite of this, a failure occurs, get in contact with one of our agents or contact us directly.

2.1 Name Plate



The name plate is placed on the right side of the device. Make sure that the device is not damaged by transport before installing it. Compare the delivered parts (look at name plate) with the bill of delivery.

2.2 Expected Readers of this Manual

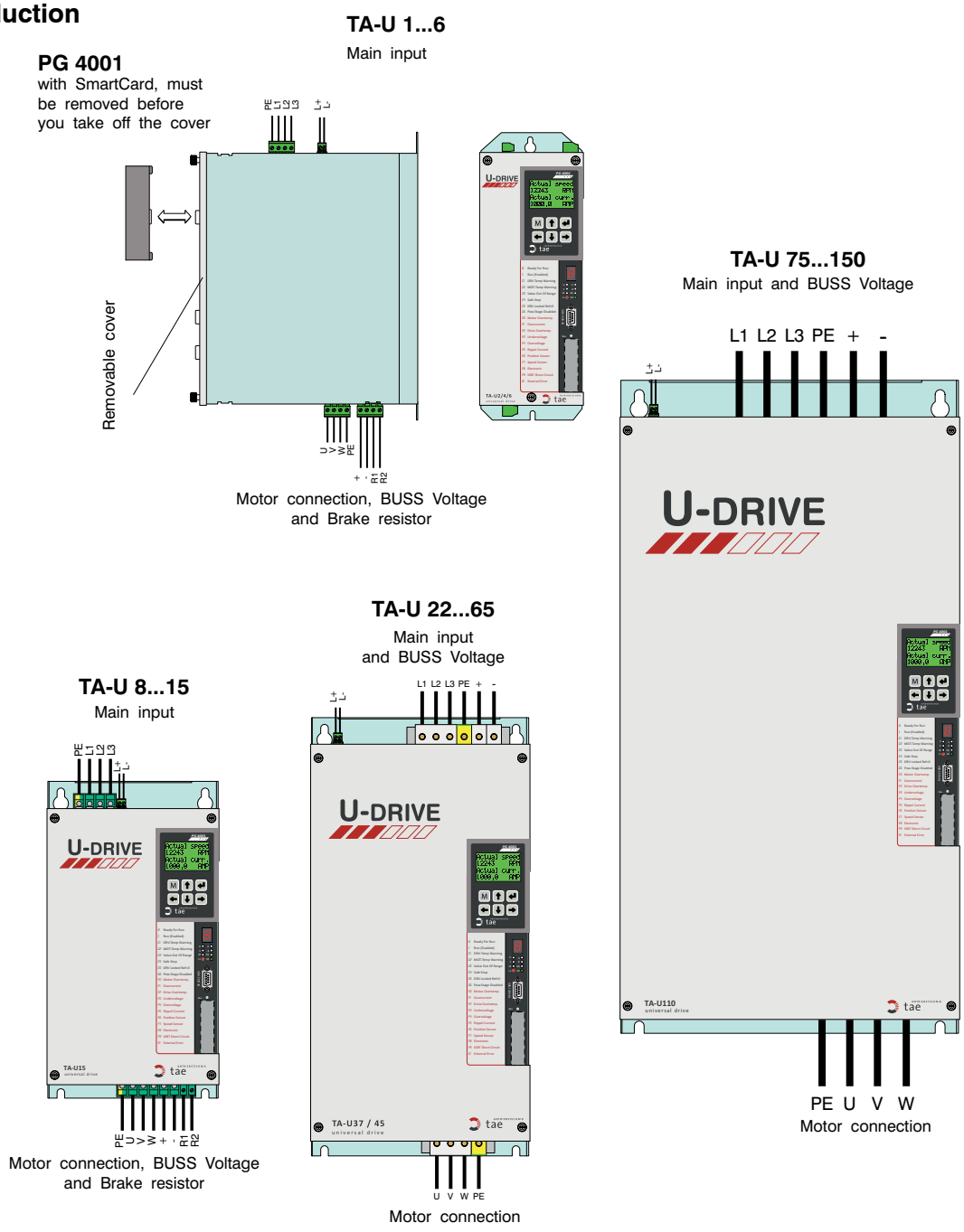
This operating manual is for users which are qualified to handle this device.

2.3 Liability

Defects within the device should not be repaired by the user. Nonauthorized repairs leads to loss of warranty.
TAE is not liable if any manipulations have been made, for example, attempts to repair.
If there is any doubt about the cause of failure or possibility of repairing, please contact TAE to avoid further damage to the device or motor.

3. Description of the Product

3.1 Introduction



3.1.1 Usability

Referring to power asynchronous and permanet magnet synchronous motors can be connected to this device which are specified by TAE.

3.1.2 Protection Against Irregular Usage

Caution! Do not apply mains to the output terminals U, V, W.

All devices are tested against high voltage and isolation resistance. Measuring of isolation resistance is not allowed

3.1.3 Norms and Directives

The designated product is in conformity with the provisions of the following European Directives.

2004/ 108/EEC EMC directive

Directive on the approximation of the laws of the Member States relating to electromagnetic compability.

(Amended by Directives 93/68/EEC)

According to these criteria, our products are classified as follows:

- Product components: Parts from suppliers which are inoperative on their own.
- Product distribution: Not commonly available, sold to qualified persons.

The law states that an EC-declaration of conformity, as well as a CE-marking, is not required for such components.

In order to meet the requirements of the EMC-directive we supply the following:

- Productrelated documents which describe the interference radiation of our products. This information will enable the user to provide all necessary steps to meet the EMC-requirements during planning and installation.
- EMC-specific components such as filters, chokes, shielded wiring, metal enclosures and others are available from TAE. TAE will furthermore provide specific technical information concerning the proper use of such components for their products in order to meet the requirements of the harmonized standards.

It is the users responsibility to carry out our instructions and to use adequate provisions. The user is also responsible that his machine and installation meets the requirements of the EMC-standards.

Based on the EMC directive and its corresponding standards, we have carried out extensive measurements at our premises. These tests have included our complete product line. With the use of filters and proper wiring all our products meet the requirements of the EMC Product standard of electrical power drive systems. These directives and recommendation for the use of electronic equipment are based on the following standards:

73/23/EWG bzw. 2006/95/EG Low Voltage Directive

Council Directive on the approximation of the laws of the Member States relating to all electrical equipment designed for use within certain voltages limits. (Amended by Directives 93/68/EEC)

Using a QM system, TAE is watching all steps from development to production of the device. So all norms and directives can be fulfilled referring to this aspect of safety.

CE-marking

The CE-marking indicates the conformity of the the TA-BL drive to the european norms and directives.

The fulfillment of the norms and directives is only guaranteed if:

.....The regulator is fitted out with a internal or external EMC filter which is tested by the manufacturer.

.....You exactly follow the Instructions for installation (refer to Chapter 4.1).

Improper installation can lead to exceeding the maximum limits of EMC and to a malfunction of devices of other manufacturers.

EN 60204-1 (VDE 0113: 1992-1)	Electrical equipment of machines
EN 60529:1991 (VDE 0470 Part 1)	Protection Provided by Enclosures
DIN EN-50178 (VDE 0160:1994-11)	Electronic equipment for use in Electrical Power installations
DIN VDE 0100	Erection of Power Installations
DIN VDE 0110	Dimensioning of Clearance and Creepage distances
DIN 40050	IP-International Protections
EN 61800-3	EMC Product standard of electrical power drive systems

3.2 Technical Data

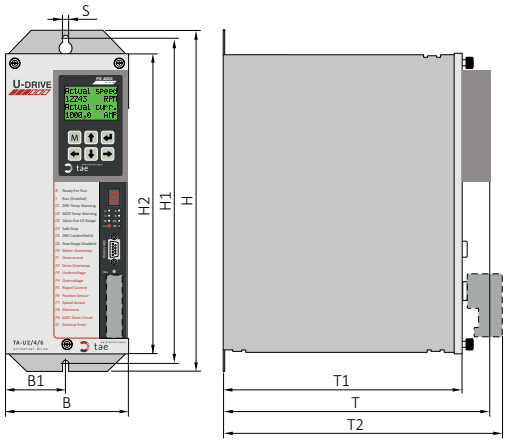
3.2.1 Drive Specifications - Part numbers TA-U1…U280

The voltages, currents and power data in this tabel are nominal data at switch frequency 8 kHz. You will find the exact value on the name plate.
If the 400V devices operate at voltage 480V, the output power will be increased at approx 20%.

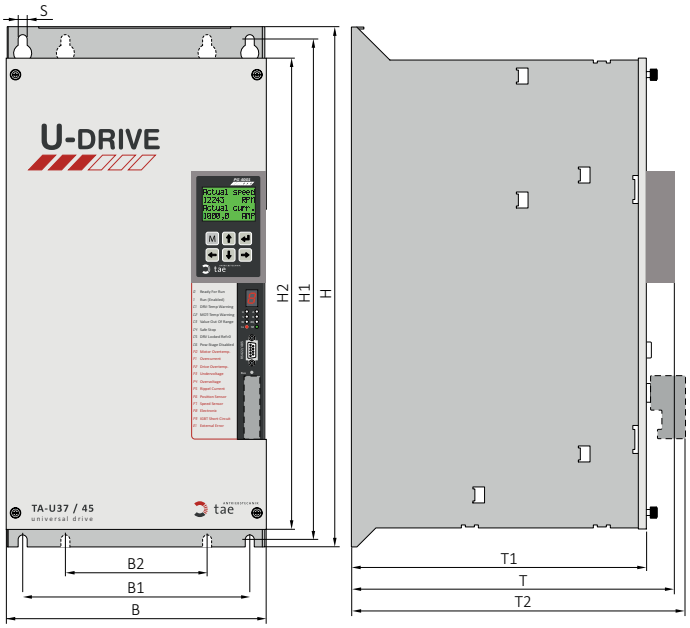
		Mains 3Ph 50/60 Hz			Power		Current (Output)		
		Voltage	Current		Output	Loss	I-Nominal	I-Overload	I-Peak (disconnect)
			BL-Motor	AC-Motor	control	drive (at 8kHz)	(at 8kHz)		
TA-U1	19101-xxxx	230V	3,2 A	3,8 A	0,8 kW	30 W	4,5 A	7,0 A	12,5 A
TA-U2	19102-xxxx	230V	5,5 A	6,0 A	1,6 kW	45 W	7,5 A	10,7 A	19 A
TA-U4 HT	19105-xxxx	230V	13 A	14 A	4 kW	90 W	20 A	25,3 A	45 A
TA-U10	19110-xxxx	230V	19 A	21 A	6 kW	130 W	25 A	30 A	53 A
TA-U15	19115-xxxx	230V	24,5 A	26 A	8 kW	180 W	36 A	43 A	76 A
TA-U22	19122-xxxx	230V	36 A	39 A	12 kW	300 W	50 A	60 A	107 A
TA-U22 HT	19123-xxxx	230V	54 A	59 A	18 kW	420 W	75 A	100 A	178 A
TA-U1	19101-xxxx	400V	2,1 A	2,4 A	1,1 kW	80 W	3,0 A	4,5 A	8,0 A
TA-U2	19102-xxxx	400V	4,3 A	5,1 A	2,2 kW	100 W	6 A	9 A	16 A
TA-U4	19104-xxxx	400V	7,0 A	7,8 A	3,7 kW	160 W	9,5 A	14,3 A	25 A
TA-U6	19106-xxxx	400V	10,5 A	12 A	5,5 kW	230 W	13 A	15,2 A	27 A
TA-U6 HT	19107-xxxx	400V	11,5 A	13 A	6,0 kW	250 W	15 A	22,5 A	40 A
TA-U8	19108-xxxx	400V	13,2 A	14,5 A	7,5 kW	280 W	18 A	27 A	47 A
TA-U8 HT	19109-xxxx	400V	13,2 A	14,5 A	7,5 kW	360 W	21 A	30 A	53 A
TA-U10	19110-xxxx	400V	19,1 A	21,0 A	11 kW	390 W	24 A	30 A	53 A
TA-U15	19115-xxxx	400V	26,0 A	29,0 A	15 kW	540 W	34 A	42,5 A	75 A
TA-U22	19122-xxxx	400V	37,0 A	40,3 A	22 kW	640 W	50 A	60 A	107 A
TA-U22 HT	19123-xxxx	400V	38,0 A	41,8 A	22 kW	660 W	50 A	87 A	154 A
TA-U30	19130-xxxx	400V	51,0 A	56,2 A	30 kW	850 W	65 A	98 A	174 A
TA-U30 HT	19131-xxxx	400V	52,0 A	57,2 A	30 kW	850 W	65 A	117 A	208 A
TA-U37	19137-xxxx	400V	64,0 A	70,4 A	37 kW	1080 W	80 A	120 A	213 A
TA-U37 HT	19138-xxxx	400V	64,0 A	70,4 A	37 kW	1100 W	80 A	144 A	255 A
TA-U45	19145-xxxx	400V	77,0 A	84,7 A	45 kW	1300 W	93 A	144 A	255 A
TA-U45 HT	19146-xxxx	400V	77,0 A	84,7 A	45 kW	1300 W	93 A	168 A	298 A
TA-U55	19155-xxxx	400V	94,0 A	103,4 A	55 kW	1600 W	115 A	168 A	298 A
TA-U55 HT	19156-xxxx	400V	94,0 A	103,4 A	55 kW	1650 W	115 A	207 A	366 A
TA-U65	19165-xxxx	400V	110,0 A	121,0 A	65 kW	1900 W	130 A	170 A	300 A
TA-U65 HT	19166-xxxx	400V	110,0 A	121,0 A	65 kW	1950 W	130 A	234 A	412 A
TA-U75	19175-xxxx	400V	127,0 A	139,7 A	75 kW	2200 W	150 A	195 A	345 A
TA-U75 HT	19176-xxxx	400V	127,0 A	139,7 A	75 kW	2250 W	150 A	270 A	478 A
TA-U90	19190-xxxx	400V	150,0 A	165,0 A	90 kW	2700 W	190 A	270 A	478 A
TA-U90 HT	19191-xxxx	400V	160,0 A	165,0 A	95 kW	2800 W	200 A	330 A	585 A
TA-U110	19211-xxxx	400V	180,0 A	192,0 A	110 kW	3320 W	225 A	270 A	478 A
TA-U110 HT	19212-xxxx	400V	180,0 A	192,0 A	110 kW	3450 W	225 A	390 A	690 A
TA-U150	19215-xxxx	400V	250,0 A	270,0 A	150 kW	4300 W	300 A	390 A	690 A
TA-U150 HT	19216-xxxx	400V	250,0 A	270,0 A	150 kW	4400 W	300 A	520 A	919 A
TA-U170	19217-xxxx	400V	280,0 A	280,0 A	170 kW	4900 W	350 A	390 A	690 A
TA-U170 HT	19218-xxxx	400V	280,0 A	280,0 A	170 kW	4900 W	350 A	540 A	956 A
TA-U200	19220-xxxx	400V	330,0 A	352,0 A	200 kW	5800 W	450 A	580 A	1026 A
TA-U250	19225-xxxx	400V	410,0 A	440,0 A	250 kW	7500 W	550 A	820 A	1450 A
TA-U280	19228-xxxx	400V	450,0 A	450,0 A	280 kW	8400 W	630 A	945 A	1665 A

3.2.2 Dimensions TA-U2...U400

TA-U 1/2/4/6



TA-U 8...280



	Housing sizes										
	U1/2/4/6	U8/10	U15	U22	U30	U37/45	U55/65	U75/90	U110	U150/170	U200/250/280
B	127	195	205	250	250	270	355	363	425	555	1100
B1	63,5	162,5	172	217	217	237	322	329	380	505	595
B2	-	-	-	-	-	-	-	-	-	-	965
H	341	378	378	390	495	520	564	660	842	981	1215
H1	325	358	358	370	475	500	544	640	815	954	1173
H2	301	330	330	341	446	471	516	611	780	919	1122
T	268/289*	267	325	306	292	338	379	369	413	418	420
T1	240/261*	239	297	278	264	310	351	341	385	390	392
T2	313/334*	312	370	351	337	383	424	414	458	463	465
S	6	9	9	9	9	9	9	9	12	13	13

Structure of complete part number:

1 9 X X X - X X X X X X

Housing sizes
1 = up to size TA-U90
2= as of size TA-U110

Rating (output power)

Voltage
0 = 170 - 250V 3Ph 50/60 Hz
1 = 300 - 480V 3Ph 50/60 Hz
2 = 170 - 250V 3Ph 50/60 Hz [1)]
3 = 300 - 480V 3Ph 50/60 Hz [1)]
4 = 240 - 390V DC Buss supply
5 = 420 - 780V DC Buss supply

Bus-system
F = Standard (without bus)
G = Profibus
I = CANopen
K = DeviceNet
L = Ethernet / Powerlink
M = EtherCAT
N = Ethernet IP
O = Profinet

Analog / digital-board I/O
0 = without
1 = with analog/digital board

Feedback system
A = Standard (Hall sensors)
B = RS 422
C = Resolver
D = SinCos-Hiperface
E = SinCos-EnDat
Z = Sensorless

EMC-Filter
0 = without
1= with EMC-filter

Control mode
0 = 1Q
1 = 4Q (without brake chopper)
2 = 4Q (with brake chopper)[2)]
3 = 4Q (with brake chopper & resistor)[3)]

[1)] with external supply for electronics
[2)] only available for TA-U2...U15
[3)] only available for TA-U2/U4/U6

3.2.3 Device data and Dimensions

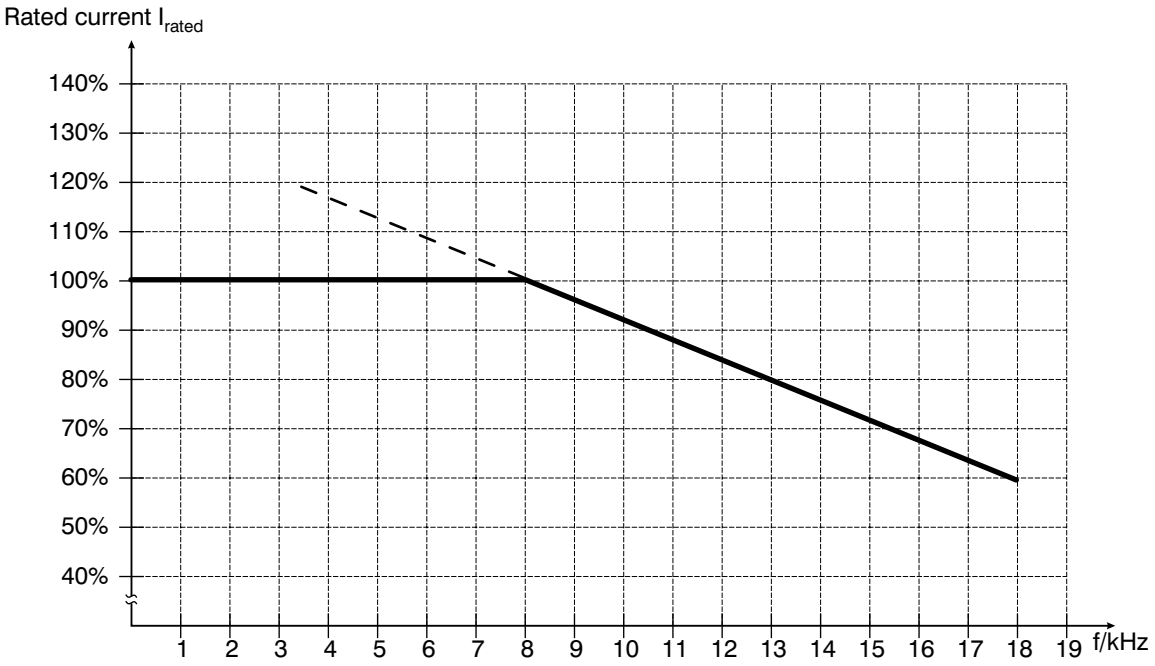
(Voltage according to name plate)	Line voltage	Deviation
	200-250V	± 10%
	300-480V	
	3 Phase 50/60Hz	
Enclosure	IP 20	
Environment [1]	Temperature 0-40°C	
Speed deviation	less than 1% with analogue reference (0-10V)	
	0% absolute (+/- 1 Digit) at digital reference	

[1] The technical data are rated at atmospheric humidity of 90% and at 1000 m above sea level. Above 1000 m and higher ambient temperatures, the power must be derated.

Drive type	Dimensions W x H x D [mm]	Mounting torque connections		Mains fuse external medium blow		Min. air flow for switch cabinet fan	Weight [kg]
		L1-L2-L3-PE	U-V-W-PE	1 Ph 230V	3 Ph 400V		
TA-U1...U2	127 x 341 x 268/289[2]	0,6 Nm	0,6 Nm	10A	6A	39 m³/h	9,5
TA-U4				16A	10A	39 m³/h	9,5
TA-U6				25A	16A	39 m³/h	9,5
TA-U8	195 x 378 x 267	1,5 Nm	1,5 Nm		20A	130 m³/h	14,0
TA-U10					25A	130 m³/h	16,5
TA-U15	205 x 378 x 325	1,5 Nm	1,5 Nm		35A	156 m³/h	17,5
TA-U22	250 x 390 x 306	3,5 Nm	10 Nm		50A	156 m³/h	26,0
TA-U30	250 x 495 x 292	3,5 Nm	10 Nm		63A	221 m³/h	35,5
TA-U37	270 x 520 x 338	10 Nm	10 Nm		80A	221 m³/h	38,0
TA-U45					100A	221 m³/h	42,0
TA-U55	355 x 564 x 379	10 Nm	10 Nm		125A	408 m³/h	67,0
TA-U65					125A	408 m³/h	76,0
TA-U75	363 x 660 x 369	30 Nm	30 Nm		160A	952 m³/h	81,0
TA-U90					160A/200A	1020 m³/h	85,0
TA-U110	425 x 842 x 413	30 Nm	40 Nm		200A	1020 m³/h	95,0
TA-U150	555 x 981 x 418	40 Nm	40 Nm		315A	1041 m³/h	120,0
TA-U170							
TA-U200	1100x1215x420	40 Nm	40 Nm		400A	2680 m³/h	
TA-U250							430,0
TA-U280		40 Nm	40 Nm		500 A		

[2] with integrated brakeresistor inside housing, mounted under the drive.

3.2.4 Rated current de-rating in relation to switch frequency



3.2.5 Standard equipments

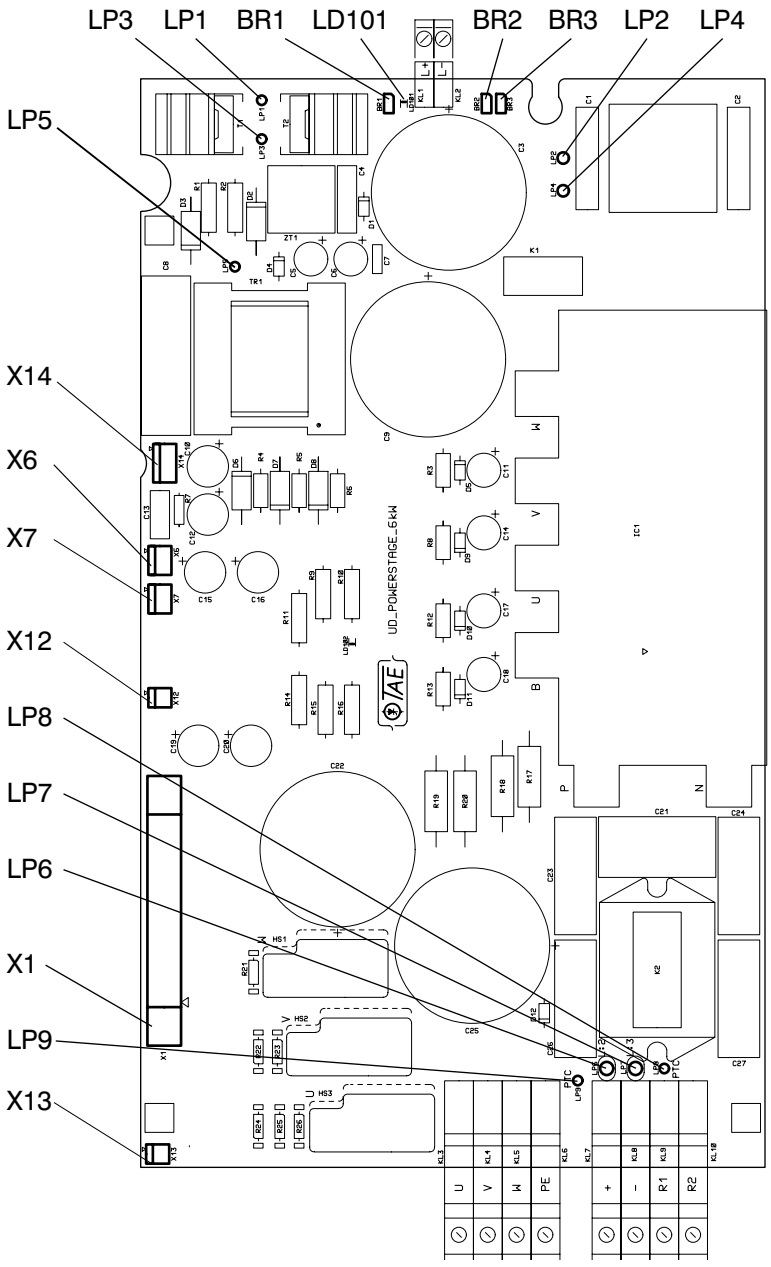
- ❒ 4 free programmable digital inputs
- ❒ 1 programmable analog input 0V to +10V, 0-20mA, 4-20mA.
- ❒ 1 programmable relay output
- ❒ 1 programmable optocoupler output
- ❒ Controlled by PG4000 or computer also in parallel operation
- ❒ Master and Slave function
- ❒ Synchronous run
- ❒ Position control
- ❒ Electronic transmissions
- ❒ Motorpotentiometer function
- ❒ 7 segment indication for status reports
- ❒ LED indication for position encoder, speed encoder 4.Q indication, current limit and speed reached
- ❒ Failure indication in the PG4000 and on the 7 segment display
- ❒ Parameterizing with PG4000 or computer
- ❒ Data memory with Smartcard or computer

3.2.6 Option equipments

- ❒ EMC filter
- ❒ Additional communication cards E.g. Profibus, CANopen, DeviceNet, Ethernet
- ❒ Digital analog upgrading
- ❒ Multifunction Control Unit PG 4000
- ❒ SmartCard for PG 4000
- ❒ Miscellaneous encoder interfaces
- ❒ Separate power supply for elektronic (starting at TA-U22)

