Parameter Manual

Appendix to TA-BL/P manual

Starting from software version 4.14

```
Mode   Para   Parameter name                                    Value  Unit
-------------------------------------------------------------------
1/02   MAXS   Maximum Speed                                     0      1/min
1/03   MINS   Minimum Speed                                     0      1/min
1/04   PRST1  Preset Speed (or Ratio) 1                         0
1/05   PRST2  Preset Speed (or Ratio) 2                         0
1/06   PRST3  Preset Speed (or Ratio) 3                         0
1/07   IL1Q   Current Limit 1st Quadrant                        0,0    A
1/08   4Qen   4Q Operation Enabled                              0
1/09   IL4Q   Current Limit 4th Quadrant                        0,0    A
1/10   RAMP   Select Ramp Mode (Jump, Lin., s)                  0
1/11   ACCEL  Acceleration Time                                 0,0    s
1/12   DECEL  Deceleration Time                                 0,0    s
1/13   LeaDe  Leaded Deceleration                               0
1/14   BraDe  Wait With HOLD for 0.5s Using a Brake             0
1/15   DelOf  Turn Regulator off if Analog Input is 0           0
1/16   P_AMP  Proportional Amplifier for Speed                  0      %
1/17   I_AMP  Integral Amplifier for Speed                      0      %
1/18   YI0P   Limit Integral Part for Speed                     0      1/min
1/19   Save   Save Parameter to EEPROM                          0
2/02   Stdrd  Load Standard Parameter                           0
2/03   RATSP  Motor rated Speed (BL-N-motors lower speed)       0      1/min
2/04   POLES  Poles of Motor                                    0
2/05   PPR    Pulses per Revolution                             0
2/06   MRACU  Motor Rated Current                               0,0    A
2/07   MPECU  Motor Peak Current (Limits IL1Q/IL4Q)             0,0    A
2/08   OCTIM  Over current time (for n < 300 rpm)               0      s
2/09   SETAB  Select Ramp A or B                                0
2/10   ACC_B  Acceleration Time B                               0,0    s
2/11   DEC_B  Deceleration Time B                               0,0    s
2/12   PhAdv  Phase Advance                                     0
2/13   PHADR  Phase Advance at Rated Speed                      0      %
2/14   PHADM  Phase Advance at Max Speed                        0      %
2/15   INCR   Speed + Increase Speed                            0
2/16   DECR   Speed - Decrease Speed                            0
2/17   FINE   Fine Adjustment, 1/4 RPM                          0
2/18   SWTR   Switch at this Speed                              0      1/min
2/19   IL20   Signalize Current Limit after this time           0      s
2/20   CodO   Fixed Function for Digital Outputs                0
2/21   DirAn  Select Revers by Negative rated value             0
2/22   4mA    Analoginput 1: 0-20mA / 4-20mA                    0
2/23   CLT1   Torque Limit Time Constant                        0,00   s
2/24   UVTIM  Undervoltage Time                                 0,0    s
2/25   OV_4Q  Overvoltage 4Q                                    0      V
2/26   PTQL   Programable Torque limit                          0,0    %
2/27   RESER  Reserved register                                 0
3/02   SRES   Input Selection Reset                             0
3/03   SRUN   Input Selection Run                               0
3/04   SPRS1  Input Selection Preset 1                          0
3/05   SDIR   Input Selection Direction (Master)                0
3/06   SHOLD  Input Selection Hold                              0
3/07   SPRS2  Input Selection Preset 2                          0
3/08   SMOT   Input Selection Motorpoti                         0
```

Parameter Manual

Information

This Parameter manual explains the differant parameters of the TA-BL/P drive appliance series and is therefore subject to the same safety conditions. The precautions and warnings, mentioned in the TA-BL/P manual, must be followed. When starting a control appliance it is essential to use the TA-BL/P instruction and operating manual. The following manual is supplementary to the TA-BL/P instruction and operating manual and does not replace it.
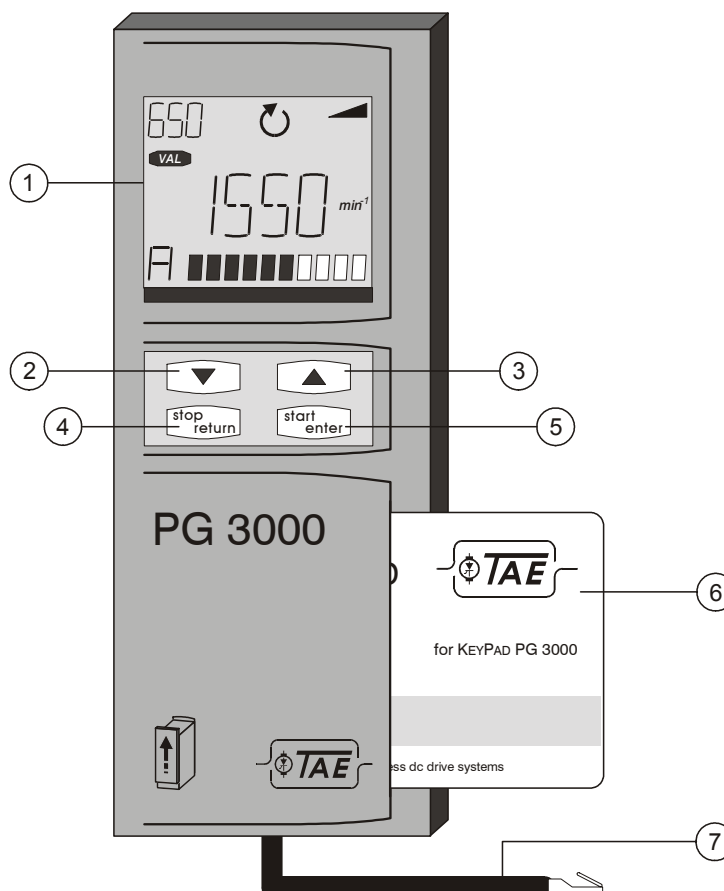
The operation should only be done by qualified personnel.

Table of content

1. Multifunction Control Unit PG 3000

1.1 Layout plan PG 3000

Pos.	Designation	Function
1	LCD display field	140 segments, green/red background
2	Arrow key down	Scroll back in menu structure
3	Arrow key up	Scroll forward in menu structure
4	Stop/Return key	Stop (Menu CTRL), interrupt or exit from selected menu
5	Start/Enter key	Start (Menu CTRL), confirm or select menu
6	SmartCard	SmartCard data storage, saving appliance settings
7	Terminal cable	Max. length 0.30 m

1.1.1 Technical data PG 3000

Dimensions (WxHxD)	62x158x21 mm
Weight	100 g
Degree of protection	VBG4, IP20
Ambient temperature	0...40°C

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## 1.2 Using the control elements

1.2.1 General

After the mains voltage has been switched on the appliance carries out a self-test (display background red).

The TA-BL/P... controller ends the test with a direct jump to the set actual value display (parameter 4/09)(display background green).
The menu option **VAL** is active. Press the **stop**/**return** key twice to switch the display to MENU and open the selection of other **MENU** options.

| Menu option	Description
VAL	Display actual values
PARA	Change parameter settings
CTRL	Control motor via KeyPad PG 3000
CARD	Load/save appliance settings with SmartCard
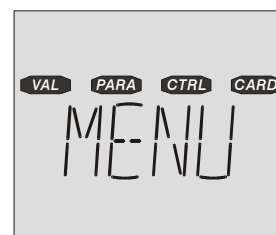
1.2.2 Control elements

Use the arrow keys to select or a menu option or to select/update individual parameters.

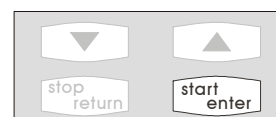Press once to jump to the next menu option or parameter or to change the setting by one step.

Hold the key to scroll the settings automatically, release to stop.
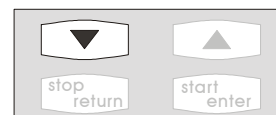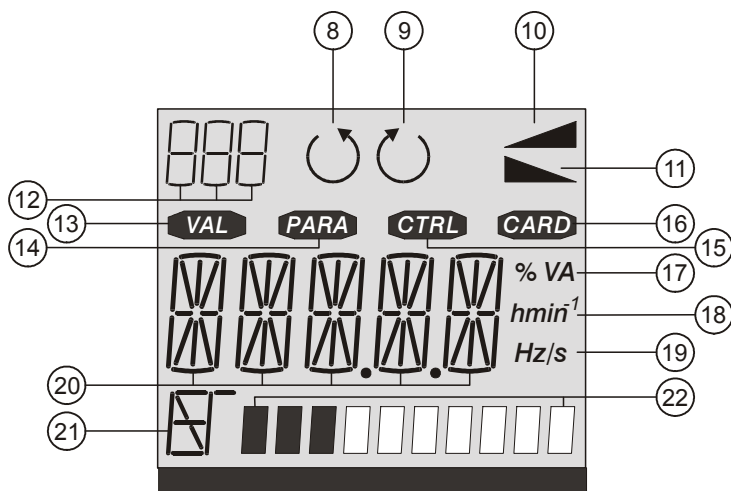

Use the **stop**/**return** key to exit a menu option or interrupt parameter updates (previous value remains in force).

Use the **start**/**enter** key to move to menu options or parameters and save changes.

1.2.3 LCD display

Pos.	Designation	Function
8	Turn to left	Control display for motor direction, counterclockwise active
9	Turn to right	Control display for motor direction, clockwise active
10	Acceleration ramp	Control display, active during acceleration
11	Brake ramp	Control display, active during braking
12	3-digitnumeric display	7-segment display for actual speed value in ‰ and parameter no.
13	VAL menu	Display actual values, e.g. speed, current, line speed, a.s.o.
14	PARA menu	Change parameter settings
15	CTRL menu	Control motor via the KeyPad PG 3000
16	CARD menu	Load/save appliance settings with the SmartCard
17	Phys. unit for Pos. 20	Displays %, V, A, VA with automatic allocation
18	Phys. unit for Pos. 20	Displays h, rpm with automatic allocation
19	Phys. unit for Pos. 20	Displays Hz, s, Hz/s with automatic allocation
20	5-digitnumerical display	15-segment display for parameter name and display
21	Bar graph designation	Displays formula characters and physical units for Pos. 22
22	10-digit bar graph	Displays parameter values, e.g. speed, current (parameter 4/10)

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1.3   Actual values menu

1.3.1 Structure of the VAL menu

Use the arrow keys to select the **VAL** menu.

Use the **start**/**enter** key to confirm and switch to the **VAL** menu.

Use the arrow keys to select the required value for the display. The preset actual values are shown in table 4.2 below.

In the example, the **SPEED** value is used.

Press the **start**/**enter** key to display the actual value.

Press the **start**/**enter** or the **stop**/**return** key to return to the actual value selection.
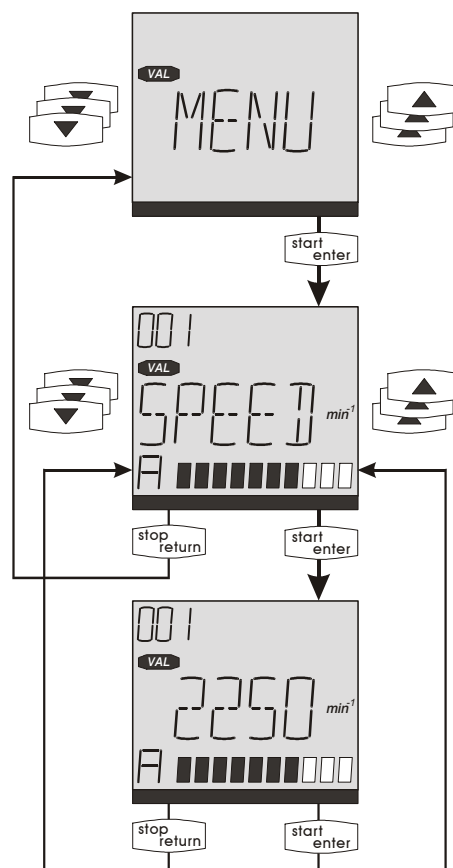
1.3.2 Actual values

Parameter	Display	Designation	Unit	Range
0/01	SPEED	Motor speed	rpm	0 - 6000
0/02	CURR	Motor current	A	0.0 - 3000.0
0/03	LSPD	Line speed	-	0 - 30000
0/04	LSPD1	Line speed 1	-	0.0 - 3000.0
0/05	LSPD2	Line speed 2	-	0.00 - 300.00
0/06	POSLO	Position (low word)	-	0 - 65535
0/07	POSHI	Position (high word)	-	0 - 65535
0/08	LEAD	Leading speed	rpm	0 - 6000
0/09	SW	Software version	-	0 - 9999
0/10	BUSV	Buss voltage	V	0 - 9999

1.4 Parameter menu

1.4.1 Structure of the PARA menu

Use the arrow keys to select the **PARA** menu.

Use the **start**/**enter** key to confirm and the menu
changes to the parameter level and the display changes
to **MODE**.

Select the parameter set (**MODE**) you want to use.

Press the **start**/**enter** key to display the actual
parameter set.

Switch to another parameter set with the arrow keys.

Press the **start**/**enter** key to confirm the selected
parameter set and the display switches back to **MODE**.

Use the arrow keys to move through the preset
parameters (**MODE**).

Use the ↑ key to move upwards through the parameter
list, and use the ↓ key to move down.

When you reach the parameter you want (in the
example **ACCEL**) press the **start**/**enter** key to display
the parameter's current value.

Use the arrow keys to change the value. Press the
start/**enter** key to save the new value.

You can use the **stop**/**return** key to break off the
procedure at any time. The previously stored value
remains in force.
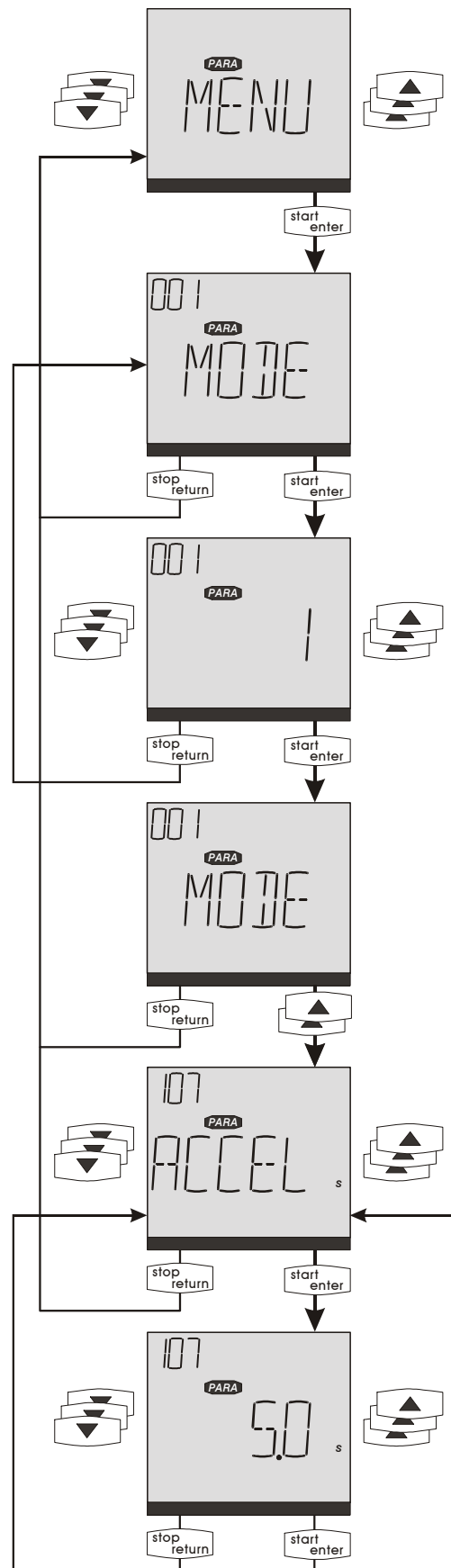
Parameter Manual

1.5 Motor control menu

1.5.1 Structure of the CTRL menu

Use the arrow keys to select the **CTRL** menu.

