

*SBL/K Motor  
Catalogue  
2002*



*Brushless  
Servomotors  
up to 32Nm*

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## SBL2...4/320 - Brushless Servomotor range up to 7.5Nm / 320V

The SBL motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B Magnets for demanding servo applications.

The brushless design means the motors are virtually maintenance free.

Commutation is controlled by a suitable servo amplifier.

The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.



### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

Motor data			SBL2-0020	SBL2-0040	SBL2-0060	SBL2-0080	SBL3-0065	SBL3-0130	SBL3-0250	SBL4-0260	SBL4-0530	SBL4-0750
Nominal torque	MN	Nm	0.19	0.36	0.55	0.72	0.55	1.15	2.15	2.3	4.6	6.3
Nominal speed*	nN	min-1	4500	4500	4500	4500	3000	3000	3000	3000	3000	3000
Nominal current	IN	A	0.6	0.9	1.15	1.45	1	1.6	2.8	2.8	5.7	7.6
Holding torque	M0	Nm	0.2	0.4	0.6	0.8	0.65	1.3	2.5	2.6	5.3	7.5
Holding current	I0	A	0.6	0.93	1.2	1.5	1.08	1.7	3	3	6.3	8.6
Maximum peak torque	Mmax	Nm	0.8	1.6	2.4	3.2	2.6	5.2	10	10	21	30
Maximum peak current	Imax	A	2.7	4.2	5.3	6.8	5	7.5	13.5	13	27.5	38
Max. rpm (mech. limit.)	nmax	min-1	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant	KM	Nm/A	0.33	0.43	0.51	0.54	0.6	0.78	0.83	0.86	0.84	0.87
Voltage constant	KE	V/1000	20	26	31	33	36.5	47	50	52	51	53
Resistance ph-ph	RPh	Ω	62	26.7	19.7	14.7	30.3	13	5.1	3.8	1.65	1
Inductance ph-ph	LPh	mH	29.5	20.5	17	13	31	22	11	15	8.5	5.9
Electr. time constant	Tel	ms	0.48	0.77	0.86	0.88	1.02	1.7	2	3.9	5.1	6
Therm. time constant	Tther	min	10	15	20	22	25	30	32	60	60	66
Moment of inertia	J	kgcm <sup>2</sup>	0.06	0.08	0.11	0.14	0.45	0.7	1.2	1.65	3.13	4.5
Weight without brake	m	kg	0.9	1.1	1.25	1.45	1.9	2.3	3.3	4.5	5.7	7.6
Weight with brake	mBr	kg	1.16	1.36	1.51	1.71	2.3	2.7	3.7	5.3	6.5	8.4
Framesize brake			4	4	4	4	6	6	6	7	7	7
Holding torque brake	MBr	Nm	1.2	1.2	1.2	1.2	2.5	2.5	2.5	5	5	5

### Notes

\* other windings / speeds on request

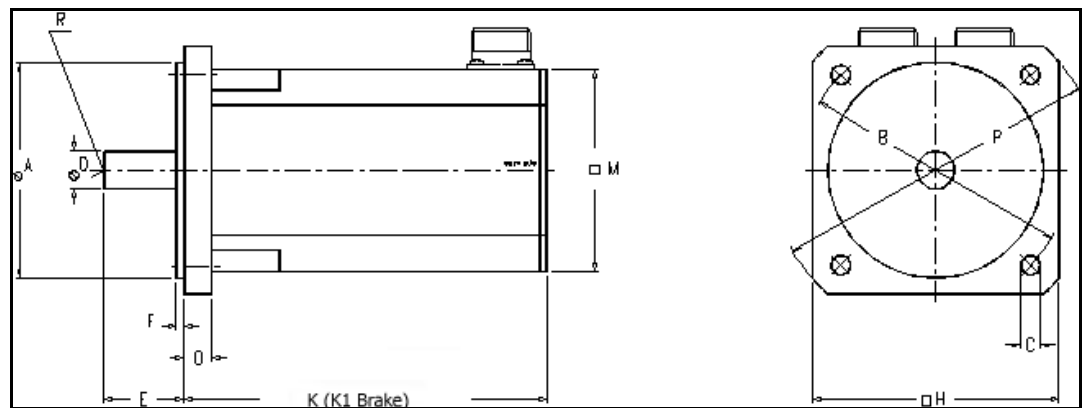
**Protection level**  
IP54, optional IP65

**Electrical connections**  
Interconnection Plug (2 off)

**Thermal motor protection**  
Thermal contact 145°C, optional PTC

**Nominal data**  
To VDE 0530 (at 1000m above sea level,  
T<sub>amb</sub>= 100 K, T<sub>v</sub>= 40°C, fitted to heat-sink)

**Servo amplifier**  
Stator winding for intermediate voltage  
U<sub>cc</sub> = 320 VDC, other voltages optional.



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBL2-0020	40	63	5.8	9	24	2.5	55	107	140	50	7	74	--
SBL2-0040	40	63	5.8	9	24	2.5	55	122	155	50	7	74	--
SBL2-0060	40	63	5.8	9	24	2.5	55	137	170	50	7	74	--
SBL2-0080	40	63	5.8	9	24	2.5	55	152	185	50	7	74	--
SBL3-0065	80	100	7	14	30	3	88	116	149	74	9	115	M4x10
SBL3-0130	80	100	7	14	30	3	88	134	167	74	9	115	M4x10
SBL3-0250	80	100	7	14	30	3	88	170	203	74	9	115	M4x10
SBL4-0260	95	115	9	19	40	3	105	155	190	97	10	134	M5x12
SBL4-0530	95	115	9	19	40	3	105	185	220	97	10	134	M5x12
SBL4-0750	95	115	9	19	40	3	105	230	265	97	10	134	M5x12

## SBL5...7/320 - Brushless Servomotor range up to 32Nm / 320V

The SBL motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B Magnets for demanding servo applications.

The brushless design means the motors are virtually maintenance free.

Commutation is controlled by a suitable servo amplifier.

The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.