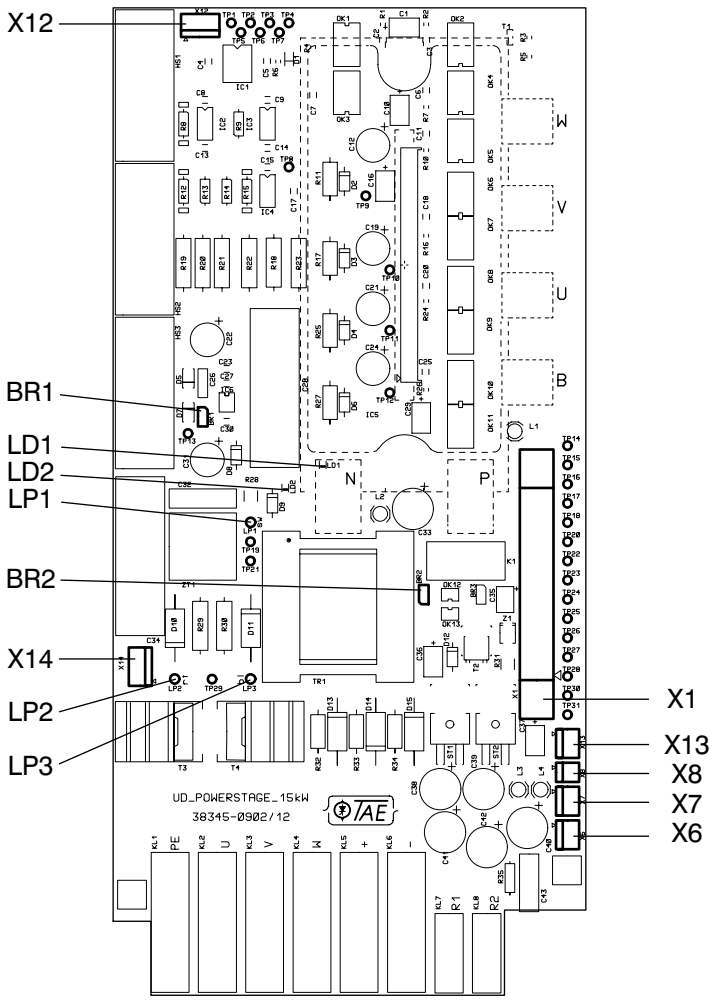
3.3 Printed Circuit boards & modules

3.3.1 Powerstage TA-U1..U6



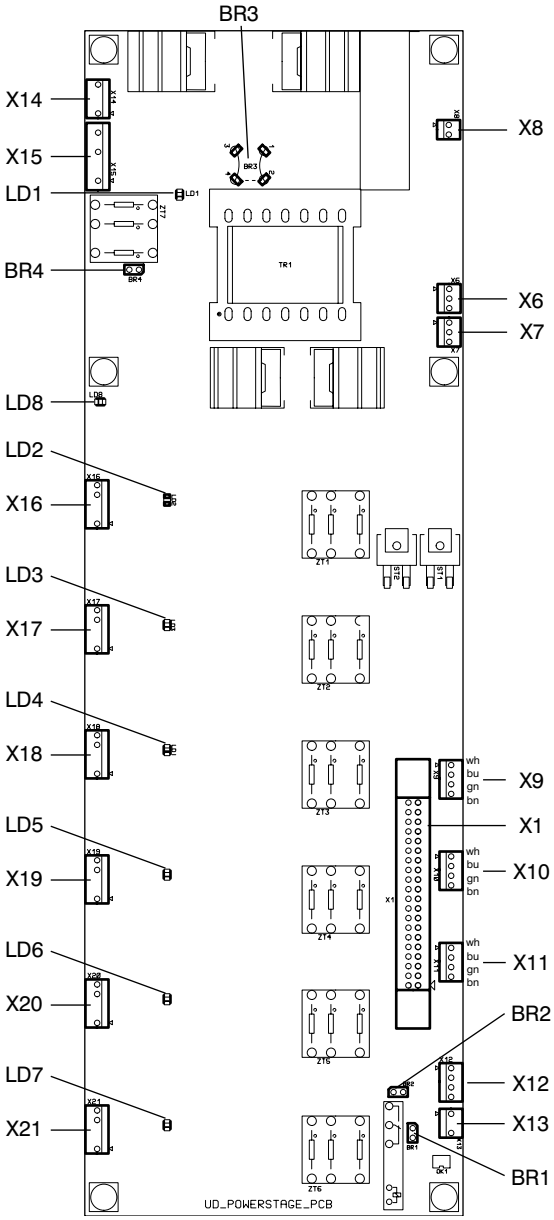
X1	Connection to controlboard	**BR1**	Mains voltage 200-250V
X6	+/-24V	**BR2**	Indication Safe Stop bridged
X7	+/-24V	**BR3**	Safe Stop bridged
X12	PT100	**LD101**	Buss voltage „Red“ back side
X13	Thermal switch	**LD102**	Power supply active „Green“ back side
X14	Buss voltage		

3.3.2 Powerstage TA-U8..U15



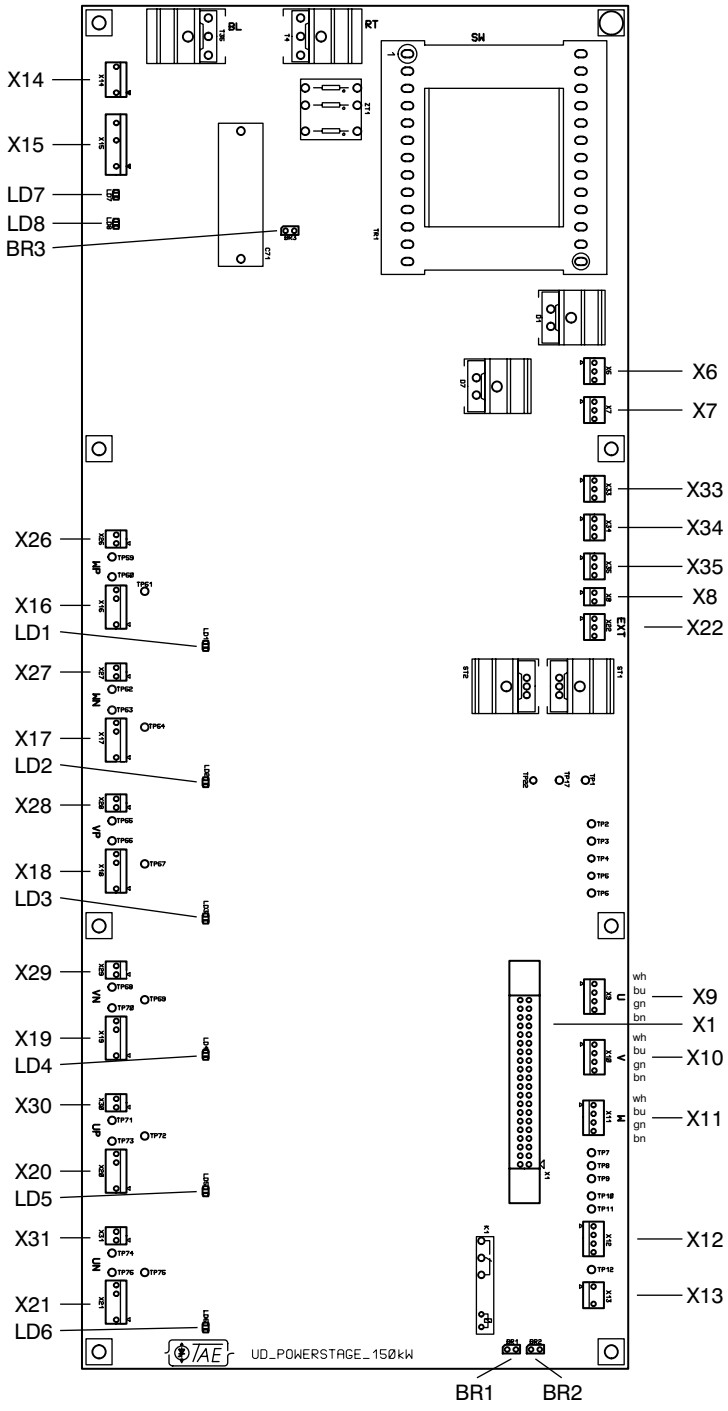
X1	Connection to controlboard	**X14**	Buss voltage
X6	+/-24V	**BR1**	Mains voltage 200-250V
X7	+/-24V	**BR2**	Indication Safe Stop bridged
X8	Charging relay	**BR3**	Safe Stop bridged
X12	PT100/Thermal switch	**LD1**	Buss voltage „Red“ back side
X13	Safe Stop	**LD2**	Power supply active „Green“ back side

3.3.3 Powerstage TA-U22..U90



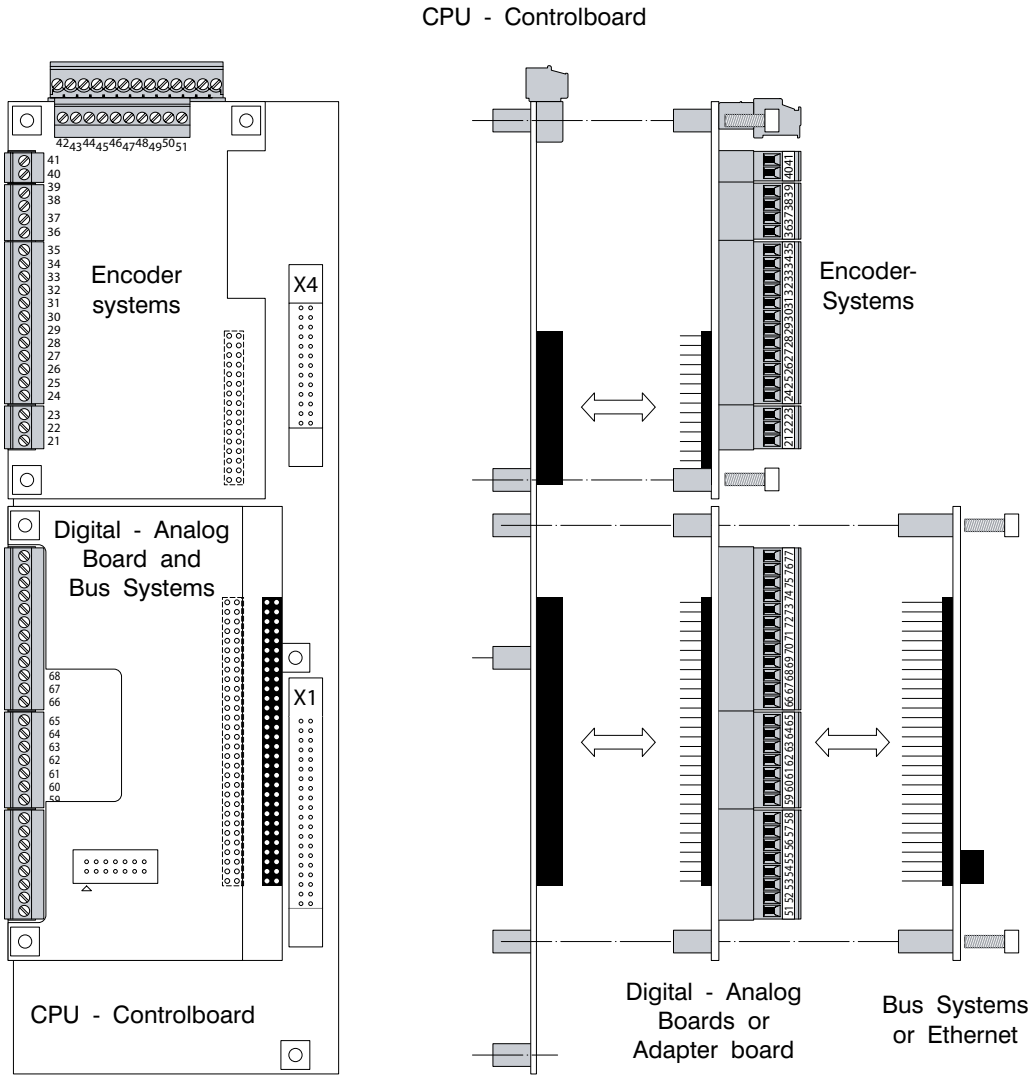
X1 Connection to controlboard
X6 +/-24V
X7 +/-24V fan (switched)
X8 Charging relay
X9 Current U
X10 Current V
X11 Current W
X12 PT100/Thermal switch
X13 Safe Stop
X14 External elektronic supply
X15 Buss voltage
X16 IGBT WP
X17 IGBT WN
X18 IGBT VP
X19 IGBT VN
X20 IGBT UP
X21 IGBT UN
LD1 Buss voltage "red"
LD2 IGBT WP
LD3 IGBT WN
LD4 IGBT VP
LD5 IGBT VN
LD6 IGBT UP
LD7 IGBT UN
LD8 Power supply active "green"
BR1 Indication Safe Stop bridged
BR2 Safe Stop bridged
BR3 Mains voltage 200V/400V
BR4 Mains voltage 200-250V

3.3.4 Powerstage start at U110

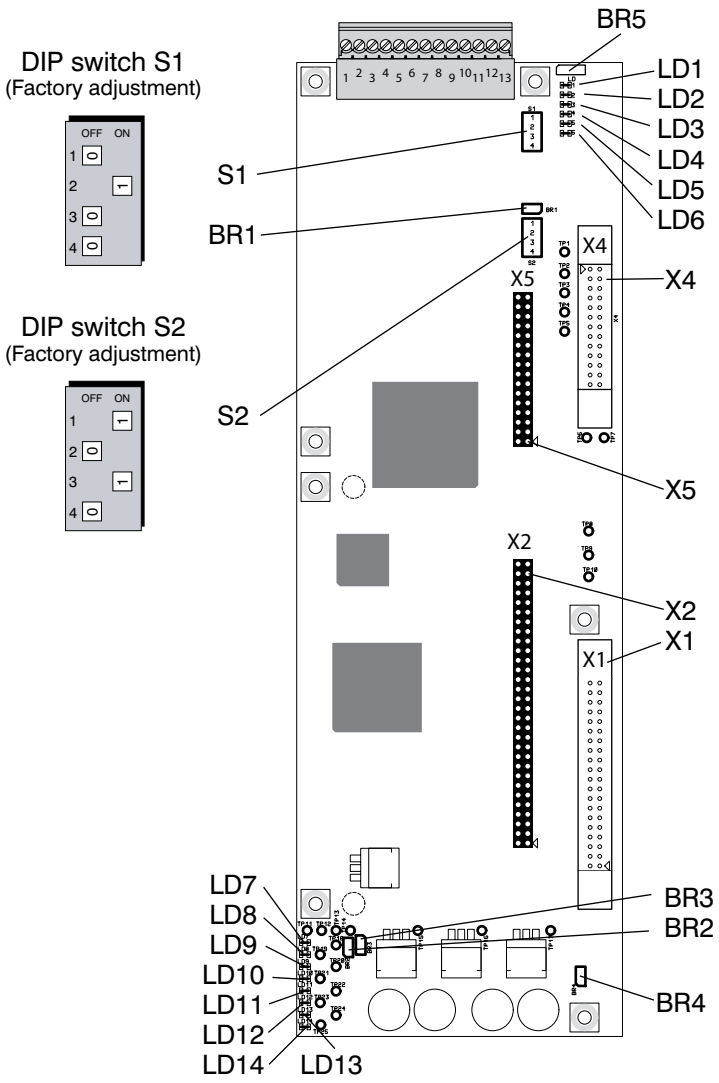


X1	Connection to controlboard
X6	+/-24V
X7	+/-24V
X8	Charging relay
X9	Current U
X10	Current V
X11	Current W
X12	PT100/Thermal switch
X13	Safe Stop
X14	External elektronic supply
X15	Buss voltage
X16/X26	IGBT WP
X17/X27	IGBT WN
X18/X28	IGBT VP
X19/X29	IGBT VN
X20/X30	IGBT UP
X21/X31	IGBT UN
X22	Supply Charging relay
X33	+/-24V fan (switched)
X34	+/-24V fan (switched)
X35	+/-24V fan (switched)
LD1	IGBT WP
LD2	IGBT WN
LD3	IGBT VP
LD4	IGBT VN
LD5	IGBT UP
LD6	IGBT UN
LD7	Buss voltage "red"
LD8	Power supply active "green"
BR1	Indication Safe Stop bridged
BR2	Safe Stop bridged
BR3	Mains voltage 200-250V

3.3.5 Printed circuit boards modules TA-U1...U150



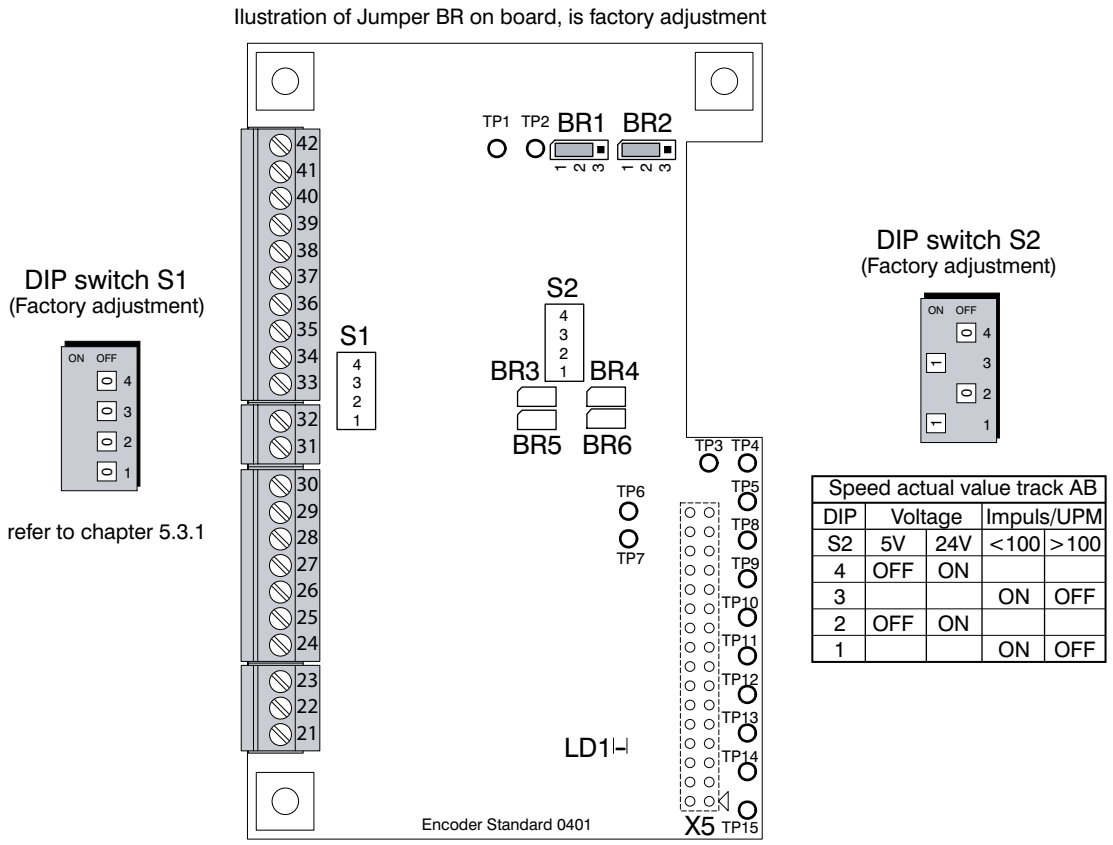
3.3.6 Controlboard TA-U1...U150



X1	Connection to powerstage
X2	Connection to Digital - Analogboard, bussystems and Ethernetboard
X4	Connection to displayboard
X5	Connection to Encoderboard
S1	Configuration of digital and anlog connections
S2	Configuration of processor
BR1	Reset μC
BR2	Real time clock active
BR3	Reset DSP
BR4	Common connection, connected to ground with 100R (or 1MR)
BR5	Digital output terminal 12,13, (refer to chapter 5.2) Pin 1-2 closed: closing contact Pin 2-3 closed: opening contact

LD1	Yellow - Input terminal 2
LD2	Yellow - Input terminal 3
LD3	Yellow - Input terminal 4
LD4	Yellow - Input terminal 5
LD5	Yellow - Output terminal 10/11
LD6	Yellow - Output terminal 12/13
LD7	Green - +3,3V
LD8	Green - +1,9V
LD9	Green - +24V
LD10	Green - +3,3V
LD11	+2,5V
LD12	Green - +6,5V
LD13	Green - -24V
LD14	Green - +5V

3.3.7 Encoderboard "Standard"



Speed actual value track AB				
DIP	Voltage		Impuls/UPM	
S2	5V	24V	<100	>100
4	OFF	ON		
3			ON	OFF
2	OFF	ON		
1			ON	OFF

X5 Connection to controlboard

S1 GND Connections of the input terminals 34,36 and 39 (Z,/Z,AB)

S2 Voltage or frequency track AB

BR1 Frequency output terminal 41, track B
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR2 Frequency output terminal 40, track A
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR3 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR4 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

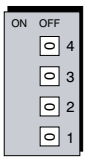
BR5 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR6 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

LD1 Green - +5V

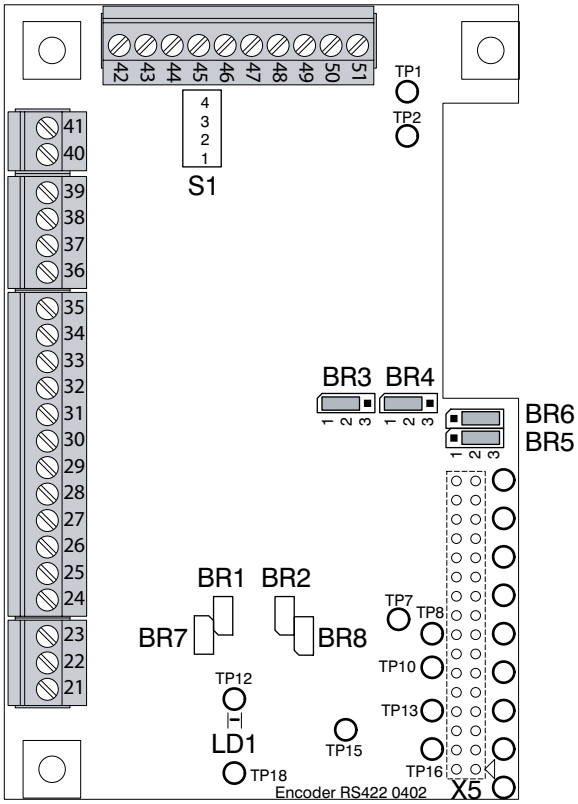
3.3.8 Encoderboard "RS422"

DIP-Schalter S1
(factory adjustment)



refer to chapter 5.3.2

Ilustration of Jumper BR on board, is factory adjustment



X5 Connection to controlboard

S1 GND Connections of the input terminals 43,45 and 48 (Z,/Z,AB)

BR1 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR2 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

BR3 Frequency output terminal 49, track A
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR4 Frequency output terminal 50, track B
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR5 Zero point signal Z2
Pin 1-2 closed: Zero point signal from encoder
Pin 2-3 closed: machine proximiti switch, factory adjustment

BR6 Zero point signal Z1
Pin 1-2 closed: Zero point signal from encoder
Pin 2-3 closed: machine proximiti switch, factory adjustment

BR7 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

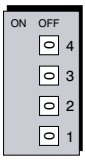
BR8 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

LD1 Green - +5V

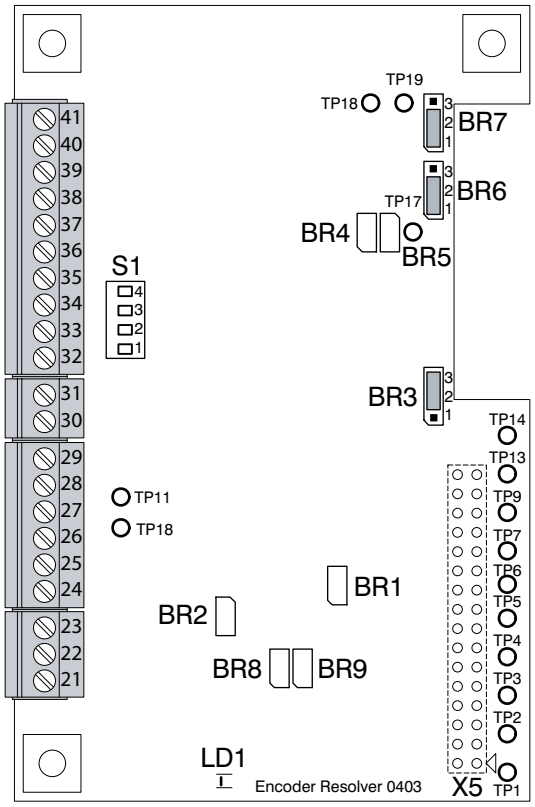
3.3.9 Encoderboard "Resolver 0403" (12 Bit)

Ilustration of Jumper BR on board, is factory adjustment

DIP switch S1
(Factory adjustment)



refer to chapter 5.3.3



X5 Connection to controlboard

S1 GND Connections of the input terminals 33,35 and 38 (Z,/Z,AB)

BR1 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

BR2 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR3 Zero point signal Z1
Pin 1-2 closed: Zero point signal from encoder
Pin 2-3 closed: machine proximiti switch, factory adjustment

BR4 Scan frequency (NC) factory adjustment open

BR5 Scan frequency (NC) factory adjustment open

BR6 Frequency output terminal 39, track A
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR7 Frequency output terminal 40, track B
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR8 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR9 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

LD1 Green - +5V

3.3.10 Encoderboard "Resolver 0406" (16 Bit)

DIP switch S1
(factory adjustment)
refer to chapter 5.3.3

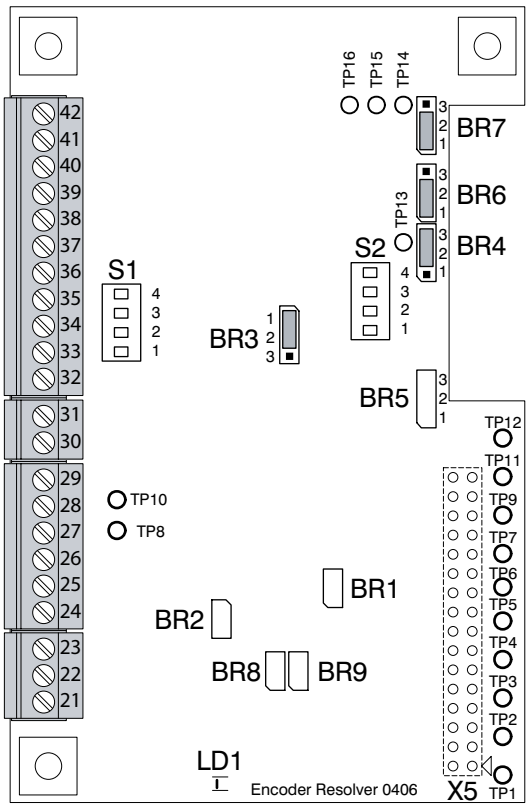
DIP switch S2
(factory adjustment)
Resolver resolution12 Bit

Resolver mode selection				
DIP-S2	1)	2)		
4	ON	OFF	-	
3	ON	OFF	-	

Parameter 53,54 resolver selection by u-Drivemanager or Keypad, active: 1) or disabled: 2)

Resolver resolution				
DIP-S2	10 Bit	12 Bit	14 Bit	16 Bit
2	ON	OFF	ON	OFF
1	ON	ON	OFF	OFF

Ilustration of Jumper BR on board, is factory adjustment



X5 Connection to controlboard

S1 GND Connections of the input terminals 33,35 and 38 (Z,/Z,AB)

S2 Resolver selection

BR1 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

BR2 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR3 Zero point signal Z2
Pin 1-2 closed: Zero point signal from encoder
Pin 2-3 closed: machine proximiti switch, factory adjustment

BR4 Scan frequency (NC) factory adjustment
open

BR5 Scan frequency (NC) factory adjustment
open

BR6 Frequency output terminal 39, track A
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR7 Frequency output terminal 40, track B
Pin 1-2 closed: actual speed value, factory adjustment
Pin 2-3 closed: special funktion

BR8 Motor temperature sensor terminal 21
open: thermo switch and PT100
closed: KTY and PTC

BR9 Motor temperature sensor terminal 22
open: thermo switch and PT100
closed: KTY and PTC

LD1 Green - +5V

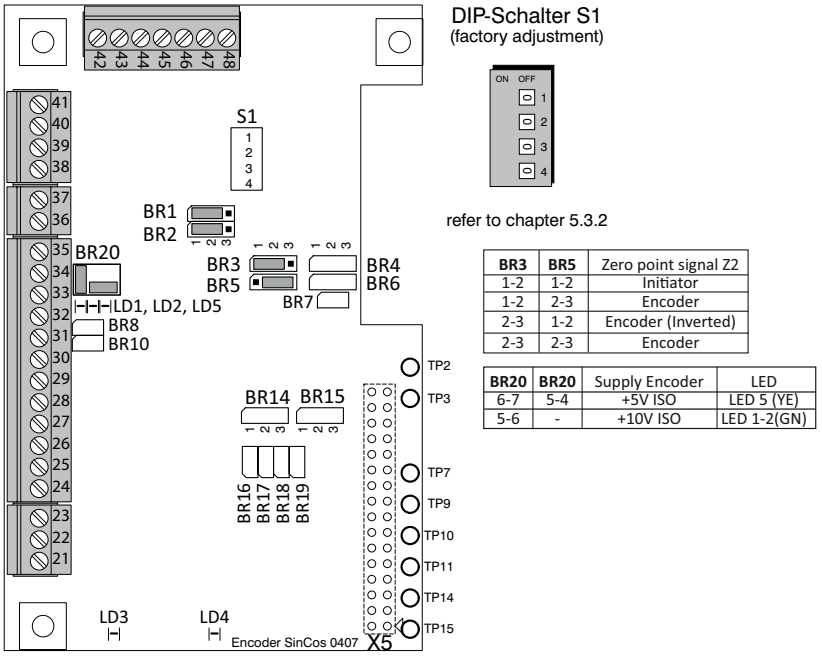
3.3.11 Encoderboard "SinCos"

Interface:

SSI (SPI)

RS485

Illustration of Jumper BR on board, is factory adjustment



BR3	BR5	Zero point signal Z2
1-2	1-2	Initiator
1-2	2-3	Encoder
2-3	1-2	Encoder (Inverted)
2-3	2-3	Encoder

BR20	BR20	Supply Encoder	LED
6-7	5-4	+5V ISO	LED 5 (YE)
5-6	-	+10V ISO	LED 1-2(GN)

X5 Connection to controlboard

S1 GND Connections of the input terminals 38,40 and 44 (Z,/Z,AB)

S2 Resolver selection

BR1 Frequency output terminal 45, track A
Pin 1-2 closed: BR4,
BR4, Pin 1-2: actual speed value,
BR4, Pin 2-3: nominal speed value
Pin 2-3 closed: special funktion

BR2 Frequency output terminal 46, track B
Pin 1-2 closed: BR6,
BR6, Pin 1-2: actual speed value,
BR6, Pin 2-3: nominal speed value
Pin 2-3 closed: special funktion

BR3 Zero point signal Z2
Pin 2-3 closed: Zero point signal from encoder, (inverted).
Pin 1-2 closed: machine proximiti switch, factory adjustment.

