

## Servo motor



UL: 05-01-08



**Planetary Gearbox PG AP - Product manual  
(being prepared)**

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UL: 05-01-06



**Planetary Gearbox PG AL - Product manual  
(being prepared)**

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UL: 12-01



**Plugs - Product description**

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UL: 12-02-01



**Cables - Product description**

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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 Type code

Marking	Standard							optional			
	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
<b>a</b>	<b>N</b> = Brushless 10 pole design
<b>b</b>	<b>X</b> = Axis motors with Ne Fe Bo magnets
<b>c</b>	Size (depends on diameter) 1 = flange □ 42 mm 2 = flange □ 56 mm 3 = flange □ 71 mm 4 = flange □ 91,5mm 6 = flange □ 121 mm 8 = flange □ 158 mm
<b>d</b>	Construction size (depends on length) magnetic – segment - length in mm 10, 20, 30, 40, 50, 60
<b>e</b>	Type of winding <b>E</b> = 5 pole pair                   ≙ standard <b>V</b> = 5 pole pair, with ventilation (only at NX860)
<b>f</b>	Motor Feedback <b>A</b> = 2pole resolver   ≙ standard <b>E</b> = Sensor - 10polig (CR410) <b>M</b> = Parvex - Multiturn Sensor <b>R</b> = HIPERFACE® - Singelturm   128 PPR, Type SKS 36 <b>S</b> = HIPERFACE® - Multiturn   128 PPR, Type 36                    (being prepared) <b>T</b> = HIPERFACE® - Singelturm   1024 PPR, Type SRS 50 <b>U</b> = HIPERFACE® - Multiturn   1024 PPR, Type SRM 50 <b>V</b> = EnDat®           - Singelturm   512 PPR, Type ECN 1113 (optical) - V2.1 <b>W</b> = EnDat®           - Multiturn   512 PPR, Type ECN 1125 (optical) - V2.1 <b>X</b> = Low cost encoder           2048 PPR, 10 commutation tracks
<b>g</b>	motor winding (≙ special coding) <b>X</b> = see motor type list
<b>h</b>	Mechanical special construction <b>R</b> = standard
<b>i</b>	Connections 1 = cable without screen 2 = screened line 3 = socket without screen 4 = socket with screen and heat-shrinkable tube 7 = connector 8 = connector and connector for forced ventilatio 9 = terminal box and connector for forced ventilatio
<b>j</b>	Temperature monitoring / brake <b>0</b> = basic motor <b>1</b> = motor with PTC monitoring <b>2</b> = motor with thermo switch <b>3</b> = motor with brake <b>4</b> = motor with brake and PTC monitoring <b>7</b> = motor with brake and thermo switch
<b>k</b>	Shaft / protection <b>00</b> = smooth shaft <b>01</b> = shaft with key <b>10</b> = IP65 protection <b>11</b> = IP65 protection, shaft with key

### 1.2.1 Typical example

A typical example of an order corresponding to the type code would be:

## **NX310EAPR7001**

<b>N</b>	= Brushless 10 pole design
<b>X</b>	= Axis motors with Ne Fe Bo magnets
<b>3</b>	= flange □ 71mm
<b>10</b>	= length = 146mm
<b>E</b>	= 5 pole pair
<b>A</b>	= 2 pole resolver
<b>P</b>	= motor winding
<b>R</b>	= standard
<b>7</b>	= connectors
<b>0</b>	= motor without brake
<b>01</b>	= shaft with key



Description		NX						
		1	2	3	4	6	8	8 <sup>1)</sup>
Degree of protection: with mating connectors	IP40	●	●	□	□	□	□	□
	IP44	□	□	□	□	□	□	●
	IP64	○	○	●	●	●	●	□
	IP65	○	○	○	○	○	○	□
Magnetic material:	Ne Fe Bo	●	●	●	●	●	●	●
Electrical connections:	Rotatable, 90° angled for motor & resolver connections flanged sockets	□	□	●	●	●	●	□
	PG couplings with flying leads	○	○	○	○	○	○	□
	Terminal box	□	□	□	□	□	□	●
	Cable with MOLEX connectors	●	○	□	□	□	□	□
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	●	●	●	●	●	●	□
	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	●	●	●	●	●	●	●
Resolver type:	2 pole resolver	●	●	●	●	●	●	●
Insulation class	F (VDE 0530) 155° C, heating 100° K	●	●	●	●	●	●	●
Varnish: (standard)	non-varnish	●	●	●	●	●	●	●