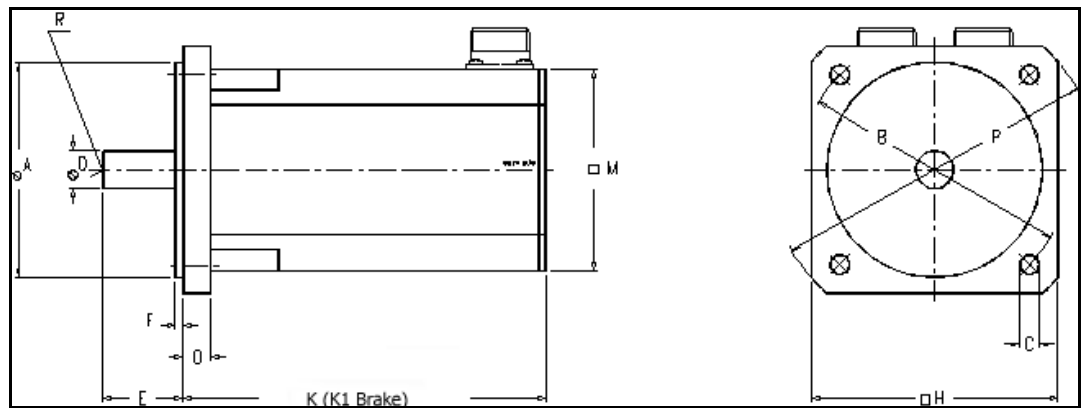


### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

Motor data			SBL5-0660	SBL5-1050	SBL5-1350	SBL6-1350	SBL6-1900	SBL6-2200	SBL7-2600	SBL7-3200
Nominal torque	MN	Nm	5.6	8.5	10.7	10	14	16	20	23
Nominal speed*	nN	min-1	3000	3000	3000	3000	3000	3000	3000	3000
Nominal current	IN	A	6.9	10.5	13.5	14.4	20	22	25.5	29.5
Holding torque	M0	Nm	6.6	10.5	13.5	13.5	19	22	26	32
Holding current	I0	A	7.7	12	15.7	18.1	25	28	30.5	37.6
Maximum peak torque	Mmax	Nm	26	42	54	54	76	88	104	128
Maximum peak current	Imax	A	35	55	72	83	114	128	137	168
Max. rpm (mech. limit.)	nmax	min-1	6000	6000	6000	5000	5000	5000	5000	5000
Torque constant	KM	Nm/A	0.86	0.88	0.86	0.74	0.76	0.79	0.85	0.85
Voltage constant	KE	V/1000	52	53	52	45	46	48	51.5	51.5
Resistance ph-ph	RPh	Ω	1.2	0.64	0.5	0.63	0.31	0.24	0.14	0.11
Inductance ph-ph	LPh	mH	5.1	3.8	3	5.1	3	2.4	1.3	1
Electr. time constant	Tel	ms	4.25	5.94	6	8.1	9.7	10	9.3	9.1
Therm. time constant	Tther	min	40	50	55	45	53	60	60	67
Moment of inertia	J	kgcm <sup>2</sup>	8.9	11.9	13.4	15.8	22	25.1	82	104
Weight without brake	m	kg	8.0	9.8	11.2	11.9	18.3	21.5	28.0	32.5
Weight with brake	mBr	kg	9.5	11.3	12.7	14.7	21.1	24.3	31.3	35.8
Framesize brake			9	9	9	11	11	11	11	11
Holding torque brake	MBr	Nm	12	12	12	20	20	20	20	20

Notes
* other windings / speeds on request
<b>Protection level</b> IP54, optional IP65
<b>Electrical connections</b> Interconnection Plug (2 off)
<b>Thermal motor protection</b> Thermal contact 145°C, optional PTC
<b>Nominal data</b> To VDE 0530 (at 1000m above sea level, T <sub>amb</sub> = 100 K, T <sub>v</sub> = 40°C, fitted to heat-sink)
<b>Servo amplifier</b> Stator winding for intermediate voltage U <sub>cc</sub> = 320 VDC, other voltages optional.



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBL5-0660	130	165	11	24	50	3.5	142	186	229	127	11	188	M8x19
SBL5-1050	130	165	11	24	50	3.5	142	220	263	127	11	188	M8x19
SBL5-1350	130	165	11	24	50	3.5	142	237	280	127	11	188	M8x19
SBL6-1350	180	215	12	24	50	3.5	190	192	238	158	12	250	M8x19
SBL6-1900	180	215	12	24	50	3.5	190	226	272	158	12	250	M8x19
SBL6-2200	180	215	12	24	50	3.5	190	243	289	158	12	250	M8x19
SBL7-2600	180	215	14	28	58	4	190	240	284	190	13	250	M10x22
SBL7-3200	180	215	14	28	58	4	190	263	307	190	13	250	M10x22

## SBL2...4/560 - Brushless Servomotor range up to 7.5Nm / 560V

The SBL motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B Magnets for demanding servo applications.

The brushless design means the motors are virtually maintenance free.

Commutation is controlled by a suitable servo amplifier.

The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.



### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

Motor data			SBL2-0020	SBL2-0040	SBL2-0060	SBL2-0080	SBL3-0065	SBL3-0130	SBL3-0250	SBL4-0260	SBL4-0530	SBL4-0750
Nominal torque	MN	Nm	0.19	0.36	0.55	0.72	0.55	1.15	2.15	2.3	4.6	6.3
Nominal speed*	nN	min-1	4500	4500	4500	4500	3000	3000	3000	3000	3000	3000
Nominal current	IN	A	0.45	0.52	0.71	0.75	0.65	0.95	1.64	1.76	3.59	4.2
Holding torque	M0	Nm	0.2	0.4	0.6	0.8	0.65	1.3	2.5	2.6	5.3	7.5
Holding current	I0	A	0.45	0.54	0.73	0.82	0.66	1	1.81	1.92	4	4.7
Maximum peak torque	Mmax	Nm	0.8	1.6	2.4	3.2	2.6	5.2	10	10	21	30
Maximum peak current	Imax	A	2	2.4	3.3	3.7	3	4.5	8.2	8.3	18	22
Max. rpm (mech. limit.)	nmax	min-1	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant	KM	Nm/A	0.44	0.73	0.82	0.98	0.98	1.29	1.38	1.36	1.32	1.59
Voltage constant	KE	V/1000	26.5	44	49.5	59	59	77.5	83.5	82	80	96
Resistance ph-ph	RPh	Ω	105	78.7	52	37	79	35.5	14.8	9.4	4.1	2.9
Inductance ph-ph	LPh	mH	52	59.5	45	42	83	61	31.4	37.8	20.7	17
Electr. time constant	Tel	ms	0.49	0.76	0.87	1.14	1.05	1.75	2.1	4	5	5.9
Therm. time constant	Tther	min	10	15	20	22	25	30	32	60	60	66
Moment of inertia	J	kgcm <sup>2</sup>	0.06	0.08	0.11	0.14	0.45	0.7	1.2	1.65	3.13	4.5
Weight without brake	m	kg	0.9	1.1	1.25	1.45	1.9	2.3	3.3	4.5	5.7	7.6
Weight with brake	mBr	kg	1.16	1.36	1.51	1.71	2.3	2.7	3.7	5.3	6.5	8.4
Framesize brake			4	4	4	4	6	6	6	7	7	7
Holding torque brake	MBr	Nm	1.2	1.2	1.2	1.2	2.5	2.5	2.5	5	5	5

