



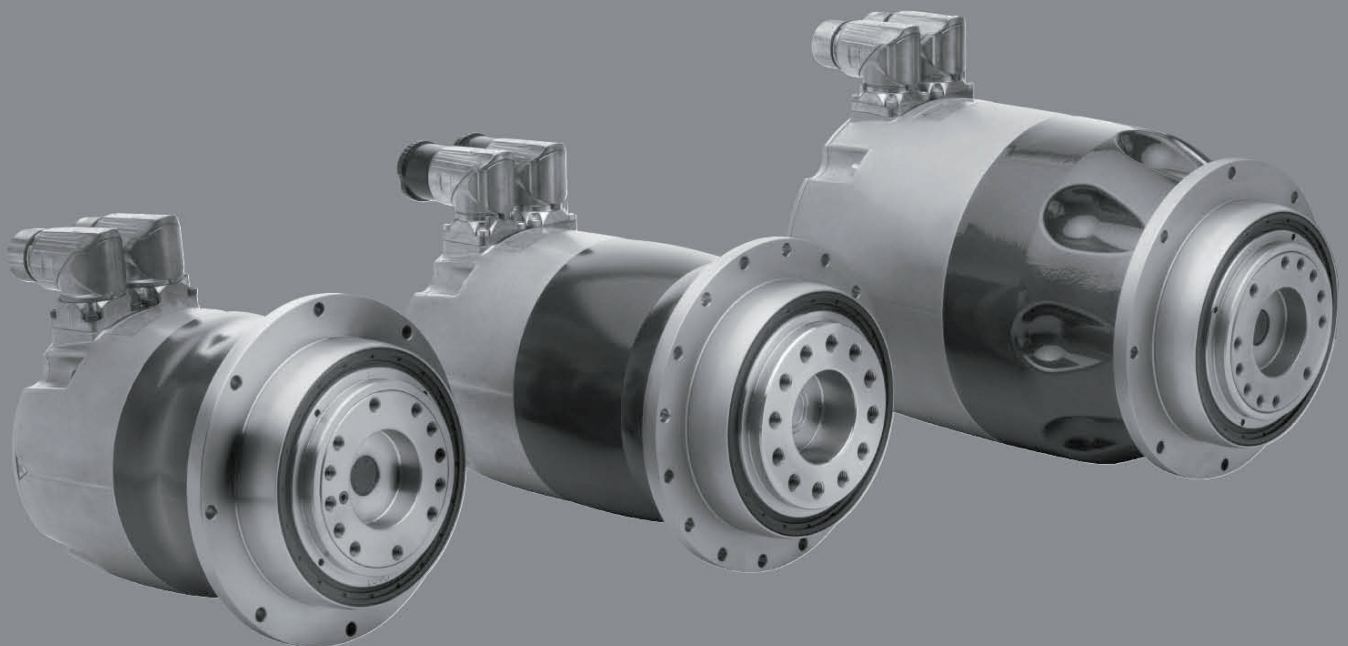
WITTENSTEIN

alpha

# TPM<sup>+</sup>

Lenze ECS

Quick Startup Guide



## Revision history

Revision	Date	Comment	Chapter
01	27 <sup>th</sup> July 2012	First release	All
02	27 <sup>th</sup> March 2017	Transition to Wittenstein alpha	All

### Service

In case you have technical questions,  
please contact:

**WITTENSTEIN alpha GmbH**

Customer Service

Walter-Wittenstein-Straße 1

D-97999 Igersheim

Tel.: +49 (0) 79 31 / 493- 12900

Fax: +49 (0) 79 31 / 493- 10903

E-Mail: [service@wittenstein.de](mailto:service@wittenstein.de)

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# 1 General Information

## 1.1 Description, designations

The AC servo actuator **TPM<sup>+</sup>** (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<sup>+</sup>** series
- Connection schematic for **TPM<sup>+</sup>**

## 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 alpha** 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

© 2017, **WITTENSTEIN alpha GmbH**

All of the product brand names which appear in this manual are trademarks of the relevant companies. If the ® and/or <sup>TM</sup> symbols are omitted, this does imply that the name is a free brand name.

## 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-alpha.de](http://www.wittenstein-alpha.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.

**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.

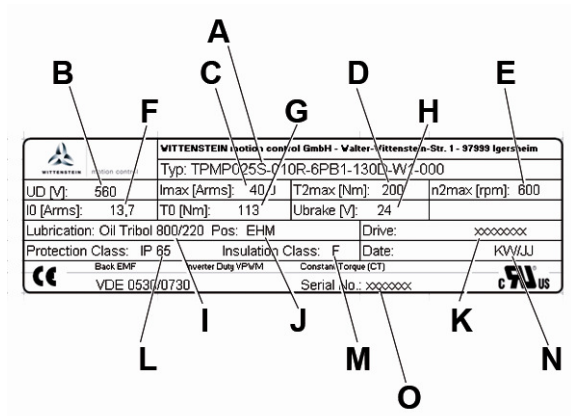
- Only use power and signal cables recommended by WITTENSTEIN alpha.
- Do not cut off power and signal cables, and do not insert extensions.
- Make sure that the U-U, V-V and W-W motor phases are correctly connected.
- Make sure that the motor encoder interface of the servo controller is compatible to 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.

