WITTENSTEIN | motion control

TPM+

B&R Acopos

Quick Startup Guide
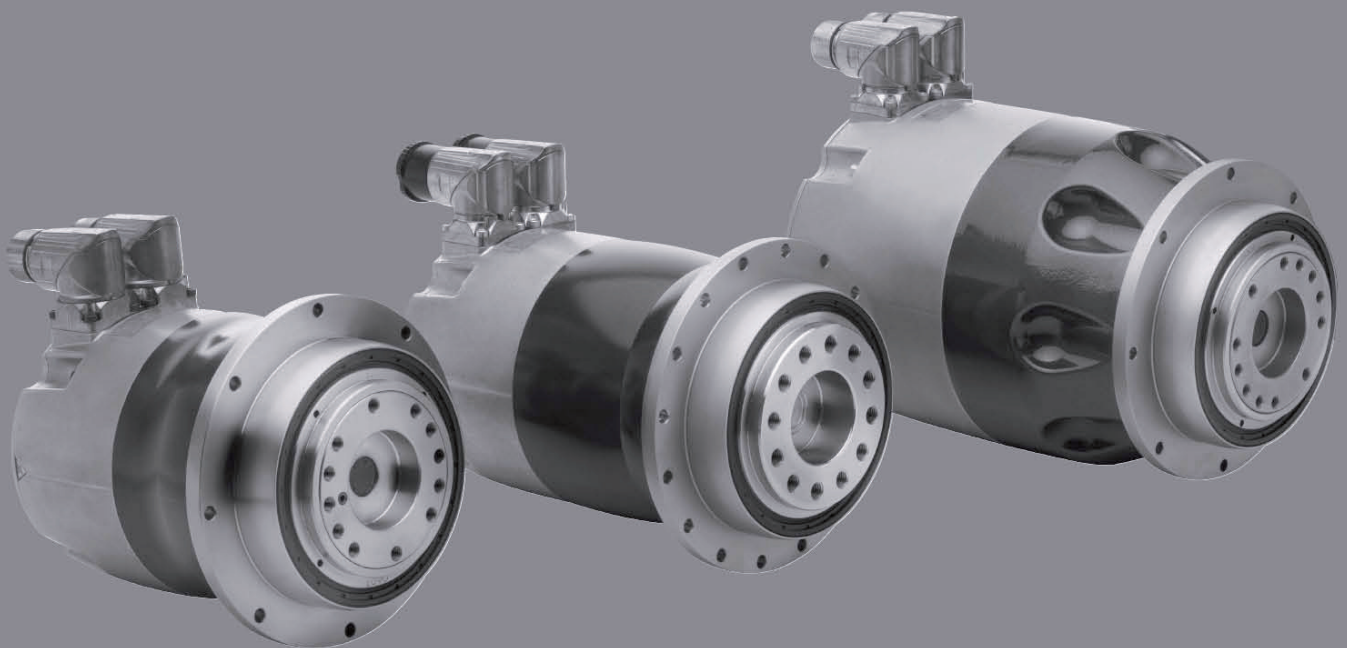
Revision history

Revision	Date	Comment	Chapter
01	27th July 2012	First release	All

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Page en-1

Table of Contents

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1   General Information

1.1 Description, designations

The AC servo actuator **TPM⁺** (hereafter referred to as servo actuator) is a combination of a low-backlash planetary gearhead and an AC servo motor.
The following manual contains the following points:
- Safety Instructions
- Parameter lists for the **TPM⁺** series
- Connection schematic for **TPM⁺**

1.2 Whom does this manual concern?

This manual concerns all persons who install, operate, or maintain this servo actuator.
They may only carry out work on the servo actuator, if they have read and understood this operating manual. Please pass the safety instructions on to other persons as well.

1.3 Which signs and symbols are referred to in this manual?

➲   An "action instruction", which requires you to carry out an action.

∇   With a "check" you can specify whether the device is ready for the next work stage.

☺   A "usage tip" shows you an option of facilitating or improving operations.

The safety instructions symbols are described in section **2 "Safety"**.

1.4 Exclusion of liability

WITTENSTEIN motion control is not liable for damages or injury caused by:
- Improper utilization of the servo actuator and the servo amplifier or
- Incorrect setting of operating parameters.

1.5 EC low-voltage directive / EMC regulations

The servo actuator has been constructed in accordance with EC directive 73/23/EEC. During installation and connection of the electrical components, the relevant regulations have to be observed (for example wire cross sections, fuse protection, etc.). Meeting all requirements for the entire system is the responsibility of the system's manufacturer.
You may only operate the equipment if you comply to the national EMC regulations (refer to the servo amplifier documentation for installation information pertaining to EMC) as they are defined for the given application.

1.6 Copyright

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2 Safety

2.1 Intended use

The servo actuator is designed for industrial applications. Its purpose is to drive machines. Please refer to our catalogue or our Internet page for the maximum permitted speeds and torques: www.wittenstein-motion-control.de

➲ Please consult our technical service if your servo actuator is more than a year old. In this way you receive valid data.

➲ Please be sure to read the documentation provided by the manufacturer of the servo actuator.

2.2 Improper use

Any use transgressing the above-named restrictions (especially higher torques and speeds) is not compliant with the regulations, and is thus prohibited.
The operation of the servo actuator is prohibited if:

- It was not installed according to regulations (for example fastening bolts).
- The servo actuator is very dirty, damaged or blocked.
- It is operated without lubricant.
- The cables are damaged or improperly connected.
- The operating parameters have not been set properly.

2.3 Safety Instructions

The following symbols are used in this manual to warn you of hazards:

DANGER!
This symbol warns you of danger of injury to yourself and others.

Attention
This symbol warns you of the risk of damage to the servo actuator.

Environment
This symbol warns of environmental pollution risk.

2.3.1 General safety instructions

Working on the servo actuator

DANGER!
Improperly executed work can lead to injury and damage.
➲ Always ensure that the servo actuator is only installed, maintained, and dismantled by trained technicians.

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DANGER!
Current-flow through the body or arcing can lead to grave injury and death.
- ➲ Only perform tasks on the electrical system if you are:
- A trained electrician.
- A person trained in electro-technology, working under the supervision of a specialist electrician.
- ➲ Always adhere to the five safety rules for the de-energised state:
- De-energise.
- Secure against being turned on (for example by locking it).
- Ensure that de-energised state exists.
- Attach ground line and short-circuit the equipment.
- Cover and safeguard any live parts in the immediate vicinity.

DANGER!
Impurities spinning through the air can cause grave injury.
- ➲ Before putting the servo actuator into operation, check that there are no impurities or tools near it.

