AC Mn

AC servo motors

Product Manual

03-05-02-E-V2005.doc

Further descriptions, that relate to this document:

UL: 05-01-08 	Planetary Gearbox PG AP - Product-manual
UL: 05-01-06 	Planetary Gearbox PG AL - Product-manual
UL: 05-01-07 	Planetary Gearbox PG AF - Product-manual
UL: 12-01 	Plugs - Product description
UL: 12-02-01 	Cables - Product description

Made in Germany, 2005

CONTENTS

The most important thing first

Thanks for your confidence choosing our product.

These operating instructions present themselves as an overview of the technical data and features.

Please read the operating instructions before operating the product.

If you have any questions, please contact your nearest SSD Drives representative.
Improper application of the product in combination with dangerous voltage can lead to injuries.
In addition, damage can also occur to motors or other products.
Therefore please observe our safety precautions strictly.

Safety precautions

We assume that, as an expert, you are familiar with the relevant safety regulations, especially in accordance with VDE 0100, VDE 0113,VDE 0160, EN 50178, the accident prevention regulations of the employers liability insurance company and the DIN regulations and that you are able to use and apply them.
As well, relevant European Directives must be observed.

Depending on the kind of application, additional regulations e.g. UL, DIN are subject to be observed.
If our products are operated in connection with components from other manufacturers, their operating instructions are also subject to be observed strictly.

1 General

1.1 Description

By using high-energy magnetic materials it is possible to design small diameter disk motors. For this reason and due to a carefully optimized technical construction of the rotor, the motors have a low moment of inertia.

The stability of the magnetic material and the design of the magnetic field in the face of demagnetization allow maximum currents of up to **3- 4 times the rated current.**

The high acceleration capacity of the low-inertia three-phase AC servo drives is the result of this.

Through the excitation of the permanent magnets, no heat losses due to current occur in the rotor.

With the three-phase AC-servomotors heat losses due to current occur only in the stator, which then can be directly drawn off.

These favorable cooling conditions allow high-capacity windings.

Since all the current heat losses are drawn off directly via the surface, the motors are designed at low cost with the enclosure type providing protection in accordance with **IP xx** and they are thus very insensitive to liquids and dirt.

The resolver is built into the B-side bearing bracket.

The signals of this integrated measuring system for the actual speed value, the rotor position and the indirect position are taken at the motor over a 12-pin connector.

Synchronous three-phase AC servo drives have a series of advantages over the DC drives:

- no electromechanical parts to wear out, therefore "maintenance-free".
- a low moment of inertia of the rotor due to power density, therefore high acceleration capacity.
- no commutation limit curve, therefore high acceleration moments, also in higher speed ranges.
- no losses in the rotor of the motor, therefore favorable thermal characteristics and a high degree of protection due to the closed construction.

Three-phase AC servomotors built in the way described, are specifically more efficient (higher rated torque) than DC servomotors and also have a small inertia. Therefore the size necessary for an application will, for this reason, be smaller with three-phase AC servos than with DC servos.

Important !

- The motor series AC G is not attachment- or pin-compatible to our drives AC M or AC R.
- Motor design AC G only in standard.

General

1.2 Type code

	Standard						optional	
Marking	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**
Type:	AC	XXX	XXXX	-X	/X	-X	XX	+ ...

Marking	Description
a	AC = three-phase
b	motor models: G = motor series G without cases M = motor series (old) Mn = motor series new M2n = motor series 2nd new version MHS = motor series Hiperface Singleturn (under preparation) MHM = motor series Hiperface Multiturn R = motor series R R(L) = motor series RL with separate fan
c	xxxx = approx. rated torque in Ncm
d	-4 = 4000 rpm at motor type: "**AC G; AC Mn; AC M2n; AC MHx**" 1..6 = *1000 1/min at motor type: "**AC R**" -X = further on request (designation does not apply with motor / gearbox systems)
e	/Y..4 = motor size (designation does not apply with motor / gearbox systems)
f	-3 = 325 V DC intermediate circuit rated voltage (≅ 230 VAC) -6 = 565 V DC intermediate circuit rated voltage (≅ 400 VAC)
g	identification for options and custom features XX = see chapter 1.3
h	+ ... = with attached gear-box: (for short description for inserted gearbox models see gearbox documentation)

Note:
Up to marking "**g**" it is only necessary with options or custom features.
No options are possible for the **AC G** drive.

1.2.1 Typical example

A typical example of an order corresponding to the model key would be:

Type: AC G 0090-4/01-3	Type: AC Mn 0320-4/2-3	Type: AC R 0095-6/1-3
AC = three phase	AC = three phase	AC = three phase
G = motor series	Mn = motor series new	R = motor series
0090 = rated torque in Ncm	0320 = rated torque in Ncm	0068 = rated torque in Ncm
–4 = 4000 rpm	–4 = 4000 rpm	–6 = 6000 rpm
/01 = motor size	/2 = motor size	/1 = motor size
–3 = 325V DC (230 VAC)	–3 = 325V DC	-3 = 325V DC

1.3 Possible options (Marking: g)

Marking	Options BR	GW	IP 65	and Marking	Description	motor types ACG	ACMn	ACM2n	ACR
GW		X			smooth motor shaft	☐	o	o	o
BR	X				holding brake, 24V DC	☐	o	o	o
BBR	X				holding brake type B 24V DC	☐	☐	o*	o
65			X		degree of protection IP 65	☐	o	o	●
BG	X	X				☐	o	o	o
AI					absolute or incremental encoder preparation of attachment	☐	o	o	o
BI	X			AI		☐	o	o	☐
PL					electrical connections via PG couplings and cable ends	☐	o	o	o
2P					2nd featherkey way	☐	o	o	o
6P			X	2P		☐	o	o	o
90					flange receptacle for motor and resolver 90° angled	☐	o	●	☐
GP		X		PL		☐	o	o	☐
G6		X	X			☐	o	o	o
MS					mech. custom designs	☐	o	o	o
PU				PL	unpainted motor	☐	o	o	o
PS		X		PU		☐	o	o	☐
SL					special finish	☐	o	o	o
GK		X			smooth motor shaft shortend	☐	o	o	o
VA	X	X		PL		☐	o	o	☐
R6			X		rust-proof motor shaft	☐	o	o	☐
P6			X	PL		☐	o	o	☐
B6	X		X			☐	o	o	o
F6			X		flange receptacle B-side	☐	o	o	☐
VI	X	X		AI		☐	o	o	o
GI		X		AI		☐	o	o	o
V6	X	X	X			☐	o	o	o
L6		X	X	PL		☐	o	o	☐
BL	X		X	PL		☐	o	o	☐
B4	X				flange B 14	☐	o	o	☐
VR		X		PL+R6+AI		☐	o	o	☐
S6			X	PL+R6+2P		☐	o	o	☐
GZ		X			with Centre hole	☐	o	o	☐
N6		X	X		with special rotation speed about software (6000)	☐	o	o	☐
HW		X			with Hollow shaft	☐	o	o	☐
T6			X		for tropical climate	☐	o	o	☐
X6				F6 + 2P		☐	o	o	☐

* only motor size 3

- ● standard design
- o optional
- ☐ not possible

2 General technical data

		AC G	AC Mn	AC M2n	AC R
Degree of protection: with mounted mating connectors and built-on motor	IP44 (with separete fan)	☐	☐	☐	⊙
	IP54	●	●	●	☐
	IP65	☐	⊙	⊙	●
Magnetic material:	NdFeB	●	●	●	☐
	SE	☐	☐	☐	●
Electrical connections:	straight flanged sockets	☐	●	☐	●
	rotatable 90° angled for motor-, resolver- and thermal connection-flanged sockets	●	☐	●	☐
	PG couplings with cable ends	◆	⊙	⊙	☐
Thermal protection of motor:	thermal detector PTC	●	●	●	●
Power:	In accordance with DIN VDE 0530 installation site: 1000 ASL T = 100K, Tu 40°C measured with attached cooling surface	●	●	●	●
Voltage:	325 V DC	●	●	●	●
	565 V DC	☐	●	●	●
	other windings are possible.	☐	⊙	⊙	☐
Cooling:	self-cooling	●	●	●	●
	separate cooling	☐	☐	☐	⊙
Operating mode:	Continuous operation S1	●	●	●	●
Bearings:	Ball bearings, service life approx. 15.000 h	●	●	●	●
Motor shaft: (standard)	with fitting key in accordance with DIN 6885	●	●	●	●
Rotational accuracy:	N, in acc. with DIN ISO 2373	●	●	●	●
Number of pole pairs:	2	☐	☐	☐	★
	3	●	●	●	★
Resolver type:	2 pole SSD Drives resolver	●	●	●	☐
	2 pole standard transmitter resolver	☐	☐	☐	●
Insulation class	F (VDE 0530) 155° C, heating 100° K	●	●	●	●
Varnish: (standard)	similar RAL 9005 (black)	●	●	●	●

● standard design
⊙ optional
☐ not possible
★ dependent on size
◆ only with larger quantities

