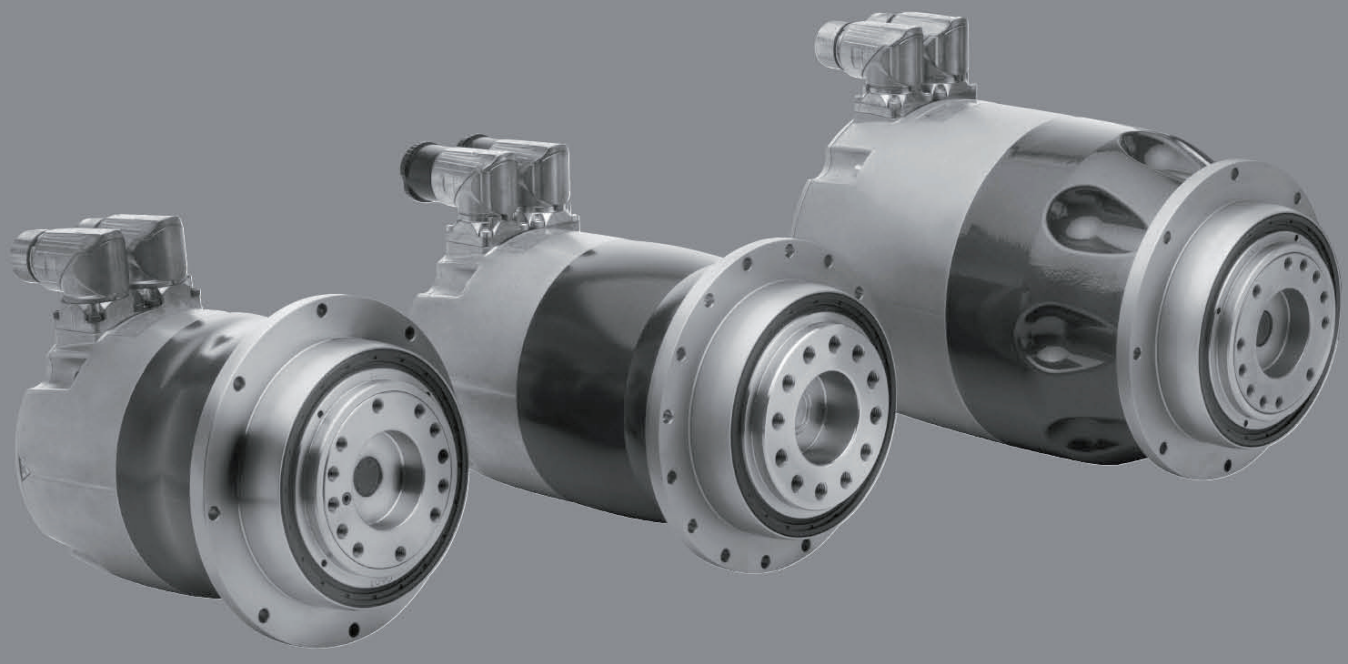
WITTENSTEIN | alpha

TPM+

Kollmorgen Servostar S700

Quick Startup Guide



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Revision history

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

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Table of Contents

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 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

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

➲ 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:

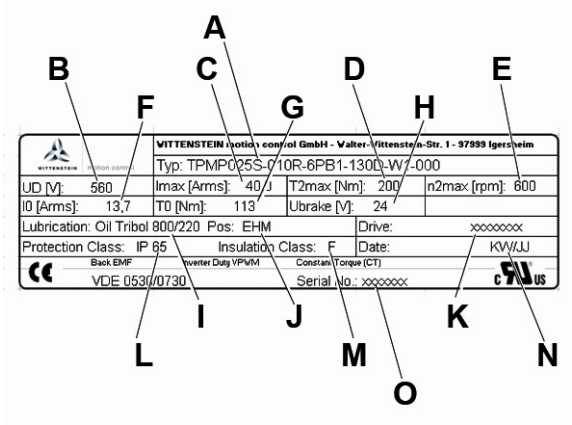
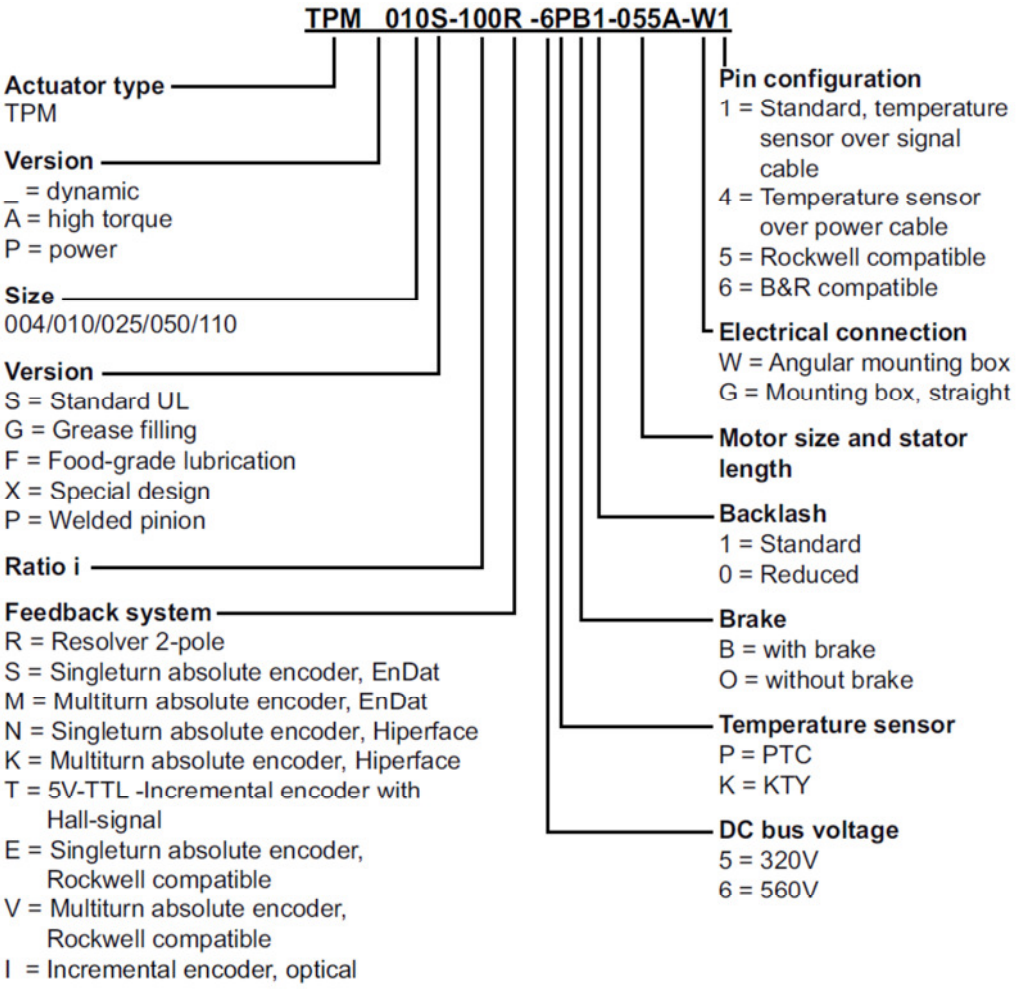


Bild 4.2

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



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 alpha with the servo drive **Servostar 300 resp. Servostar 700.**

The parameters can be entered with the software **DriveGui.**

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 Selection of the motorfeedback, brake and commutation offset

For the selection of the motor feedback, the brake and the encoder offset the following inputs has to be done:

1. Open the screen Terminal in the Drive software
2. Depending on the motor feedback enter the following commands:
   Resolver: **„FBTYPE 0“**
   „MRESPOLES 2“
   Heidenhain EnDat: **„FBTYPE 4“**
   Sick-Stegmann Hiperface: **„FBTYPE 2“**
   After input of **„FBTYPE <WERT>“**, please confirm the message „Save to EEPROM and reset?“ with „YES“.
3. After the restart of the drive open the screen Terminal and enter the encoder offset with the command **„MPHASE <OFFSET>“**. Instead of **<OFFSET>** enter he appropriate value of the following parameter list.
4. In case of TPM+ with brake enter the command **„MBRAKE 1“** to activate the break control.
5. For TPM+ with Resolver the entered data is stored in the amplifier with the input of the command **„SAVE“**.
   For TPM+ with EnDat the entered data is stored in the motor feedback with the input of the command **„HSAVE“**.
   For TPM+ with Hiperface the entered data is stored in the motor feedback with the input of the commands **„HSAVE ERASE“** and **„HSAVE“**.
6. Restart the amplifier with the input of **„COLDSTART“**.

4.2 Parameter TPM+ Dynamic 004 560V

Parameter	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 004S	TPM 004S
MICONT	Continuous current	Arms	1,10	0,80
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,70	0,47
ML	L, Line-to-Line	mH	33,30	30,00
MRS	Stator winding resistance	Ohm	28,20	37,40
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 010S	TPM 010S
MICONT	Continuous current	Arms	1,30	0,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,97	0,78
ML	L, Line-to-Line	mH	22,80	30,00
MRS	Stator winding resistance	Ohm	21,30	40,00
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 025S	TPM 025S
MICONT	Continuous current	Arms	5,70	1,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,98	1,02
ML	L, Line-to-Line	mH	6,00	18,90
MRS	Stator winding resistance	Ohm	2,20	13,50
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 050S	TPM 050S
MICONT	Continuous current	Arms	13,70	3,80
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	5000	5000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,00	0,97
ML	L, Line-to-Line	mH	3,00	11,10
MRS	Stator winding resistance	Ohm	0,45	4,00
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 560 VDC	i=61-91 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 110S	TPM 110S
MICONT	Continuous current	Arms	16,70	13,70
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	5000	5000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,00	1,00
ML	L, Line-to-Line	mH	2,40	3,00
MRS	Stator winding resistance	Ohm	0,32	0,45
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 004S	TPM 004S
MICONT	Continuous current	Arms	1,90	1,40
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,40	0,27
ML	L, Line-to-Line	mH	11,10	10,00
MRS	Stator winding resistance	Ohm	9,40	12,50
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 010S	TPM 010S
MICONT	Continuous current	Arms	2,20	1,60
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,56	0,45
ML	L, Line-to-Line	mH	7,33	10,00
MRS	Stator winding resistance	Ohm	7,10	13,30
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 025S	TPM 025S
MICONT	Continuous current	Arms	9,90	3,30
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,56	0,59
ML	L, Line-to-Line	mH	2,00	6,30
MRS	Stator winding resistance	Ohm	0,73	4,50
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 050S	TPM 050S
MICONT	Continuous current	Arms	23,70	6,60
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	5000	5000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,58	0,56
ML	L, Line-to-Line	mH	1,00	3,70
MRS	Stator winding resistance	Ohm	0,13	1,33
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=16-31 320 VDC	i=61-91 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPM 110S	TPM 110S
MICONT	Continuous current	Arms	16,70	23,70
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	3700	5000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,00	0,58
ML	L, Line-to-Line	mH	2,40	1,00
MRS	Stator winding resistance	Ohm	0,32	0,13
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP004S	TPMP004S
MICONT	Continuous current	Arms	1,60	1,00
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,97	0,78
ML	L, Line-to-Line	mH	22,80	30,00
MRS	Stator winding resistance	Ohm	21,30	40,00
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP010S	TPMP010S
MICONT	Continuous current	Arms	5,40	1,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,98	1,02
ML	L, Line-to-Line	mH	6,00	18,90
MRS	Stator winding resistance	Ohm	2,20	13,50