### Notes

\* other windings / speeds on request

#### Protection level

IP54, optional IP65

#### Electrical connections

Interconnectron Plug (2 off)

#### Thermal motor protection

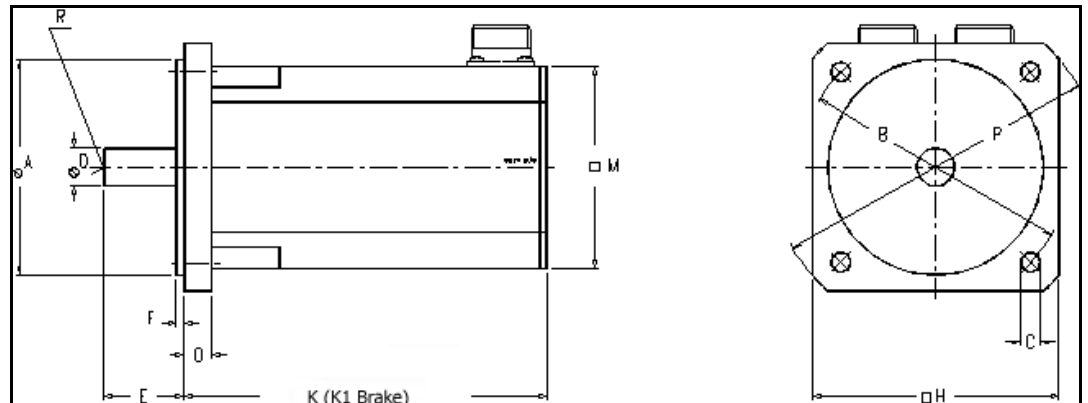
Thermal contact 145°C, optional PTC

#### Nominal data

To VDE 0530 (at 1000m above sea level, T<sub>amb</sub>= 100 K, T<sub>v</sub>= 40°C, fitted to heat-sink)

#### Servo amplifier

Stator winding for intermediate voltage U<sub>cc</sub> = 560 VDC, other voltages optional.



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBL2-0020	40	63	5.8	9	24	2.5	55	107	140	50	7	74	--
SBL2-0040	40	63	5.8	9	24	2.5	55	122	155	50	7	74	--
SBL2-0060	40	63	5.8	9	24	2.5	55	137	170	50	7	74	--
SBL2-0080	40	63	5.8	9	24	2.5	55	152	185	50	7	74	--
SBL3-0065	80	100	7	14	30	3	88	116	149	74	9	115	M4x10
SBL3-0130	80	100	7	14	30	3	88	134	167	74	9	115	M4x10
SBL3-0250	80	100	7	14	30	3	88	170	203	74	9	115	M4x10
SBL4-0260	95	115	9	19	40	3	105	155	190	97	10	134	M5x12
SBL4-0530	95	115	9	19	40	3	105	185	220	97	10	134	M5x12
SBL4-0750	95	115	9	19	40	3	105	230	265	97	10	134	M5x12

## SBL5...7/560 - Brushless Servomotor range up to 32Nm / 560V

The SBL motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B Magnets for demanding servo applications.

The brushless design means the motors are virtually maintenance free.

Commutation is controlled by a suitable servo amplifier.

The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.



### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

Motor data			SBL5-0660	SBL5-1050	SBL5-1350	SBL6-1350	SBL6-1900	SBL6-2200	SBL7-2600	SBL7-3200
Nominal torque	MN Nm		5.6	8.5	10.7	10	14	16	20	23
Nominal speed*	nN min-1		3000	3000	3000	3000	3000	3000	3000	3000
Nominal current	IN A		4.1	6	7.6	8.7	11.8	12.9	14.1	16.9
Holding torque	M0 Nm		6.6	10.5	13.5	13.5	19	22	26	32
Holding current	I0 A		4.6	6.9	8.9	10.8	14.7	16.3	17	21.4
Maximum peak torque	Mmax Nm		26	42	54	54	76	88	104	128
Maximum peak current	Imax A		21	32	41	49	67	75	76	96
Max. rpm (mech. limit.)	nmax min-1		6000	6000	6000	5000	5000	5000	5000	5000
Torque constant	KM Nm/A		1.45	1.52	1.52	1.25	1.29	1.35	1.53	1.5
Voltage constant	KE V/1000		87.5	92	92	75	78	82	92.5	90.5
Resistance ph-ph	RPh Ω		3.55	1.7	1.48	1.75	0.89	0.81	0.46	0.31
Inductance ph-ph	LPh mH		15.8	11.5	9	13.5	8.7	7.2	4.1	3.1
Electr. time constant	Tel ms		4.45	6.76	5.4	7.7	9.8	8.9	8.9	10
Therm. time constant	Tther min		40	50	55	45	53	60	60	67
Moment of inertia	J kgcm <sup>2</sup>		8.9	11.9	13.4	15.8	22	25.1	82	104
Weight without brake	m kg		8.0	9.8	11.2	11.9	18.3	21.5	28.0	32.5
Weight with brake	mBr kg		9.5	11.3	12.7	14.7	21.1	24.3	31.3	35.8
Framesize brake			9	9	9	11	11	11	11	11
Holding torque brake	MBr Nm		12	12	12	20	20	20	20	20