Maintenance

DANGER!
An unintentional start of the machine during maintenance work can lead to serious accidents.
- ➲ Ensure that no one can start the machine while you are working on it.

DANGER!
Even only briefly running the machine during maintenance work can lead to accidents if the safety devices are not operating.
- ➲ Check that all safety devices have been mounted and are activated.

Wiring

DANGER!
Incorrect wiring can lead to injuries and damage.
- ➲ Only use power and signal cables recommended by WITTENSTEIN motion control.
- ➲ Do not cut off power and signal cables, and do not insert extensions.
- ➲ Make sure that the U-U, V-V and W-W motor phases are correctly connected.
- ➲ Make sure that the motor encoder interface of the servo controller is compatible to the servo actuator.
- ➲ Observe the prescribed voltage for the brakes (usually 24 V DC) and the polarity.

3 Type plate information – identification

➲ The technical specifications can be found on your servo actuator's type plate according to the following scheme.

3.1 Identification plate, designation

The following specifications can be found on the identification plate:

Bild 4.2
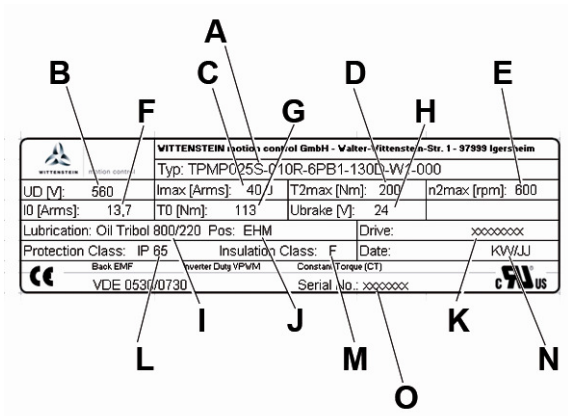
A	Ordering code
B	DC-Bus voltage
C	Maximum current
D	Maximum torque at gear output
E	Maximum gear output speed
F	Continuous stall current
G	Continuous stall torque at gear output
H	Brake voltage
I	Lubricant
J	Mounting position
K	For use with drive
L	Type of protection
M	Insulation class
N	Manufacturing date
O	Serial number

TPM 010S-100R -6PB1-055A-W1

Actuator type
TPM

Version
_ = dynamic
A = high torque
P = power

Size
004/010/025/050/110

Version
S = Standard UL
G = Grease filling
F = Food-grade lubrication
X = Special design
P = Welded pinion

Ratio i

Feedback system
R = Resolver 2-pole
S = Singleturn absolute encoder, EnDat
M = Multiturn absolute encoder, EnDat
N = Singleturn absolute encoder, Hiperface
K = Multiturn absolute encoder, Hiperface
T = 5V-TTL -Incremental encoder with Hall-signal
E = Singleturn absolute encoder, Rockwell compatible
V = Multiturn absolute encoder, Rockwell compatible
I = Incremental encoder, optical

Pin configuration
1 = Standard, temperature sensor over signal cable
4 = Temperature sensor over power cable
5 = Rockwell compatible
6 = B&R compatible

Electrical connection
W = Angular mounting box
G = Mounting box, straight

Motor size and stator length

Backlash
1 = Standard
0 = Reduced

Brake
B = with brake
O = without brake

Temperature sensor
P = PTC
K = KTY

DC bus voltage
5 = 320V
6 = 560V

4   Setting the parameters

The tables in chapter **4** contain all of the parameters that are required for the initial start-up of a **TPM⁺** servo actuator from WITTENSTEIN motion control at a servo drive **B&R Acopos**. When the servo actuator and the servo drive are properly connected, these parameters guarantee that the servo actuator can be operated at idle with speed control.
Based on these default settings, you can optimize the dynamics of the speed controller depending on the application.

Follow the details of the type plate.
Data for combinations not shown here are available on demand.

4.1   Temperature sensor

Depending on the used temperature sensor the parameterization can be done according to the following table:

Temperature sensor			KTY84-130	PTC STM160
B&R Code	Parameter	Unit	TPMxxxx-xxxx-xKxx	TPMxxxx-xxxx-xPxx
64	MOTOR_TEMPSENS_PAR1	Ohm	391	940
65	MOTOR_TEMPSENS_PAR2	Ohm	1334	0
66	MOTOR_TEMPSENS_PAR3	°C	-30	160
67	MOTOR_TEMPSENS_PAR4	°C	6	0
68	MOTOR_TEMPSENS_PAR5	°C	37	0
69	MOTOR_TEMPSENS_PAR6	°C	64	0
70	MOTOR_TEMPSENS_PAR7	°C	88	0
71	MOTOR_TEMPSENS_PAR8	°C	110	0
72	MOTOR_TEMPSENS_PAR9	°C	130	0
73	MOTOR_TEMPSENS_PAR10	°C	150	0

4.2   TPM⁺ with absolute encoder Heidenhain EnDat ECN1113 / EQN 1125

TPM+ with Heidenhain EnDat are programmed by WITTENSTEIN motion control with the appropriate electronic nameplate to operate with B&R Acopos. During commissioning only the gearbox ratio and if necessary torque limitations with respect to the application have to be entered.

4.3   Parameter TPM+ Dynamic 004 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	42,20	28,30
50	MOTOR_SPEED_RATED	rpm	4400	5800
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	0,72	0,36
53	MOTOR_TORQ_RATED	Nm	0,72	0,36
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,70	0,47
56	MOTOR_CURR_STALL	Arms	1,10	0,80
57	MOTOR_CURR_RATED	Arms	1,10	0,80
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0667	0,04909
60	MOTOR_STATOR_RESISTANCE	Ohm	28,20	37,40
61	MOTOR_STATOR_INDUCTANCE	H	0,0333	0,0300
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000021	0,000023	2,00	3,20	2,00	3,20
21	0,000020	0,000023	1,60	2,60	2,00	3,20
31	0,000020	0,000022	1,40	2,20	2,00	3,20
61	0,000012	0,000014	0,60	1,40	1,00	2,40
64	0,000011	0,000013	0,60	1,30	1,00	2,40
91	0,000012	0,000014	0,40	0,90	1,00	2,40