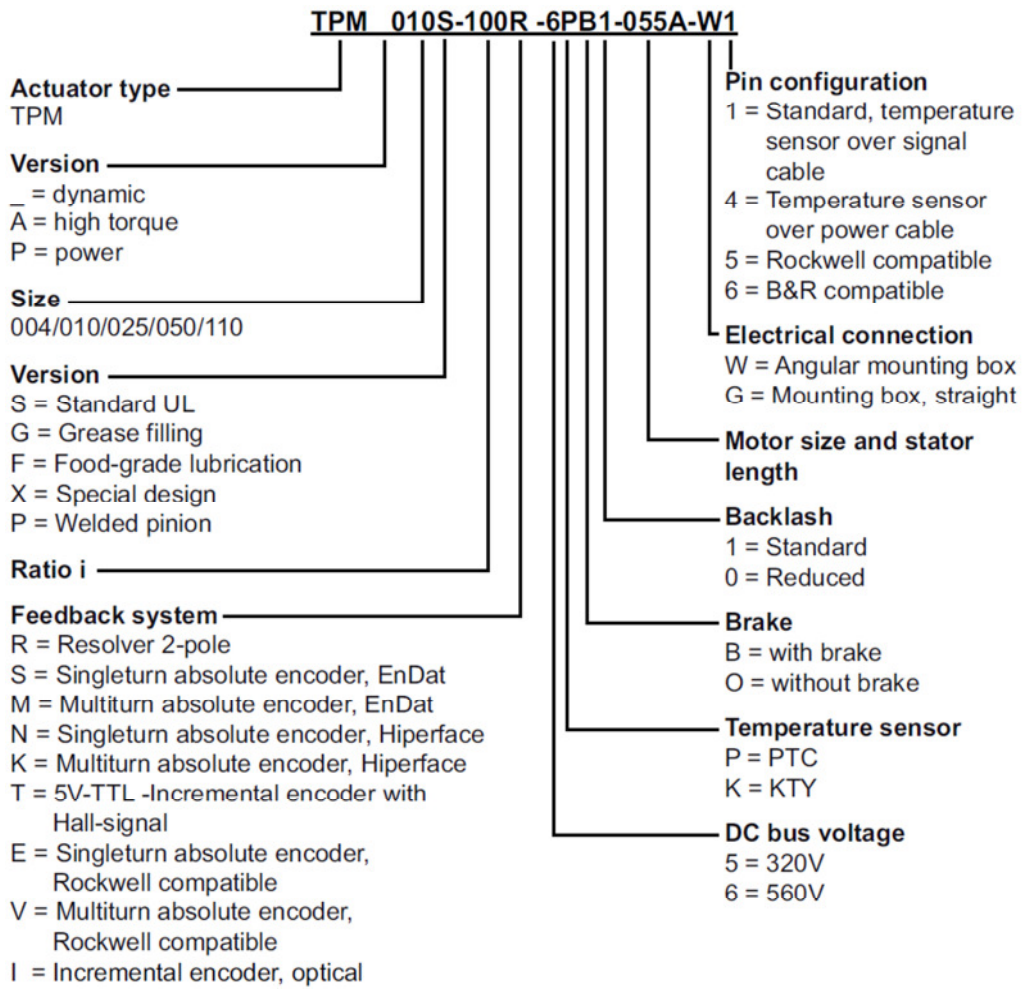
#### 3.1 Identification plate, designation

The following specifications can be found on the identification plate:



- 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

Bild 4.2





## 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<sup>+</sup>** servo actuator from WITTENSTEIN alpha at a servo drive **Lenze ECS**. 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 Parameterization of motor feedback

<b>Motor feedback Resolver</b>		
C 0058	Rotor diff Resolver [°]	179,9
C 0080	Res pole no.	1
C 0490	Feedback pos	0
C 0495	Feedback speed	0

<b>Motor feedback Hiperface</b>		
C 0490	Feedpack pos	Singleturn: 3 / Multiturn: 4
C 0495	Feedback speed	Singleturn: 3 / Multiturn: 4
C 0419	Enc. Setup	Singleturn: 308 / Multiturn: 408
C 0058	Rotor diff SinCos [°]	Measurement with pole detection function C0095

