Service Instruction

DriveStar
Operator terminal
D-DS.1

Nr.: 182-02792
Rev. 8.0

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1 Before starting

1.1 General hints

The Stromag amplifiers of the DriveStar Series can be parameterised and set into service through the interface RS 232 using the operator terminal D-DS.1.

Caution !!
Operating the operator terminal D-DS.1 presupposes that the service manual of the corresponding drive amplifier has been read and understood.

In particular adhere to the safety instructions.

1.2 Connection between the drive amplifier and the operator terminal

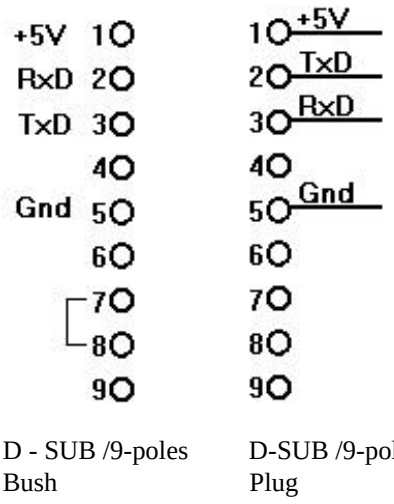


Fig. 1: Wiring

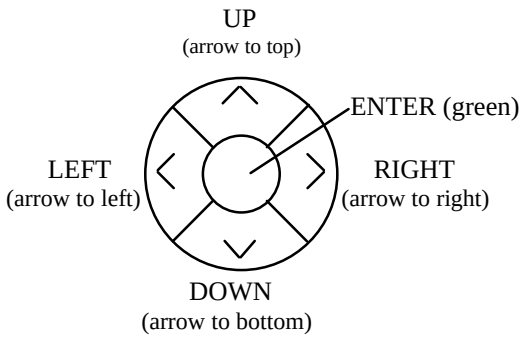
1.3 Make the communication to the AC-Servo

Make the connection between the operator terminal D-DS.1 and the servoamplifier as per fig. 1, i.e. connect the 9-pole plug of the operator terminal to the bush X 14.
Engage the AC-Servo and the operator terminal starts the baud rate detection. With correct configuration of the interfaces, the service condition and the actual values are displayed.

When the communication is interrupted or not realised, the display module as well as the amplifier software try automatically to re-make the communication. If impossible even after a number of trials (signal: „Keine Verbindung!“, i.e. „no link“), unplug the plug of the operator terminal from the bush X14 at the amplifier and re-plug it.

2 Keyboard

2.1 Structure of the keyboard

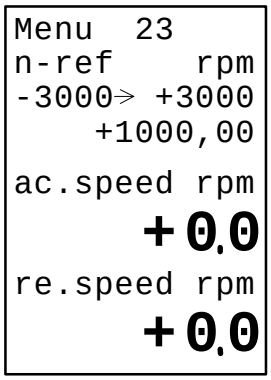


2.2 Moving within the menus

After having built-up the communication between the operator terminal and the servoamplifier, the basic menu is displayed.
To enter into the main menu level, the key ‘DOWN’ has to be actuated. This key is also used to diplay the other menu points or to count down the values in numerical input fields.

By the key „UP“ the former menu points can be selected or the values can be counted-up in numerical input fields.
The key ‘ENTER’ (round green) serves to acknowledge input values or to select menu points and consequently to change into the selected menu.
Return to the former menu level or leave a sub-menu by the key „LEFT“. In numerical input fields, this key serves to shift the cursor by one place to left.
The key „RIGHT“ is used to call a selected menu or to shift the cursor to right in numerical input fields.
To leave a numerical input field (the cursor is flashing) without taking-over the value, the keys „LEFT“ and „RIGHT“ have to be actuated simultaneously.