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.4 Parameter TPM+ Dynamic 010 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	58,50	47,40
50	MOTOR_SPEED_RATED	rpm	4000	5500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	1,20	0,67
53	MOTOR_TORQ_RATED	Nm	1,20	0,67
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,97	0,78
56	MOTOR_CURR_STALL	Arms	1,30	0,90
57	MOTOR_CURR_RATED	Arms	1,30	0,90
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0927	0,06157
60	MOTOR_STATOR_RESISTANCE	Ohm	21,30	40,00
61	MOTOR_STATOR_INDUCTANCE	H	0,0228	0,0300
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000032	0,000034	3,80	5,20	3,80	5,20
21	0,000032	0,000034	3,80	5,20	3,80	5,20
31	0,000032	0,000034	3,50	4,70	3,80	5,20
61	0,000017	0,000019	1,40	2,20	1,90	3,00
64	0,000017	0,000019	1,40	2,10	1,90	3,00
91	0,000017	0,000019	1,00	1,50	1,90	3,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.5 Parameter TPM+ Dynamic 025 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	59,50	61,30
50	MOTOR_SPEED_RATED	rpm	3500	4500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	5,50	1,86
53	MOTOR_TORQ_RATED	Nm	5,50	1,86
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,98	1,02
56	MOTOR_CURR_STALL	Arms	5,70	1,90
57	MOTOR_CURR_RATED	Arms	5,70	1,90
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	2,20	13,50
61	MOTOR_STATOR_INDUCTANCE	H	0,0060	0,0189
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000216	0,000235	12,10	17,00	12,10	17,00
21	0,000216	0,000235	12,10	17,00	12,10	17,00
31	0,000217	0,000236	10,40	14,10	12,10	17,00
61	0,000077	0,000096	4,40	5,90	4,40	6,00
64	0,000076	0,000095	4,20	5,60	4,40	6,00
91	0,000076	0,000095	3,00	3,80	4,40	6,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.6 Parameter TPM+ Dynamic 050 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	61,00	58,70
50	MOTOR_SPEED_RATED	rpm	2500	3500
51	MOTOR_SPEED_MAX	rpm	5000	5000
52	MOTOR_TORQ_STALL	Nm	13,49	3,59
53	MOTOR_TORQ_RATED	Nm	13,49	3,59
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,00	0,97
56	MOTOR_CURR_STALL	Arms	13,70	3,80
57	MOTOR_CURR_RATED	Arms	13,70	3,80
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,5281
60	MOTOR_STATOR_RESISTANCE	Ohm	0,45	4,00
61	MOTOR_STATOR_INDUCTANCE	H	0,0030	0,0111
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000907	0,001007	28,90	40,00	28,90	40,00
21	0,000907	0,001007	25,50	34,30	28,90	40,00
31	0,000894	0,000993	22,70	29,40	28,90	40,00
61	0,000251	0,000351	7,80	12,00	7,80	12,00
64	0,000249	0,000349	7,80	12,00	7,80	12,00
91	0,000249	0,000349	6,00	8,40	7,80	12,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.7 Parameter TPM+ Dynamic 110 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	61,00	61,00
50	MOTOR_SPEED_RATED	rpm	2000	2600
51	MOTOR_SPEED_MAX	rpm	5000	5000
52	MOTOR_TORQ_STALL	Nm	16,42	13,49
53	MOTOR_TORQ_RATED	Nm	16,42	13,49
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,00	1,00
56	MOTOR_CURR_STALL	Arms	16,70	13,70
57	MOTOR_CURR_RATED	Arms	16,70	13,70
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,66	2,1653
60	MOTOR_STATOR_RESISTANCE	Ohm	0,32	0,45
61	MOTOR_STATOR_INDUCTANCE	H	0,0024	0,0030
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,001314	0,001414	43,90	70,00	43,90	70,00
21	0,001314	0,001414	43,90	70,00	43,90	70,00
31	0,001284	0,001384	43,90	70,00	43,90	70,00
61	0,000889	0,000988	23,00	30,00	28,90	40,00
64	0,000883	0,000983	22,00	28,30	28,90	40,00
91	0,000883	0,000983	16,00	18,00	28,90	40,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.8 Parameter TPM+ Dynamic 004 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	24,40	16,30
50	MOTOR_SPEED_RATED	rpm	4400	5800
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	0,72	0,36
53	MOTOR_TORQ_RATED	Nm	0,72	0,36
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,40	0,27
56	MOTOR_CURR_STALL	Arms	1,90	1,38
57	MOTOR_CURR_RATED	Arms	1,90	1,38
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0667	0,04909
60	MOTOR_STATOR_RESISTANCE	Ohm	9,40	12,50
61	MOTOR_STATOR_INDUCTANCE	H	0,0111	0,0100
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000021	0,000023	2,00	5,50	2,00	5,50
21	0,000020	0,000023	1,60	4,50	2,00	5,50
31	0,000020	0,000022	1,40	3,80	2,00	5,50
61	0,000012	0,000014	0,60	2,40	1,00	4,20
64	0,000011	0,000013	0,60	2,30	1,00	4,20
91	0,000012	0,000014	0,40	1,60	1,00	4,20

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.9 Parameter TPM+ Dynamic 010 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	34,10	27,60
50	MOTOR_SPEED_RATED	rpm	4000	5500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	1,20	0,67
53	MOTOR_TORQ_RATED	Nm	1,20	0,67
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,56	0,45
56	MOTOR_CURR_STALL	Arms	2,25	1,60
57	MOTOR_CURR_RATED	Arms	2,25	1,60
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0927	0,06157
60	MOTOR_STATOR_RESISTANCE	Ohm	7,10	13,30
61	MOTOR_STATOR_INDUCTANCE	H	0,0073	0,0100
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000032	0,000034	3,80	9,00	3,80	9,00
21	0,000032	0,000034	3,80	9,00	3,80	9,00
31	0,000032	0,000034	3,50	8,10	3,80	9,00
61	0,000017	0,000019	1,40	3,80	1,90	5,20
64	0,000017	0,000019	1,00	2,50	1,90	5,20
91	0,000017	0,000019	1,40	3,60	1,90	5,20

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.10 Parameter TPM+ Dynamic 025 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	34,30	35,40
50	MOTOR_SPEED_RATED	rpm	3500	4500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	5,50	1,86
53	MOTOR_TORQ_RATED	Nm	5,50	1,86
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,56	0,59
56	MOTOR_CURR_STALL	Arms	9,90	3,30
57	MOTOR_CURR_RATED	Arms	9,90	3,30
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	0,73	4,50
61	MOTOR_STATOR_INDUCTANCE	H	0,0020	0,0063
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000216	0,000235	12,10	29,40	12,10	29,40
21	0,000216	0,000235	12,10	29,40	12,10	29,40
31	0,000217	0,000236	10,40	24,40	12,10	29,40
61	0,000077	0,000096	4,40	10,30	4,40	10,40
64	0,000076	0,000095	4,20	9,80	4,40	10,40
91	0,000076	0,000095	3,00	6,50	4,40	10,40