3 Technical data

Model: AC Mn

AC-Servo motor Model:	size	Technical data				Static torque	max. Static torque	Static current	Moment of inertia included Resolver
		Nominal power	Rated torque	Rated current with 325V DC	Rated current with 565V DC				
		PN (KW)	MN (Nm)	IN325 (A)	IN565 (A)	M0 (Nm)	Momax (Nm)	I0 (A)	JM (kgcm²)
AC Mn0010-4/0-3	0.0	0,04	0,1	0,2	-	0,13	0,4	0,25	0,05
AC Mn0030-4/0-3	0.1	0,13	0,3	0,8	-	0,33	1	0,9	0,1
AC Mn0045-4/0-3	0.2	0,2	0,45	1,08	-	0,5	1,8	1,2	0,15
AC Mn0045-4/0-6		0,2	0,45	-	0,6	0,5	1,8	0,65	0,15
AC Mn0070-4/0-3	0.3	0,29	0,7	1,46	-	0,77	2,5	1,6	0,2
AC Mn0070-4/0-6		0,29	0,7	-	0,82	0,77	2,5	0,9	0,2
AC Mn0090-4/1-3	1.0	0,38	0,9	1,8	-	1,5	3,5	3	0,68
AC Mn0090-4/1-6		0,38	0,9	-	1,1	1,5	3,5	1,8	0,68
AC Mn0150-4/1-3	1.1	0,63	1,5	3,3	-	2,5	6	5	1
AC Mn0150-4/1-6		0,63	1,5	-	1,9	2,5	6	2,7	1
AC Mn0220-4/1-3	1.2	0,92	2,2	4,7	-	3	9	6,4	1,3
AC Mn0220-4/1-6		0,92	2,2	-	2,8	3	9	3,8	1,3
[1)]AC Mn0070-12/2-3	2.0	0,88	0,7	7	-	1,5		15	0,55
AC Mn0320-4/2-3	2.1	1,34	3,2	6,4	-	4	13	8,6	2,7
AC Mn0320-4/2-6		1,34	3,2	-	3,2	4	13	4,3	2,7
AC Mn0480-4/2-3	2.2	2	4,8	11,2	-	7	19	13,6	3,4
AC Mn0480-4/2-6		2	4,8	-	5,6	7	19	6,8	3,4
[2)]AC Mn0600-1/2-3		0,75	6	6	-	7	19	6,8	3,4
AC Mn0650-4/2-3	2.3	2,72	6,5	12	-	9	26	16,4	4,5
AC Mn0650-4/2-6		2,72	6,5	-	6	9	26	8,3	4,5
AC Mn0960-4/3-3	3.1	4	9,6	19,3	-	16	38	32	6
AC Mn0960-4/3-6		4	9,6	-	12	16	38	19	6
AC Mn1200-4/3-3	3.2	5	12	25	-	21	48	42	7,5
AC Mn1200-4/3-6		5	12	-	15	21	48	25	7,5

[1)] Data at rated speed of 4000 rpm

[2)] Data at rated speed of 12000 rpm

Data at rated speed of 1200 rpm

Note: Drives of motor size 4 see AC R type series!

Technical data

Model: AC Mn

AC-Servo motor Model:	size	Mass	Motor resistance	Motor inductance	Thermal time constant with IN	with Imax	Torque constant	e.m.f constant eff.
		m (kg)	Rph/ph (Ω)	Lph/ph (mH)	TthN (min)	Tthmax (s)	KT (Nm/A)	KE (V/1000 min-1)
AC Mn0010-4/0-3	0.0	0,83	112	63	7	18	0,5	30
AC Mn0030-4/0-3	0.1	1,15	18,5	15	10	26	0,4	24
AC Mn0045-4/0-3	0.2	1,5	12	10	12	31	0,41	25
AC Mn0045-4/0-6		1,5	30	28	12	31	0,74	45
AC Mn0070-4/0-3	0.3	1,9	8,5	8,5	14	36	0,5	30
AC Mn0070-4/0-6		1,9	23	23	14	36	0,83	50
AC Mn0090-4/1-3	1.0	2,7	3,1	10	20	51	0,5	30
AC Mn0090-4/1-6		2,7	8,5	24	20	51	0,83	50
AC Mn0150-4/1-3	1.1	3,5	2,2	6	23	59	0,5	30
AC Mn0150-4/1-6		3,5	5	15	23	59	0,94	57
AC Mn0220-4/1-3	1.2	4,7	1,1	4,2	26	66	0,5	30
AC Mn0220-4/1-6		4,7	2,8	11	26	66	0,83	50
[1)]AC Mn0070-12/2-3	2.0	4,85	0,78	2,95	-	-	0,1	6
AC Mn0320-4/2-3	2.1	5,6	1,2	5,1	19	49	0,5	30
AC Mn0320-4/2-6		5,6	3,4	16	19	49	0,99	60
AC Mn0480-4/2-3	2.2	8,2	0,5	2,7	29	74	0,5	30
AC Mn0480-4/2-6		8,2	2,1	12,3	29	74	0,99	60
[2)]AC Mn0600-1/2-3		8,2	2,1	12,3	29	74	0,99	60
AC Mn0650-4/2-3	2.3	10,6	0,6	2,6	38	97	0,55	33
AC Mn0650-4/2-6		10,6	2	10	38	97	1,09	60
AC Mn0960-4/3-3	3.1	19,0	0,32	2,9	36	92	0,5	30
AC Mn0960-4/3-6		19,0	0,75	8,7	36	92	0,83	50
AC Mn1200-4/3-3	3.2	23,0	0,14	1,5	52	133	0,5	30
AC Mn1200-4/3-6		23,0	0,38	4,1	52	133	0,83	50

[1)] Data at rated speed of 4000 rpm

[2)] Data at rated speed of 12000 rpm

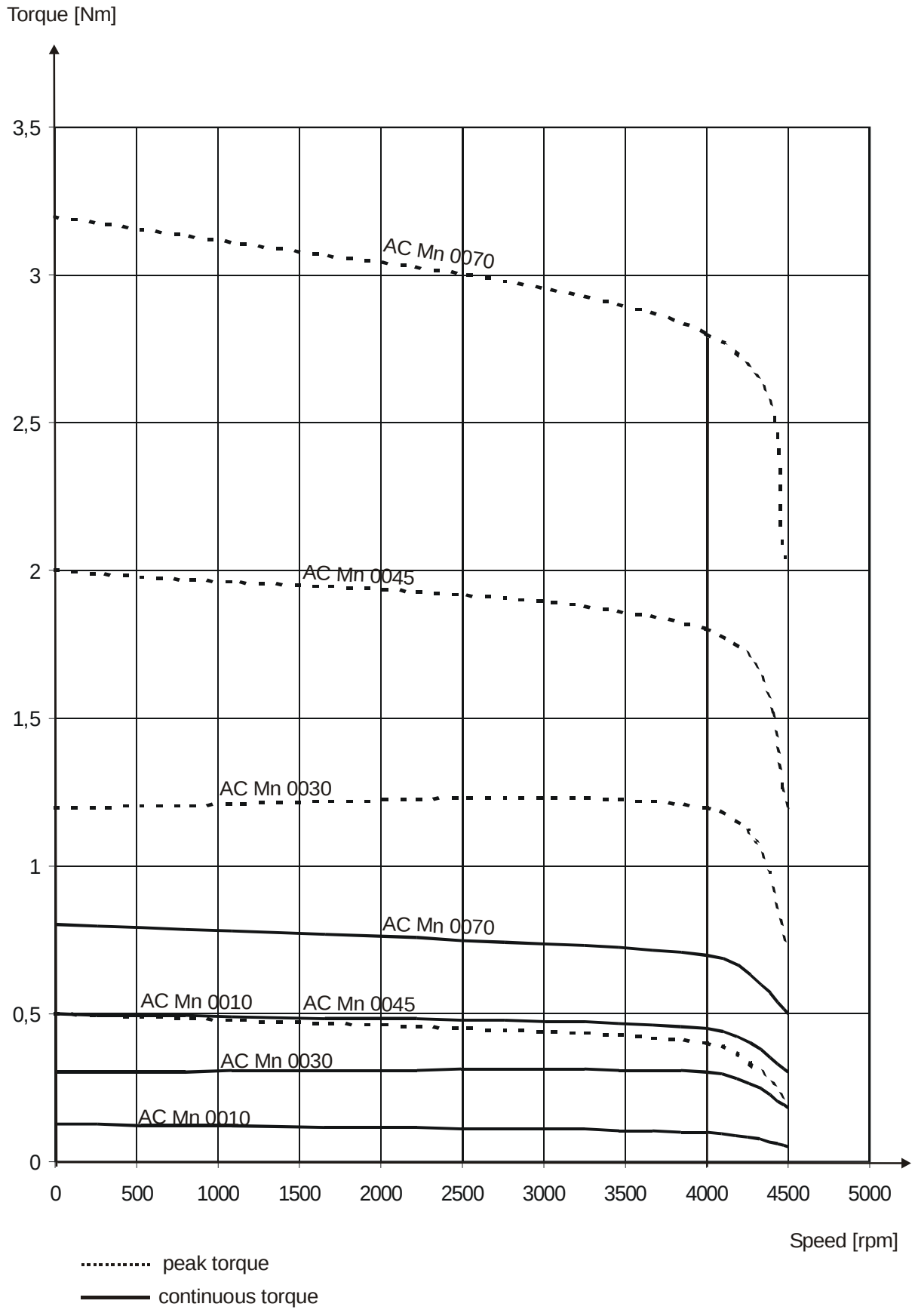
Data at rated speed of 1200 rpm

Note: Drives of motor size 4 see AC R type series!