- 1) ventilated version  
 ● standard design  
 ○ optional  
 □ not possible

Type: NX

Servo motor Type	size	Technical data					Static torque	Static current	Max. Static torque	Moment of inertia including resolver
		Nominal power	Rated torque	Rated speed	Rated current					
					310 V DC	540V DC				
-	-	P <sub>N</sub> (KW)	M <sub>N</sub> (Nm)	n <sub>N</sub> (rpm)	I <sub>N310</sub> (A)	I <sub>N540</sub> (A)	M <sub>0</sub> (Nm)	I <sub>0</sub> (A)	M <sub>0max</sub> (Nm)	J <sub>M</sub> (kgcm <sup>2</sup> )
NX110EAP	1	0,21	0,33	6000	0,79	-	0,45	0,99	1,72	0,154
NX210EAP	2	0,39	0,61	6000	1,32	-	1,00	1,99	3,40	0,404
NX210EAT		0,33	0,80	4000	1,11	-	1,00	1,33	3,40	0,404
		0,39	0,61	6000	-	0,89	1,00	1,33	3,40	0,404
NX310EAK	3	0,71	1,68	4000	2,14	-	2,00	2,47	6,60	0,814
		0,89	1,42	6000	-	1,75	2,00	2,47	6,60	0,814
NX310EAP		0,45	1,85	2300	1,33	-	2,00	1,40	6,60	0,814
		0,71	1,68	4000	-	1,22	2,00	1,40	6,60	0,814
NX420EAJ	4	1,42	3,38	4000	4,18	-	4,00	4,88	13,40	2,920
NX420EAP		0,91	3,78	2300	2,69	-	4,00	2,82	13,40	2,920
		1,42	3,38	4000	-	2,42	4,00	2,82	13,40	2,920
NX420EAV		0,80	3,83	2000	-	1,36	4,00	1,41	13,40	2,920
NX430EAF		1,80	4,29	4000	5,28	-	5,50	6,64	18,80	4,280
NX430EAJ		1,57	4,68	3200	4,52	-	5,50	5,24	18,80	4,280
NX430EAL		1,21	5,04	2300	3,49	-	5,50	3,78	18,80	4,280
		1,80	4,28	4000	-	3,01	5,50	3,78	18,80	4,280
NX430EAP		0,93	5,22	1700	2,69	-	5,50	2,82	18,80	4,280
		1,50	4,77	3000	-	2,48	5,50	2,82	18,80	4,280
NX430EAV		0,32	5,45	550	1,4	-	5,50	1,41	18,80	4,280
		0,56	5,38	1000	-	1,38	5,50	1,41	18,80	4,280
NX620EAJ	6	2,55	6,08	4000	7,82	-	8,00	9,89	26,70	9,820
NX620EAR		1,71	7,42	2200	4,99	-	8,00	5,31	26,70	9,820
		2,52	6,17	3900	-	4,25	8,00	5,31	26,70	9,820
NX620EAV		0,90	7,85	1100	2,79	-	8,00	2,83	26,70	9,820
		1,57	7,52	2000	-	2,69	8,00	2,83	26,70	9,820
NX630EAG		3,48	8,31	4000	10,90	-	12,00	15,00	40,00	14,700
NX630EAK		2,99	10,20	2800	9,22	-	12,00	10,60	40,00	14,700
NX630EAN		2,60	10,80	2300	7,79	-	12,00	8,54	40,00	14,700
		3,48	8,31	4000	-	6,18	12,00	8,54	40,00	14,700
NX630EAR		1,75	11,50	1450	5,47	-	12,00	5,65	40,00	14,700
		2,92	10,30	2700	-	4,96	12,00	5,65	40,00	14,700
NX630EAV		0,93	11,90	750	2,80	-	12,00	2,83	40,00	14,700
		1,64	11,60	1350	-	2,75	12,00	2,83	40,00	14,700
NX820EAL	8	4,99	13,20	3600	14,80	-	16,00	17,60	50,00	32,000
NX820EAR		3,34	14,50	2200	10,0	-	16,00	11,00	50,00	32,000
		5,29	12,90	3900	-	9,07	16,00	11,00	50,00	32,000
NX820EAX		1,61	15,40	1000	4,98	-	16,00	5,16	50,00	32,000
		2,93	14,70	1900	-	4,79	16,00	5,16	50,00	32,000
NX840EAJ		5,27	22,90	2200	15,70	-	28,00	18,90	92,00	62,000
NX840EAK		4,91	23,50	2000	14,30	-	28,00	16,80	92,00	62,000
		6,80	18,60	3500	-	11,50	28,00	16,80	92,00	62,000
NX840EAQ		3,21	25,5	1200	9,27	-	28,00	10,10	92,00	62,000
		5,09	23,20	2100	-	8,47	28,00	10,10	92,00	62,000
NX860EAD		7,48	27,50	2600	22,70	-	41,00	33,00	137,00	92,000
NX860EAJ		5,40	35,60	1450	16,30	-	41,00	18,60	137,00	92,000
		7,48	27,50	2600	-	12,80	41,00	18,60	137,00	92,000
NX860VAG	1)	11,40	54,40	2000	33,30	-	64,00	39,20	137,00	92,000
NX860VAJ	1)	8,74	57,60	1450	26,4	-	64,00	29,40	137,00	92,000
		13,80	50,50	2600	-	23,20	64,00	29,40	137,00	92,000

1) motor with ventilation

Type: **NX**

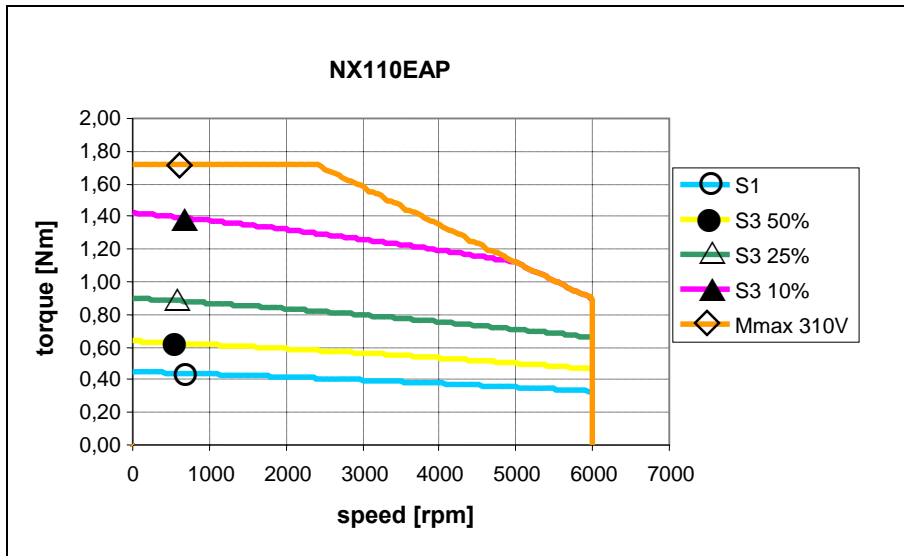
Servo motor Type	size	Mass	Motor resistance	Motor inductance	Thermal time constant		Torque constant	e.m.f Const eff.
					with I <sub>N</sub>	with I <sub>max</sub>		
-	-	M (kg)	R <sub>ph</sub> /ph (Ω)	L <sub>ph</sub> /ph (mH)	T <sub>thN</sub> (min)	T <sub>thmax</sub> (s)	KT (Nm/A)	KE (V/1000 min <sup>-1</sup> )
NX110EAP	1	0,85	22,00	26,50	11	25,4	0,46	30,5
NX210EAP	2	1,30	7,74	25,20	20	42,7	0,50	32,6
NX210EAT		1,30	16,30	56,00	20	44,9	0,75	48,6
NX310EAK	3	2,10	6,58	20,30	20	62,1	0,81	50,9
NX310EAP		2,10	20,70	62,00	20	60,2	1,42	88,9
NX420EAJ	4	3,80	2,39	11,00	12	76,2	0,82	51,4
NX420EAP		3,80	7,44	33,00	12	73,5	1,42	89,0
NX420EAV		3,80	29,40	131,00	12	73,8	2,83	177,0
NX430EAF		4,80	1,48	6,80	18	81,1	0,83	51,8
NX430EAJ		4,80	2,33	10,90	18	82,6	1,05	65,5
NX430EAL		4,80	4,53	21,00	18	81,7	1,45	90,9
NX430EAP		4,80	7,78	37,80	18	85,6	1,95	122,0
NX430EAV		4,80	31,10	151,00	18	85,7	3,90	244,0
NX620EAJ	6	7,00	0,60	5,52	27	146,0	0,81	51,3
NX620EAR		7,00	2,24	19,20	27	137,0	1,51	95,7
NX620EAV		7,00	7,90	67,60	27	137,0	2,83	180,0
NX630EAG		8,90	0,34	3,53	33	160,0	0,80	50,8
NX630EAK		8,90	0,67	7,06	33	161,0	1,13	71,8
NX630EAN		8,90	1,12	10,90	33	150,0	1,41	89,3
NX630EAR		8,90	2,43	24,90	33	158,0	2,12	135,0
NX630EAV		8,90	9,19	99,60	33	167,0	4,24	270,0
NX820EAL	8	13,00	0,38	3,35	34	141,0	0,91	56,9
NX820EAR		13,00	1,01	8,57	34	135,0	1,46	91,0
NX820EAX		13,00	4,53	38,70	34	137,0	3,10	193,0
NX840EAJ		20,00	0,37	4,28	52	192,0	1,48	92,2
NX840EAK		20,00	0,49	5,42	52	183,0	1,67	104,0
NX840EAQ		20,00	1,36	15,10	52	184,0	2,78	173,0
NX860EAD		27,00	0,16	2,03	60	209,0	1,24	77,8
NX860EAJ		27,00	0,50	6,43	60	206,0	2,21	138,0
NX860VAG	1)	31,00	0,29	3,61	22	78,0	1,63	104,0
NX860VAJ	1)	31,00	0,50	6,43	22	81,0	2,18	138,0

