NX

anything Parker Possible™

SSD DRIVES

Servo motor

Product Manual

03-06-01-E-V0405.doc

UL: 05-01-08 	**Planetary Gearbox PG AP - Product manual**
UL: 05-01-06 	**Planetary Gearbox PG ALP - Product manual**
UL: 12-01 	**Plugs - Product description**
UL: 12-02-01 	**Cables - Product description**

Made in Germany, 2005

Contents

Seite

Seite

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.

1.1 Description

The recent NX series brushless servomotors are characterized by their compact size and high dynamics.

Based on 10-pole design, the rotor is built with concentrated-flux Ne Fe Bo magnets.

The NX series meet the demands of the advanced servo system applications.

NX series offer torque ratings from 0.45 to 64Nm and speed up to 6000 rpm.

The 6 motor sizes are designed for 230V and 400-460VAC supplies. (NX1 only for 230V)

The characterised of the series NX3 - NX6 is the UL - certifying

1.2 Modle code

	Standard							Options			
Marking	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**	**j**	**k**
Type:	**N**	**X**	x	xx	x	x	x	x	x	x	xx

Marking	Description
a	**N** = Brushless 10 pole design
b	**X** = Axis motors with Ne Fe Bo magnets
c	Size (depends on diameter) 1 = Flange ☐ 42,5 mm 2 = Flange ☐ 56,5 mm 3 = Flange ☐ 71 mm 4 = Flange ☐ 91,5 mm 6 = Flange ☐ 121 mm 8 = Flange ☐ 158 mm
d	Construction size (depends on length) magnetic – segment - length in mm 10, 20, 30, 40, 50, 60
e	Type of winding **E** = 5 pole pair ≙ Standard V = 5 pole pair, with ventilation (only at NX860)
f	Motor Feedback **A** = 2 pole resolver ≙ Standard E = Sensor - 10pole (CR410) M = Parvex - Multiturn Sensor R = HIPERFACE® - Singelturn 128 PPR, Type SKS 36 S = HIPERFACE® - Multiturn 128 PPR, Type SKM 36 T = HIPERFACE® - Singelturn 1024 PPR, Type SRS 50 U = HIPERFACE® - Multiturn 1024 PPR, Type SRM 50 V = EnDat® - Singelturn 512 PPR, Type ECN 1113 (optical) - V2.1 W = EnDat® - Multiturn 512 PPR, Type ECN 1125 (optical) - V2.1 X = Low cost encoder 2048 PPR, 10 commutation tracks
g	Motor winding (≙ special coding) X = See motor type list
h	Varnish code **B** = Standard black (RAL 9005) R = Special unvarnished
i	Electrical - Connections 1 = Cable without screen 2 = Cable with screen 3 = Wire end ferrule without screen 4 = Wire end ferrule with screen and heat-shrinkable tube 6 = Terminal box **7** = Connector 8 = Connector and connector for forced ventilation 9 = Terminal box and connector for forced ventilation
j	Temperature monitoring / brake 0 = Grundmotor **1** = Motor with PTC monitoring (Standard) 2 = Motor with thermo switch 3 = Motor with brake 4 = Motor with brake and PTC monitoring 5 = Motor with brake and thermo switch
k	Shaft / protection 00 = Smooth shaft **01** = Shaft with key 10 = P65 protection 11 = IP65 protection, shaft with key

1.2.1 Typical Example

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

NX310EAPB7101

N	=	**Brushless 10 pole design**
X	=	**Axis motors with Ne Fe Bo magnets**
3	=	**Flange □ 71mm**
10	=	**Length = 146mm**
E	=	**5 pole pair**
A	=	**2 pole resolver**
P	=	**Motor winding**
B	=	**Standard black (RAL 9005)**
7	=	**Connectors**
1	=	**Motor with PTC monitoring**
01	=	**Shaft with key**

Description		NX 1	2	3	4	6	8	8[1)]
Degree of protection: with mating connectors	IP44	☐	☐	☐	☐	☐	☐	●
	IP64	●	●	●	●	●	●	☐
	IP65	○	○	○	○	○	○	☐
Magnetic material:	Nd Fe Bo	●	●	●	●	●	●	●
Electrical connections:	Rotatable, 90° angled for motor & resolver connections flanged sockets	☐	●	●	●	●	●	☐
	PG couplings with flying leads	☐	○	○	○	○	○	☐
	Terminal box	☐	☐	☐	☐	☐	☐	●
Thermal protection of motor:	Thermal detector PTC	●	●	●	●	●	●	●
Power:	n 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	●	●	●	●	●	●	☐
	Ventilated	☐	☐	☐	☐	☐	☐	●
Ambient temperature:	-10 … +40°C	●	●	●	●	●	●	●
Operating mode:	Continuous operation S1	●	●	●	●	●	●	●
Bearings:	Ball bearings	●	●	●	●	●	●	●
Motor shaft:	with fitting key in accordance with DIN 6885	●	●	●	●	●	●	●
Rotational accuracy:	N, in acc. with DIN ISO 2373	●	●	●	●	●	●	●
Number of pole pairs:	5	●	●	●	●	●	●	●
Motor feedback system:	2 pole resolver	●	●	●	●	●	●	●
Insulation class	F (VDE 0530) 155° C, heating 100° K	●	●	●	●	●	●	●
Varnish: (standard)	Black (RAL 9005)	●	●	●	●	●	●	●

[1)] Ventilated version
● Standard design
○ Optional
☐ Not possible

3.1 Power supply 1 x 230VAC / 3 x 230VAC

Servo motor Type		Static- torque	Static- current	Rated- torque	Rated- speed	Rated- current	Rated- power	Max. Static torque	Moment of intertia without brake	Moment of intertia with brake
-		M_0 [Nm]	I_0 [A]	M_N [Nm]	n_N [min^{-1}]	I_{N310} [A]	P_N [kW]	M_{0max} [Nm]	J_M [kgcm²]	J_M [kgcm²]
NX110 E..P..		0,45	0,99	0,33	6000	0,79	0,21	1,72	0,136	0,152
NX205 E..V..		0,45	0,97	0,37	5000	0,84	0,19	2,00	0,240	0,301
NX205 E..S..		0,45	1,34	0,29	7500	0,95	0,23	2,00	0,240	0,301
NX210 E..T..		1,00	1,33	0,80	4000	1,11	0,33	3,40	0,404	0,471
NX210 E..P..		1,00	1,99	0,61	6000	1,32	0,39	3,40	0,404	0,471
NX310 E..P..		2,00	1,41	1,85	2300	1,33	0,45	6,60	0,184	0,882
NX310 E..K..		2,00	2,47	1,68	4000	2,14	0,71	6,60	0,184	0,882
NX420 E..P..		4,00	2,82	3,78	2300	2,69	0,91	13,40	2,920	3,100
NX420 E..J..		4,00	4,88	3,38	4000	4,18	1,42	13,40	2,920	3,100
NX430 E..L..		5,50	3,78	5,04	2300	3,49	1,21	18,80	4,280	4,460
NX430 E..J..		5,50	5,24	4,68	3200	4,52	1,57	18,80	4,280	4,460
NX430 E..F..		5,50	6,64	4,29	4000	5,28	1,80	18,80	4,280	4,460
NX620 E..R..		8,00	5,31	7,42	2200	4,99	1,71	26,70	9,820	10,360
NX620 E..J..		8,00	9,89	6,08	4000	7,82	2,55	26,70	9,820	10,360
NX630 E..R..		12,00	5,65	11,50	1450	5,47	1,75	40,00	14,700	15,240
NX630 E..N..		12,00	8,54	10,80	2300	7,79	2,60	40,00	14,700	15,240
NX630 E..K..		12,00	10,60	10,20	2800	9,22	2,99	40,00	14,700	15,240
NX630 E..G..		12,00	15,00	8,31	4000	10,90	3,48	40,00	14,700	15,240
NX820 E..R..		16,00	11,00	14,50	2200	10,00	3,34	50,00	32,000	37,560
NX820 E..L..		16,00	17,60	13,20	3600	14,80	4,99	50,00	32,000	37,560
NX840 E..Q..		28,00	10,10	25,50	1200	9,27	3,21	92,00	62,000	37,560
NX840 E..J..		28,00	18,90	22,90	2200	15,70	5,27	92,00	62,000	37,560
NX860 E..J..		41,00	18,60	35,60	1450	16,30	5,40	137,00	92,000	97,560
NX860 E..D..		41,00	33,00	27,50	2600	22,70	7,48	137,00	92,000	97,560
NX860 V..J..	*	64,00	29,40	57,60	1450	26,40	8,74	137,00	92,000	97,560
NX860 V..G..	*	64,00	39,20	54,40	2000	33,30	11,40	137,00	92,000	97,560

* Motor with ventilation and Terminal box

3.2 Power supply 1 x 400VAC

Servo motor Type		Static- torque	Static- current	Static- torque	Static- brake	Static- brake	Static- power	Max. Static torque	Moment of intertia without brake	Moment of intertia with brake
-		M_0 [Nm]	I_0 [A]	M_N [Nm]	n_N [min^{-1}]	I_{N565} [A]	P_N [kW]	M_{0max} [Nm]	J_M [kgcm²]	J_M [kgcm²]
NX205 E..V..		0,45	0,97	0,29	7500	0,69	0,23	2,00	0,240	0,301
NX205 E..S..		0,45	1,34	0,23	8900	0,79	0,21	2,00	0,240	0,301
NX210 E..T..		1,00	1,33	0,61	6000	0,89	0,39	3,40	0,404	0,471
NX310 E..P..		2,00	1,41	1,68	4000	1,22	0,71	6,60	0,814	0,882
NX420 E..V..		4,00	1,41	3,83	2000	1,36	0,80	13,40	2,920	3,100
NX420 E..P..		4,00	2,82	3,38	4000	2,42	1,42	13,40	2,920	3,100
NX430 E..V..		5,50	1,41	5,38	1000	1,38	0,56	18,80	4,280	4,460
NX430 E..P..		5,50	2,82	4,77	3000	2,48	1,50	18,80	4,280	4,460
NX430 E..L..		5,50	3,78	4,29	4000	3,01	1,80	18,80	4,280	4,460
NX620 E..V..		8,00	2,83	7,52	2000	2,69	1,57	26,70	9,820	10,360
NX620 E..R..		8,00	5,31	6,17	3900	4,25	2,52	26,70	9,820	10,360
NX630 E..V..		12,00	2,83	11,60	1350	2,75	1,64	40,00	14,700	15,240
NX630 E..R..		12,00	5,65	10,30	2700	4,96	2,92	40,00	14,700	15,240
NX630 E..N..		12,00	8,54	8,31	4000	6,18	3,48	40,00	14,700	15,240
NX820 E..X..		16,00	5,16	14,70	1900	4,79	2,93	50,00	32,000	37,560
NX820 E..R..		16,00	11,00	12,90	3900	9,07	5,29	50,00	32,000	37,560
NX840 E..Q..		28,00	10,10	23,20	2100	8,47	5,15	92,00	62,000	67,560
NX840 E..K..		28,00	16,80	18,60	3500	11,50	6,80	92,00	62,000	67,560
NX860 E..J..		41,00	18,60	27,50	2600	12,80	7,48	137,00	92,000	97,560
NX860 V..G..	*	64,00	29,40	50,50	2600	23,20	13,80	137,00	92,000	97,560

* Motor with ventilation and Terminal box

Power supply 1 x 230VAC / 3 x 230VAC

Servo motor Type		Mass	Motor- resistance	Motor- inductance	Therminal time constant with I_N	Therminal time constant with I_{max}	Torque- constant	E.M.F Constant eff.
		M [kg]	Rph/ph [Ω]	Lph/ph [mH]	Tth_N [min]	Tth_{max} [s]	KT [Nm/A]	KE [V/1000 min^{-1}]
NX110 E..P..		0,85	22,00	26,50	11,0	25,4	0,46	30,5
NX205 E..V..		1,00	17,60	46,40	8,5	58,2	4,47	30,2
NX205 E..X..		1,00	8,89	24,3	8,5	60,3	0,34	21,9
NX210 E..T..		1,30	16,30	56,00	20,0	44,9	0,75	48,6
NX210 E..P..		1,30	7,74	25,20	20,0	42,7	0,50	32,6
NX310 E..P..		2,10	20,70	62,00	20,0	60,2	1,42	88,9
NX310 E..K..		2,10	6,58	20,30	20,0	62,1	0,81	50,9
NX420 E..P..		3,80	7,44	33,00	12,0	73,5	1,42	89,0
NX420 E..J..		3,80	2,39	11,00	12,0	76,2	0,82	51,4
NX430 E..L..		4,80	4,53	21,00	18,0	81,7	1,45	90,9
NX430 E..J..		4,80	2,33	10,90	18,0	82,6	1,05	65,5
NX430 E..F..		4,80	1,48	6,80	18,0	81,1	0,83	51,8
NX620 E..R..		7,00	2,24	19,20	27,0	137,0	1,51	95,7
NX620 E..J..		7,00	0,60	5,52	27,0	146,0	0,81	51,3
NX630 E..R..		8,90	2,43	24,90	33,0	158,0	2,12	135,0
NX630 E..N..		8,90	1,12	10,90	33,0	150,0	1,41	89,3
NX630 E..K..		8,90	0,67	7,06	33,0	161,0	1,13	71,8
NX630 E..G..		8,90	0,34	3,53	33,0	160,0	0,80	50,8
NX820 E..R..		13,00	1,01	8,57	34,0	135,0	1,46	91,0
NX820 E..L..		13,00	0,38	3,35	34,0	141,0	0,91	56,9
NX840 E..Q..		20,00	1,36	15,10	52,0	184,0	2,78	173,0
NX840 E..J..		20,00	0,37	4,28	52,0	192,0	1,48	92,2
NX860 E..J..		27,00	0,50	6,43	60,0	206,0	2,21	138,0
NX860 E..D..		27,00	0,16	2,03	60,0	209,0	1,24	77,8
NX860 V..J..	*	31,00	0,50	6,43	22,0	81,0	2,18	138,0
NX860 V..G..	*	31,00	0,29	3,61	22,0	78,0	1,63	104,0