Technical data

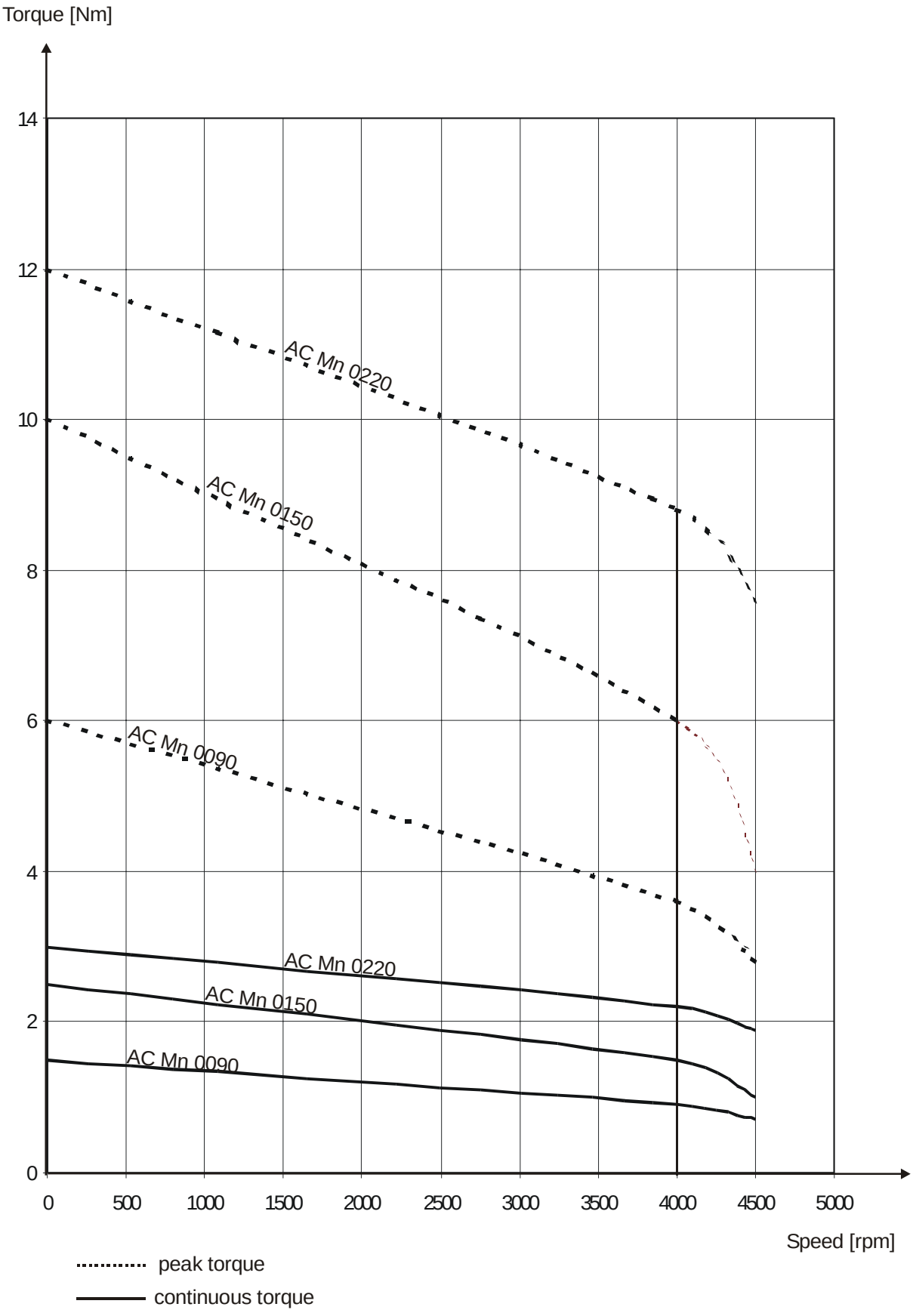
3.1 Torque/Speed Diagrams

3.1.1 Motor size 0



Torque/Speed Diagrams

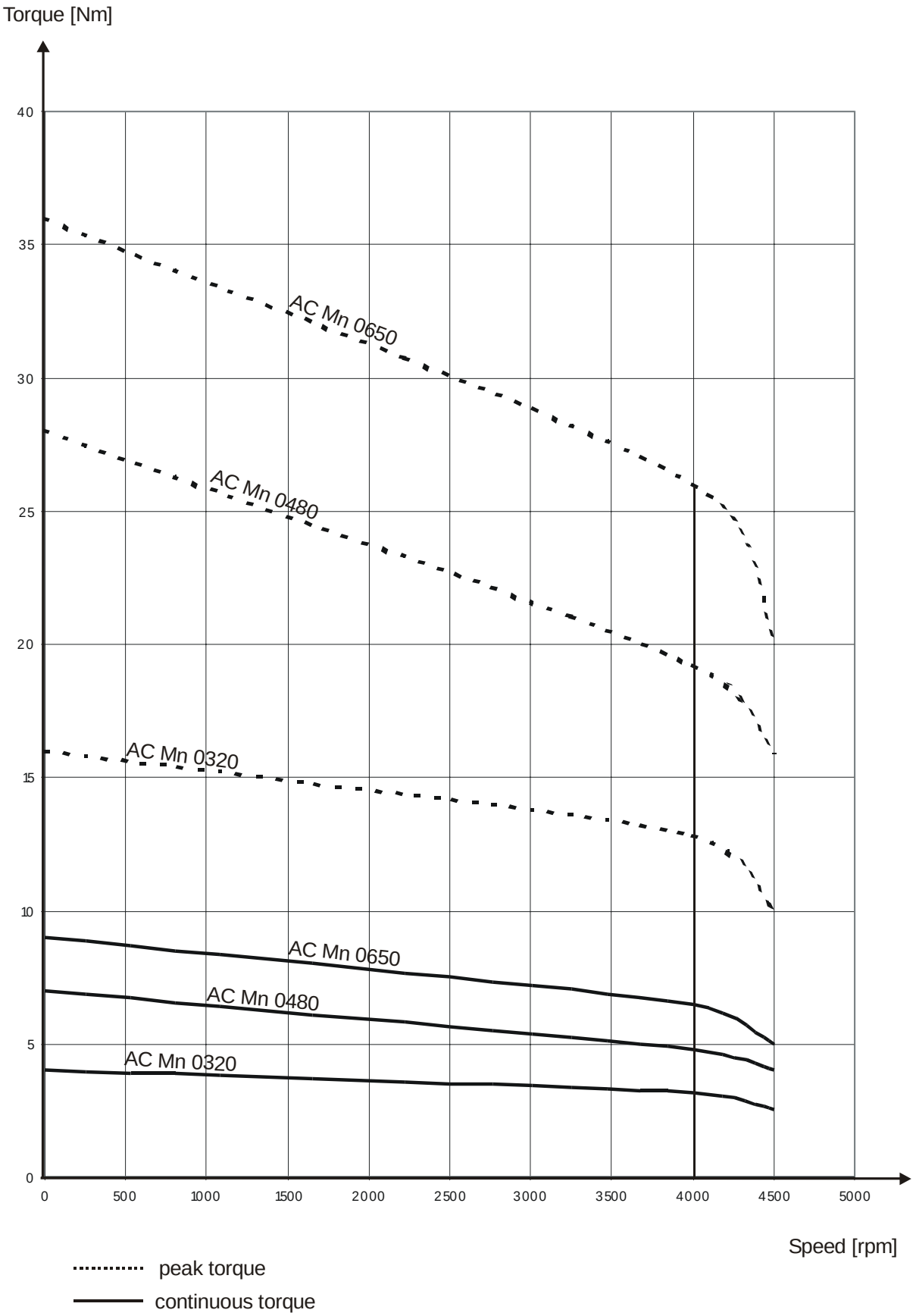
3.1.2 Motor size 1



Technical data

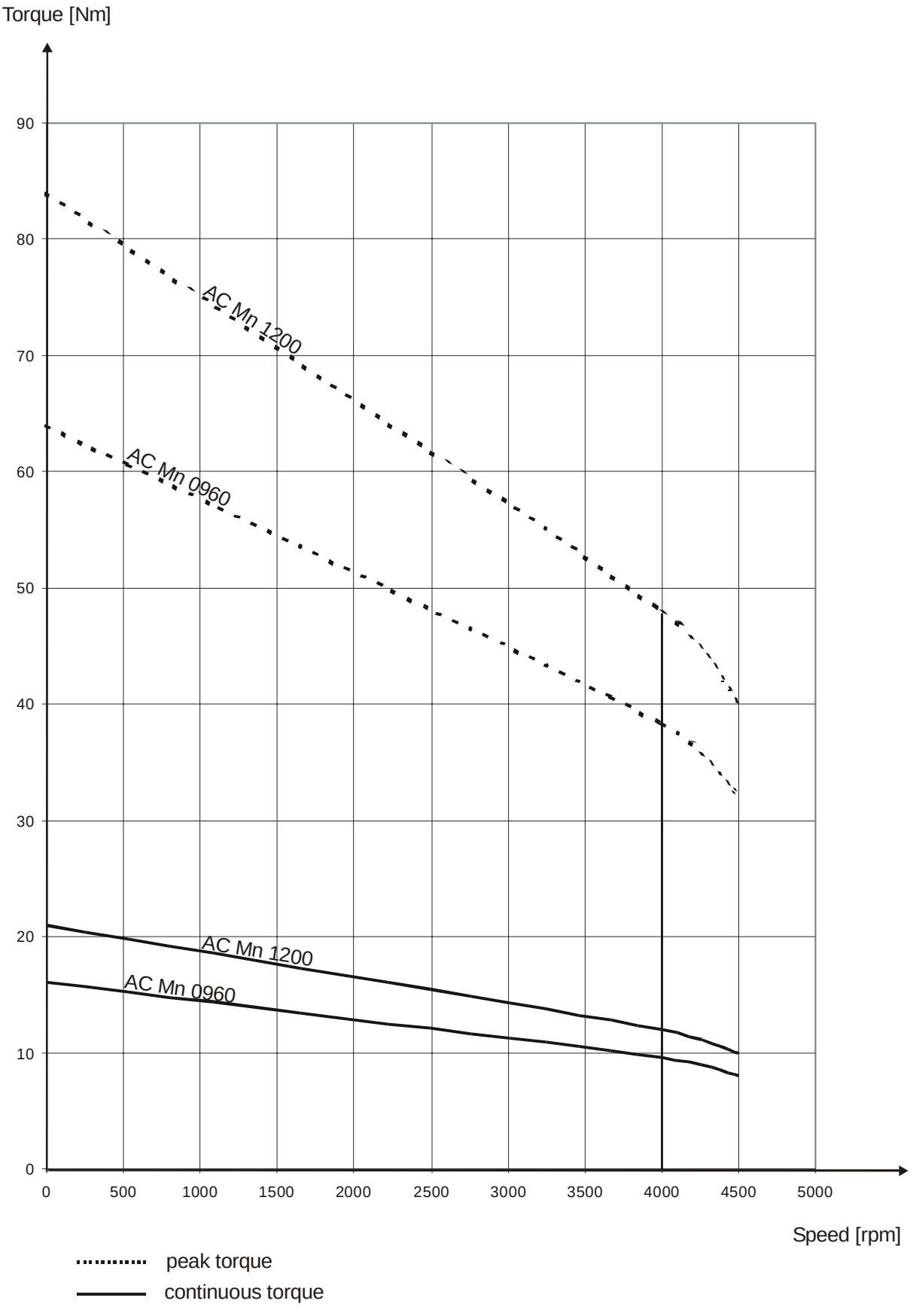
Torque/Speed Diagrams

3.1.3 Motor size 2



Torque/Speed Diagrams

3.1.4 Motor size 3

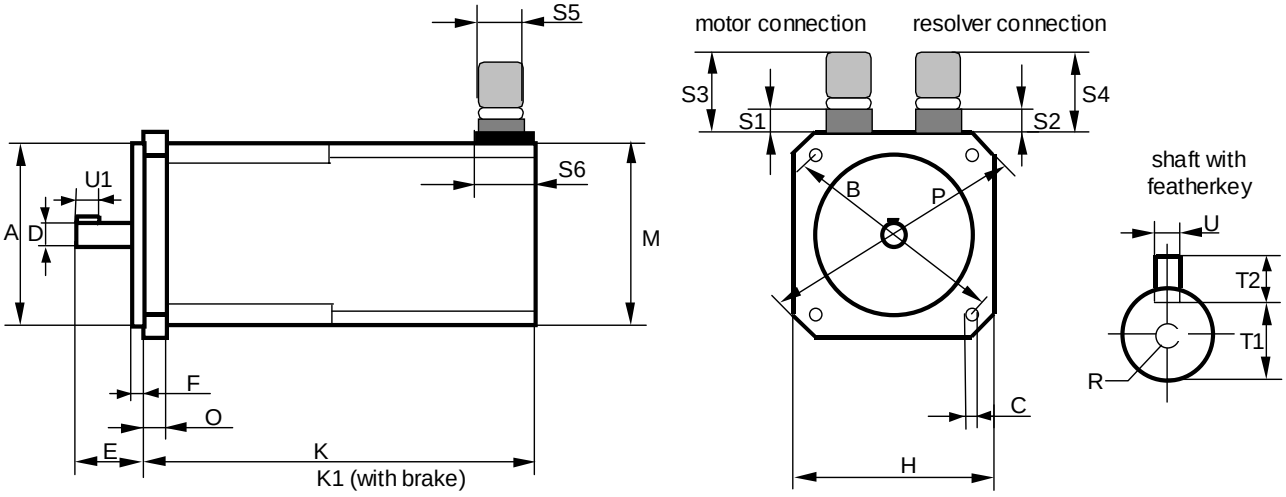


4 Dimensions

4.1 Standard design Motor size 0...3

4.1.1 Connections via connectors

Please observe the bending radius of the cable !



Size	Motor				Resolver			
	S1	S3	S5	S6	S2	S4	S5	S6
0	28,0	88,0	28,0	30,0	31,0 - 34,0	71,0 - 74,0	26,0	25,4
1	16,0	76,0	28,0	30,0	21,0 - 24,0	61,0 - 64,0	26,0	25,4
2	16,0	76,0	28,0	30,0	21,0 - 24,0	61,0 - 64,0	26,0	25,4
3	25,0	96,0	35,6	38,0	21,0 - 24,0	61,0 - 64,0	26,0	25,4

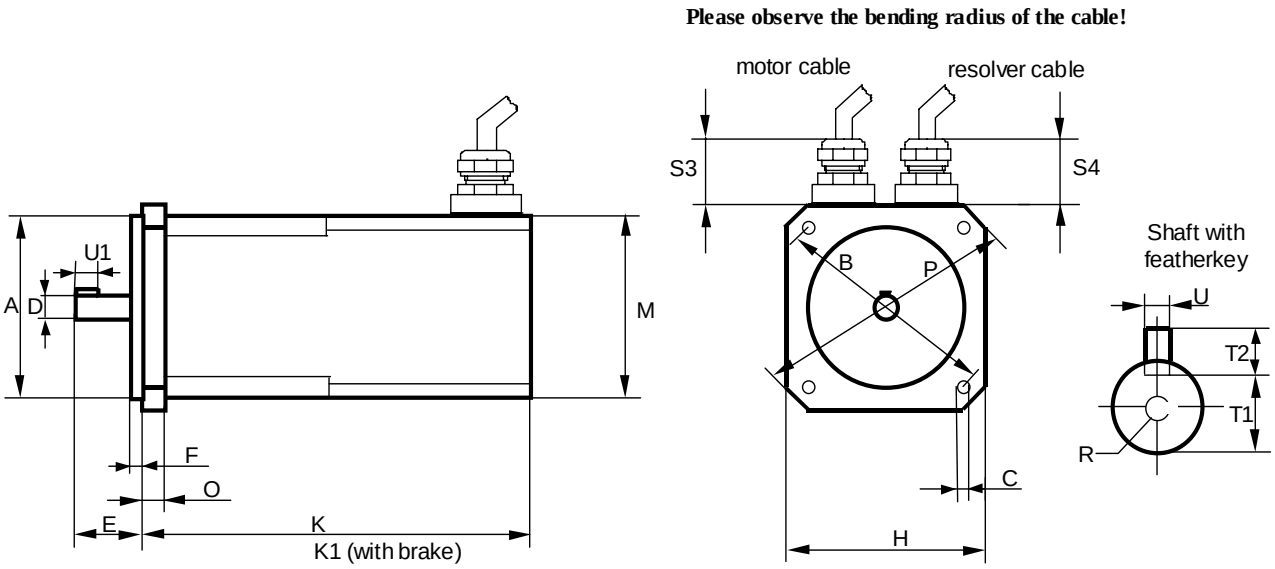
Model AC Mn	BG	A (j6)	B	C	D (k6)	E	F	H	K	K1	M	O	P	R	T1	T2 (h9)	U (h9)	U1
0010-4/0-3	0.0	40	63	5,8	9	24	2,5	55	94	126	55	8	74	M3·10	7,2	3	3	14
0030-4/0-3	0.1	40	63	5,8	9	24	2,5	55	116	155	55	8	74	M3·10	7,2	3	3	14
0045-4/0-x	0.2	40	63	5,8	9	24	2,5	55	138	171	55	8	74	M3·10	7,2	3	3	14
0070-4/0-x	0.3	40	63	5,8	9	24	2,5	55	158	191	55	8	74	M3·10	7,2	3	3	14
0090-4/1-x	1.0	80	100	7	14	30	3	88	132	173	82	10	115	M4·12	11,1	5	5	20