Ex.: Numerical input field
Menu 23 Internal setpoint
(speed reference value)



1. Line: Menu No.
2. Line: Text display and unit of the value
3. Line: Min. and max. value
4. Line: current value (taken-over with ENTER)
break-off with RIGHT and LEFT
(Line 5-8: actual value indications)

3 Menu structure of the operator terminal

Basic menu - service condition

- ready for operation: ready / not ready
  or fault signal (in case of fault)
- regulator enable / inhibit
- HLA-enable / inhibit
- speed signals
- actual value indications

Menu 0 - main menu

Selection of the menus 1-8:
<=service condition
1= commissioning
2= reference values (setpoints)
3= actual values
4= parameters
5= error signals
6= information
7= interfaces
8= technology

Menu 1 - commissioning

<=main menu
1=initial commissioning
2=IBN(commissioning)-control
3=status I/O (inputs / outputs)
4=IBN(commissioning)-test menu

Menu 11 - initial commissioning

(force guided, i.e. polling at the end
of the menu only: taking-over
or breaking off?)
code polling (The code is '0', if it has not
been changed in menu 4.2.6 by an user.)

110 reference value selector 1 (setpoint sel.1)
111 reference value selector 2 (setpoint sel.2)
112 adaptation reference value 1
113 adaptation reference value 2
114 HLA-ramps t1-t4
115 HLA-ramp t5
116 max. current
117 I_nom/I_max
118 amplification speed regulator (vpn)
119 time constant speed regulator (TNn)

Menu 12 - IBN(commissioning)-control

<= return
121 regulator enable
122 HLA-enable
123 acknowledge
124 speed/torque control
125 limit switch logic
126 brake mode

Menu 13 - status I/O

<=return
131- status of inputs:

	Terminal unit type WD_, CD_ UD_/AD_	Terminal unit type A-DS_ U-DS_	Standard
1	X2.15	X2.2.5	torque control
2	X2.16	X2.2.6	C-axis-operation
3	X2.17	X2.2.7	regulator enable
4	X2.18	X2.2.8	output stage enable
5	X2.19	X2.2.9	acknowledge fault
6	X2.20	X2.2.10	HLA-enable
7	X2.21	X2.2.11	limit switch 1
8	X2.22	X2.2.12	limit switch 2

132- status of outputs:

	Terminal unit type WD_, CD_ UD_/AD_	Terminal unit type A-DS_ U-DS_	Standard
1	X2.23	X2.2.13	„ready“ signal
2	X2.24	X2.2.14	I^2*t supervisor
3	X2.25	X2.2.15	n_act. = n_set
4	X2.26	X2.2.16	n > n1
5	X2.27	X2.2.17	n > 0 / release the brake
6	X2.28	X2.2.18	overtemperature motor
7	X2.29	X2.2.19	overtemp. output stage
8	X2.30	X2.2.20	output reserve

With technology or customized applications
the allocation of the digital inputs and outputs can
be deviating from the standard.
See pertinent manual.

Menu 14 - IBN(commission.)-test menu

code polling
<=return
141 input 1
142 input 2
143 input 3
144 input 4
145 input 5
146 output 1
147 output 2
148 output 3
149 output 4

Menu 2 - reference values (setpoints)

<=main menu
1=reference value selector 1 (setpoint sel.1)
2=reference value selector 2 (setpoint sel.2)
3=internal reference value (setpoint) through operator terminal

Menu 21 - reference value selector 1

<=return
1=reference value=0 (setpoint=0)
2=analog input 1
3=analog input 2
4=operator terminal
5=serial interface (PC-program VecWin)
6=field bus
7=technology
8=selection of direction analog input 1
9=quick analog input 1
(reference value input 1 and 2 locked against each other: only the points 1, 8 and 9 may be identical; change possible only, when regulator enable is not engaged!)

Menu 22 - reference value selector 2

<=return
1=reference value=0 (setpoint=0)
2=analog input 1
3=analog input 2
4=operator terminal
5=serial interface (PC-program VecWin)
6=field bus
7=technology
8=selection of direction analog input 2
9=external current limit
(external current limit: normal / inverse)
(reference value input 1 and 2 locked against each other: only the points 1, 8 and 9 may be identical; change possible only, when regulator enable is not engaged!)