* Motor with ventilation and Terminal box

$KT \approx KT_0 \approx KT_N$

Power supply 1 x 400VAC

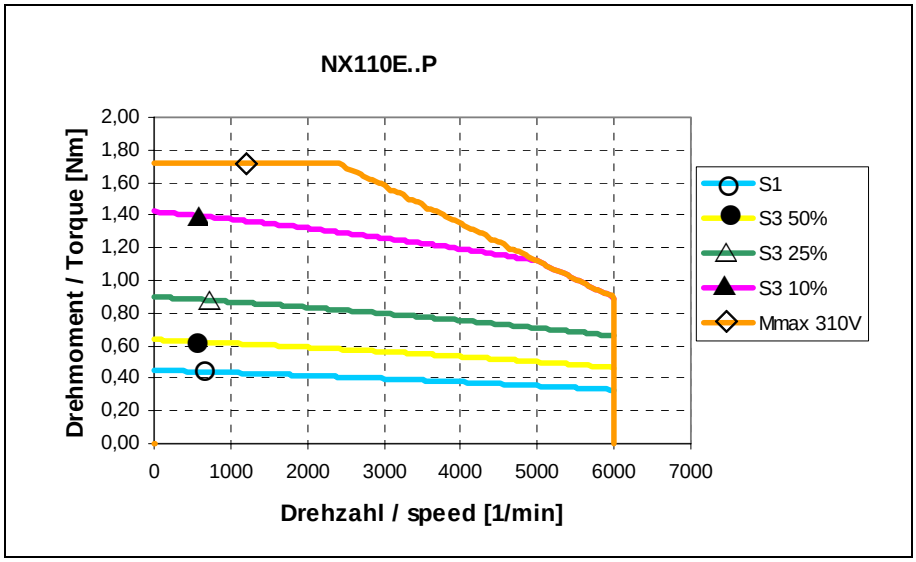
Servo motor Type		Mass	Motor- resistance	Motor- inductance	Therminal time constant with I_N	Therminal time constant with I_{max}	Torque- constant	E.M.F Constant eff.
		M [kg]	Rph/ph [Ω]	Lph/ph [mH]	Tth_N [min]	Tth_{max} [s]	KT [Nm/A]	KE [V/1000 min^{-1}]
NX205 E..V..		1,00	17,60	46,40	8,5	58,2	4,47	30,2
NX205 E..S..		1,00	8,89	24,3	8,5	60,3	0,34	21,9
NX210 E..T..		1,30	16,30	56,00	20	44,9	0,75	48,6
NX310 E..P..		2,10	20,70	62,00	20	60,2	1,42	88,9
NX420 E..V..		3,80	29,40	131,00	12	73,8	2,83	177,0
NX420 E..P..		3,80	7,44	33,00	12,0	73,5	1,42	89,0
NX430 E..V..		4,80	31,10	151,00	18	85,7	3,90	244,0
NX430 E..P..		4,80	7,78	37,80	18	85,6	1,95	122,0
NX430 E..L..		4,80	4,53	21,00	18,0	81,7	1,45	90,9
NX620 E..V..		7,00	7,90	67,60	27	137,0	2,83	180,0
NX620 E..R..		8,90	2,43	24,90	33,0	158,0	2,12	135,0
NX630 E..V..		8,90	9,19	99,60	33	167,0	4,24	270,0
NX630 E..R..		8,90	2,43	24,90	33,0	158,0	2,12	135,0
NX630 E..N..		8,90	1,12	10,90	33,0	150,0	1,41	89,3
NX820 E..X..		13,00	4,53	38,70	34	137,0	3,10	193,0
NX820 E..R..		13,00	1,01	8,57	34,0	135,0	1,46	91,0
NX840 E..Q..		20,00	1,36	15,10	52,0	184,0	2,78	173,0
NX840 E..K..		20,00	0,49	5,42	52	183,0	1,67	104,0
NX860 E..J..		31,00	0,50	6,43	22,0	81,0	2,18	138,0
NX860 V..G..	*	31,00	0,29	3,61	22,0	78,0	1,63	104,0