0150-4/1-x	1.1	80	100	7	14	30	3	88	151	193	82	10	115	M4·12	11,1	5	5	20
0220-4/1-x	1.2	80	100	7	14	30	3	88	171	213	82	10	115	M4·12	11,1	5	5	20
0070-12/2-3	2.0	95	115	9	19	40	3	105	160	-	105	12	134	M6·15	15,5	6	6	30
0320-4/2-x	2.1	95	115	9	19	40	3	105	200	240	105	12	134	M6·15	15,5	6	6	30
0480-4/2-x	2.2	95	115	9	19	40	3	105	230	270	105	12	134	M6·15	15,5	6	6	30
0600-4/2-x	2.	95	115	9	19	40	3	105	230	-	105	12	134	M6·15	15,5	6	6	30
0650-4/2-x	2.3	95	115	9	19	40	3	105	280	315	105	12	134	M6·15	15,5	6	6	30
0960-4/3-x	3.1	130	165	11	24	50	3,5	145	300	345	145	12	188	M8·25	19,9	8	8	40
1200-4/3-x	3.2	130	165	11	24	50	3,5	145	340	383	145	12	188	M8·25	19,9	8	8	40

all dimensions in "mm"

Dimensions

4.2 Special design Motor size 0...3

4.2.1 Connections via PG couplings and cables



Dimensions like standard design, except:

AC Mn size	S3 Design Skintop	S3 Design EMC	S4 Design Skintop	S4 Design EMC	Motor connection via PG coupling	Resolver connection via PG coupling	Comments
0	-	-	-	-	-	-	-
1	28	21	25	20	13,5	9	-
2	28	21	25	20	13,5	9	-
3	-	-	-	-	-	-	-

Attention with S3 and S4:
Observe the bending radius of the cables !

4.2.2 Motor with pulse encoder attachment preparation for incremenal encoder DG60 resp. ROD426 for motor size 1 - 3

Dimension drawing: on request !