Menu 23 - internal reference value

(Speed/frequency reference value (setpoint) in relation to the menu 4221 'indication unit' or with torque regulation (menu 124) I-set)

Menu 3 - actual values

(Select in the individual actual value sub-menus whether the actual value shall be displayed in the upper or in the lower actual value display (An1/An2). If the value is already displayed on the other actual value line, the two actual value displays are exchanged.)
<=main menu
1=speed
2=motor currents
3=rotor position
4=temperature
5=analog monitor 1
6=analog monitor 2
7=service hour (operating hour meter: display in the upper lines, as in actual value indications the seconds cannot be displayed)
8=D.C. link voltage Uzk

Menu 31 - actual speeds

(speed/frequency values in relation to menu 4221 'indication unit' speed or frequency)
<=return
311 speed/frequency actual value
312 speed/frequency reference value (is displayed only when the enables are engaged)

Menu 32 - motor current actual values

<=return
321 active current
322 blind (reactive) current
323 apparent current

Menu 33 - rotor position actual values

<=return
331 rotor position in degrees
332 rotor position in revolutions (only with EQN1325 and Stegmann encoder)

Menu 34 - temperature actual values

<=return
341 temperature converter
342 temperature motor

Menu 35 - analog monitor 1

<=return
351 speed/frequency reference value (setpoint)
352 speed/frequency actual value
353 phase current ir
354 active current
355 blind (reactive) current
356 rotor position
357 amount speed/frequency actual value
358 torque reference value (setpoint)

Menu 36 analog monitor 2

<=return
361 speed/frequency reference value (setpoint)
362 speed/frequency actual value
363 phase current ir
364 active current
365 blind (reactive) current
366 rotor position
367 amount speed/frequency actual value
368 torque reference value (setpoint)

Menu 37 - service hour

(operating hour meter: hhhhh:mm:ss)

Menu 38 - D.C. link voltage Uzk

Menu 4 - parameters

<=main menu
1=display parameters
2=change parameters

Menu 41 - display parameters

<=return
1=output stage parameters
2=unit parameters
3=limit values
4=motor data

Menu 42 - change parameters

Code polling (The code is '0', if it was not changed through an user in menu 4.2.6.)

<=return
1=output stage parameters
2=unit parameters
3=limit values
4=motor data
5=parameter set
6=change code

The menu point x depends on the question whether parameters shall be indicated (1=display) or shall be changed (2=change). In menu 41, the sub-menus „parameter set" and „change code" cannot be selected.

Menu 4x1 - output stage parameters

<=return
4x11 drive type
(in menu 42 „change parameters" the drive type is displayed only, the drive type is set in the works)
4x12 clock frequency (switching frequency)

Menu 4x2 - unit parameters

<=return
1=indication unit
2=reference value adaptation
3=HLA-ramps (acceleration ramps)
4=actual value adaptation
5=speed/frequency signals (in relation to the indication unit.)
6=speed regulator
7=current regulator
8=flux regulator (if menu 4x46: asyn./field), slip regulator (if menu 4x46: U/f-charac. curve).

Menu 4x21 indication unit
(rpm/Hz) with indication unit 'Hz' the number of pole pairs is polled, too)

Menu 4x22 - reference value adaptation
<=return
4x221 adaptation analog reference value input 1
4x222 adaptation analog reference value input 2
4x223 smoothing analog reference value input 1
4x224 smoothing analog reference value input 2
4x225 smoothing fast analog input
4x226 offset analog reference value input 1
4x227 offset analog reference value input 2