* Motor with ventilation and Terminal box

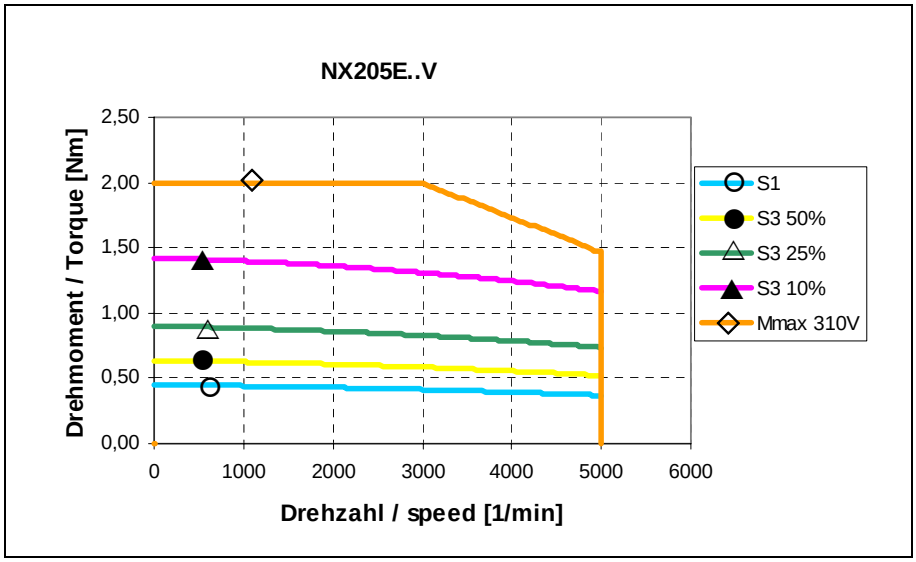
$KT \approx KT_0 \approx KT_N$

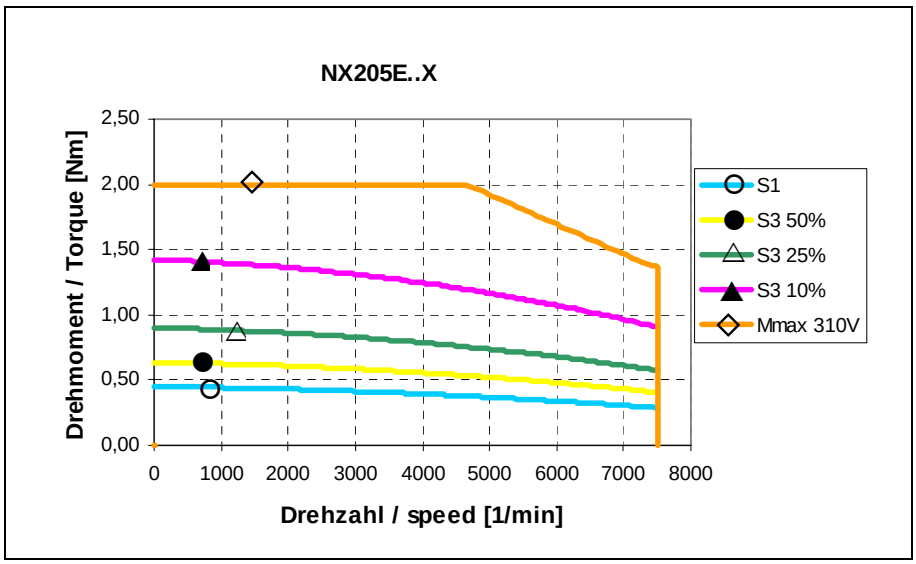
3.3 Torque/Speed Diagrams

3.3.1 Motor size 1



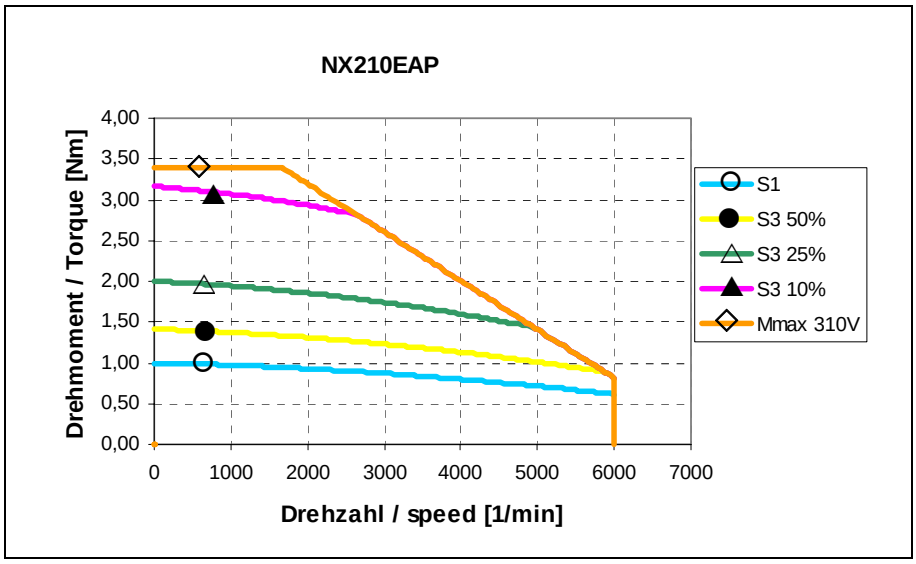
3.3.2 Motor size 2

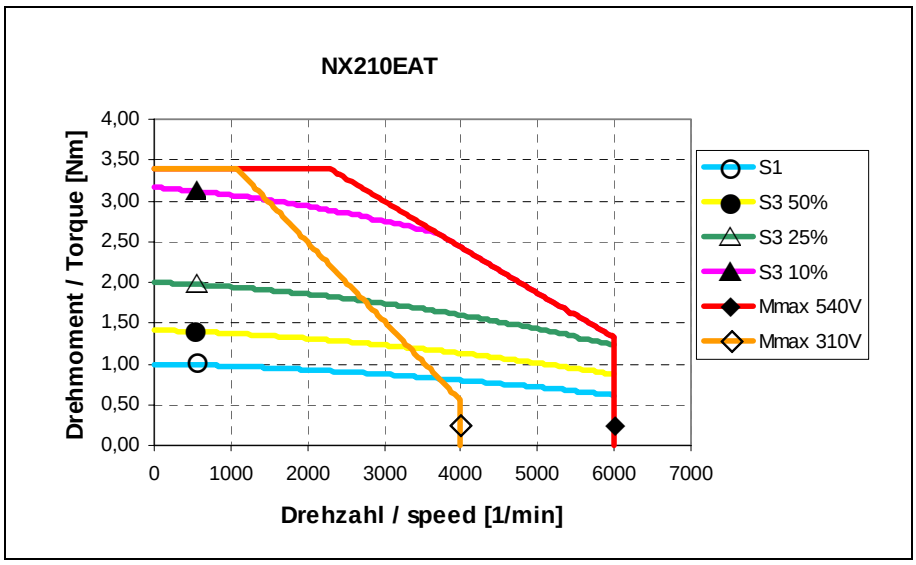




Torque/Speed Diagrams

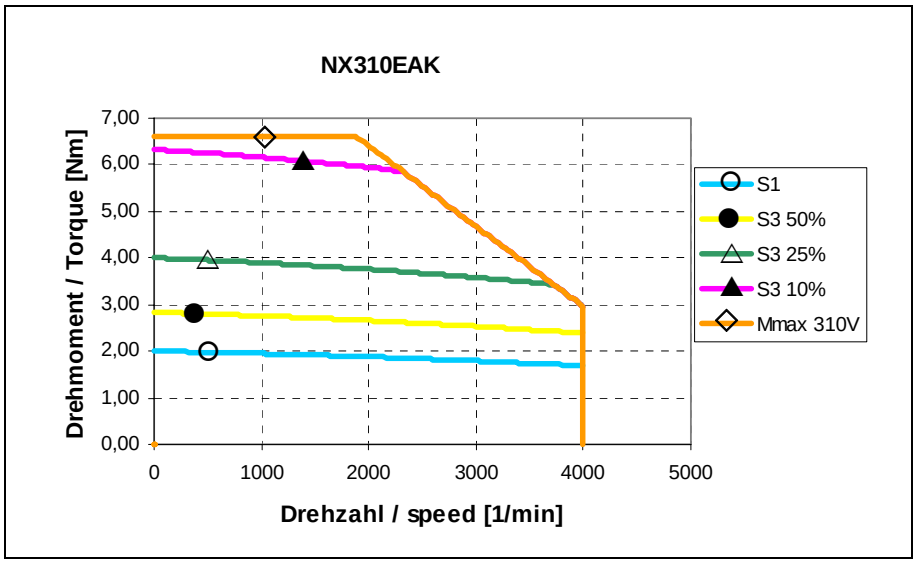
Motor size 2

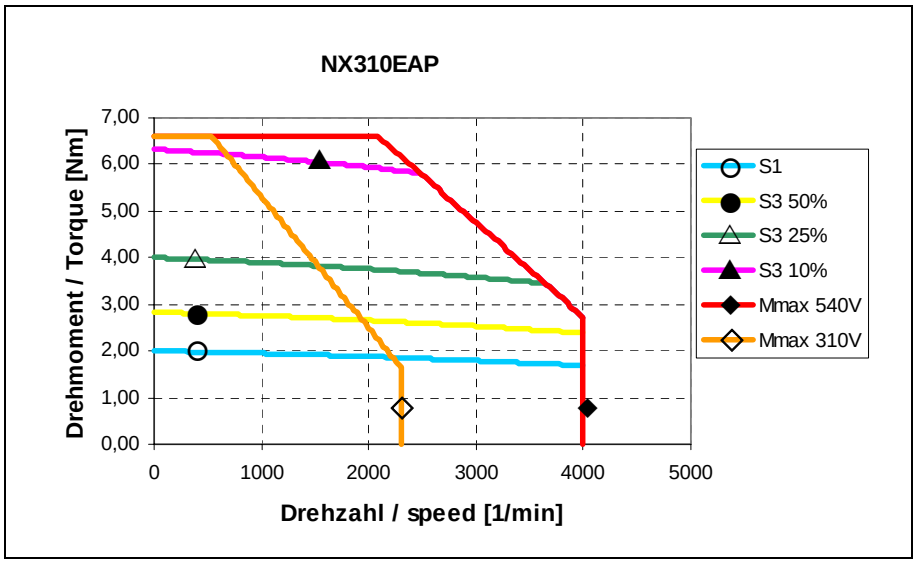




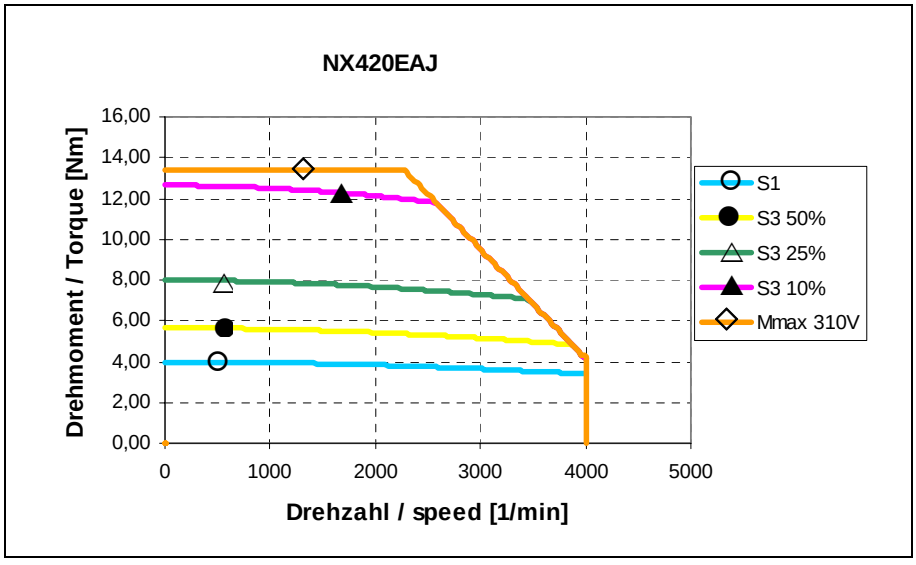
Torque/Speed Diagrams

3.3.3 Motor size 3



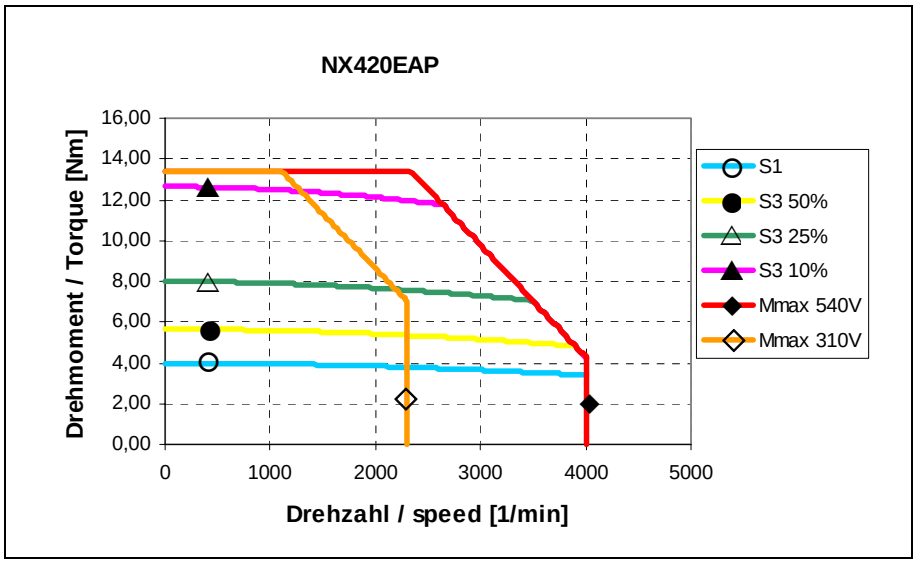


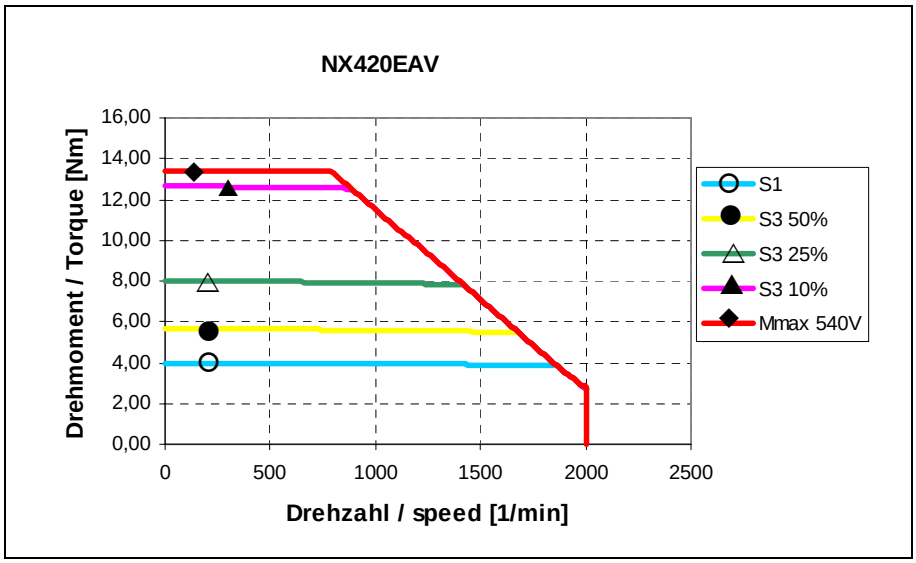
3.3.4 Motor size 4

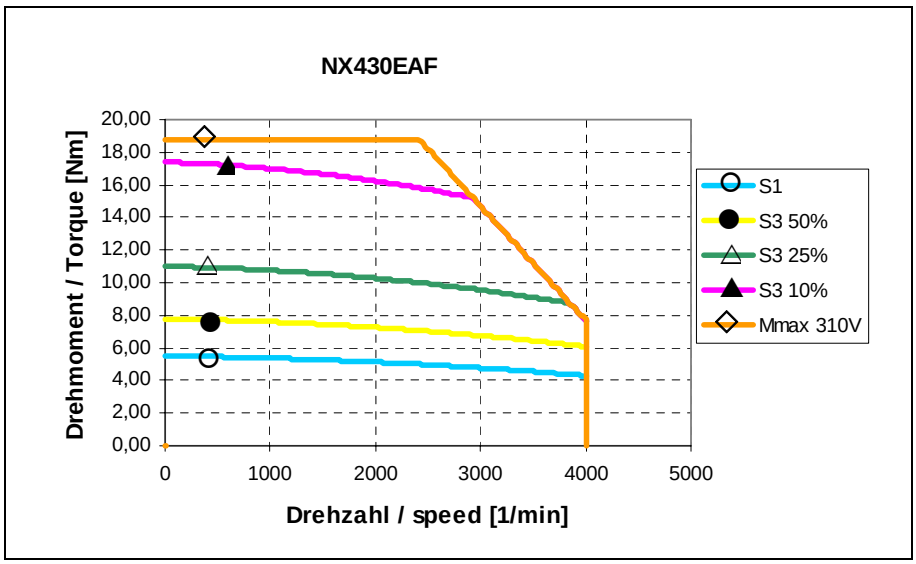


Torque/Speed Diagrams

Motor size 4

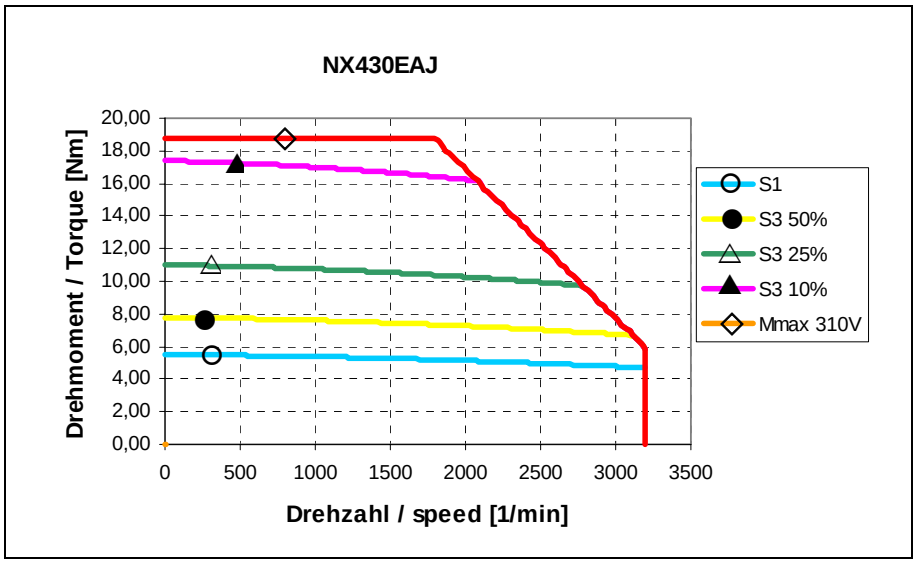


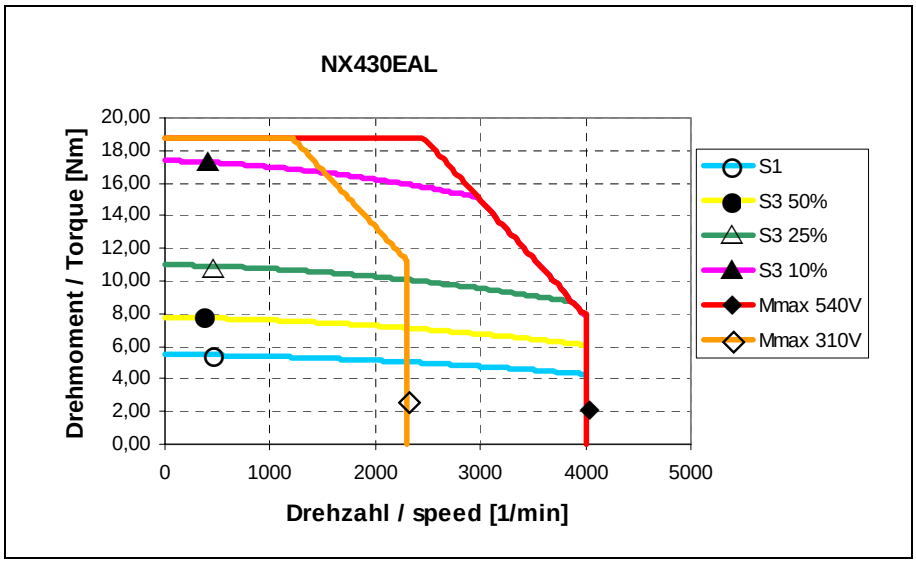


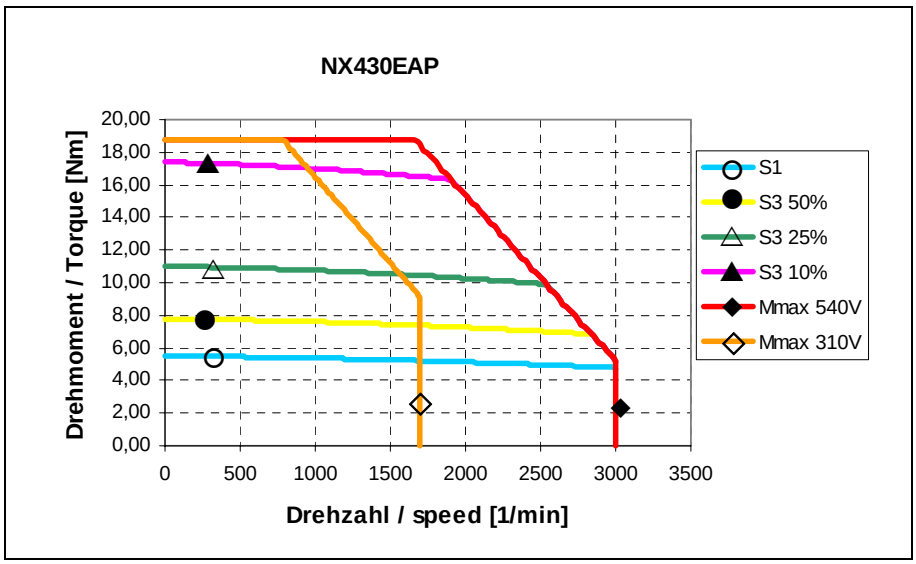


Torque/Speed Diagrams

Motor size 4

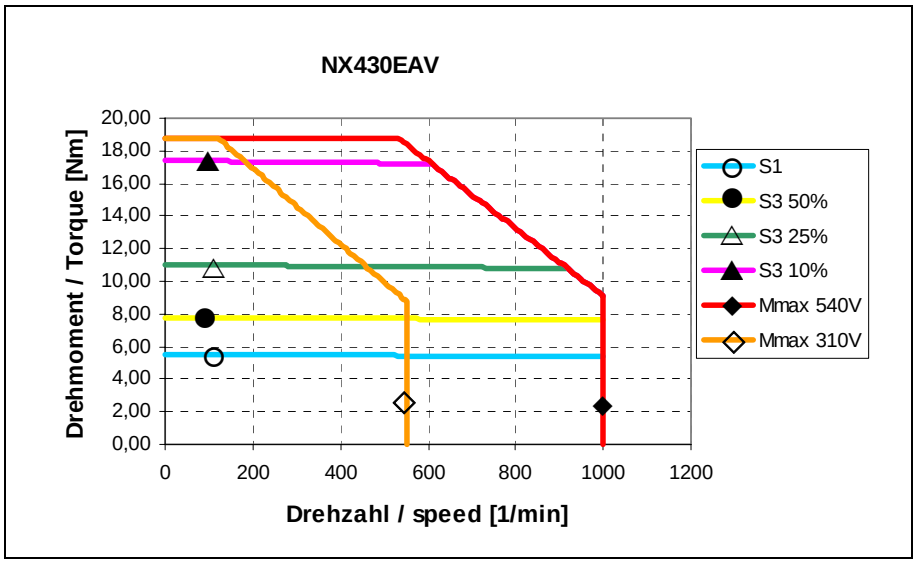




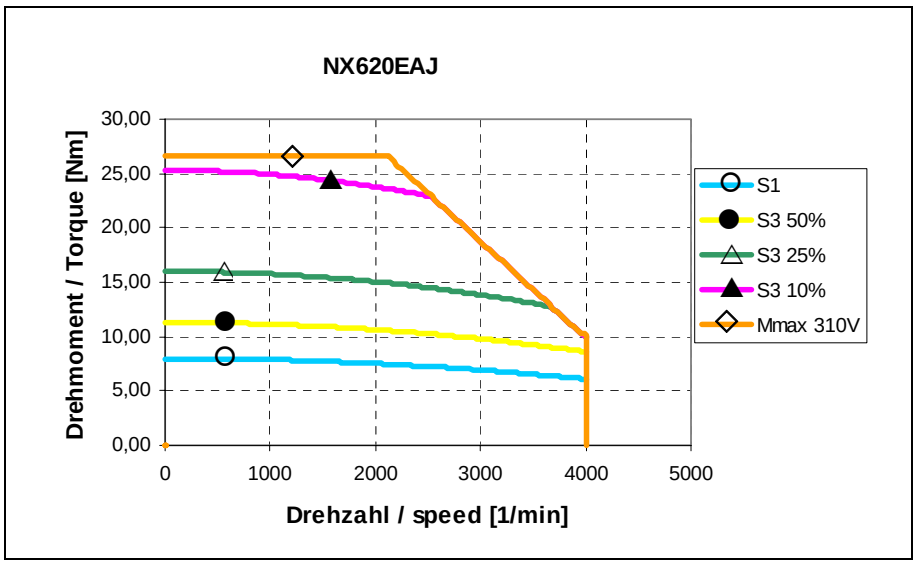


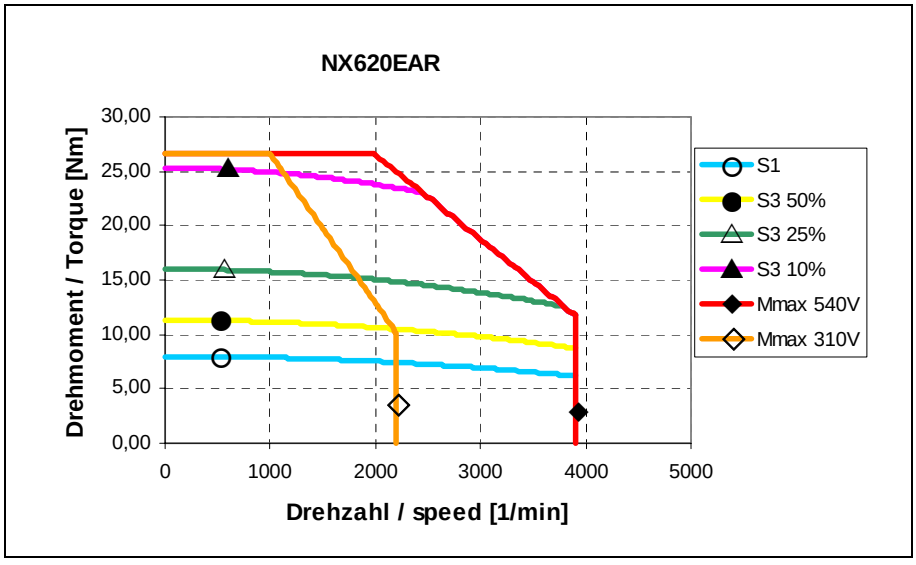
Torque/Speed Diagrams

Motor size 4



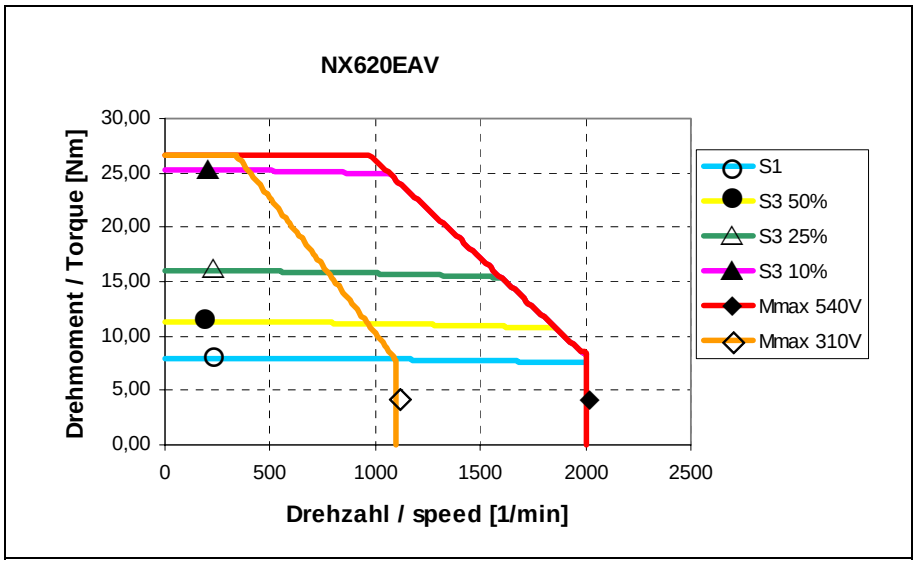
3.3.5 Motor size 6

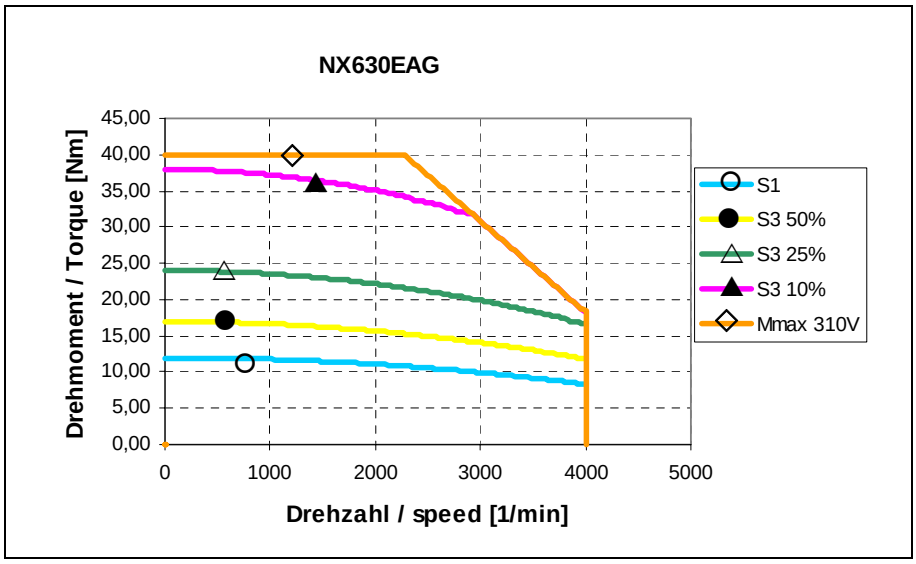