1) motor with ventilation

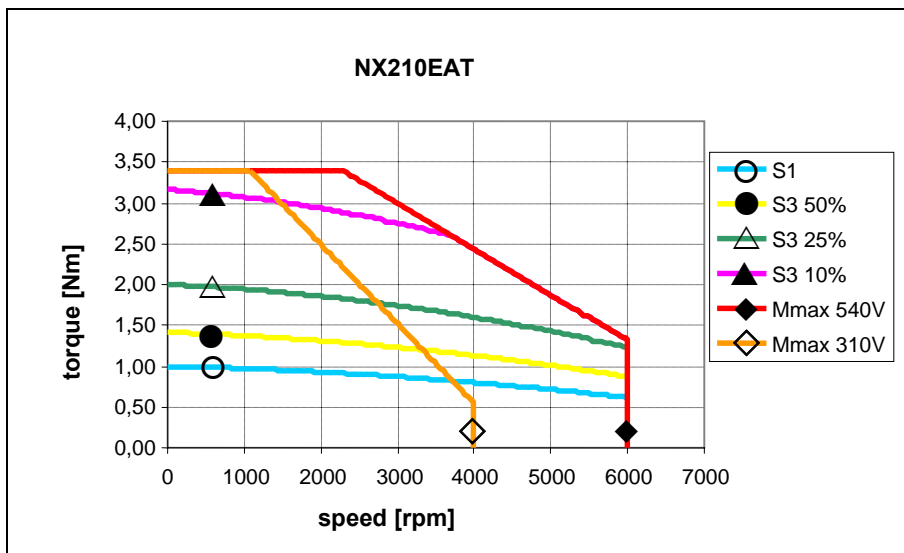
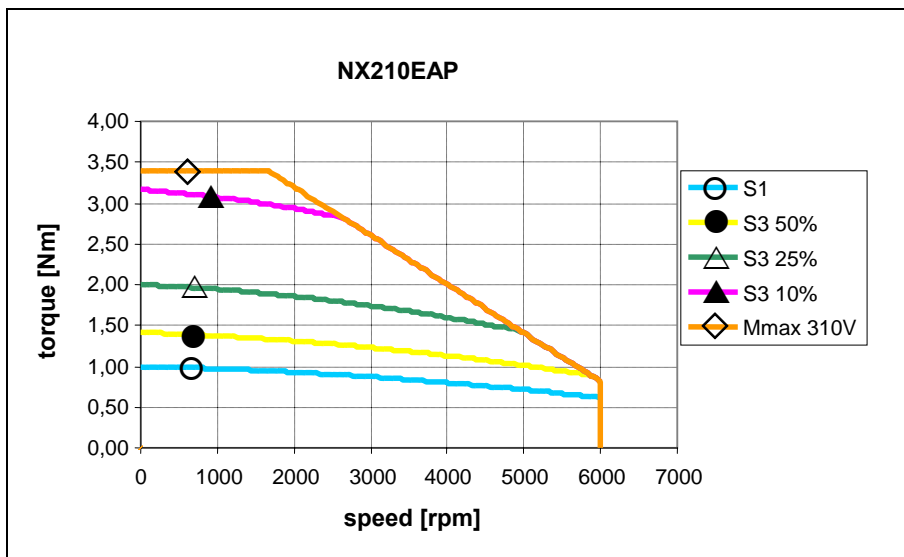
KT ≈ KT<sub>0</sub> ≈ KT<sub>N</sub>

### 3.1 Torque/Speed Diagrams

#### 3.1.1 Motor size 1

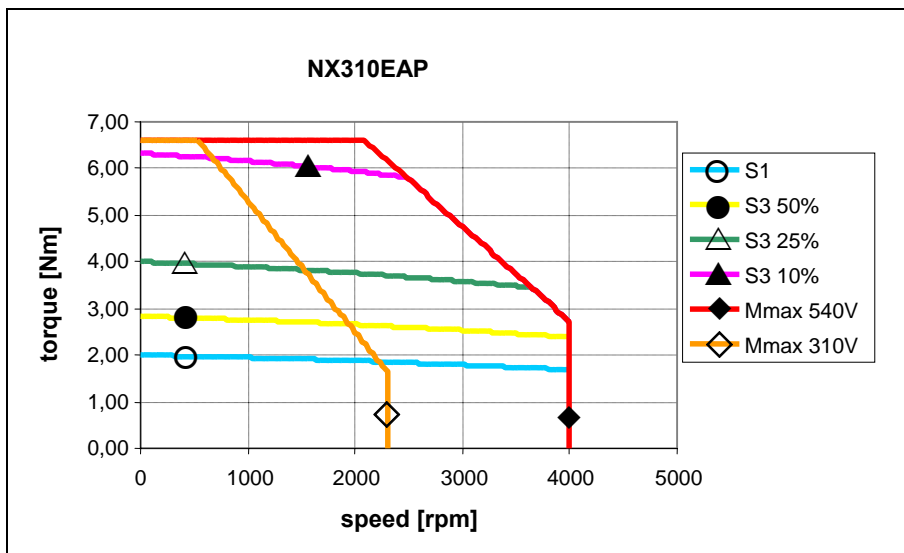
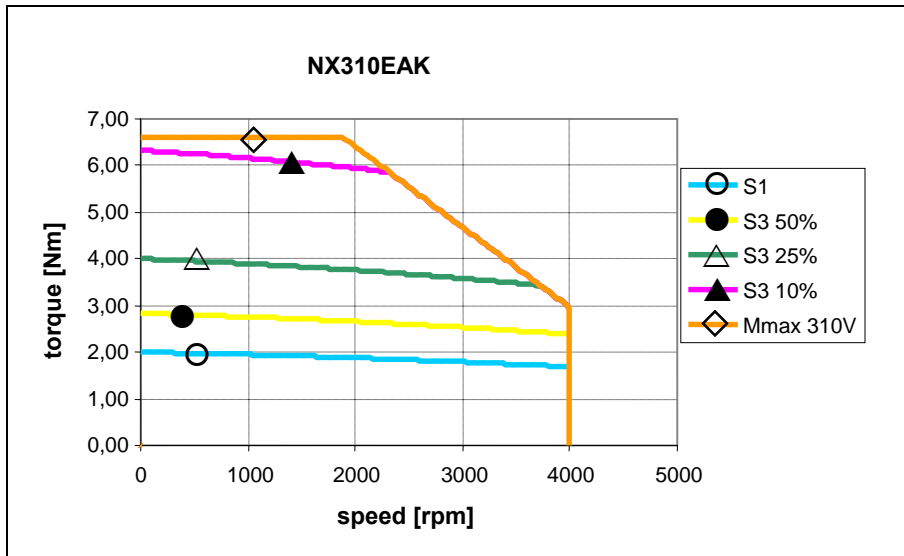