## 4.2 Parameter TPM+ Dynamic 004 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	66,6	60,0
C 0076	T <sub>n</sub> currCTRL	msec	1,18	0,80
C 0081	Mot power	kW	0,50	0,20
C 0084	Mot R <sub>s</sub>	Ohm	14,10	18,70
C 0085	Mot L <sub>s</sub>	mH	16,6	15,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	1,10	0,80
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	V <sub>rms</sub>	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> [A <sub>rms</sub> ] <sup>1</sup>	I <sub>max dyn</sub> [A <sub>rms</sub> ] <sup>2</sup>
16	0,21	0,23	3,20	3,20
21	0,20	0,23	2,60	3,20
31	0,20	0,22	2,20	3,20
61	0,12	0,14	1,40	2,40
64	0,11	0,13	1,30	2,40
91	0,12	0,14	0,90	2,40

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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.

### 4.3 Parameter TPM+ Dynamic 010 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	45,6	60,0
C 0076	Tn currCTRL	msec	1,07	0,75
C 0081	Mot power	kW	0,80	0,40
C 0084	Mot Rs	Ohm	10,65	20,00
C 0085	Mot Ls	mH	11,4	15,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	1,30	0,90
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	0,32	0,34	5,20	5,20
21	0,32	0,34	5,20	5,20
31	0,32	0,34	4,70	5,20
61	0,17	0,19	2,20	3,00
64	0,17	0,19	2,10	3,00
91	0,17	0,19	1,50	3,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 025 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	12,0	37,8
C 0076	T <sub>n</sub> currCTRL	msec	2,73	1,40
C 0081	Mot power	kW	3,50	1,20
C 0084	Mot R <sub>s</sub>	Ohm	1,10	6,75
C 0085	Mot L <sub>s</sub>	mH	3,0	9,4
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	5,70	1,90
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	V <sub>rms</sub>	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	2,16	2,35	17,00	17,00
21	2,16	2,35	17,00	17,00
31	2,17	2,36	14,10	17,00
61	0,77	0,96	5,90	6,00
64	0,76	0,95	5,60	6,00
91	0,76	0,95	3,80	6,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 050 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	5000	5000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	6,0	22,2
C 0076	Tn currCTRL	msec	6,73	2,78
C 0081	Mot power	kW	7,10	1,90
C 0084	Mot Rs	Ohm	0,22	2,00
C 0085	Mot Ls	mH	1,5	5,6
C 0087	Mot speed	rpm	5000	5000
C 0088	Mot current	Arms	13,70	3,80
C 0089	Mot frequency	Hz	500	500
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	9,07	10,07	40,00	40,00
21	9,07	10,07	34,30	40,00
31	8,94	9,93	29,40	40,00
61	2,51	3,51	12,00	12,00
64	2,49	3,49	12,00	12,00
91	2,49	3,49	8,40	12,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 110 560V

Code	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	5000	5000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,8	6,0
C 0076	Tn currCTRL	msec	7,41	6,73
C 0081	Mot power	kW	8,60	7,10
C 0084	Mot Rs	Ohm	0,16	0,22
C 0085	Mot Ls	mH	1,2	1,5
C 0087	Mot speed	rpm	5000	5000
C 0088	Mot current	Arms	16,70	13,70
C 0089	Mot frequency	Hz	500	500
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	13,14	14,14	70,00	70,00
21	13,14	14,14	70,00	70,00
31	12,84	13,84	70,00	70,00
61	8,89	9,88	30,00	40,00
64	8,83	9,83	28,30	40,00
91	8,83	9,83	18,00	40,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 004 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	22,2	20,0
C 0076	Tn currCTRL	msec	1,18	0,80
C 0081	Mot power	kW	0,50	0,20
C 0084	Mot Rs	Ohm	4,70	6,25
C 0085	Mot Ls	mH	5,6	5,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	1,90	1,40
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	0,21	0,23	5,50	5,50
21	0,20	0,23	4,50	5,50
31	0,20	0,22	3,80	5,50
61	0,12	0,14	2,40	4,20
64	0,11	0,13	2,30	4,20
91	0,12	0,14	1,60	4,20

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 010 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	14,7	20,0
C 0076	Tn currCTRL	msec	1,03	0,75
C 0081	Mot power	kW	0,80	0,40
C 0084	Mot Rs	Ohm	3,55	6,65
C 0085	Mot Ls	mH	3,7	5,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	2,20	1,60
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	0,32	0,34	9,00	9,00
21	0,32	0,34	9,00	9,00
31	0,32	0,34	8,10	9,00
61	0,17	0,19	3,80	5,20
64	0,17	0,19	2,50	5,20
91	0,17	0,19	3,60	5,20