Press the **start**/**enter** key to confirm and the program changes to password input and the display shows **PW**.

Use the arrow keys to enter the password and press the **start**/**enter** key to confirm (*factory setting for password* = 111).

You can now enter a setpoint value using the arrow keys (e.g. 2250 rpm).

Press the **start**/**enter** key and the direction of rotation display begins to blink; the controller starts with the preset acceleration ramp to the setpoint value.
The display also shows the actual value in % (small display). You can change the setpoint with the arrow keys.

Press the **start**/**enter** key to stop the rotation display blinking; the controller moves on the preset braking ramp down to speed 0. (braking only possible at 4 quadrant operation or servo operation)

If you want to change the direction of rotation you must use the arrow keys beforehand to set the setpoint to 0. If the drive is not moving, use the ↓ key to change the direction of rotation.

You can now enter a setpoint value and release the controller be pressing the **start**/**enter** key.
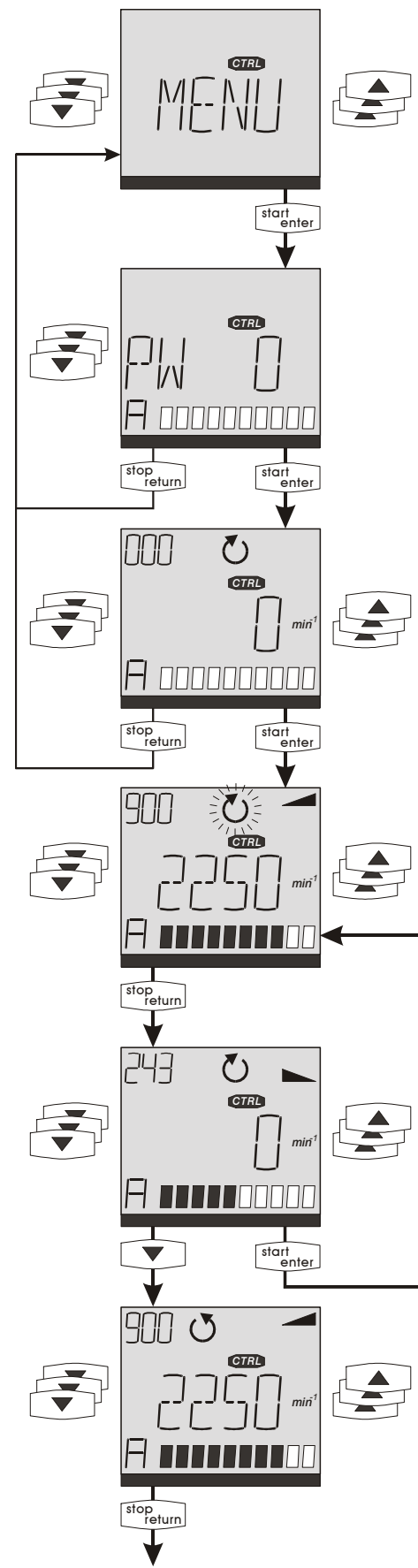
1.6 SmartCard menu

1.6.1 Structure of the CARD menu

Use the arrow keys to select the **CARD** menu.

Use the **start**/**enter** key to confirm and switch to the SmartCard menu.

Use the arrow keys to select the required function. The existing functions are shown in table 8.6.2 below.

In the example, the **READ** function (download appliance settings from the SmartCard) is used.

Press the **start**/**enter** key to confirm the function and the display shows **START**.

Press the **start**/**enter** to start the function.

In the example, the appliance settings are downloaded from the SmartCard to the TA-BL/P ... appliance.

If the function is completed without faults, **READY** appears in the display.

Press the **stop**/**return** key to return to menu selection.
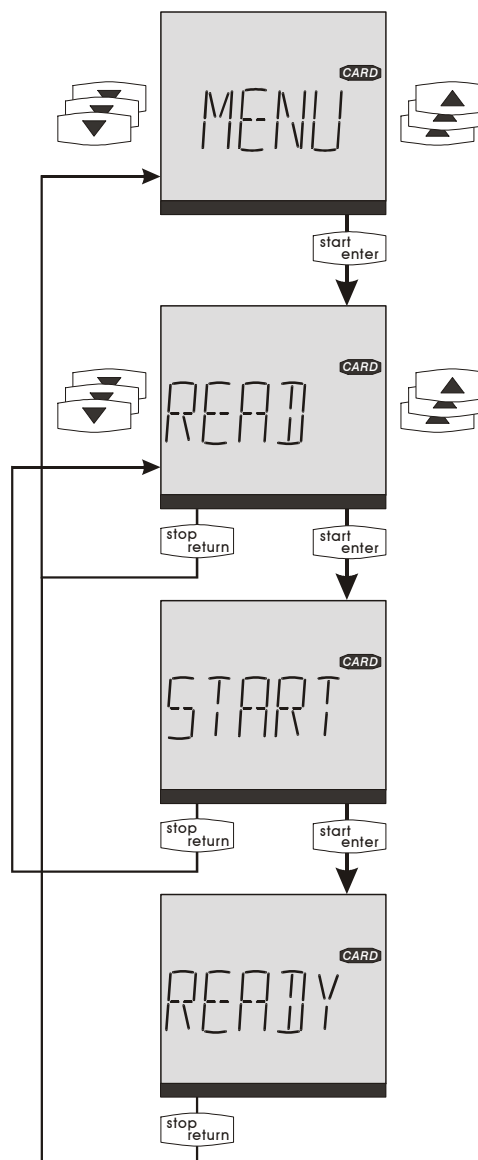
1.6.2 SmartCard functions

Display	Designation
READ	Download appliance settings from the SmartCard to the controller.
WRITE	Save appliance settings to the SmartCard.
LOCK	No function (reserved)
UNLOCK	No function (reserved)

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1.7 Errors

1.7.1 Error messages of the TA-BL/P

The device displays following faults. The device is jammed when a fault appears, which is displayed by a red background light in the display of the PG 3000.

Error	Display	
	Device	PG3000
Motor overtemperature (only if parameter *3/55 KLIXEN* is set on 1)	F0	MTEMP
Overcurrent	F1	OC
Overtemperature Power unit	F2	TEMP
Undervoltage (only if the motor is in operation)	F3	UV
BUSS-Overvoltage	F4	OV
Ripple Current	F5	RC
Position Sensor HS1, HS2 or HS3 (only if parameter *3/13 POSEN* is set on 1)	F6	POS
Speed sensor HS4 or HS3	F7	SPEED
Plausibility Error	F8	PFLT
Short-Circuit IGBT	F9	IGBT
External Error (only active if a digital input is associated with parameter *3/22 SSER*)	E1	EXT

[*)] Error is only evaluated at Regulators with Control Board TA-BL-E/P98 Art.-No. 78320-0F

All faults can be reseted by the terminals, the serial interface (RS 485 and RS 422), with the PG 3000 or by a communication option e.g. profibus or interbus. A fault reset is only possible when the drive is locked, the motor stands still and all faults are disappeared. If the fault is reseted externaly, the latest fault in the PG 3000 remains till the PG 3000 is reseted. The PG 3000 can also be reseted during operation. If a fault in the PG 3000 is not reseted the background remains red and the display shows always the latest fault.

1.7.2 PG 3000 operator errors *(no equipment malfunktion)*

ATT1 Changing parameters in online mode (with motor running) not allowed
ATT2 Controlling motor from KeyPad PG 3000 not allowed in online mode.
ATT3 Accesss to SmartCard not allowed in online mode.
ATT4 System malfunction. Control from KeyPad PG 3000 not allowed.
ATT5 Motor data must be complete for selected function.
ERROR Invalid password

Acknowledge error by pressing **start**/**enter** *key.*

1.7.3 Errors when using SmartCard *(no equipment malfunktion)*

ERR91 SmartCard is write protected.
ERR92 Validity check error.
ERR93 SmartCard not readable. Inverter/Servo Controller type incorrect.
ERR94 SmartCard not readable. Parameters incompatible.
ERR96 Connection to SmartCard broken.
ERR97 SmartCard data invalide.
ERR98 Insufficient memory on SmartCar.

Acknowledge error by pressing **start**/**enter** *key.*

2. Parameters description

2.1 Parameter Group 1

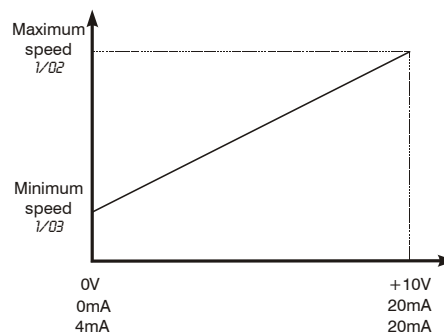| Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/02	MAXS	Maximum speed	10..6000	1000	min^{-1}

See also Parameters: 2/12, 2/13, 2/14

This parameter determines the maximum speed of the motor. If the speed set is greater than the rated speed of the motor, take into account that when the rated speed of the motor is exceeded, the torque might drop. When operating the motor above the rated speed of the motor, the "Advanced Function" phase should be used.
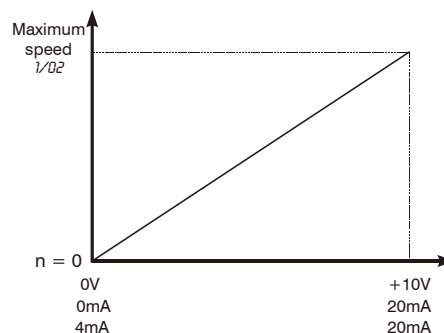
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/03	MINS	Minimum speed	0..6000	0	min^{-1}

The minimum speed at which the motor runs without a set-point value is set under this parameter. After a successful start command, at a set-point value of 0 the drive runs up to the speed set here.

If the minimum speed set is greater than the maximum speed, it will be limited to the maximum speed. The minimum speed set takes affect with an analogue set-point value specification, motor potentiometer function or set-point value over PG 3000. With set-point value over a preset speed of PC, the minimum speed limit is not active.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/04	PRST1	Preset speed 1 / Multiplier 1	0..64000	0	min^{-1} / -

See also Parameters: 3/04, 3/13, 4/12, 4/13

The function of Parameter 1/04 PRST1 depends on the operating mode of the TA-BL/P regulator as master or slave drive (master or slave). The operating mode is determined in Parameter 3/13 SSLAV.

If the drive is operated as master drive (master), then the first preset speed can be deposited in Parameter 1/04 PRST1. The input is made in min^{-1}. The speed is always limited through the maximum speed (Parameter 1/02 MAXS), independently of the setting in Parameter ¼ PRST1.

If the drive is employed as slave drive (slave), Parameter 1/04 PRST1 in conjunction with Parameter 4/13 determines the first multiplier to the master drive (master). The multipliers is calculated according to the following formula:

$$\text{Multiplier} = \frac{\text{Parameter } 1/04}{\text{Parameter } 4/13}$$

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Examples:

1/04=20.000, *4/13*=10.000   ⇒ Speed multiplier = 2
1/04=05000, *4/13*=10.000   ⇒ Speed multiplier =0,5

The various preset speeds and/or multipliers are triggered either via the digital inputs or vie an communication bus (such as Profibus-DP).

The terminal allocation for selecting the preset speeds is prescribed in Parameters 3/04 SPRs1 and 3/07 SPRS2.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/05	*PRST2*	Preset speed 2 / Multiplier 2	*0..64000*	*0*	min^{-1} / -

See also Parameters: 3/04, 3/07

The functioning is analogous to Parameter *1/04*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/06	*PRST3*	Preset speed 3 / Multiplier 3	*0..64000*	*0*	min^{-1} / -

See also Parameters: 3/04, 3/07, 3/13

The functioning is analogous to Parameter *1/04*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/07	*IL1Q*	Max. current during motor operation (1.Q)	*0,1..I-MAX*	*I-MAX*	A

See also Parameters: 2/06, 2/07, 2/08, 4/02

The maximum output current (motor current) is limited to the value indicated here. A separate critical current applies to 4Q operation [Parameter *1/08 IL4Q*].

The maximum adjustable current (max. value) is limited by the software side depending on the peak motor current, rated equipment current and depending on the clock frequency set.

The maximum current in Parameter *1/07 IL1Q* is equivalent to 1.2-1.5 times the rated equipment current, depending on the controlling equipment. At speeds below 300 min^{-1} output currents above the rated equipment current are limited in Parameter *2/08 OCTIM* to the rated equipment value when the overcurrent period lapses.

It is not possible to set values greater than 65% of the peak motor current (Parameter *2/07 MPECU*).

The maximum current enables a limitation of the motor current in the first quadrant (motor operation). When the output current reaches the value set in this parameter, the motor speed decreases as a function of the load. When the maximum motor current is reached during the acceleration phase, the start-up time is extended accordingly.

The red LED I-limit on the TA-BL/display signals the current limit being reached. It is also possible to give a message on the programmable outputs, the allocation of which is determined with Parameters *3/37-3/41*.

The limitation of the maximum motor current cannot prevent the triggering of a malfunction message and disconnection through sudden overcurrent, because of a short-circuit, for example.

The maximum current can be calculated by multiplying the peak equipment current (see table for technical data in Section 4.2.1TA-BL/P Manual) by a factor of 0.82.

The rated equipment current is listed in the following as a function of the switching frequency (Parameter *4/02 CFMAX*). The max. current follows the same curve shape.

Rated current I_{rated}
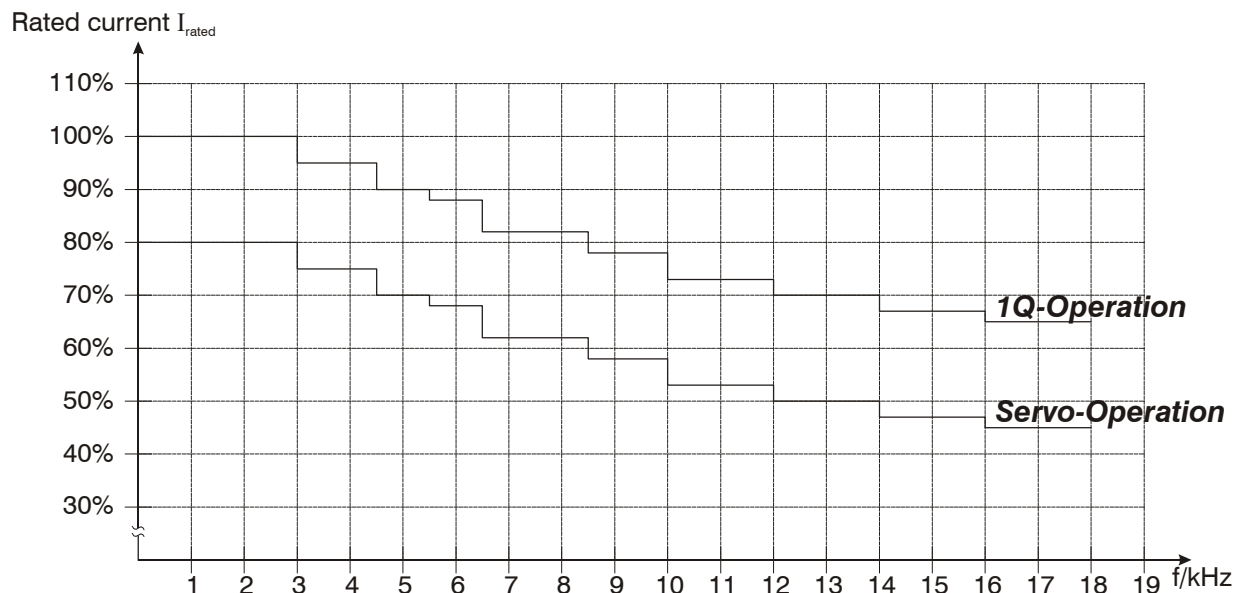
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/08	4QEN	Generator operation, enabled	0..1	0	-

See also Parameters: 2/25, 1/09

This parameter activates or deactivated the 4Q operation of the drive. When this parameter is set to 0, 4Q operation will be prevented and whenever there is a delay, the motor will spin slower and slower until the new set-point speed is reached.