#### 3.1.2 Motor size 2

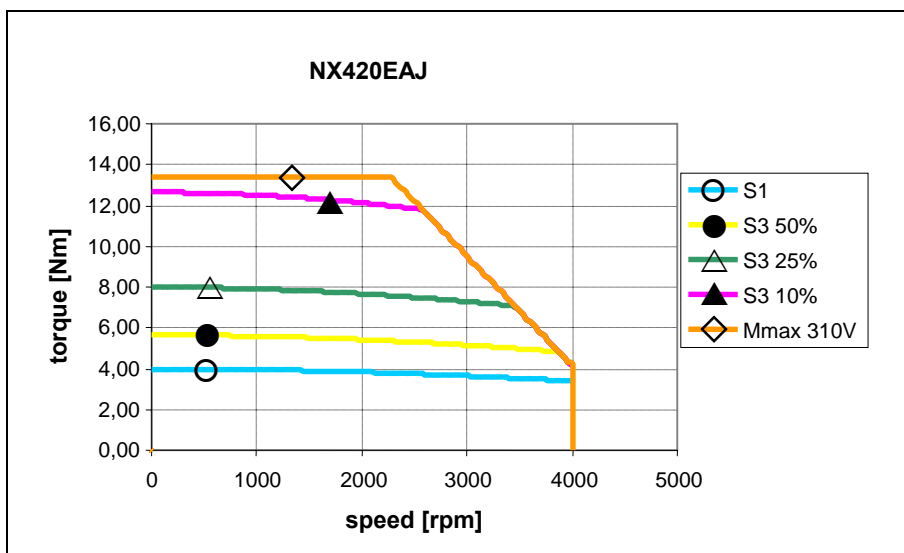


## Torque/Speed Diagrams

### 3.1.3 Motor size 3

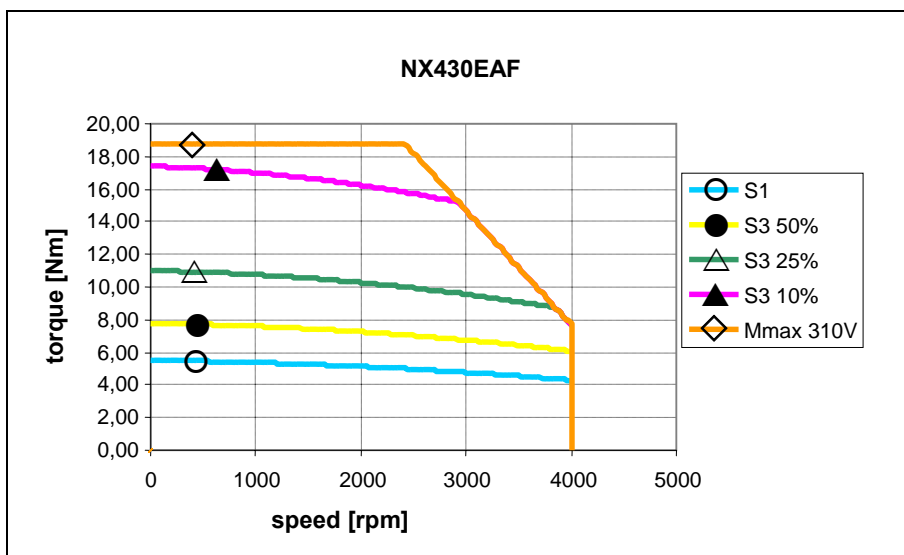
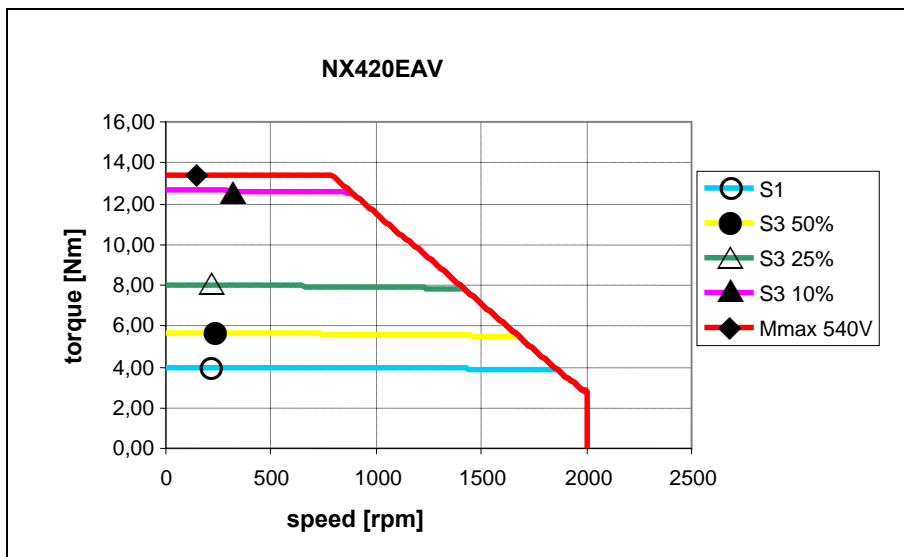
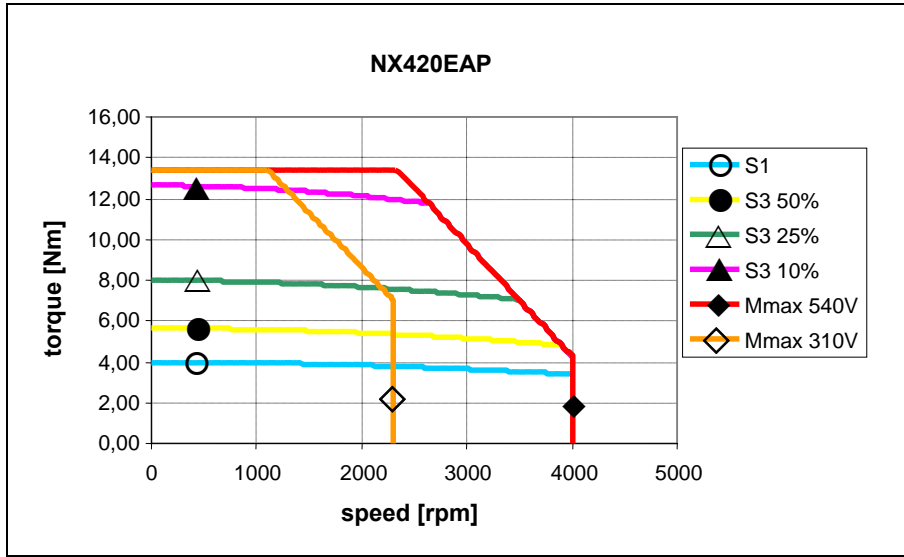