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP025S	TPMP025S
MICONT	Continuous current	Arms	13,70	4,00
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,00	0,97
ML	L, Line-to-Line	mH	3,00	11,10
MRS	Stator winding resistance	Ohm	0,45	4,00
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP050S	TPMP050S
MICONT	Continuous current	Arms	19,00	7,50
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	5000	5000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,19	0,91
ML	L, Line-to-Line	mH	2,10	5,10
MRS	Stator winding resistance	Ohm	0,27	1,81
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	40	40
TBRAKE0	Enable delay (brake)	ms	50	50
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 560 VDC	i=40-100 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP110S	TPMP110S
MICONT	Continuous current	Arms	38,60	21,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4200	4500
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,09	1,08
ML	L, Line-to-Line	mH	0,90	1,90
MRS	Stator winding resistance	Ohm	0,08	0,25
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	50	50
TBRAKE0	Enable delay (brake)	ms	200	200
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP004S	TPMP004S
MICONT	Continuous current	Arms	2,70	1,70
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	8	8
MKT	Motor torque constant	Nm/Arms	0,56	0,45
ML	L, Line-to-Line	mH	7,33	10,00
MRS	Stator winding resistance	Ohm	7,10	13,30
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	10	10
TBRAKE0	Enable delay (brake)	ms	12	12
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	90	90
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP010S	TPMP010S
MICONT	Continuous current	Arms	9,40	3,20
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,56	0,59
ML	L, Line-to-Line	mH	2,00	6,30
MRS	Stator winding resistance	Ohm	0,73	4,50
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=4-35 320 VDC	i=40-100 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMP025S	TPMP025S
MICONT	Continuous current	Arms	23,70	6,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	6000	6000
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,58	0,56
ML	L, Line-to-Line	mH	1,00	3,70
MRS	Stator winding resistance	Ohm	0,13	1,33
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=22-110 560 VDC	i=154-220 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMA010S	TPMA010S
MICONT	Continuous current	Arms	5,00	1,90
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4850	4850
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,83	0,82
ML	L, Line-to-Line	mH	6,00	18,90
MRS	Stator winding resistance	Ohm	2,36	15,70
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	25
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMA025S	TPMA025S
MICONT	Continuous current	Arms	13,10	5,80
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4850	4850
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,98	0,83
ML	L, Line-to-Line	mH	3,00	6,00
MRS	Stator winding resistance	Ohm	0,47	2,36
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=22-55 560 VDC	i=66-220 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMA050S	TPMA050S
MICONT	Continuous current	Arms	17,90	12,60
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4500	4850
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	1,21	1,00
ML	L, Line-to-Line	mH	2,10	3,00
MRS	Stator winding resistance	Ohm	0,29	0,47
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	40	20
TBRAKE0	Enable delay (brake)	ms	50	42
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	400	400
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=22-55 560 VDC	i=66-88 560 VDC	i=110-220 560 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor		
MNAME	Motor Name	-	TPMA110S	TPMA110S	TPMA110S
MICONT	Continuous current	Arms	Tbd	40,80	20,50
MIPEAK	Peak current	Arms	See table below		
MSPEED	Maximum speed	1/min	4150	4150	4500
MPOLES	Motor poles	-	12	12	12
MKT	Motor torque constant	Nm/Arms	1,17	1,09	1,19
ML	L, Line-to-Line	mH	0,67	0,90	2,10
MRS	Stator winding resistance	Ohm	0,05	0,08	0,29
MJ	Motor inertia	kgcm²	See table below		
MBRAKE	Brake	-	with / without		
TBRAKE	Disable delay (brake)	ms	50	50	40
TBRAKE0	Enable delay (brake)	ms	200	200	50
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300	300
FBTYPE	Feedback Type	-	0: Resolver		
	Feedback Type	-	2: SinCos-Enc. Hiperface		
	Feedback Type	-	4: SinCos-Enc. EnDAT		
VBUSBAL	Max. allowed line voltage	V	400	400	400
MPHASE	Offset Resolver	°	270	270	270
	Offset Hiperface	°	150	150	150
	Offset EnDat	°	90	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