With "active" loads, such as hoisting gear, the load can even accelerate the drive. When this parameter is set to 1, then the 4Q operation is enabled. An external braking unit, however, should then be used as otherwise the drive might malfunction with overcurrent in the intermediate circuit. As an example, Type BC... braking units can be used made by TAE with braking resistors. The generating braking power is limited by the generating current limit [Parameter *1/09 IL4Q*] or by the limit value for the DC-bus voltage [Parameter *2/25 OV_4Q*].

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/09	IL4Q	Current limit, Generator operation	0,1..I-MAX	I-MAX	A

See also Parameters: 1/08, 4/02

When you have enabled the 4Q operation of the drive [Parameter *1/08 4QEN*], this parameter limits the maximum permissible current with 4Q operation in the fourth quadrant. The maximum permissible regulator current with 4Q operation depends on the switching frequency [Parameter *4/02 CFMAX*], the peak motor current [Parameter *2/07 MPECU*] and the equipment size. You can take the exact value from the technical table in the TA-BL/P Manual Section 4.3.1.

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Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/10	RAMP	Speed ramp type	0..2	1	-

See also Parameters: 1/11, 1/12, 2/10, 2/11

There are various types of ramps available which should be used for the set-point speed value. 0 = no ramp (step function), 1 = linear ramp, 2 = S-curved ramp

0 = no ramp in effect

The motor speed complies with the set-point speed as fast as possible. The acceleration times are dependent only on the effective inertia of masses and the current available. The acceleration times are dependent on the motor's current limit [Parameter 1/07 IL1Q]. The delay times from the 4Q current limit [Parameter 1/08 4QEN and 1/09 IL4Q]. The maximum delay is only possible with a braking unit.
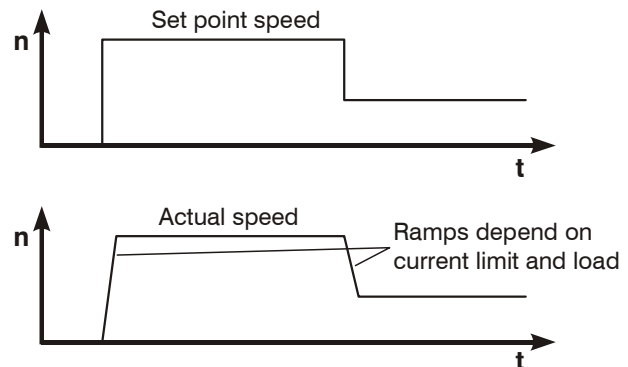
1= linear ramp

The motor speed always complies with the set-point by means of the liner ramps programmed. [Parameter 1/11 ACCEL, 1/12 DECEL or 2/10 ACCB, 2/11 DECB]. The acceleration from a dead stop to the maximum speed is carried out during the ramp period set.

Owing to gyrating masses being too high, the acceleration time can be extended. With 4Q operation not enabled [Parameter 1/08 4QEN], too low a current limit [Parameter 1/08 IL4Q] or too low DC-bus current level [Parameter OV_4Q], the delay period can be extended.
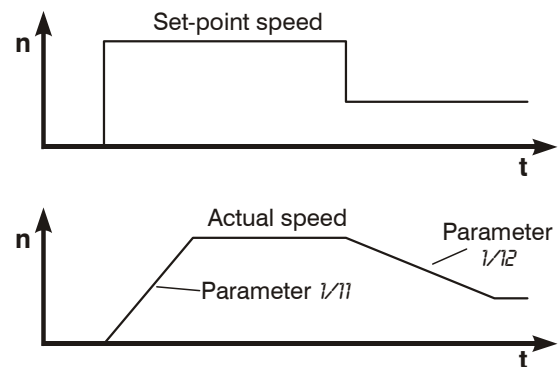
2 = S-curved ramp

The motor speed always complies with the set-point speed by means of the programmed S-curved ramps. The acceleration from a dead stop to the maximum speed is carried out during the ramp period set. [Parameter 1/11 ACCEL, 1/12 DECEL or 2/10 ACCB, 2/11 DECB]

A rounding off of the speed ramp prevents overshooting of the speed, and acceleration is limited at the beginning and end of each change of speed so as to go easy on the mechanism.
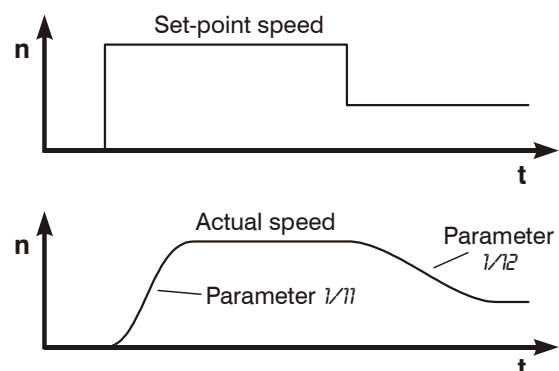
Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/11	ACCEL	Acceleration time A (start-up)	0,1..599,9	10,0	s

See also Parameters: 1/10

Setting of the acceleration time from dead stop to maximum speed.
If the drive reaches the motor's current limit [Parameter 1/07 IL1Q] during acceleration, the acceleration will be extended accordingly.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/12	DECEL	Deceleration time A (shut down)	0,1..599,9	10,0	s

See also Parameters: 1/10

Setting of the delay time from maximum speed to a dead stop.
If 4Q operation [Parameter 1/08 4QEN] has not been enabled, then the drive will spin slower and slower until it has reached the new set-point speed.

If the drive reaches the 4Q current limit [Parameter 1/09 IL4Q] during the delay, then the delay will be extended accordingly.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/13	LEADE	Leaded deceleration	0..1	0	-

See also Parameters: 1/12, 2/11

This parameter determines whether, with Controller Enable OFF, the drive spins to a stop or is brought down on a ramp to a speed of zero.

0 = When the Controller Enable is cancelled, the final stage is disabled immediately, i.e. the motor is no longer supplied with current and it spins to a stop.

1 = When the Controller Enable is cancelled, the motor is brought down to a speed of zero on the active delay ramp. The final stage is not disconnected until a speed of zero.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/14	BRAKE	0,5s stopping torque at n<10min^{-1}	0..1	0	-

See also Parameters: 1/13, 4/15

0 = Stopping torque not active

1 = Stopping torque active

This function is only supported with guided delay with Drive Lock [Parameter 1/13 LEADE = 1] supported.

If, after the Controller Enable is cancelled, the drive has fallen short of a speed limit of 10 min^{-1}, the final stage will not be disabled immediately, but rather the motor will, for another 500 ms, be kept at a speed of zero and full torque availability.

With a lifting drive, for example, the drive is stopped and then held for 500 ms until the mechanical stop brake has engaged. This prevents any sagging.

With the stop brake closed and in conjunction with a mechanical stop brake, the Controller Enable has to be withdrawn, as otherwise with the slightest control deviation the drive would run against the brake at maximum current.

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Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/15	DELOF	Drive lock at set-point value=0 & n=0	0..1	0	-

Parameter 1/15 DELOF provides an automated drive lock.
When Parameter 1/15 is at 1, the drive lock is activated automatically if both the set-point speed and the actual speed equal zero. this means that, with the motor at a stop, the controller is only connected by means of a speed set-point value unequal to zero and that the drive disconnects automatically again when the set-point value and the actual value have again reached zero.

0 = automatic drive lock not active
1 = automatic drive lock active

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/16	P AMP	Speed regulator, P-amplification	0..100	5	%

See also Parameters: 1/17

This parameter determines the amplification factor of the speed control circuit and is required to adjust the speed control circuit in a steady fashion.
If the amplification is too little, then the drive will react rather insufficiently, in particular to disturbance variables. If the amplification is too great, the drive will become unsteady, reacting jerkily.
The amplification is indicated as a percentage in relation to the greatest possible amplification allowed.

$P\ AMP = 1\%\quad \Rightarrow\quad K_p = 1$
$P\ AMP = 100\%\quad \Rightarrow\quad K_p = 100$

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/17	I AMP	Speed regulator, Integral proportion	0..100	4	%

See also Parameters: 1/16

This parameter determines the integral proportion of the speed controller, seeing to it that in stationary operation no control deviation remains.
Together with the amplification, this parameter determines the stability of the drive.
If the value is too low, then it will take the drive a very long time to comply with new set-point values, and disturbance variables will be corrected rather slowly. If the values are too high, the drive will become unsteady.
The integral proportion is indicated as a percentage in relation to the shortest integration time.

$I\ AMP = 1\%\quad \Rightarrow\quad T_I = 25\ ms$
$I\ AMP = 100\%\quad \Rightarrow\quad T_I = 0{,}25\ ms$

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
1/18	YIOP	Valid range of I-proportion in n-regulator	1..255	255	min^{-1}

See also Parameters: 1/17

The integral proportion of the speed controller can be deactivated with very dynamic applications as a function of the speed error (difference between speed set point and actual value) to obtain faster reactions to changes in set-points and to disturbance variables with less overshooting.
This function can be activated and deactivated.

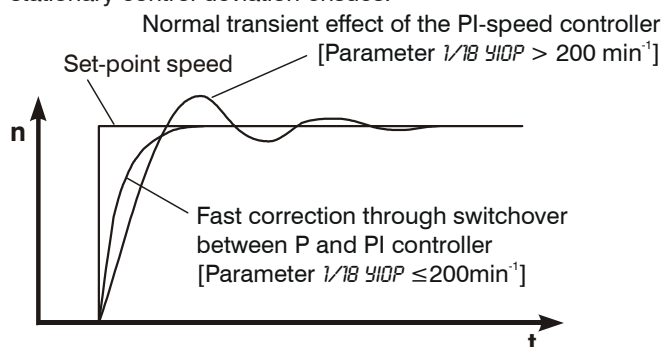$0\text{-}200\ min^{-1}\quad \Rightarrow\quad$ function active
$>200\ min^{-1}\quad \Rightarrow\quad$ function not active

CAUTION: Only use this function with very dynamic applications without a high base load, as is the case, for example, with flywheels or running gear. This function is not suited for applications with a high base load, as, for example, with extruders!

Selective deactivation and activation of the integral proportion of the speed controller allows extremely dynamic behaviour of the drive with a minimum of overshooting. This function is active when Parameter *1/18 YIOP* contains a value of ≤ 200 min^{-1}. The integral proportion of the speed controller is then deactivated until the speed error becomes less than the value in Parameter *1/18 YIOP*. This way the amplification of the controller can be increased without the drive overshooting to an extreme extent or becoming unsteady. Starting from a small speed error, the integral proportion is activated in order to eliminate the stationary control deviation.

However, if the base load of the driving motor is so great that the speed controller cannot, purely with P-proportion, adjust the speed error to a value beneath the limit in Parameter *1/18 YIOP*, then the integral proportion remains inactive and a stationary control deviation ensues.

Normal transient effect of the PI-speed controller
[Parameter *1/18 YIOP* > 200 min^{-1}]

Set-point speed

n

Fast correction through switchover
between P and PI controller
[Parameter *1/18 YIOP* $\leq$ 200min^{-1}]

t

Behaviour of the actual speed with limited and unlimited valid range of the speed controller and a load machine with a low base load

Set-point speed

n

Stationary speed deviation
is greater than the value in
Parameter *1/18 YIOP*

Actual speed with too
great a base load
(purely P-controller)

t
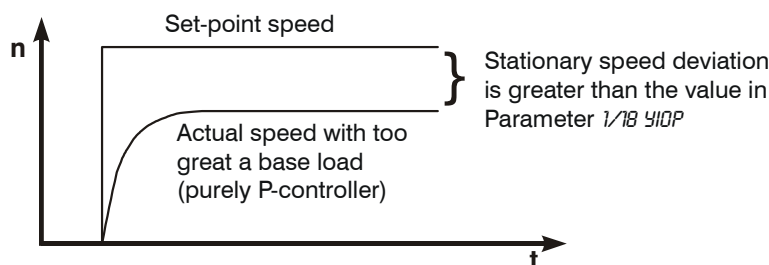
Behaviour with limited valid range of the I-proportion with the speed controller and a load machine with a great base load, so that the stationary control deviation is too great (e.g. extruder).

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
1/19	*SAVE*	Save parameter to EEPROM	*0..1*	*0*	-

See also Parameters: 2/04

All the control parameters, excluding Parameter *2/04* Motor Poles, can be changed online during operation. When all of the parameters are to be imported to the fixed storage, **the controller has to be inactive and the motor have stopped. The seven segment display on the controller signals this with a "0".**
Parameter *1/19* has to be set to 1 and then acknowledged with the ENTER key.
For safety reasons, the TA-BL/P controller does not automatically import all changes when the unit is turned off.

When the unit is turned off, all changes are lost which have not been saved manually beforehand.

Parameter Manual

2.2 Parameter Group 2

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/02	*STDRD*	Read standard parameters	*0..1*	-	-

See also Parameters: 1/19

If you set this value to "1" and then acknowledge (confirm with ENTER key), the standard parameters given in the parameter list will be loaded. If the parameters are to imported into the fixed storage, see Parameter *1/19 SAVE*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/03	*RATSP*	Motor rated speed	*0..6000*	-	min^{-1}

The rated speed of the motor according to type plate is set in these parameters.
With BL-N-types, indicate the lowest speed.

If you have acquired from TAE Antriebstechnik a complete drive package consisting of motor and controller, all the motor data has already been set and optimised in the controller.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/04	*POLES*	Motor poles	*2..32*	-	-

In these parameters the number of poles of the motor is set according to type plate.
- The motor's number of pairs of poles is absolutely necessary for the electronic commutation evaluation. Entering an incorrect value will result in malfunctioning of the drive.
- **This parameter cannot be changed during operation (online).**

If you have acquired from TAE Antriebstechnik a complete drive package consisting of motor and controller, all the motor data has already been set and optimised in the controller.

The following numbers of pairs of poles are standard for TAE-supplied motors:

Series BL-N... Neodymium Magnet Motors:		**Series BL-... Ferrite Magnet Motors:**	
BL-N-71 - BL-N-100	6 poles	BL-71 - BL-160	4 pole s
BL-N-112 - BL-N-....	8 poles	BL-180 - BL-315	8 poles

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/05	PPR	Pulses per revolution from motor x4	1..9999	-	-

In this parameter the pulses per revolution are set for the engine speed sensor (incremental transmitter). One has to enter quadruple the value of the pulses per revolution from the transmitter, because the TA-BL/P controller evaluates all of the increasing and falling edges of Tracks A and B to determine speed.