### 3.1.4 Motor size 4



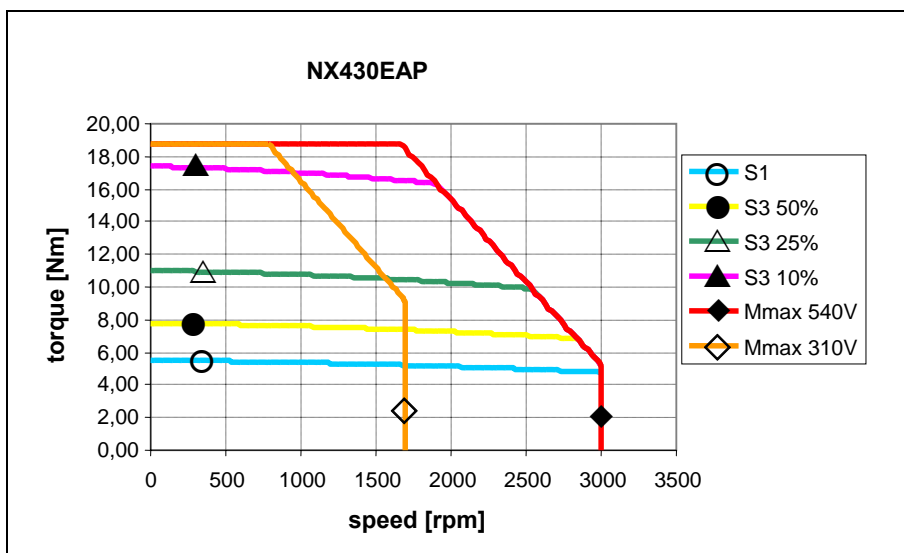
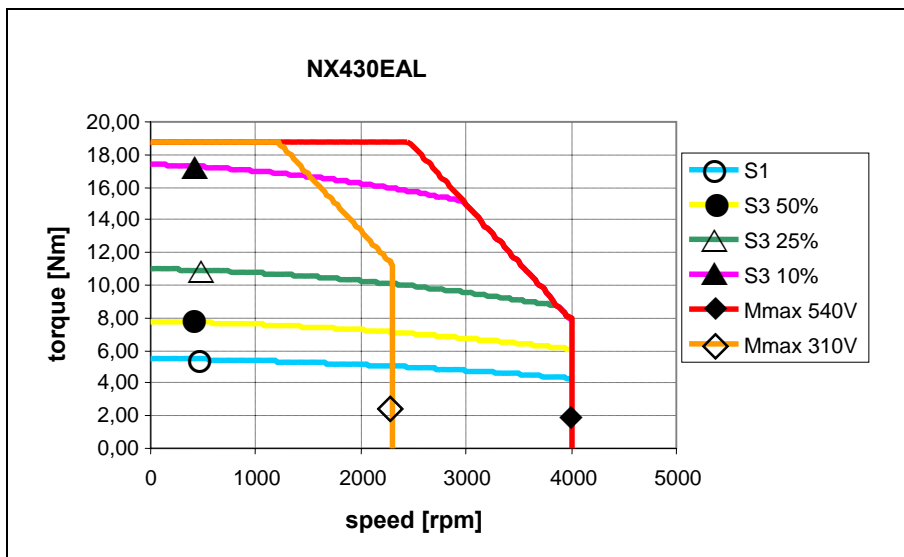
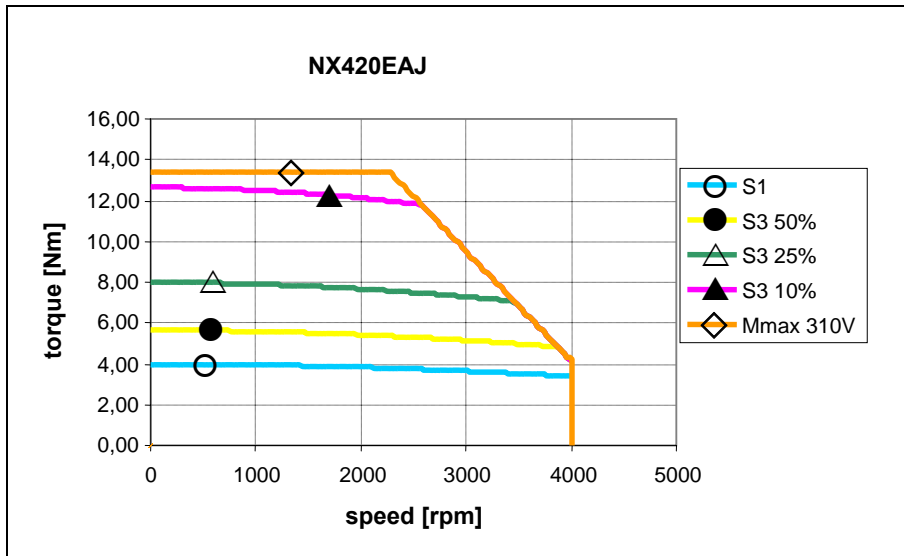
Torque/Speed Diagrams