Menu 4x23 - HLA-ramps (accel. ramps)
(in relation to the indication unit: speed/frequency values)
<=return
4x231 time t1: 0 → max. speed/frequency
4x232 time t2: max. speed/frequency → 0
4x233 time t3: 0 → neg. max. speed/frequency
4x234 time t4: neg. max. speed/frequency→ 0
4x235 time t5: quick stop
4x236 t1 = t3
4x237 t2 = t4
4x238 t1 = t2 = t3 = t4
4x239 S-curve

Menu 4x24 - actual value adaptation
<=return
4x241 actual value smoothing
4x242 sensor adjustment [°]

Menu 4x25 - speed signals
(in relation to the indication unit: speed/frequency signal)
<=return
4x251 speed trigger n1
4x252 speed hysteresis n_act > n1
4x253 speed hysteresis n_act = n_ref
4x254 speed hysteresis n_act > 0
4x255 smoothing speed trigger n1

Menu 4x26 - speed regulator
<=return
4x261 speed regulator amplification vpn
4x262 speed regulator time constant TNn

Menu 4x27 - current regulator
<=return
4x271 current regulator amplification vpi
4x272 current regulator time constant TNi
4x273 smoothing active current ref.value isq_ref
4x274 blind current reference value
(only if menu 4x46: synchron.)

Menu 4x28 - flux/slip regulator
flux regulator (if menu 4x46: asyn./field.),
slip regualtor (if menu 4x46: U/f-charac. curve)
sub-menu 1-8 with asyn. operation (field orient.)
<=return
4x281 amplification flux regulator vp_psi
4x282 time constant flux regulator TN_psi
4x283 nominal magnetising current Imr_ref
4x284 nominal speed n_nom
4x285 rotor time constant
4x286 transfer speed
4x287 transfer current with max. speed Iq:n_max
4x288 current rise speed d Iq/T_ab
Sub-menu 1-2 with U/f-charc. curve operation
<=return
4x281 amplification slip regulator vp_slip
4x282 time constant slip regulator TN_slip

Menu 4x3 - limit values
<=return
1=speed/frequency (in relation to menu 4221: 'indication unit' speed or frequency)
2=current
3=I^2*t

Menu 4x31 - speed/frequency limit values
(in relation to menu 4221 'indication unit': speed or frequency)
<=return
4x311 min. limit value (n_min / f_min)
4x312 max. limit value (n_max / f_max)

Menu 4x32 - current limit values
<=return
4x321 free
4x322 free
4x323 I_max (peak current)
4x324 I_nom (nominal current)

Menu 4x33 - I^2*t-limit values
<=return
4x331 t_up (integration time up)
4x332 t_down (integration time down)

Menu 4x4 - motor data

<=return
4x41 number of pole pairs
4x42 sensor type
4x421 resolver
4x422 incremental encoder
increments/revolution
4x423 ERN 1387
4x424 ECN 1313
4x425 EQN 1325
zero point shift
SSI-output ON/OFF
4x426 resolver RDC
4x427 no sensor
4x428 ERN 1188
4x429 EQN 425
4x43 no. of increments encoder output (pulse)
4x44 delay (deceler.) time brake
4x45 delay (deceler.) time motor temperature
4x46 type of drive
4x461 type of drive=synchronous
4x462 type of drive=asyn. (field orientated)
4x463 type of drive=U/f-charac. curve

4x47 voltage constant (is displayed only with 4x462 type of drive=syn.)

4x47 motor data U/f-charc. (is displayed only with 4x463 type of drive=U/f-charact.)
4x471 stator resistance (R-Stator)
4x472 nominal frequency (f_nom)
4x473 nominal motor current (I_nom)
4x474 nominal speed (n_nom)
4x475 nominal voltage (U_nom)
4x476 minimum voltage (U_min)
4x477 power factor cos φ (cos-Phi)