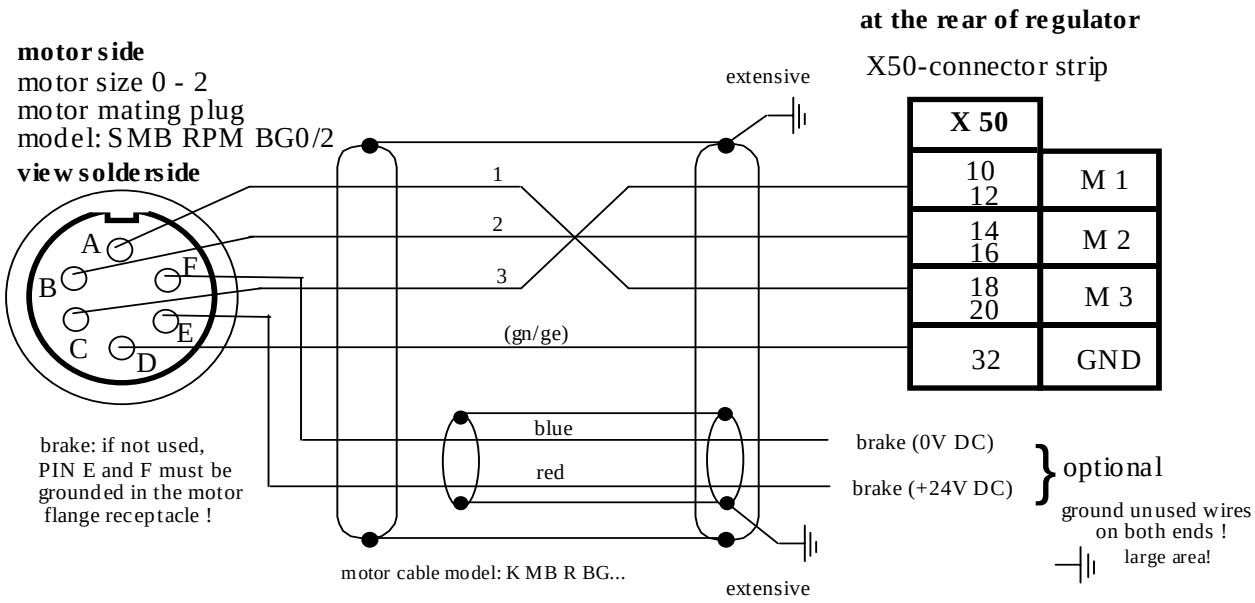
5 Connector assignment

5.1 Motor connection for standard design Pin assignment for SSD Drives motors, size 0...3

5.1.1 SSD Drives-servo drives 635/DER / 637/D6R

(and old products FRR AC S, ESR AC S)

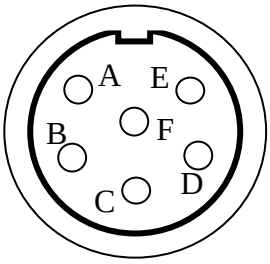
in the SSD Drives Rack



Motor-line-shield: on both ends, extensively connected!

motor size 3
motor mating plug
model: SMB R BG 3

view solderside



connections see above !

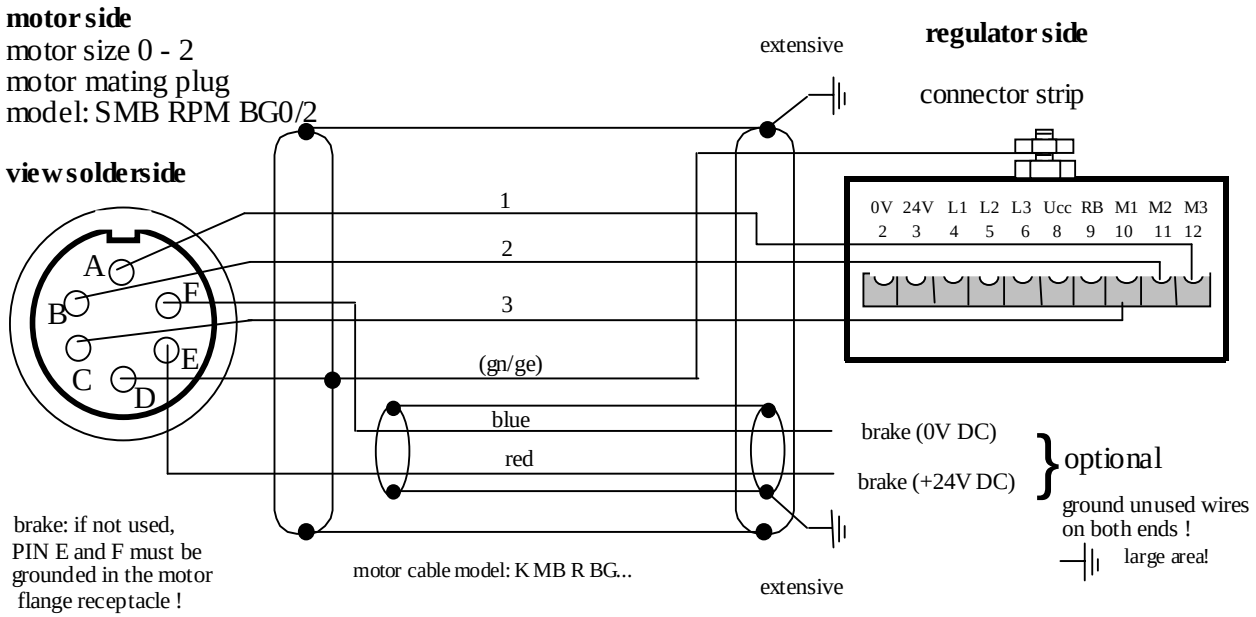
The mating plugs are not included in the standard delivery!

Connector assignment

Motor connection for standard design Pin assignment for SSD Drives motors, size 0...3

5.1.2 SSD Drives-servo drive 635/K DER

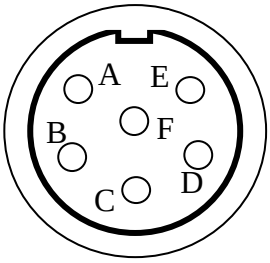
in the compact enclosure



Motor-line-shield: on both ends, extensively connected!

motor size 3
motor mating plug
model: SMB R BG 3

view solderside



connections see above !

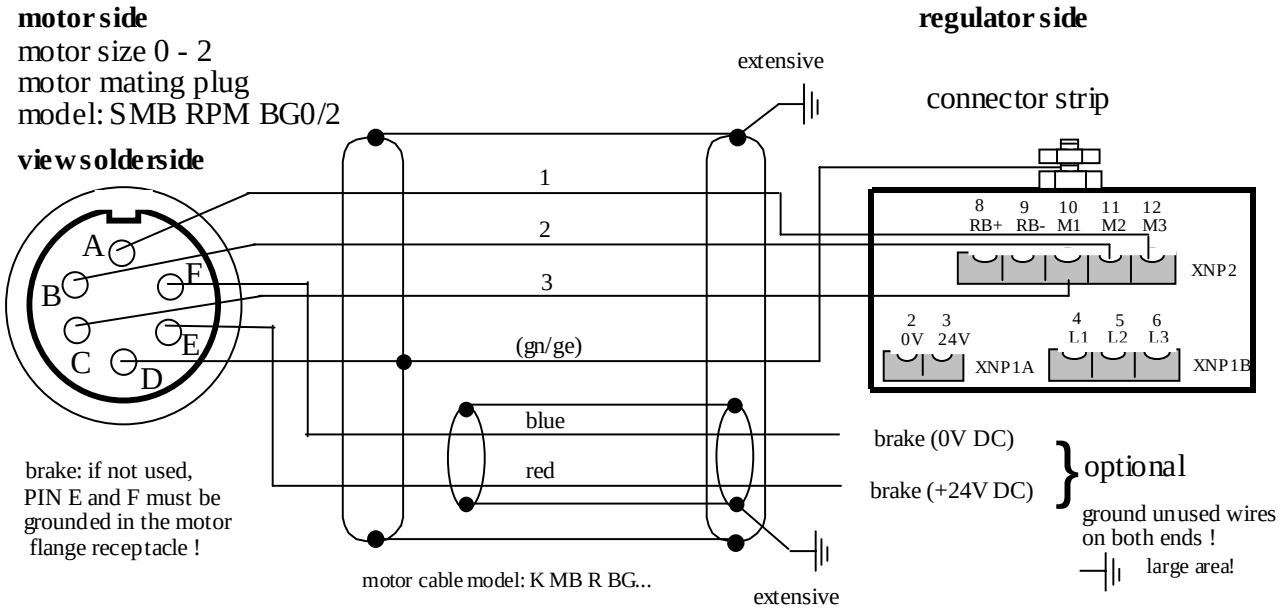
The mating plugs are not included in the standard delivery!

Connector assignment

Motor connection for standard design Pin assignment for SSD Drives motors, size 0...3

5.1.3 SSD Drives-servo drive 637/K D6R

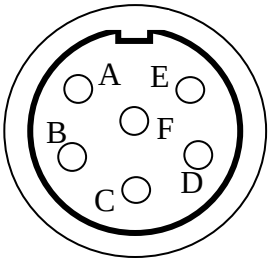
in the compact enclosure



Motor-line-shield:on both ends, extensively connected!

motor size 3
motor mating plug
model: SMB R BG 3

view solderside



connections see above !

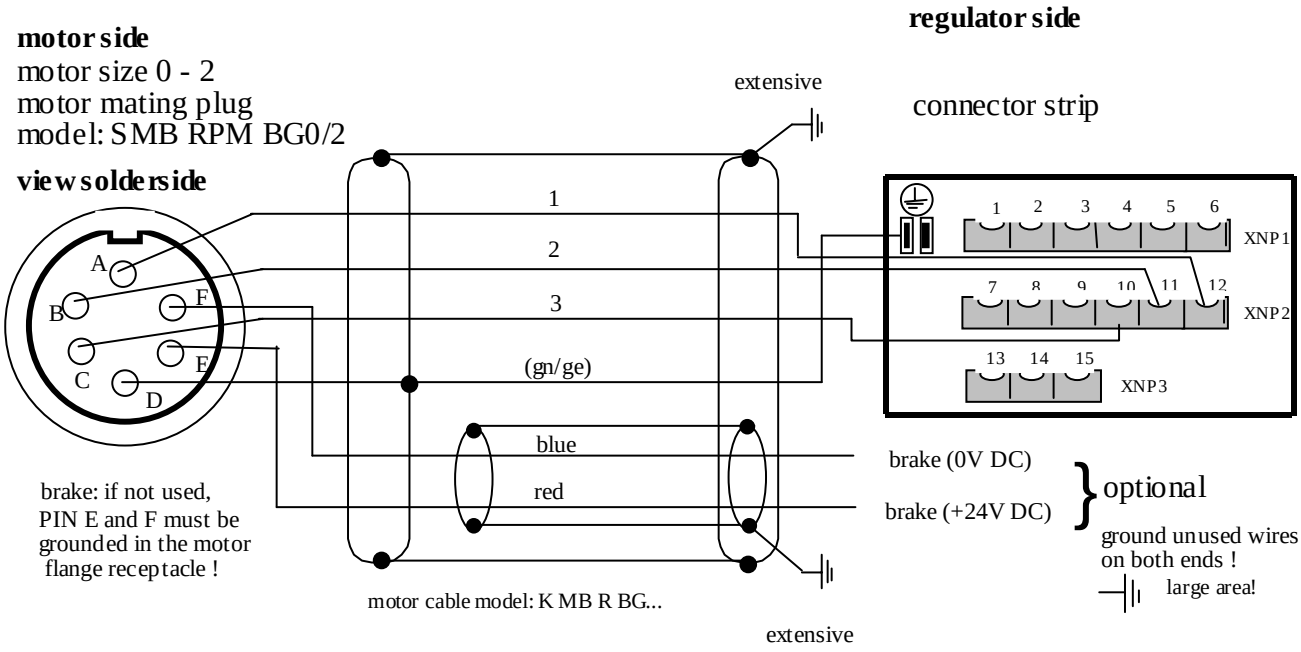
The mating plugs are not included in the standard delivery!