Motor size 4



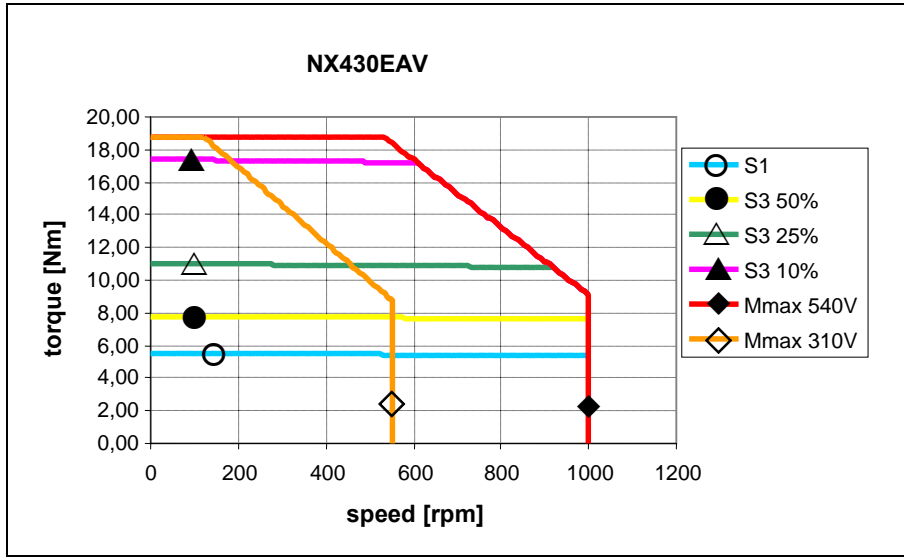
## Torque/Speed Diagrams

### Motor size 4

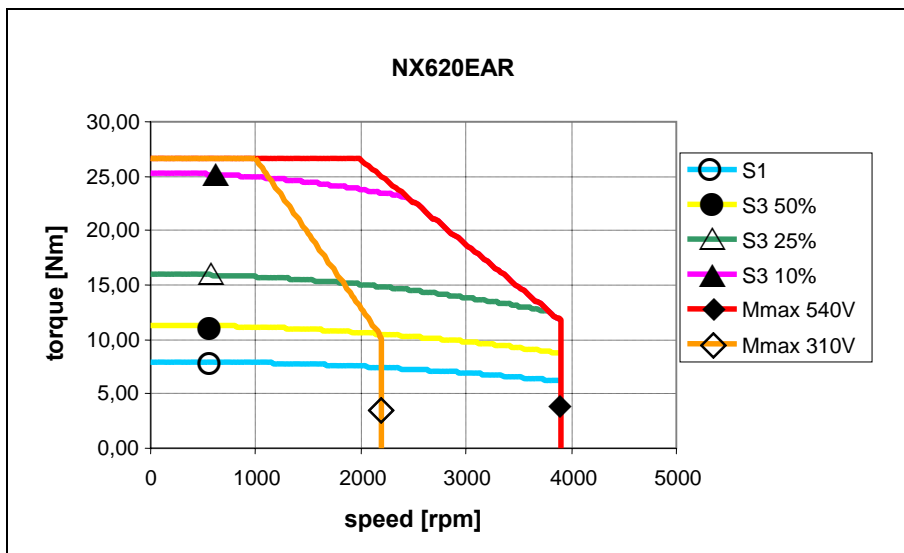
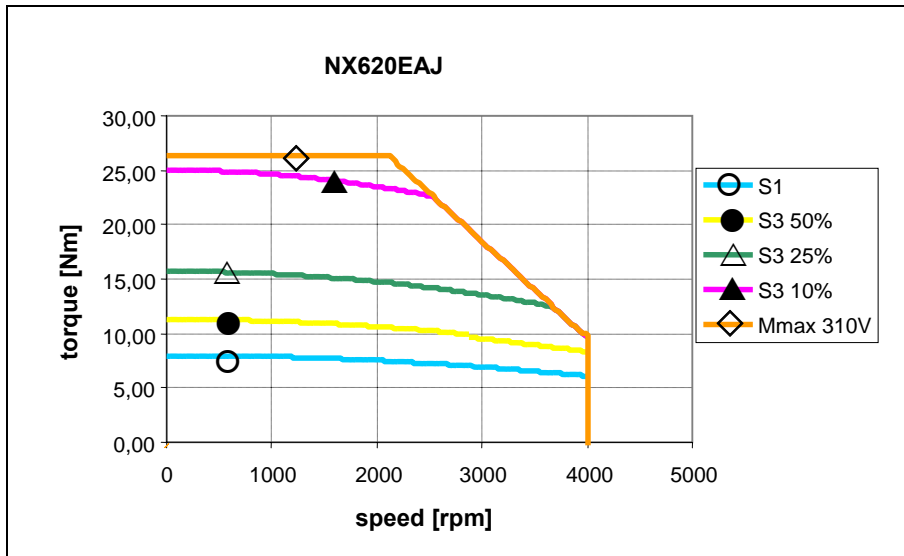


Torque/Speed Diagrams

Motor size 4



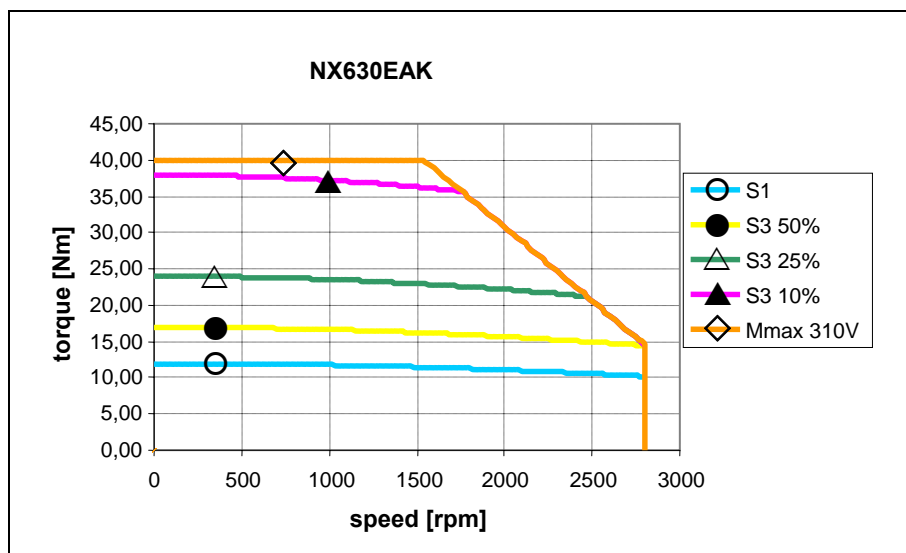
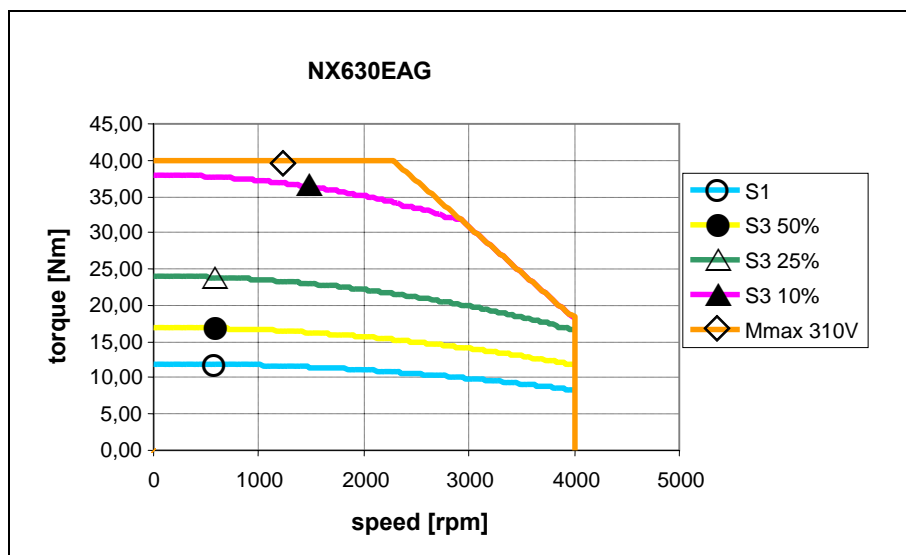
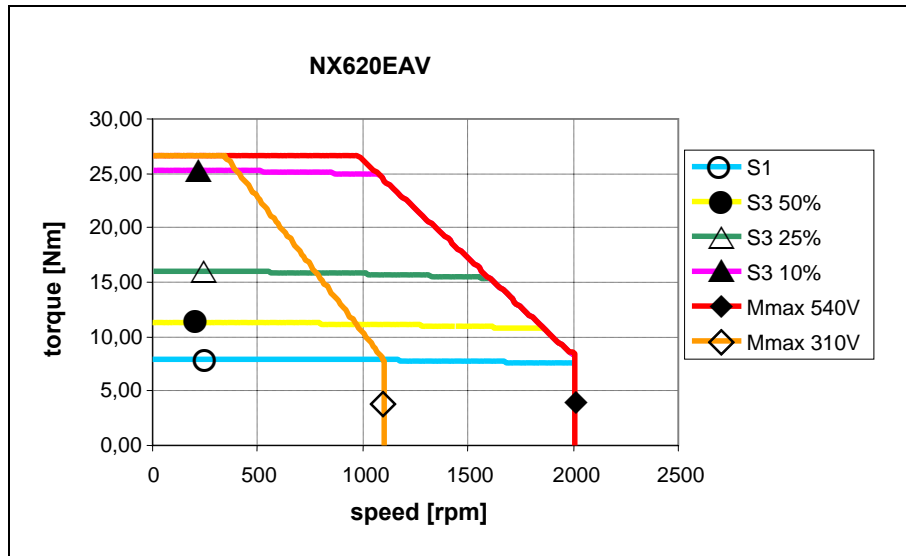
3.1.5 Motor size 6