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.11 Parameter TPM+ Dynamic 050 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	35,40	33,90
50	MOTOR_SPEED_RATED	rpm	2500	3500
51	MOTOR_SPEED_MAX	rpm	5000	5000
52	MOTOR_TORQ_STALL	Nm	13,49	3,59
53	MOTOR_TORQ_RATED	Nm	13,49	3,59
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,58	0,56
56	MOTOR_CURR_STALL	Arms	23,70	6,60
57	MOTOR_CURR_RATED	Arms	23,70	6,60
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,5281
60	MOTOR_STATOR_RESISTANCE	Ohm	0,13	1,33
61	MOTOR_STATOR_INDUCTANCE	H	0,0010	0,0037
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,000907	0,001007	28,90	70,00	28,90	70,00
21	0,000907	0,001007	25,50	59,90	28,90	70,00
31	0,000894	0,000993	22,70	51,40	28,90	70,00
61	0,000251	0,000351	7,80	21,00	7,80	21,00
64	0,000249	0,000349	7,80	21,00	7,80	21,00
91	0,000249	0,000349	6,00	14,70	7,80	21,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.12 **Parameter TPM+ Dynamic 110 320V**

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	61,00	35,40
50	MOTOR_SPEED_RATED	rpm	2000	2600
51	MOTOR_SPEED_MAX	rpm	3700	5000
52	MOTOR_TORQ_STALL	Nm	16,42	13,49
53	MOTOR_TORQ_RATED	Nm	16,42	13,49
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,00	0,58
56	MOTOR_CURR_STALL	Arms	16,70	23,70
57	MOTOR_CURR_RATED	Arms	16,70	23,70
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,66	2,1653
60	MOTOR_STATOR_RESISTANCE	Ohm	0,32	0,13
61	MOTOR_STATOR_INDUCTANCE	H	0,0024	0,0010
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
16	0,001314	0,001414	43,90	70,00	43,90	70,00
21	0,001314	0,001414	43,90	70,00	43,90	70,00
31	0,001284	0,001384	43,90	70,00	43,90	70,00
61	0,000889	0,000988	23,00	52,40	28,90	70,00
64	0,000883	0,000983	22,00	49,40	28,90	70,00
91	0,000883	0,000983	16,00	31,30	28,90	70,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.13 Parameter TPM+ Power 004 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	58,50	47,40
50	MOTOR_SPEED_RATED	rpm	3000	4400
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	1,25	0,66
53	MOTOR_TORQ_RATED	Nm	1,25	0,66
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,97	0,78
56	MOTOR_CURR_STALL	Arms	1,56	1,00
57	MOTOR_CURR_RATED	Arms	1,56	1,00
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0927	0,06157
60	MOTOR_STATOR_RESISTANCE	Ohm	21,30	40,00
61	MOTOR_STATOR_INDUCTANCE	H	0,0228	0,0300
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,000039	0,000041	3,80	5,20	3,80	5,20
5	0,000036	0,000038	3,80	5,20	3,80	5,20
7	0,000033	0,000035	3,80	5,20	3,80	5,20
10	0,000031	0,000034	2,70	3,60	3,80	5,20
16	0,000032	0,000034	3,20	4,40	3,80	5,20
20	0,000031	0,000034	2,60	3,50	3,80	5,20
25	0,000031	0,000034	2,10	2,80	3,80	5,20
28	0,000031	0,000033	1,90	2,50	3,80	5,20
35	0,000031	0,000033	1,50	1,90	3,80	5,20
40	0,000016	0,000018	1,30	2,10	1,90	3,00
50	0,000016	0,000018	1,10	1,70	1,90	3,00
70	0,000016	0,000018	0,80	1,20	1,90	3,00
100	0,000016	0,000018	0,4	0,60	1,90	3,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