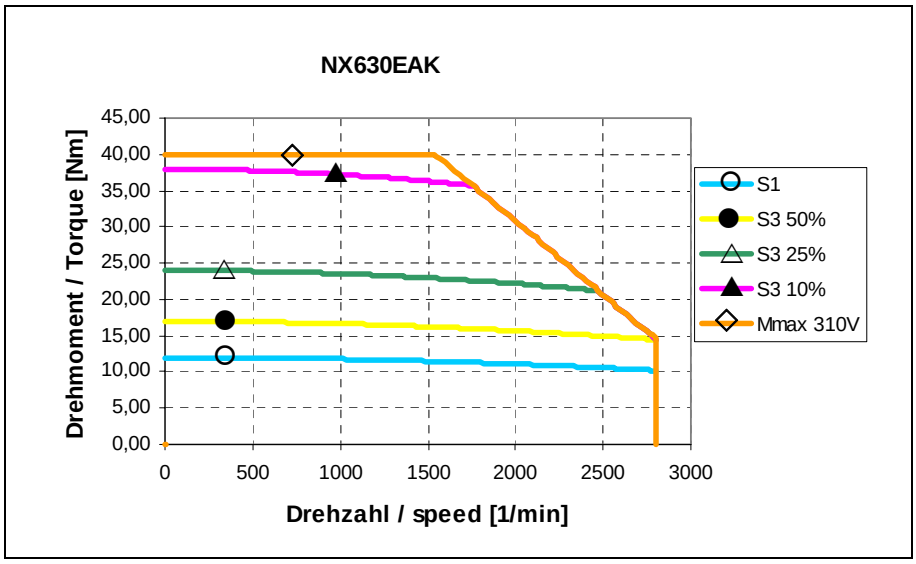


Torque/Speed Diagrams

Motor size 6

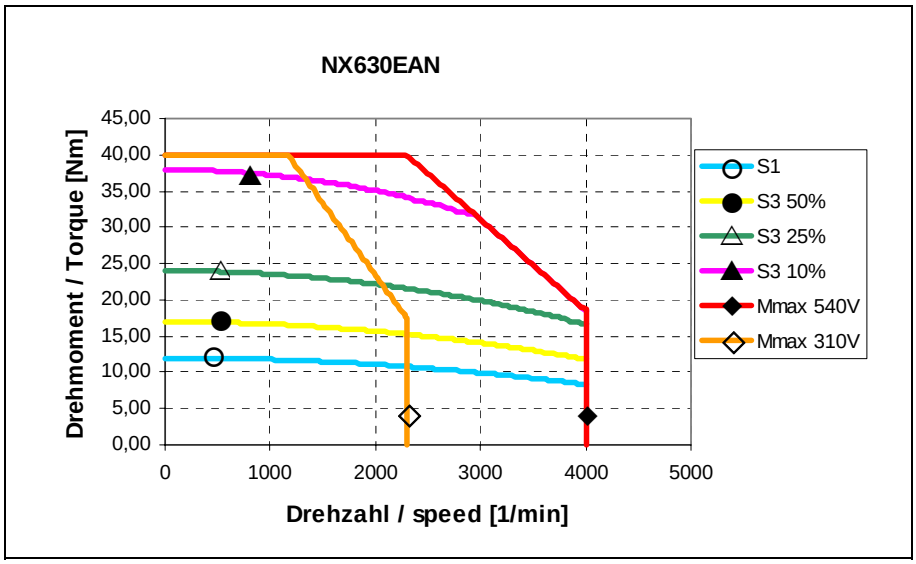


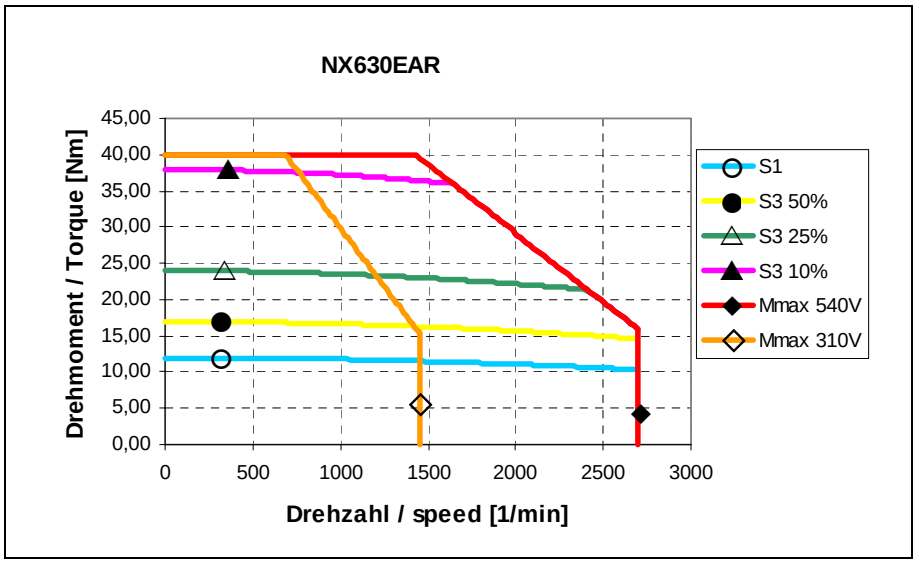


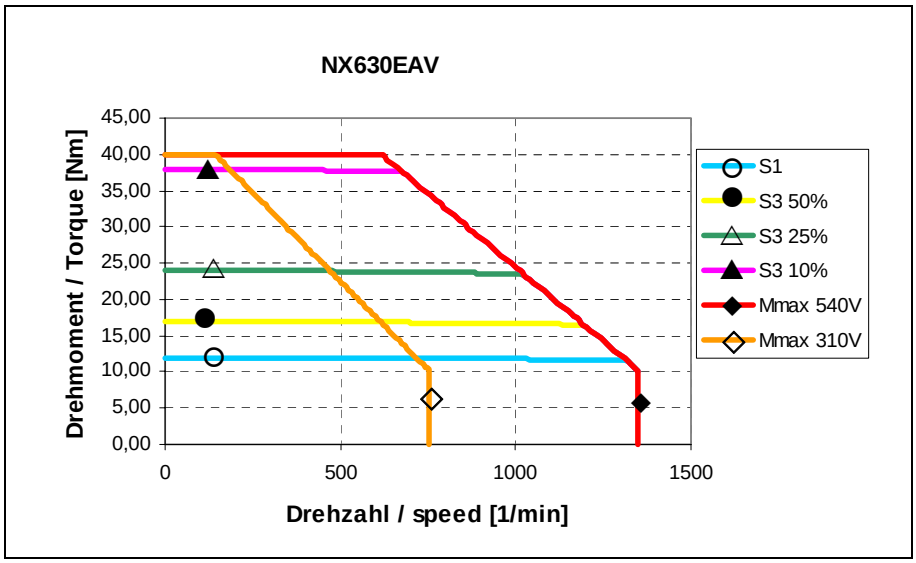


Torque/Speed Diagrams

Motor size 6

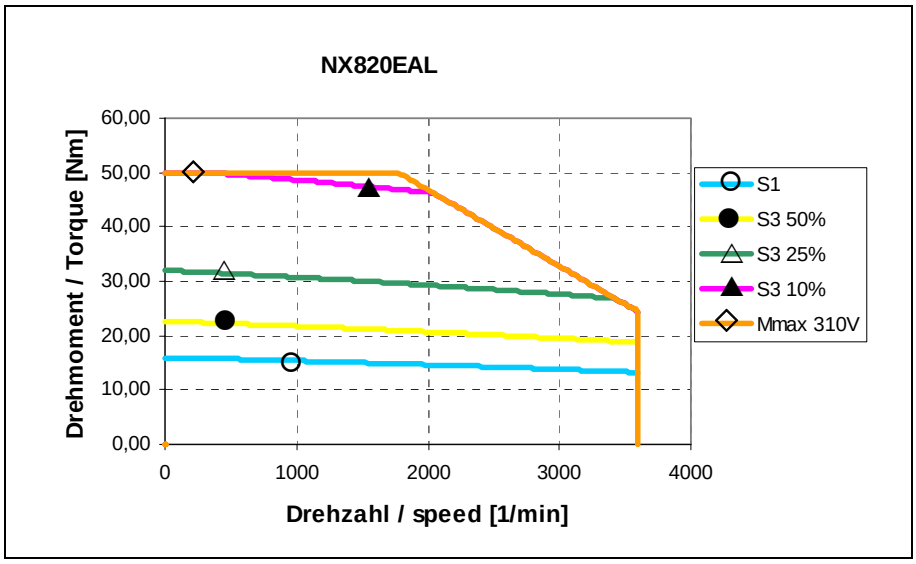


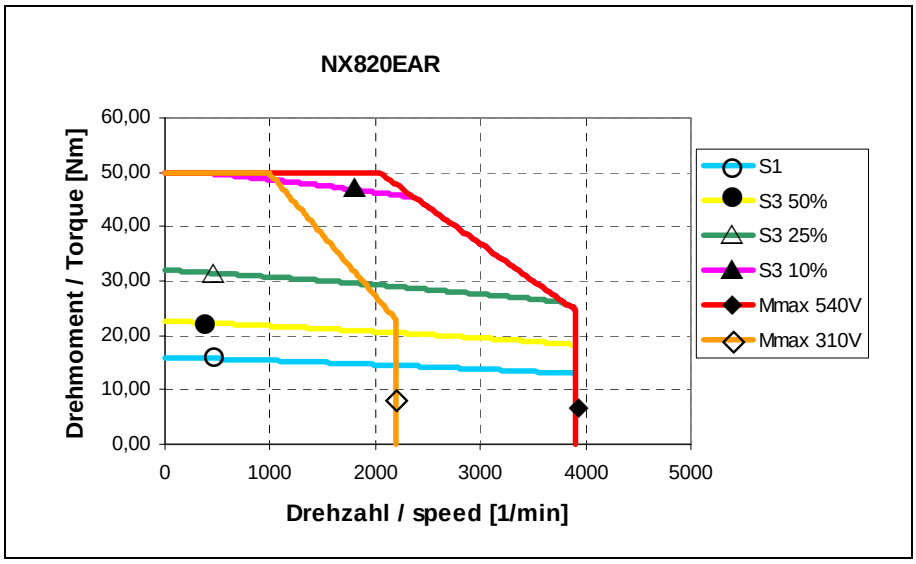


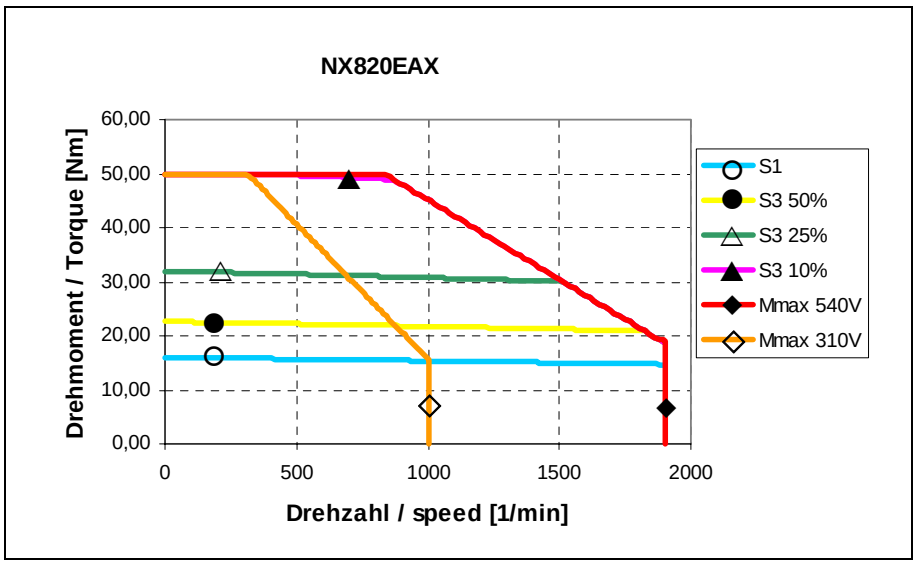


Torque/Speed Diagrams

3.3.6 Motor size 8

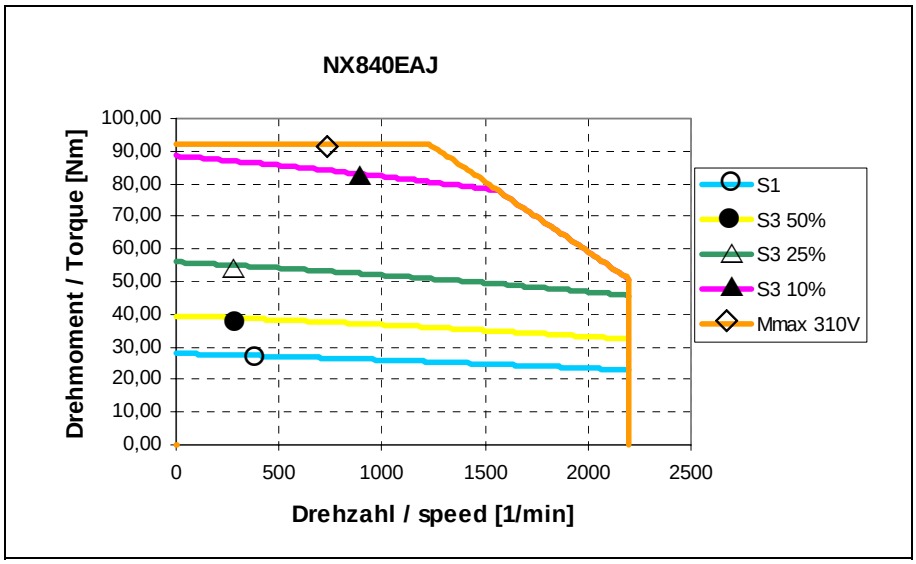


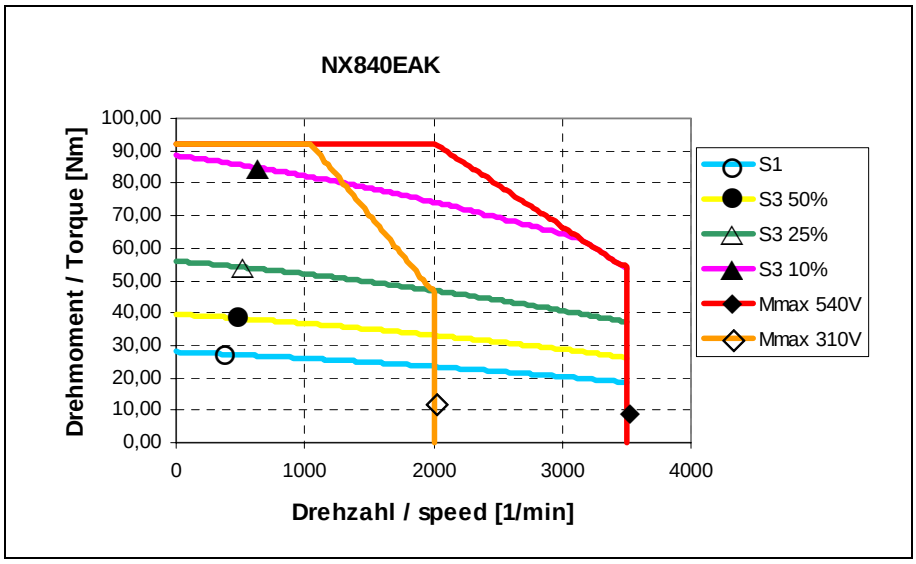


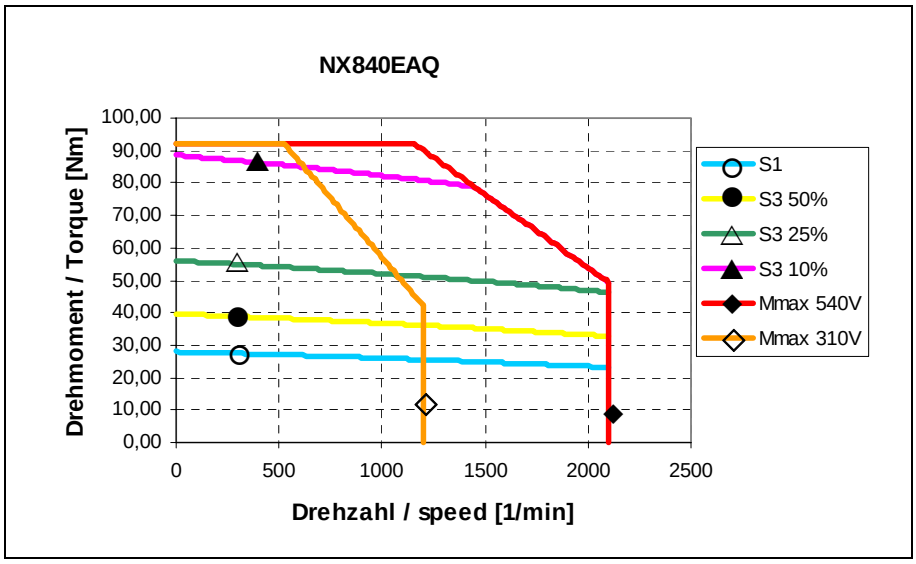


Torque/Speed Diagrams

Motor size 8

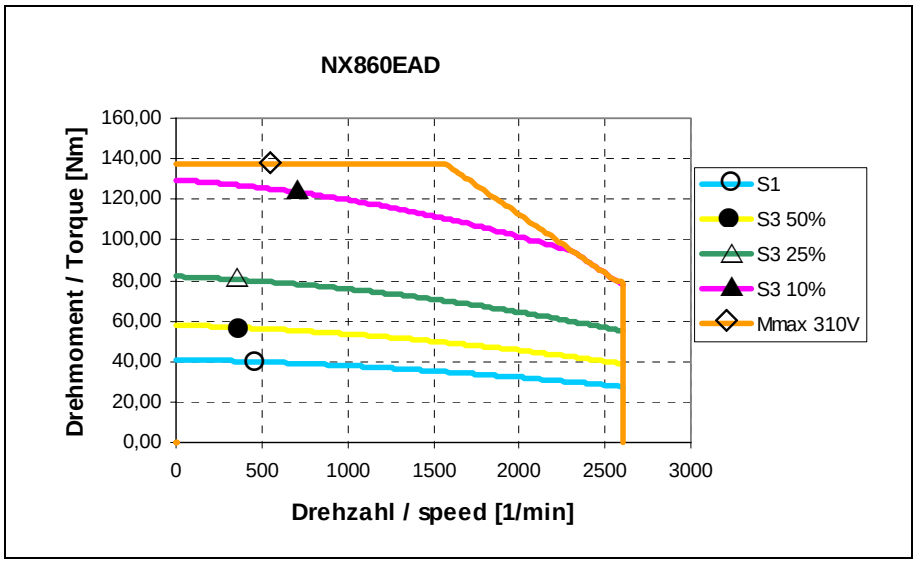


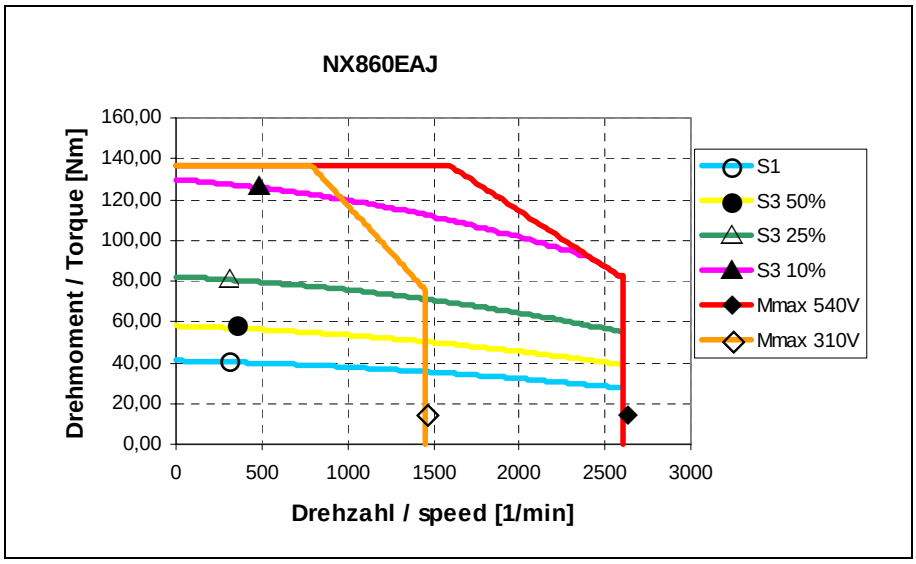




Torque/Speed Diagrams

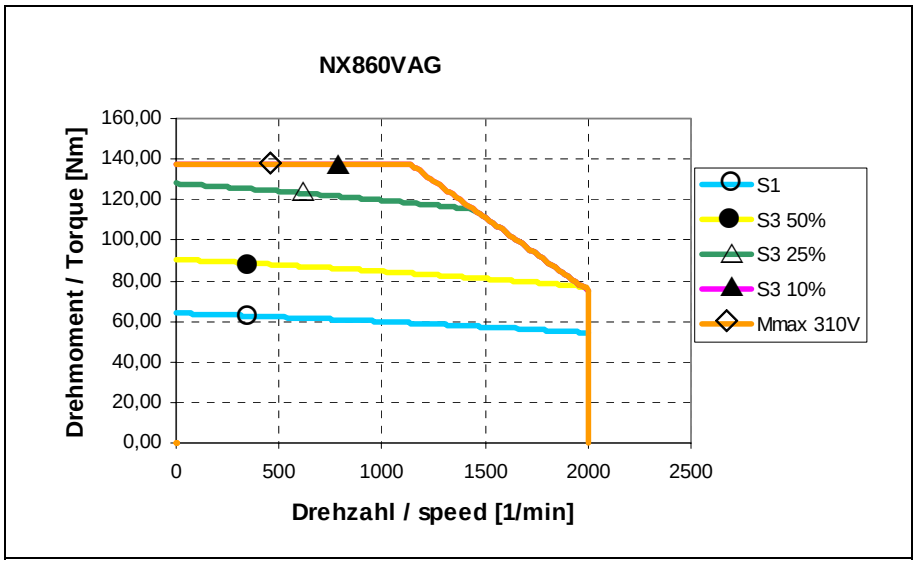
Motor size 8

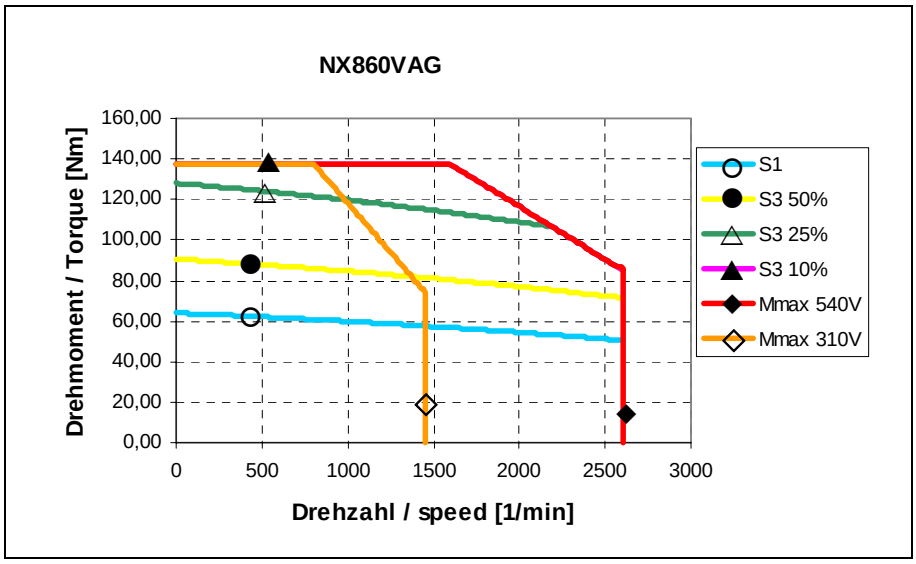




Torque/Speed Diagrams

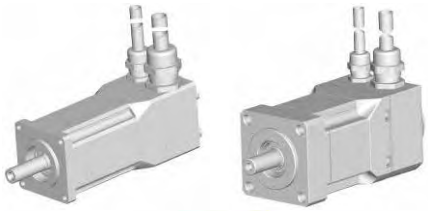
3.3.6.1 Motor size 8 with ventilation

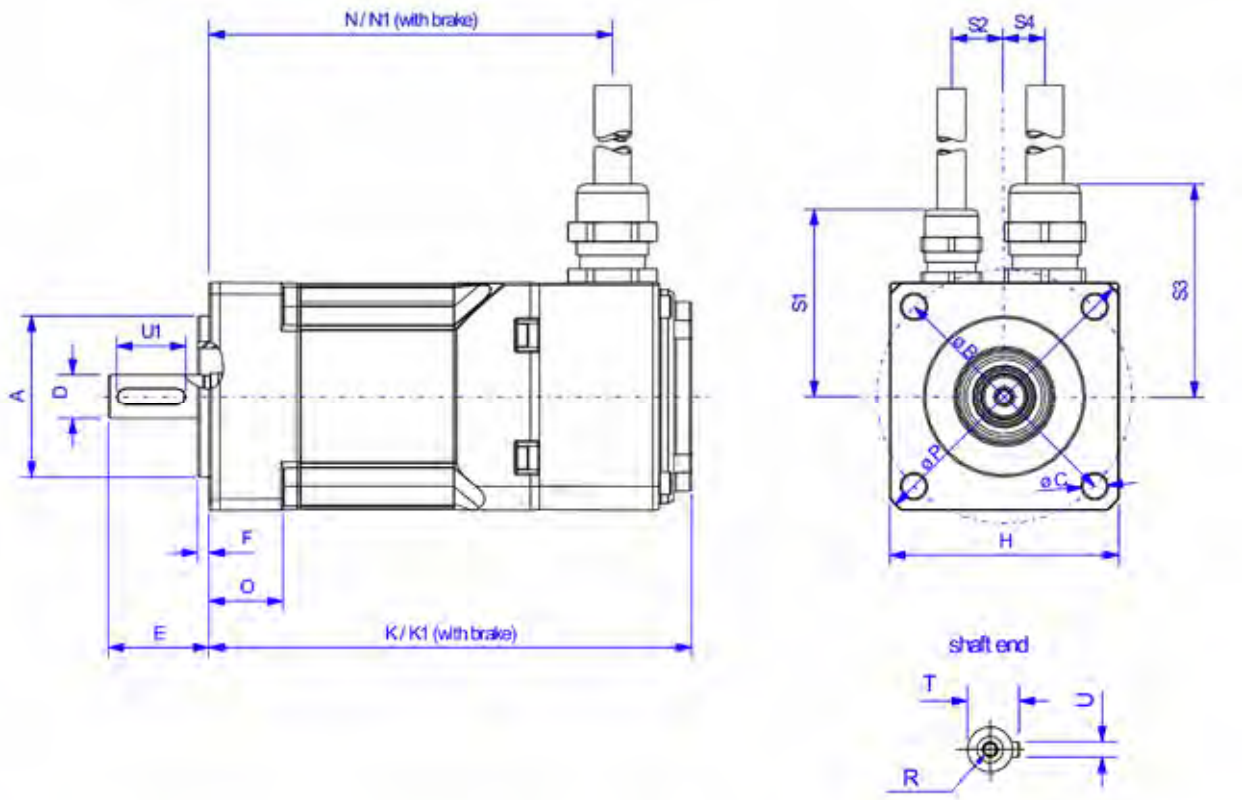




4.1 Design with wire end ferrule, motor size NX1 and NX2

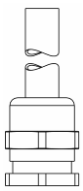
NX110 NX205 / NX210





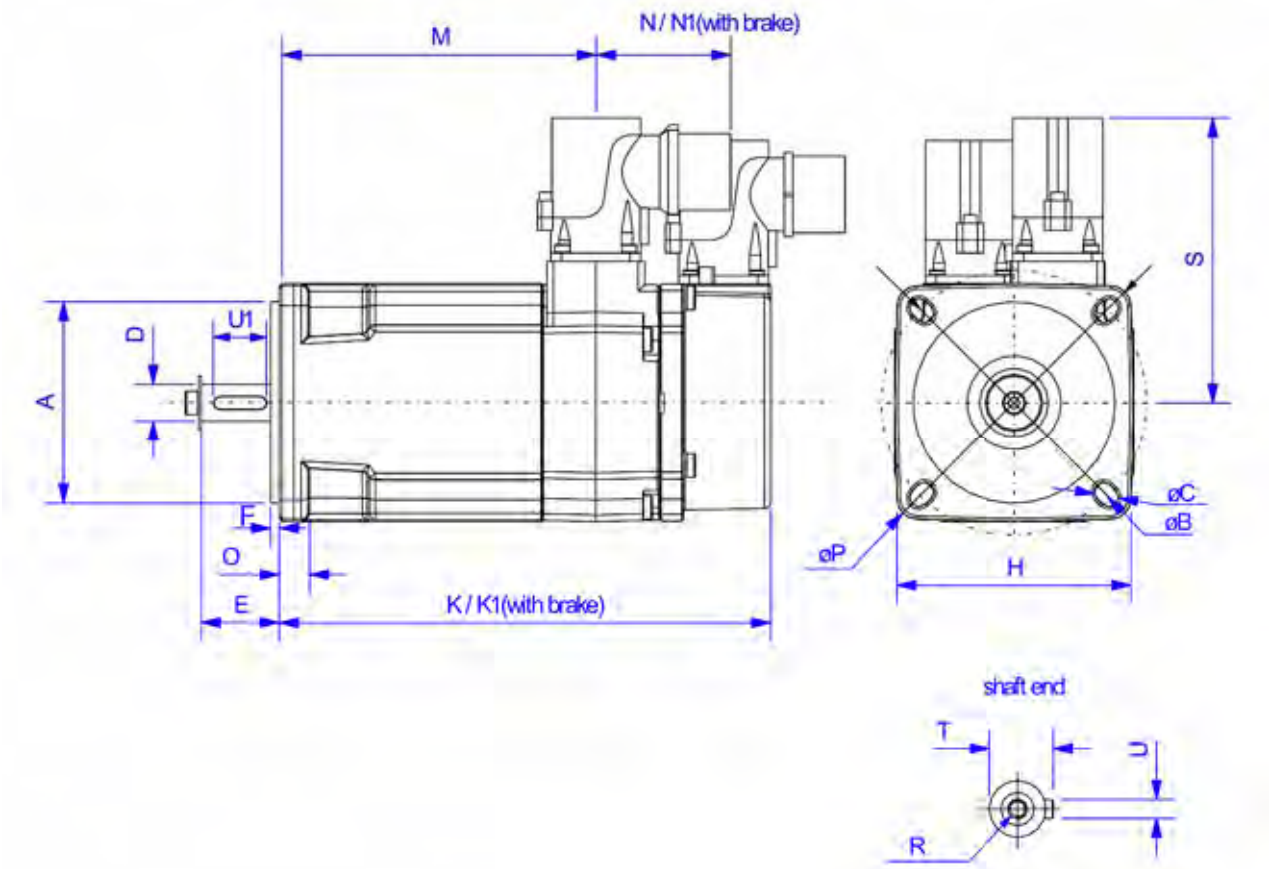
Type	A j6	B	C	D j6	E ±0,6	F	H	K	K1	N	N1	O	P	R	S1	S2	S3	S4	T	U h9	U1