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 025 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,0	12,6
C 0076	Tn currCTRL	msec	2,74	1,40
C 0081	Mot power	kW	3,50	1,20
C 0084	Mot Rs	Ohm	0,36	2,25
C 0085	Mot Ls	mH	1,0	3,2
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	9,90	3,30
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	2,16	2,35	29,40	29,40
21	2,16	2,35	29,40	29,40
31	2,17	2,36	24,40	29,40
61	0,77	0,96	10,30	10,40
64	0,76	0,95	9,80	10,40
91	0,76	0,95	6,50	10,40

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 050 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	5000	5000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	2,0	7,4
C 0076	Tn currCTRL	msec	7,72	2,78
C 0081	Mot power	kW	7,10	1,90
C 0084	Mot Rs	Ohm	0,06	0,66
C 0085	Mot Ls	mH	0,5	1,8
C 0087	Mot speed	rpm	5000	5000
C 0088	Mot current	Arms	23,70	6,60
C 0089	Mot frequency	Hz	500	500
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	9,07	10,07	70,00	70,00
21	9,07	10,07	59,90	70,00
31	8,94	9,93	51,40	70,00
61	2,51	3,51	21,00	21,00
64	2,49	3,49	21,00	21,00
91	2,49	3,49	14,70	21,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 110 320V

Code	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	3700	5000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,8	2,0
C 0076	Tn currCTRL	msec	7,41	7,72
C 0081	Mot power	kW	6,40	7,10
C 0084	Mot Rs	Ohm	0,16	0,06
C 0085	Mot Ls	mH	1,2	0,5
C 0087	Mot speed	rpm	3700	5000
C 0088	Mot current	Arms	16,70	23,70
C 0089	Mot frequency	Hz	370	500
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
16	13,14	14,14	70,00	70,00
21	13,14	14,14	70,00	70,00
31	12,84	13,84	70,00	70,00
61	8,89	9,88	52,40	70,00
64	8,83	9,83	49,40	70,00
91	8,83	9,83	31,30	70,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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+ Power 004 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	45,6	60,0
C 0076	T <sub>n</sub> currCTRL	msec	1,07	0,75
C 0081	Mot power	kW	0,80	0,40
C 0084	Mot R <sub>s</sub>	Ohm	10,65	20,00
C 0085	Mot L <sub>s</sub>	mH	11,4	15,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	1,60	1,00
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	V <sub>rms</sub>	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	0,39	0,41	5,20	5,20
5	0,36	0,38	5,20	5,20
7	0,33	0,35	5,20	5,20
10	0,31	0,34	3,60	5,20
16	0,32	0,34	4,40	5,20
20	0,31	0,34	3,50	5,20
25	0,31	0,34	2,80	5,20
28	0,31	0,33	2,50	5,20
35	0,31	0,33	1,90	5,20
40	0,16	0,18	2,10	3,00
50	0,16	0,18	1,70	3,00
70	0,16	0,18	1,20	3,00
100	0,16	0,18	0,60	3,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T<sub>2B</sub>.

<sup>2</sup> 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 010 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	12,0	37,8
C 0076	T <sub>n</sub> currCTRL	msec	2,73	1,40
C 0081	Mot power	kW	2,80	0,90
C 0084	Mot R <sub>s</sub>	Ohm	1,10	6,75
C 0085	Mot L <sub>s</sub>	mH	3,0	9,4
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	5,40	1,90
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	V <sub>rms</sub>	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	2,38	2,57	17,00	17,00
5	2,22	2,41	17,00	17,00
7	2,08	2,27	17,00	17,00
10	2,00	2,19	12,20	17,00
16	2,02	2,21	11,50	17,00
20	1,99	2,18	8,90	17,00
25	1,98	2,17	6,90	17,00
28	1,96	2,15	6,00	17,00
35	1,96	2,14	4,70	17,00
40	0,72	0,91	4,70	6,00
50	0,72	0,91	3,70	6,00
70	0,72	0,91	2,70	6,00
100	0,72	0,91	1,50	6,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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.

#### 4.14 Parameter TPM+ Power 025 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	6,0	22,2
C 0076	Tn currCTRL	msec	6,73	2,78
C 0081	Mot power	kW	7,30	1,90
C 0084	Mot Rs	Ohm	0,22	2,00
C 0085	Mot Ls	mH	1,5	5,6
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	13,70	4,00
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	9,98	10,98	40,00	40,00
5	9,50	10,50	40,00	40,00
7	9,07	10,07	40,00	40,00
10	8,84	9,84	27,00	40,00
16	8,94	9,94	29,90	40,00
20	8,83	9,82	23,10	40,00
25	8,81	9,80	19,50	40,00
28	8,72	9,72	15,30	40,00
35	8,71	9,71	13,00	40,00
40	2,48	3,48	12,00	12,00
50	2,48	3,48	12,00	12,00
70	2,48	3,47	7,10	12,00
100	2,47	3,47	3,70	12,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 050 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	5000	5000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,2	10,2
C 0076	Tn currCTRL	msec	7,78	2,82
C 0081	Mot power	kW	10,10	2,80
C 0084	Mot Rs	Ohm	0,14	0,90
C 0085	Mot Ls	mH	1,0	2,6
C 0087	Mot speed	rpm	5000	5000
C 0088	Mot current	Arms	19,00	7,50
C 0089	Mot frequency	Hz	500	500
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	26,42	28,22	63,50	63,50
5	24,80	26,60	63,50	63,50
7	23,34	25,14	54,90	63,50
10	22,54	24,34	38,40	63,50
16	23,07	24,87	53,10	63,50
20	22,61	24,41	41,70	63,50
25	22,55	24,35	32,60	63,50
28	22,20	24,00	28,60	63,50
35	22,17	23,97	22,20	63,50
40	6,3	8,1	33,00	33,00
50	6,28	8,08	32,50	33,00
70	6,27	8,07	19,90	33,00
100	6,26	8,06	8,30	33,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 110 560V