### Notes

\* other windings / speeds on request

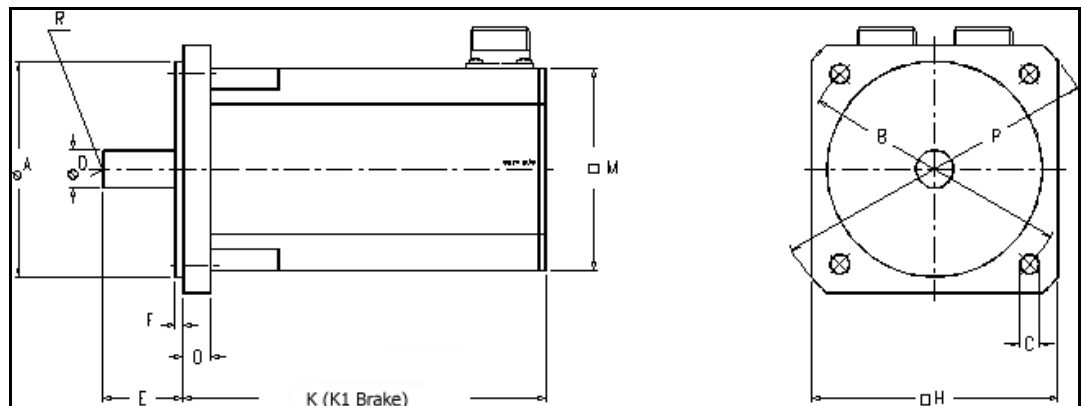
**Protection level**  
IP54, optional IP65

**Electrical connections**  
Interconnecton Plug (2 off)

**Thermal motor protection**  
Thermal contact 145°C, optional PTC

**Nominal data**  
To VDE 0530 (at 1000m above sea level,  
T<sub>over</sub> = 100 K, T<sub>a</sub> = 40°C, fitted to heat-sink)

**Servo amplifier**  
Stator winding for intermediate voltage  
U<sub>cc</sub> = 560 VDC, other voltages optional.



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBL5-0660	130	165	11	24	50	3.5	142	186	229	127	11	188	M8x19
SBL5-1050	130	165	11	24	50	3.5	142	220	263	127	11	188	M8x19
SBL5-1350	130	165	11	24	50	3.5	142	237	280	127	11	188	M8x19
SBL6-1350	180	215	12	24	50	3.5	190	192	238	158	12	250	M8x19
SBL6-1900	180	215	12	24	50	3.5	190	226	272	158	12	250	M8x19
SBL6-2200	180	215	12	24	50	3.5	190	243	289	158	12	250	M8x19
SBL7-2600	180	215	14	28	58	4	190	240	284	190	13	250	M10x22
SBL7-3200	180	215	14	28	58	4	190	263	307	190	13	250	M10x22

## SBK4...7/320 - Short Servomotor range up to 19.5Nm / 320V

The SBK range of brushless servo motors are low inertia, high performance, low maintenance units with a difference, **size!**

Based on the SBL range the SBKs offer a **real alternative to pancake and printed motors** due to their short construction.

The SBK motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B magnets for demanding servo applications.



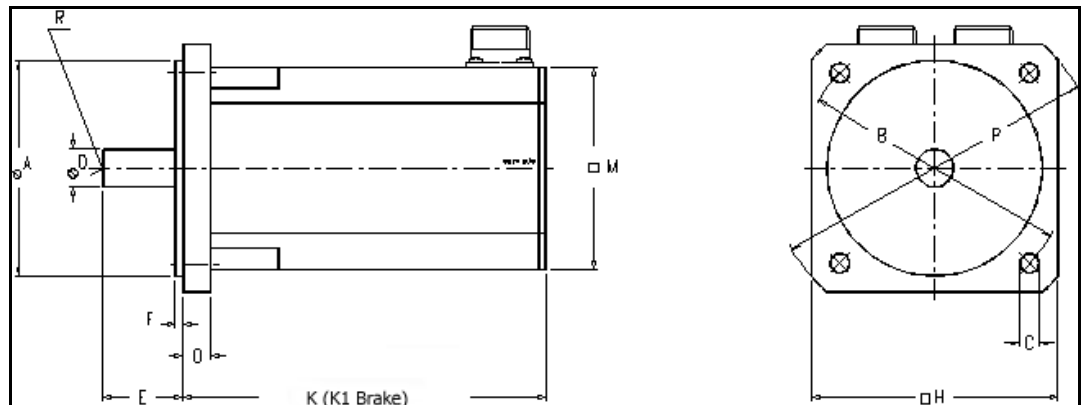
The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.

### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

Motor data			SBK4-0100	SBK5-0210	SBK5-0430	SBK6-0350	SBK6-0700	SBK7-0650	SBK7-1200	SBK7-1950
Nominal torque	MN Nm		0.9	1.9	3.9	3	6	5	10	15
Nominal speed*	nN min-1		3000	3000	3000	3000	3000	3000	3000	3000
Nominal current	IN A		1.95	2.6	4.8	5.2	8.2	7.6	12.5	18.2
Holding torque	M0 Nm		1	2.1	4.3	3.5	7	6.5	12	19.5
Holding current	IO A		2	2.7	5	5.2	9	8.5	14	21.8
Maximum peak torque	Mmax Nm		4	8.4	17	14	28	26	48	78
Maximum peak current	Imax A		9.2	12	22	23	41	39	64	100
Max. rpm (mech. limit.)	nmax min-1		10000	6000	6000	5000	5000	5000	5000	5000
Torque constant	KM Nm/A		0.5	0.79	0.87	0.68	0.78	0.76	0.85	0.89
Voltage constant	KE V/1000		30	47.5	52	41	47	46	51	54
Resistance ph-ph	RPh Ω		13.9	7	2.16	3.6	1.26	1.31	0.45	0.25
Inductance ph-ph	LPh mH		23	16.5	10	12	8.6	4.2	1.9	1.4
Electr. time constant	Tel ms		1.65	2.4	4.6	3.3	6.8	3.2	4.2	5.6
Therm. time constant	Tther min		40	33	34	31	38	79	70	61
Moment of inertia	J kgcm2		0.64	4	5.8	8	11.3	29	47	62
Weight without brake	m kg		2.7	3.9	6.8	5.5	8.7	10	14.5	19
Weight with brake	mBr kg		3.15	4.9	7.8	7	10.2	12.5	17	21.5
Frame size brake			06	07	07	07	07	09	09	09
Holding torque brake	MBr Nm		2.5	5	5	5	5	12	12	12