Page en-19

TPM⁺ | motion control | **Quick Startup Guide**

4.14 Parameter TPM+ Power 010 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	59,50	61,30
50	MOTOR_SPEED_RATED	rpm	2600	3500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	4,50	1,38
53	MOTOR_TORQ_RATED	Nm	4,50	1,38
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,98	1,02
56	MOTOR_CURR_STALL	Arms	5,40	1,86
57	MOTOR_CURR_RATED	Arms	5,40	1,86
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	2,20	13,50
61	MOTOR_STATOR_INDUCTANCE	H	0,0060	0,0189
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [A_{rms}][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [A_{rms}][3]
4	0,000238	0,000257	12,10	17,00	12,10	17,00
5	0,000222	0,000241	12,10	17,00	12,10	17,00
7	0,000208	0,000227	12,10	17,00	12,10	17,00
10	0,000200	0,000219	9,00	12,20	12,10	17,00
16	0,000202	0,000221	8,50	11,50	12,10	17,00
20	0,000199	0,000218	6,80	8,90	12,10	17,00
25	0,000198	0,000217	5,50	6,90	12,10	17,00
28	0,000196	0,000215	4,90	6,00	12,10	17,00
35	0,000196	0,000214	3,90	4,70	12,10	17,00
40	0,000072	0,000091	3,40	4,70	4,40	6,00
50	0,000072	0,000091	2,80	3,70	4,40	6,00
70	0,000072	0,000091	2,00	2,70	4,40	6,00
100	0,000072	0,000091	1,1	1,50	4,40	6,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.15 Parameter TPM+ Power 025 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	61,00	58,70
50	MOTOR_SPEED_RATED	rpm	1500	2800
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	11,68	3,00
53	MOTOR_TORQ_RATED	Nm	11,68	3,00
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,00	0,97
56	MOTOR_CURR_STALL	Arms	13,70	4,00
57	MOTOR_CURR_RATED	Arms	13,70	4,00
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,5281
60	MOTOR_STATOR_RESISTANCE	Ohm	0,45	4,00
61	MOTOR_STATOR_INDUCTANCE	H	0,0030	0,0111
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [A_{rms}][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [A_{rms}][3]
4	0,000998	0,001098	28,90	40,00	28,90	40,00
5	0,000950	0,001050	28,90	40,00	28,90	40,00
7	0,000907	0,001007	28,90	40,00	28,90	40,00
10	0,000884	0,000984	20,40	27,00	28,90	40,00
16	0,000894	0,000994	22,30	29,90	28,90	40,00
20	0,000883	0,000982	17,80	23,10	28,90	40,00
25	0,000881	0,000980	15,50	19,50	28,90	40,00
28	0,000872	0,000972	12,70	15,30	28,90	40,00
35	0,000871	0,000971	11,10	13,00	28,90	40,00
40	0,000248	0,000348	7,80	12,00	7,80	12,00
50	0,000248	0,000348	7,80	12,00	7,80	12,00
70	0,000248	0,000347	4,90	7,10	7,80	12,00
100	0,000247	0,000347	2,8	3,70	7,80	12,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.16 Parameter TPM+ Power 050 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	1	1
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	23	23
44 [1]	MOTORBRAKE_ON_TIME	ms	0,040	0,040
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,050	0,050
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	71,90	55,10
50	MOTOR_SPEED_RATED	rpm	1200	2500
51	MOTOR_SPEED_MAX	rpm	5000	5000
52	MOTOR_TORQ_STALL	Nm	19,30	5,40
53	MOTOR_TORQ_RATED	Nm	19,30	5,40
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,19	0,91
56	MOTOR_CURR_STALL	Arms	19,00	7,50
57	MOTOR_CURR_RATED	Arms	19,00	7,50
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	3,03	1,03
60	MOTOR_STATOR_RESISTANCE	Ohm	0,27	1,81
61	MOTOR_STATOR_INDUCTANCE	H	0,0021	0,0051
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,002642	0,002822	56,60	63,50	56,60	63,50
5	0,002480	0,002660	56,60	63,50	56,60	63,50
7	0,002334	0,002514	49,40	54,90	56,60	63,50
10	0,002254	0,002434	35,60	38,40	56,60	63,50
16	0,002307	0,002487	47,90	53,10	56,60	63,50
20	0,002261	0,002441	38,30	41,70	56,60	63,50
25	0,002255	0,002435	30,70	32,60	56,60	63,50
28	0,002220	0,002400	27,40	28,60	56,60	63,50
35	0,002217	0,002397	22,00	22,20	56,60	63,50
40	0,00063	0,00081	15,60	33,00	15,60	33,00
50	0,000628	0,000808	15,40	32,50	15,60	33,00
70	0,000627	0,000807	10,40	19,90	15,60	33,00
100	0,000626	0,000806	5,7	8,30	15,60	33,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.17 Parameter TPM+ Power 110 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	1,67	1,67
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	72	72
44 [1]	MOTORBRAKE_ON_TIME	ms	0,050	0,050
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,200	0,200
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	66,10	65,30
50	MOTOR_SPEED_RATED	rpm	600	1400
51	MOTOR_SPEED_MAX	rpm	4200	4500
52	MOTOR_TORQ_STALL	Nm	36,90	20,74
53	MOTOR_TORQ_RATED	Nm	36,90	20,74
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,09	1,08
56	MOTOR_CURR_STALL	Arms	38,60	21,90
57	MOTOR_CURR_RATED	Arms	38,60	21,90
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	7,07	3,54
60	MOTOR_STATOR_RESISTANCE	Ohm	0,08	0,25
61	MOTOR_STATOR_INDUCTANCE	H	0,0009	0,0019
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,014173	0,015873	88,00	100,00	88,00	100,00
5	0,013191	0,014891	88,00	100,00	88,00	100,00
7	0,012300	0,014000	88,00	100,00	88,00	100,00
10	0,011812	0,013512	56,80	62,60	88,00	100,00
16	0,011699	0,013399	88,00	100,00	88,00	100,00
20	0,011670	0,013370	81,70	92,40	88,00	100,00
25	0,011630	0,013330	65,50	72,90	88,00	100,00
28	0,011505	0,013205	58,40	64,40	88,00	100,00
35	0,011485	0,013185	46,80	50,50	88,00	100,00
40	0,006023	0,007723	40,90	46,00	44,20	50,00
50	0,006013	0,007713	32,80	36,30	44,20	50,00
70	0,006004	0,007704	23,60	25,30	44,20	50,00
100	0,005999	0,007699	14,6	15,50	44,20	50,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.18 Parameter TPM+ Power 004 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	4	4
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,42	0,42
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	1,1	1,1
44 [1]	MOTORBRAKE_ON_TIME	ms	0,010	0,010
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,012	0,012
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	34,10	27,60
50	MOTOR_SPEED_RATED	rpm	3000	4400
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	1,25	0,66
53	MOTOR_TORQ_RATED	Nm	1,25	0,66
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,56	0,45
56	MOTOR_CURR_STALL	Arms	2,70	1,73
57	MOTOR_CURR_RATED	Arms	2,70	1,73
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,0927	0,06157
60	MOTOR_STATOR_RESISTANCE	Ohm	7,10	13,30
61	MOTOR_STATOR_INDUCTANCE	H	0,0073	0,0100
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,000039	0,000041	3,80	9,00	3,80	9,00
5	0,000036	0,000038	3,80	9,00	3,80	9,00
7	0,000033	0,000035	3,80	9,00	3,80	9,00
10	0,000031	0,000034	2,70	6,20	3,80	9,00
16	0,000032	0,000034	3,20	7,60	3,80	9,00
20	0,000031	0,000034	2,60	6,10	3,80	9,00
25	0,000031	0,000034	2,10	4,80	3,80	9,00
28	0,000031	0,000033	1,90	4,20	3,80	9,00
35	0,000031	0,000033	1,50	3,30	3,80	9,00
40	0,000016	0,000018	1,30	3,60	1,90	5,20
50	0,000016	0,000018	1,10	2,90	1,90	5,20
70	0,000016	0,000018	0,80	2,00	1,90	5,20
100	0,000016	0,000018	0,4	1,10	1,90	5,20

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

Page en-24

4.19 Parameter TPM+ Power 010 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	34,30	35,40
50	MOTOR_SPEED_RATED	rpm	2600	3500
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	4,50	1,38
53	MOTOR_TORQ_RATED	Nm	4,50	1,38
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,56	0,59
56	MOTOR_CURR_STALL	Arms	9,35	3,22
57	MOTOR_CURR_RATED	Arms	9,35	3,22
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	0,73	4,50
61	MOTOR_STATOR_INDUCTANCE	H	0,0020	0,0063
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,000238	0,000257	12,10	29,40	12,10	29,40
5	0,000222	0,000241	12,10	29,40	12,10	29,40
7	0,000208	0,000227	12,10	29,40	12,10	29,40
10	0,000200	0,000219	9,00	21,10	12,10	29,40
16	0,000202	0,000221	8,50	19,90	12,10	29,40
20	0,000199	0,000218	6,80	15,50	12,10	29,40
25	0,000198	0,000217	5,50	11,90	12,10	29,40
28	0,000196	0,000215	4,90	10,30	12,10	29,40
35	0,000196	0,000214	3,90	8,20	12,10	29,40
40	0,000072	0,000091	3,40	8,10	4,40	10,40
50	0,000072	0,000091	2,80	6,50	4,40	10,40
70	0,000072	0,000091	2,00	4,70	4,40	10,40
100	0,000072	0,000091	1,1	2,60	4,40	10,40