Code	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4200	4500
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	1,8	3,8
C 0076	Tn currCTRL	msec	10,84	7,60
C 0081	Mot power	kW	16,20	9,80
C 0084	Mot Rs	Ohm	0,04	0,12
C 0085	Mot Ls	mH	0,4	1,0
C 0087	Mot speed	rpm	4200	4500
C 0088	Mot current	Arms	38,60	21,90
C 0089	Mot frequency	Hz	420	450
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	141,73	158,73	100,00	100,00
5	131,91	148,91	100,00	100,00
7	123,00	140,00	100,00	100,00
10	118,12	135,12	62,60	100,00
16	116,99	133,99	100,00	100,00
20	116,70	133,70	92,40	100,00
25	116,30	133,30	72,90	100,00
28	115,05	132,05	64,40	100,00
35	114,85	131,85	50,50	100,00
40	60,23	77,23	46,00	50,00
50	60,13	77,13	36,30	50,00
70	60,04	77,04	25,30	50,00
100	59,99	76,99	15,50	50,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 004 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	14,7	20,0
C 0076	Tn currCTRL	msec	1,03	0,75
C 0081	Mot power	kW	0,80	0,40
C 0084	Mot Rs	Ohm	3,55	6,65
C 0085	Mot Ls	mH	3,7	5,0
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	2,70	1,70
C 0089	Mot frequency	Hz	400	400
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	0,39	0,41	9,00	9,00
5	0,36	0,38	9,00	9,00
7	0,33	0,35	9,00	9,00
10	0,31	0,34	6,20	9,00
16	0,32	0,34	7,60	9,00
20	0,31	0,34	6,10	9,00
25	0,31	0,34	4,80	9,00
28	0,31	0,33	4,20	9,00
35	0,31	0,33	3,30	9,00
40	0,16	0,18	3,60	5,20
50	0,16	0,18	2,90	5,20
70	0,16	0,18	2,00	5,20
100	0,16	0,18	1,10	5,20

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 010 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,0	12,6
C 0076	Tn currCTRL	msec	2,74	1,40
C 0081	Mot power	kW	2,80	0,90
C 0084	Mot Rs	Ohm	0,36	2,25
C 0085	Mot Ls	mH	1,0	3,2
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	9,40	3,20
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	2,38	2,57	29,40	29,40
5	2,22	2,41	29,40	29,40
7	2,08	2,27	29,40	29,40
10	2,00	2,19	21,10	29,40
16	2,02	2,21	19,90	29,40
20	1,99	2,18	15,50	29,40
25	1,98	2,17	11,90	29,40
28	1,96	2,15	10,30	29,40
35	1,96	2,14	8,20	29,40
40	0,72	0,91	8,10	10,40
50	0,72	0,91	6,50	10,40
70	0,72	0,91	4,70	10,40
100	0,72	0,91	2,60	10,40

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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.

#### 4.19 Parameter TPM+ Power 025 320V

Code	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	6000	6000
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	2,0	7,4
C 0076	Tn currCTRL	msec	7,72	2,78
C 0081	Mot power	kW	7,30	1,90
C 0084	Mot Rs	Ohm	0,06	0,66
C 0085	Mot Ls	mH	0,5	1,8
C 0087	Mot speed	rpm	6000	6000
C 0088	Mot current	Arms	23,70	6,90
C 0089	Mot frequency	Hz	600	600
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
4	9,98	10,98	70,00	70,00
5	9,50	10,50	70,00	70,00
7	9,07	10,07	70,00	70,00
10	8,84	9,84	47,10	70,00
16	8,94	9,94	52,20	70,00
20	8,83	9,82	40,20	70,00
25	8,81	9,80	34,00	70,00
28	8,72	9,72	26,60	70,00
35	8,71	9,71	22,50	70,00
40	2,48	3,48	21,00	21,00
50	2,48	3,48	20,90	21,00
70	2,48	3,47	12,40	21,00
100	2,47	3,47	11,10	21,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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+ High Torque 010 560V