NX110	30	50	3,2	9	25	2,5	42,5	110	141	90	121	6	57,5	M3x9	40	10	46	10	10,2	3	16
NX205	40	63	5,5	11	25	2,5	56,5	100	137	80	118	18	76	M4x10	47	13	53	10	12,5	4	16
NX210	40	63	5,5	11	25	2,5	56,5	122	157	100	138	18	76	M4x10	47	13	53	10	12,5	4	16

Connector assignment:

Power - connection	Function	Colour coding	core cross-section
	brake +	green / red	2 x 0,5mm²
	brake -	green / blue	
	M1 (U)	black	4 x 0,5mm²
	M2 (V)	white	
	M3 (W)	red	
	ground	yellow / green	
	screen	-	-

Resolver - connection	Function	Colour coding	core cross-section
	carrier +	red/ white	6 x 0,08mm²
	carrier -	black / white	
	Cos +	black	
	Cos -	red	
	Sin +	yellow	
	Sin -	blue	
	screen	-	-

4.2 Design with connectors, motor size NX2, NX3, NX4, NX6 and NX8

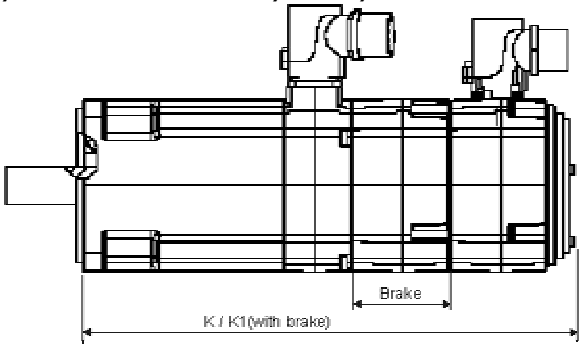


Type	A j6	B	C	D j6	E ±0,6	F	H	K	K1	M	N	N1	O	P	R	S	T	U h9	U1
NX205	40	63	5,5	11	25	2,5	56,5	100	137	78	0	35	18	76	M4x10	71	12,5	4	16
NX210	40	63	5,5	11	25	2,5	56,5	122	157	98	0	35	18	76	M4x10	71	12,5	4	16
NX310	60	75-80	5,5	11	23	2,5	71	146	194	94	38	86	8,5	94	M4x10	84	12,5	4	16
NX420	80	100	7	19	40	3	91,5	175	226	120	40	91	10,5	118	M6x16	94	21,5	6	32