BR5 Zero point signal Z2
Pin 1-2 closed: Zero point signal from encoder
Pin 2-3 closed: machine proximiti switch, factory adjustment.

BR7 Reset Processor

BR8 Terminating resistor 130R

BR10 Terminating resistor 130R

BR14 Interface Configuration terminal 31 and 32
Pin 1-2 closed: SPISIMOB (SSI)
Pin 2-3 closed: SCITXDA (RS485).

BR15 Interface Configuration terminal 31 and 32
Pin 1-2 closed: SPISOMI (SSI)
Pin 2-3 closed: SCIRXDA (RS485).

BR16 Motor temperature sensor terminal 21 open: thermo switch and PT100.
closed: KTY and PTC

BR17 Motor temperature sensor terminal 21 open: thermo switch and PT100.
closed: KTY and PTC

BR18 Motor temperature sensor terminal 22 open: thermo switch and PT100.
closed: KTY and PTC

BR19 Motor temperature sensor terminal 22 open: thermo switch and PT100.
closed: KTY and PTC

BR20 Encoder supply Terminal 35
Pin 5-4-6-7 closed: +5V
factory adjustment
Pin 5-6 closed: +10V.

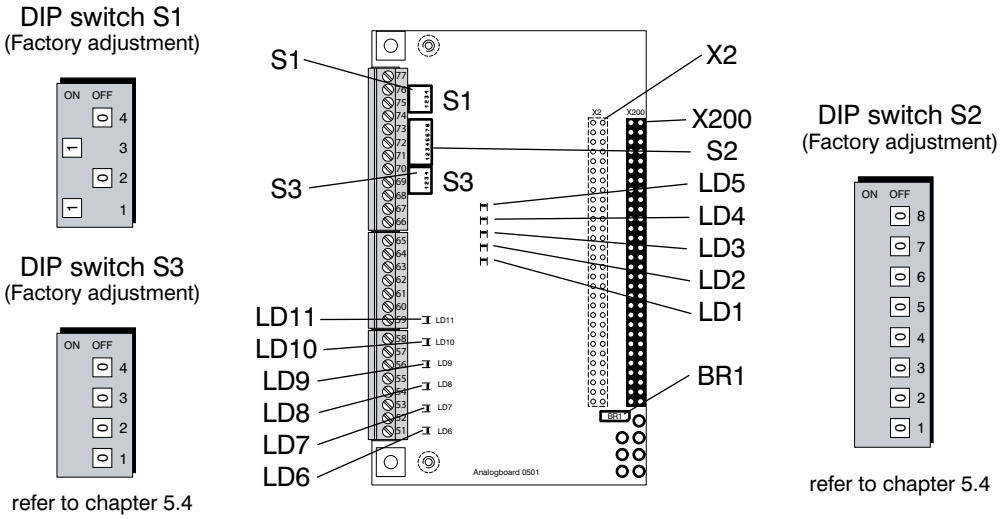
LD1-LD2 Green - +10V ISO

LD3 Green - +3,3V

LD4 Green - +5V

LD5 Yellow - +5V ISO

3.3.12 Digital - Analog board



X2 Connection to bussystems

X200 Connection to controlboard

S1 Analogue output V or mA

S2 Analogue output V or mA

S3 GND Connections digital and anlog inputs

BR1 Readmode D/A transformer (left)

LD1 Yellow - digital output terminal 60

LD2 Yellow - digital output terminal 61

LD3 Yellow - digital output terminal 63

LD4 Yellow - digital output terminal 64

LD5 Yellow - digital output terminal 65

LD6 Yellow - digital intput terminal 52

LD7 Yellow - digital intput terminal 53

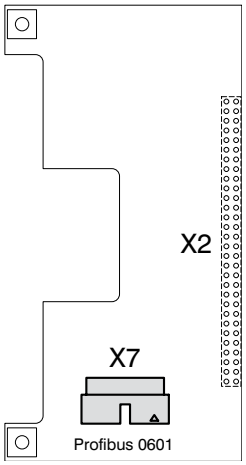
LD8 Yellow - digital intput terminal 54

LD9 Yellow - digital intput terminal 55

LD10 Yellow - digital intput terminal 56

LD11 Yellow - digital intput terminal 57

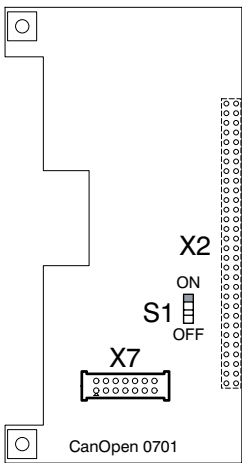
3.3.13 Bussystems - Profibus



X2 Connection to controlboard

X7 Connection to Profibus plug

3.3.14 CanOpen



X2 Connection to controlboard

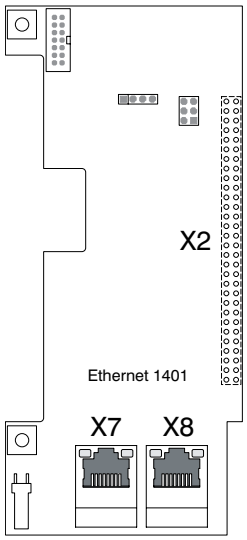
X7 Connection to CanOpen plug

S1 load resistor

On=top

OFF=bottom

3.3.15 Ethernetboard



X2 Connection to controlboard

X7 Connection ethernet

X8 Connection ethernet

S1

BR1

3.3.16 Displayboard

7 Segment Display

0 Ready for run

1 Run (Enable)

C1 Drive temperature pre-warning

C2 Motor temperature pre-warning

C3 Max value out of range

C4 Safe Stop

C5 Drive Locked ref>0

C6 Powerstage disabled

C7 Actual speed > norming

C8 Parameterization fault

Fault signals: (F and number shine alternately)

F0 Motor overtemperature

F1 Overcurrent

F2 Drive overtemperature

F3 Undervoltage

F4 Overvoltage

F5 Rippel Current

F6 Position sensor U, V and W

F7 Speed sensor A and B

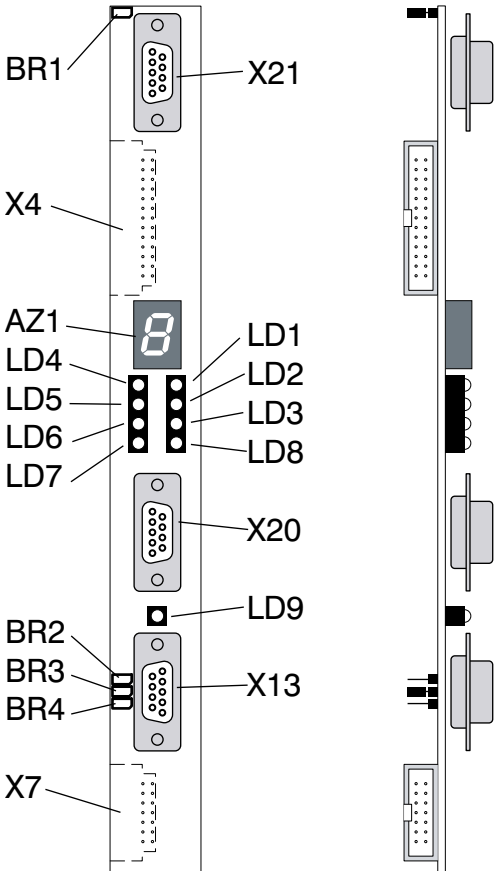
F8 Elektronic

F9 Short-Circuit IGBT

E1 External error at terminals

E2 No reducing circuit

E3 Fault brake feedback



LED indication Displayboard

LD 4	pale	Position sensor U
LD 5	pale	Position sensor V
LD 6	pale	Position sensor W
LD 1	pale	Speed sensor track B
LD 2	pale	Speed sensor track A
LD 3	pale	Runs 4Q
LD 7	red	Current limit
LD 8	green	Speed reached
LD 9	Bus	
AZ1	7 segment display	

Connections and jumpers

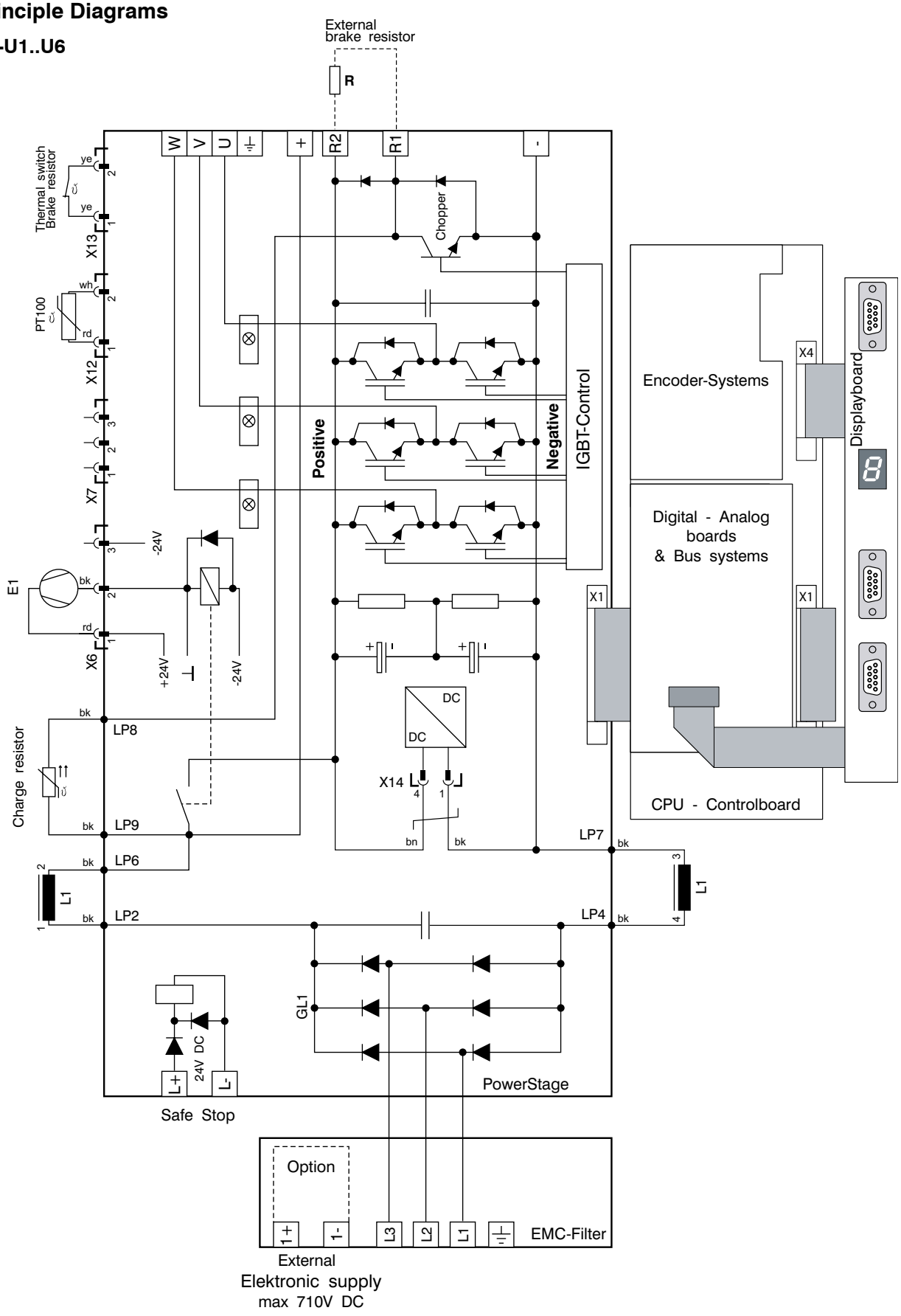
X4 Connection to controlboard

X7 Connection to field bus

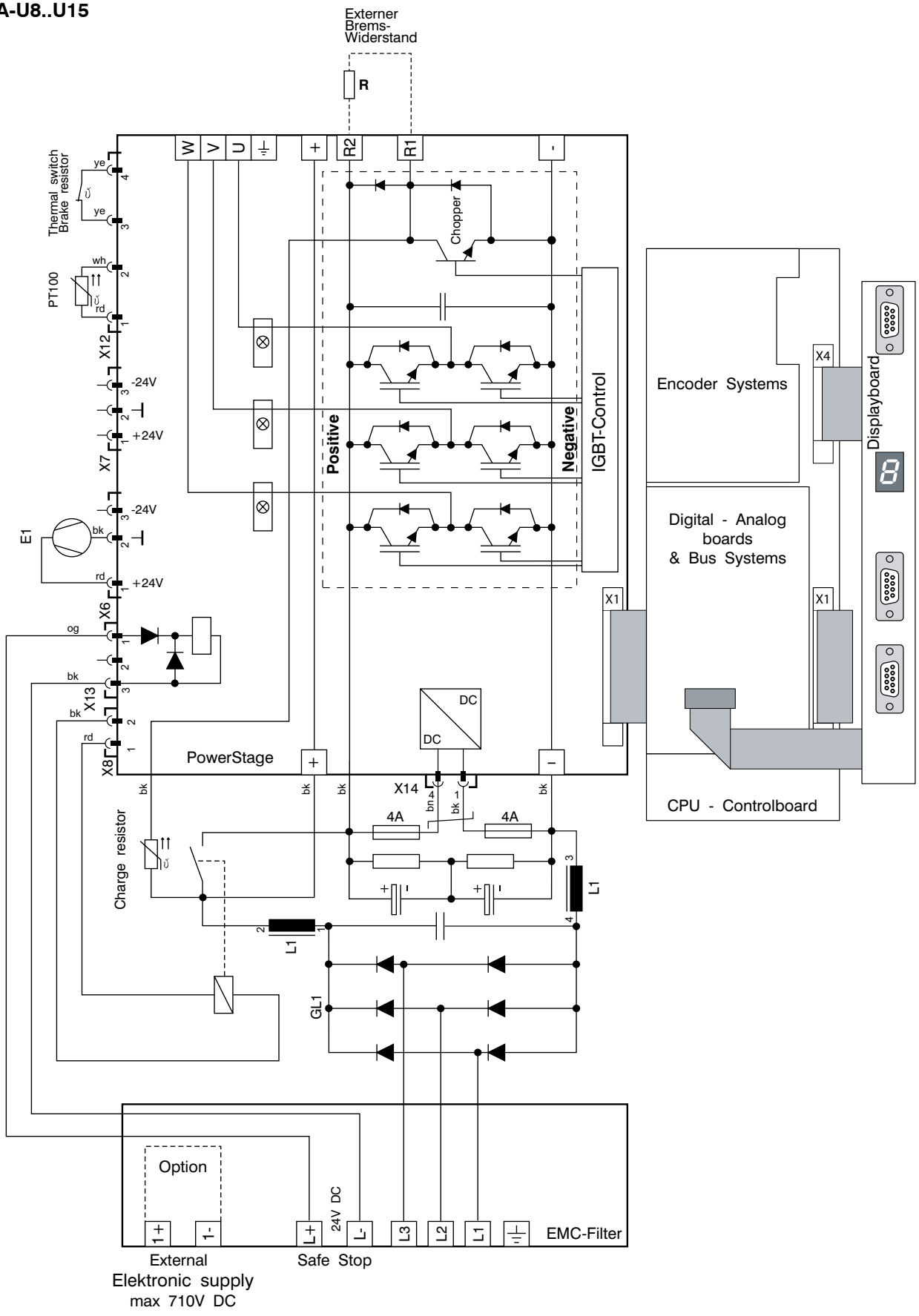
X13	Field bus
X20	RS422/485
X21	PG4000
BR1	Terminating resistor PG 4000
BR2	RS485 (able to bus)
BR3	Terminating resistor RS 422/485
BR4	RS485 (able to bus)

3.4 Principle Diagrams

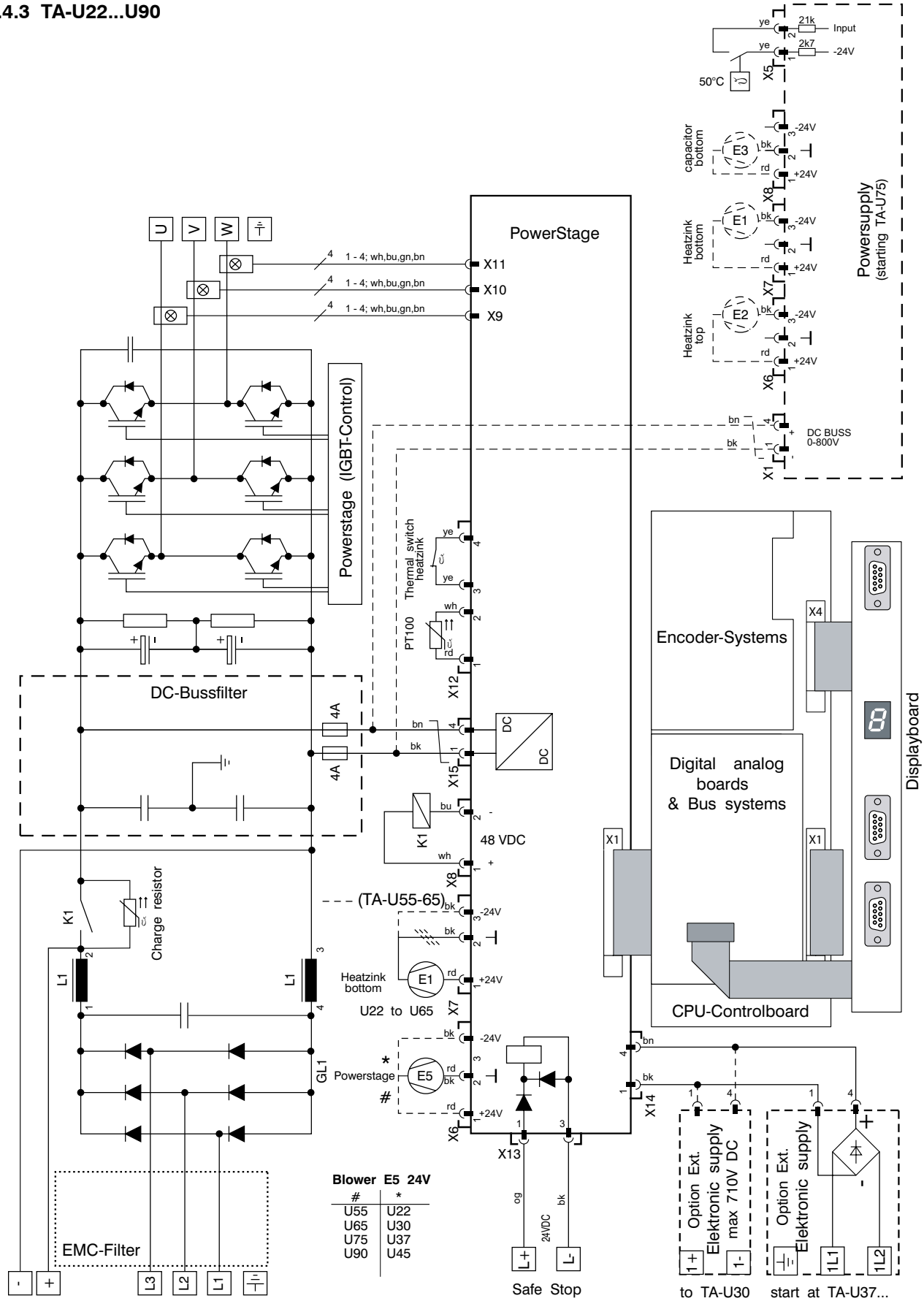
3.4.1 TA-U1..U6



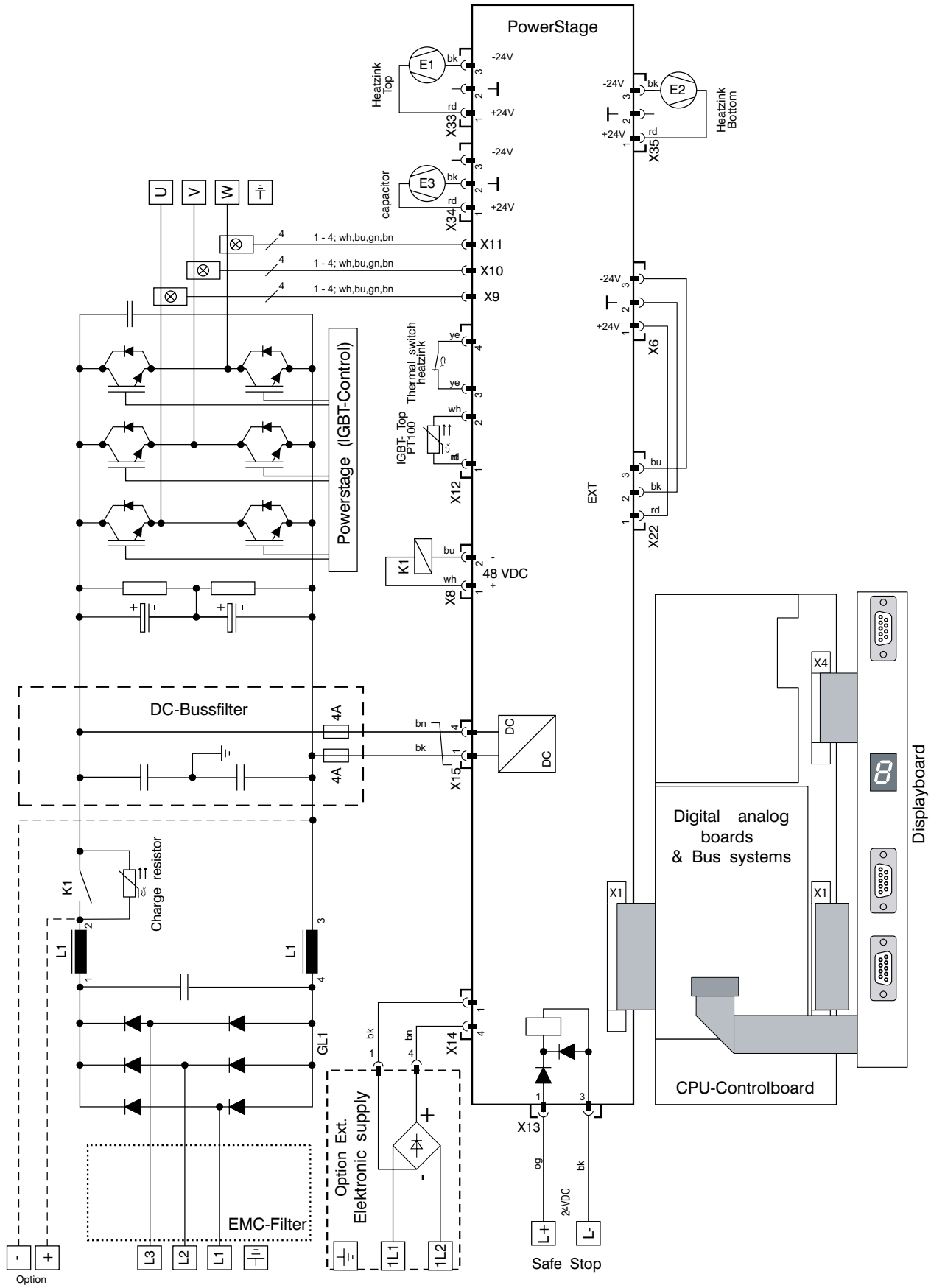
3.4.2 TA-U8..U15


Externer
Brems-
Widerstand
R
W
V
U
+
R2
R1
-
Thermal switch
Brake resistor
PT100
X12
X7
X6
X13
X8
E1
-24V
+24V
Chopper
Positive
Negative
IGBT-Control
Encoder Systems
Digital - Analog
boards
& Bus Systems
CPU - Controlboard
Displayboard
X4
X1
PowerStage
DC
X14
4A
Charge resistor
L1
GL1
Option
24V DC
L3
L2
EMC-Filter
External
Elektronic supply
max 710V DC
Safe Stop