Code	Description	Unit	i=22-110 560 VDC	i=154-220 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4850	4850
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	12,0	37,8
C 0076	Tn currCTRL	msec	2,54	1,20
C 0081	Mot power	kW	1,90	0,70
C 0084	Mot Rs	Ohm	1,18	7,85
C 0085	Mot Ls	mH	3,0	9,4
C 0087	Mot speed	rpm	4850	4850
C 0088	Mot current	Arms	5,00	1,90
C 0089	Mot frequency	Hz	485	485
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
22	2,06	2,25	15,00	17,00
27,5	2,03	2,22	11,90	17,00
38,5	2,01	2,20	8,40	17,00
55	1,99	2,18	5,80	17,00
66	-	-	-	-
88	2,01	2,20	3,70	17,00
110	2,00	2,19	3,00	17,00
154	0,68	0,87	2,20	6,00
220	0,67	0,86	1,60	6,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 025 560V

Code	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4850	4850
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	6,0	12,0
C 0076	Tn currCTRL	msec	6,38	2,54
C 0081	Mot power	kW	5,50	2,10
C 0084	Mot Rs	Ohm	0,24	1,18
C 0085	Mot Ls	mH	1,5	3,0
C 0087	Mot speed	rpm	4850	4850
C 0088	Mot current	Arms	13,10	5,80
C 0089	Mot frequency	Hz	485	485
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
22	9,01	10,00	33,40	40,00
27,5	8,83	9,83	26,10	40,00
38,5	8,74	9,74	17,80	40,00
55	8,69	9,69	11,80	40,00
66	2,03	2,22	10,50	17,00
88	1,96	2,15	7,80	17,00
110	1,93	2,12	6,20	17,00
154	1,91	2,10	4,40	17,00
220	1,89	2,08	3,10	17,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 050 560V

Code	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4500	4850
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,2	6,0
C 0076	Tn currCTRL	msec	7,32	6,38
C 0081	Mot power	kW	9,10	5,60
C 0084	Mot Rs	Ohm	0,14	0,24
C 0085	Mot Ls	mH	1,0	1,5
C 0087	Mot speed	rpm	4500	4850
C 0088	Mot current	Arms	17,90	12,60
C 0089	Mot frequency	Hz	450	485
C 0090	Mot voltage	Vrms	480	480
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
22	23,80	25,60	48,10	63,50
27,5	23,35	25,15	37,30	63,50
38,5	22,99	24,79	25,10	63,50
55	22,81	24,61	16,40	63,50
66	9,23	10,22	18,20	40,00
88	9,04	10,03	12,50	40,00
110	8,84	9,83	10,10	40,00
154	8,74	9,74	7,20	40,00
220	8,69	9,69	5,00	40,00

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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 110 560V

Code	Description	Unit	i=22-55 560 VDC	i=66-88 560 VDC	i=110-220 560 VDC
C 0006	OP Mode	-	1	1	1
C 0011	Nmax	rpm	4150	4150	4500
C 0018	fchop	kHz	8	8	8
C 0022	I <sub>max</sub> current	Arms	See table below		
C 0070	VP SpeedCTRL	-	0,1	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0	0
C 0075	VP currCTRL	V/A	1,3	1,8	4,2
C 0076	T <sub>n</sub> currCTRL	msec	13,96	10,84	7,24
C 0081	Mot power	kW	27,60	17,50	10,50
C 0084	Mot R <sub>s</sub>	Ohm	0,02	0,04	0,14
C 0085	Mot L <sub>s</sub>	mH	0,3	0,4	1,0
C 0087	Mot speed	rpm	4150	4150	4500
C 0088	Mot current	Arms	Tbd	40,80	20,50
C 0089	Mot frequency	Hz	415	415	450
C 0090	Mot voltage	V <sub>rms</sub>	480	480	480
C 0091	Mot cos phi	-	1	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific		
C 1190	MPTC mode	-	1	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35		
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150		
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498		
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334		

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> [A <sub>rms</sub> ] <sup>1</sup>	I <sub>max dyn</sub> [A <sub>rms</sub> ] <sup>2</sup>
22	220,37	236,87	tbd	tbd
27,5	218,91	235,41	tbd	tbd
38,5	217,63	234,13	tbd	tbd
55	216,94	233,44	tbd	tbd
66	111,82	128,82	40,50	100,00
88	108,24	125,24	30,40	100,00
110	22,86	24,66	23,00	63,50
154	22,48	24,28	15,90	63,50
220	22,25	24,05	11,20	63,50

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

<sup>2</sup> 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.