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.20 Parameter TPM+ Power 025 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	35,40	33,90
50	MOTOR_SPEED_RATED	rpm	1500	2800
51	MOTOR_SPEED_MAX	rpm	6000	6000
52	MOTOR_TORQ_STALL	Nm	11,68	3,00
53	MOTOR_TORQ_RATED	Nm	11,68	3,00
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,58	0,56
56	MOTOR_CURR_STALL	Arms	23,73	6,93
57	MOTOR_CURR_RATED	Arms	23,73	6,93
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,5281
60	MOTOR_STATOR_RESISTANCE	Ohm	0,13	1,33
61	MOTOR_STATOR_INDUCTANCE	H	0,0010	0,0037
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
4	0,000998	0,001098	28,90	70,00	28,90	70,00
5	0,000950	0,001050	28,90	70,00	28,90	70,00
7	0,000907	0,001007	28,90	70,00	28,90	70,00
10	0,000884	0,000984	20,40	47,10	28,90	70,00
16	0,000894	0,000994	22,30	52,20	28,90	70,00
20	0,000883	0,000982	17,80	40,20	28,90	70,00
25	0,000881	0,000980	15,50	34,00	28,90	70,00
28	0,000872	0,000972	12,70	26,60	28,90	70,00
35	0,000871	0,000971	11,10	22,50	28,90	70,00
40	0,000248	0,000348	7,80	21,00	7,80	21,00
50	0,000248	0,000348	7,80	20,90	7,80	21,00
70	0,000248	0,000347	4,90	12,40	7,80	21,00
100	0,000247	0,000347	2,8	11,10	7,80	21,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.21 Parameter TPM+ High Torque 010 560V

Code	Description	Unit	i=22-110 560 VDC	i=154-220 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,46
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	1,8
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,025
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	50,30	49,20
50	MOTOR_SPEED_RATED	rpm	2500	4500
51	MOTOR_SPEED_MAX	rpm	4850	4850
52	MOTOR_TORQ_STALL	Nm	3,75	1,44
53	MOTOR_TORQ_RATED	Nm	3,75	1,44
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,83	0,82
56	MOTOR_CURR_STALL	Arms	4,99	1,92
57	MOTOR_CURR_RATED	Arms	4,99	1,92
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	2,36	15,70
61	MOTOR_STATOR_INDUCTANCE	H	0,0060	0,0189
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [A_{rms}][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [A_{rms}][3]
22	0,000206	0,000225	10,60	15,00	12,00	17,00
27,5	0,000203	0,000222	8,50	11,90	12,00	17,00
38,5	0,000201	0,000220	6,10	8,40	12,00	17,00
55	0,000199	0,000218	4,30	5,80	12,00	17,00
66	-	-	-	-	-	-
88	0,000201	0,000220	2,80	3,70	12,00	17,00
110	0,000200	0,000219	2,20	3,00	12,00	17,00
154	0,000068	0,000087	1,60	2,20	4,40	6,00
220	0,000067	0,000086	1,20	1,60	4,40	6,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.22 Parameter TPM+ High Torque 025 560V

Code	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	59,20	50,30
50	MOTOR_SPEED_RATED	rpm	1500	2400
51	MOTOR_SPEED_MAX	rpm	4850	4850
52	MOTOR_TORQ_STALL	Nm	10,92	4,19
53	MOTOR_TORQ_RATED	Nm	10,92	4,19
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,98	0,83
56	MOTOR_CURR_STALL	Arms	13,08	5,76
57	MOTOR_CURR_RATED	Arms	13,08	5,76
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,54058
60	MOTOR_STATOR_RESISTANCE	Ohm	0,47	2,36
61	MOTOR_STATOR_INDUCTANCE	H	0,0030	0,0060
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
22	0,000901	0,001000	24,50	33,40	28,90	40,00
27,5	0,000883	0,000983	19,60	26,10	28,90	40,00
38,5	0,000874	0,000974	14,00	17,80	28,90	40,00
55	0,000869	0,000969	9,80	11,80	28,90	40,00
66	0,000203	0,000222	7,40	10,50	12,00	17,00
88	0,000196	0,000215	5,60	7,80	12,00	17,00
110	0,000193	0,000212	4,50	6,20	12,00	17,00
154	0,000191	0,000210	3,20	4,40	12,00	17,00
220	0,000189	0,000208	2,30	3,10	12,00	17,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.23 **Parameter TPM+ High Torque 050 560V**

Code	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	1	0,71
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	23	13
44 [1]	MOTORBRAKE_ON_TIME	ms	0,040	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,050	0,042
48	MOTOR_VOLTAGE_RATED	Vrms	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	73,40	61,02
50	MOTOR_SPEED_RATED	rpm	1000	1500
51	MOTOR_SPEED_MAX	rpm	4500	4850
52	MOTOR_TORQ_STALL	Nm	19,28	11,11
53	MOTOR_TORQ_RATED	Nm	19,28	11,11
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	1,21	1,00
56	MOTOR_CURR_STALL	Arms	17,93	12,60
57	MOTOR_CURR_RATED	Arms	17,93	12,60
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	3,03	2,1653
60	MOTOR_STATOR_RESISTANCE	Ohm	0,29	0,47
61	MOTOR_STATOR_INDUCTANCE	H	0,0021	0,0030
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
22	0,002380	0,002560	44,00	48,10	56,60	63,50
27,5	0,002335	0,002515	35,20	37,30	56,60	63,50
38,5	0,002299	0,002479	25,10	25,10	56,60	63,50
55	0,002281	0,002461	17,60	16,40	56,60	63,50
66	0,000923	0,001022	14,70	18,20	28,90	40,00
88	0,000904	0,001003	11,10	12,50	28,90	40,00
110	0,000884	0,000983	8,90	10,10	28,90	40,00
154	0,000874	0,000974	6,30	7,20	28,90	40,00
220	0,000869	0,000969	4,40	5,00	28,90	40,00