NX430	80	100	7	19	40	3	91,5	200	251	145	40	91	10,5	118	M6x16	94	21,5	6	32
NX620	110	130	9	24	50	3,5	121	181	236	130	37	91	11	152	M8x20	109	27	8	40
NX630	110	130	9	24	50	3,5	121	210	265	159	37	91	11	152	M8x20	109	27	8	40
NX820	130	165	12	32	58	3,5	158	200	266	134	51	117	12	200	M12x28	120	35	10	50
NX840	130	165	12	32	58	3,5	158	260	326	194	51	117	12	200	M12x28	120	35	10	50
NX860	130	165	12	32	58	3,5	158	320	386	254	51	117	12	200	M12x28	120	35	10	50

all dimension in “mm”

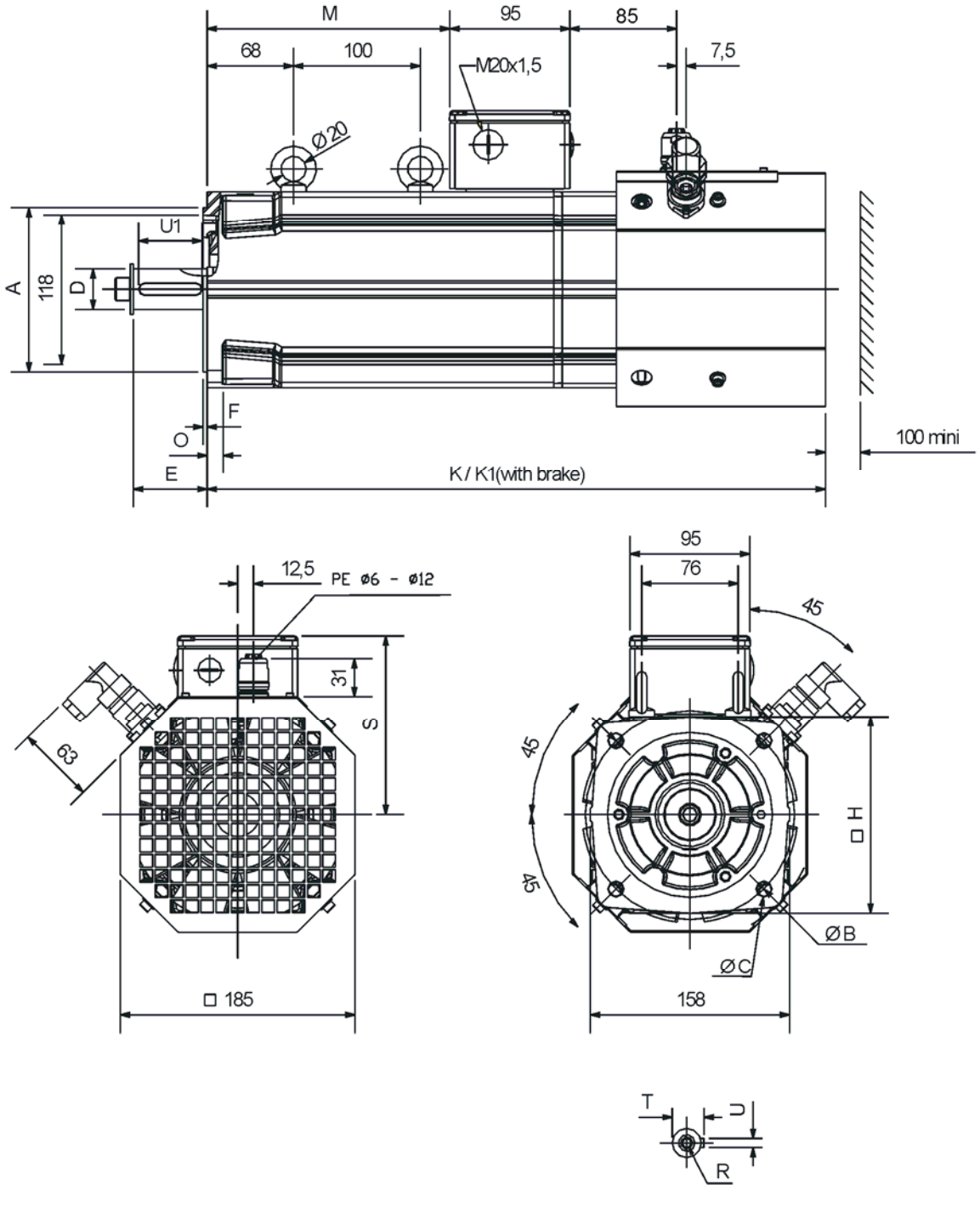
4.2.1 Design with HIPERFACE®, motor size NX3, NX4, NX6 and NX8

Type	K	K1
NX310	173	199
NX420	205	256
NX430	230	281
NX620	214	268
NX630	243	297
NX820	236	282
NX840	296	342
NX860	356	402



other dimensions unchanged to standard design without HIPERFACE®

4.2.2 Design with terminal box and ventilation, motor size NX8



Type	A j6	B	C	D k6	E ±0,6	F	H	K	K1	M	N	O	P	R	S	T	U h9	U1
NX860V	130	165	12	32	58	3,5	155	424	490	254	117	12	200	M12x28	142	35	10	50

all dimensions in “mm”

5.1 Connector NX2 .. NX6 with resolver

Power connector

motor side

SSD Parvex - motor size 2...6

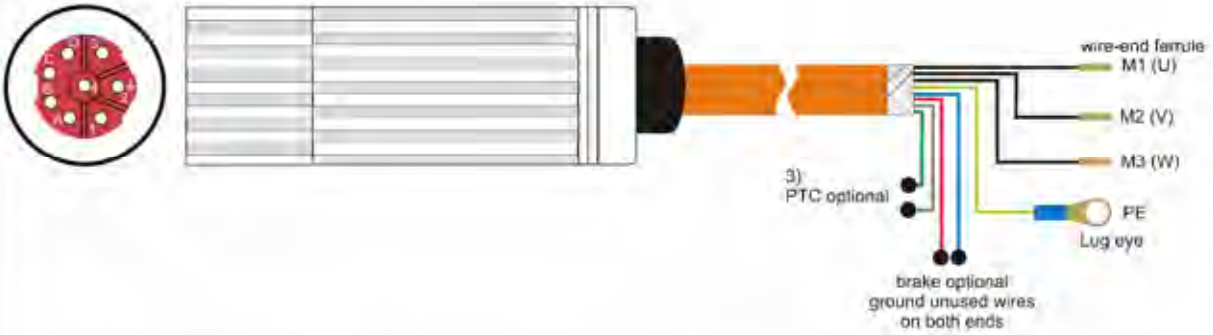
Type: NX ...