#### 4.24 Parameter TPM+ High Torque 010 320V

Code	Description	Unit	i=22-110 320 VDC	i=154-220 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4850	4850
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	T <sub>n</sub> SpeedCTRL	-	10	10
C 0072	T <sub>d</sub> SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	4,0	12,6
C 0076	T <sub>n</sub> currCTRL	msec	2,47	1,20
C 0081	Mot power	kW	1,90	0,70
C 0084	Mot R <sub>s</sub>	Ohm	0,40	2,62
C 0085	Mot L <sub>s</sub>	mH	1,0	3,2
C 0087	Mot speed	rpm	4850	4850
C 0088	Mot current	Arms	8,60	3,30
C 0089	Mot frequency	Hz	485	485
C 0090	Mot voltage	V <sub>rms</sub>	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> [A <sub>rms</sub> ] <sup>1</sup>	I <sub>max dyn</sub> [A <sub>rms</sub> ] <sup>2</sup>
22	2,06	2,25	26,00	29,40
27,5	2,03	2,22	20,60	29,40
38,5	2,01	2,20	14,60	29,40
55	1,99	2,18	10,00	29,40
66	-	-	-	-
88	2,01	2,20	6,30	29,40
110	2,00	2,19	5,10	29,40
154	0,68	0,87	3,70	10,40
220	0,67	0,86	2,70	10,40

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T<sub>2B</sub>.

<sup>2</sup> 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 025 320V

Code	Description	Unit	i=22-55 320 VDC	i=66-220 320 VDC
C 0006	OP Mode	-	1	1
C 0011	Nmax	rpm	4850	4850
C 0018	fchop	kHz	8	8
C 0022	I <sub>max</sub> current	Arms	See table below	
C 0070	VP SpeedCTRL	-	0,1	0,1
C 0071	Tn SpeedCTRL	-	10	10
C 0072	Td SpeedCTRL	-	0	0
C 0075	VP currCTRL	V/A	2,0	4,0
C 0076	Tn currCTRL	msec	6,39	2,47
C 0081	Mot power	kW	5,50	2,10
C 0084	Mot Rs	Ohm	0,08	0,40
C 0085	Mot Ls	mH	0,5	1,0
C 0087	Mot speed	rpm	4850	4850
C 0088	Mot current	Arms	22,70	10,00
C 0089	Mot frequency	Hz	485	485
C 0090	Mot voltage	Vrms	230	230
C 0091	Mot cos phi	-	1	1
C 0594	MONIT SD6	-	0 / 2 Application specific	
C 1190	MPTC mode	-	1	1
C 1191/1	Char.: Temp 1	°C	PTC: 35 / KTY: 35	
C 1191/2	Char.: Temp 2	°C	PTC: 150 / KTY: 150	
C 1192/1	Char.: Ohm 1	Ohm	PTC: 100 / KTY: 498	
C 1192/2	Char.: Ohm 2	Ohm	PTC: 1330 / KTY: 1334	

Ratio	Motor inertia w/o brake[kgcm <sup>2</sup> ]	Motor inertia with brake[kgcm <sup>2</sup> ]	I <sub>max stat</sub> <sup>1</sup> [A <sub>rms</sub> ]	I <sub>max dyn</sub> <sup>2</sup> [A <sub>rms</sub> ]
22	9,01	10,00	58,30	70,00
27,5	8,83	9,83	45,60	70,00
38,5	8,74	9,74	30,90	70,00
55	8,69	9,69	20,40	70,00
66	2,03	2,22	18,10	29,40
88	1,96	2,15	13,60	29,40
110	1,93	2,12	10,80	29,40
154	1,91	2,10	7,70	29,40
220	1,89	2,08	5,40	29,40

<sup>1</sup> Static maximum motorcurrent: Use this maximum current to protect the gear reducer from overload and to reduce the torque safely to T2B.