- **This parameter cannot be changed during operation (online).**

With the TAE motors, the following pulses per revolution are standard:

BL-N-71...100
BL-71 - BL-160 $\quad : \quad 30 \dfrac{\text{Impulses}}{\text{Revolution}} \times 4 = \underline{\underline{120}}$

BL-N-112...
BL-180 - BL-315 $\quad : \quad 60 \dfrac{\text{Impulses}}{\text{Revolution}} \times 4 = \underline{\underline{240}}$

TAE-Servo Motors $\quad : \quad 600 \dfrac{\text{Impulses}}{\text{Revolution}} \times 4 = \underline{\underline{2400}}$

If you have acquired from TAE Antriebstechnik a complete drive package consisting of motor and controller, all the motor data has already been set and optimised in the controller.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/06	MRACU	Motor rated current	1,0..3000,0	-	A

The rated motor current is set in this parameter according to the motor type plate.

If you have acquired from TAE Antriebstechnik a complete drive package consisting of motor and controller, all the motor data has already been set and optimised in the controller.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/07	MPECU	Motor peak current	1,0..3000,0	-	A

See also Parameters: 1/07

The peak motor current is set in this parameter according to the motor type plate.

Caution: It is absolutely essential for the peak motor current to be set correctly. With this parameter set incorrectly, the motor can be damaged!

If the peak motor current is set too high, the motor might get demagnetised, causing the torque availability of the drive package to drop.
If the peak motor current is set too low, the controller will limit the motor current too soon, which will have an effect on the available motor torque.

If you have acquired from TAE Antriebstechnik a complete drive package consisting of motor and controller, all the motor data has already been set and optimised in the controller.

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/08	OCTIM	Overcurrent time	0..200	80	s

See also Parameters: 2/06

When there are sudden mechanical peak loads or with a high start-up torque, the drive is able to produce a higher motor torque up to 200 s.

The overcurrent time begins to expire when the motor current has exceeded the rated motor current. The controller allows the maximum regulator current until the overcurrent time lapses. During this period the controller will be thermally overloaded. The overloading capacity is within a range of 120% to 150%, depending on the controller. When the overcurrent period lapses the output current **is only** reduced to the rated controller current **if the speed is less than 300 min^{-1}.**

When the rated controller current is fallen short of, the overcurrent period begins to run up again so that afterwards overload current is again available.

Example: Setting of 200 s

When the output current has exceeded the rated controller current, the overcurrent time begins to run. In 200 s, the output current is limited to the rated controller value so that the controller will not be overloaded thermally. If the rated controller current is then fallen short of for 30 s, the overload current will afterwards again be available for 30 s.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/09	SETAB	Selection ramp A or B	0..6	0	-

See also Parameters: 1/11, 1/12, 2/10, 2/11, 2/18

There are two different and independent pairs of speed ramps available which are capable of being parameterised. With Parameter *2/09 SETAB* one determines when Ramp Pair A or B is active. The start-up time and the shut-down time are adjustable separately from one another.

0 = Ramp Pair A are always active.

1 = Beneath the selected speed in Parameter *2/18 SWTR*, Speed Ramp Pair A are used and above it, Speed Ramp Pair B.

3 = Speed Ramp Pair A is used with a positive direction of rotation (cw, clockwise rotation), and Speed Ramp Pair B with a negative direction of rotation (ccw, counter clockwise rotation).

Example: Parameter *2/09*=3

4 = Speed Ramp Pair B is always used.

5 = With a speed specification above motor potentiometer, Speed Ramp Pair B are used. Otherwise always Speed Ramp Pair A

6 = A switchover is carried out between Speed Ramp Pairs A and B by means of a digital input. (The assignment to a terminal is specified by means of Parameter *3/19 SSETB*.

7 = If the controller works in slavemode, the ramp time *ACCB* parameter *2/10* and *DECB* parameter *2/11* get active.
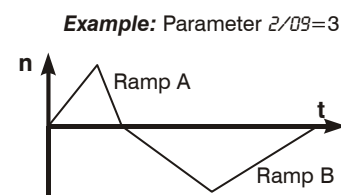
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/10	ACC B	Acceleration time B (start-up)	0,1..599,9	180,0	s

See also Parameters: 1/02, 1/10, 1/11, 1/12, 2/09, 2/11

Adjustment of the acceleration time from dead stop until the maximum motor speed [Parameter *1/02 MAXS*].
The acceleration speed is indicated in increments of 0.1 s.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/11	DEC B	Deceleration time B (shut down)	0,1..599,9	180,0	s

See also Parameters: 1/02, 1/10, 1/11, 1/12, 2/09, 2/10

Adjustment of the delay time from the maximum motor sped [Parameter 1/02 MAXS] until dead stop.
The delay time is indicated in increments of 0.1 s.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/12	PHADV	Phase advance	0..1	0	-

See also Parameters: 2/13, 2/14

0 = inactive
1 = active

Starting from 20% rated current and 300 min^{-1}, using the Advance Function phase enables shifting the electronic commutation of the current as a function of the speed. This makes it possible to keep the ratio of motor current to torque constant up to the rated motor speed. The Advanced Function phase also makes it possible to operate the motor beyond the rated speed [Parameter 2/03 RATSP] with constant power. Above the rated speed, the behaviour of the brushless D.C. motor with the Advance Function phase is similar to the behaviour of the D.C. motor in the field weakening.

With BL-N... neodymium motors, the rated speed can, with the help of the Advanced phase, be raised to the higher rated speed indicated on the type plate. The motor output increases accordingly.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/13	PHADR	Phase advance at nominal speed	0.99	30	%

See also Parameters: 2/12, 2/14

By means of Parameter 2/13 PHADR, the shifting is set of the commutation for the rated motor speed. This value is indicated as a percentage in relation to the maximum possible angle of shift.
The effective angle of shift of the commutation depends on the motor speed of the drive. A general adjustment of this parameter cannot be demonstrated, because the best possible value depends on the leakage inductance of the motor, the number of pairs of poles and other motor parameters. The standard value indicated constitutes an average value which has been found from experience in the past with a very broad spectrum of applications.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/14	PHADM	Phase advance at maximum speed	0.99	50	%

See also Parameters: 2/12, 2/13

The shifting of the electronic commutation above the rated motor speed is determined by means of Parameter 2/14 PHADM. Through a well-adjusted Advanced Function phase, the motor can be operated at up to around 1.5 times the rated motor speed.

As with the D.C. motor or rotary current motor, the available torque decreases starting from the rated speed with increasing speed.

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/15	INCR	Increase speed multiplier	0..9999	0	min⁻¹/-

See also Parameters: 3/11, 3/13

The Increase Speed function depends on whether the drive is running as a master drive (master) or slave drive (slave). The operating mode master or slave is determined in Parameter *3/13 SSLAV*.

- Operation as master drive (master)
  When the drive is running as master drive, with Increase Speed active, the speed value from Parameter *2/15 INCR* is added to the set-point value selected.
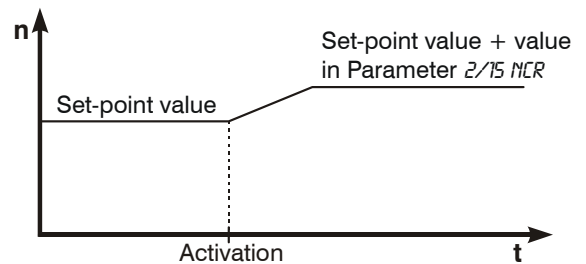
- Operation as slave operation (slave)
  When the drive is operated as slave drive, then with Increase Speed active, the multiplier between master and slave drive is increased according to the following formula.
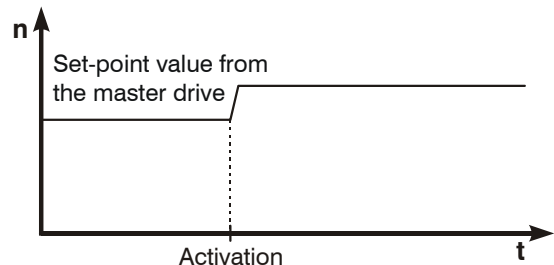
$$\text{Master speed} \times \frac{\left(\textit{TRAN1} \text{ Parameter } 4/12 + \textit{INCR} \text{ Parameter } 2/15\right)}{\textit{TRAN2} \text{ Parameter } 4/13}$$

With adjusted and activated fixed ratios, the active ratio replaces *TRAN1*. Parameters *1/04* to *1/06* and/or Parameters *3/04* and *3/07*.

The increase in speed is activated or deactivated by means of Parameter *3/11 SINC*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/16	DECR	Decrease speed, multiplier	0.9999	0	min⁻¹ / -

See also Parameters: 3/12, 3/13

The function of Decrease Speed functions analogously to Increase Speed [Parameter *2/15 INCR*]

$$\text{Master speed} \times \frac{\left(\textit{TRAN1} \text{ Parameter } 4/12 - \textit{DECR} \text{ Parameter } 2/16\right)}{\textit{TRAN2} \text{ Parameter } 4/13}$$

The increase in speed is activated or deactivated by means of Parameter *3/12 SDEC*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/11	FINE	Speed fine tuning	0..3	0	1/4 min⁻¹

If the drive is given a fixed set-point value, such as the case when using preset speeds or with specified set-point values via a bus system, then the set-point value can only be specified in whole revolutions per minute. By means of Fine Adjustment, the precision of the specified set-point value is corrected by a factor of four, because the set-point value can then be exactly specified with a resolution of ¼ rotation.

A value of $\dfrac{\text{Parameter } 2/11}{4}$ rotations is added to the set-point value.

Example: ¼, ½, ¾

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/18	SWTR	Speed message	10..6000	100	min⁻¹

See also Parameters: 2/09, 3/37, 3/38, 3/39, 3/40, 3/41

The control unit has a freely adjustable overspeed monitor. By means of Parameter *2/18 SWTR*, a switching point can be freely selected between 10 min⁻¹ and 6000 min⁻¹. The information as to whether the momentary speed is greater than the switching point can be used either through a digital output or internally, for a ramp switchover, for example.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/19	IL2O	Message delay, current limit reached	1..9999	1	s

See also Parameters: 3/37, 3/38, 3/39, 3/40, 3/41

TA-BL/P controlling equipment is able to report when the motor current has exceeded the parameterised value of the controller max. current in Parameter *1/07 IL1O* or in Parameter *1/09 IL4O*. This report is issued via a digital output with the delay in Parameter *2/19 IL2O*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/20	CODO	Fixed configuration of the digital outputs	0..1	0	-

The fixed configuration of the digital outputs enables detailed reporting of error messages by the TA-BL/P through the digital outputs. When Parameter *2/20 CODO* is active (value = 1), the parameters of the digital output programming *3/37* to *3/46* are not active and their settings have no effects upon the functioning of the outputs. You can find the exact allocation of the digital outputs with fixed configuration of the digital outputs in the following table.

Fault	43	44	45	47	48
Common fault	-	-	-	0	-
Ready	-	-	-	1	1
Speed > 0	-	-	1	1	-
Current limit reached	-	0	-	1	-
Short circuit	-	1	-	0	-
Error in intermediate circuit	-	-	-	0	1
Excess temperature	-	-	1	0	1

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/21	*DIRAN*	Reverse by negative input voltage	*0..1*	*0*	-

Siehe auch Parameter: 3/05

This parameter makes it possible to activate a reversal in the direction of rotation with negative analogue set-point value. If Parameter *2/21 DIRAN* is set to 0, the motor always run in positive direction irrespective of the polarity sign of the set-point value signal (value formation).

If Parameter *2/21 DIRAN* is set to 1, then, with positive analogue set-point value the motor runs clockwise and with negative analogue set-point value counter-clockwise. If the direction of rotation is changed through the digital output, the drive will behave the other way around.

Only possible when Analogue Input 1 is used				
	Parameter *2/21* = 0		Parameter *2/21* = 1	
	Start Right	Start Left	Start Right	Start Left
positiveanalogue set-point value	Clockwise(CW)	Counter-clockwise (CCW)	Clockwise (CW)	Counter-clockwise (CCW)
negativeanalogue set-point value	Clockwise(CW)	Counter-clockwise (CCW)	Counter-clockwise (CCW)	Clockwise (CW)

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/22	*4MA*	Analogue input 1, 0-20 mA or 4-20 mA	*0..1*	*0*	-

With analogue specification of set-point value by means of current set-point, it must be entered in Parameter *2/22* whether the signal is with 0-20 mA or 4-20 mA.
The following table shows how to adjust Parameter *2/22 4MA*.

Set-point value specification	Parameter *2/22 4MA*
0-20mA	0
4-20mA	1

Be sure to bear in mind that the DIP switches on the controller board also have to be adjusted in accordance with the connection diagram in the TA-BL/P Manual section 6.2.3.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/23	*CLT1*	Torque limit, time constant	*0,01..300,00*	*0,01*	s

See also Parameters: 3/50

When the current limit is specified by means of an analogue input or a digital value setting, the current set-point is guided via a low-pass filter in order to damp the input signal. The time constant of the low-pass filter is determined by means of Parameter *2/23 CLT1*.

The lower the value in Parameter *2/23 CLT1* is, the more dynamic the current limit can change and the less also is the suppression of interfering signals.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/24	UVTIM	Delay of undervoltage switch off	0,0..3000,0	0,1	s

With TA-BL/P controlling equipment, the line voltage is not monitored directly, because the control-system electronics are supplied from the intermediate circuit. The monitoring of line under voltage is based on the intermediate circuit voltage measured. When the intermediate circuit voltage drops below the undervoltage limit, the TA-BL/P controller recognises the undercurrent error. This undercurrent error immediately activates the internal controller disable and then no more current is supplied to the motor.

The error message is delayed by the time period parameterised in Parameter 2/24 UVTIM.

When the time period in Parameter 2/24 UVTIM lapses, the error is saved and has to be reset either by an external reset command or through the controller being turned on and off.

If the time period in Parameter 2/24 UVTIM has not yet lapsed, and the DC-bus voltage again rises above the undercurrent limit, then the controller will automatically again start regular operation without error disconnection.
The undercurrent limit is has a fixed setting and cannot be modified.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/25	OV_4Q	Maximum reducing circuit voltage	100..1500	800	V

See also Parameters: 1/08

To be able to operate the TA-BL/P controller in 4Q-mode, this mode of operation has to be cleared with Parameter 1/08 4QEN!
When operating the TA-BL/P controlling equipment in 4Q-mode, power is taken away from the load machine, which is stored in the DC-bus and then converted by means of a braking unit. If no braking unit is used, or if the output converted is too low, the intermediate circuit current will rise. When it has reached the overcurrent, the TA-BL/P disconnects hardware-wise with the message, "overcurrent in intermediate circuit" so as to protect the power semiconductor and the intermediate circuit capacitors.

Parameter 2/25 OV_4Q enables operation of the TA-BL/P controller in 4Q-mode operation even without an external braking unit. The braking power is reduced when the voltage set in Parameter 2/25 OV-4Q is reached to the point that the intermediate circuit voltage does not exceed the value set. Take into account, however, that this will extend the brake ramp.