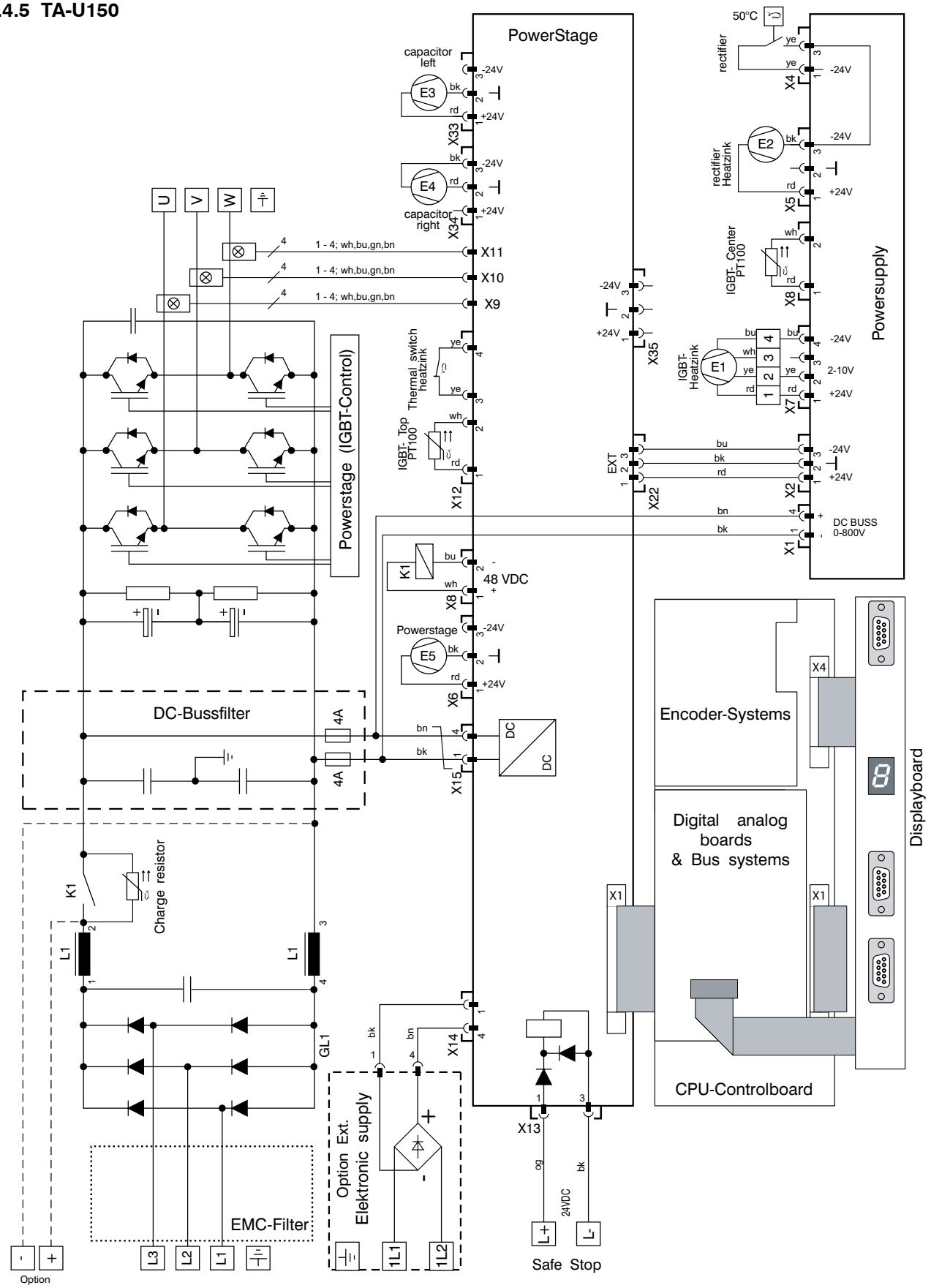
3.4.3 TA-U22...U90



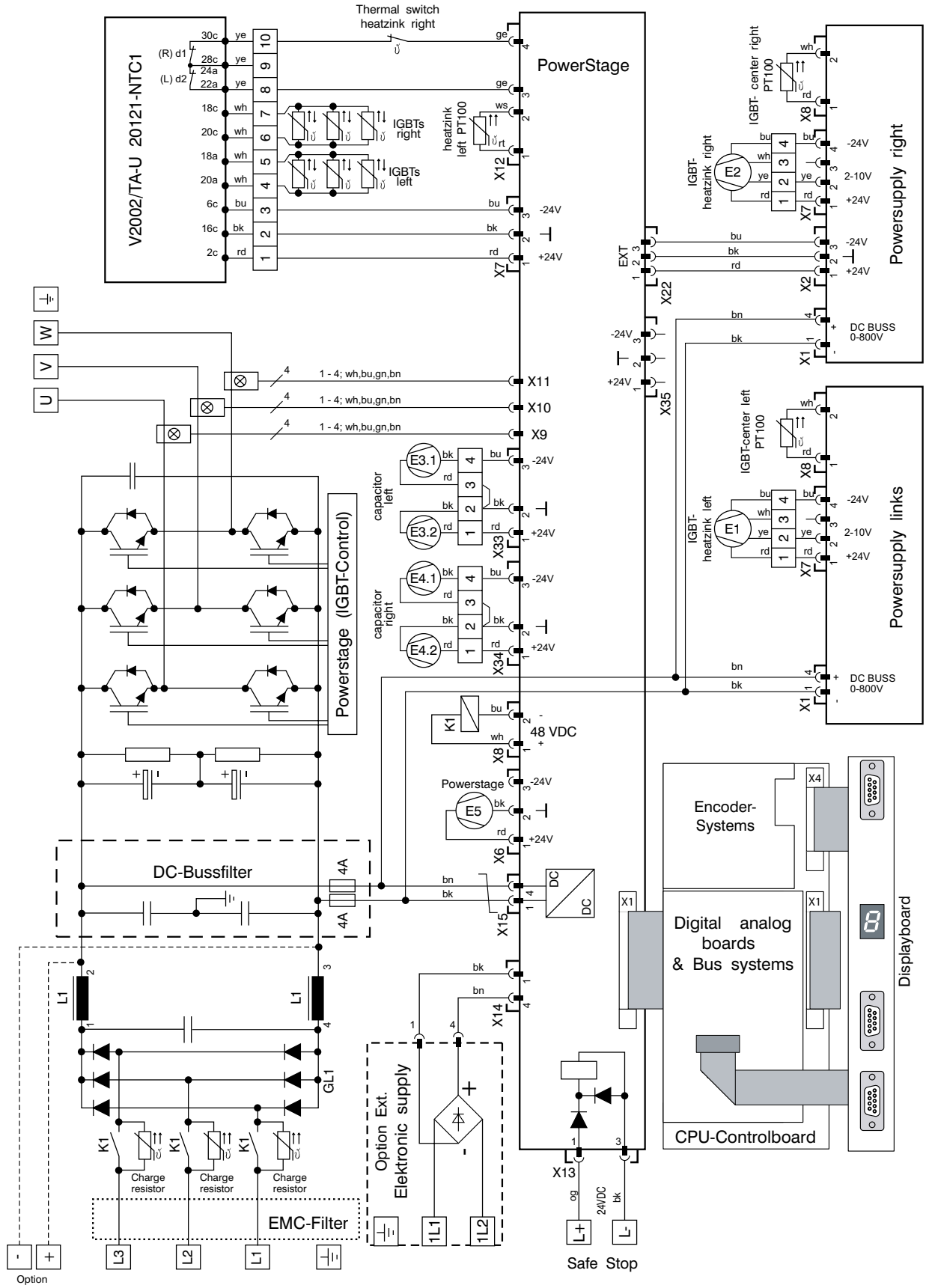
3.4.4 TA-U110


PowerStage
Heatzink Top
E1
bk
rd
-24V
+24V
X33
capacitor
E3
X34
Heatzink Bottom
E2
X35
U
V
W
1 - 4; wh,bu,gn,bn
X11
X10
X9
Powerstage (IGBT-Control)
Thermal switch heatzink
ye
IGBT- Top PT100
wh
X12
EXT
X6
X22
bu
K1
48 VDC
X8
DC-Bussfilter
4A
bn
X15
DC
Digital analog boards & Bus systems
X4
X1
Displayboard
CPU-Controlboard
Charge resistor
L1
GL1
X14
Option Ext. Elektronic supply
X13
og
24VDC
L+
L-
Safe Stop
EMC-Filter
L3
L2
L1
1L1
1L2
Option

3.4.5 TA-U150


PowerStage
Powersupply
Powerstage (IGBT-Control)
DC-Bussfilter
EMC-Filter
Option Ext. Elektronic supply
Encoder-Systems
Digital analog boards & Bus systems
CPU-Controlboard
Displayboard
Charge resistor
Thermal switch heatzink
IGBT Top PT100
IGBT Center PT100
IGBT-Heatzink
rectifier
rectifier Heatzink
capacitor left
capacitor right
Powerstage
48 VDC
DC BUSS 0-800V
50°C
1 - 4; wh,bu,gn,bn
Option
Safe Stop
24VDC

3.4.6 TA-U200...U280



4.0 Setting up

4.1 Setting up instructions

Follow the safety advises in Chapter 1. Furthermore the following advice for installation have to be applied.

The installation should only be done by qualified personnel.

Interchanging of the terminals U, V, W while connecting synchronous motor results in a malfunction of the motor. Furthermore, the encoder cable from the motor has to be a screened cable. TAE is offering premounted cables for this purpose. Without the correct connection of the cable, the drive is not functional.

During installation, general installation regulations such as the following should be observed:

VDE 0100 General requirements for the installation of power with mains voltage up to 1000V.

VDE 0113 General requirements for the installation of electrical equipment for production and tooling machines.

VDE 0160 Requirements for electronic equipment for use in electrical power installations.

Further regulations may have to be observed if a special use for the unit is planned.

As protection equipment the following concepts could be used if allowed by your energy supplier:

Fault-Voltage-circuit-breaker (FU), protection earth or grounding (if allowed), Fault-Current-circuit-breaker (FI) can not be used.

High leakage currents of EMC filters could trigger the protection device.

Use only functional devices. After safety equipment has been triggered, the cause must be found and the failure has to be corrected. Defects on the device can only be repaired by TAE or from TAE authorized qualified personal.

Safety equipment must not be bypassed or removed. More information about the provided safety and protection equipment may be found in Chapter 7.0 and 7.1.

4.1.1 Switching Devices

According to the VDE regulations, the controller must be connected to mains supply line in such a manner that it can be separated from the mains supply with suitable circuit breakers (for example main switch, circuit).

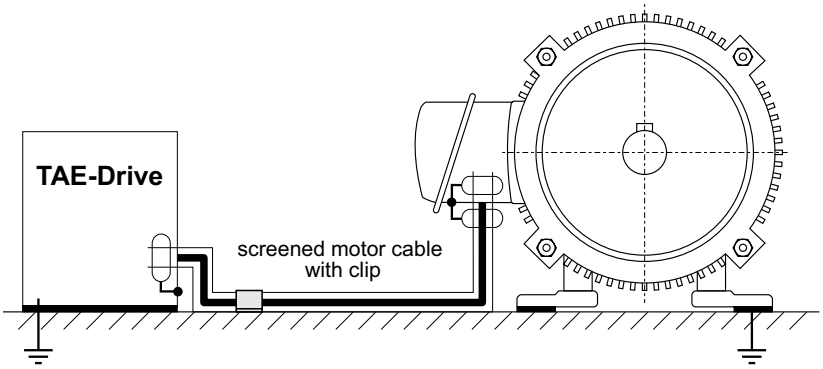
4.1.2 Arrangement of Wires

The supply cable should be a stranded conductor and not a solid conductor type to achieve proper connection inside the terminal block. Rails for high current with their screw connection are also suited. Cable lengths inside the wiring cabinet should be kept to a minimum.

The supply cables, motor cables and control cables should never run together in the same trunking or conduit.

Keep the electronic control cables separated from the power control cables to avoid feedback. The distance should be at least 20 cm. For the digital and analog reference and feedback cables screened cable has to be used in general.

Since the cable between regulator and motor is the major source of radiated and conducted interference, it should be a screened type and as short as possible.



4.1.3 Conditions for Grounding

All metal frames have to be connected to ground by their own. Make a well defined path for high ground currents.

For short-circuits to frame and leakage currents of filter components exists minimum cross-sections.

If one or two phases become disconnected the EMC filter can produce leakage currents up to 100mA. Filters and devices with build in filters have to be connected to ground before mains.

To clamp high frequency currents it is required to take some care along to the advice made above about grounding:

All grounding leads should be as short as possible. Poor connections and loops of cable will act as aerials and pick up stray radiated emissions. The screen should be connected to ground by removing the coat pressing the screen with a clip to the backplate bonded ground. Do not use a "pig tail" to connect the screen of the cable. The screen should lead into the device. On the motor it is possible to connect the screen with a EMC screwing. On the regulator the screen will be surrounded by a metal clip pressing it on mounting plate or grounding bar.

Make ground connection of the regulator by a wide plain on the backplate of the wiring cabinet. It is preferable to use a galvanized backplate not sealed with varnish. This concept does not replace the national safety codes for grounding.

4.1.4 International Protection

Suit protection class IP20 for switch cabinet mounting.

4.1.5 Instruction for Mounting

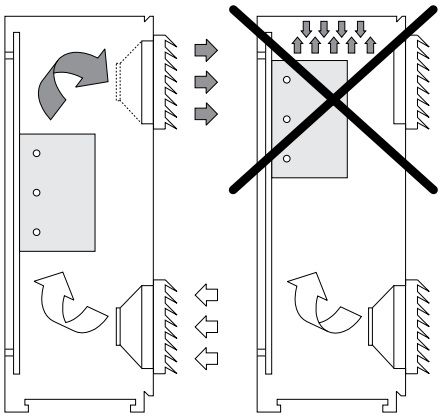
It is recommended to use a galvanized backplate.

All drives are to be mounted in a vertical position. The location where the unit is mounted should be free of dust, moisture and aggressive gas. In cases where the unit or the switch cabinet is subjected to excessive vibrations, it is recommended to protect the electronic components by either mounting the plate or the complete switch cabinet in a shock and vibration absorbing manner.

The sum of the air flows of the devices in the switch cabinet must be less to the air flow of the switch cabinet.

The power data sheet shown in the technical data for the U-drive refer to a internal switch-cabinet-temperature of 0 - 40°C. (see drawing)

Drawing
The left picture shows the drive mounted in a optimal position. In the right hand picture the drive is mounted too high. The developed heat cannot escape from the upper part of the cabinet.

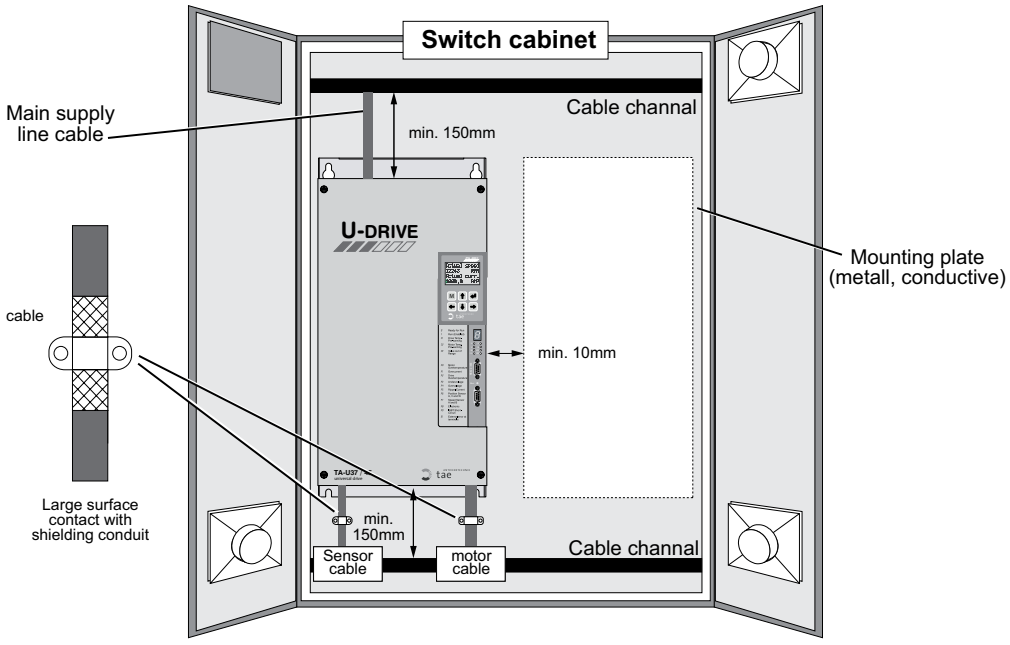


4.1.6 Arrangement in Switch Cabinet

If several drives are installed next to each other, then a minimum clearance of 50mm should be maintained. When installing several drives one above the other, a minimum clearance of 300mm should be maintained. For units without heat source,-for example cable channels - then a minimum clearance should be observed. This spacing is 150mm above and 150mm below the units and 10mm to each side.

Power Supply and Motor Cable

Keep the separation of input and output cables as great as possible to prevent feedback. Input and output cables should never be run together in the same trunking or conduit. Power supply cable and motor cable must be screened and should not run side by side, or in the same cable channel.

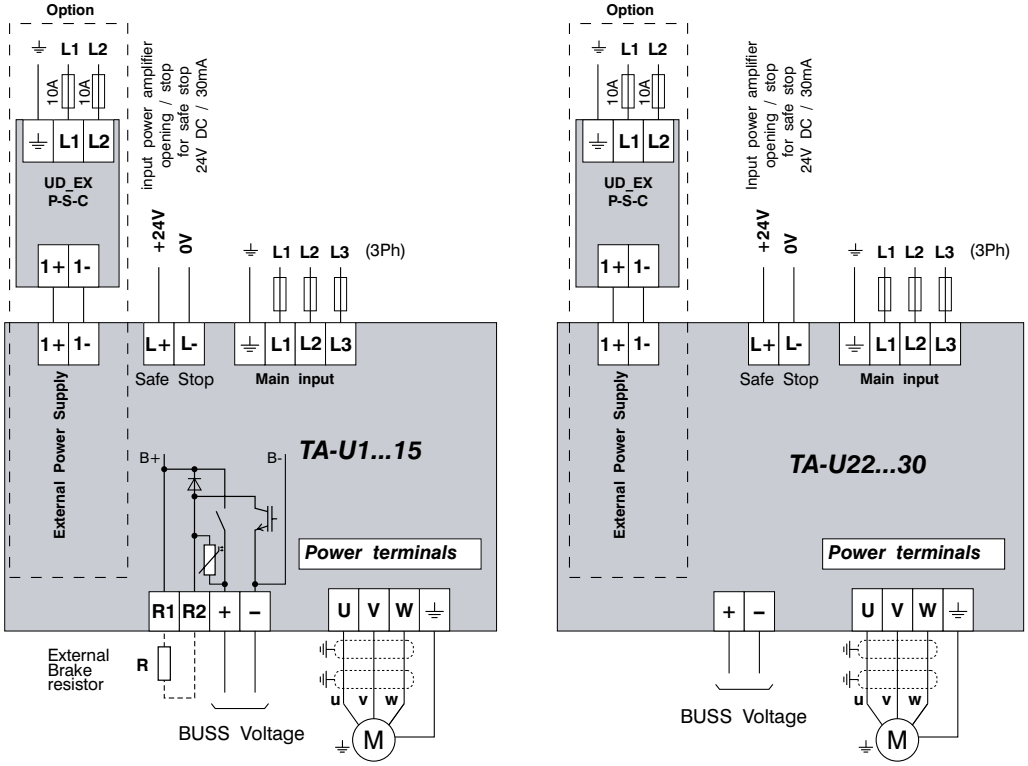


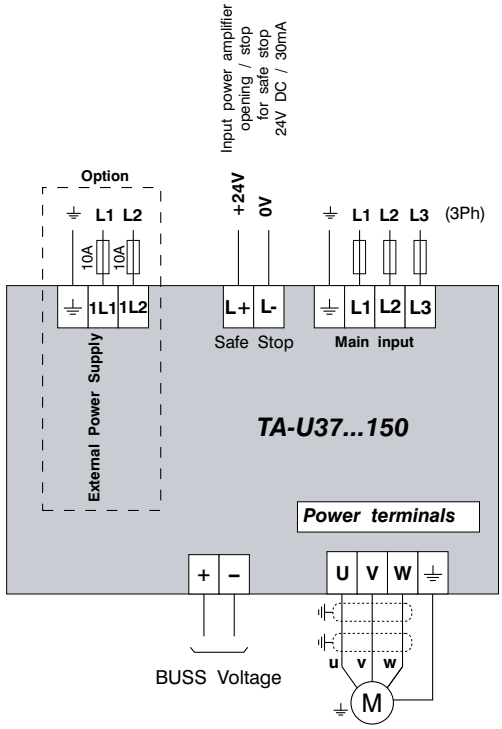
5.1.7 Braking Unit

Connection between braking chopper, braking resistor and regulator are a source of radiated and conducted interference. The cable should be screened and as short as possible. Ensure proper grounding (Chapter 4.1.3).

5.0 Connections

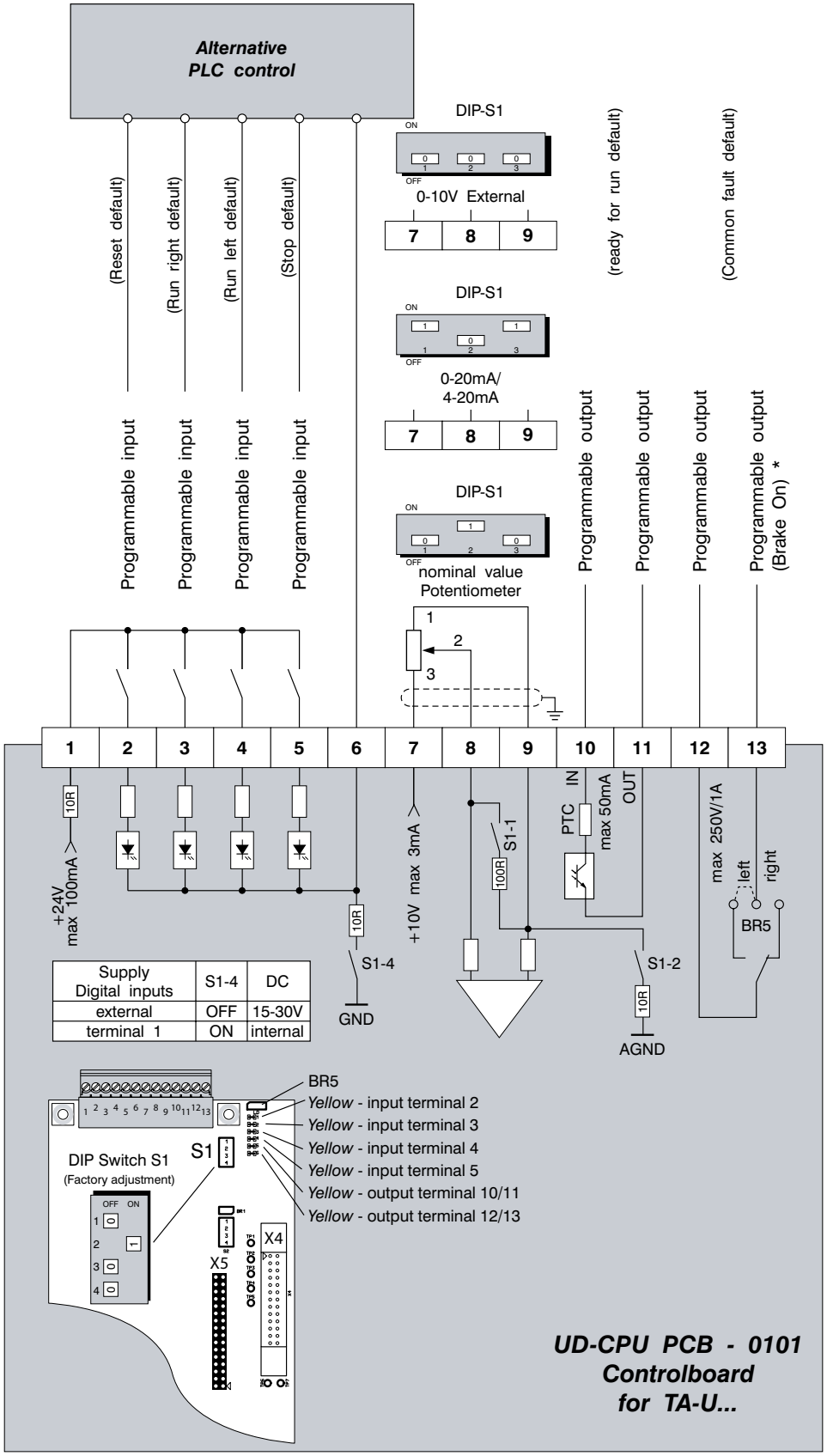
5.1 Power Connections





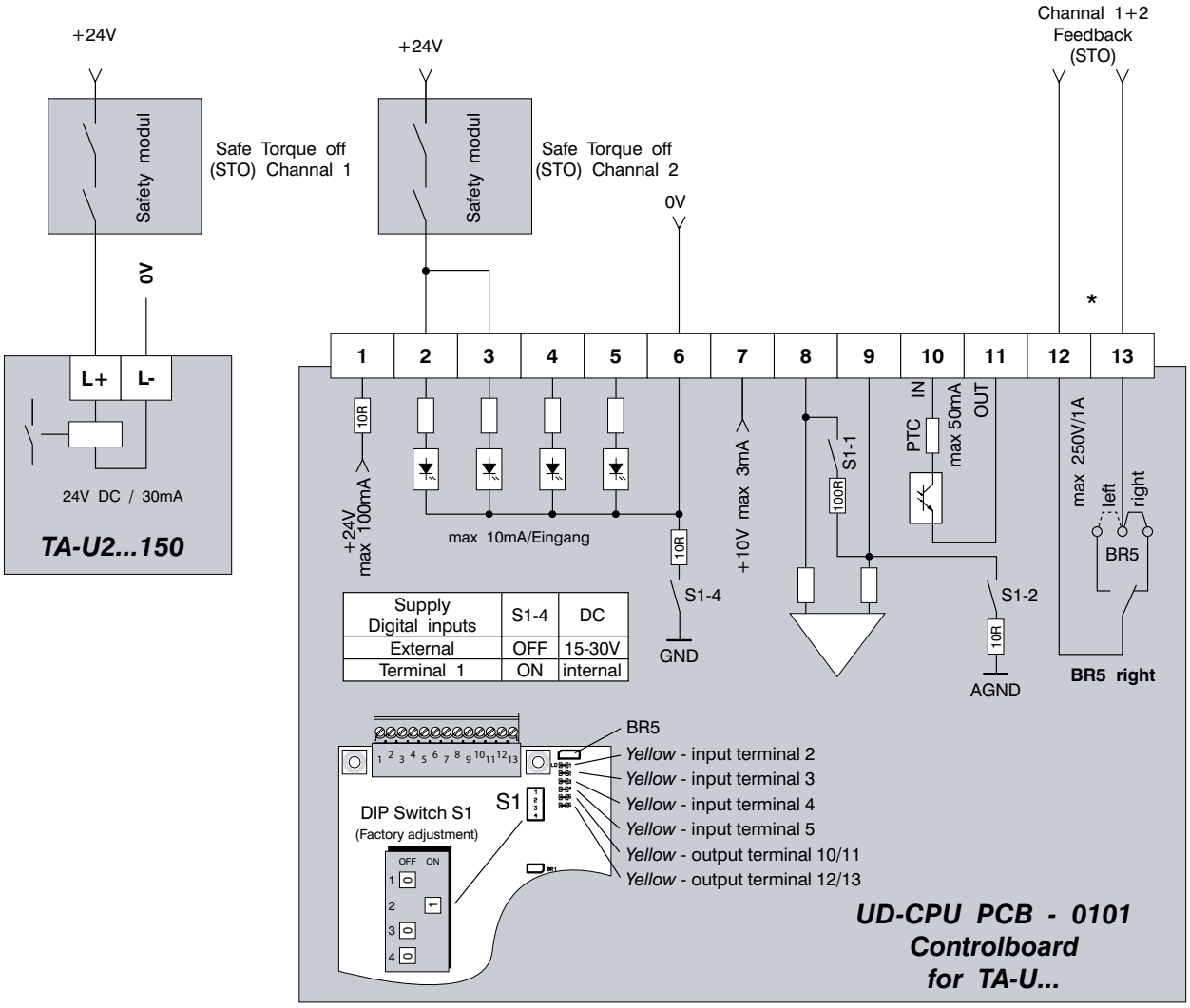
5.2 Connection Diagram Controlboard

5.2.1 Connection Diagram Controlboard standard



* At Brake function active (parameter 860.00) is relay output at terminal 12/13 generally configured to control the brake.