Notes
* other windings / speeds on request
<b>Protection level</b> IP54, optional IP65
<b>Electrical connections</b> Interconnection Plug (2 off)
<b>Thermal motor protection</b> Thermal contact 145°C, optional PTC
<b>Nominal data</b> To VDE 0530 (at 1000m above sea level, T <sub>amb</sub> = 100 K, T <sub>a</sub> = 40°C, fitted to heat-sink)
<b>Servo amplifier</b> Stator winding for intermediate voltage U <sub>cc</sub> = 320 VDC, other voltages optional.



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBK4-0100	95	115	9	14	30	2.5	105	92	122	97	8	134	M4x10
SBK5-0210	130	165	11	19	40	3	142	121	157	127	9	188	M5x12
SBK5-0430	130	165	11	19	40	3	142	138	174	127	9	188	M5x12
SBK6-0350	180	215	12	19	50	3.5	190	126	158	158	10	250	M5x12
SBK6-0700	180	215	12	19	50	3.5	190	143	175	158	10	250	M5x12
SBK7-0650	180	215	14	24	50	3.5	190	137	175	190	11	250	M8x19
SBK7-1200	180	215	14	24	50	3.5	190	160	198	190	11	250	M8x19
SBK7-1950	180	215	14	24	50	3.5	190	198	236	190	11	250	M8x19

## SBK4...7/560 - Short Servomotor range up to 19.5Nm / 560V

The SBK range of brushless servo motors are low inertia, high performance, low maintenance units with a difference, **size!**

Based on the SBL range the SBKs offer a **real alternative to pancake and printed motors** due to their short construction.

The SBK motors are three-phase AC brushless synchronous servomotors with Nd-Fe-B magnets for demanding servo applications.



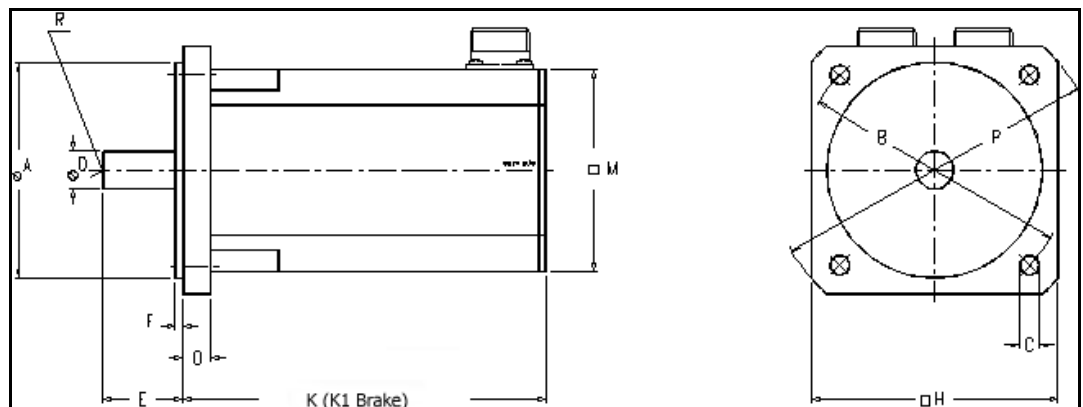
The standard motor incorporates a 2-pole resolver as feedback device. The motors have a 6-pole winding.

### Options

- adapter for external encoder
- incremental or hyperface encoder as feedback device
- holding brake
- high shaft tolerance
- key-way / key
- IP 65 / shaft seals
- suitable planetary and worm gearboxes
- suitable servo drives

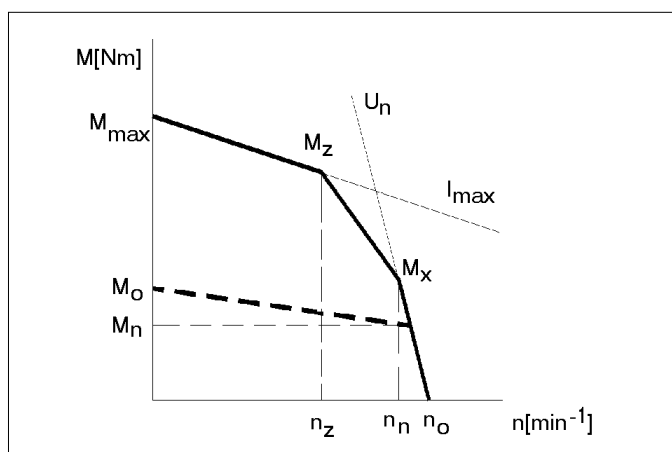
Motor data			SBK4-0100	SBK5-0210	SBK5-0430	SBK6-0350	SBK6-0700	SBK7-0650	SBK7-1200	SBK7-1950
Nominal torque	MN Nm		0.9	1.9	3.9	3	6	5	10	15
Nominal speed*	nN min-1		3000	3000	3000	3000	3000	3000	3000	3000
Nominal current	IN A		1.06	1.5	2.8	2.7	4.6	3.8	6.8	10
Holding torque	M0 Nm		1	2.1	4.3	3.5	7	6.5	12	19.5
Holding current	I0 A		1.1	1.55	2.85	2.8	5.1	4.5	7.4	11.8
Maximum peak torque	Mmax Nm		4	8.4	17	14	28	26	48	78
Maximum peak current	Imax A		4.8	6.9	12.6	12.7	22.7	20.5	33	53
Max. rpm (mech. limit.)	nmax min-1		10000	6000	6000	5000	5000	5000	5000	5000
Torque constant	KM Nm/A		0.93	1.36	1.51	1.24	1.39	1.43	1.61	1.65
Voltage constant	KE V/1000		56	82.5	91.5	75	84	86.5	97.5	100
Resistance ph-ph	RPh Ω		38	21.6	6.7	12.4	4	4.75	1.65	0.9
Inductance ph-ph	LPh mH		70	50	30.5	40	27.5	15	6.9	4.9
Electr. time constant	Tel ms		1.84	2.31	4.55	3.2	6.9	3.2	4.2	5.4
Therm. time constant	Tther min		40	33	34	31	38	79	70	61
Moment of inertia	J kgcm2		0.64	4	5.8	8	11.3	29	47	62
Weight without brake	m kg		2.7	3.9	6.8	5.5	8.7	10	14.5	19
Weight with brake	mBr kg		3.15	4.9	7.8	7	10.2	12.5	17	21.5
Framesize brake			06	07	07	07	07	09	09	09
Holding torque brake	MBr Nm		2.5	5	5	5	5	12	12	12