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

WITTENSTEIN | motion control

4.24 Parameter TPM+ High Torque 110 560V

Code	Description	Unit	i=22-55 560 VDC	i=66-88 560 VDC	i=110-220 560 VDC
30	MOTOR_TYPE	-	2	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1	1
47	MOTOR_POLPAIRS	-	6	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	1,67	1,67	1
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	72	72	23
44 [1]	MOTORBRAKE_ON_TIME	ms	0,050	0,050	0,040
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,200	0,200	0,050
48	MOTOR_VOLTAGE_RATED	Vrms	400	400	400
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	70,90	66,10	71,90
50	MOTOR_SPEED_RATED	rpm	600	800	1500
51	MOTOR_SPEED_MAX	rpm	4150	4150	4500
52	MOTOR_TORQ_STALL	Nm	Tbd	40,35	22,18
53	MOTOR_TORQ_RATED	Nm	Tbd	40,35	22,18
54	MOTOR_TORQ_MAX	Nm	See table below		
55	MOTOR_TORQ_CONST	Nm/Arms	1,17	1,09	1,19
56	MOTOR_CURR_STALL	Arms	Tbd	40,85	20,50
57	MOTOR_CURR_RATED	Arms	Tbd	40,85	20,50
58	MOTOR_CURR_MAX	Arms	See table below		
59	MOTOR_WIND_CROSS_SECT	mm²	11,259	7,07	3,03
60	MOTOR_STATOR_RESISTANCE	Ohm	0,05	0,08	0,29
61	MOTOR_STATOR_INDUCTANCE	H	0,0007	0,0009	0,0021
62	MOTOR_INERTIA	kgm²	See table below		
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	°C	155	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
22	0,022037	0,023687	tbd	tbd	tbd	tbd
27,5	0,021891	0,023541	tbd	tbd	tbd	tbd
38,5	0,021763	0,023413	tbd	tbd	tbd	tbd
55	0,021694	0,023344	tbd	tbd	tbd	tbd
66	0,011182	0,012882	40,00	40,50	88,00	100,00
88	0,010824	0,012524	30,10	30,40	88,00	100,00
110	0,002286	0,002466	24,20	23,00	56,60	63,50
154	0,002248	0,002428	17,20	15,90	56,60	63,50
220	0,002225	0,002405	12,10	11,20	56,60	63,50

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

4.25 Parameter TPM+ High Torque 010 320V

Code	Description	Unit	i=22-110 320 VDC	i=154-220 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,58	0,46
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	4,5	1,8
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,025
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,030	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	29,00	28,40
50	MOTOR_SPEED_RATED	rpm	2500	4500
51	MOTOR_SPEED_MAX	rpm	4850	4850
52	MOTOR_TORQ_STALL	Nm	3,75	1,44
53	MOTOR_TORQ_RATED	Nm	3,75	1,44
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,48	0,47
56	MOTOR_CURR_STALL	Arms	8,64	3,33
57	MOTOR_CURR_RATED	Arms	8,64	3,33
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	0,54058	0,16607
60	MOTOR_STATOR_RESISTANCE	Ohm	0,81	5,23
61	MOTOR_STATOR_INDUCTANCE	H	0,0020	0,0063
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
22	0,000206	0,000225	10,60	26,00	12,00	29,40
27,5	0,000203	0,000222	8,50	20,60	12,00	29,40
38,5	0,000201	0,000220	6,10	14,60	12,00	29,40
55	0,000199	0,000218	4,30	10,00	12,00	29,40
66	-	-	-	-	-	-
88	0,000201	0,000220	2,80	6,30	12,00	29,40
110	0,000200	0,000219	2,20	5,10	12,00	29,40
154	0,000068	0,000087	1,60	3,70	4,40	10,40
220	0,000067	0,000086	1,20	2,70	4,40	10,40

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

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4.26 Parameter TPM+ High Torque 025 320V

Code	Description	Unit	i=22-55 320 VDC	i=66-220 320 VDC
30	MOTOR_TYPE	-	2	2
31	MOTOR_COMPATIBILITY	-	0x0201	0x0201
46	MOTOR_WIND_CONNECT	-	1	1
47	MOTOR_POLPAIRS	-	6	6
42 [1]	MOTORBRAKE_CURR_RATED	A-DC	0,71	0,58
43 [1]	MOTORBRAKE_TORQ_RATED	Nm	13	4,5
44 [1]	MOTORBRAKE_ON_TIME	ms	0,020	0,020
45 [1]	MOTORBRAKE_OFF_TIME	ms	0,042	0,030
48	MOTOR_VOLTAGE_RATED	Vrms	230	230
49	MOTOR_VOLTAGE_CONST	mVrms/rpm	34,20	29,04
50	MOTOR_SPEED_RATED	rpm	1500	2400
51	MOTOR_SPEED_MAX	rpm	4850	4850
52	MOTOR_TORQ_STALL	Nm	10,92	4,19
53	MOTOR_TORQ_RATED	Nm	10,92	4,19
54	MOTOR_TORQ_MAX	Nm	See table below	
55	MOTOR_TORQ_CONST	Nm/Arms	0,56	0,48
56	MOTOR_CURR_STALL	Arms	22,66	9,98
57	MOTOR_CURR_RATED	Arms	22,66	9,98
58	MOTOR_CURR_MAX	Arms	See table below	
59	MOTOR_WIND_CROSS_SECT	mm²	2,1653	0,54058
60	MOTOR_STATOR_RESISTANCE	Ohm	0,16	0,81
61	MOTOR_STATOR_INDUCTANCE	H	0,0010	0,0020
62	MOTOR_INERTIA	kgm²	See table below	
63	MOTOR_COMMUT_OFFSET	-	3,14159	3,14159
74	MOTOR_WIND_TEMP_MAX	℃	155	155

[1] In case of no brake is used, parameters 42-45 have to set to 0.

Ratio	Motor inertia w/o brake[kgm²]	Motor inertia with brake[kgm²]	$T_{max\ stat}$ [Nm][2]	$I_{max\ stat}$ [Arms][2]	$T_{max\ dyn}$ [Nm][3]	$I_{max\ dyn}$ [Arms][3]
22	0,000901	0,001000	24,50	58,30	28,90	70,00
27,5	0,000883	0,000983	19,60	45,60	28,90	70,00
38,5	0,000874	0,000974	14,00	30,90	28,90	70,00
55	0,000869	0,000969	9,80	20,40	28,90	70,00
66	0,000203	0,000222	7,40	18,10	12,00	29,40
88	0,000196	0,000215	5,60	13,60	12,00	29,40
110	0,000193	0,000212	4,50	10,80	12,00	29,40
154	0,000191	0,000210	3,20	7,70	12,00	29,40
220	0,000189	0,000208	2,30	5,40	12,00	29,40

[2] Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

[3] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

5 Connection schematic TPM⁺

➲ Detailed information on cable design and the type of shielding can be found in the documentation from the servo drive manufacturer.