Also bear in mind that any braking units used optionally will not function correctly if the value for the maximum intermediate circuit voltage in Parameter 2/25 OV_4Q is set too low.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/26	PTQL	Programable torque limit	0...100	100	%

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/27	MPTUL	Motorpoti transmission limit (UP)	0...100	0	%

See also Parameters: 2/28

Slave ratio "UPWARDS" through the motor transmission can be adjusted to the pre-set ratio of the motor in percent..

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
2/28	MPTDL	Motorpoti transmission limit (DOWN)	0...100	0	%

See also Parameters: 2/27

Slave ratio "DOWNWARDS" through the motor transmission can be adjusted to the pre-set ratio of the motor in percent..

Parameter Manual

2.3 Parameter Group 3

Parameters *3/02* - *3/24* are activated either by means of:

Terminal 2-13: If the number of a terminal (2-13) is programmed, the function is activated through this digital input.

or programming device: Wird die Zahl 0 programmiert ist die Funktion immer Aus.
Wird die Zahl 1 programmiert ist die Funktion immer Ein.

Input low or high active? See Parameters 3/25-3/26

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/02	SRES	Reset fault	0..13	2	-

All the error messages saved in the unit can be reset by means of an external signal. Parameter *3/02 SRES* prescribes which terminal is allocated with the function Reset Error, or deactivates this functions.

An error condition is reported by means of the unit's 7-segment display, this display showing Error *F0-F9* or *E1*.

A list of all the error messages can be found in the appendix to these Operating instructions.

A reset is, of course, only possible with controller inactive and with dead stop of the motor.

When an error occurs, the display of Keypad PG3000 changes from green to red. Even after a reset of the error, the display of the Keypad will remain red until the error has been manually reset on the Keypad.

Errors can also be reset by be controlling equipment being disconnected from the mains until all the displays go out.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/03	SRUN	Run	0..13	3	-

A controller clearance has to be made so that the TA-BL/P controlling equipment can be operated. Parameter *3/03 SRUN* is allocated to a terminal with the programmable controller clearance.

In addition to the controller clearance programmable with Parameter *3/03 SRUN*, Terminal 5 has a fixed effectiveness via the hardware as the controller clearance.

To be able to reset an error, the drive has to have come to a stop and the controller clearance has to have been deactivated!

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/04	*SPRS1*	Preset speed 1 / Multiplier 1	*0..13*	*4*	-

See also Parameters: 1/04, 1/05, 1/06, 4/12

The TA-BL/P controlling equipment has three programmable preset speeds, which can be called up via two digital inputs or the keypad. The following table illustrates the selection of the active preset speed or of the active multiplier at which the drive runs.

SPRS1 Parameter *3/04*	*SPRS2* Parameter *3/04*	Master mode	Slave operation
deactivated	deactivated	Standard set-point value	TRAN1 Parameter 4/12
activated	deactivated	Preset Speed 1 Parameter *1/04*	Multiplier 1 Parameter *1/04*
deactivated	activated	Preset Speed 2 Parameter *1/05*	Multiplier 2 Parameter *1/05*
activated	activated	Preset Speed 3 Parameter *1/06*	Multiplier 3 Parameter *1/06*

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/05	*SDIR*	Direction of rotation (Master mode)	*0..13*	*5*	-

See also Parameters: 3/20

With operation as master drive, the direction of rotation has fixed definition as clockwise (CW) and counter-clockwise (CCW). The standard direction is clockwise.

With operation as slave drive, be sure take into account Parameter *3/20 SLDIR*.

Terminal 5 always activates controller clearance (hardware). This function makes it possible to start the controller to counter-clockwise with a signal (bit).

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/06	SHOLD	Quick stop	0..13	6	-

See also Parameters: 1/08, 1/09, 4/05

When Parameter *3/06 SHOLD* is activated, then a braking procedure is initiated with maximum available torque at the 4Q current limit (Parameter *1/09 IL4Q*).

To be able to use the function, however, the drive has to be operated as a servo-controller (Parameter *4/05 SERVO="1"*) or 4Q drive (Parameter *1/08 4 QEN="1"*), and a braking unit should be used (such as Bremschopper BC2.1 or BC3.1). If one foregoes using a braking unit, then the braking torque will only amount to approx. 3% of the rated torque.

If the drive is only operated in the first quadrant (Parameter *1/08 4QEN="0"*), then the drive will spin to a stop according to the centrifugal mass of the machine.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/07	SPRS2	Preset speed 2 / Multiplier 2	0..13	7	-

See also Parameters: 3/04, 2/09

Parameter *3/07 SPRS2* is for selecting a second preset speed. The way it functions is analogous to Parameter *3/08 SPRS1*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/08	SMOT	Motor potentiometer function / ON-OFF	0..13	8	-

See also Parameters: 3/09, 3/10, 2/09

The functioning of the motor potentiometer is different in operation in the master and slave modes.

<u>Motor pot. functioning in master drive operation (master drive)</u>

- When the motor potentiometer function is activated the first time after the drive has been turned on (PowerOn), the motor potentiometer adopts the speed set-point value current at that moment. From there the speed can be increased or decreased (see Parameter *3/09* and *3/10*).
- When the motor potentiometer is deactivated, the last value will be saved and so it will be available and used when the function is activated again.
- When the voltage supply to the unit is stopped, the last motor potentiometer value is lost.
- Reset the motor potentiometer to "0".

    The speed set point of the motor potentiometer can be reset to zero by, with motor potentiometer activated, "Up" (Parameter *3/09 SUP*) and "Down" (Parameter *3/10 SDOWN*) are activated simultaneously.
- Adopt the current speed for the motor potentiometer.
- If, with deactivated motor potentiometer "Up" (Parameter *3/09 SUP*) and "Down" (Parameter *3/10 SDOWN*) are activated simultaneously, then the current speed will be adopted for the motor potentiometer.
- Ramp selection, see Parameter *2/09*.
- Ramp time set refers to the 0-max. speed.

Motor potentiometer functioning in slave drive operation (slave drive)

- When operating in slave drive, the motor potentiometer is for controlling the multiplier to the master drive.
- When the motor potentiometer function is activated for the first time after the drive has been turned on, the current multiplier is adopted. From there the multiplier to the master drive can then be increased or decreased (see Parameter *3/09* and *3/10*).
- With simultaneous activation of "Up" (Parameter *3/09 SUP*) and "Down" (Parameter *3/10 SDOWN*), the fixed multiplier set will always be adopted.
- Ramp time refers to: 0 - 64000 x master speed.

If a value between ≥2 and ≤13 is set in Parameter *3/08 SMOT*, then this value directly represents the terminal allocated with the function.
If a "0" is entered, then the function is deactivated; if a "1" is entered, then the function is activated.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/09	*SUP*	Motor poti function speed-up	*0..13*	*9*	-

See also Parameters: 3/08

The value of the motor potentiometer is increased as long as Parameter *3/09 SUP* is activated. With master drive, the set-point speed is increased, and with master drive the multiplier.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/10	*SDOWN*	Motor poti function speed-down	*0..13*	*10*	-

See also Parameters: 3/08

The value of the motor pot. is decreased as long as Parameter *3/10 SDOWN* is activated. With master drive, the set-point speed is decreased, and with master drive the multiplier.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/11	*SINC*	Increase speed / speed multiplier	*0..13*	*11*	-

See also Parameters: 2/15

When Parameter *3/11* is activated, in master drive operation (master) the set-point speed is increased by the value in Parameter *2/15 INCR*.

In slave drive operation, the multiplication factor is increased by the value in Parameter *2/15 INCR*.

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/12	SDEC	Decrease speed / speed multiplier	0..13	12	-

See also Parameters: 2/16

When Parameter *3/12 SDEC* is activated, in master drive operation (master) the set-point speed is decreased by the value in Parameter *2/16 DECR*.
In slave drive operation, the multiplication factor is decreased by the value in Parameter *2/16 DECR*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/13	SSLAV	Master / Slave	0..13	13	-

See also Parameters: 1/04, 2/15, 4/09, 4/10, 4/11

Parameter *3/13 SSLAV* determines whether the drive is operated as a master or slave drive. When this function is deactivated, the drive functions as in the master mode and when it is activated in the slave mode.

Operation as master drive
- If the speed specification is made via the analogue inputs (0-10 V or 0(4)-20mA), then this equivalent to a speed range from the minimum speed (Parameter *1/03 MINS*) to the maximum speed (Parameter *1/02 MAXS*).
- The preset speeds are entered with the PG3000 Programming Device or on the PC in min^{-1}. (Parameter *1/04 PRST1-1/06 PRST3*)
- Direct specification of speed is entered by means of the PG3000 Programming Device or on the PC in min^{-1}.
- Increases or decreases in the speed are entered in min^{-1}; see Parameter *3/08, 2/15*.

Operation as slave drive
- Operation as slave drive is equivalent to operation as electronic gearing. This means the drive follows a master drive that has fixed specification of the multiplier, which can be freely adjusted.
- The master set point is always prescribed for slave drives in the form of a frequency, which is proportional to the master speed. Alternatively, the master set point can read as an A/B frequency impulse with 90° offset or as an A frequency impulse + rotational-direction signal to Terminals 33-35 (see also Connections Diagram in the TA-BL/P Manual Section 6.2.3).
- Speed specification via the analogue inputs is not working.
- The multipliers are prescribed with the PG3000 Programming Device or on the PC according to the formulas listed below.
- The multiplier decrease or increase is also decreased or increased according to the relevant formula given. See description of Parameters *2/15, 3/08*.
- The speed of the drive is always limited to a maximum speed.
- The master speed is multiplied by the value of Parameter *4/12 TRAN1* and then divided by the value of Parameter *4/13 TRAN2* and then used as the set-point speed.
- When using several fixed multipliers, the master speed is multiplied by the values of multipliers 1-3 (Parameter *1/04-1/06*)
- **Parameter *4/11 PPRM* determines the number of impulses per rotation of the master drive. By doing so, this also makes it possible to display the speed of the master drive.**

Multiplier between master drive and slave drive:

When using a fixed multiplier:

$$\text{Multiplier} = \frac{\text{Parameter } 1/04 \ldots 1/06 \ (PRST1 \ldots PRST3)}{\text{Parameter } 4/13 \ TRAN2}$$

otherwise:

$$\text{Multiplier} = \frac{\text{Parameter } 4/12 \ TRAN1}{\text{Parameter } 4/13 \ TRAN2}$$

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/14	*SPOS*	Positioning	*0..13*	*0*	-

This function is not supported in the current software.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/15	*SSYNC*	Synchron., angle or speed	*0..13*	*1*	-

See also Parameters: *4/14*

When operating the TA-BL/P controller as slave drive, two operating modes are possible:

Inactive =   angle synchronous
Active   =   speed synchronous

- With angle synchronisation, sudden differences in speed between master drive and slave drive (e.g. through a load surge) are corrected. If the slave drive cannot follow the master drive quickly, then the impulses missed will be added up and made up for later so that no angle error between master and slave drive develops. The position of the drives to one another is maintained in this operating mode.

- With speed synchronisation, the slave drive is regulated to the master drive at a fixed speed ratio. Any shift of angle, through sudden loading, for example, is not readjusted.

Parameter *3/15 SSYNC* does not influence the behaviour of the drive when the current limit is reached. Parameter *4/14 LIMIT* determines how the drive behaves when the current limit is reached.

If Parameter *4/14 LIMIT* contains the value 1, then lost impulses will be "forgotten" then the current limit is reached and not made up for. A typical application are, for example, drives on endless production facilities. If Parameter *4/14 LIMIT* is set to the value 0, then "lost" impulses will be added up when the current limit is reached and caught up with as soon as possible. A typical application is positioning drives.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/16	*SANG*	Angle correction	*0..13*	*0*	-

This function is not supported in the current software.

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/17	SICW	End switch clockwise (cw)	0..13	0	-

Inactive = End switch function Off
Active = End switch function On

The prelim end switch function makes it possible to input prelim end switches directly into the TA-BL/P controller (e.g. for hoisting and running gear). When the prelim end switch is actuated, the drives stops and then cannot be started clockwise as long as the end switch has not been actuated.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/18	SICCW	End switch counter-clockwise (ccw)	0..13	0	-

Inactive = End switch function Off
Active = End switch function On

The functioning of this is analogous to Parameter 3/17 SICW, but with disabling of counter-clockwise.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/19	SSETB	Ramp A or B selection	0..13	0	-

See also Parameters: 2/09

Inactive = Ramp Pair A active
Active = Ramp Pair B active

By means of Parameter 3/19 SSETB, a switch can be made between Ramp Pairs A and B.

This parameter is only active when Parameter 2/09 SETAB = "6" (external ramp selection) has been set!

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/20	SLDIR	Change rotating direction for follow-up drives	0..13	0	-

Inactive = The slave has the same direction of rotation as the master drive
Active = The slave rotates in the inverse direction of rotation of the master drive

When operating the TA-BL/P controller as slave drive with A/B track admittance, the direction of rotation does not have fixed definition, because the direction of rotation is changed by the change of tracks A and B. To save on the wiring involved and on changes to the documentation, the direction of rotation can be inverted.

Caution:
If the direction of rotation is changed while the motor is running, this will occur at max. torque.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/21	SECL	External current limit	0..13	0	-

See also Parameters: 3/50

Inactive = Internal current limit
Active = External current limit

When Parameter 3/21 SECL is set to active, the limiting of the motor current will carried out as a function of the analogue signal. Further information can be found under Parameter 3/50.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/22	SSER	External error shut down	0..13	0	-

Via the digital input prescribed in Parameter 3/22, an external error disconnection can be produced (e.g. overloading of the motor's separate fan).

The TA-BL/P controlling equipment treats such an error disconnection as an internal error and disables the controller. The display shows the Error Message "E1" and the PG3000 displays "EXT".

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/23	SSDC	Disable controller	0...13	0	-

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/24	STLAP	Torque limit analog / Programmable	0...13	0	-

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Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
_3/25...36_	_IPL2...13_	Input logic terminals 2 to 13	_0..1_	_1_	-

The polarities of the digital inputs can be determined by means of the following parameters (see Parameters _3/02_ to _3/22_). When the respective polarity bit has been set, the terminal is inactive and is activated by the application of a direct voltage of (15 V to 30 V). With a polarity bit of a terminal not set, the opposite applies. This means that if the respective polarity bit of a terminal is not set, then the terminal is active and is deactivated by the application of a direct voltage of (15 V to 30 V) (see table).

Digital Inputs Direct Voltage (15 to 30V)	Polarity of Digital Inputs _IPL2....IPL13_	Function Parameters (_3/02_ to _3/22_)
0	0	activated
0	1	deactivated
1	0	deactivated
1	1	activated

Remark:
The voltage levels under 3 V apply to the digital inputs as Low and over 8 V as High. Since the digital inputs bear a maximum voltage of only 30 V, the direct voltage to be applied should be less than this value.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
_3/37_	_5048_	Function Relay 1 (Terminal 48)	_0..13_	_4_	-

*See also Parameters: _3/42_*

The function of Relay Output (1 make contact) is prescribed by means of Parameter _3/37 5048_. Nine different allocations are available, which are listed in the following table.