Connector assignment

Motor connection for standard design Pin assignment for SSD Drives motors, size 0...3

5.1.4 SSD Drives-servo drive (old product FRR AC S)

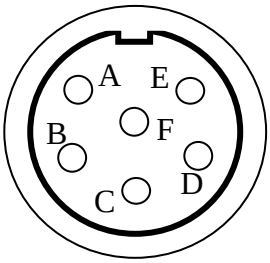
in the compact enclosure



Motor-line-shield:on both ends, extensively connected!

motor size 3
motor mating plug
model: SMB R BG 3

view solderside



connections see above !

The mating plugs are not included in the standard delivery!

Connector assignment

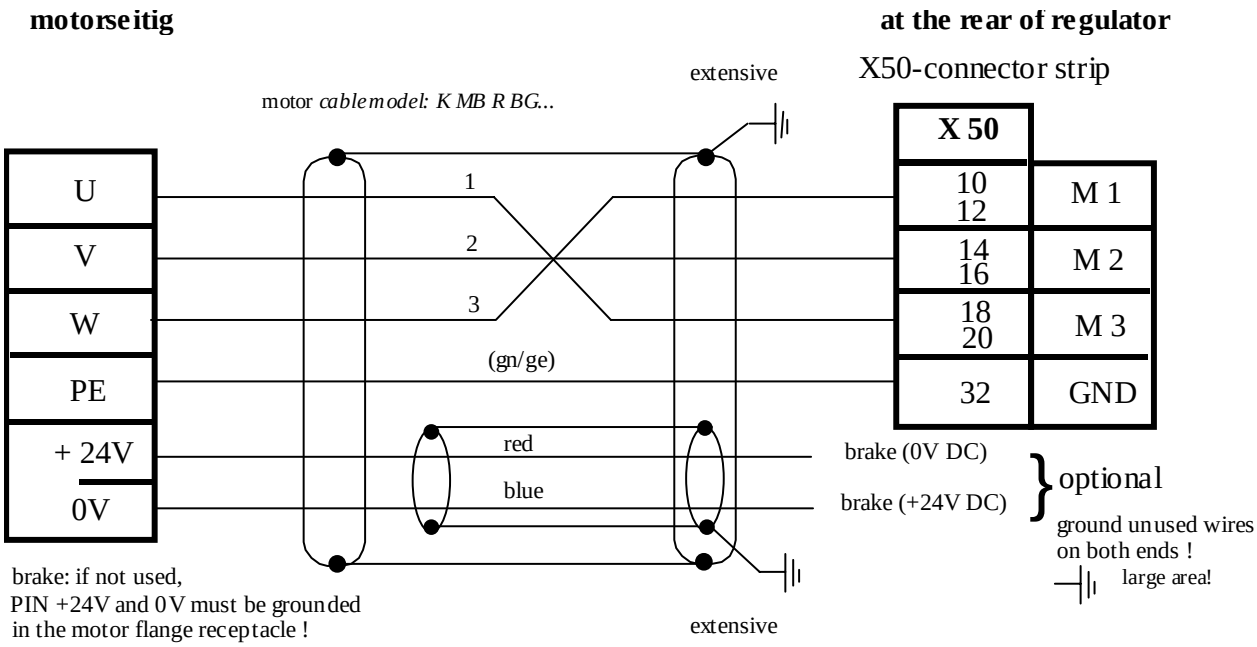
5.2 Motor connection for special design (Connections via PG with cable ends)

Pin assignment for SSD Drives motors, size 0...3

5.2.1 SSD Drives-servo drives 635/DER / 637/D6R

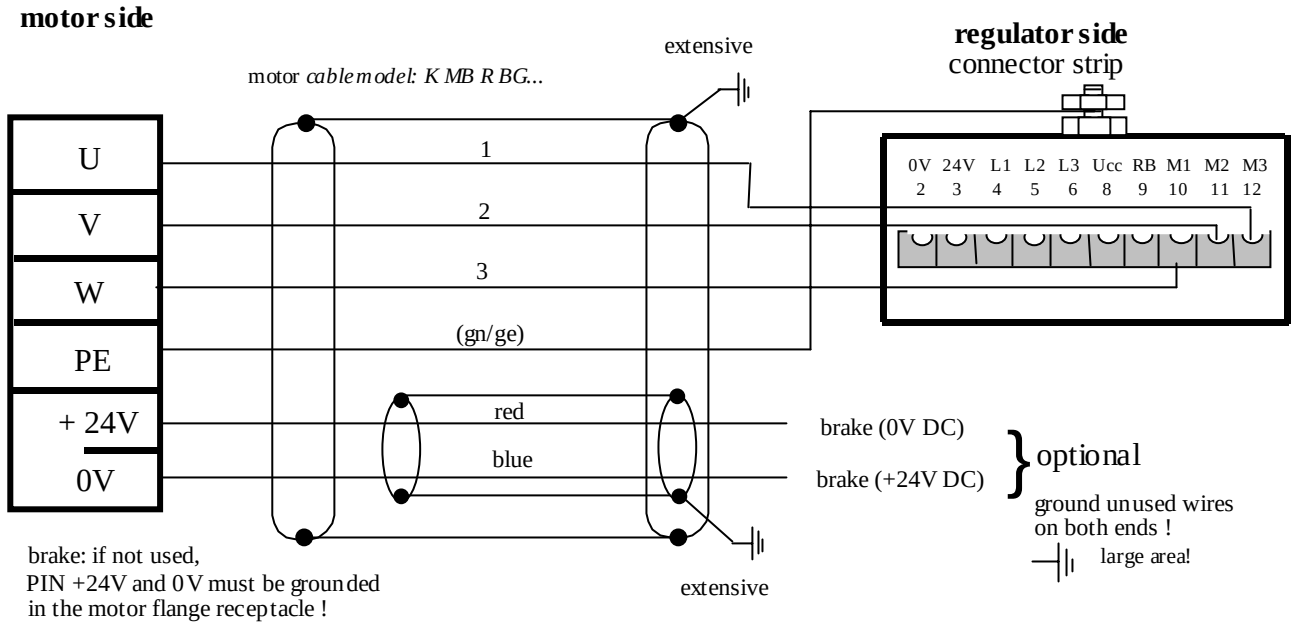
(old products ESR AC S, FRR AC S)

in the SSD Drives Rack



5.2.2 SSD Drives-servo drive 635/K DER

in the compact- or low cost enclosure



Motor-line-shield: on both ends, extensively connected!

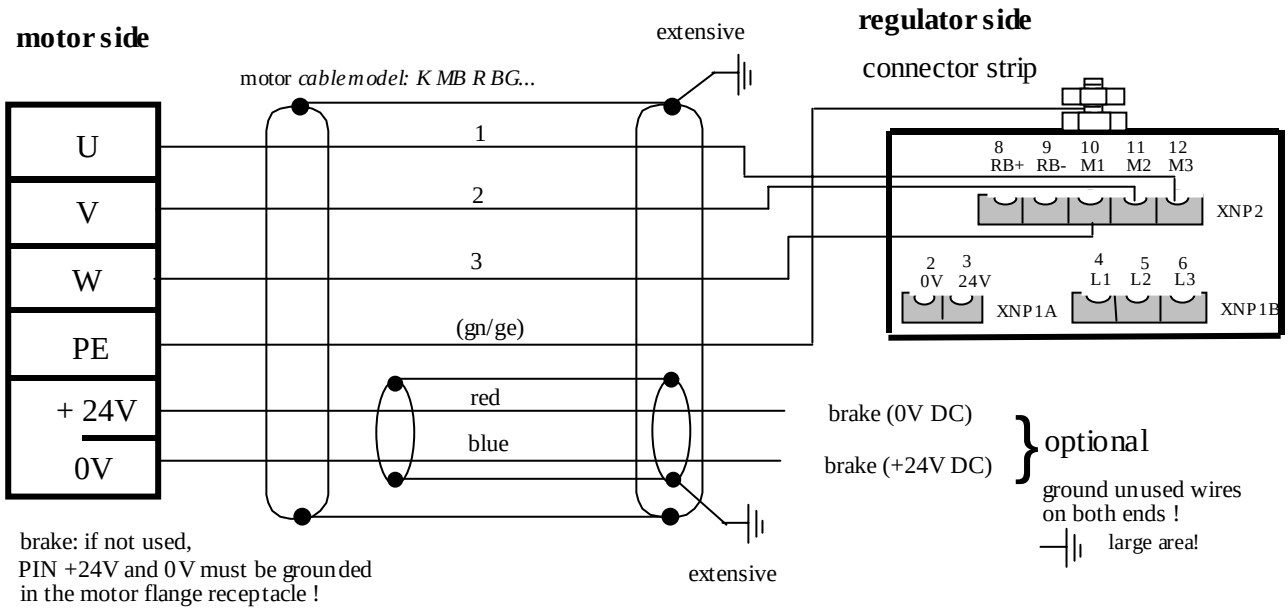
Connector assignment

Motor connection for special design (Connections via PG with cable ends)