Menu 425 - parameter set

('parameter set' not available in the menu 41 „display parameters")
<=return
4251 basic parameter set
42511 load basic parameter set (charge)
(reset is triggered, if communication interrupted, unplug D-DS.1 plug and re-plug it)
4252 parameter set 2
42521 store parameter set 2
42522 load parameter set 2 (charge)
(reset is triggerd, if communication interrupted, unplug D-DS.1 plug and re-plug it)
4253 parameter set 1 (from version D01.10/L02.01)
42531 AC → display (sending the parameter set of the AC-servo to the display and storing it) (from version D01.10 / L02.01)
42532 display → AC (sending stored parameter set from the display to the AC-servo) (from version D01.10 / L02.01)

It is only possible to send a parameter set from the display to the AC-Servo (42532 display → AC), if a complete parameter set was loaded already via the menu '42531 AC → display' to the AC-Servo. If no-one or no complete parameter set is stored and the menu '42532 display → AC' is called, the message 'Load first!' appears. The memory functions (4253 parameter set 1) be supported only from display-version D01.10 and from LCD-version L02.01 (see menu '627 display version' and '628 LCD version').
The parameter change are only taken-over after a reset (disengage and re-engage) of the amplifier!

Menu 426 - change code

('change code' not available in the menu 41 'display parameters".)
Input new customer's code and acknowledge with ENTER.

Menu 5 - error signals

<=main menu
1=present error
2=error memory

Menu 51 - present error

(by actuation of the key 'DOWN' scrolling between possibly existing faults is possible)

Menu 52 - error memory

<=return
521 indicate error memory
(serial no., service hour, error; By actuation of the key 'DOWN'
scrolling between the faults 0 (last fault) to 31 is possible)
522 clear error memory

Menu 6 - information

<=main menu
1=language
2=versions
3=sample times
4=display illumination ON/OFF (light)

Menu 61 - languages

<=return
611 German
612 English
613 French

Menu 62 - versions

<=return
621 drive control software version
622 VeCon-software version
623 terminal software version
624 communication software version
625 technology software version
626 field bus software version
627 display software version
628 LCD-version
629 reference number

Menu 63 - sample times

(regulation/setpoint sample time in µs)

Menu 64 - display illumination (light)

(engage and disengage -ON/OFF-)

Menu 7 - interface

<=main menu
1=RS 232
2=RS 485

Menu 71 - RS 232

<=return
711 mode RS 232
(baud rate, parity, data bits, stop bits)
712 baud rate
713 parity (n=none, o=odd, e=even)
714 number of data bits
(the operator unit D-DS.1 only communicates with 8 data bits with the drive amplifier, as with 7 data bits the set of signs is limited.)
715 number of stop bits
716 unit address

Menu 72 - RS 485

<=return
721 mode RS 485
(baud rate, parity, data bits, stop bits)
722 baud rate
723 parity (n=none, o=odd, e=even)
724 number of data bits
725 number of stop bits

Menu 73 - field bus

This menu point is active only with units with integrated user 'field bus'-software.
Please adhere to the pertinent additional documentation for the technology.

Menu 8 - technology

This menu point is active only with units with integrated user software, such as:
- positioning
- synchronisation
- flying saw

Please adhere to the pertinent additional documentation for the technology.

Hint:

- The parameter drive type (menu 4111 / 4211) cannot be changed, as it is adjusted in the works.
- The following parameters are taken-over after a reset only (disengage and re-engage):

Menu	Parameters
4212	clock frequency
4241	number of pole pairs
4242	sensor type
4246	drive type
712	RS 232 Baud rate
713	RS 232 Parity
714	RS 232 Data bits
715	RS 232 Stop bits
722	RS 485 Baud rate
723	RS 485 Parity
724	RS 485 Data bits
725	RS 485 Stop bits

3.1 Menu points in alphabetical order

The menu point x depends on the question whether the parameters shall be indicated (x=1 display) or changed (x=2 change). In the menu 41 the sub-menus „parameter set“ and „change code“ cannot be selected.