Setting	Function
0	not allocated
1	Commonfault
2	Current limit reached, delayed
3	Speed reached
4	Ready for operation
5	Operation
6	Speed message
7	Speed > 9min^{-1}
8	Current limit
9	Passed motor current
10	Reserve
11	Motor in position
12	Motor speed reached (only at positioning)
13	Passed position

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/38	*SO47*	Function Relay 2 (Terminal 47)	*0..13*	*1*	-

See also Parameters: 3/37, 3/43

The function of Relay Output 2 (break contact)
is prescribed by means of Parameter *3/38 SO47*. Nine different allocations are available, which are listed under Parameter *3/37 SO48*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/39	*SOK45*	Function digital output 1 (Terminal 45)	*0..13*	*7*	-

See also Parameters: 3/37, 3/44

The function of Digital Output 1 (optocoupler) is prescribed by means of Parameter *3/39 SOK45*. There nine different allocations available, which are listed under Parameter *3/37 SO48*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/40	*SOK44*	Function digital output 2 (Terminal 44)	*0..13*	*2*	-

See also Parameters: 3/37, 3/45

The function of Digital Output 2 (optocoupler) is prescribed by means of Parameter *3/40 SOK44*. There nine different allocations available, which are listed under Parameter *3/37 SO48*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/41	*SOK43*	Function digital output 3 (Terminal 43)	*0..13*	*6*	-

See also Parameters: 3/37, 3/46

The function of Digital Output 3 (optocoupler) is prescribed by means of Parameter *3/41 SOK43*. There nine different allocations available, which are listed under Parameter *3/37 SO48*.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/42...46	*PO48...43*	Output logic	*0..1*	-	-

The logic of the relay and/or optocoupler outputs can be realised in the following table.

	Outputs	Parameter *3/42-46*		Relay or optocoupler	Standard parameter
Function selected in Parameter *3/37* active	Relay (break contact) Tm. 48	P048	0	Inactive	1
			1	Active	
	Relay (make contact) Tm. 47	P047	0	Inactive	1
			1	Active	
	Optocoupler (make contact) Tm. 45	P045	0	Inactive	1
			1	Active	
	Optocoupler (make contact) Tm. 44	P044	0	Inactive	0
			1	Active	
	Optocoupler (make contact) Tm. 43	P043	0	Inactive	1
			1	Active	

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Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/47	AOSEL	Function Analogue output	1..2	1	-

See also Parameters: 3/72

0-10 V = 0-max. speed (clockwise)

Parameter 3/47 AOSEL determines the allocation of the analogue output on Terminal 21.

   1 = motor speed   0 - 10V ≙ 0- max. speed; clockwise (maximum speed in Parameter 1/02 MAXS)

                          0-(-10V) ≙ 0- max. speed; counter-clockwise (maximum speed in Parameter 1/02 MAXS)

   2 = motor current   (0 - 5V ≙ 0 - rated equipment current)

   The polarity of the analogue output can be inverted by means of Parameter 3/72.

The motor current is also available at Terminals 0 and I. (not programmable)

-5V ≙ Rated equipment current

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/48	RSEL1	Set-point speed with ramp	0..15	1	-

See also Parameters: 3/49

0= Function not allocated to any analogue input

1= Analogue Input 1 (Terminal 19)

2= Analogue Input 2 (Terminal 20)

Parameter 3/48 RSEL1 determines, with operation in master mode (master) the analogue input for the speed set point before the ramp generator. The drive follows each change in the set-point speed with the active speed ramp.

0-10V ≙ 0-max. speed (Parameter 1/02 MAXS).

0- (-10V) see Parameter 2/21.

The speed set point selected in Parameter 3/49 RSEL2 is added to the speed set point selected here after the ramp generator.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/49	RSEL2	Set-point speed without ramp	0..15	0	-

See also Parameters: 3/48

0= Function not allocated to any analogue input

1= Analogue Input 1 (Terminal 19)

2= Analogue Input 2 (Terminal 20)

Parameter 3/49 RSEL2 determines which analogue input is assigned a speed set point without start-up/shut-down ramp.

The set-point value defined in Parameter 3/49 RSEL2 results in an immediately change of speed with max. torque on the motor.

The speed set point defined in Parameter 3/49 RSEL2 is added to the set-point value defined in Parameter 3/48 RSEL1 after the speed ramp generator.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/50	RSEL3	Set-point value, torque limit	0..15	0	-

0= Function not allocated to any analogue input
1= Analogue Input 1 (Terminal 19)
2= Analogue Input 2 (Terminal 20)

Parameter 3/50 RSEL3 determines the analogue input for external torque limitation. This function can be used as torque limitation, because with the brushless direct voltage drive, the motor current matches the torque of the drive within broad limits. The torque precision attainable depends on the speed control range required.

The input is scaled such that 10 V or 20 mA (20 mA only possible with analogue input 1; see TA-BL/P Manual Connections Diagram, Item 6.2.3) is equivalent to the limitation of the motor current to the maximum equipment current.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/51	RSEL4	Source of Position maximum speed	0..15	0	-

The source of maximum positioning speed (analog or digital) can be selected through Parameter 3/51
3/51 = 0 Digital Value = (2/34)   Position maximum speed done by field bus system
3/51 = 1 Analog input 1   Position maximum speed done by analog input 1
3/51 = 2 Analog input 2   Position maximum speed done by analog input 2

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/52-53	RSEL5-6	Selection of analogue input (reserved)	0..15	0	-

These parameters are reserved for later use and are not used in the current software.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/54	TRQEN	Operate torque regulation	0..1	0	-

See also Parameters: 1/07

Parameter for turning on and off the torque limitation. When this bit is set to 1, then the superimposed control circuit functions as a torque limiter and can be attained especially at the current limit in the rated speed range or higher speed rang, where the EMF plays a big part, linear torque speed property of the brushless DC motor used. The current control circuit is subordinate to the speed controller. When the bit is not set, the peak current is limited. However, this is not proportional to the torque over the entire course of speed.
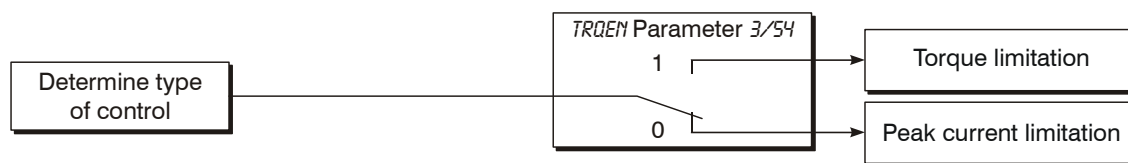
Example 1: Parameter 3/54 = 0   *Example 2: Parameter 3/54 = 1*
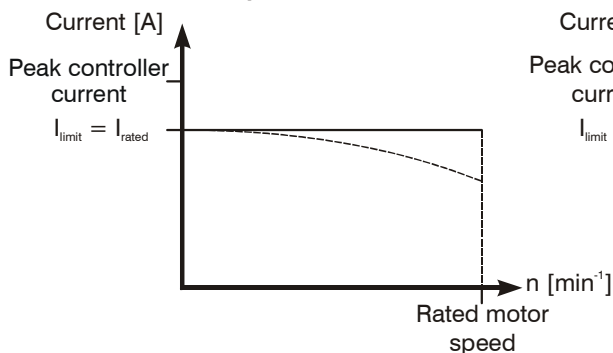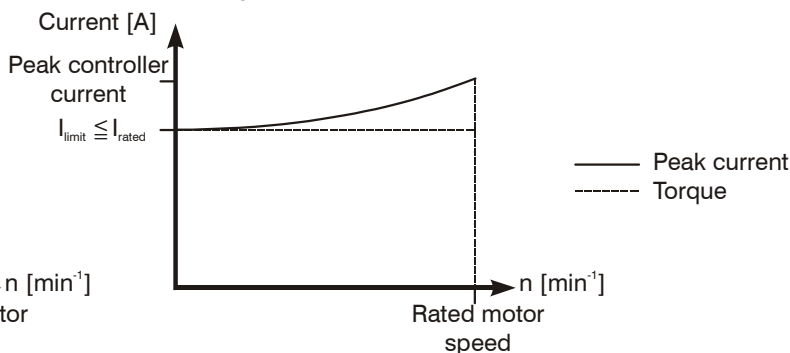
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As can be seen in the diagram, a linear torque limitation is only possible when the max. current adjusted Parameter *1/ 07 ILIQ* is not greater than the rated controller current. (See following example.)

Example 3: Parameter *3/54* = 1
(however I-limit Parameter 1/07 ILIQ is greater than rated current)
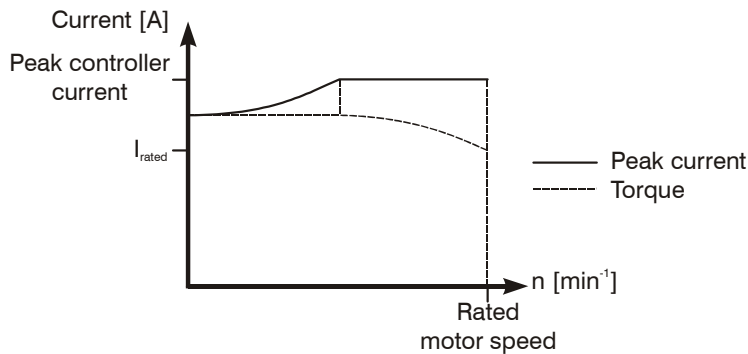
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/55	*KLIXEN*	Thermal switch active	*0..1*	*0*	-

0 = Only message
1 = Drive stop (group malfunction)

In Parameter *3/55* one can prescribe whether motor excess temperature should trigger a malfunction in TA-BL/P, i.e. a motor stop, if only a message should be issued.
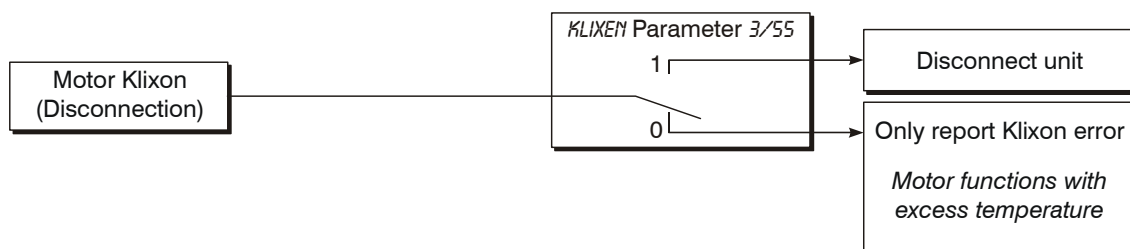
Note:
Before a Klixon error occurs, a preliminary warning is given n advance by a second Klixon.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/56...71	*PPOR...PP7W*	Profibus parameters	*0..255*	*0*	-

3/56 to *3/71* Profibus parameter:

PP(x)*R* for Read and *PP*(x)*W* for Write, it being possible for x to be a value from 0 to 7.

The parameter Read *PP*(x)*R*:

With this function an automation unit can obtain all the information about the condition of a static power converter. Provided they are limited by write disable or access rights, all the parameters (values, description, texts) are readable.

Parameter Write *PP*(x)*W*:

With this function a master can change the informational content of a parameter. Provided they are limited by access rights, the parameter values and some of the parameter descriptions can be changed.

Note:
With TA-BL/P equipment, the values listed in the Profibus description (Profibus-DP Initial Start-up and Adjusting Instructions), can easily be read (status register) or changed (command register).

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/72	*CROP1*	Change analogue output polarity	*0..1*	*0*	-

See also Parameters: 3/47

The analogue output (Tm. 21) which is selected through Parameter 3/47 "AOSEL" = 1 or 2 can be inverted by setting this parameter. In doing so:
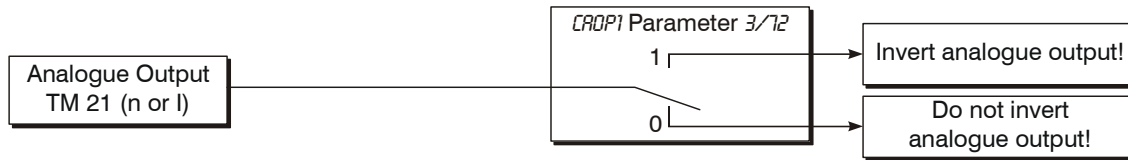
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/73	*POSEN*	Commonfault in position sensor	*0..1*	*0*	-

If a positioning error develops and the bit "POSEN" is set, the TA-BL/P (common fault) will be disconnected. With "POSEN" set, the positioning error will only be reported. With large loads, the motor is supplied with current and with small loads only the coils not affected by the error are supplied with current (motor diesels or nails).
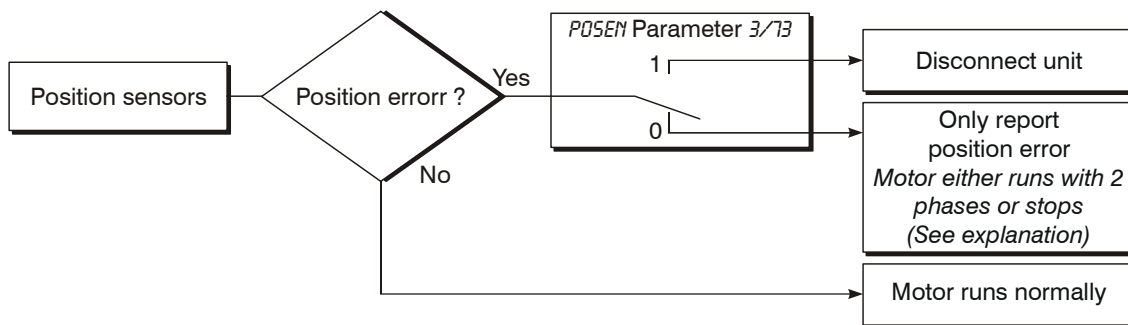
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/74...3/79		Refer to chapter 3. Positioning with a driveTA-BL/P			

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/80	*INVCD*	Invert Counter dir when Pos-Off	*0..1*	*0*	-

If this Bit is active, at positioning **inactive** the position value in the Parameter 0/06 and 0/07 will be invert counted.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/81		Refer to chapter 3. Positioning with a driveTA-BL/P			

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
3/82	*SMPOT*	Save Motorpoti value by power down	*0..1*	*0*	-

The parameter is to save the actuel digital Motorpoti value by power down. The value of the Motorpoti wil be displayed in Parameter 0/12.

0 = save

1 = not save

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2.4 Parameter Group 4

The settings for the TA-BL/P equipment are carried out in this parameter group.