Notes	
* other windings / speeds on request	
<b>Protection level</b> IP54, optional IP65	
<b>Electrical connections</b> Interconnecton Plug (2 off)	
<b>Thermal motor protection</b> Thermal contact 145°C, optional PTC	
<b>Nominal data</b> To VDE 0530 (at 1000m above sea level, T <sub>amb</sub> = 100 K, T <sub>v</sub> = 40°C, fitted to heat-sink)	
<b>Servo amplifier</b> Stator winding for intermediate voltage U <sub>cc</sub> = 560 VDC, other voltages optional.	



Motor dim.	Aj6	B	C	Dk6	E	F	H	K	K1	M	O	P	R
SBK4-0100	95	115	9	14	30	2.5	105	92	122	97	8	134	M4x10
SBK5-0210	130	165	11	19	40	3	142	121	157	127	9	188	M5x12
SBK5-0430	130	165	11	19	40	3	142	138	174	127	9	188	M5x12
SBK6-0350	180	215	12	19	50	3.5	190	126	158	158	10	250	M5x12
SBK6-0700	180	215	12	19	50	3.5	190	143	175	158	10	250	M5x12
SBK7-0650	180	215	14	24	50	3.5	190	137	175	190	11	250	M8x19
SBK7-1200	180	215	14	24	50	3.5	190	160	198	190	11	250	M8x19
SBK7-1950	180	215	14	24	50	3.5	190	198	236	190	11	250	M8x19

## Torque-Speed Curves for 320V Brushless Servomotors



The torque-speed curve (left) should only be used in conjunction with the data contained in the tables below.

Relevant data-sheets for the motors are available on request.

Please note that this data only applies to motors wound for 320V operation.

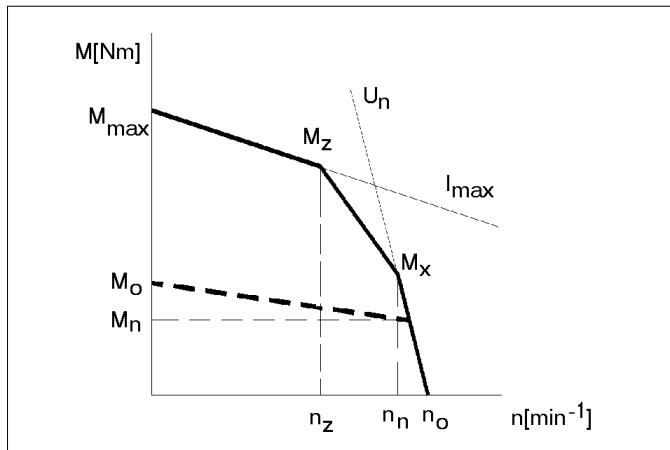
For 560V operation please request the relevant data-sheet.

Motor Type			SBL2-0020	SBL2-0040	SBL2-0060	SBL3-0065	SBL3-0130	SBL3-0250	SBL4-0260	SBL4-0530	SBL4-0750
Nominal torque	$M_n$	Nm	0,19	0,36	0,55	0,55	1,15	2,15	2,3	4,6	6,3
Nominal speed	$n_n$	$\text{min}^{-1}$	4500	4500	4500	3000	3000	3000	3000	3000	3000
Holding torque	$M_o$	Nm	0,2	0,4	0,6	0,65	1,3	2,5	2,6	5,3	7,5
Maximum peak torque	$M_{max}$	Nm	0,8	1,6	2,4	2,6	5,2	10	10	21	30
Maximum torque at $n_n$	$M_x$	Nm	0,34	0,7	0,83	1	1,75	3,65	3,8	7,8	13
No load speed	$n_o$	$\text{min}^{-1}$	9500	7300	6100	5200	4000	3800	3600	3700	3600
Speed limit at $I_{max} + M_z$	$n_z$	$\text{min}^{-1}$	1250	1250	1300	1000	1000	1550	1700	1600	1800
Current limit at $I_{max} + n_z$	$M_z$	Nm	0,69	1,55	2,35	2,55	5	9,7	9,3	19,5	28,5

Motor Type			SBL5-0660	SBL5-1050	SBL5-1350	SBL6-1350	SBL6-1900	SBL6-2200	SBL7-2600	SBL7-3200
Nominal torque	$M_n$	Nm	5,6	8,5	10,7	10	14	16	20	23
Nominal speed	$n_n$	$\text{min}^{-1}$	3000	3000	4500	3000	3000	3000	3000	3000
Holding torque	$M_o$	Nm	6,6	10,5	13,5	13,5	19	22	26	32
Maximum peak torque	$M_{max}$	Nm	26	42	54	54	76	88	104	128
Maximum torque at $n_n$	$M_x$	Nm	11	16	21	17	29	35	62	78
No load speed	$n_o$	$\text{min}^{-1}$	3700	3600	3700	4200	4100	4000	3700	3700
Speed limit at $I_{max} + M_z$	$n_z$	$\text{min}^{-1}$	2000	1700	1800	1250	1450	1550	2300	2300
Current limit at $I_{max} + n_z$	$M_z$	Nm	26	42	51	53	74	87	102	126

Motor Type			SBK4-0100	SBK5-0210	SBK5-0430	SBK6-0350	SBK6-0700	SBK7-0650	SBK7-1200	SBK7-1950
Nominal torque	$M_n$	Nm	0,9	1,9	3,9	3	6	5	10	15
Nominal speed	$n_n$	$\text{min}^{-1}$	3000	3000	3000	3000	3000	3000	3000	3000
Holding torque	$M_o$	Nm	1	2,1	4,3	3,5	7	6,5	12	19,5
Maximum peak torque	$M_{max}$	Nm	4	8,4	17	14	28	26	48	78
Maximum torque at $n_n$	$M_x$	Nm	2	3,2	5,9	5,5	9	15	27	45
No load speed	$n_o$	$\text{min}^{-1}$	6300	4000	3700	4700	4100	4200	3700	3600
Speed limit at $I_{max} + M_z$	$n_z$	$\text{min}^{-1}$	1000	1500	1700	1350	1350	2100	2300	2400
Current limit at $I_{max} + n_z$	$M_z$	Nm	3,95	8	15,5	13,5	25	25	47	76

## Torque-Speed Curves for 560V Brushless Servomotors



The torque-speed curve (left) should only be used in conjunction with the data contained in the tables below.