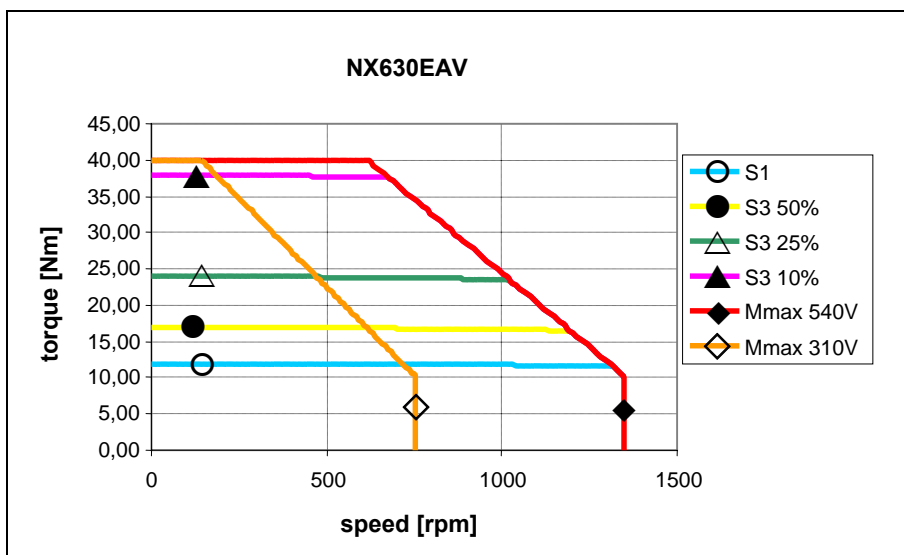
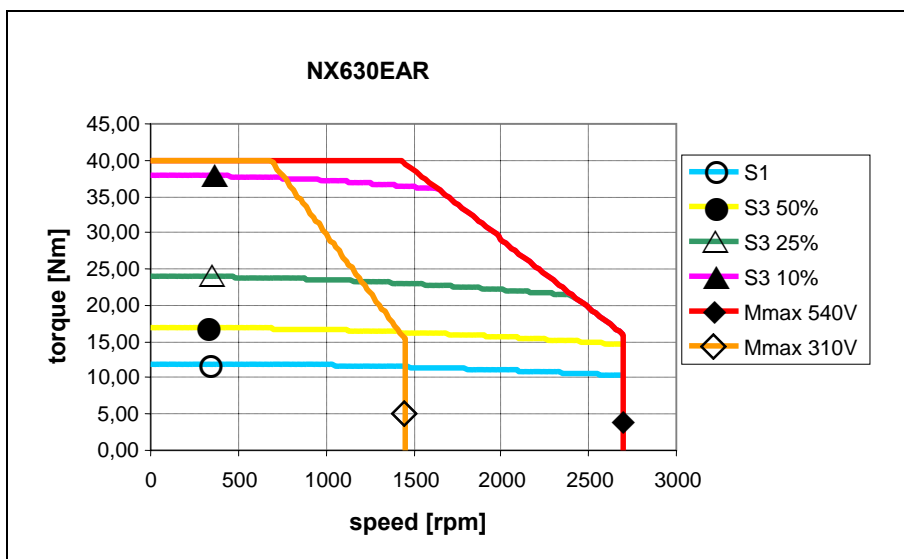
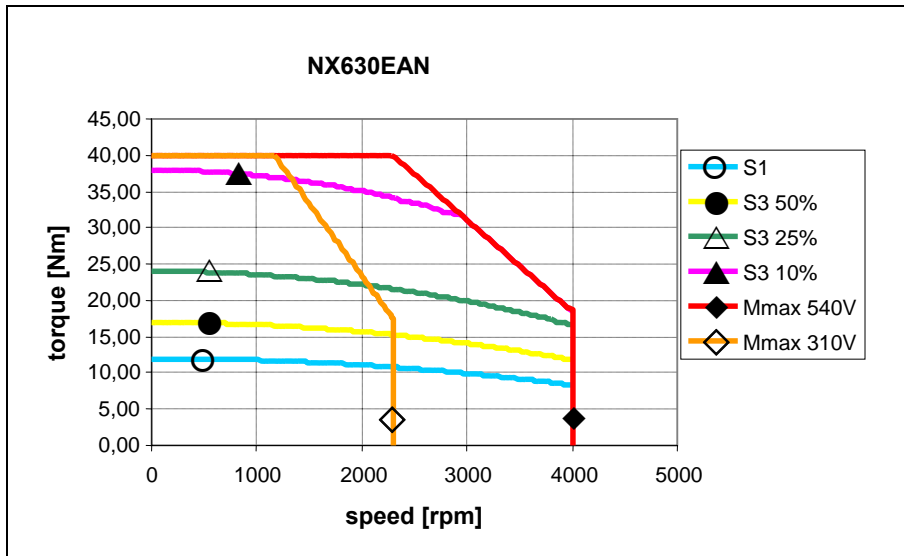
## Torque/Speed Diagrams