> ⚠️ **Only qualified personnel may carry out changes to Parameters of Parameter Group 4.**

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/02	CFMAX	Maximum switch frequency	500..1800	4500	Hz

See also Parameters: 1/07, 1/09

This is where the maximum switch frequency is set for the current regulation. The limit of the maximum equipment current for the various operating modes (motor, 4Q or servo-operation) is made dependent on this frequency (see Parameter 1/07). This measure guarantees a longer service life of the equipment. In servo-operation the switch frequency within the entire speed is equal to the maximum switch frequency. For motors with a lower phase-winding inductance, the maximum switch frequency should be increased to improve the efficiency and to minimise the motor noise.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/03	CFMIN	Star-up frequency	300..2500	500	Hz

See also Parameters: 4/02, 4/04

The start-up frequency is the switch frequency of the current regulator in the blocked condition of the motor. For the lower speed range, the switch frequency of which is determined by Parameter 4/04, this parameter is used together with Parameter 4/02, 4/04 and the current speed for the formation of a frequency ramp, with which the regulation of the current is carried out. If one operates the drive system in the 4Q mode or servo-mode, the start-up frequency has not significance. (Graphic illustration)
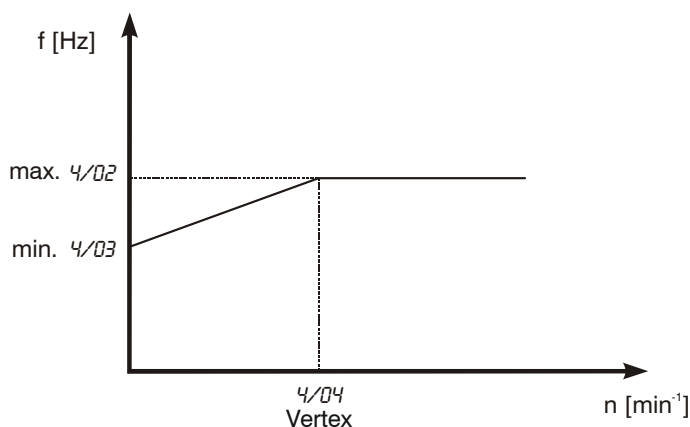
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/04	CRENO	Vertex for maximum switch frequency	100..800	300	min⁻¹

See also Parameters: 4/02, 4/03

If the momentary speed of the motor is less than this value (4/04), the current is regulated as a function of the current speed at a frequency that is between the switch frequency prescribed in Parameters 4/03 and 4/02. If the current speed increases above the speed value set in Parameter 4/04, then the maximum switch frequency comes into effect. By doing so, one obtains better efficiency from the system. This parameter has no effect with 4Q or servo-operation.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/05	SERVO	Servo function	0..1	0	-

See also Parameters: 1/07

Activating this bit activates the servo function. With this parameter the circuitry is changed of the power transistors. This gives the motor a better concentric running.

Note: - Losses in the controller increase

- The current limit is reduced by approx. 20%.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/06	ADR	Device address	1..99	1	-

Every piece of TA-BL/P equipment can be addressed with this parameter, it being possible for you to communicate with a drive administrator or communication bus (such PROFIBUS). If various equipment is programmed with different addresses and linked via a PROFIBUS, one is able to operate the various pieces of equipment from one single operating interface (such as SPS).

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/07	PW PA	Parameter password (PG3000)	0..999	0	-

See also Parameters: 4/08

If changes of the parameters set through the PG3000 are not desired for unauthorised individuals, you (qualified personnel) have the possibility of blocking access to the parameters with a password.

Note:
Only qualified personnel should make any changes to the parameters.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/08	PW CN	Control password (PG3000)	0..999	111	-

See also Parameters: 4/07

The control system of the TA-BL/P equipment can be accessed with a password by means of a KeyPad (PG3000). If control by means of KeyPad is not desired, this is blocked by a password.

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Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/09	C DSP	Selection of the PG3000 display	1..10	1	-

See also Parameters: 0/01 - 0/10

With Parameter 4/09 an actual value can be selected which will always be displayed when the mains voltage is applied. When the respective number of an actual value has been selected from Parameter Group 0, then the actual value desired appears when the KeyPad is turned on. (See TA-BL/P Manual PG3000 Description, Item 1.3)

Standard adjustment:　　　Motor speed

Group/ Parameter	Display	Description	Value range	Standard parameter	Unit
4/09	C DSP	"Selection of display", which appears when the display of the PG3000 is turned on.	1 =Motor speed 2 =Current 3 =Line speed 4 =Line speed 1 5 =Line speed 2 6 =Position (low) 7 =Position (high) 8 =Master speed 9 =Software version 10=Intermediate circuit voltage	1	-

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/10	B DSP	Bar graph selection (bar display)	0..4	2	-

With the KeyPad (PG3000) it is possible to present and observe a system quantity as a bar graph (bar display). The TA-BL/P equipment supports this function and enables momentary presentation of the following system quantities:

Group/ Parameter	Display	Description	Value range	Standard parameter	Unit
4/10	B DSP	Bar graph selection (PG3000) (bar display)	0=OFF 1=Speed 2=Current 3=Position (low) 4=Reserved	2	-

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/11	DSP F	Line speed multiplier	1..9999	1000	-

See also Parameters: 0/03, 0/04, 0/05

By means of this parameter a factor can be set for calculating the line speed from the current actual speed. The line speeds are then provided in 1, 1/10 and 1/100 in Parameter Group 0 (see Parameters 0/3, 0/4 and 0/5) according to the following formula.
Line speed, for example, = 85 m/min at motor speed n = 1550 min^{-1}

$$\text{Line speed multiplier } (4/11) = \frac{\text{Line speed}(0/03) \times 1000}{\text{Speed}(0/01)} = \frac{85 \text{ m/min} \times 1000}{1550 \text{ min}^{-1}} = \underline{\underline{54}}$$

Line speed (0/03) = Line speed   = 85   m/min
Line speed (0/04) = Line speed (0/03)/10   = 8,5   m/min
Line speed (0/05) = Line speed (0/03)/100 = 0,85 m/min

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/12	TRAN1	Ratio multiplier (master) x value	1..64000	1000	-

See also Parameters: 1/04, 3/13, 4/13, 4/17

The speed of the motor running as a slave can be derived from the master speed by multiplying by this parameter as a function of Parameter 4/13 (see the following equation). If the speed of the master changes, the slave drive changes the speed according to the active ramp in order t prevent any jumpy changing of speed by the slave. If you want to preselect different ratios, be sure to read Parameter 1/04 PRST1.

$$\text{Slave\_speed} = \frac{\text{Master\_speed} \times TRAN1 \ (4/12)}{TRAN2 \ (4/13)}$$

Since the value range extends to 64000, the multiplier can be adjusted very precisely. (With servo applications, for example)
If a change of PRESET1, PRESET2, PRESET3 or TRANSMISSION1
occurs, (depending on the selected multiplication factor) the new muliplication factor (between Master and Slave)
will be realized with a ramp.

EThe operating principal of slave operation can be found in detail Parameter 3/13 SSLAV.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/13	TRAN2	Ratio multiplier (master) / value	1..64000	1000	-

See also Parameters: 4/12

The speed of the motor running as a slave can be derived from the master speed by dividing by this parameter as a function of Parameter 4/12 (see the equation in 4/12).

Both parameters (4/12 and 4/13) determine the speed ratio between master and slave drives.

Parameter Manual

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/14	LIMIT	Master-Slave pulse limiting	0..1	1	-

See also Parameters: 3/15

Synchronous running between master and slave is guaranteed as long as the current limit (see Parameters 1/07 and 1/09) has not been reached. However, if the slave drive reaches the current limit, when accelerating, for example, the following possibilities are available to you:

0 = Master impulses are saved and made up for even if the slave drive is running at the current limit.

1 = As long as the slave drive is running at the current limit, the master impulses will not be made up.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/15	AB CD	Leading freq. AB-signal or switch/direction of rotation	0..1	0	-

See also Parameters: 4/17 (See also TA-BL/P Manual Connections Diagram, Item 6.2.3)

0 = Two-track master frequency

1 = Single-trace master frequency and rotational-direction signal

The TA-BL/P series provides two possibilities for incremental set-point processing for slave operation.

1. Master signal by means of two square-wave frequencies which are phase-shifted to 90° of one another. Two-track master frequencies have the advantage that the direction of rotation is recognised through the phase shifting.

Channel A: ⊓⊔⊓⊔ Digital input terminal 33
Channel B: ⊔⊓⊔⊓ Digital input terminal 34

2. Master signal with a frequency track and a static selection of the direction of rotation.

Digital input terminal 34 ⊓⊔⊓⊔⊓⊔⊓⊔ Master frequency
Digital input terminal 33 ⎺⎺⎺⎺⎺⎺ Direction of rotation signal

Motor clockwise | Motor counter clockwise
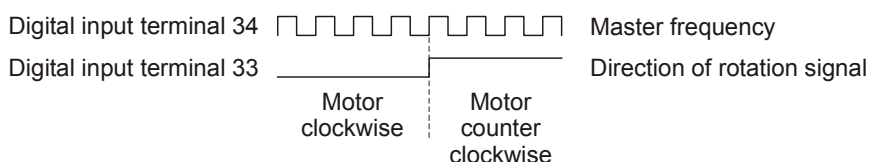
Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/16	ANCOR	Angle correction	0..99	0	-

This parameter is reserved for later use and is not used in the current software.

Group/Parameter	Display	Parameter Description	Range	Standard Parameter	Unit
4/17	PPR M	Pulses from master	1..9999	120	-

See also Parameters: 4/15

With the help of this parameter the master speed is calculated.

1. For slave operation with A/B signal from the master, the impulse number/rotation has to be multiplied by 4.

2. For slave operation with a frequency track, the actual impulse number/rotation is adjusted.

Example:

$$A/B - \text{track } 30 \text{ impulses/rotation} \times 4 = \underline{120}$$

$$\text{Single - track } 200 \text{ impulses/rotation} \times 1 = \underline{200}$$

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/18	KPSLV	P-amplification slave (static)	0..100	1	%

This parameter determines the proportional amplification factor of the lag error regulation.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/19	KPAM	P-amplification acceleration	0..100	0	%

This parameter determines the proportional amplification factor during the dynamic phase. If the electronic gearing Is adjusted to be "angle synchronous" (Parameter 4/20 = 1), then the parameter for calculating the internal acceleration part of the list speed value of the slave applies.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/20	SMOD	Select operating mode of slave	0..1	1	-

If the slave is not only to follow the master at exact speed but also at the exact angle, then the operating mode "Electronic Gearing Angle Synchronous" has to be selected. This means that if the parameter is set to 1, then the master and slave drives are linked by electronic gearing and run at synchronous angles. In this operating mode the lag error is detected and corrected. If this bit remains un-set, then the master drive and slave drive run by means of simple speed regulation.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/21	PULSE	Target pulse number	1..64000	1	-

This parameter is not evaluated in the current software.

Gruppe/Parameter	Display	Parameterbezeichnung	Wertebereich	Standardparameter	Einheit
4/22	CORR	Dynamic advance	0..9999	0	-

This parameter is not evaluated in the current software.

Parameter Manual

3. Positioning with a driveTA-BL/P from company TAE GmbH

3.1 Graph simple positioning
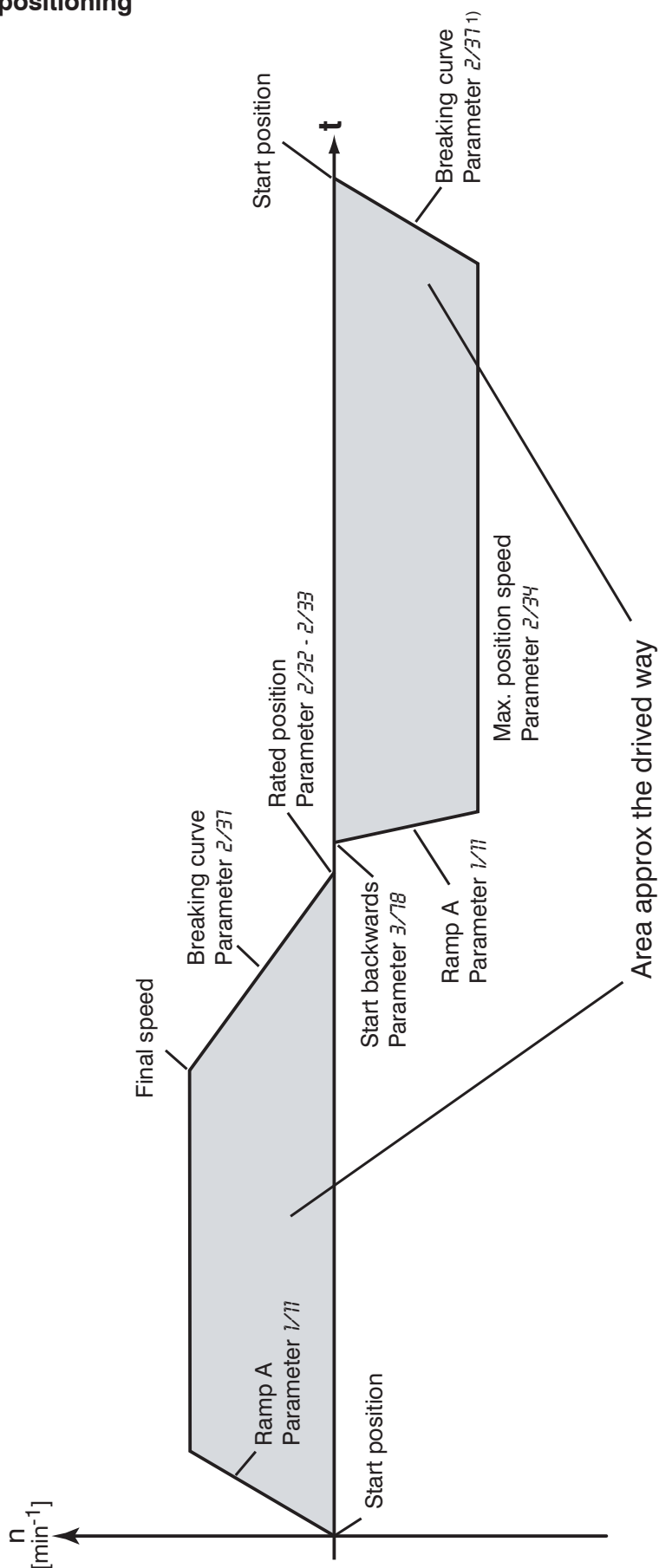
Start position

Breaking curve
Parameter 2/37 [1]

Rated position
Parameter 2/32 - 2/33

Max. position speed
Parameter 2/34

Breaking curve
Parameter 2/31

Final speed

Start backwards
Parameter 3/18

Ramp A
Parameter 1/11

Area approx the drived way

Ramp A
Parameter 1/11

Start position

t

n
[min⁻¹]

[1] Is the brake time to short, can the drive not reach the position and turn to stop function.
The drive can be turned back to start position.

3.2 Graph example switching on slave

n [min⁻¹] → n [min^{-1}]

Max. position speed (must be higher than slave speed
Parameter *2/34*

Max. speed would not be reached,
because of to short distance to the position

Slave speed = Master x $\dfrac{\text{TRANS 1}}{\text{TRANS 2}}$

Ramp B
Parameter *2/11*

Pulses
Parameter *4/33*

Ramp C
Parameter *2/29*

Switching Ramp C
Requirement: actual position > pulses
(Parameter *4/21*)

Final speed = Master n x $\dfrac{\text{Tr1 - Decrease } 2/15}{\text{TR2}}$

Breaking curve
Parameter *2/31*

Max position
Parameter *2/30 - 2/31*
(Rated position 2)

Start position

Breaking curve
Parameter *2/31* [1]

t

Max. Position speed
Parameter *2/34*

Start backwards
Parameter *3/18*

Ramp A
Parameter *1/11*

Area approx the drived way

Ramp B
Parameter *2/10*

Breaking curve
Parameter *2/31* [1]

Rated position 1
Parameter *2/32 - 2/33*

Ramp A
Parameter *1/11*

Start position

[1] Is the brake time to short, can the drive not reach the position and turn to stop function.
The drive can be turned back to start position.