Relevant data-sheets for the motors are available on request.

Please note that this data only applies to motors wound for 560V operation.

For 320V operation please request the relevant data-sheet.

Motor Type			SBL2-0020	SBL2-0040	SBL2-0060	SBL3-0065	SBL3-0130	SBL3-0250	SBL4-0260	SBL4-0530	SBL4-0750
Nominal torque	$M_n$	Nm	0,19	0,36	0,55	0,55	1,15	2,15	2,3	4,6	6,3
Nominal speed	$n_n$	min <sup>-1</sup>	4500	4500	4500	3000	3000	3000	3000	3000	3000
Holding torque	$M_0$	Nm	0,2	0,4	0,6	0,65	1,3	2,5	2,6	5,3	7,5
Maximum peak torque	$M_{max}$	Nm	0,8	1,6	2,4	2,6	5,2	10	10	21	30
Maximum torque at $n_n$	$M_x$	Nm	0,65	0,86	1,2	1,33	2,3	4,7	5,6	11,3	11
No load speed	$n_0$	min <sup>-1</sup>	12500	7500	6700	5600	4300	4000	4000	4100	3400
Speed limit at $I_{max} + M_z$	$n_z$	min <sup>-1</sup>	2300	1900	2100	1000	1800	1800	2000	1900	1800
Current limit at $I_{max} + n_z$	$M_z$	Nm	0,79	1,58	2,4	2,56	5,1	9,8	9,8	21	29

Motor Type			SBL5-0660	SBL5-1050	SBL5-1350	SBL6-1350	SBL6-1900	SBL6-2200	SBL7-2600	SBL7-3200
Nominal torque	$M_n$	Nm	5,6	8,5	10,7	10	14	16	20	23
Nominal speed	$n_n$	min <sup>-1</sup>	3000	3000	4500	3000	3000	3000	3000	3000
Holding torque	$M_0$	Nm	6,6	10,5	13,5	13,5	19	22	26	32
Maximum peak torque	$M_{max}$	Nm	26	42	54	54	76	88	104	128
Maximum torque at $n_n$	$M_x$	Nm	12	16	19	19	30	36	54	76
No load speed	$n_0$	min <sup>-1</sup>	3800	3600	3600	4400	4200	4000	3600	3700
Speed limit at $I_{max} + M_z$	$n_z$	min <sup>-1</sup>	2000	1700	1800	1300	1500	1600	2200	2300
Current limit at $I_{max} + n_z$	$M_z$	Nm	26	42	51	53	74	87	102	125

Motor Type			SBK4-0100	SBK5-0210	SBK5-0430	SBK6-0350	SBK6-0700	SBK7-0650	SBK7-1200	SBK7-1950
Nominal torque	$M_n$	Nm	0,9	1,9	3,9	3	6	5	10	15
Nominal speed	$n_n$	min <sup>-1</sup>	3000	3000	3000	3000	3000	3000	3000	3000
Holding torque	$M_0$	Nm	1	2,1	4,3	3,5	7	6,5	12	19,5
Maximum peak torque	$M_{max}$	Nm	4	8,4	17	14	28	26	48	78
Maximum torque at $n_n$	$M_x$	Nm	2,1	3,1	5,8	4,8	8,5	11	20	30
No load speed	$n_0$	min <sup>-1</sup>	6000	4000	3700	4400	4000	3900	3400	3400
Speed limit at $I_{max} + M_z$	$n_z$	min <sup>-1</sup>	700	1400	1700	1200	1300	1900	2200	2000
Current limit at $I_{max} + n_z$	$M_z$	Nm	5	7,6	15,5	13	26	24	44	73

## Options and additional data for SBL and SBK Servomotors

### Shaft and key/key-way dimensions (Option)

Dimensions (mm)	SBL2	SBL3	SBL4	SBL5	SBL6	SBL7	SBK4	SBK5	SBK6	SBK7
shaft	9x24	14x30	19x40	24x50	24x50	28x58	14x30	19x40	19x50	24x50
key	3x18	5x23	6x32	8x40	8x40	8x40	5x23	6x32	6x32	8x40

### Holding Brake (option)

The SBL/SBK motors can be supplied with a "zero-speed" holding brake. Please note that this option increases the overall length of the motors (see dimensions). Motor inertia and weight will also increase.

BINDER holding brakes for Servomotors SBL/SBK			
	moment of inertia	holding torque	weight
Motortype:	of the brake [kgcm <sup>2</sup> ]	[Nm]	[kg]
SBL2	0.07	1.2	0.26
SBL3	0.38	2.5	0.4
SBL4	1.06	5	0.75
SBL5	3.6	12	1.5
SBL6	9.5	20	2.75
SBL7	9.5(31.8)	20(40)	3.25(4.9)
SBK4	0.38	2.5	0.45
SBK5	1.06	5	1
SBK6	1.06	5	1.45
SBK7	3.6(9.5)	12(20)	2.5(3.3)

### Permissible mechanical loading of the motor shaft

Basis: Life of the bearings 20.000 hrs, Radial force FR applied at the mid-point of the shaft and at a motor speed of 3.000 rpm, max. FR und FA not applied at the same time

	SBL2	SBL3	SBL4	SBL5	SBL6	SBL7	SBK4	SBK5	SBK6	SBK7
Radial force FR [N]	130	390	650	730	760	870	660	710	730	770
Axial force FA [N]	90	110	180	210	230	360	180	200	200	230

**Order Codes for SBL and SBK Servomotors**

**Example SBL3-0100-30-0 would be:**

Standard motor, frame size 3, 1Nm holding torque, 3000rpm, thermal contactor with connections over power connector, plain shaft, straight connector / socket, IP54, 320V winding, fitted with resolver.