5.2.2 Connection Diagram Controlboard save Torque



*** At Brake function active (parameter 860.00) is relay output at terminal 12/13 generally configured to control the brake. In this case the terminals 59 and 61 must be used as STO feedback (Analogue-Digital-upgrading)**

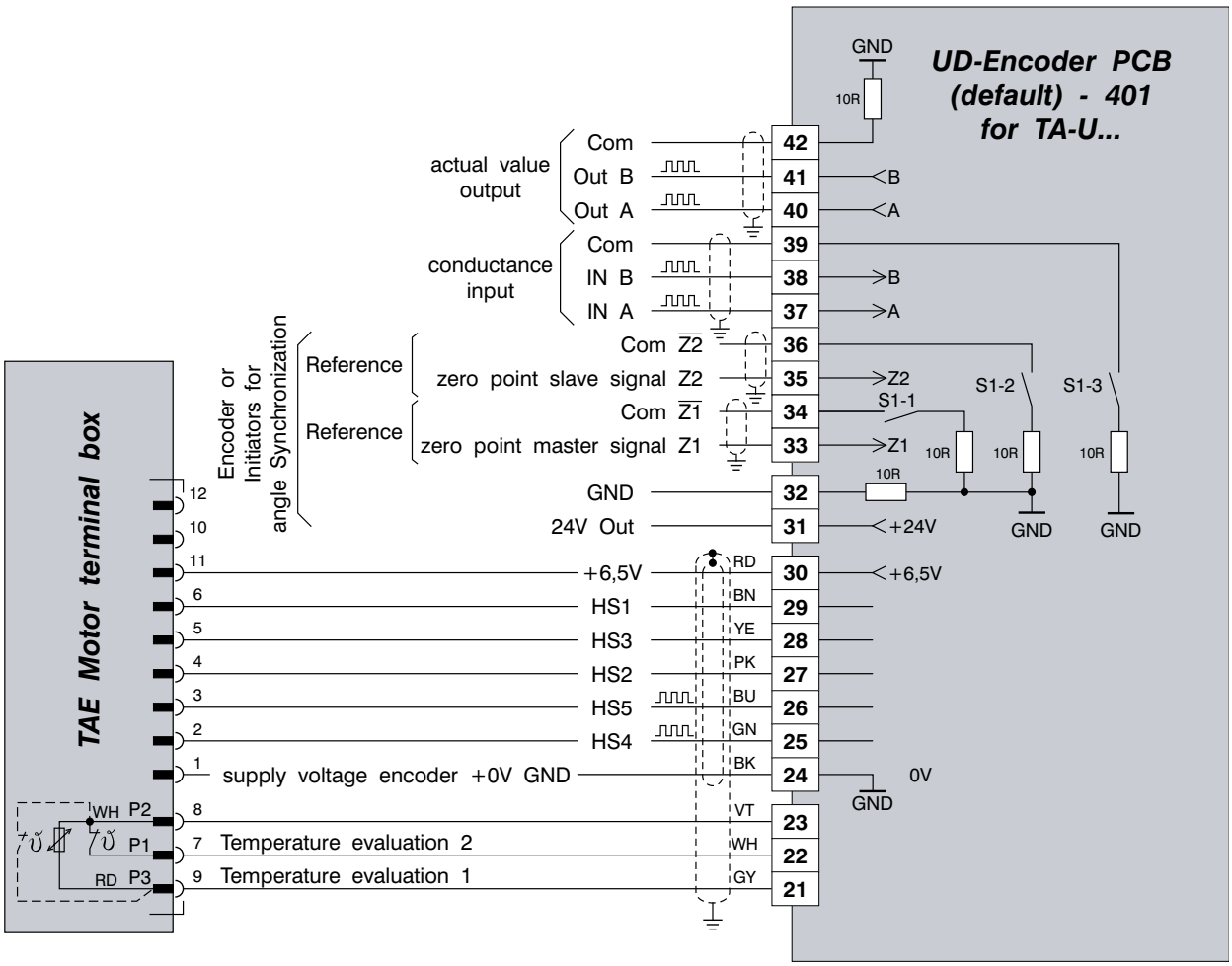
Following configuration of parameters is neccessary for 2 channels operating with feedback

Parameter	value
302	20008
303	20009
304	57005
305	20008
306	20009
307	57003
334	55212
339	21009

Parameter	Bit	value
366	00	1
366	01	1
366	02-31	0
371	00-01	0
371	02	1
371	03	1
371	04	1
371	05	1
371	06-31	0
400	00	0
400	01	0
400	02	0
400	03	1
400	04	1
400	05	0
402	00-05	0
403	00	1
403	05	1

5.3 Connection Diagram Encoders

5.3.1 Encoder standard



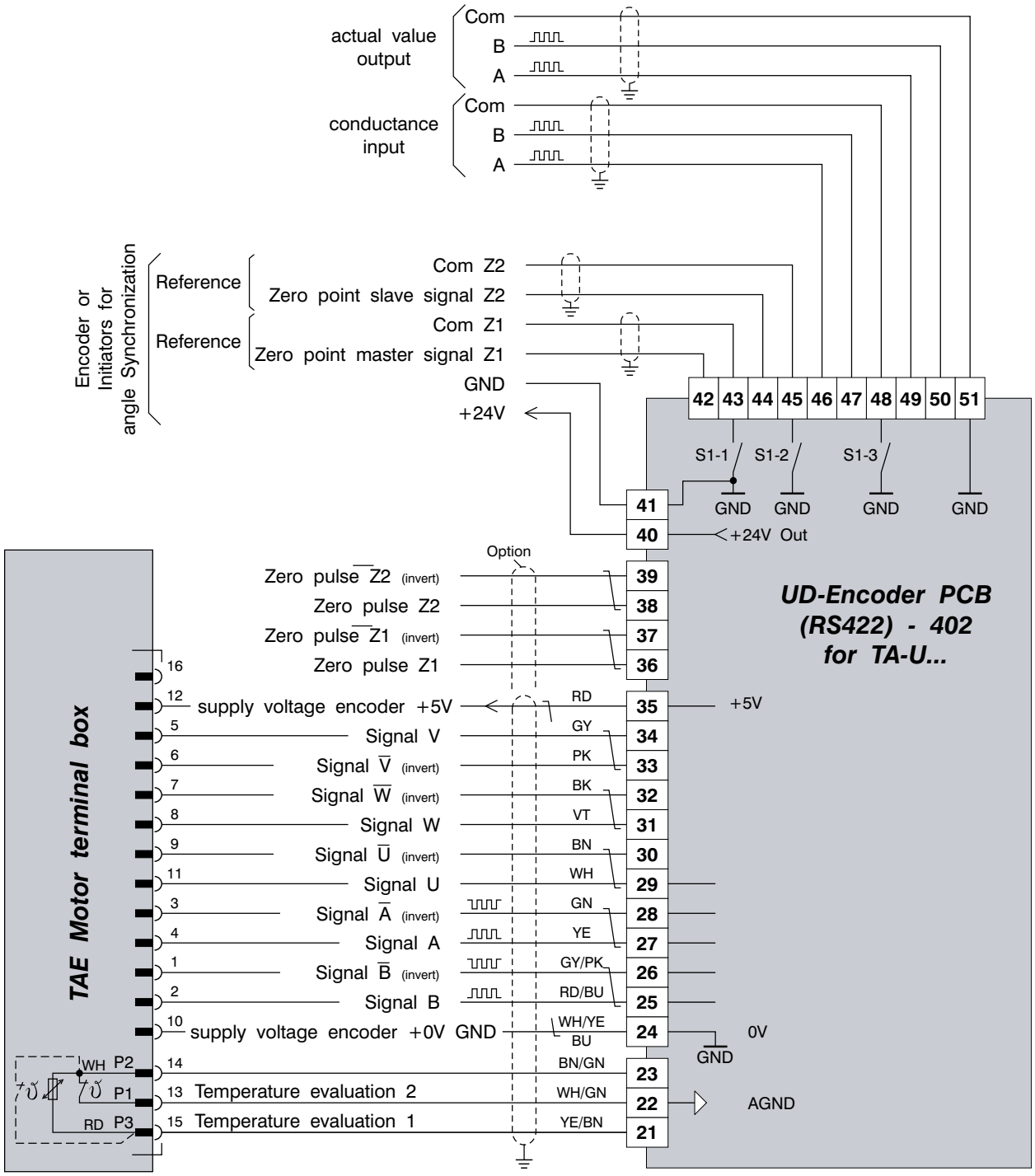
*) Temperature evaluation 1

Klixon = Pre-warning
PT100 = Temperature indicator, pre-warning and switch-OFF preseted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF preseted with software

*) Temperature evaluation 2

Klixon = Switch-OFF
PT100 = Temperature indicator, pre-warning and switch-OFF preseted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF preseted with software

5.3.2 Encoder RS422



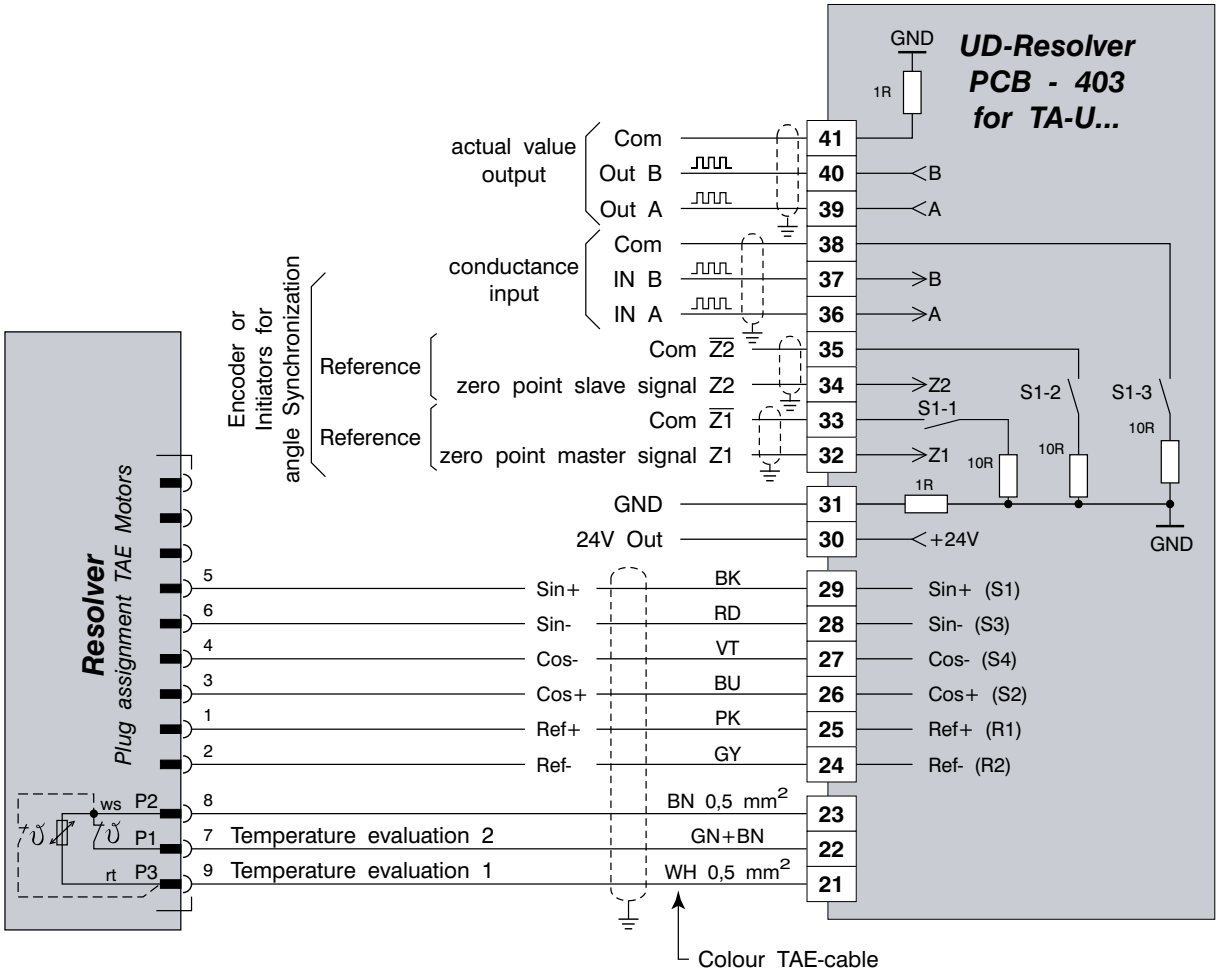
*) Temperature evaluation 1

Klixon = Pre-warning
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

*) Temperature evaluation 2

Klixon = Switch-OFF
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

5.3.3 Resolver - 403 12 Bit



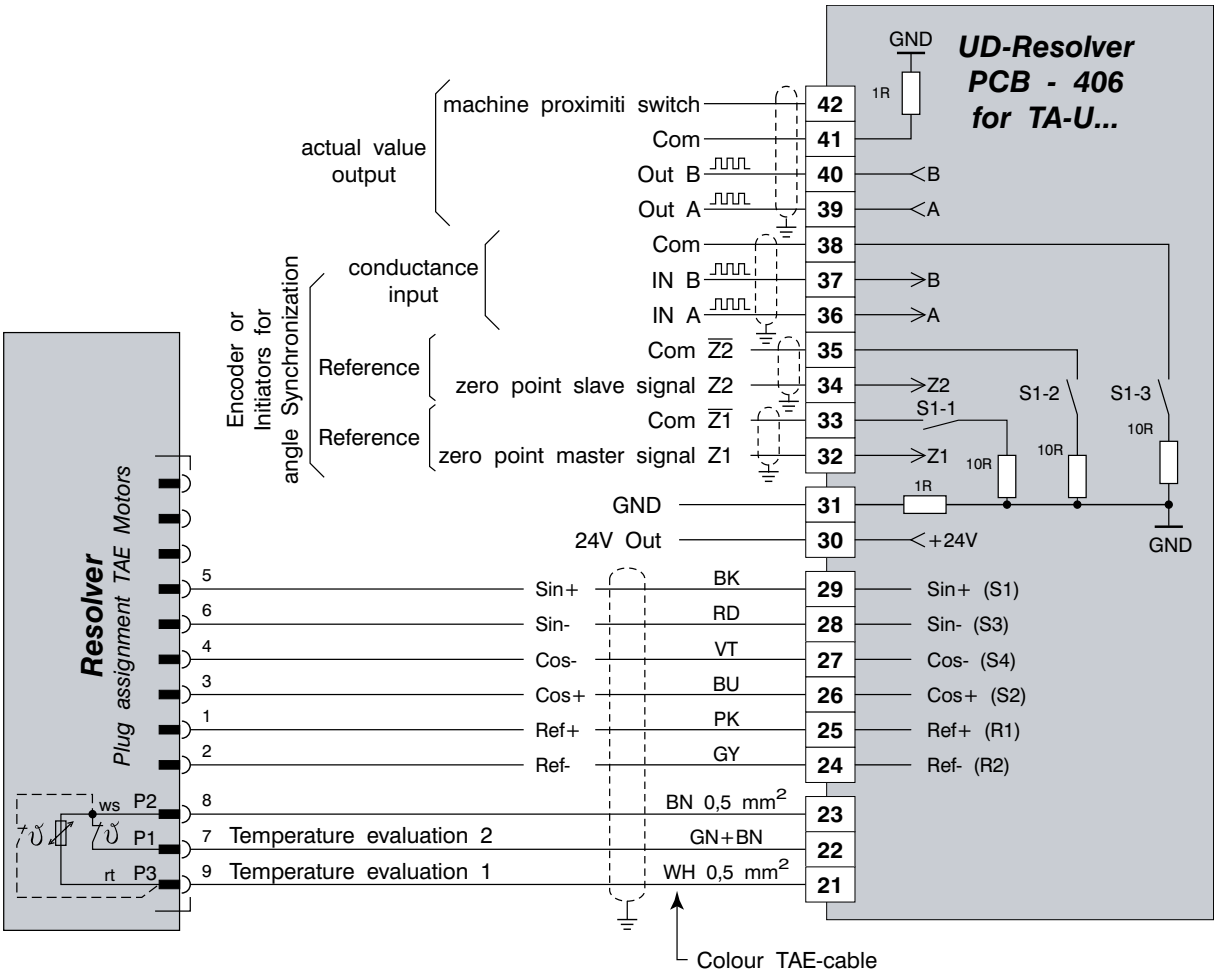
*) Temperature evaluation 1

Klixon = Pre-warning
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

*) Temperature evaluation 2

Klixon = Switch-OFF
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

5.3.4 Resolver - 406 16 Bit



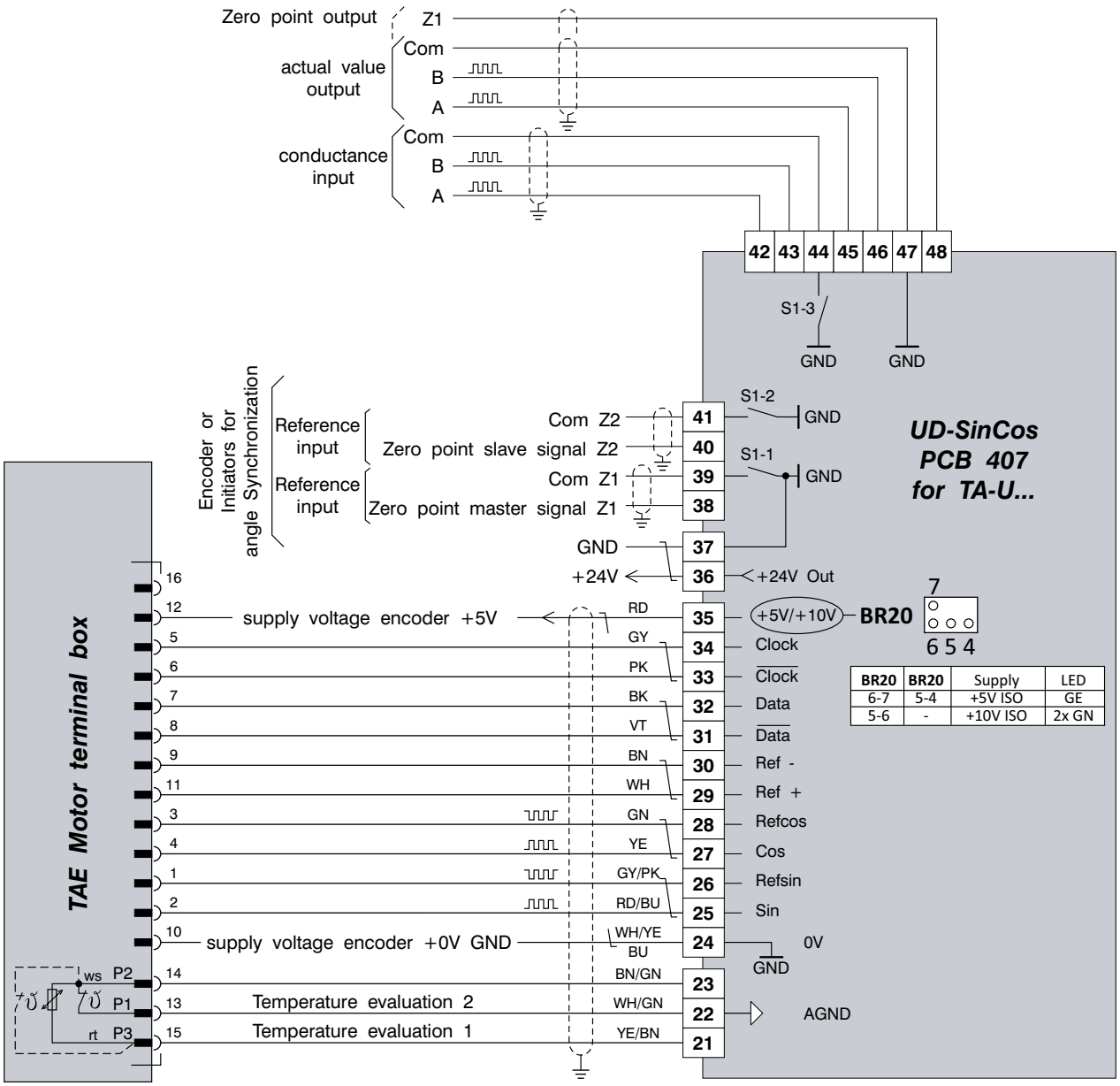
*) Temperature evaluation 1

Klixon = Pre-warning
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

*) Temperature evaluation 2

Klixon = Switch-OFF
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

5.3.5 Encoder SinCos



BR20	BR20	Supply	LED
6-7	5-4	+5V ISO	GE
5-6	-	+10V ISO	2x GN

*) Temperature evaluation 1

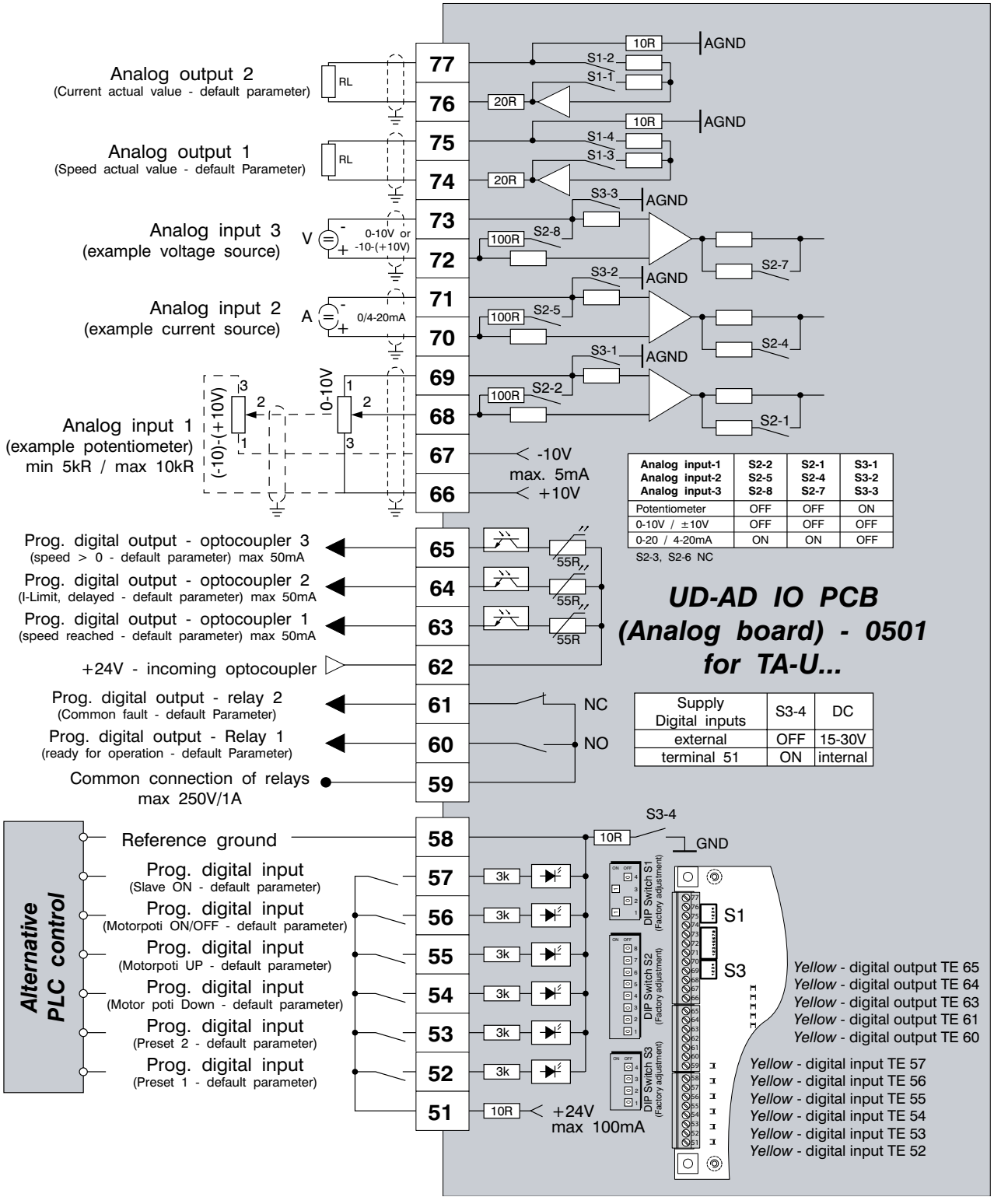
Klixon = Pre-warning
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

*) Temperature evaluation 2

Klixon = Switch-OFF
PT100 = Temperature indicator, pre-warning and switch-OFF pre-seted with software
KTY84130 = Temperature indicator, pre-warning and switch-OFF pre-seted with software

5.4 Connection Diagram Analog - Digital upgrading

Analog output-1 Analog output-2	S1-3 S1-1	S1-4 S1-2	RL [Ohm] Min	 Max
0-20 / 4-20mA	OFF	ON	100	500
0-10V / ±10V	ON	OFF	500	∞



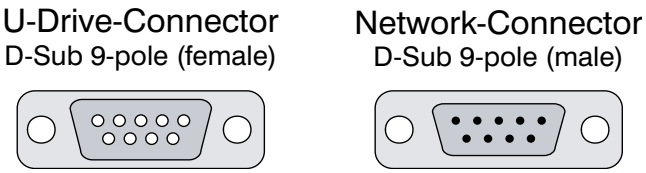
Analog input-1 Analog input-2 Analog input-3	S2-2 S2-5 S2-8	S2-1 S2-4 S2-7	S3-1 S3-2 S3-3
Potentiometer	OFF	OFF	ON
0-10V / ±10V	OFF	OFF	OFF
0-20 / 4-20mA	ON	ON	OFF

S2-3, S2-6 NC

UD-AD IO PCB (Analog board) - 0501 for TA-U...

Supply Digital inputs	S3-4	DC
external	OFF	15-30V
terminal 51	ON	internal

5.5 Assignment RS422 - interface "X20"



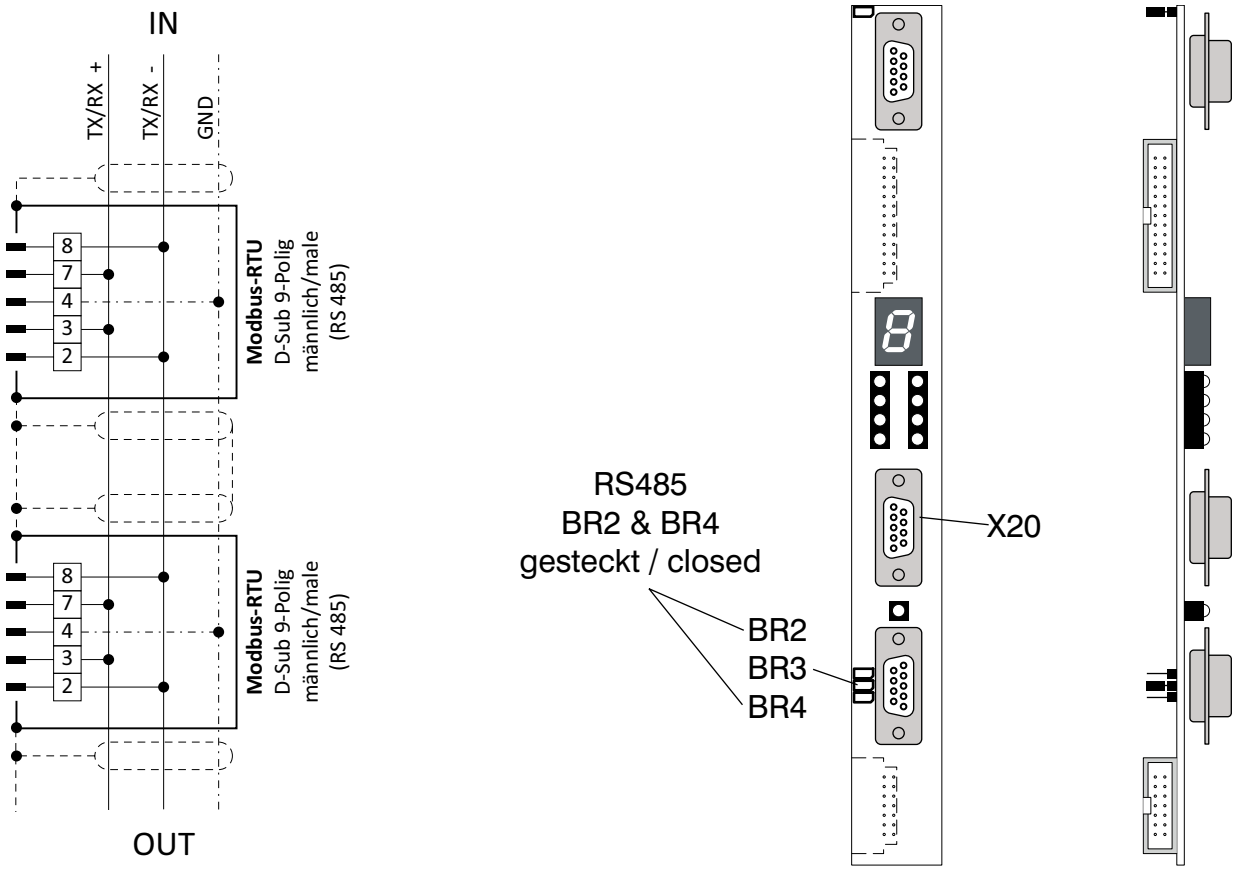
The Device-Connector (X20) is located on the Display-Board of the U-Drive. The Network-Connector establishes connection to the RS422 network.