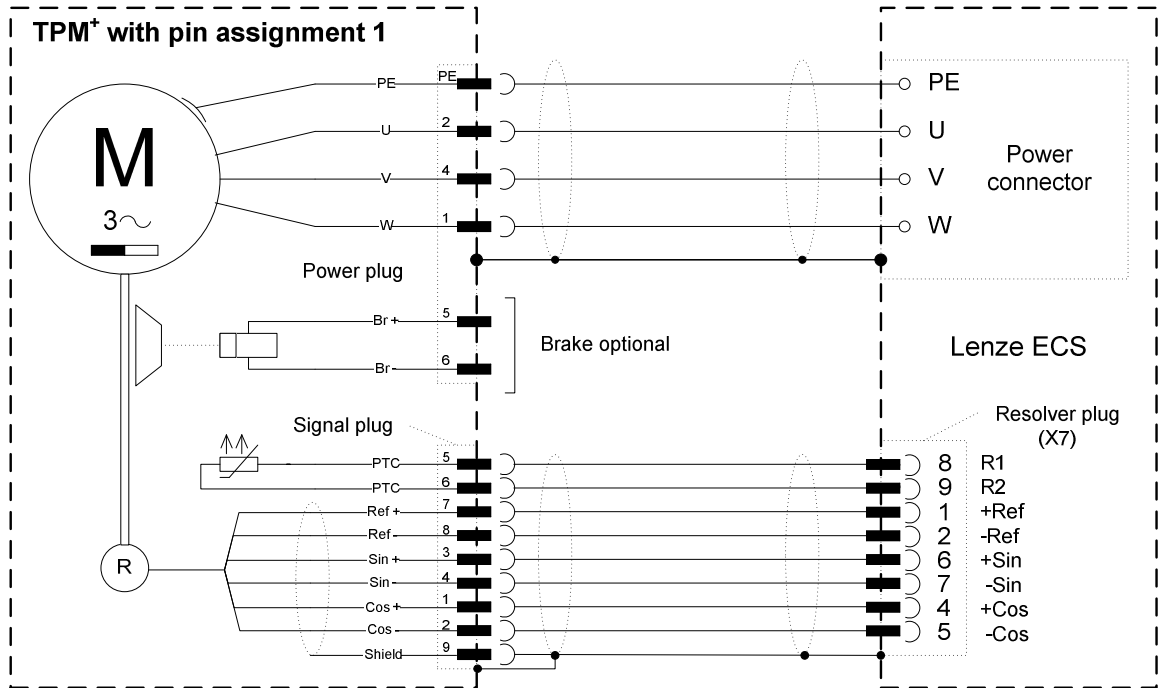
<sup>2</sup> Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

## 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.

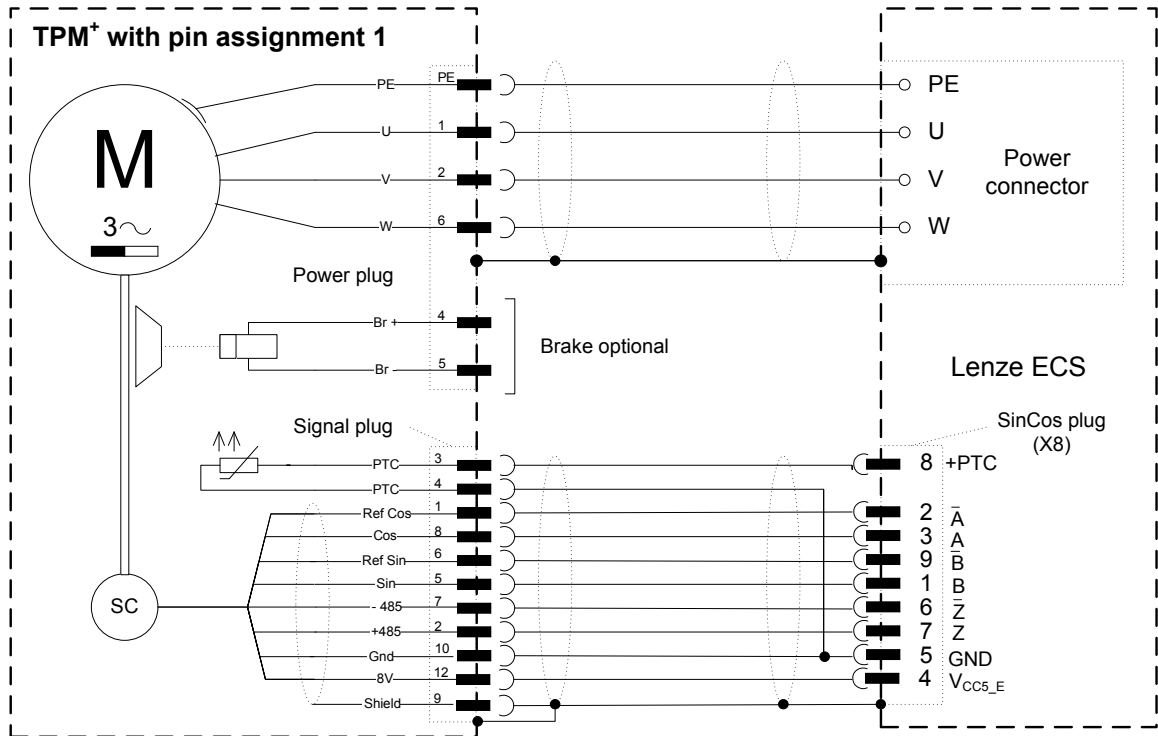
### 5.1 TPM+ with resolver

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



**5.2 TPM+ with absolute encoder Stegmann SKS / SKM 36**

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





alpha

WITTENSTEIN alpha GmbH · Walter-Wittenstein-Straße 1 · 97999 Igersheim · Germany  
Tel. +49 7931 493-12900 · [info@wittenstein.de](mailto:info@wittenstein.de)

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