Menu points in alphabetical order	Menu
AC → display (sending the parameter set of the AC-servo to the display and storing it) (from version D01.10 / L02.01)	42531
Acceleration ramps (HLA-ramps) (in relation to indication unit: speed / frequency values)	4x23
Acknowledge	123
Active current (analog monitor 1)	354
Active current (analog monitor 2)	364
Active current actual value	321
Actual speeds (speed/frequency values in relation to menu 4221 ‘indication unit’ speed or frequency)	31
Actual value adaptation	4x24
Actual value smoothing	4x241
Actual values (Select in the individual actual value sub-menus whether the actual value shall be displayed in the upper or lower actual value display (An1/An2). If the value is already displayed on the other actual value line, the two actual value indications are exchanged.)	3
Adaptation analog reference value input 1	4x221
Adaptation analog reference value input 2	4x222
Adaptation reference value 1 (initial commissioning)	112
Adaptation reference value 2 (initial commissioning)	113
Amount speed/frequency actual value (analog monitor 1)	357
Amount speed/frequency actual value (analog monitor 2)	367
Amplification flux regulator vp_psi (only with asyn.)	4x281
Amplification slip regulator vp_slip (only with U/f-characteristic)	4x281
Amplification speed regulator vpn (initial commissioning)	118
Analog monitor 1	35
Analog monitor 2	36
Apparent current actual value	323
Basic parameter set	4251
Baud rate RS 232	712
Baud rate RS 485	722
Blind (reactive) current (analog monitor 1)	355
Blind (reactive) current (analog monitor 2)	365
Blind (reactive) current actual value	322
Blind (reactive) current reference value (only when menu 4x46: synchronous)	4x274
Brake mode	126
Change code no available in the menu 41“display parameters“	426
Change parameters	42
Clear errror memory	522
Clock frequency (Switching frequency)	4x12
Commissioning	1
Communication software version	624
Current limit values	4x32
Current regulator	4x27
Current regulator amplification vpi	4x271
Current regulator time constant TNi	4x272
Current rise speed d Iq/T_ab (only with asyn.)	4x288
D.C. link voltage Uzk	38
Data bits RS 232	714
Data bits RS 485	724
Delay (Decel.) time motor temperature	4x45
Delay (deceleration) time brake	4x44
Display → AC (sending stored parameter set from the display to the AC-servo) (from version D01.10 / L02.01)	42532
Display illumination (light: ON/OFF)	64
Display parameters	41
Display software version	627
Drive control software version	621
Drive type (in the menu 42 ‘change parameters’ the drive type is indicated only, the drive type is adjusted in the works)	4x11
ECN 1313 (sensor type)	4x424
English (language)	612
EQN 1325 (sensor type) zero point shift SSI-output ON/OFF	4x425
EQN 425 (sensor type)	4x429
ERN 1188 (sensor type)	4x428
ERN 1387 (sensor type)	4x423
Error memory	52
Error signals	5
Field bus software version	626
Flux/slip regulator Flux regulator (if menu 4x46: asyn./field), (8 sub-menu points) Slip regulator (if menu 4x46: U/f-charac.), (2 sub-menu points)	4x28
free	4x321

