



PM Ctendo SZ – EnDat digital

PILZ
THE SPIRIT OF SAFETY

Section 1	Safety instructions	3
	1.1 General safety instructions	3
	1.2 Safety with electrical connections	3
	1.3 Preventing connection errors	3
	1.4 Safe functions and EMC of the drive system	4
Section 2	Connection – Motor housing to grounding conductor system	5
Section 3	EnDat 2.2 power and feedback plug connectors	6
	3.1 Terminal assignment – Power plug connectors	8
	3.2 Terminal assignment – EnDat 2.2 feedback plug connectors	10
Section 4	Forced ventilation unit	11
Section 5	Appendix	12
	5.1 Trademarks	12

1 Safety instructions

1.1 General safety instructions

**WARNING!**

Injury due to moving or rotating parts!

Burns due to contact with hot surfaces!

- Only connect the motor while observing the following safety instructions, the associated operating manual and any applicable national, local or system-specific regulations.

1.2 Safety with electrical connections

**DANGER!**

Electric shock!

Serious injuries due to contact with live parts!

- Carry out all work on a de-energized motor!
- Make sure that the motor shaft is stationary during all work. A rotating rotor can cause high voltages at the connections.
- Disconnect the supply voltage. Be aware that there may still be dangerously high voltages at the servo amplifier, even 10 minutes after switching off the supply voltage, due to the residual charge of the link capacitors.
- Cover all open electrical connections, e.g. using protective caps.
- Secure the installation location as per regulations, e.g. using locks or warning signs.

1.3 Preventing connection errors

**CAUTION!**

Damage to the motor or motor components due to electrical connection errors!

- Observe the motor nameplate and this connection plan. Contact Technical Support in case of questions.

1.4 Safe functions and EMC of the drive system

**CAUTION!**

Damage to the motor or impairment of motor function!


Violation of EMC requirements mandated by law!

While commissioning the motor, the motor may be damaged or compliance with legal EMC requirements may no longer be possible if you use connection cables or servo amplifiers that are not suitable for the motor. Any warranty claims shall be void under these circumstances.

- Use connection cables or servo amplifiers from Pilz GmbH & Co. that are appropriate for the motor.

2 **Connection – Motor housing to grounding conductor system**

Connect the motor housing to the grounding conductor system of the machine in order to prevent personal injury and faulty triggering of residual current protective devices.

All attachment parts required for the connection of the grounding conductor to the motor housing are delivered with the motor. The grounding screw of the motor is identified with the  symbol as per IEC 60417-DB. The cross-section of the grounding conductor has to be at least as large as the cross-section of the lines in the power connection.

3 EnDat 2.2 power and feedback plug connectors

Synchronous servo motors are equipped with twistable quick-lock plug connectors in the standard version.

In motors with forced ventilation, avoid collisions between the motor connection cables and the plug connector of the forced ventilation unit. In the event of a collision, turn the motor plug connectors accordingly.

The following images show the position of the plug connectors upon delivery.

PM Ctendo SZ.3x – Turning ranges of the plug connectors

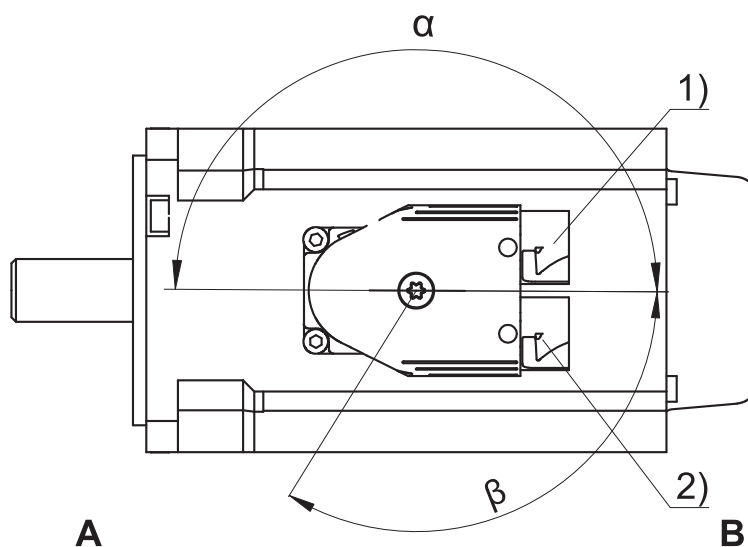


Fig.: PM Ctendo SZ.3x – Turning ranges of the plug connectors

Legend

- | | | | |
|---|--|---|-------------------------|
| 1 | Power plug connector | 2 | Feedback plug connector |
| A | Attachment or output side of the motor | B | Rear side of the motor |

PMctendo SZ.4x – SZ.8x – Turning ranges of the plug connectors

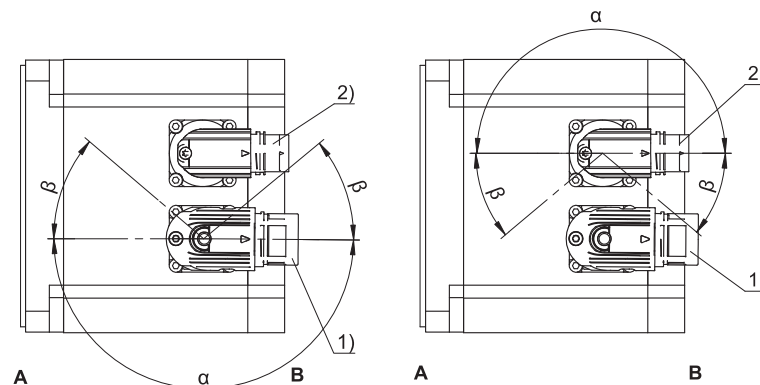


Fig.: PMCtendo SZ.4x – SZ.8x – Turning ranges of the plug connectors

Legend

- | | | | |
|---|--|---|-------------------------|
| 1 | Power plug connector | 2 | Feedback plug connector |
| A | Attachment or output side of the motor | B | Rear side of the motor |