[2] 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

Parameter	Description	Unit	i=22-110 320 VDC	i=154-220 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMA010S	TPMA010S
MICONT	Continuous current	Arms	8,60	3,30
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4850	4850
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,48	0,47
ML	L, Line-to-Line	mH	2,00	6,30
MRS	Stator winding resistance	Ohm	0,81	5,23
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	25
TBRAKE0	Enable delay (brake)	ms	30	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ $[A_{rms}]^1$	$I_{max\ dyn}$ $[A_{rms}]^2$
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

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

[2] 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

Parameter	Description	Unit	i=22-55 320 VDC	i=66-220 320 VDC
MTYPE	Motor Type	-	1 PM Rotary Motor	
MNAME	Motor Name	-	TPMA025S	TPMA025S
MICONT	Continuous current	Arms	22,70	10,00
MIPEAK	Peak current	Arms	See table below	
MSPEED	Maximum speed	1/min	4850	4850
MPOLES	Motor poles	-	12	12
MKT	Motor torque constant	Nm/Arms	0,56	0,48
ML	L, Line-to-Line	mH	1,00	2,00
MRS	Stator winding resistance	Ohm	0,16	0,81
MJ	Motor inertia	kgcm²	See table below	
MBRAKE	Brake	-	with / without	
TBRAKE	Disable delay (brake)	ms	20	20
TBRAKE0	Enable delay (brake)	ms	42	30
MAXTEMPM	Thermistor Switch-off Threshold	Ohm	300	300
FBTYPE	Feedback Type	-	0: Resolver	
	Feedback Type	-	2: SinCos-Enc. Hiperface	
	Feedback Type	-	4: SinCos-Enc. EnDAT	
VBUSBAL	Max. allowed line voltage	V	230	230
MPHASE	Offset Resolver	°	270	270
	Offset Hiperface	°	150	150
	Offset EnDat	°	90	90

Ratio	Motor inertia w/o brake[kgcm²]	Motor inertia with brake[kgcm²]	$I_{max\ stat}$ [A_{rms}][1]	$I_{max\ dyn}$ [A_{rms}][2]
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

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

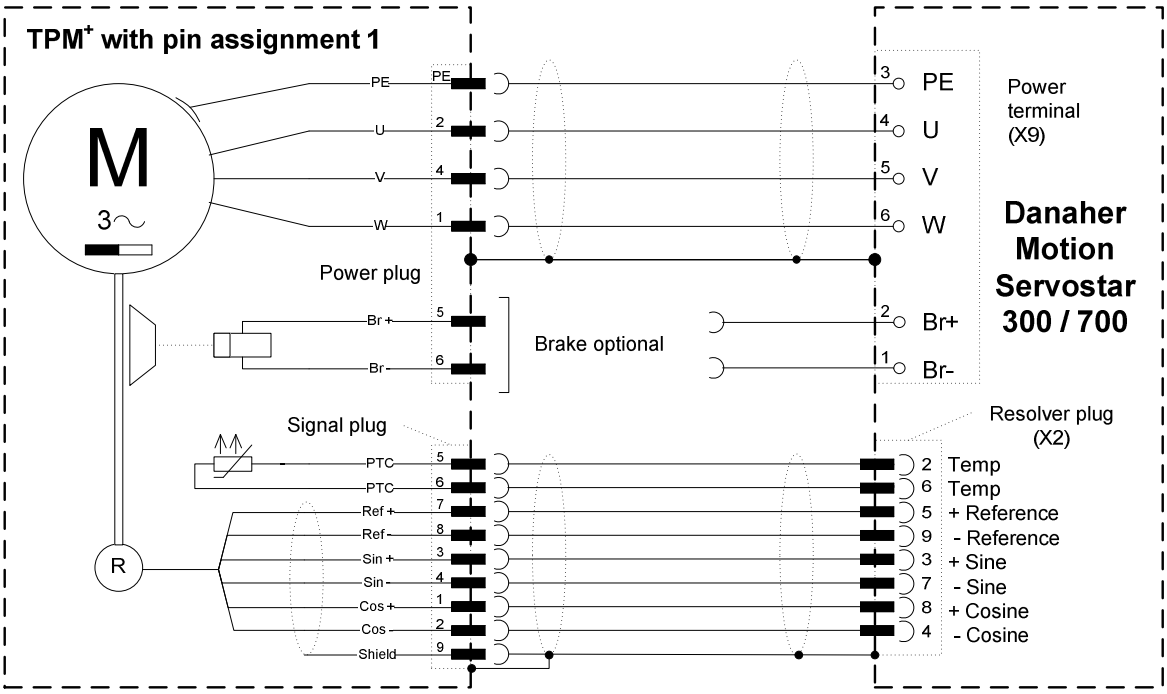
[2] Dynamic maximum motorcurrent: For dynamic applications the maximum current can be increased to this value in dependency of the mass moment of inertia relation. We recommend a detailed calculation with Cymex.