regulator side

SSD Drives - Servo drives

Type: 631/635 and 637/637+/637f
in the compact enclosure

view solder / crimp connector - side



S MB GM2nRn BG0/3-C ST.0100.3001		KMBT BG0/2-O-K-ULCSA KA.0003.6305			wire-end ferrule
PIN - Nr.		colour	function		-
1		black 1	motor connection		M1 (U)
2	1)	yellow / green	ground connection		PE
3		black 3	motor connection		M3 (W)
4		black 2	motor connection		M2 (V)
A		red	brake +24V DC	2)	connection not on terminal
B		blue	brake 0V DC		
C		brown	temperature	3)	not use at the moment
D		green	temperature		
case	1)				case

1)
The screen is connected at the connector pin and also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV). Otherwise the insulation class of the drive becomes reduced or the use of an additional galvanic seperation is required

						Maßstab / scale:	
						Typ / type: KK MBT NX 3/6.K-xx.x/O	
				Bear.	03.02.04	DL	Bezeichnung / designation: Orange motor cable (compact enclosure) for SSD Parvex standard motors and servo drives from SSD Drives
				Gep.	05.02.04	EH	
				Norm			
02	size 2	04.11.04	DL				Zeichnungsnummer / drawing No: Z-MK-6920-xxxx — Blatt sheet 1
01	con. marking	02.06.04	DL				
Zust.	Änderung	Datum	Name	Ursprung			Dateiname / File name: Z-MK-6920-E.cdr

5.1.1 Connector NX8 with resolver

Power connector

motor side

SSD Parvex - motor size 8

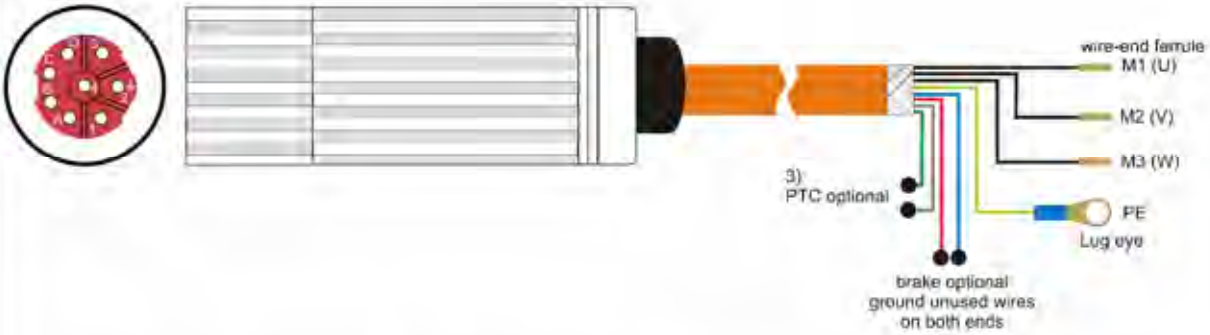
Type: NX ...

regulator side

SSD Drives - Servo drives

Type: 635 and 637/637+/637f
in the compact enclosure

view solder / crimp connector - side



S MB GM2nRn BG0/3-C ST.0100.3001		KMBT BG3-O-K-ULCSA KA.0003.6306			wire-end ferrule
PIN - Nr.		colour	function		-
1		black 1	motor connection		M1 (U)
2	1)	yellow / green	ground connection		PE
3		black 3	motor connection		M3 (W)
4		black 2	motor connection		M2 (V)
A		red	brake +24V DC	2)	connection not on terminal
B		blue	brake 0V DC		
C		brown	temperature	3)	not use at the moment
D		green	temperature		
case	1)				case

1)
The screen is connected at the connector pin and also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV). Otherwise the insulation class of the drive becomes reduced or the use of an additional galvanic seperation is required

					Maßstab / scale:	
					Typ / type: KK MBT NX 8.K-xx.x/O	
				Bear. 04.02.04	DL	Bezeichnung / designation: Orange motor cable (compact enclosure) for standard NX 8 motors and SSD Drives servo drives
				Gep. 05.02.04	EH	
				Norm		
						Zeichnungsnummer / drawing No: Z-MK-6930-xxxx — Blatt / sheet 1
01	con. marking	02.06.04	DL			
Zust.	Änderung	Datum	Name	Ursprung		Dateiname / File name: Z-MK-6930-E.cdr

5.2 Connector NX2 .. NX6 with HIPERFACE® - encoder

Power connector

motor side

SSD Parvex - motor size 2...6

Type: NX ... with HIPERFACE

regulator side

SSD Drives - Servo drives

Type: 631/635 and 637/637+/637f
in the compact enclosure

view solder / crimp connector - side

S MB NXH BG0/3-C ST.0100.4001		KMBT BG0/2-O-K-ULCSA KA.0003.6305			wire-end ferrule
PIN - Nr.		colour	function		-
1		black 1	motor connection		M1 (U)
2	1)	yellow / green	ground connection		PE
3		black 2	motor connection		M2 (V)
4		black 3	motor connection		M3 (W)
A		red	brake +24V DC	2)	connection not on terminal
B		blue	brake 0V DC		
C		brown	temperature	3)	not use at the moment
D		green	temperature		
case	1)				case

1)
The screen is connected at the connector pin and also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV). Otherwise the insulation class of the drive becomes reduced or the use of an additional galvanic seperation is required

SSD DRIVES							Maßstab / scale:
				Bear.	22.10.04	DL	Typ / type: KK H MBT NX 3/6.K-xx.x/O
				Gep.	22.10.04	EH	Bezeichnung / designation: Orange motor cable (compact enclosure) for SSD Parvex HIPERFACE motors and servo drives from SSD Drives
				Norm			
							Zeichnungsnummer / drawing No: Z-MK-6940-xxxx — Blatt / sheet 1
01	Size 2	04.11.04	DL				
Zust.	Änderung	Datum	Name	Ursprung			Dateiname / File name: Z-MK-6940-E.cdr

5.2.1 Connector NX8 with HIPERFACE® - encoder

Power connector

motor side

SSD Parvex - motor size 8

Type: NX... with HIPERFACE

regulator side

SSD Drives - Servo drives

Type: 631/635 and 637/637+/637f
in the compact enclosure

view solder / crimp connector - side

S MB NXH BG0/3-C ST.0100.4001		K MBT BG3-O-K-ULCSA KA.0003.6306			wire-end ferrule
PIN - Nr.		colour	function		-
1		black 1	motor connection		M1 (U)
2	1)	yellow / green	ground connection		PE
3		black 2	motor connection		M2 (V)
4		black 3	motor connection		M3 (W)
A		red	brake +24V DC	2)	connection not on terminal
B		blue	brake 0V DC		
C		brown	temperature	3)	not use at the moment
D		green	temperature		
case	1)				case

1)
The screen is connected
at the connector pin and
also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV).
Otherwise the insulation class of the drive becomes reduced
or the use of an additional galvanic seperation is required

SSD DRIVES					**Maßstab / scale:**	
					Typ / type: KK H MBT NX 8.K-xx.x/O	
				Bearb. 22.10.04 DL	**Bezeichnung / designation:** Orange motor cable (compact enclosure) for SSD Parvex HIPERFACE motors and servo drives from SSD Drives	
				Gep. 22.10.04 EH		
				Norm		
					Zeichnungsnummer / drawing No: Z-MK-6960-xxxx	Blatt sheet 1
Zust.	Änderung	Datum	Name	Ursprung	Dateiname / File name: Z-MK-6960-E.cdr	

5.3 X50 - connector NX2 .. NX6 with resolver

X50 - connector

motor side

SSD Parvex - motor size 2...6

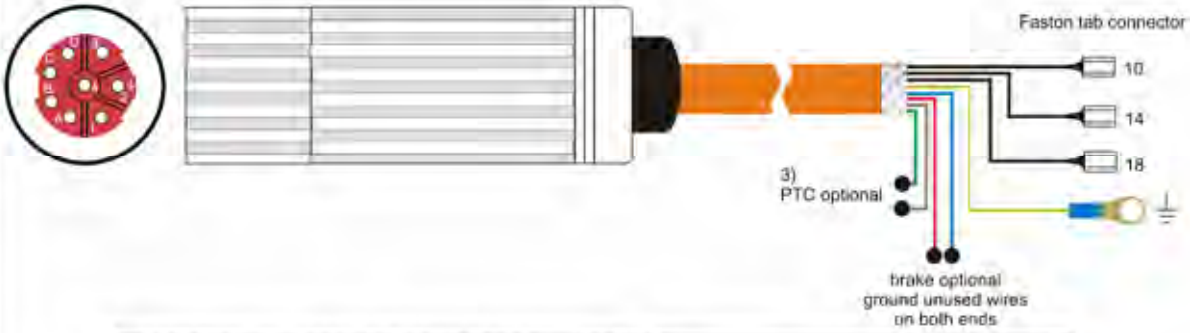
Type: NX ...

regulator side

SSD Drives - Servo drives

Type: 635 and 637/637+/637f
in the rack

view solder / crimp connector - side



S MB GM2nRn BG0/3-C ST.0100.3001		KMBT BG0/2-O-K-ULCSA KA.0003.6305			X50 connector strip	4)
PIN - Nr.		colour	function		-	
1		black 1	motor connection		10	
					12	
2	1)	yellow / green	ground connection		Ground	
3		black 3	motor connection		18	
					20	
4		black 2	motor connection		14	
					16	
A		red	brake +24V DC	2)	-	
B		blue	brake 0V DC		-	
C		brown	temperature	3)	-	
D		green	temperature		-	
case	1)				case	

1)
The screen is connected at the connector pin and also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV). Otherwise the insulation class of the drive becomes reduced or the use of an additional galvanic seperation is required

4)
not in the scope of delivery

						Maßstab / scale:
						Typ / type: KK MBT NX 3/6,R-xx.x/O
				Bear.	03.02.04	DL
				Gep.	05.02.04	EH
				Norm		
						Bezeichnung / designation: Orange motor cable (plugs/terminal strip)) for standard NX motors and SSD Drives servo drives
						Zeichnungsnummer / drawing No: Z-MK-6921-xxxx
01	size2	04.11.04	DL			Blatt / sheet 1
Zust.	Änderung	Datum	Name	Ursprung		Dateiname / File name: Z-MK-6921-E.cdr

5.3.1 X50 - connector NX8 with resolver

X50 - connector

motor side

SSD Parvex - motor size 8

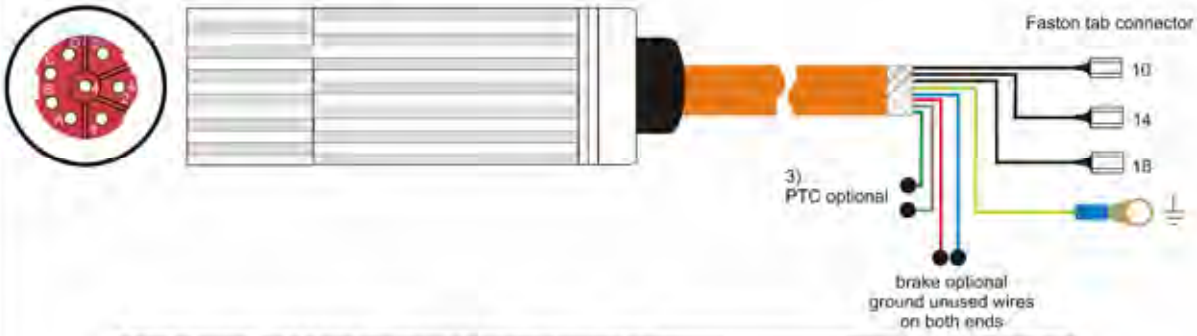
Type: NX ...

regulator side

SSD Drives - Servo drives

Type: 635 and 637/637+/637f
in the rack

view solder / crimp connector - side



S MB GM2nRn BG0/3-C+L ST.0100.3001		KMBT BG3-O-K-ULCSA KA.0003.6306			X50 connector strip	4)
PIN - Nr.		colour	function		-	
1		black 1	motor connection		10	
					12	
2	1)	yellow / green	ground connection		Ground	
3		black 3	motor connection		18	
					20	
4		black 2	motor connection		14	
					16	
A		red	brake +24V DC	2)	-	
B		blue	brake 0V DC		-	
C		brown	temperature	3)	-	
D		green	temperature		-	
case	1)				case	

1)
The screen is connected
at the connector pin and
also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV).
Otherwise the insulation class of the drive becomes reduced
or the use of an additional galvanic seperation is required

4)
not in the scope of delivery

					Maßstab / scale:	
					Typ / type: KK MBT NX 8.R-xx.x/O	
				Bear. 04.02.04 DL	Bezeichnung / designation: Orange motor cable (plugs/terminal strip)) for standard NX 8 motors and SSD Drives servo drives	
				Gep. 05.02.04 EH		
				Norm		
					Zeichnungsnummer / drawing No: Z-MK-6931-xxxx	Blatt sheet 1
Zust.	Änderung	Datum	Name	Ursprung	Dateiname / File name: Z-MK-6931-E.cdr	

5.4 X50 - connector NX2 .. NX6 with HIPERFACE® - encoder

X50 - connector

motor side

SSD Parvex - motor size 2...6

Type: NX ...with HIPERFACE

regulator side

SSD Drives - Servo drives

Type: 635 and 637/637+/637f
in the rack

view solder / crimp connector - side

S MB NXH BG0/3-C ST.0100.3001		KMBT BG0/2-O-K-ULCSA KA.0003.6305			X50 connector strip	4)
PIN - Nr.		colour	function		-	
1		black 1	motor connection		10	
					12	
2	1)	yellow / green	ground connection		Ground	
3		black 2	motor connection		18	
					20	
4		black 3	motor connection		14	
					16	
A		red	brake +24V DC	2)	-	
B		blue	brake 0V DC		-	
C		brown	temperature	3)	-	
D		green	temperature		-	
case	1)				case	

1)
The screen is connected at the connector pin and also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV). Otherwise the insulation class of the drive becomes reduced or the use of an additional galvanic seperation is required

4)
not in the scope of delivery

SSD DRIVES						Maßstab / scale:	
						Typ / type: KK H MBT NX 3/6.R-xx.x/O	
				Bear.	22.10.04	DL	Bezeichnung / designation: Orange motor cable (plugs/terminal strip)for HIPERFACE NX motors and servo drives from SSD Drives
				Gep.	22.10.04	EH	
				Norm			
						Zeichnungsnummer / drawing No: Z-MK-6941-xxxx	Blatt / sheet 1
01	Size 2	04.11.04	DL				
Zust.	Änderung	Datum	Name	Ursprung		Dateiname / File name: Z-MK-6941-E.odt	