Features – Power plug connectors

Type	Size	Connection	Turning range	
			α	β
SZ.3x	con.15	Quick lock	180°	120°
SZ.4x, SZ.5x, SZ.71, SZ.73	con.23	Quick lock	180°	40°
SZ.75, SZ.82, SZ.83, SZ.85...K	con.40	Quick lock	180°	40°
SZ.85...F	con.58	Screw thread	0°	0°

Features – Feedback plug connectors

Type	Size	Connection	Turning range	
			α	β
SZ.3x	con.15	Quick lock	180°	120°
SZ.4x, SZ.5x, SZ.7x, SZ.82, SZ.83, SZ.85...K	con.23	Quick lock	180°	40°
SZ.85...F	con.23	Quick lock	180°	0°

Notes

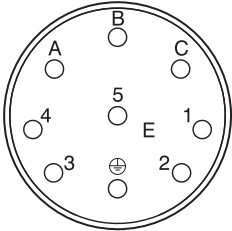
- ▶ The number after "con." indicates the approximate external thread diameter of the plug connector in mm (for example, con.23 designates a plug connector with an external thread diameter of about 23 mm).
- ▶ In turning range β , the power or feedback plug connectors can be turned only if doing so does not cause them to collide.
- ▶ For motor type SZ.3x, the power and feedback plug connectors are connected mechanically and can only be turned together.

3.1 Terminal assignment – Power plug connectors

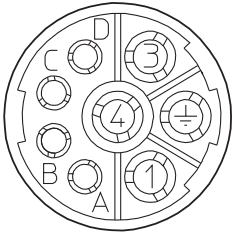
The following power plug connectors are available for PMCtendo SZ motors (the color information relates to the connecting wires and is only relevant for the internal motor wiring).

The size of the plug connector depends on the size of the motor; terminal assignment changes depending on the connector size.

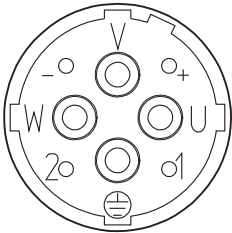
con.15 connector size

Connection diagram	Pin	Connection	Color
	A	1U1	black
	B	1V1	blue
	C	1W1	red
	1		
	2		
	3	1BR+ (brake + DC 24 V)	red
	4	1BR- (brake 0 V)	black
	⊥	PE	green-yellow

con.23 connector size

Connection diagram	Pin	Connection	Color
	1	1U1	black
	3	1W1	red
	4	1V1	blue
	A	1BR+ (brake + DC 24 V)	red
	B	1BR- (brake 0 V)	black
	C		
	D		
	⊥	PE	green-yellow

con.40 connector sizes

Connection diagram	Pin	Connection	Color
	U	1U1	black
	V	1V1	blue
	W	1W1	red
	+	1BR+ (brake + DC 24 V)	red
	-	1BR- (brake 0 V)	black
	1		
	2		
	⊥	PE	green-yellow

con.58 connector sizes

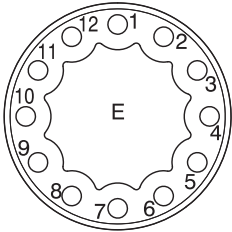
Connection diagram	Pin	Connection	Color
	U	1U1	black
	V	1V1	blue
	W	1W1	red
	+	1BR+ (brake + DC 24 V)	red
	-	1BR- (brake 0 V)	black
	1		
	2		
		PE	green-yellow

3.2 Terminal assignment – EnDat 2.2 feedback plug connectors

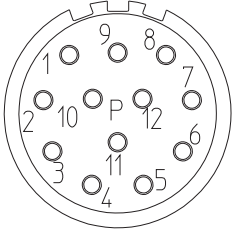
The following EnDat 2.2 plug connectors are available for PMCtendo SZ motors (the color information relates to the connecting wires and is only relevant for internal motor wiring).

The size of the plug connector depends on the size of the motor; the terminal assignment changes depending on the connector size.



EnDat 2.2 – con.15 plug connectors

Connection diagram	Pin	Connection	Color
	1	CLOCK	violet
	2		
	3		
	4	PTC	white
	5	DATA/	pink
	6	DATA	grey
	7		
	8	CLOCK/	yellow
	9		
	10	0 V GND	white green
	11	PTC	black
	12	Up	brown green

EnDat 2.2 – con.23 plug connectors

Connection diagram	Pin	Connection	Color
	1	CLOCK	violet
	2		
	3		
	4	PTC	white
	5	DATA/	pink
	6	DATA	grey
	7		
	8	CLOCK/	yellow
	9		
	10	0 V GND	white green
	11	PTC	black
	12	Up	brown green

4 Forced ventilation unit

Connection diagram	Pin	Connection
	1	L1 (phase)
	2	N (neutral conductor)
	3	
		PE

5 Appendix

5.1 Trademarks

The following names used in connection with the device, its optional equipment and its accessories are trademarks or registered trademarks of other companies:

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