Pin-assignment is as follows:

Pin	Assignment	Pin	Assignment
1	-	6	-
2	RX -	7	RX +
3	TX +	8	TX -
4	GND	9	-
5	+5V (Out)	Casing	Ground

Termination, see Jumper "BR3" (120 Ohm) at the displayboard, at the 1. respectively at the last subscriber.

5.6 Assignment Modbus-RTU, D-Sub 9-Poles "X20"



6.0 Operation

6.1 Instructions of Safety

The operation should only be done by qualified personnel. Follow the advice in Chapter 1 and 2 about usability and protection against irregular usage.

As with any form of electrical equipment, there is always a risk involved in the handling of electrical machinery. The greatest care must always be exercised during installation and maintenance. It is recommended that service is performed by authorized personnel only.

Make sure that the unit and the motor is properly grounded in order to avoid electrical hazzards! Improper grounding will also cause damage to the electronic circuit and to the encoders of the motor! The common connection of the electronic circuit can be jumpered, connected to ground with 1MR or 100R.

Caution - Danger !

Disconnect unit from mains before making any repairs. Only when the BUSS-capacitors have discharged, (5 minutes after the device has been seperated from line, the unit may be opened and worked on).

6.2.1 Dip-switches

Before operating the drive it is necessary to check the configuration of the Dip-switches.
In general these Dip-switches are already properly configured with factory settings.
Nevertheless make sure that the configuration corresponds to your requirements.
Detailed information concerning the settings of these Dip-switches is provided in Chapter 5.2 - 5.4.

6.2.2 Setting of Motor Parameters

The motor parameters (Chapter 3.3) are programmed with standard parameters by the factory. The adjustment refers to the nominal data of the selected motor and are documented in the applied test protocol.

6.2.3 Functional Tests and Initial Operation

Every statement in this chapter is referring to the control board. Chapter 5.2 - 5.4 give a description of the control connections, signals and adjustments. Before the first operation of the drive proceed according to the following check-list:

1) Install and interconnect the drive with reference to Chapters 4 and 5

2) Check,...

.....**if your line voltage corresponds to the voltage indicated on the type-marking of the drive.**

.....**if the drive and the motor is properly grounded.**

.....if all connections are properly tightened.

.....if all Dip-switches on the control board are properly adjusted.

.....if all connections correspond to the wiring-schematic

.....the motor output phases U, V and W with an ohm-meter for possible shorts to ground. The measuring should read a resistance to ground > 500KΩ-1MΩ.

3) Switch on the line voltage

- After max 5 seconds the 7 segment display on the Displayboard with *0* and min. 1 LED and max. 4 LEDs must shine.

- Set with the Keypad PG4000 the parameters, so that they correspond to your requirements.

4) The drive can be started

Please take the corresponding parameters from the list of chapter 8.0

6.2.4 Sequence for Turn On / Turn Off

There is no sequence for turn on/turn off in general. Nevertheless we recommend the following to take care of relais' and fuses.

- Switch-on mains. After signal "ready for operation" the drive can be started.
- before disconnect from mains the drive should be stoped.
- Immediate turn on is possible while the signal "ready for operation" is active. Otherwise turn on again after10 seconds or after the supply of the electronic is off (Switched mode power supply is off, the 7 segment display will then extinguish).
- Short phase failure is not indicated ! If the buss voltage sinks below 420V, undervoltage is indicated.

7.0 Troubles

Separating protection equipment:

Internal: start at TA-U8: Prefuse F1 and F2 switched mode power supply

External: Mains fuse (look at Chapter 3.2.3 Drive data and Dimensions)

Non separating protection equipment:

To keep the device working correctly the following errors and operating states will be evaluated by the control board. They will be displayed and stored.

These errors will disable the drive.

Chapter 7.1 gives detailed information about this.

F0 Motor overtemperature

F1 Overcurrent

F2 Drive overtemperature

F3 Undervoltage

F4 Overvoltage

F5 Rippel Current

F6 Position sensor U, V and W

F7 Speed sensor A and B

F8 Elektronic

F9 Short-Circuit IGBT

E1 External error at terminals

E2 No reducing circuit

E3 Fault brake feedback

The faults can be reseted by the terminals, the serial interface (RS 485 and RS 422), with the PG 4000. A fault reset is only possible when the drive is locked, the motor stands still and all faults are disappeared.

Status indications:

0 Ready for run

1 Run (Enable)

C1 Drive temperature pre-warning

C2 Motor temperature pre-warning

C3 Max value out of range

C4 Safe Stop

C5 Drive Locked ref>0

C6 Powerstage disabled

C7 Actual speed > norming

C8 Parameterization fault

7.2 Fault Description

F0	Motor over temperature:	a) Overload motor. b) Sensor cable defective. c) Temperature control defective.
F1	Overcurrent switch-off:	a) Short-circuit power stage. b) The motor has a winding short-circuit or a ground fault.
F2	Over zemperature power stage:	The heat sink temperature of the device has max. temperature exceeded (> 80 ° C): a) The ambient temperature is too high (about 40 ° C). b) The internal fan is faulty. c) The permanent current of the device (I_{rated}) is exceeded. d) The device is wrongly mounted (see chapter 4.1.6 Arrangement in Switch Cabinet).
F3	Buss undervoltage:	The buss voltage is too low: a) Mains too low. b) A phase is missing. c) Contactor K1 is not switching or defective.
F4	Buss overvoltage:	The buss voltage is too high (>780V) : a) The device current in 4Q operation is too high for attached chopper or braking resistor. b) The 4th quadrant is operate without chopper.
F5	Ripple current:	The ripple in the buss voltage is too high: a) A phase is missing b) Buss capacitor is defective.
F6	Position sensor U, V and W:	The feedback of the motor about the rotor position is faulty: a) Cables or plugs defective. b) Position sensor, sensorboard or encoder assembly is defective. (refer to Operating & Maintenance Manual of the motor).
F7	Speedsensor:	The feedback from the speedsensor is faulty: a) A or B is not conected b) A with B is exchanged
F8	Elektronic:	
F9	Short-circuit IGBT / motor ground fault:	a) Short-circuit at output U, V, W. b) Motor power cable defective. c) Power stage (IGBT) defective.
E1	External error:	An external error can be release by a digital input. The input can supervise e.g. overcurrent release from a independent blower of the motor

7.2 Troubleshooting

7.2.1 Sensor test

The five LED indicators U, V, W, A, B (pale) indicate a proper working of the sensors from the motor.

U / V / W - Position sensors

A / B - Speed sensors

To check the hall-sensors, you have to proceed as follows:

a) Disconnect device from mains.

b) Connect control cables to motor.

c) Remove power cables of motor on terminals U, V, W on the regulator.

d) Turn on mains and control voltage and carry out after the operationally following test.

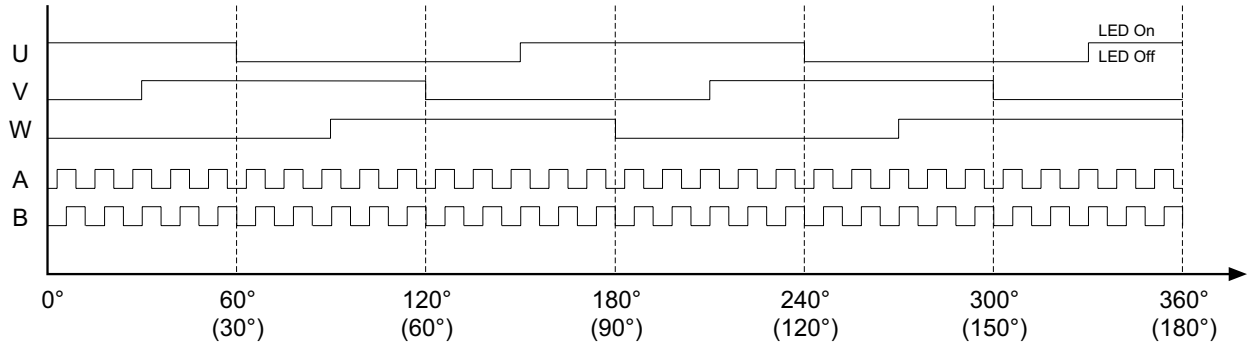
e) Turn the motor shaft slowly counterclockwise with your hand (look at output shaft). The LED indicators U, V, W, A, B start to light on and off in a definite order. (refer to diagram below).

Diagramm: light-intervals (ideal diagram)

Correspond to light-intervals diagramm, the sensors and motor control cable works properly

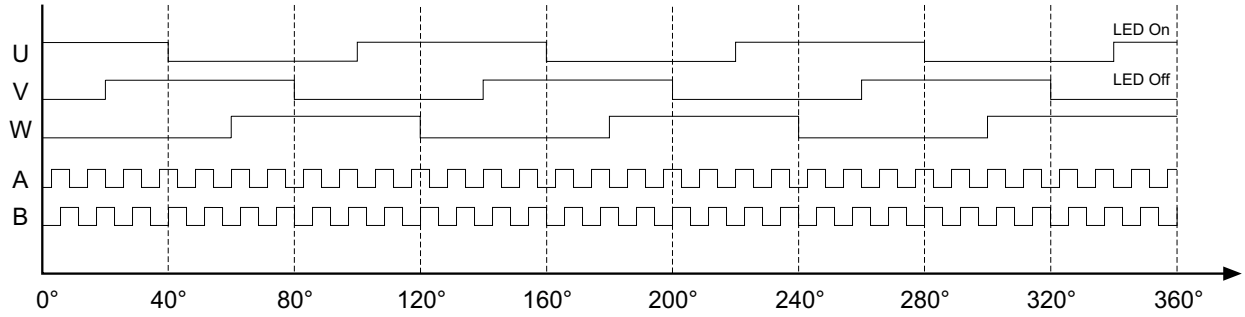
4-pole motor: BL-71...BL-160	with incremental encoder with 30 pulses/360° scale 0-360°
6-pole motor: BL-N-71...BL-N-100	with incremental encoder with 30 pulses/360° scale 0-360°
8-pole motor: BL-180...BL-315 and BL-N-112...BL-N-180	with incremental encoder with 60 pulses/360° scale 0-180°

Diagramm light-intervals 4- and 8-pole motors



1 motor revolution 4-pole motor
(1/2 motor revolution 8-pole motor)

Diagramm light-intervals 6-pole motors



1 motor revolution 6-pole motor

Appendix 1 list of Parameters

Access explanation

R and RC = Read
RW = Read / Write
RW (0) = Read, Write while staionary

01: EEPROM, SMC and EZU					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
1	Memory CMD	0000h ... 333Fh	2000h	[bits]	RW

Bit	Name	Notes
0	Store Parameters	Save parameters on the U-Drive-EEPROM
1	Load Parameters	Load parameters from the U-Drive-EEPROM
2	Store Default Parameters	Save current parameters as "standardparameter" on EEPROM
3	Load Default Parameters	Load standard parameters from EEPROM
4	Store Factory Defaults	Save current parameters as "factory setting" on EEPROM
5	Load Factory Defaults	Load parameters "factory setting" from EEPROM
6		
7		
8	Store Parameters	Save current parameters onto Smart-Card
9	Load Parameters	Load parameters from Smart-Card
10		
11		
12	Set Clock	Transfer set time to real-time clock
13	Get Clock	Read real-time clock in cycles
14		
15		

01: EEPROM, SMC and EZU					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
2	Memory STAT	0000h ... 038Fh	---h	[bits]	R

All data bits in parameter 2 are actual values and only 20-40ms is visible

Bit	Name	Notes
0	Store Ok	Parameters saved on U-Drive EEPROM
1	Load Ok	Parameters loaded from U-Drive EEPROM
2	Store Error	Error message while saving the parameters on the U-Drive EEPROM
3	Load Error	Error message while loading the parameters from the U-Drive EEPROM
4		
5		
6		
7	Set Clock Ok	Confirmation: Set time adopted
8	Get Clock Ok	Confirmation: Time read
9		
10		
11		
12		
13		
14		
15		

01: EEPROM, SMC and EZU					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
4	RTC Second	0 ... 59	---	s	R
5	RTC Minute	0 ... 59	---	min	R
6	RTC Hour	0 ... 23	---	h	R

01: EEPROM, SMC and EZU					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
7	RTC Day	1 ... 31	---	d	R
8	RTC Month	1 ... 12	---	mon	R
9	RTC Year	2007 ... 2099	---	y	R
11	N Read Errors	0 ... 65535	---		NONE
12	N Write Errors	0 ... 65535	---		NONE
14	main_state_dsp_check	0 ... 65535	---		NONE
15	init_counter_dsp_check	0 ... 1	---		NONE
16	test1_counter_dsp_check	0 ... 65535	---		NONE
17	test2_counter_dsp_check	0 ... 65535	---		NONE

01: EEPROM, SMC and EZU					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
19	Peripherals	0000h ... 00FEh	---	[bits]	R

Display of existing circuit board options

Bit	Name	Notes
0		
1	CanOpenPCBoard	
2	ProfibusPCBoard	
3	EthernetPCBoard	
4	ADIOPCBoard	
5	TaeEncoderPCBoard	
6	422EncoderPCBoard	
7	ResolverPCBoard	

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
20	Motor Type	[00] ASM_UF ... [04] SM_SL	---		RW

Selecting the motor type:

No.	Name	Notes
0	ASM U/F	Asynchronous motor operated with voltage/frequency characteristics
1	ASM Sensor	Vector controlled asynchronous motor with rotation speed sensor
2	ASM Sensorless	Vector controlled asynchronous motor without rotation speed sensor
3	Syn Sensor	Synchronous motor with rotor position and rotation speed sensor
4	Syn Sensorless	Synchronous motor without “sensorless”rotation speed sensor

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
21	Article Number (TAE)	0 ... 65535	---		RW
22	Motor Size	0 ... 65535	---		RW

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
23	Kind of Winding	[00] Star ... [01] Delta	[00] Stern		RW

Choosing the method of connection:
Not in use, always choose the star connection

Nr.	Name	
0	Star	
1	Delta	

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
24	Motor EMF	0,00 ... 1000,00	---	V/1000rpm	RW(0)
25	Motor Pole Pairs	1 ... 120	---		RW(0)
26	Motor Resistance	0,000 ... 200,000	---	Ohm	RW(0)
27	Motor Inductance	0,000 ... 600,000	---	mH	RW(0)
28	Motor Rated Current	0,0 ... 50,0	---	A	RW(0)
29	Motor Max Current	0,0 ... 50,0	---	A	RW(0)
30	Motor Rated Speed	1,0 ... 1000,0	---	rpm	RW(0)
31	Motor Max Speed electr.	1,0 ... 1000,0	---	rpm	RW
32	Motor Max Speed mech.	1,0 ... 1000,0	---	rpm	RW
33	Torque constant	0,000 ... 50,000	---	Nm/A	RW
34	DC Buss Voltage	0 ... 600	---	V	RW
35	Encoder PPR	0 ... 10000	---	ppr	RW(0)
36	Motor Accepted Type	[00] ASM UF ... [04] SM SL	---		R
37	Encoder Type	[00] Sensorlos ... [03] Resolver	---		R
38	Encoder Phase Correction	-180,0 ... 180,0	---	deg	RW

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
39	Motor adjustment	0000h ... 0003h	0000h		RW

Bit	Name	Notes
0	Start Autotuning	If Bit 0 is set, Par. 40-44 will be determined and registered within 30sec. The motor is stationary during this process. **Only for asynchronous motors!**
1	Encoder adjustment	Sufficient adjusting current (Par.49) required (the motor should be able to move), set Par. 39 Bit 1 and then enable controller. The motor will align itself, **with an undefined direction of rotation**. The angle needed for the sensor will be shown in Par. 38! Set Bit 2! Sensor angle will be frozen (Par.38). Then re-enable controller and reset B1 **afterwards**.
2	Freeze Encoder position	

02: Motor Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
40	ASM Main Inductance	0,000 ... 2500,000	---	mH	RW(0)
41	ASM Rotor Resistance	0,000 ... 200,000	---	Ohm	RW(0)
42	ASM Stator Resistance	0,000 ... 200,000	---	Ohm	RW(0)
43	ASM Leakage Inductance Rotor	0,000 ... 500,000	---	mH	RW(0)
44	ASM Leakage Inductance Stator	0,000 ... 500,000	---	mH	RW(0)
45	ASM Rated Voltage effective	0,0 ... 600,0	400	V	RW(0)
46	ASM Rated Frequency	0,000 ... 120,000	50	Hz	RW(0)
47	Cable compensation for Param 26/27	0 ... 100	100	%	RW(0)
48	ASM Brake current	0,0 ... 0,0	0	A	RW
49	Motor adj. Current	0,0 ... 0,0	0	A	RW
50	Test frequency	-50,0 ... 50,0	0	Hz	RW

03: Drive Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
60	Device Type	0 ... 65535	---		RC
61	Serial Number	0 ... 65535	---		RC
62	Rev_Firmware MCU	0.000.0 ... 5.535.0	---		RC
63	Rev_Firmware DSP	0.000.0 ... 5.535.0	---		RC
64	Rated Voltage	[200] 200-250 ... [400] 380-480	---	V	RC
65	Rated Power	0,0 ... 300,0	---	kW	RC
66	Rated Current Drv	0,0 ... 100,0	---	A	RC
67	Max Current Drv	0,0 ... 100,0	---	A	RC
68	Max Pulse Frequency	1,000 ... 12,000	6,000	kHz	RW(0)

03: Drive Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
69	Pulse Frequency Max Threshold	1,000 ... 20,000	3,000	Hz	RC
70	Pulse Frequency Hysteresis	1,000 ... 20,000	5,000	%	RC
71	Start Frequency	1,00 ... 12,00	1,80	kHz	RC
72	Increase Frequency-Ramp	0,000 ... 100,000	---	Hz	R
73	Increase Speed-Ramp	1,0 ... 1500,0	---	rpm	R
74	Switch-Off Peak Current	1,000 ... 1000,000	---	A	RC
75	Controller Speed Limit	1,0 ... 15000,0	3900,000	rpm	RC
76	Controller Current Limit	0,000 ... 1000,000	---	A	RC
80	Current Calibration	100,00 ... 3000,00	---	A	R
81	Speed Calibration	1000,00 ... 15000,00	---	rpm	R
82	Current Calibration negative	-3000,00 ... 100,00	---	A	R
83	Speed Calibration negative	-15000,00 ... 1000,00	-1500,00	rpm	R

04: Machine Data					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
90	Machine Speed Factor	0 ... 100000	---	--	RW
91	Machine Speed Divisor	1 ... 100000	---	--	RW
92	Machine Torque Factor	0 ... 100000	1	--	RW
93	Machine Torque Divisor	1 ... 100000	1	--	RW
94	Machine Tension Factor	0 ... 100000	1	--	RW
95	Machine Tension Divisor	1 ... 100000	1	--	RW
97	Machine Speed	0,000 ... 2147483647,000	---	--	R
98	Machine Torque	0,000 ... 2147483647,000	---	Nm	R
99	Machine Tension	0,000 ... 2147483647,000	---	N	R

05: Drehzahl/Strom					
ID	**Name**	**Wertebereich**	**Standardwert**	**Einheit**	**Zugriff**
100	Dig. Speed-Set	0,0 ... 1000,0	0,0	rpm	RW
101	Max Speed	0,0 ... 1000,0	100,0	rpm	RW
102	Min Speed	0,0 ... 1000,0	0,0	rpm	RW
103	Torque-Set	0,0 ... 200,0	100,0	%	RW
104	Max Current Accel (1Q)	0,00 ... Par.67	Par.66	A	RW
105	Max Current Decel (4Q)	0,00 ... Par.67	0,00	A	RW
106	Motor working load	0,0 ... 500,0	---	%	RC
107	Drive working load 1Q	0,0 ... 500,0	---	%	RC
108	Drive working load 4Q	0,0 ... 500,0	---	%	RC
109	Overload time	1,00 ... 1000,00	1,00	s	RW(0)
110	Speed Preset 1	0,0 ... 1000,0	0,0	rpm	RW
111	Speed Preset 2	0,0 ... 1000,0	0,0	rpm	RW
112	Speed Preset 3	0,0 ... 1000,0	0,0	rpm	RW
113	Speed Preset 4	0,0 ... 1000,0	0,0	rpm	RW
114	Speed Preset 5	0,0 ... 1000,0	0,0	rpm	RW
115	Speed Preset 6	0,0 ... 1000,0	0,0	rpm	RW
116	Speed Preset 7	0,0 ... 1000,0	0,0	rpm	RW

05: Speed/Current					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
117	Reference Speed Selection	[00] Preset Speed ... [08] Positioning	[03] Analog Input TR8	---	RW

The definition of the required rotational speed setpoint source can be selected as follows:
The number in brackets corresponds with the priority of the set function. (1=highest priority)
This means, for example, if "analog input" is selected and the "slave-function" is then turned on, the analog input is deactivated and the incremental slave setpoint is activated.
The current reference source is shown in Par. 567 (current source of reference rotational speed)

Nr.	(Priorität) Name	Notes
0	(1) Preset Speed	Is also valid for manual inputting of the setpoint via the U-drive Manager
1	(5)Analog Inputs	Digital/analog PCB (Option)
2		
3	(5) Analog Input TR 8	
4	(3) Master/Slave	Incremental setpoint.
5	(2) Motorpoti	
6	(4) Profibus	
7		
8	(2) Positioning	

06: Ramps					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
119	Ramp Reference Speed	0,0 ... Par.75	100,0	rpm	RW
120	Ramp 0: Accel	0,00 ... 600,00	10,00	s	RW
121	Ramp 0: Decel	0,00 ... 600,00	10,00	s	RW
122	Ramp 0: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
123	Ramp 0: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
124	Ramp 0: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
125	Ramp 0: S-Decel-End	0,00 ... 600,00	0,00	s	RW
126	Ramp 1: Accel	0,00 ... 600,00	10,00	s	RW
127	Ramp 1: Decel	0,00 ... 600,00	10,00	s	RW
128	Ramp 1: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
129	Ramp 1: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
130	Ramp 1: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
131	Ramp 1: S-Decel-End	0,00 ... 600,00	0,00	s	RW
132	Ramp 2: Accel	0,00 ... 600,00	10,00	s	RW
133	Ramp 2: Decel	0,00 ... 600,00	10,00	s	RW
134	Ramp 2: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
135	Ramp 2: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
136	Ramp 2: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
137	Ramp 2: S-Decel-End	0,00 ... 600,00	0,00	s	RW
138	Ramp 3: Accel	0,00 ... 600,00	10,00	s	RW
139	Ramp 3: Decel	0,00 ... 600,00	10,00	s	RW
140	Ramp 3: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
141	Ramp 3: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
142	Ramp 3: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
143	Ramp 3: S-Decel-End	0,00 ... 600,00	0,00	s	RW
144	Ramp 4: Accel	0,00 ... 600,00	10,00	s	RW
145	Ramp 4: Decel	0,00 ... 600,00	10,00	s	RW
146	Ramp 4: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
147	Ramp 4: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
148	Ramp 4: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
149	Ramp 4: S-Decel-End	0,00 ... 600,00	0,00	s	RW
150	Ramp 5: Accel	0,00 ... 600,00	10,00	s	RW
151	Ramp 5: Decel	0,00 ... 600,00	10,00	s	RW
152	Ramp 5: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW

06: Ramps					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
153	Ramp 5: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
154	Ramp 5: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
155	Ramp 5: S-Decel-End	0,00 ... 600,00	0,00	s	RW
156	Ramp 6: Accel	0,00 ... 600,00	10,00	s	RW
157	Ramp 6: Decel	0,00 ... 600,00	10,00	s	RW
158	Ramp 6: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
159	Ramp 6: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
160	Ramp 6: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
161	Ramp 6: S-Decel-End	0,00 ... 600,00	0,00	s	RW
162	Ramp 7: Accel	0,00 ... 600,00	10,00	s	RW
163	Ramp 7: Decel	0,00 ... 600,00	10,00	s	RW
164	Ramp 7: S-Accel-Rise	0,00 ... 600,00	0,00	s	RW
165	Ramp 7: S-Accel-Reach	0,00 ... 600,00	0,00	s	RW
166	Ramp 7: S-Decel-Start	0,00 ... 600,00	0,00	s	RW
167	Ramp 7: S-Decel-End	0,00 ... 600,00	0,00	s	RW

07: Control Dynamics					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
170	P N	0 ... 32767	---		RC
171	I N	0 ... 32767	---		RC
172	D N	0 ... 32767	---		RC
173	Dt N	0 ... 32767	---		RC
174	Speed P_Min	0,0 ... 100,0	2,0		RW
175	Speed P_Max	0,0 ... 100,0	10,0		RW
176	Speed I_Min	0,0 ... 1000,0	200,0	ms	RW
177	Speed I_Max	0,0 ... 1000,0	50,0	ms	RW
178	Speed D_Min	0,0 ... 100,0	2,0		RW
179	Speed D_Max	0,0 ... 100,0	3,0		RW
180	Speed Dt_Min	0,0 ... 1000,0	100,0	ms	RW
181	Speed Dt_Max	0,0 ... 1000,0	50,0	ms	RW
182	Speed Min_Threshold	0,0 ... 1000,0	30,0	rpm	RW
183	Speed Max_Threshold	0,0 ... 1000,0	100,0	rpm	RW
184	Speed P_Factor	1 ... 10	4		RC
185	Speed D_Factor	1 ... 10	4		RC
195	Flux Weakening : P	0,0 ... 100,0	5,0		RW
196	Flux Weakening: I	0,0 ... 1000,0	100,0	ms	RW

08: Digital I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
200	DI-Physical	0000h ... 0F3Fh	---	[bits]	R

Physical state of the digital inputs.
0=low, 1=high

Bit	Name	Notes
0	Terminal 52	
1	Terminal 53	
2	Terminal 54	
3	Terminal 55	
4	Terminal 56	
5	Terminal 57	
6		
7		
8	Terminal 2	
9	Terminal 3	
10	Terminal 4	
11	Terminal 5	
12		
13		
14		
15		

08: Digital I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
201	Master/Slave DI	0000h ... 000Fh	---	[bits]	R

Physical state of the inputs.
0=low, 1=high

Bit	Name	Notes
0	Z0 Master	Zero impulse from the Master drive
1	Z0 Slave	Zero impulse from the Slave drive
2	AI Master	A-track from the Master drive
3	BI Master	B-track from the Master drive

08: Digital I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
202	DI-Logical	0000h ... 0F3Fh	---	[bits]	R

Logical state of the inputs.
0=low, 1=high

Bit	Name	Notes
0	Terminal 52	
1	Terminal 53	
2	Terminal 54	
3	Terminal 55	
4	Terminal 56	
5	Terminal 57	
6		
7		
8	Terminal 2	
9	Terminal 3	
10	Terminal 4	
11	Terminal 5	
12		
13		
14		
15		

08: Digital I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
210	DO Set	0000h ... 031Fh	0000h	[bits]	RW

The digital outputs can be set manually. (e.g. for the purpose of checking the signal)
0=low, 1=high

Bit	Name	Notes
0	Terminal 60	
1	Terminal 61	
2	Terminal 63	
3	Terminal 64	
4	Terminal 65	
5		
6		
7		
8	Terminal 11	
9	Terminal 13	
10		
11		
12		
13		
14		
15		

08: Digital I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
211	DO Set Actual	0000h ... 031Fh	---	[bits]	R

Current state of the digital outputs.
0=low, 1=high

Bit	Name	Notes
0	Terminal 60	
1	Terminal 61	
2	Terminal 63	
3	Terminal 64	
4	Terminal 65	
5		
6		
7		
8	Terminal 11	
9	Terminal 13	
10		
11		
12		
13		
14		
15		

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
220	A-IN 8 Mode	[00] 0~10V ... [02] 4~20mA	[00] 0~10V		RW

Analog input terminal 8:
Selecting the physical input parameter. (unipolar)

Analog inputs are configured to a voltage in the factory; **when used as a current input (e.g. 4-20mA), the dip switch position of the input has to be altered!** (See wiring diagram)

Nr.	Name	Notes
0	0-10V	
1	0-20mA	
2	4-20mA	

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
221	A-IN 8 Offset	0 ... 32767	---		RW
222	A-IN 8 Gain	0,00 ... 105,00	---		RW
223	A-IN 8 Dest-Parameter	0 ... 65535	521		RW
224	A-IN 8 Act Value	0 ... 32767	---		R

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
230	A-IN 68 Mode	[00] 0~10V ... [05] 0~-10V	[00] 0~10V		RW
231	A-IN 68 Offset	0 ... 32767	---		RW
232	A-IN 68 Gain	0,00 ... 105,00	100,00		RW
233	A-IN 68 Dest-Parameter	0 ... 65535	---		RW
234	A-IN 68 Act Value	-32767 ... 32767	---		R

Analog input terminal 68-72: (Bipolar)
Same as Par.220-224 except that negative values are possible.