Pin assignment for SSD Drives motors, size 0...3 (only motor size 0 at the moment)

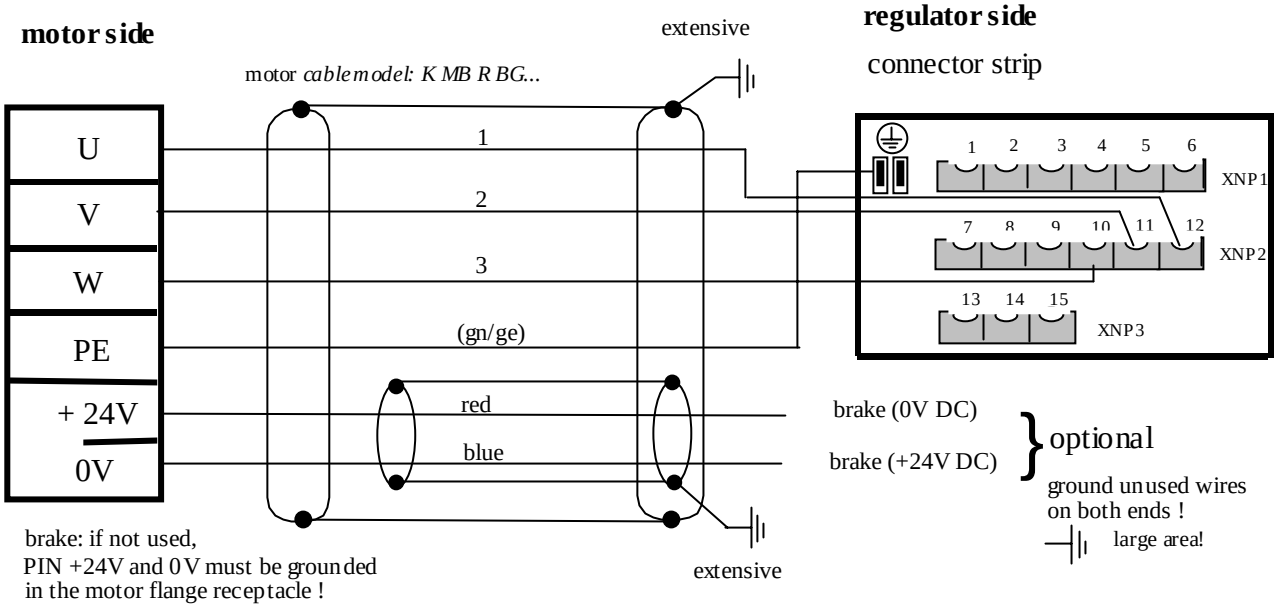
5.2.3 SSD Drives-servo drive 637/K D6R

in thea compact enclosure



5.2.4 SSD Drives-servo drive (old product FRR AC S)

in the compact enclosure



Motor-line-shield: on both ends, extensively connected!

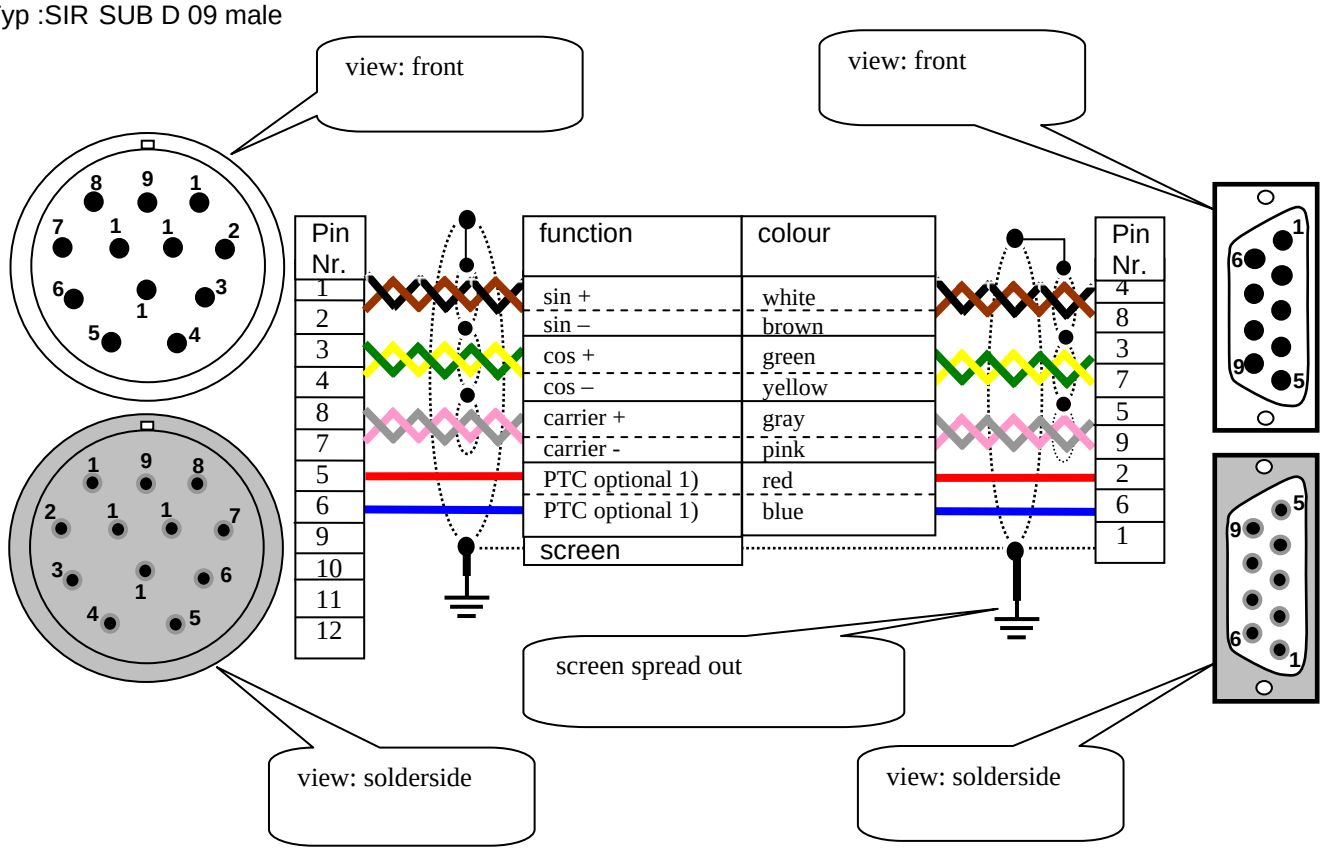
Connector assignment

5.3 Resolver connection

for SSD Drives motor size 0...3 and on servo drive 631/635 and 637/637+

motor side
resolver mating plugs
Typ :SIR SUB D 09 male

controller side
X 30 mating plugs



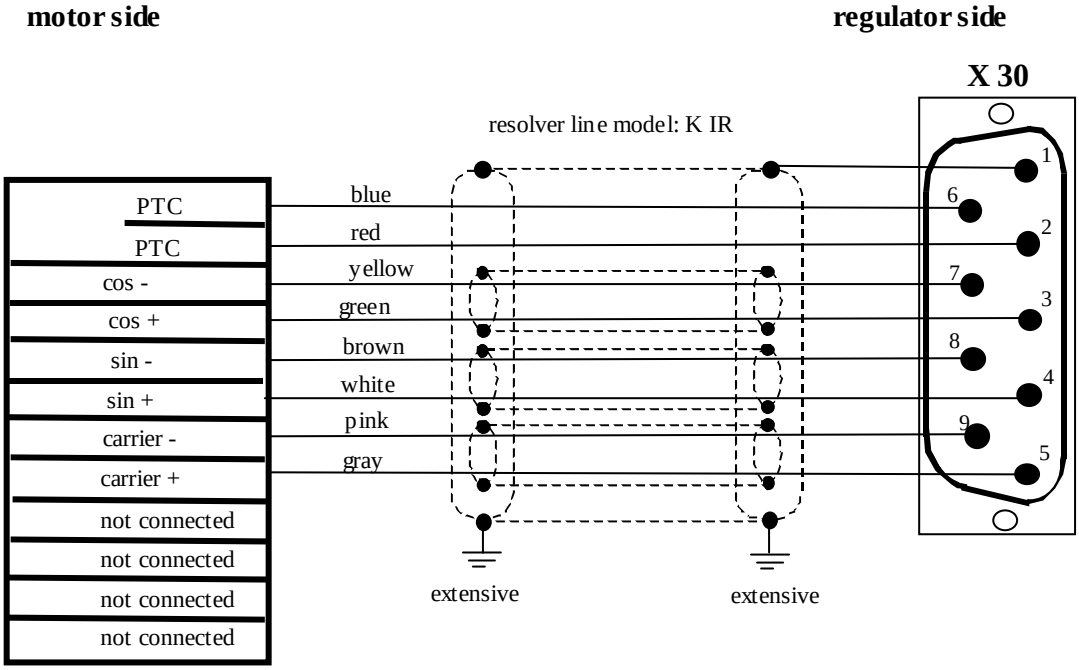
1) ⚠ **Attention ! Security and insulation:**
The temperature sensor in the motor winding must be insolated for secure division (PELV).
Otherwise, the insulation class of the drive becomes reduced or the effort of an additional galvanic seperation is required.

The mating plugs are not included in the standard delivery

Connector assignment

Resolver connection

5.3.1 Special design with the cables PG-coupling



5.4 Cabling instructions

Important rules when operating servo regulators and servomotors:

1. A radio interference suppression level cannot be maintained without an interference suppression filter at the line input. Moreover, line filter increase the immunity of the system to interference.