Parameter Manual

4.   List of Paramerters

4.1   Parameter group 1

Group/ Parameter	Display	Description	Range	Standard Parameter	Unit
1/02	MAXS	Maximum speed	100 - 6000	1000	min⁻¹
1/03	MINS	Minimum speed	0 - 6000	0	min⁻¹
1/04	PRST1	1. preset speed at master operation 1. multiplier in slave operation	0 - 64000	0	-
1/05	PRST2	2. preset speed at master operation 2. multiplier in slave operation	0 - 64000	0	-
1/06	PRST3	3. preset speed at master operation 3. multiplier in slave operation	0 - 64000	0	-
1/07	IL1Q	Max. current during motor operation (1Q)	0,1 - I-max.	I-max.	A
1/08	4QEN	Generator operation, enabled	0 or 1	0	-
1/09	IL4Q	Curremt limit, Generator operation	0,1 - I-max.	I-max.	A
1/10	RAMP	Speed ramp type	0=jump 1=ramp 2=S-curve	1	-
1/11	ACCEL	Acceleration time A (start-up)	0,1 - 599,9	10,0	s
1/12	DECEL	Deceleration time A (shut-down)	0,1 - 599,9	10,0	s
1/13	LEADE	Leaded deceleration	0 or 1	0	-
1/14	BRADE	0,5s stopping torque at n<10	0 or 1	0	-
1/15	DELOF	Drive lock at set-point value=0 & n=0	0 or 1	0	-
1/16	P AMP	Speed regulator, P-amplification	0 - 100	5	%
1/17	I AMP	Speed regulator, Integral proportion	0 - 100	4	%
1/18	YIOP	Valid range of I-proportion in n-regulator	1 - 255	255	min⁻¹
1/19	SAVE	Save Parameter to EEPROM	0 or 1	0	-

4.2 Parameter group 2

Group/ Parameter	Display	Description	Range	Standard- Parameter	Unit
2/02	STORD	Read standard parameters	0 or 1	-	-
2/03	RATSP	Motor rated speed (Lower Speed by BL-N-Motors)	0 - 6000	-	min⁻¹
2/04	POLES	Motor poles	2 - 32	-	-
2/05	PPR	Pulses per revolution from Motor x4	1 - 9999	-	-
2/06	MRACU	Motor rated current	1,0 - 3000,0	-	A
2/07	MPECU	Motor peak current	1,0 - 3000,0	-	A
2/08	OCTIM	Overcurrent time (at n<300 min⁻¹)	0 - 200	80	s
2/09	SETAB	Selection ramp A or B or change between ramp A or B	0 = ramp A 1 = SWTR 3 = dir 4 = ramp B 5 = motorpoti 6 = set B 7= slave set B	0	-
2/10	ACC B	Acceleration time B (start-up)	0,1 - 599,9	180,0	s
2/11	DEC B	Deceleration time B (shut-down)	0,1 - 599,9	180,0	s
2/12	PHADV	Phase advance	0 or 1	0	-
2/13	PHADR	Phase advance at nominal speed	0 - 99	30	%
2/14	PHADM	Phase advance at maximum speed	0 - 99	50	%
2/15	INCR	Increase speed (master operation) Increase multiplier (slave operation)	0 - 9999	0	min⁻¹/-
2/16	DECR	Decrease speed (master operation) Decrease multiplier (slave operation)	0 - 9999	0	min⁻¹/-
2/17	FINE	Speed fine tuning1/4 rpm	0 - 3	0	1/4 min⁻¹
2/18	SWTR	Speed message	10 - 6000	100	min⁻¹
2/19	IL2O	Message delay, current limit reached	1 - 9999	1	s
2/20	CODO	Fixed configuration of the digital outputs	0 or 1	0	-
2/21	DIRAN	Revers by negative input voltage	0 or 1	0	-
2/22	4MA	Analog input 1, 0-20mA or 20mA	0 or 1	0	-
2/23	CLT1	Torque limit, time constant	0,01 - 300,00	0,01	s
2/24	UVTIM	Delay of undervoltage switch off	0,0 - 3000,0	0,1	s
2/25	OV_4Q	Maximum reducing circuit voltage	100 - 1500	900	V
2/26	PTQL	Programable torque limit	0 - 100,0	100,0	%
2/27	MPTUL	Motorpoti transmission limit (UP)	0 - 100	0	%
2/28	MPTDL	Motorpoti transmission limit (DOWN)	0 - 100	0	%

Parameters 2/29 to 2/37 are parameters for options refer to chapter 4.5

Parameter Manual

4.3 Parameter group 3

Group/ Parameter	Display	Description Range	Range		Standard-Parameter
3/02	SRES	Reset fault			2 (TE.2)
3/03	SRUN	Run			3 (TE.3)
3/04	SPRS1	Preset speed (1)			4 (TE.4)
3/05	SDIR	Direction of rotation (Master mode)			5 (TE.5)
3/06	SHOLD	Quick stop			6 (TE.6)
3/07	SPRS2	Preset speed (2)			7 (TE.7)
3/08	SMOT	Motorpoti function / ON-OFF			8 (TE.8)
3/09	SUP	Motorpoti function speed - UP			9 (TE.9)
3/10	SDOWN	Motorpoti function speed - DOWN			10 (TE.10)
3/11	SINC	Increase speed (master operation) Increase multiplier (slave operation)			11 (TE.11)
3/12	SDEC	Decrease speed (master operation) Decrease multiplier (slave operation)	0 = OFF 1 = ON 2 to 13 = terminals at the TA-BL/P		12 (TE.12)
3/13	SSLAV	Master/Slave			13 (TE.13)
3/14	SSPER	Suppress feedback error			0
3/15	SSYNC	Synchron, angle or speed			1
3/16	SANG	Angle correction			0
3/17	SICW	End switch clockwise (cw)			0
3/18	SICCW	End switch counter clockwise (ccw)			0
3/19	SSETB	Ramp A or ramp B selection			0
3/20	SLDIR	Change rotating direction for follow-up drives			0
3/21	STQL	External torque limit			0
3/22	SSER	External Error shut down			0
3/23	SSDC	Disable controller			0
3/24	STLAP	Torque limit analog / Programmable			0
3/25	IPL2	Input logic terminals 2 to 13 (Polarity inversion)	TE.2	0=Input is active and if +24V are connected input is inactive 1=Input is inactive and if +24V are connected input is active	1
3/26	IPL3		TE.3		1
3/27	IPL4		TE.4		1

Group/ Parameter	Display	Description Range			Range	Standard Parameter	
3/28	IPL5	Input logic terminals 2 to 13 (Polarity inversion)		TE.5	0=Input is active and if +24V are connected input is inactive 1=Input is inactive and if +24V are connected input is active	1	
3/29	IPL6			TE.6		1	
3/30	IPL7			TE.7		1	
3/31	IPL8			TE.8		1	
3/32	IPL9			TE.9		1	
3/33	IPL10			TE.10		1	
3/34	IPL11			TE.11		1	
3/35	IPL12			TE.12		1	
3/36	IPL13			TE.13		1	
3/37	SO48	Output programming		TE.48	0=OFF 1=Fault 2=Delayed Current limit 3=Speed reached 4=Ready 5=Operation 6=Speed detected 7=n > 9 rpm 8=current limit 9=motor over current 10=reserve 11=position OK 12=leaded speed reached 13=position pass	4	If the fixed configuration of the digital outputs is set (parameter 2/20 = 1), the values of the parameters 3/37 to 3/46 are without any function.
3/38	SO47			TE.47		1	
3/39	SOK45			TE.45		7	
3/40	SOK44			TE.44		2	
3/41	SOK43			TE.43		6	
3/42	PO48	Output logic relay		TE.48	0 or 1	1	
3/43	PO47			TE.47	0 or 1	1	
3/44	POK45	Output logic optocoupler		TE.45	0 or 1	1	
3/45	POK44			TE.44	0 or 1	0	
3/46	POK43			TE.43	0 or 1	1	
3/47	AOSEL	Function analog output			1=Motor speed 2=Motor current	1	
3/48	RSEL1	Set-point speed with ramp			0=OFF 1=analog input 2=analog input 2 3=(without funktion) . . . 15=(without funktion)	1	
3/49	RSEL2	Set-point speed without ramp				0	
3/50	RSEL3	Set-point value, torque limit				0	
3/51	RSEL4	Source of Position maximum speed				0	
3/52	RSEL5	Selection of analog input (reserved)				0	
3/53	RSEL6	Selection of analog input (reserved)				0	
3/54	TRQEN	Operate Torque regulation			0=OFF 1=ON	0	
3/55	KLIXEN	Thermal switch active			0=inactive 1=active	0	

Parameter Manual

Group/ Parameter	Display	Description Range			Range	Standard Parameter
3/56	PP0R		0	read		0
3/57	PP0W		0	write		0
3/58	PP1R		1	read		0
3/59	PP1W		1	write		0
3/60	PP2R		2	read		0
3/61	PP2W		2	write		0
3/62	PP3R		3	read		0
3/63	PP3W	Profibus parameters	3	write	Profibus-No. 0 - 255	0
3/64	PP4R		4	read		0
3/65	PP4W		4	write		0
3/66	PP5R		5	read		0
3/67	PP5W		5	write		0
3/68	PP6R		6	read		0
3/69	PP6W		6	write		0
3/70	PP7R		7	read		0
3/71	PP7W		7	write		0
3/72	CAOP1	Change analog output polarity			0=inactive 1=active	0
3/73	POSEN	Commonfault in position sensor			0=inactive 1=active	0
3/80	INVCD	Invert Counter dir when Pos-Off			0=inactive 1=active	0
3/82	SMPOT	Save Motorpoti value by Power down			0=inactive 1=active	0

Parameters 3/74 to 3/79, 3/81 are parameters for options refer to chapter 4.5

An alteration of the parameters in the parameter group -4-, may be carried out by trained staff only.

4.4 Parameter group 4

Group/ Parameter	Display	Description	Range	Standard Parameter	Unit
4/02	CFMAX	Maximum switch frequency	500 - 18000	4500	Hz
4/03	CFMIN	Start-up frequency	300 - 2500	500	Hz
4/04	CREND	Vertex for maximum switch frequency	100 - 800	300	min^{-1}
4/05	SERVO	Servo function	0 or 1	0	-
4/06	ADR	Device address for serial interface	1 - 99	1	-
4/07	PW PA	Parameter password(PG3000)	0 - 999	0	-
4/08	PW CN	Control password(PG3000)	0 - 999	111	-
4/09	C DSP	Selection of the actual value which is indicated on the display of the PG 3000 after switch on.	1=Speed 2=Current 3=Line speed 4=Line speed 1 5=Line speed 2 6=Position (low) 7=Position (high) 8=Leading speed 9=Software vers. 10=Buss voltage	1	-
4/10	B DSP	Bargraph selection(PG3000)	0=OFF 1=Speed 2=Current 3=Position (low) 4=reserved	2	-
4/11	DSP F	Line speed multiplier 1,000 (PG3000)	1 - 9999	1000	-
4/12	TRAN1	Ratio multplier n (Master) x value	1 - 64000	1000	-
4/13	TRAN2	Ratio multplier n (Master) / value	1 - 64000	1000	-
4/14	LIMIT	Master-Slave pulse limiting at current limit	0 or 1	1	-
4/15	AB CD	Leading frequency AB-signal or switch/direction of rotation	0 or 1	0	-
4/16	ANCOR	Angle correction	0 - 99	0	-
4/17	PPR M	Pulses from Master	1 - 9999	120	-
4/18	KPSLV	P-amplification slave (static)	0 - 100	1	%
4/19	KPAM	P-amplification acceleration	0 - 100	0	%
4/20	SMOD	Select operating mode of slave	1=Elektrical gear	1	-
4/21	PULSE	Target puls number	1 - 64000	1	-
4/22	CORR	Dynamic advance	0 - 9999	0	-

Parameter Manual

4.5   Parameters for option positioning

Group/ Parameter	Display	Description	Range	Standard- parameter	Unit
2/29	DEC_C	Deceleration Time C	0,1 - 599,9	180,0	s
2/30	PHMAX	Maximum rated-Position x10000	0 - 65535	0	-
2/31	PLMAX	Maximum rated-Position x1	0 - 9999	0	-
2/32	PHIGH	Rated-Position x10000	0 - 65535	0	-
2/33	PLOW	Rated-Position x1	0 - 9999	0	-
2/34	MPOSP	Position maximum speed	1 - 6000	100	min^{-1}
2/35	WINPO	position window(encoder pulses x4)	1 - 255	30	-
2/36	KPP_P	proportional Amplifier for Positioning	1 - 255	75	-
2/37	ADJBC	Adjust start of breaking curve	0,1 - 100,0	1,0	s

| Group/ Parameter	Display	Description	Range	Standard- parameter	Unit
3/74	STPOS	Input Selection Go to 1st position		0	-
3/75	BRCUR	Input Selection Type of Break curve: Ramp/S-curve	0=OFF 1=ON 2 to 13= terminals at the TA-BL/P	0	-
3/76	REPOS	Input Selection Reset Position		0	-
3/77	REFPO	Input Selection Define direction of position		0	-
3/78	RUKPO	Input Selection Go to Start position		0	-
3/79	ENPOS	Input Selection Enable positioning		0	-
3/81	F_JOG	Input Select. Dig. Speed Rated Value enable		0	-

At version BL60430:

Remark:

The source of maximum positioning speed (analog or digital) can be selected through Parameter *3/51*

3/51 = 0   Digital Value = (*2/34*)   Position maximum speed done by field bus system
3/51 = 1   Analog input 1   Position maximum speed done by analog input 1
3/51 = 2   Analog input 2   Position maximum speed done by analog input 2

The parameters *3/74* to *3/79* and *3/81* can be also activated through digital inputs.
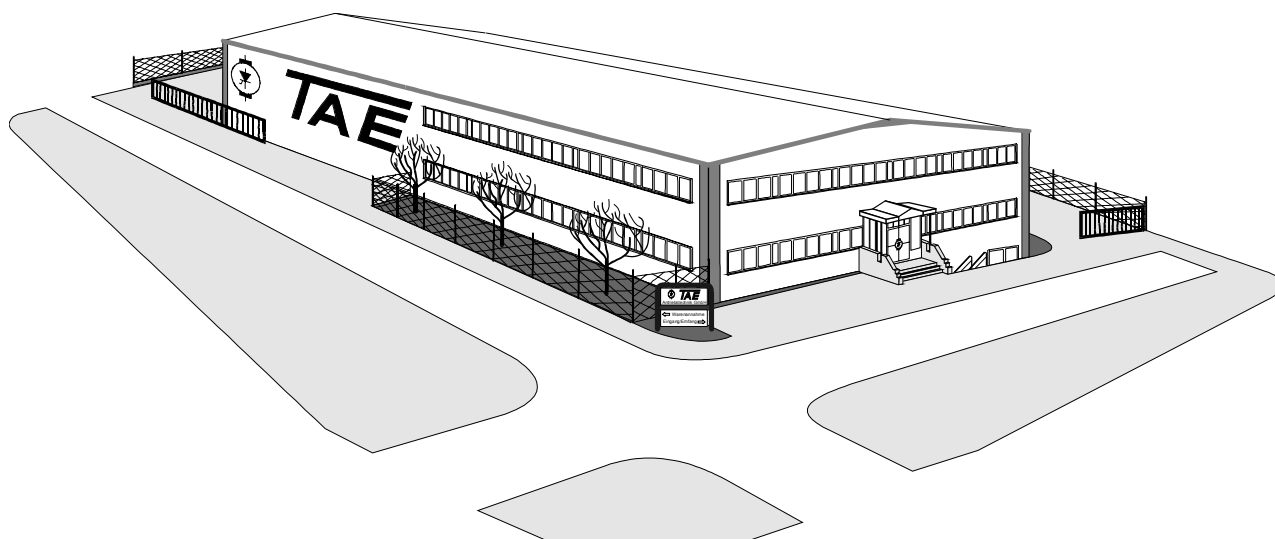
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