5.4.1 X50 - connector NX8 with HIPERFACE® - encoder

X50 - connector

motor side

SSD Parvex - motor size 8

Type: NX ...with HIPERFACE

regulator side

SSD Drives - Servo drives

Type: 635 and 637/637+/637f
in the rack

view solder / crimp connector - side

S NXH BG3/8-C ST.0100.3001		KMBT BG3-O-K-ULCSA KA.0003.6306			X50 connector strip	4)
PIN - Nr.		colour	function		-	
1		black 1	motor connection		10 12	
2	1)	yellow / green	ground connection		Ground	
3		black 2	motor connection		18 20	
4		black 3	motor connection		14 16	
A		red	brake +24V DC	2)	-	
B		blue	brake 0V DC		-	
C		brown	temperature	3)	-	
D		green	temperature		-	
case	1)				case	

1)
The screen is connected
at the connector pin and
also to the connector shell

2)
Attention ! Safety and insulation:
The brake must be insulated for protective separation (PELV).
Otherwise the insulation class of the drive becomes reduced
or the use of an additional galvanic seperation is required

4)
not in the scope of delivery

SSD DRIVES					Maßstab / scale:	
					Typ / type: KKH MBT NX 8.R-xx.x/O	
			Bear.	22.10.04	DL	Bezeichnung / designation: Orange motor cable (plugs/terminal strip)for HIPERFACE NX 8 motors and servo drives from SSD Drives
			Gep.	22.10.04	EH	
			Norm			
						Zeichnungsnummer / drawing No: Z-MK-6961-xxxx
						Blatt sheet 1
Zust.	Änderung	Datum	Name	Ursprung		Dateiname / File name: Z-MK-6961-E.cdr

5.5 Resolver connector

Resolver connector

motor side

SSD Parvex - motor size 2...8

Type: NX...

regulator side

SSD Drives - servo drives

Type: 631/635 and 637/637+/637i

view solderside

view solderside

SIR ST.0200.0001	KIR -G- UL KA.0001.6302		SUB - D 09 S/V ST.1002.2101
PIN - Nr.	colour	function	PIN - Nr.
7	red	sin +	4
8	blue	sin -	8
1	green	cos +	3
2	yellow	cos -	7
12	pink	carrier -	9
10	grey	carrier +	5
case		screen	case

SSD DRIVES						Maßstab / scale:	
						Typ / type: KK R NX-xx.x/G	
				Bear.	04.02.04	DL	Bezeichnung / designation: Green resolver cable for Parvex standard motors with servo drives from SSD Drives
				Ges.	05.04.04	EH	
				Norm			
							Zeichnungsnummer / drawing No: Z-RK.6920.xxxx — Blatt / sheet 1
01	Size2	04.11.04	DL				
Zust.	Änderung	Datum	Name	Ursprung			Dateiname / File name: Z-RK-6920-E.cdr

5.5.1 HIPERFACE - connector

Hiperface connector

motorside

SSD Parvex - motor size 2...8

Type: NX... with HIPERFACE

regulator side

SSD Drives - servo drive

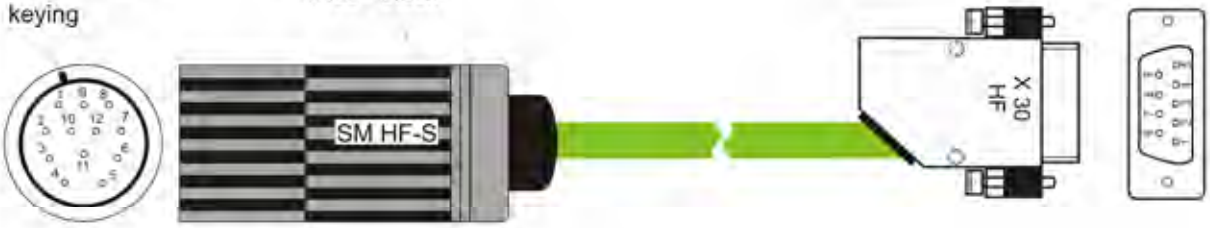
Type: 637+/637f

view solderside

keying

case - black

view solderside



S HF - S ST.0400.0001	KIR -G- UL KA.0001.6302		SUB - D 09 S/V ST.1002.2101
PIN - Nr.	colour	function	PIN - Nr.
1	withe	sin +	4
2	brown	ref sin	8
3	green	cos +	3
4	yellow	ref cos	7
9	pink	data +	9
10	grey	data -	5
11	red	10 V DC	2
12	blue	GND	1
case		screen	case

						Maßstab / scale:	
						Typ / type: KK H NX-xx.x/G	
				Bearb.	04.02.04	DL	Bezeichnung / designation: Green Hiperface cable for SSD Parvex NX-Hiperface motors and 637+/637f servo drives
				Gep.	05.02.04	EH	
				Norm			
02	Size 2	04.11.04	DL				Zeichnungsnummer / drawing No: Z-RK.8930.xxxx — Blatt / sheet 1
01	keying	13.10.04	DL				
Zust.	Änderung	Datum	Name	Ursprung			Dateiname / File name: Z-RK-8930-E.cdr

5.6 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 filters 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 Eurotherm motor cables!

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-passivating 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 electromotive series! Use the good conductivity and the large surface of the galvanized mounting plate as earth potential!

4. Relays, contactors and solenoid values built into the same circuit must be connected with spark-suppressing components limiting over voltage spikes.. 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 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 planner must integrate in his concept high frequency emitted interference as well as the electromagnetic susceptibilityof 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 near the servo regulator (10 - 50 cm). Sensitive measuring leads should be 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 at least 30 - 40 cm from the channel for the signal lines.

5.7 Plug designation

5.7.1 Mating plugs for motor- and brake connections

Size	Plug designation	Item - No.
NX2…8	S MB GM2n Rn BG03/-C+L	ST.0100.3001

5.7.2 Mating plugs for resolver connection

Size	Plug designation	Item - No.
NX2…8	SIR	ST.0200.0001

5.7.3 Mating plugs for HIPERFACE connection

Size	Plug designation	Item - No.
NX2…8	S HF - S	ST.0400.0001

5.8 Cable designation

5.8.1 Motor-cable

Size	Cable designation	Item - No.
NX2…6	KMBT BG0/2-O-K-ULSA	KA.0003.6305
NX8	KMBT BG3-O-K-ULSA	KA.0003.6306

5.8.2 Resolver and HIPERFACE cable

Size	Cable designation	Item - No.
NX2…8	KIR - G - UL	KA.0001.6302

Optional

Holding brake Type:	Motor size size (-)	Holding torque M_{BrH} (20° C) (Nm)	Max. current I_{max} (A)	Moment of inertia J_{Br} (kg cm²)	Weight m_{Br} (g)
NX1	1	0,40	0,25	0,010	65
NX2	2	2,20	0,33	0,012	170
NX3	3	2,50	0,46	0,068	180
NX4	4	5,50	0,50	0,180	300
NX6	6	9,00	0,75	0,540	460
NX8	8	36,00	0,83	5,560	3500

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

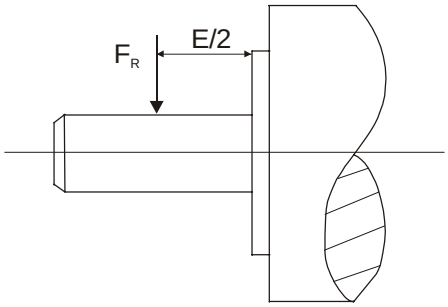
Fail-safe holding brake

- 24 VDC +/-10% supply voltage
- Static use: Motor locking in the stopped position
- Dynamic use: For emergency stopping only. Dynamic torque is approximately half the holding torque and the number of switching operations is limited.

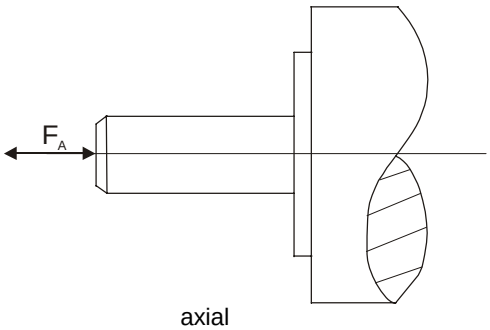
The inserted brake is not characterized for the general slowing-down the drives, but is merely a standstill and/or holding brake.
Therefore, it must become guaranteed by the customer, that the motor is stopped, before the brake is engaged. Should the brake become engaged during movement of the motor, so it's generally the wear and therefore the holding torque of the brake depends on:

- the speed of the motor when the brake is engaged
- the load moment of inertia connected to the motor
- environmental conditions such as temperature, and so forth.
- the number of braking operations and so forth

7.1 Representation of the Definition



radial



axial

7.2 Technical data of the max. radial FR (N) and axial F_A (N) shaft load (rated speed)

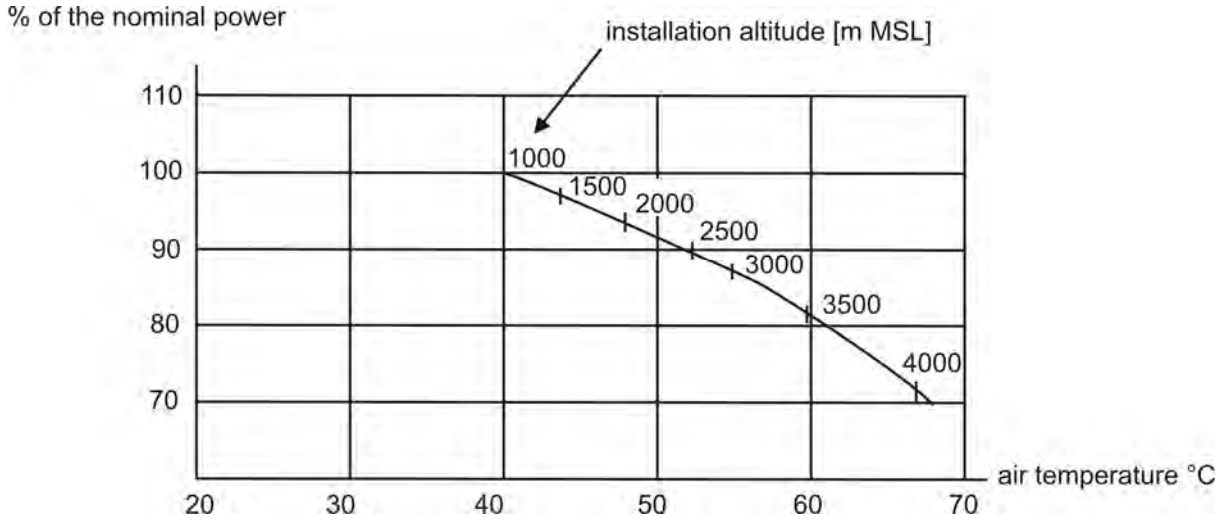
Motor type	maximum radial shaft load	maximum axial shaft load
[-]	F_R [N]	F_A [N]
NX110..	150	69
NX205..	300	167
NX210..	300	167
NX310..	360	200
NX420..	820	240
NX430..	820	240
NX620..	860	540
NX630..	860	540
NX820..	1500	380
NX840..	1550	440
NX860..	1600	470

The specifications refer to 20000 hours of operation !

7.3 Use Ball Bearing Type

Motor type	Ball Bearing Type	
	A-side	B-side
NX110..	6000	607
NX205..	6001	629
NX210..	6001	629
NX310..	6002	6000
NX420..	6204	6202
NX430..	6204	6202
NX620..	6205	6204
NX630..	6205	6204
NX820..	6207	6205
NX840..	6207	6205
NX860..	6207	6205

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 curve 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 graph.



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 multiplied.

Certificate of Compliance

Certificate Number 060504 - E242959
Report Reference E242959,April 29th, 2004
Issue Date 2004 May 6

Underwriters Laboratories Inc.®

Issued to: PARVEX S A
8 AVE DU LAC
F-21000 DIJON FRANCE

This is to certify that representative samples of Brushless servo motor
Models NX310, NX420, NX430, NX620, NX630, followed by E, J or V; followed by A through Z, followed A through Z, followed by R, followed by code 1,6,7,8 for NX3-NX4-NX6 motors, followed by code 0 through 5, followed by code 00 through 99.

Have been investigated by Underwriters Laboratories Inc.® in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: **UL 1004 - Electric Motors**
CSA C22.2 No. 100-95 - Motors and Generators

Additional Information: See Addendum for Electrical Ratings

Only those products bearing the UL Recognized Component Marks for the U.S. and Canada should be considered as being covered by UL's Recognition and Follow-Up Service and meeting the appropriate U.S. and Canadian requirements.
The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark may be used in conjuction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions. The UL Recognized Component Mark for Canada consists of the UL Recognized Mark for Canada and the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory.

Look for the UL Recognized Component Mark on the product

Issued by: Svetlana Lagaude - Project Engineer
UL International France SA

Reviewed by: Thomas Sussner - Technical Leader Appliances
UL International France SA

Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc.
For questions in France, you may call +33 (0)1 69 12 88 00.

Certificate of Compliance

Certificate Number 060504 - E242959
Report Reference E242959,April 29th, 2004
Issue Date 2004 May 6

Underwriters Laboratories Inc.

This is to verify that representative samples of the product as specified on this certificate were tested according to the current UR, cUR requirements.

RATINGS:

Model	Volts (V)	Torque S1 (Nm) max	A rated S1 (A) max	RPM max
NX310	230 400-480	2 2	3.3 4.6 2.2 3.1	7600 100 7600 100
NX420	230 400-480	4 4	5.8 7.7 4 5.3	6000 100 6000 100
NX430	230 400-480	5.5 5.5	8 10.6 5.1 6.7	6000 100 6000 100
NX620	230 400-480	8 8	8.7 14 5 11	6000 100 6000 100
NX630	230 400-480	12 12	10 14 5.7 14	6000 100 6000 100

The motor Power is proportional to the motor Speed (rd/s) multiplied by the motor Load (Nm) (the motor speed in rd/s is calculated from the speed in rpm divided by 60 and multiplied by 2*pi).

Issued by Svetlana Lagaude - Project Engineer
UL International France SA

Reviewed by Thomas Sussner - Technical Leader Appliances
UL International France SA

Version	Modification	Chapter	Date	Name	Comment
V0103	New		24.11.2003	N. Dreilich	Eurotherm/Parvex
V0204	corrections		10.02.2004	N. Dreilich	US - Version
V0304	type code technical data, NX310E..K with 560V dimension NX 210 new Connecting HIPERFACE cable UL - Certificate SSD Drives	1.2 3 4.2 5 9 all	 15.11.2004	 N. Dreilich	expand supplement expand supplement Logos
V0405	New motor type NX110 and 205		20.12.2005	N. Dreilich	

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