Nr.	Name	Notes
0	0-10V	
1	0-20mA	
2	4-20mA	
3	+10-(-10V)	
4	-10-(+10V)	
5	0-(-10V)	

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
240	A-IN 70 Mode	[00] 0~10V ... [05] 0~-10V	[00] 0~10V		RW
241	A-IN 70 Offset	0 ... 32767	---		RW
242	A-IN 70 Gain	0,00 ... 105,00	100,00		RW
243	A-IN 70 Dest-Parameter	0 ... 65535	---		RW
244	A-IN 70 Act Value	-32767 ... 32767	---		R
250	A-IN 72 Mode	[00] 0~10V ... [05] 0~-10V	[00] 0~10V		RW
251	A-IN 72 Offset	0 ... 32767	---		RW
252	A-IN 72 Gain	0,00 ... 105,00	100,00		RW
253	A-IN 72 Dest-Parameter	0 ... 65535	---		RW
254	A-IN 72 Act Value	-32767 ... 32767	---		R

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
260	A-OUT 74 Mode	[00] 0~10V ... [05] 0~-10V	[00] 0~10V		RW

Analog output terminal 74:
Selecting the physical output variable. (Bipolar)

Analog outputs are configured to a voltage in the factory; **when used as a current outputput (e.g. 4-20mA), the dip switch position of the output has to be altered!** (See wiring diagram)

Nr.	Name	Notes
0	0-10V	
1	0-20mA	
2	4-20mA	
3	+10-(-10V)	
4	-10-(+10V)	
5	0-(-10V)	

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
261	A-OUT 74 Offset	-32767 ... 32767	---		RW
262	A-OUT 74 Gain	0,00 ... 105,00	100,00		RW
263	A-OUT 74 Src-Parameter	0 ... 1200	520		RW
264	A-OUT 74 Norm Value	0 ... 32767	---		RW
265	A-OUT 74 Act Value	-32767 ... 32767	---		R

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
270	A-OUT 76 Mode	[00] 0~10V ... [05] 0~-10V	[00] 0~10V		RW
271	A-OUT 76 Offset	-32767 ... 32767	---		RW
272	A-OUT 76 Gain	0,00 ... 105,00	100,00		RW
273	A-OUT 76 Src-Parameter	0 ... 1200	522		RW
274	A-OUT 76 Norm Value	0 ... 32767	---		RW
275	A-OUT 76 Act Value	-32767 ... 32767	---		R

09: Analog I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
280	Temp22 Motor Sensor Type	[00] Klixon ... [04] PTC-Thermistor	[00] Klixon		RW
281	Temp22 Motor Offset	-320,0 ... 320,0	0,0[1)]	°Cel	RW
282	Temp22 Motor Gain	0,0 ... 200,0	100,0[1)]		RW
283	Temp22 Motor Act Value	-320,0 ... 320,0	0,0	°Cel	R
285	Temp21 Motor pre warn Sensor Type	[00] Klixon ... [04] PTC-Thermistor	[01] PT100		RW
286	Temp21 Motor pre warn Offset	-320,0 ... 320,0	0,0[1)]	°Cel	RW
287	Temp21 Motor pre warn Gain	0,0 ... 200,0	100,0[1)]		RW
288	Temp21 Motor pre warn Act Value	-320,0 ... 320,0	---	°Cel	R
290	Temp Drive Sensor Type	[00] Klixon ... [04] PTC-Thermistor	[01] PT100		RW
291	Temp Drive Offset	-320,0 ... 320,0	0,0[1)]	°Cel	RW
292	Temp Drive Gain	0,0 ... 200,0	100,0[1)]		RW
293	Temp Drive Act Value	-320,0 ... 320,0	---	°Cel	R

Zero point or. offset setting when using a PT-100 or a KTY.
Because the measurement can be corrupted by the resistivity of the cable.
(at complete delivery, adjusted by TAE)

Select motor temperature sensor for terminal 21, 22
Select drive temperature sensor

Nr.	Name	Notes
0	Klixon	Thermal switch (break contact)
1	PT-100	Thermal resistance 100Ohm at 0°C
2	KTY-83	Note the input amplification. (jumper on the encoder board, see wiring diagram)
3	KTY-84	Note the input gain. (jumper on the encoder board, see wiring diagram)
4	PTC-Thermistor	In case the resistance is higher than 150Ohm at 25°C: Take the input amplification into account. (jumper on the encoder board, see wiring diagram)

10: PLC I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
300	PLC-IO CMD	0000h ... 00F3h	0000h	[bits]	RW

Bit	Name	Notes
0	Reload CFG	Re-load the parameters / configuration
1	Clear CFG	Reset the parameters / configuration
2		
3		
4	Susp: All	Stop all functions
5	Susp: GetIN	Stop reading the inputs
6	Susp: Calc	Stop calculating the outputs
7	Susp: SetOut	Stop setting the outputs
8…15		

10: PLC I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
301	PLC-IO STAT	0000h ... 001Fh	0000h	[bits]	R

Bit	Name	Notes
0	Busy GetIN	Status: Read inputs
1	Busy Calc	Status: Calculate the outputs
2	Busy SetOut	Status: Set the outputs
3	Busy Reset	Status: Reset
4	Error:Link	Error in parameterised I/O connection (invalid parameter)
5…15		

10: PLC I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
302	Input Param ID/Bit 01	0 ... 200000	20008		RW
303	Input Param ID/Bit 02	0 ... 200000	20009		RW
304	Input Param ID/Bit 03	0 ... 200000	20010		RW
305	Input Param ID/Bit 04	0 ... 200000	20011		RW
306	Input Param ID/Bit 05	0 ... 200000	56000		RW
307	Input Param ID/Bit 06	0 ... 200000	56008		RW
308	Input Param ID/Bit 07	0 ... 200000	20000		RW
309	Input Param ID/Bit 08	0 ... 200000	20001		RW
310	Input Param ID/Bit 09	0 ... 200000	20002		RW
311	Input Param ID/Bit 10	0 ... 200000	20003		RW
312	Input Param ID/Bit 11	0 ... 200000	20004		RW
313	Input Param ID/Bit 12	0 ... 200000	20005		RW
314	Input Param ID/Bit 13	0 ... 200000	56002		RW
315	Input Param ID/Bit 14	0 ... 200000	56005		RW
316	Input Param ID/Bit 15	0 ... 200000	56010		RW
317	Input Param ID/Bit 16	0 ... 200000	0		RW
318	Input Param ID/Bit 17	0 ... 200000	0		RW
319	Input Param ID/Bit 18	0 ... 200000	0		RW
320	Input Param ID/Bit 19	0 ... 200000	0		RW
321	Input Param ID/Bit 20	0 ... 200000	0		RW
322	Input Param ID/Bit 21	0 ... 200000	0		RW
323	Input Param ID/Bit 22	0 ... 200000	0		RW
324	Input Param ID/Bit 23	0 ... 200000	0		RW
325	Input Param ID/Bit 24	0 ... 200000	0		RW
326	Input Param ID/Bit 25	0 ... 200000	0		RW
327	Input Param ID/Bit 26	0 ... 200000	0		RW
328	Input Param ID/Bit 27	0 ... 200000	0		RW
329	Input Param ID/Bit 28	0 ... 200000	0		RW
330	Input Param ID/Bit 29	0 ... 200000	0		RW
331	Input Param ID/Bit 30	0 ... 200000	0		RW
332	Input Param ID/Bit 31	0 ... 200000	0		RW
333	Input Param ID/Bit 32	0 ... 200000	0		RW
334	Output Param ID/Bit 01	0 ... 200000	55200		RW
335	Output Param ID/Bit 02	0 ... 200000	55201		RW
336	Output Param ID/Bit 03	0 ... 200000	55202		RW
337	Output Param ID/Bit 04	0 ... 200000	55210		RW
338	Output Param ID/Bit 05	0 ... 200000	21008		RW
339	Output Param ID/Bit 06	0 ... 200000	21009		RW
340	Output Param ID/Bit 07	0 ... 200000	56500		RW
341	Output Param ID/Bit 08	0 ... 200000	56501		RW
342	Output Param ID/Bit 09	0 ... 200000	55214		RW
343	Output Param ID/Bit 10	0 ... 200000	55213		RW
344	Output Param ID/Bit 11	0 ... 200000	21000		RW

10: PLC I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
345	Output Param ID/Bit 12	0 ... 200000	21001		RW
346	Output Param ID/Bit 13	0 ... 200000	21004		RW
347	Output Param ID/Bit 14	0 ... 200000	21003		RW
348	Output Param ID/Bit 15	0 ... 200000	21002		RW
349	Output Param ID/Bit 16	0 ... 200000	55213		RW
350	Output Param ID/Bit 17	0 ... 200000	0		RW
351	Output Param ID/Bit 18	0 ... 200000	0		RW
352	Output Param ID/Bit 19	0 ... 200000	0		RW
353	Output Param ID/Bit 20	0 ... 200000	0		RW
354	Output Param ID/Bit 21	0 ... 200000	0		RW
355	Output Param ID/Bit 22	0 ... 200000	0		RW
356	Output Param ID/Bit 23	0 ... 200000	0		RW
357	Output Param ID/Bit 24	0 ... 200000	0		RW
358	Output Param ID/Bit 25	0 ... 200000	0		RW
359	Output Param ID/Bit 26	0 ... 200000	0		RW
360	Output Param ID/Bit 27	0 ... 200000	0		RW
361	Output Param ID/Bit 28	0 ... 200000	0		RW
362	Output Param ID/Bit 29	0 ... 200000	0		RW
363	Output Param ID/Bit 30	0 ... 200000	0		RW
364	Output Param ID/Bit 31	0 ... 200000	0		RW
365	Output Param ID/Bit 32	0 ... 200000	0		RW
366	Conn Out 01	00000000h ... FFFFFFFFh	00000001h		RW
367	Conn Out 02	00000000h ... FFFFFFFFh	00000006h		RW
368	Conn Out 03	00000000h ... FFFFFFFFh	00000004h		RW
369	Conn Out 04	00000000h ... FFFFFFFFh	00000008h		RW
370	Conn Out 05	00000000h ... FFFFFFFFh	00000010h		RW
371	Conn Out 06	00000000h ... FFFFFFFFh	00000020h		RW
372	Conn Out 07	00000000h ... FFFFFFFFh	00000040h		RW
373	Conn Out 08	00000000h ... FFFFFFFFh	00000080h		RW
374	Conn Out 09	00000000h ... FFFFFFFFh	00000100h		RW
375	Conn Out 10	00000000h ... FFFFFFFFh	00000200h		RW
376	Conn Out 11	00000000h ... FFFFFFFFh	00000010h		RW
377	Conn Out 12	00000000h ... FFFFFFFFh	00000020h		RW
378	Conn Out 13	00000000h ... FFFFFFFFh	00001000h		RW
379	Conn Out 14	00000000h ... FFFFFFFFh	00002000h		RW
380	Conn Out 15	00000000h ... FFFFFFFFh	00004000h		RW
381	Conn Out 16	00000000h ... FFFFFFFFh	00000400h		RW
382	Conn Out 17	00000000h ... FFFFFFFFh	00000000h		RW
383	Conn Out 18	00000000h ... FFFFFFFFh	00000000h		RW
384	Conn Out 19	00000000h ... FFFFFFFFh	00000000h		RW
385	Conn Out 20	00000000h ... FFFFFFFFh	00000000h		RW
386	Conn Out 21	00000000h ... FFFFFFFFh	00000000h		RW
387	Conn Out 22	00000000h ... FFFFFFFFh	00000000h		RW
388	Conn Out 23	00000000h ... FFFFFFFFh	00000000h		RW
389	Conn Out 24	00000000h ... FFFFFFFFh	00000000h		RW
390	Conn Out 25	00000000h ... FFFFFFFFh	00000000h		RW
391	Conn Out 26	00000000h ... FFFFFFFFh	00000000h		RW
392	Conn Out 27	00000000h ... FFFFFFFFh	00000000h		RW
393	Conn Out 28	00000000h ... FFFFFFFFh	00000000h		RW
394	Conn Out 29	00000000h ... FFFFFFFFh	00000000h		RW
395	Conn Out 30	00000000h ... FFFFFFFFh	00000000h		RW
396	Conn Out 31	00000000h ... FFFFFFFFh	00000000h		RW
397	Conn Out 32	00000000h ... FFFFFFFFh	00000000h		RW
400	IN Polarity	00000000h ... FFFFFFFFh	FFFFFFFFh		RW
401	IN Set/Reset	00000000h ... FFFFFFFFh	FFFFFFFFh		RW
402	IN Edge	00000000h ... FFFFFFFFh	00000000h		RW

10: PLC I/O					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
403	OUT Polarity	00000000h ... FFFFFFFFh	FFFFFFFFh		RW
410	IO N_Inputs	0 ... 32	---		R
411	IO N_Outputs	0 ... 32	---		R
412	Valid Input	00000000h ... FFFFFFFFh	---		R
413	Valid Output	00000000h ... FFFFFFFFh	---		R
414	IO_ActIN	00000000h ... FFFFFFFFh	---		R
415	IO_ActOUT	00000000h ... FFFFFFFFh	---		R

11: Monitoring-Limits					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
500	Drive Over-Temp Limit	0,0 ... 85,0	80,0	°Cel	RW
501	Drive Over-Voltage Limit	0 ... 800	780/390	V	R
502	Drive Under-Voltage Limit	0 ... 800	360/205	V	R
503	Drive Over-Current Limit	0,000 ... Par.74	---	A	R
504	Drive Brake-Chopper Off Voltage	1 ... 800	740/365	V	R
505	Drive Brake-Chopper On Voltage	1 ... 800	750/375	V	R
506	Motor Max Speed electr.	0,0 ... Par.75	---	rpm	R
507	Motor Max Speed mech.	0,0 ... Par.75	---	rpm	R
508	Motor Over-Temp Limit	0,0 ... 250,0	---	°Cel	RW
509	Motor Warn Temp Limit	0,0 ... 250,0	---	°Cel	RW
510	Speed detect Limit	0,0 ... Par.75	300,0	rpm	RW
511	Current detect Limit	0,00 ... Par.104	Par.28	A	RW
512	Delayed Message Current limit reached	0,0 ... 1000,0	5,0	s	RW
513	Drive Warn Temp Limit	0,0 ... 80,0	75,0	°Cel	RW
514	Under-Voltage delay time	0 ... 60000	---	ms	RW

12: Actual Values					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
520	Act Speed	-1000,0 ... 1000,0	---	rpm	R
521	Ref Speed	-1000,0 ... 1000,0	---	rpm	R
522	Actual Current	0,00 ... 0,00	---	A	R
523	Motor Torque	0,00 ... 2147483647,00	---	Nm	R
524	Buss Voltage	0 ... 800	---	V	R
525	Motor Temp. Terminal 22	-320,0 ... 320,0	---	°Cel	R
526	Motor Pre.-Temp. Terminal 21	-320,0 ... 320,0	---	°Cel	R
527	Drive Temp.	-267,0 ... 267,0	---	°Cel	R
528	Actual Lead Speed	-1000,0 ... 1000,0	---	rpm	R
529	Machine Speed	0,000 ... 2147483647,000	---	--	R
530	Act Pulse Frequency	1,00 ... 20,00	---	kHz	R
531	Motor Current U	-100,00 ... 100,00	---	A	R
532	Motor Current V	-100,00 ... 100,00	---	A	R
533	Motor Current W	-100,00 ... 100,00	---	A	R
534	Brake Chopper Volt	0,0 ... 800,0	---	V	R
535	n-Controller Ref Speed	-1000,0 ... 1000,0	---	rpm	R
536	n-Controller Act Speed	-1000,0 ... 1000,0	---	rpm	R
537	n-Controller Deviation	-1000,0 ... 1000,0	---	rpm	R
538	n-Controller Output	-100,00 ... 100,00	---	A	R
539	Actual Current unfiltered	0,00 ... 0,00	---	A	R
540	ASM minimum flux	-32767 ... 32767	---		R
541	ASM rated flux	-32767 ... 32767	---		R
542	Flux Weakening	0,00 ... 0,00	---	A	R
546	Drive Working minutes	0 ... 59	---	min	R
547	Drive Working hours	0 ... 2147483647	---	h	R
548	Drive Operating minutes	0 ... 59	---	min	R
549	Drive Operating hours	0 ... 2147483647	---	h	R

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
550	DrvCtrl Act	0000h ... FFFFh	0000h	[bits]	R

Actual status of control word 1

Control word 1 can be controlled by four different sources (field bus, digital inputs, PG4000 or U-drive Manager)!

The bits for the four control words (Par.551 to 554) are incorporated in Control Word 1 or linked (1=dominant).

Bit	Name	Notes
0	Reset	Only possible when the drive is **not** started!
1	Running	Start the drive.
2	Direction CCW	**Motor** turning counter-clockwise
3	Hold	Drive braking with current limit after rotational speed of Nil
4	Preset Speed 1	Fixed speeds 3, 5, 6 and 7 are controlled using binary code from the bit combinations in Bits 4-6. Example: fixed speed 5 = Bit 4 (fixed speed 1) + Bit 6 (fixed speed 4) **See also Par.110-116 and 565**
5	Preset Speed 2	
6	Preset Speed 4	
7	Ramp 1	Ramps 3, 5, 6 and 7 are controlled using binary codes from the bit combinations in Bits 7-9. Example: ramp 3 = Bit 7 (ramp 1) + Bit 8 (ramp 2) **If no bit is triggered then ramp 0 is active! See also Par.566 und parameter group 6**
8	Ramp 2	
9	Ramp 4	
10	Slave Function	Incremental setpoint
11	Change Slave direction	Invert direction of rotation for Slave operation
12	SetDisableController	e.g.: for repair switch function
13	Digital Motorpoti	Switch on motor potentiometer
14	Motorpoti Up	
15	Motorpoti Down	

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
551	DrvCtrl FBus	0000h ... FFFFh	0000h	[bits]	R
552	DrvCtrl D-In	0000h ... FFFFh	0000h	[bits]	R
553	DrvCtrl Kpd/PC	0000h ... FFFFh	0000h	[bits]	RW
554	DrvCtrl Command	0000h ... FFFFh	0000h	[bits]	RW

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
555	DrvCtrl Flags Act	0000h ... FFFFh	0000h	[bits]	R

Actual status of control word 2.
Control word 2 can be controlled by two different sources (field bus, digital inputs, PG4000 or U-drive Manager)!
The bits for both control words (Par.556 to 557) are incorporated in control word 2 or linked (1=dominant).

Bit	Name	Notes
0	LeadedDeceleration	At stop, the drive delays with the active ramp
1	WaitWithHoldUsingBrake	After a controlled run down (the fall time will be bridged by the holding brake)
2	CurLimitAfterOverloadTimeMotCur	Only allowed for the amount of time set in Par.109.
3	CurLimitAfterOverloadTimeDrvCur	Only allowed for the amount of time set in Par.109.
4	SuppressF6	Suppress error message rotor position sensor for fault diagnosis.
5	SuppressF7	Suppress error message rotation sensor for fault diagnosis
6	InhibiteCW	
7	InhibiteCCW	
8	DisDrvByRefAndActSpEquZero	Controller interlock occurs when setpoint and actual values = 0
9	EnDrvByRefSpeedEquZero	Controller cannot be started when rotation speed setpoint > 0
10	Torquelimit	Torque setpoint can be specified via Par.103
11	External fault shutdown	controller portion takes place when this bit is set
12	NotCatchActSpeed	After switching the drive off and back on again, drive will **not** be intercepted at current rotational speed. The drive will coast to a stop and then starts again.
13	Reserved	
14	FieldWeakeningActive	Will be enabled
15	FeedbackPhaseCorrection	Enables the phase correction (Par.38) of the electronic commutation. **Should only be adjusted if controller is interlocked, otherwise current overloads may occur.**

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
556	DrvCtrl Flags Cfg	0000h ... FFFFh	0000h	[bits]	RW
557	DrvCtrl Flags Dyn	0000h ... FFFFh	0000h	[bits]	RW

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
560	General Stat	0000h ... FFFFh	---	[bits]	R

Displays the most important operation conditions for the drive.

Bit	Name	Notes
0	Ready	
1	Running	
2	Speed > 0	
3	Speed > X	Also see Par.510
4	Powerstage active	
5	I-Limit reached	Also see Par.512
6	I > X	Also see Par.511
7	Generator Mode	
8	Collective Error	
9	Value out of range	
10	Set-Value reached	
11	n-set/n-act in tolerance range	Tolerance = 1% of the max. rotational speed (Par.101)
12	Fieldbus controlling	
13	Current > Motor Rated Current	
14	Field Weakening active	
15	Asynch Control active	Asynchronous motor active

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
561	Motor Stat	0000h ... 000Fh	---	[bits]	R

Display of auto-tuning status (ASM)

Bit	Name	Notes
0	Auto tuning started	
1	Auto tuning and run	
2	Auto tuning finshed	

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
562	Drive Stat	0000h ... FFFEh	---	[bits]	R
565	Spd Prst Sel	[00] --- ... [07] Spd Preset 7	[00] ---	[bits]	RW
566	Ramp Sel	[00] Ramp 0 ... [07] Ramp 7	[00] Rampe 0	[bits]	RW

13: Command/Status Words					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
567	Selected Reference Speed Source	[00] Preset Speed ...[08] Positioning	---	---	R

Display of active setpoint reference sources

Nr.	Name	Notes
0	Preset Speed	
1		
2		
3	Analog input Terminal 8	
4	Master/Slave	Incremental
5	Motorpoti	
6	Fieldbus	
7		
8	Positioning	

14: Error-Status					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
570	Control Messages	0000h ... 00DAh	---	[bits]	R

Display of prewarning and conditions which cause the drive to malfunction.

Bit	Name	Notes
0	Drive Temp Prew C1	Controller temperature is close to shut-off! (See Par.513)
1	Motor Temp Prew C2	Motor temperature is close to shut-off! (See Par.509)
2	Value Out Of Range C3	Value outside the permissible value range
3	Emergency Stop C4	No voltage at terminals L+/L- (24VDC)
4	Enable Drive by Ref. Speed Equal Zero C5	Drive can only start when the setpoint = 0! **(See Par.555 Bit 9)**
5	Drive disabled C6	e.g.: repair switch is open
6	Actual Speed GT Speed Calibration C7	e.g.: motor is overshooting
7	Parametring error C8	Physical motor parameters for this type of controller are outside of possible range!
8	Direction inhibited C9	Selected direction of rotation is blocked. **(See Par.555 Bit 6 or 7)**

14: Error-Status					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
571	Failures	0000h ... FFFFh	---	[bits]	R

Error messages which cause the drive to malfunction.

Bit	Name	Notes
0	Overcurrent F1	Short circuit – Incorrect end stage, motor or motor cable or physical data of the motor! (See Par.74)
1	IGBT F9	Defective end stage or short circuit or earth fault at motor connection!
2	Ripple Current F5	Defective intermediate circuit electrolytic capacitor, missing network phase oder brief mains voltage failure!
3	Overvoltage F4	Intermediate circuit voltage too high: brake resistance highly resistive or generating operation without braking unit! (See Par.501)
4	Undervoltage F3	Intermediate circuit voltage too low, failure in mains voltage, missing network phase or defective or non-functioning internal charging relay! (See Par.502)
5	Drive Over Temperature F2	Controller permanently overloaded: ambient temperature too high, non-functioning switching cabinet or equipment ventilation or equipment improperly installed in switching cabinet (heat accumulation). (See Par.500)
6	Drive Temperature Pre-Warning C1	Controller temperature is close to shut-off! (See Par.513)
7	Position Sensor F6	Defective rotor position sensor in motor or defective sensor cable, incorrect connection, or motor or sensor cable incorrectly shielded!
8	Speed Sensor F7	Defective rotation speed sensor in motor or defective sensor cable, incorrect connection, or motor or sensor cable incorrectly shielded or mix-up in Tracks A and B!
9	Electronic Failure F8	Internal processor is not working!
10	Drive disabled C6	e.g.: repair switch is open
11	Emergency Stop C4	No voltage at terminals L+/L- (24VDC)
12	Motor Over Temperature F0	Motor permanently overloaded, defective temperature probe or probe wire!
13	Motor Temperature Pre-Warning C2	Motor temperature is close to shut-off! (See Par.509)
14	Brake FeedBack Signal Error E3	Feedback: Incorrect electromechanical brake! (See parameter group 20)
15	External Error E1	Error caused externally! (e.g.: overload relay from external motor fan)

14: Error-Status					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
572	DSP_Errors	0000h ... FFFFh	0000h		R
573	StatusParaError	0000h ... FFFFh	0000h	[bits]	R
574	StatusParaError2	0000h ... FFFFh	0000h	[bits]	R
575	StatusParaError3	0000h ... 1FFFh	0000h	[bits]	R
576	StatusParaError4	0000h ... 001Fh	0000h	[bits]	R

15: Kommunikation					
ID	**Name**	**Wertebereich**	**Standard-Wert**	**Einheit**	**Zugriff**
600	Device ID	0 ... 126	---		RW
601	SSC-Baudrate	0 ... 65535	38400		RW

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
610	FBus Type	[00] None ... [08] EtherNetPCBoard	---		R

Display of the installed Field Bus option.

Nr.	Name	Note
0	None	
2	CANopen	
4	Profibus	
8	Ethernet	

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
611	Profibus Command word	0000h ... 07FFh	---	[bits]	R

Display of Profibus control word.

Bit	Name	Note	
0	BusCmON	0=Stop	
1	BusCmN_AUS2	Not supported, must be set to 1	
2	BusCmN_AUS3	Not supported, must be set to 1	
3	BusCmEnableOperation	0=In descending order, as programmed	
4	BusCmNoQuickStop_HLG	0=Set ramp generator exit to 0	
5	BusCmEnable_N_HLG2	Not supported, must be set to 1	
6	BusCmEnableSetPoint	0= Set ramp generator input to 0	
7	BusCmResetError	Reset fault	
8	Inching 1	Fixed rotational speed 1	If both are 1 = Fixed rotational speed 3
9	Inching 2	Fixed rotational speed 2	
10	Controled by Profibus		
11			
12			
13			
14			
15			

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
612	Profibus Status word	0000h ... 07FFh	---	[bits]	R

Display of Profibus status word.

Bit	Name	Note
0	BusStReadyToSwitchON	Electronic voltage available
1	BusStReadyToSwitchOperate	Intermediate circuit loaded
2	BusStDriveEnabled	End stage enabled
3	BusStError	0 = No fault
4	BusStNo_AUS2	Not supported
5	BusStNo_AUS3	Not supported
6	BusStStartUpLockOut	End stage blocked C4 or C6
7	BusStWarning	0 = No warning
8	BusStSpeedToleranceRange	Within tolerance range
9	BusStControlledThroughProfibus	Profibus active
10	BusStnReached	0 = Actual rotational speed different from setpoint speed
11		
12		
13		
14		
15		

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
613	Profibus configuration	0000h ... FFFFh	---	[bits]	R

Display of current baudrate and PPO type.

Bit	Name	Note
0	12 MBaud	
1	6 MBaud	
2	3 MBaud	
3	1,5 MBaud	
4	500 KBaud	
5	187,5 KBaud	
6	93,75 KBaud	
7	45,45 KBaud	
8	19,2 KBaud	
9	9,6 KBaud	
10	PPO-Overrun	PPO content larger than selected PPO type
11	PPO-Typ1	
12	PPO-Typ2	
13	PPO-Typ3	
14	PPO-Typ4	
15	PPO-Typ5	

Baudrate and PPO types will be transmitted by Profibus master on initialisation!