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.

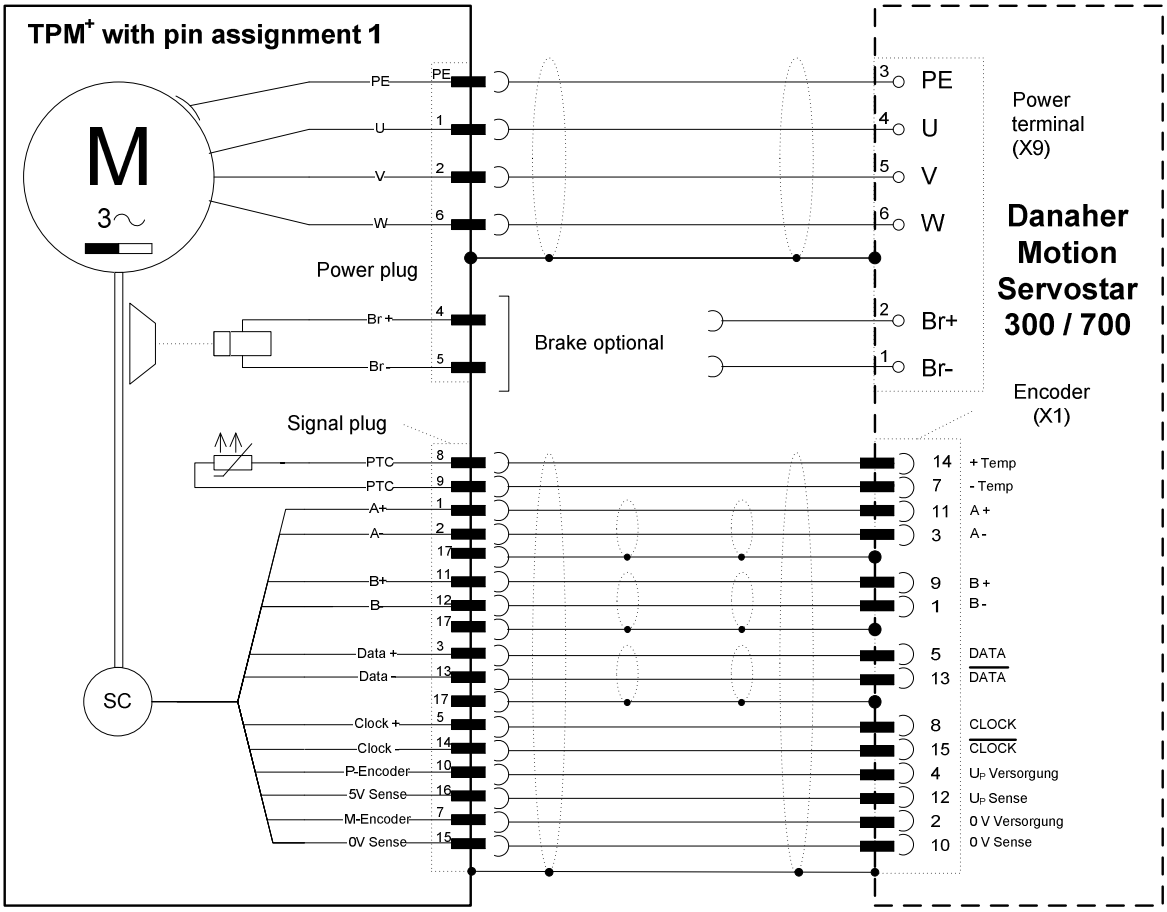
5.1 TPM+ with resolver

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



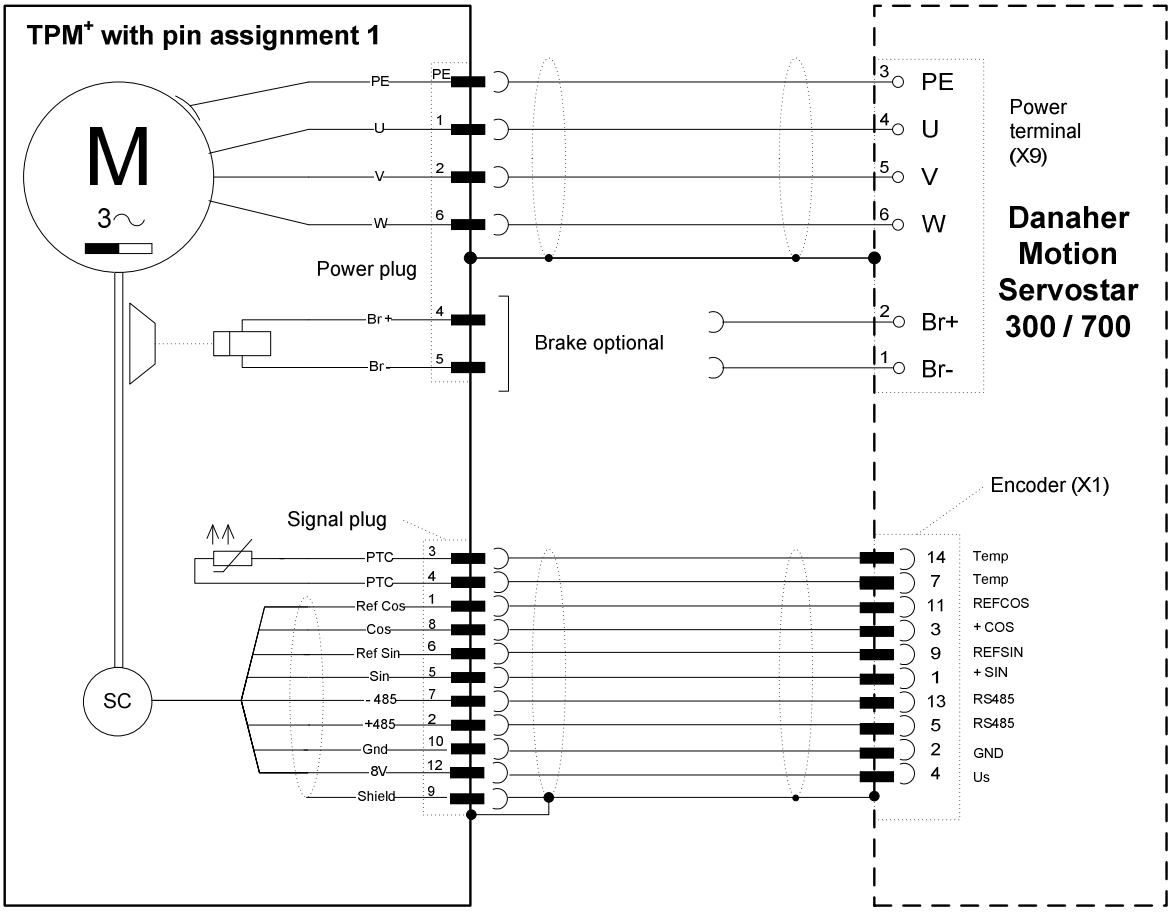
5.2 TPM+ with absolute encoder Heidenhain EnDat ECN1113 /EQN 1125

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



5.3 TPM+ with absolute encoder Sick-Stegmann SKS36 / SKM36

WITTENSTEIN alpha 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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