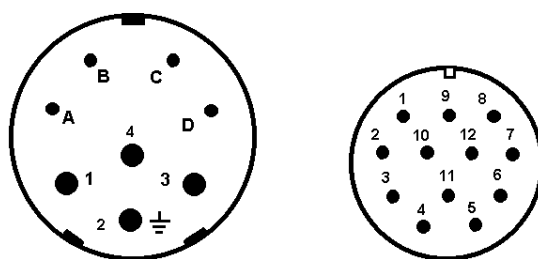
Code	Your requirement	Description
<b>SBL/ SBK</b>		Motor series: SBL = standard SBK = short
<b>2...7</b>		Motor frame size
<b>0020...3200</b>		Holding torque in Ncm (see datasheet)
<b>30</b> (standard)		Nominal speed (rpm) x 100, Standard nominal speed is 3.000 rpm (4.500 rpm for SBL2), other speeds available on request
		<b>Thermal contactor can be configured as follows:</b>
<b>0</b>		Connections to 8-pin Interconnection-Motor connector pins A+B or 9-pin Cannon Motor connector pins G+H
<b>1</b>		Thermal protector PTC, connection detail as per the standard configuration
<b>2</b>		Thermal protector NTC, connection detail as per the standard configuration
<b>3</b>		Thermal contact, connections on 12-pin Interconnection-resolver
<b>4</b>		Thermal protector PTC, connections on 12-pin Interconnection-resolver
<b>5</b>		Thermal protector NTC, connections on 12-pin Interconnection-resolver

Further options should be indicated after the base code, for example SBL3-0100-30-0/BP. Please insert a "/" before listing the options.

		<b>Holding brake:</b>
<b>B</b>		Holding brake 24Vdc
		<b>Shaft options:</b>
<b>P</b>		Key-way / key to DIN 6885
<b>R</b>		Shaft tolerance to DIN 42955R
		<b>Connector options:</b> If not otherwise specified, connectors exit straight up.
<b>S-A</b>		Angled socket / connector to A-Side
<b>S-B</b>		Angled socket / connector to B-Side
		<b>Ingress protection:</b> If not otherwise specified, protection level is IP54.
<b>V</b>		Protection to IP65 without Shaft seal
<b>W</b>		Protection to IP65 with Shaft seal, Motor length increases by approx. 10 mm
		<b>Winding options:</b> If not otherwise specified, winding is 320V for given speed.
<b>M</b>		Motor wound for 320V with insulation for 560V operation
<b>560</b>		Motor wound for 560V
		<b>Feedback options:</b> If not otherwise specified, motor is supplied with a 2-pole resolver.
<b>F1</b>		Motor with resolver and additional encoder adapter (ROD426)
<b>F2</b>		Motor with encoder adapter (ROD426), no resolver
<b>F3</b>		Motor with hyperface encoder (sinusoidal output), please specify exact requirement
<b>F4</b>		Motor with incremental encoder with commutation tracks, 2048ppr, 5V TTL
<b>X</b>		<b>Specials:</b> Special shaft / flange or 2nd shaft, encoder adapter, to be described in words.
<b>MT</b>		<b>Motor Technology standard motor configuration:</b> Winding option M up to 5.3Nm, then 560V winding. Keyed motor shaft (P). Angled socket to B-side (S-B). IP65 protection without shaft-seal. Thermal contact (3).

## Connection details for SBL and SBK Servomotors

Motor-Connector 4+4 pole		Resolver- Connector 12 pole	
1	M1 (phase U)	1	screen
2	housing (earth)	2	thermal contact
3	M3 (phase W)	3	cos + (S4)
4	M2 (phase V)	4	sin + (S3)
A	holding brake +	5	reference + (R2)
B	holding brake -	6	thermal contact
C	nc	7	cos - (S2)
D	nc	8	sin - (S1)
		9	reference - (R1)
		10	nc
		11	nc
		12	nc



(viewing the top of the connector / pins)

## Connection details for typical Servodrives

Motor 4+4 pole	Description	Servostar 400	Servostar 600	Micro ET631	Apollo ET635 / Samson ET637
1	M1 (phase U)	X6 - 4	X9 - 4	X1 - M2	H15 - 11
2	housing (earth)	X6 - 3	X9 - 3	X1 - earth	earth bolt
3	M3 (phase W)	X6 - 6	X9 - 6	X1 - M3	H15 - 12
4	M2 (phase V)	X6 - 5	X9 - 5	X1 - M1	H15 - 10
A	holding brake +	X6 - 2	X9 - 2	nc	H15 - 8
B	holding brake -	X6 - 1	X9 - 1	nc	H15 - 9
C	nc	nc	nc	nc	nc
D	nc	nc	nc	nc	nc
Resolver 12 pole					
1	screen	X5 - 1	X2 - 1	X30 - Pin 1	X30 - Pin 1
2	thermal contact	X5 - 2	X2 - 2	X30 - Pin 2	X30 - Pin 2
3	cos + (S4)	X5 - 3	X2 - 3	X30 - Pin 3	X30 - Pin 3
4	sin + (S3)	X5 - 4	X2 - 4	X30 - Pin 4	X30 - Pin 4
5	reference + (R2)	X5 - 5	X2 - 5	X30 - Pin 5	X30 - Pin 5
6	thermal contact	X5 - 6	X2 - 6	X30 - Pin 6	X30 - Pin 6
7	cos - (S2)	X5 - 7	X2 - 7	X30 - Pin 7	X30 - Pin 7
8	sin - (S1)	X5 - 8	X2 - 8	X30 - Pin 8	X30 - Pin 8
9	reference - (R1)	X5 - 9	X2 - 9	X30 - Pin 9	X30 - Pin 9
10	nc	nc	nc	nc	nc
11	nc	nc	nc	nc	nc
12	nc	nc	nc	nc	nc