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
618	FBus Speed Decimals	-1 ... 3	0		RW
619	FBus Current Decimals	-1 ... 3	1		RW
620	Tx PDO 1	-1 ... 3000	0		RW
621	Tx PDO 2	-1 ... 3000	0		RW
622	Tx PDO 3	-1 ... 3000	0		RW

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
623	Tx PDO 4	-1 ... 3000	0		RW
624	Tx PDO 5	-1 ... 3000	0		RW
625	Tx PDO 6	-1 ... 3000	0		RW
626	Tx PDO 7	-1 ... 3000	0		RW
627	Tx PDO 8	-1 ... 3000	0		RW
630	Rx PDO 1	-1 ... 3000	0		RW
631	Rx PDO 2	-1 ... 3000	0		RW
632	Rx PDO 3	-1 ... 3000	0		RW
633	Rx PDO 4	-1 ... 3000	0		RW
634	Rx PDO 5	-1 ... 3000	0		RW
635	Rx PDO 6	-1 ... 3000	0		RW
636	Rx PDO 7	-1 ... 3000	0		RW
637	Rx PDO 8	-1 ... 3000	0		RW

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
640	CO-Baudrate	[00] BAUD_1000 ... [08] BAUD_10	[02] BAUD_500		RW

Selecting the baudrate when using **CANopen**.

Nr.	Name	Bemerkung
0	1000 KBaud	
1	800 KBaud	
2	500 KBaud	
3	250 KBaud	
4	125 KBaud	
5	100 KBaud	
6	50 KBaud	
7	20 KBaud	
8	10 KBaud	

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
641	CO-Control	0000h ... F3FFh	0000h	[bits]	RW

Various functions in the CanOpen module can be activated within the control word.

Bit	Designation	Function/Meaning
0	Reset	Set baudrat, reload PDO mapping, delete Bus-Off Flag
1	SetBaudrate	Baudrate in [640] is adopted
2	StopCan	
3	StartCan	
4	SetHeartbeat	Heartbeat-Time in [643] is adopted
5	Reload PDO Mapping	Mapping entries in [620 … 627, 630 … 637] are adopted
6	SetNodeState	Manually set NodeState (only for test purposes!)
7	CustomCobWrite	Write value from [649] into object directory (see below)
8	Reset PDO-Parameters	
9	Reload PDO-Parameters	
10		
11		
12	TxPDO 1	Send PDO 1
13	TxPDO 2	Send PDO 2
14	TxPDO 3	Send PDO 3
15	TxPDO 4	Send PDO 4

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
642	CO-Driver State	0000h ... 007Fh	0000h	[bits]	R

Current status of the CANopen module

Bit	Designation	Function/Meaning
0	CANFLAG_INIT	CanModul in the Initialisation phase
1	CANFLAG_ACTIVE	CanModul is active
2	CANFLAG_BUSOFF	CanModul in Bus-Off error status
3	CANFLAG_PASSIVE	CanModul in error passive status
4	CANFLAG_OVERFLOW	CanModul error – telegram overflow
5	CANFLAG_TXBUFFER_OVERFLOW	CanModul: Send buffer overflow
6	CANFLAG_RXBUFFER_OVERFLOW	CanModul: Receive buffer overflow

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
643	CO Heartbeat Set	0 ... 30000	1000	ms	RW
644	CO Heartbeat Act	0 ... 30000	1000	ms	R

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
645	CO NodeState Set	[00] UNKNOWN ... [129] RESET_COMM	[00] UNKNOWN		RW

Node-State: manual selection. (Only for test purposes)

Value	Designation	Function/Meaning
0	UNKNOWN	Deactivate Can
1	CO_INITIALISING	Initialise Can
4	CO_STOPPED	Stop Can
5	CO_OPERATIONAL	Activate Operational Mode (SDO + PDO)
127	CO_PRE_OP	Activate Pre-Operational Mode (SDO only)
128	CO_RESET_APP	Activate Reset Application
129	CO_RESET_COM	Activate Reset Communication

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
646	CO NodeState Act	[00] UNKNOWN ... [129] RESET_COMM	[00] UNKNOWN		R

Node-State: Current value

Value	Designation	Function/Meaning
0	UNKNOWN	Can is not activated
1	CO_INITIALISING	Can is being initialised
4	CO_STOPPED	Can stopped
5	CO_OPERATIONAL	Operational Mode (SDO + PDO)
127	CO_PRE_OP	Pre-Operational Mode (SDO only)
128	CO_RESET_APP	Reset Application is active
129	CO_RESET_COM	Reset Communication is active
0x19	PL_INITIALISING	
0x29	PL_RST_APP	
0x39	PL_RST_COM	
0x79	PL_RST_CFG	
0x1c	PL_NOT_ACTIVE	
0x1d	PL_PRE_OP_1	
0x5d	PL_PRE_OP_2	
0x6d	PL_RDY_OP	
0xfd	PL_OPERATIONAL	
0x4d	PL_STOPPED	
0x01e	PL_BASIC_ETH	
0xff	PL_UNKNOWN	

15: Communication					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
647	CO ObjIndex	0 ... 32767	0		RW
648	CO SubIdx	0 ... 127	0		RW
649	CO Value Set	0 ... 4294967295	0		RW
650	CO Value Read	0 ... 4294967295	0		R
651	CO ValueSize	0 ... 4294967295	0		R
652	CO ValAddress	0 ... 4294967295	0		R
653	CO Val#Test	0 ... 4294967295	0		R
654	TAE_CoBuffer_Id	0 ... 1200	0		RW
655	TAE_CoBufferValue	0 ... 4294967295	0		R

16: Master/Slave					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
670	MaSlv Ctrl	0000h ... FFFFh	0000h	[bits]	RW

Controlling the Master/Slave operating modes

Bit	Name	Note
0	Slave Function	Activate
1	Master with single track On Tr. B	Only functions with connection with input Track B, Connection Track A is used to define direction of rotation.
2	Exchange Master Signals A-B	Slave's direction of rotation is inverted and Par.680 Master Impulse Meter changes direction
3	Synchron Angle Not Speed	Angle deviations are readjusted taking the preset ratios into consideration
4	Slave Angle Correction	Enables angle correction (Par.674)
5	Change Slave Direction	Slave drive switches direction of rotation
6	Limit Master Pulse By ILimit	Impulse differences during current threshold are **not** readjusted!
7	Limit Master Pulse By Maxspeed	Impulse differences during maximum rotational speed are **not** readjusted!
8	Exchange Slave Signals A-B	To adapt the AB tracks of the motor.
9	Reset Counter	Par.680/681 (Current Master or Slave impulses) are reset.
10	Enable Sync On Motor Shaft (Z0)	2 machines are angularly synchronised with the motor shafts using 2 zero impulses
11	Enable Sync with Initiators (2Ini)	2 machines are randomly angularly sunchronised using 2 additional standard initiators.
12	Enable Electromagnetic Coupling (2 Ini)	Load will be switched on via electromagnetic coupling
13	Measure Master/Slave ratio (2 Ini)	Ascertains impulse ratio between Master and Slave according to gears.
14	Measure Master/Slave Impuls relation (2 Ini)	The Master and Slave ratio will be defined according to the impulse ratio
15	Get absolute Position of Slave (Z0)	Registers the offset of the slave motor to the master motor

16: Master/Slave					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
671	MaSlv Stat	0000h ... FFFFh	0000h	[bits]	R

Status of the Master/Slave – operating modes

Bit	Name	Note
0	Slave Function	Active
1	Master with single track On Tr. B	Only functions with connection with input Track B, Connection Track A is used to define direction of rotation.
2	Exchange Master Signals A-B	Slave's direction of rotation is inverted and Par.680 Master Impulse Meter changes direction
3	Synchron Angle Not Speed	Angle deviations are readjusted taking the preset ratios into consideration
4	Slave Angle Correction	Enables angle correction (Par.674)
5	Change Slave Direction	Slave drive switches direction of rotation
6	Limit Master Pulse By ILimit	Impulse differences during current threshold are **not** readjusted!
7	Limit Master Pulse By Maxspeed	Impulse differences during maximum rotational speed are **not** readjusted!
8	Exchange Slave Signals A-B	To adapt the AB tracks of the motor.
9	Reset Counter	Par.680/681 (Current Master or Slave impulses) are reset.
10	Enable Sync On Motor Shaft (Z0)	2 machines are angularly synchronised with the motor shafts using 2 zero impulses
11	Enable Sync with Initiators (2Ini)	2 machines are randomly angularly sunchronised using 2 additional standard initiators.
12	Enable Electromagnetic Coupling (2 Ini)	Load will be switched on via electromagnetic coupling
13	Elec Magn Coupling ON (2 Ini)	Coupling active
14	Position OK (Z0)	Angle shifting located inside position window
15		

16: Master/Slave					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
672	Ratio multiplier n(master) * Value	0 ... 64000	1000		RW
673	Ratio divisor n(master) / Value	0 ... 64000	1000		RW
674	Angle correction	-32767 ... 32767	0	°deg	RW
675	Encoder PPR Master	0 ... 32367	0	ppr	RW
676	P-amplification slave (static)	0 ... 100	50		RW
677	P-amplification acceleration	0 ... 100	5		RW
678	Angle displacement	-2147483647 ... 2147483647	0	Imp	RC
679	Angle displacement reaction time	0 ... 60000	1	ms	RW
680	Actual Impulse Master	-2147483647 ... 2147483647	---	Imp	R
681	Actual Impulse Slave	-2147483647 ... 2147483647	---	Imp	R
682	Slave Speed Calibration	0 ... 32767	---	rpm	R
683	Leading Speed	-1000,0 ... 1000,0	---	rpm	R
684	Position window (Ini)	1 ... 1000	10	Imp	RW
685	Position maximum speed (Ini)	0,0 ... 1000,0	100,0	rpm	RW
686	P-amplification positioning (Ini)	0 ... 100	0		RW
687	EM-Coupling delay (Ini)	0 ... 60000	0	Imp	RW
688	Master-Slave relation factor (Ini/Z0)	1,00 ... 600,00	1,00		RW

17: Motorpotentiometer					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
690	Digital Motorpoti Selection	0000h ... 0007h	0000h	[bits]	RW

Selection of the basic motor potentiometer functions.

Bit	Name	Note
0	Motorpoti	Activate motor potentiometer
1	Save Motorpoti value by Power down	When mains voltage OFF
2	Start Motorpoti by Zero	When motor potentiometer ON, value is always zero

17: Motorpotentiometer					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
691	Digital Motorpoti Command	0000h ... 0003h	0000h	[bits]	RW

To control the motor potentiometer.

Bit	Name	Note
0	Motorpoti UP	With active ramp
1	Motorpoti DOWN	With active ramp

17: Motorpotentiometer					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
692	Digital Motorpoti Status	0000h ... 0003h	---	[bits]	R

To display the motor potentiometer status.

Bit	Name	Note
0	Motorpoti	Motor potentiometer ON
1	Motorpoti UP	With active ramp
2	Motorpoti DOWN	With active ramp
3	Save Motorpoti value by Power down	When mains voltage OFF
4	Start Motorpoti by Zero	When motor potentiometer ON, value is always zero

17: Motorpotentiometer					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
693	Motorpoti Wert	0,0 ... Par.101	0,0	rpm	R
694	Motorpoti Grenze oben	0,0 ... 100,0	100,0	%	RW
695	Motorpoti Grenze unten	0,0 ... 100,0	0,0	%	RW

18: Positioning					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
840	Positioning Control	0000h ... FFFFh	0000h	[bits]	RW

Controlling various positioning tasks.

Bit	Name	Note
0	Enable positioning	
1	Definie Pos Direction	The preset Forwards direction of rotation from Par. 553 Bit 2 is read using the Pulse command.
2	Goto First Position	Drive travels on into position set in Par.847
3	Goto Start Position	Drives moves back into the Start position.
4	Select Break Curve Linear	Drive brakes linearly in the target position
5	Select Break Curve Elliptic	Drive brakes in the target position in an S-curve shape.
6	Reset Position	Position meter is reset to zero.
7	Positions Correction near PosWindow	Deviation due to drag error – position screen is correction.
8	Correct Positioning Error	Drive is only positioned in one direction; with every Reset, drive travels the same route if Bit 2 is statically pending.
9	Enable Resolution Encoder Pulses x 4	Encoder impulses are evaluated four times
10	Cyclic positioning	Drive loops between 2 positions.
11		
12		
13	Change Counter Direction	Position meter runs in opposite direction.
14		
15		

18: Positioning					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
841	Positioning Status	0000h ... FFFFh	---	[bits]	R

Displays the current positioning function.

Bit	Name	Note
0	Positioning enabled	
1	Definie Pos Direction	The Pulse command is used to read the set Forward direction of rotation from Par.553 Bit 2.
2	Goto First Position	Drive travels into the preset position (Par.847)
3	Goto Start Position	Drive returns to Start position.
4		
5		
6	Reset Position	Position meter is reset to zero.
7		
8	Position not OK	Drive is located outside the position window.
9		
10	Cyclic positioning	Drive loops between 2 positions.
11	Position OK	Drive located within the position window.
12		
13		
14	New Ref Position	A change in the reference position has occurred during operation
15	New Ref PosSTActPos	The reference position was reduced during operation

18: Positioning					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
842	Maximum reference position	0 ... 2147483647	0	Imp	RW
843	Position window	1 ... 1000	10	Imp	RW
844	Position maximum speed	0,0 ... Par.75	100,0	rpm	RW
845	P-amplification for positioning	0 ... 100	80		RW
846	Speed Min_Threshold	0,0 ... Par.75	100,0	rpm	RW

18: Positioning					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
847	Reference position	0 ... 2147483647	0	Imp	RW
848	Adjust brake curve time	0,0 ... 600,0	0,2	s	RW
849	Actual reference position	-2147483647 ... 2147483647	---	Imp	R
850	Actual position	-2147483647 ... 2147483647	---	Imp	R
851	Actual position difference	-2147483647 ... 2147483647	---	Imp	R
852	P-amplification near pos. window	0 ... 100	0		RW
853	Zero reference position	-2147483647 ... 2147483647	0	Imp	RW

20: Brake Systems					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
860	Brake System Control	0000h ... 0003h	0000h		RW

Bit	Name	Note
0	Enable Brake System	Activated control of brake by drive. **Caution! Digital output Terminal 13 is reserved for addressing the brake. Other interlinks to Terminal 13 (Par.210 Bit 9) have no function.**
1	Brake System with Feedback	Acknowledge contact integrated in controls

20: Brake Systems					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
861	Brake System Status	0000h ... 001Fh	---		R

Bit	Name	Note
0	Brake System Enabled	Braking system is active
1	Brake System with Feedback	Brake equipped with Feedback contact
2	Brake Feedback Signal	Pending (Brake bled). Feedback must be linked with this Bit via the digital input and SPC function.
3	Brake loosened	Brake is basically addressed with this Bit via relay output terminal 13. **Other interlinks to Terminal 13 (Par.210 Bit 9) have no function.**
4	Brake Feedback Signal Error	Addressing of brake and feedback do not match! **Drive is set to Holding function until regulator is blocked and Reset has been performed!**
5	Brake leaded Decleration	Controlled run-down is activated automatically

20: Brake Systems					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
862	Brake Delay start time	0 ... 60000	0	ms	RW
863	Brake Delay stop time	0 ... 60000	0	ms	RW

21: Keypad PG4000					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
700	menu_control	0000h ... 0011h	0000h		RW

Bit	Name	Function
0	Inhibit Err-/Warn Messages	Disable error and warning messages on the Keypad
1…3		
4	Reset GetText	Reset text buffer

21: Keypad PG4000					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
701	pg4000_timeout	1 ... 5000	100	ms	RW
702	keypad_delay_init	1 ... 1000	10		RW
703	keypad_delay_repeat	1 ... 1000	2		RW

21: Keypad PG4000					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
704	sercom_protocol	0 ... 2	0		RW
705	Menu.refresh_cycle_time	0 ... 2000	200	ms	RW
706	Menu-Language	[00] English ... [01] Deutsch	[00] english		RW
720	KEYS_Bitmap	0000h ... 003Fh	0000h	[bits]	R
721	keypad_run	0000h ... 003Fh	0000h	[bits]	R
722	KEYS_Counter[0]	0 ... 256	0		R
723	KEYS_Counter[1]	0 ... 256	0		R
724	KEYS_Counter[2]	0 ... 256	0		R
725	KEYS_Counter[3]	0 ... 256	0		R
726	KEYS_Counter[4]	0 ... 256	0		R
727	KEYS_Counter[5]	0 ... 256	0		R

22: Error Log					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
800	errlog_ctrl	0000h ... F331h	0000h		RW

Bit	Name	Function
0	Suspend Log	Stop recording
1	-	
2	-	
3	-	
4	No WrapAround	Disable ring buffer (no overwriting of old entries)
5	Reverse Order	Reverse order sequence of Entry Selector
6	-	
7	-	
8	Clear History	Delete Logbook
9	Reset History	Reset Logbook
10…15	-	

22: Error Log					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
801	errlog_status	0000h ... 0011h	---h		R

Bit	Name	Function
0	Error active	Error status is active
1…3		
4	Hist_limit_reached	Error Logbook is full

22: Error Log					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
802	errlog_eep_config.n_errors	0 ... 100	---		R
803	errlog_selector_idx	0 ... 99	---		R
804	errlog_selector	-100 ... 100	0		RW
805	errlog_selector_accepted	-100 ... 100	---		R
806	errlog_selected_logitem.time	2000-00-00T00:00:00 ... 2063-15-31T31:63:63	---		R
807	errlog_selected_logitem.error	0000h ... FFFFh	---h	[bits]	R
808	errlog_selected_logitem.xerror	0000h ... FFFFh	---h	[bits]	R
813	errlog_eep_config.last_idx	-1 ... 100	---		R
814	errlog_act_errors	0000h ... FFFFh	---h	[bits]	R
815	errlog_act_errors_mask	0000h ... FFFFh	FFFFh	[bits]	RW
816	errlog_act_errors_DBG	0000h ... FFFFh	0000h	[bits]	R
817	errlog_eep_errors_read	0 ... 100	---		R
818	errlog_eep_errors_write	0 ... 100	---		R

22: Error Log					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
819	errlog_time_now	2000-00-00T00:00:00 ... 2063-15-31T31:63:63	---		R

Current system time of regulator in T32 format

T32 Time Format
Timestamps are saved in the Error Logbook in a compact double word format. The structure of the bit field is as follows:

T32 Time Format – Bit Field Description			
Offset	N Bits	Name	Value Range
0	6	Seconds	(0 … 59)
6	6	Minutes	(0 … 59)
12	4	Month	(0 … 11)
16	5	Hour	(0 … 23)
21	5	Day	(1 … 31)
27	6	Years since 2000	(0 … 63)

A time range from 2000-00-00T00:00:00 yo 2063-15-31T23:59:59 can therefore be displayed with this.

23: Trace					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
1000	trace command	0000h ... 0037h	0000h	[bits]	RW

Bit	Name	Function
0	Start Now	Start Trace
1	Start On Trigger	Start Trace including Trigger condition
2	Run Idle	Activate Non-Real-time Trace
3	–	–
4	Cancel	Cancel current Trace
5	Reset	Cancel current Trace and reset error/status flags
6…15		

23: Trace					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
1001	trace status	0000h ... F133h	---h	[bits]	R

Bit	Name	Function
0	Trace Running	Trace is currently active
1	Idle Running	Idle-Trace (Polling Mode) is active
2		
3		
4	Trace done	Trace is completed
5	Trigger active	Trigger condition is currently fulfilled
6		
7		
8	Trace N/A	Trace function is not available
9		
10		
11		
12	Err#TrigParam	Error: Invalid Trigger Parameter [1011]
13	Err#BufferOvrun	Error: Trace buffer overflow
14	Err#BankSel	Error: Invalid Trace Bank Selector [1040]
15	Err#ChSize	Error: Maximum size of all Trace channels exceeded

23: Trace					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
1010	trigger type	[00] > v (immediate) ... [07] Bit=0 (on edge)	[04] Bit=1 (sofort)	[bits]	

Bit	Name	Comments
0	> v (immediate)	Trigger remains active until the comparison value is exceeded
1	< v (immediate)	… remains active until the comparison value cannot be met
2	> v (on edge)	… is currently active, as soon as the comparison value is exceeded
3	< v (on edge)	… is currently active, as soon as the comparison value cannot be met
4	Bit=1 (immediate)	… active as long as all the Bits set in the reference value are present in the Trigger parameters
5	Bit=0 (immediate)	… active as long as all the Bits set in the reference value are 0 within the Trigger parameters
6	Bit=1 (on edge)	… will become active once all the Bits set in the reference value are 1 in the Trigger parameters
7	Bit=0 (on edge)	... will become active once all the Bits set in the reference value are 0 in the Trigger parameters

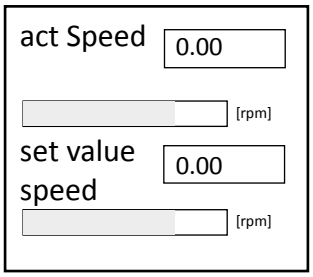
- Reference value: (Par.1013)
- Comparison value: (Par.1014)

23: Trace					
ID	**Name**	**Value-Range**	**Default-Value**	**Unit**	**Access**
1011	trigger parameter id	0 ... 4294967295	560		RW
1012	trigger parameter decimals	-1 ... 10	0		RW
1013	trigger compare value	-1000000 ... 1000000	0		RW
1014	trigger actual value	-1000000 ... 1000000	---		R
1015	trigger time-stamp	0 ... 4294967295	---		R
1020	sample dilation factor	1 ... 10000	1		RW
1021	sample time tick	0,000 ... 100000000,000	---	us	R
1022	sample time period	0,000 ... 100000000,000	---	us	R
1023	trace time total	0,000 ... 100000000,000	---	ms	R
1024	sample size	0 ... 16	---	B	R
1025	n sample buffer size	0 ... 65535	2048	W	R
1026	n samples available	0 ... 65535	---		R
1027	trace sample running	0 ... 65535	---		R
1030	param ch #1	0 ... 4294967295	0		RW
1031	param ch #2	0 ... 4294967295	0		RW
1032	param ch #3	0 ... 4294967295	0		RW
1033	param ch #4	0 ... 4294967295	0		RW
1034	param ch #5	0 ... 4294967295	0		RW
1035	param ch #6	0 ... 4294967295	0		RW
1036	param ch #7	0 ... 4294967295	0		RW
1037	param ch #8	0 ... 4294967295	0		RW
1040	sample bank select	-1 ... 65535	0		RW
1041	sample act time-stamp	0 ... 4294967295	---	us	R
1042	sample value #1	0 ... 4294967295	---		R
1043	sample value #2	0 ... 4294967295	---		R
1044	sample value #3	0 ... 4294967295	---		R
1045	sample value #4	0 ... 4294967295	---		R
1046	sample value #5	0 ... 4294967295	---		R
1047	sample value #6	0 ... 4294967295	---		R
1048	sample value #7	0 ... 4294967295	---		R
1049	sample value #8	0 ... 4294967295	---		R

Appendix 2: PG4001

Actual values

act. measurements:



Key	Action
↑	Select previous actual value
↓	Select next actual value
←	Switch: Bar/value display
→	Switch: Bar/value display
↵	
M	>> Go to main menu

Main menu

Main menü:

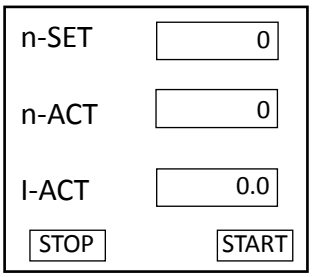
act. measurements
U-Drive Control
groups/parameters
data management
status/error msg.
settings/info

Key	Action
↑	Menu selection up
↓	Menu selection down
←	
→	
↵	>> Go to selected sub-menu
M	>> Go to ACTUAL value menu

Sub-menus:

Control

U-Drive Control:



Key	Action
↑	Increase set N value
↓	Reduce set N value
←	Cursor left (increase decimal)
→	(a) Cursor right (reduce decimal) (b) When decimal is already on 1: Invert rotation direction in set value!
↵	(a) Confirm set value (b) START
M	(a) Cancel set value input (b) STOP (c) Exit control (>> main menu)

Parameters

Group selection

The parameters on the U-drive are divided into several groups.

Use the keypad to first select the group and then open it to view and, if necessary, change the parameters it contains.

Groupen/parameters:

1. EEPROM, SMC a. EZU
2. motor data
3. drive data
4. maschine data
5. speed/current
6. ramps
7. control dynamics
8. digital I/O
9. analog I/O
10. PLC I/O
11. monitoring-limits
12. actual values
13. command/statusword
14. error-status
15. communication
16. master/slave
17. motorpotentiometer
18. positioning
19. winder
20. brake systems
21. keypad PG4001
22. fault log book
23. trace
24. signal generator

Key	Action
	One group up (min. Group 01)
	One group down (to max. number of groups)
	
	
	Open group
	Exit menu (>> main menu)

Selecting parameters

The up / down keys may be used to select the parameters within a group. The right / left keys allow the values for some parameters to be displayed differently (e.g. control words may be presented as a bit field or hexadecimal value).

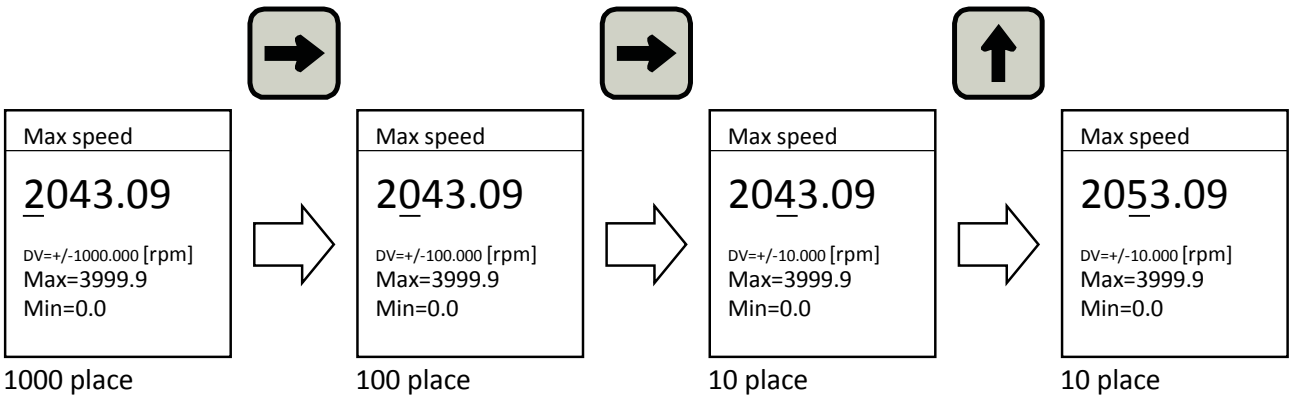
The parameter value changes may be activated with the ENTER key.

Change parameter value

Key	Action
↑	Increase set N value
↓	Reduce set N value
←	Cursor left (increase decimal)
→	(c) Cursor right (reduce decimal) (d) When decimal is already on 1: Invert rotation direction in set value!
↵	(a) Confirm set value (b) START
M	(a) Cancel set value input (b) STOP (c) Exit control (>> main menu)

Sequence (example).

Editing the "Max. speed" parameter with Parameter ID 101 in Group 05:



a) Cursor on the hundreds' place

b) Arrow up increases the hundreds' place

c) Arrow right moves the cursor to the right to the tens' place of value

d) Arrow down reduces the value by 10

The value will only be accepted when the ENTER key is pressed.

Data management

The data management is separated in the Groups U-Drive, smart Card and Keypad PG4001.

There the data can be saved or loaded. You can also loaded or save standard data

data management:

U-Drive
Smartcard
Keypad PG4001

Taste	Aktion
	Cursor up
	Cursor down
	
	
	>> Confirm
	>> level back