5.1 TPM⁺ with resolver

WITTENSTEIN motion control offers pre-manufactured and drag chain compatible cablesets for this servo drive. Please take the required order informations from the TPM+ catalogue.

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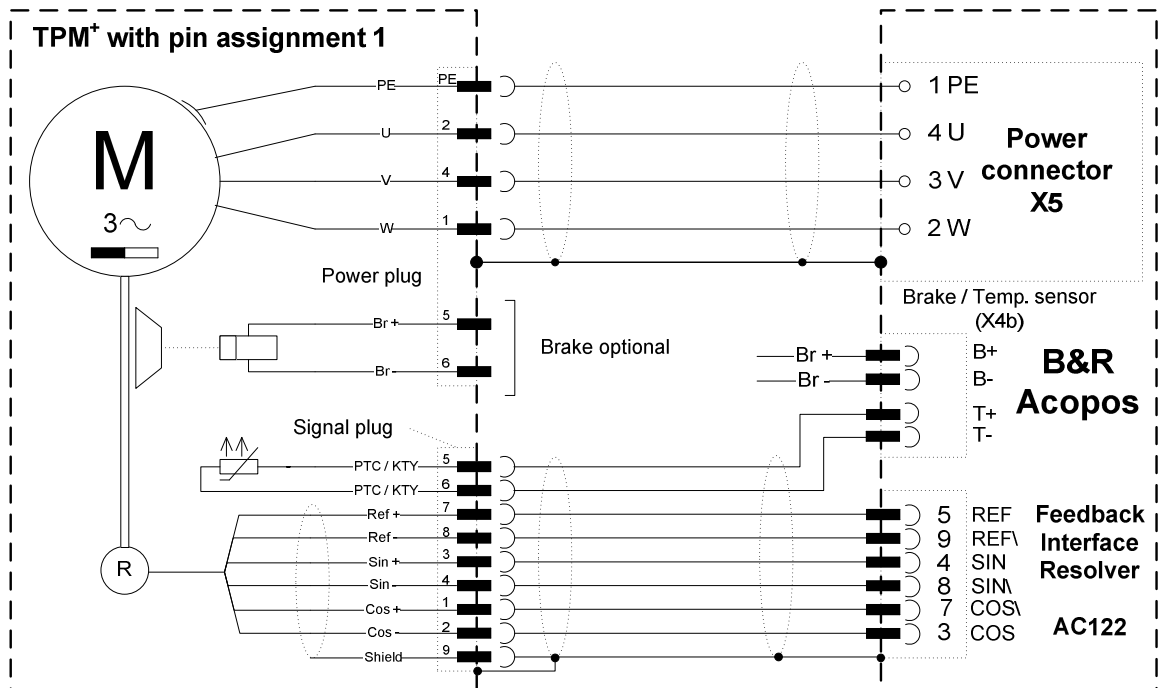
5.2 TPM⁺ with absolute encoder Heidenhain EnDat ECN1113 / EQN 1125

WITTENSTEIN motion control offers pre-manufactured and drag chain compatible cablesets for this servo drive. Please take the required order informations from the TPM+ catalogue.
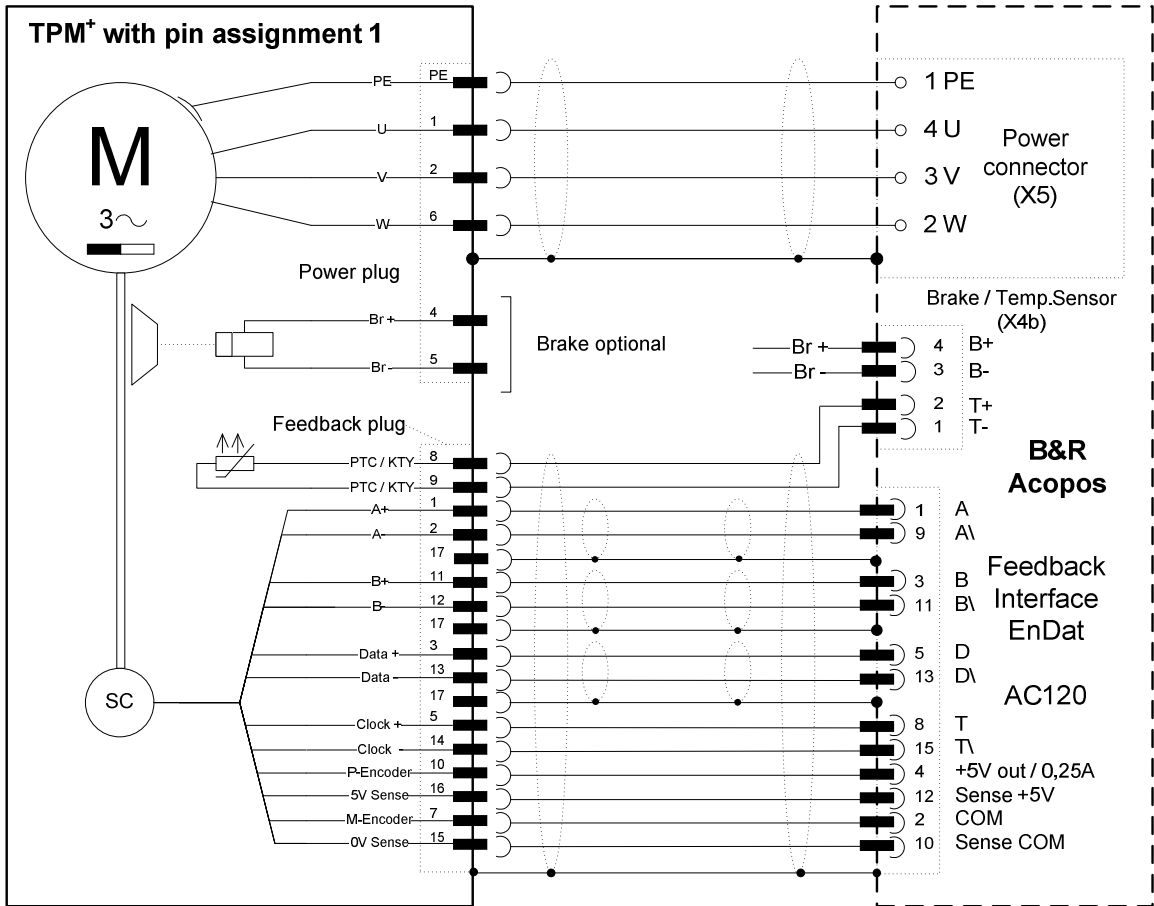
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