2. The cable between the power electronics and the motor must be shielded as YCY. A SY shield is not suitable. The shield support for the power cable (motor cable) must be on both ends.
We recommend using SSD Drives motor cables K M BG xx – B!

3. Metal parts in the switching cabinet must be connected with each other having large areas of contact and must carry high frequencies very well. Avoid anodized, yellow-passivized and painted surfaces which can have very high resistance values based on the frequency!
Make sure that the metals lie close together in the chemical circuit voltage class! Use the good conductivity and the large surface of the galvanized mounting plate as earth potential!

4. Relays, contactors and solenoid values build into the same circuit must be connected with spark-suppressing combinations or components limiting over voltage, respectively. This applies also if these parts are not mounted in the same cabinet as the servo regulator.

5. The shield for the analog signal lines must be installed on one end and, if possible, in the switching cabinet. Ensure a connection which provides extensive contact and which is low-resistant! The shield for the digital signal lines must be installed on both ends, must have extensive contact and must be low resistance. An additional equalizer is to be laid parallel when there are potential differences. It is necessary to use plugs with metal enclosures with separable connections.

6. Avoid unnecessary extra loops on all connecting cables. All measures regarding filtering and shielding can be short cicuited on them with high frequency. Connect unused litz wires in cables on both ends to the equipment ground conductor.

7. Unshielded cables of a cicuit, the conductors going out and returning, should be twisted due to symmetrical interferences.

8. Separate physically "live" and "dead" wires even in the planning phase. Give special attention to the motor cables. The area of the common terminal strip-line input and motor output is especially endangered.

9. Relays, contactors and solenoid values. The cables should be laid in the switching cabinet as close as possible to the ground; wires hanging freely in the air are preferred EMC victims as well as active and passive aerials.

10. When operating with more than one line component in a common network, EMC problems are to be expected. From the start, the installation planer must integrate in his concept high frequency emitted interference as well as the electromagnetic susceptibility of the components to one another and take measures against it.

11. It is absolutely necessary to run cable shields completely up to the connectors. The connection of the cable shields to ground must be in the near field of the servo regulator (10 - 50 cm). Sensitive measuring leads should be removed as far as possible from this area; this applies also when they are shielded!

12. It is mandatory to run the motor cables in a separate cable channel and to lay flexible cable shielding also when these are shielded. This channel must be separated by at least 30 - 40 cm from the channel for the signal lines.

Connector assignment

5.5 Plug designation

5.5.1 Mating plugs for motor- and brake connections

Size	Plug designation
0 - 2	SMB RPM BG 0/2
3	SMB R BG 3

5.5.2 Mating plugs for resolver- and thermal connection

Size	Plug designation
all	SIR

6 Technical data of the holding brake

optional

holding brake	motor size	holding torque	max. current	moment of inertia	weight
Model:	**BG** (-)	**M_{BrH}** (Nm)	**I_{max}** (A)	**J_{Br}** (kg cm²)	**m_{Br}** (g)
BR M BG0	0	1,2	0,37	0,01	190
BR M BG1	1	3,2	0,42	0,3	445
BR M BG2	2	6,0	0,55	0,63	700
BR M BG3	3	12,0	0,75	2,1	1280

Supply voltage: U_S = 24 V DC, ± 10% acc. VDE 0580

Holding brakes are integrated on A- side; therefore the motor length is changed,
see dimension K1 !

The inserted brake is not characterized for the general slowing-down the drives, but is merely a standstill and/or holding brake.

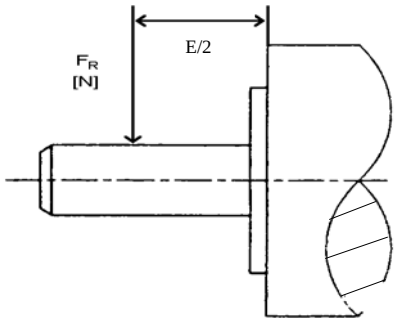
Therefore, it must become guaranteed by the customer that the drive stands, before that brake comes in. Should that brake not only become employed in the case of standing drives, so it's generally the wear and therefore the holding torque of the brake depending on:

- the speed of the drive with witch the brake will be switched
- the load moment of inertia on the drive
- environmental conditions as temperature, and so forth.
- the number of braking and so forth

7 Shaft loads

7.1 radial shaft load

7.1.1 Representation of the definition

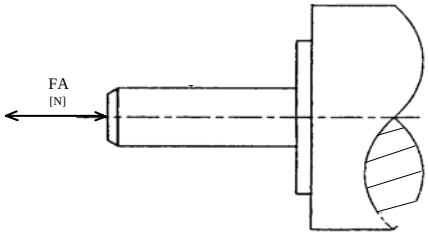


7.1.2 technical dates of the max. radial shaft load FR (N)

Motor size	rated speed	maximum radial shaft load
(-)	MN (1/min)	FR (N)
0	4000	220
1	4000	250
2	4000	300
3	4000	570

7.2 axial shaft load

7.2.1 Representation of the definition



7.2.2 technical dates of the max. axial shaft load FA (N)

Motor size	rated speed	maximum axial shaft load
(-)	MN (1/min)	FR (N)
0	4000	80
1	4000	90
2	4000	100
3	4000	200

The specifications refers to 20000 hours of operation !

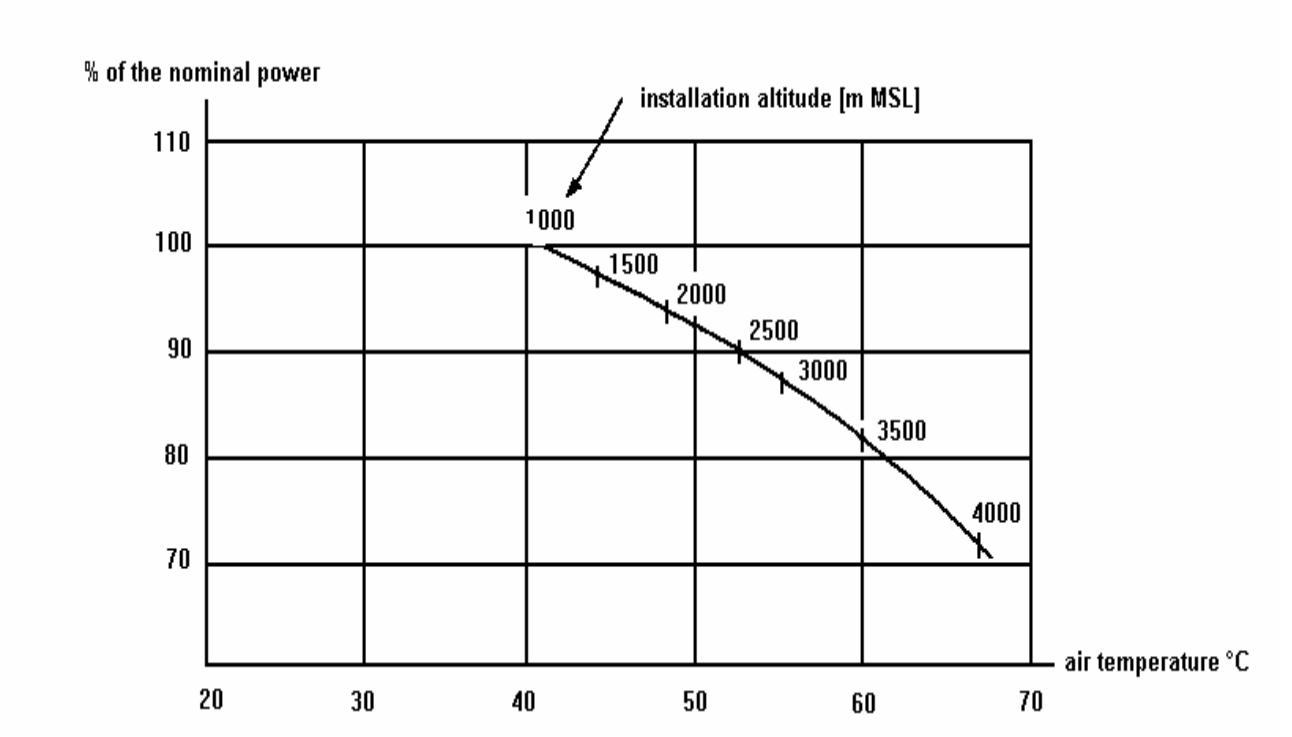
7.3 Use Ball bearing type

Motor-Size	Ball bearing type	
	A-seitig	B-seitig
0	6001	6001
1	6003	6001
2	6004	6002
3	6005	6003

8 Nominal power dependence of the SSD Drives AC servo motors concerning the installation altitude

8.1 Short description

When selecting an adequate motor the following is to be considered:
Workload (power), operating mode, starting, braking and by-passing processes, additional moment of inertia, moment course of the operating machine, speed control if necessary, net ratios, coolant temperature, installation altitude etc.
The nominal power is the power which is mechanically available at the shaft, if the installation site is not situated above 1000 m MSL, the air temperature does not exceed 40° C, and the net ratios are normal.
With deviating conditions concerning installation altitude and air temperature, the permissible power must be corrected corresponding to the following picture.



Check the air temperature and the installation altitude separately. Should there be different air temperatures and installation altitude at the same time, the factors for the permissible power must be multiplicated.

9 Modification Record

Version	Modification	Chapter	Date	Name	Comment
V16.04EH99	new chapter resolver connection text addition text modification new chapter	4.2.2 5.3.1 6 7 9	03.02.1999	K. Stadler	Documentation in ET - design
V17.16EH99	text addition technical data new chapter text addition	1.3 3 3.1 6	20.04.1999	K. Stadler	
V18.43EH99	technical data dimensions technical data	2 4.1.1 5.3.1	27.10.1999	Iris Worm	
V1901	Separation German / English	all	18.01.2001	N. Dreilich	
V2005	SSD Drives	all	08.04.2005	N. Dreilich	Logos

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