free	4x322
French (language)	613
German (language)	611
HLA-enable	122
HLA-ramp t5 (initial commissioning)	115
HLA-ramps t1-t4 (initial commissioning)	114
HLA-ramps (in relation to indication unit: speed / frequency values)	4x23
I_max (peak current)	4x323
I_nom (nominal current)	4x324
I_nom/I_max (initial commissioning)	117
I²*t-limit values	4x33
IBN(commissioning)-control	12
IBN(commissioning)-test menu	14
Incremental encoder (sensor type) increments/revolution	4x422
Indicate error memory (serial No., service hour, error; By actuation of the key 'DOWN' scrolling between the faults 0 (last fault) to 31 is possible)	521
Indication unit (rpm/Hz) with indication unit 'Hz' the number of pole pairs is polled, too)	4x21
Information	6
Initial commissioning (force guided, i.e. polling at the end of the menu only: take-over of break-off?) Code polling	11
Input 1 (IBN-test menu)	141
Input 2 (IBN-test menu)	142
Input 3 (IBN-test menu)	143
Input 4 (IBN-test menu)	144
Input 5 (IBN-test menu)	145
Interface	7
Internal reference value (speed/frequency reference value (setpoint) in relation to menu 4221 'indication unit' or with torque control (menu 124) I-ref)	23
Languages	61
LCD-version	628
Limit switch logic	125
Limit values	4x3
Load basic parameter set (charge) (Reset is triggered)	42511
Load parameter set 2 (charge) (Reset is triggered)	42522
Main menu	0
Maximal current (initial commissioning)	116
Maximal limit value (n_max / f_max)	4x312
Minimal limit value (n_min / f_min)	4x311
Minimum voltage (U_min) with type of drive=U/f-characteristic	4x476

Mode RS 232 (Baud rate, parity, data bits, stop bits)	711
Mode RS 485 (Baud rate, parity, data bits, stop bits)	721
Motor current actual values	32
Motor data	4x4
Motor data U/f-charact. (is displayed only with 4x463 type of drive=U/f-characteristic)	4x47
no sensor (sensor type)	4x427
No. of increments encoder output (pulse)	4x43
Nominal frequency (f_nom) with type of drive=U/f-characteristic	4x472
Nominal magnetising current Imr_ref (only with asyn.)	4x283
Nominal motor current (I_nom) with type of drive=U/f-characteristic	4x473
Nominal speed (n_nom) with type of drive=U/f-characteristic	4x474
Nominal speed n_nom (only with asyn.)	4x284
Nominal voltage (U_nom) with type of drive=U/f-characteristic	4x475
Number of data bits RS 232	714
Number of data bits RS 485	724
Number of pole pairs	4x41
Number of stop bits RS 232	715
Number of stop bits RS 485	725
Offset analog reference value input 1	4x226
Offset analog reference value input 2	4x227
Output 1 (IBN-Test menu)	146
Output 2 (IBN-Test menu)	147
Output 3 (IBN-Test menu)	148
Output 4 (IBN-Test menu)	149
Output stage parameters	4x1
Pair of poles	4x41
Parameter set 1 (from version D01.10/L02.01)	4253
Parameter set 2	4252
Parameter set not existing in the menu 41 „display parameters“	425
Parameters	4
Parameter (display)	41
Parameter (change)	42
Parity RS 232 (n=none, o=odd, e=even)	713
Parity RS 485 (n=none, o=odd, e=even)	723
Phase current ir (analog monitor 1)	353
Phase current ir (analog monitor 2)	363
Power factor cos φ (cos-Phi) with type of drive=U/f-characteristic.	4x477
Present error (by actuation of the key 'DOWN' scrolling between possibly existing faults is possible)	51
Reference number	629

Reference value adaptation	4x22
Reference values	2
Reference value selector 1 (initial commiss.)	110
Reference value selector 1 1=Reference value=0 2=Analog input 1 3=Analog input 2 4=Operator terminal 5=Serial interface (PC-Program VecWin) 6=Field bus 7=Technology 8=Selection of direction analog input 1 9=Quick analog input 1 (Reference value input 1 and 2 locked against each other: only the points 1, 8 and 9 may be identical; change possible only when regulator enable is not engaged!)	21
Reference value selector 2 (initial commiss.)	111
Reference value selector 2 1=Reference value=0 2=Analog input 1 3=Analog input 2 4=Operator terminal 5=Serial interface (PC-Program VecWin) 6=Field bus 7=Technology 8=Selection of direction analog input 2 9= External current limit (External current limit: normal / inverse) (Reference value 1 and 2 locked against each other: only the points 1, 8 and 9 may be identical; change possible only when regulator enable is not engaged!)	22
Reference values (Setpoints)	2
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