### Motor size 6



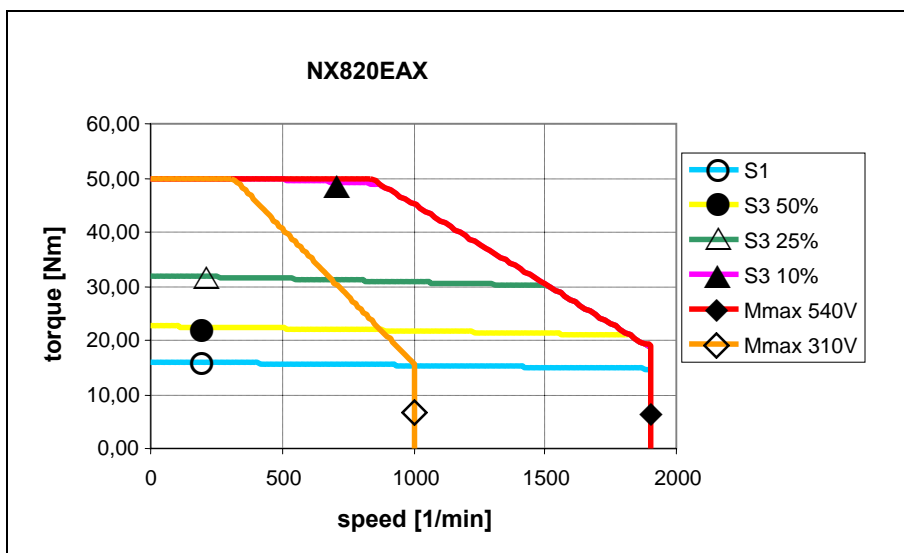
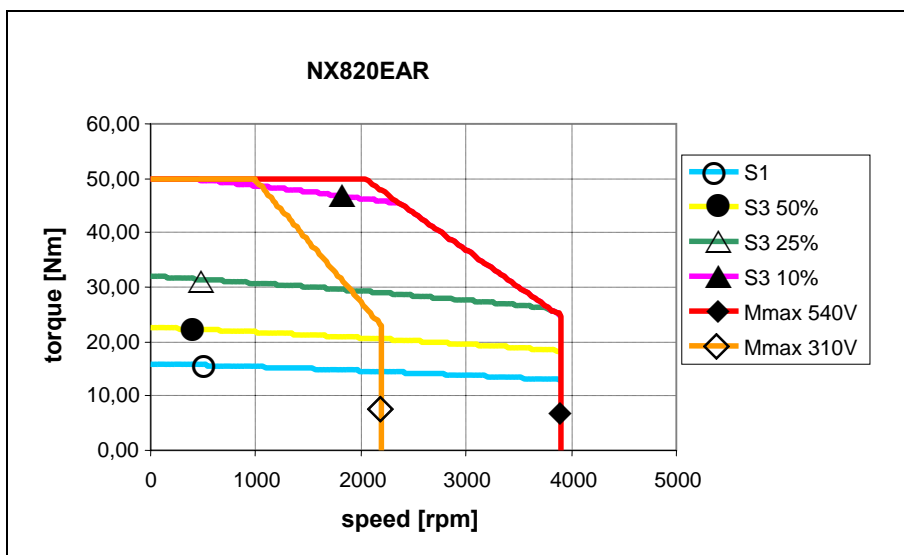
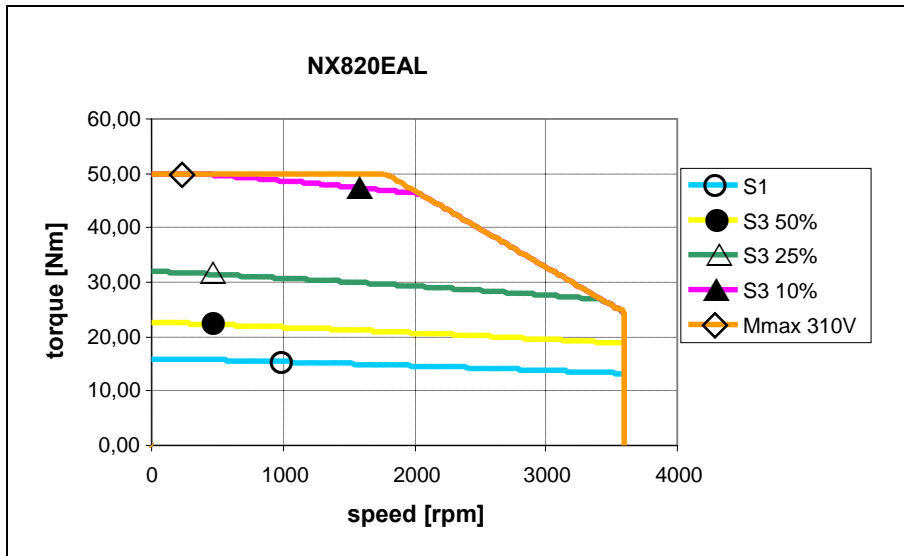
Torque/Speed Diagrams

Motor size 6



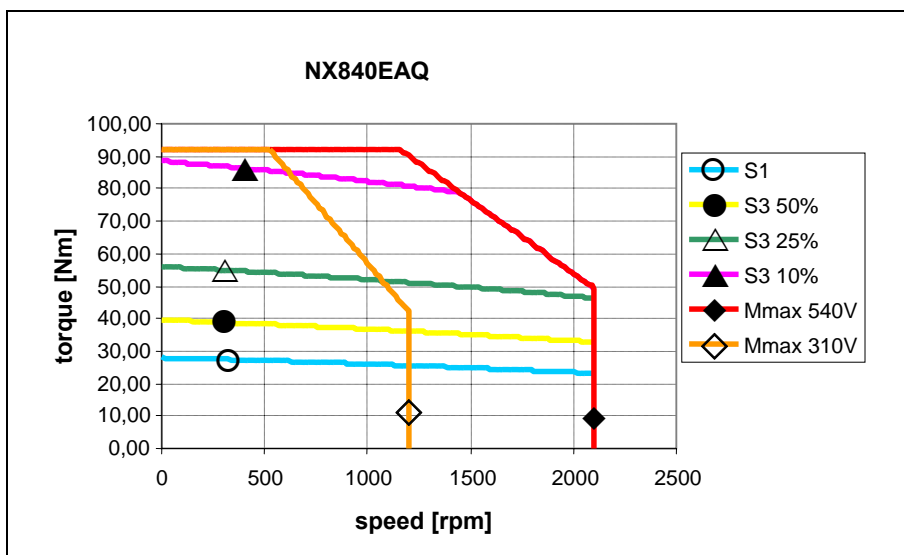
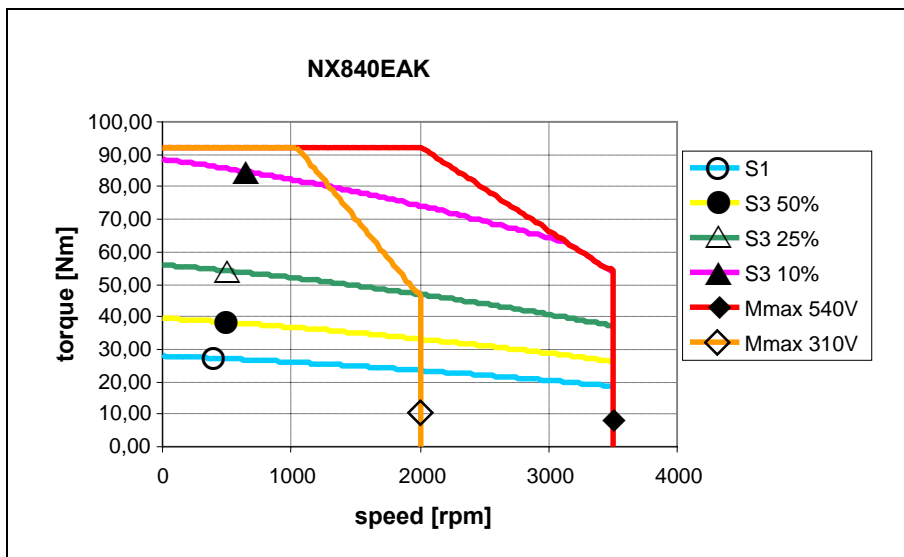
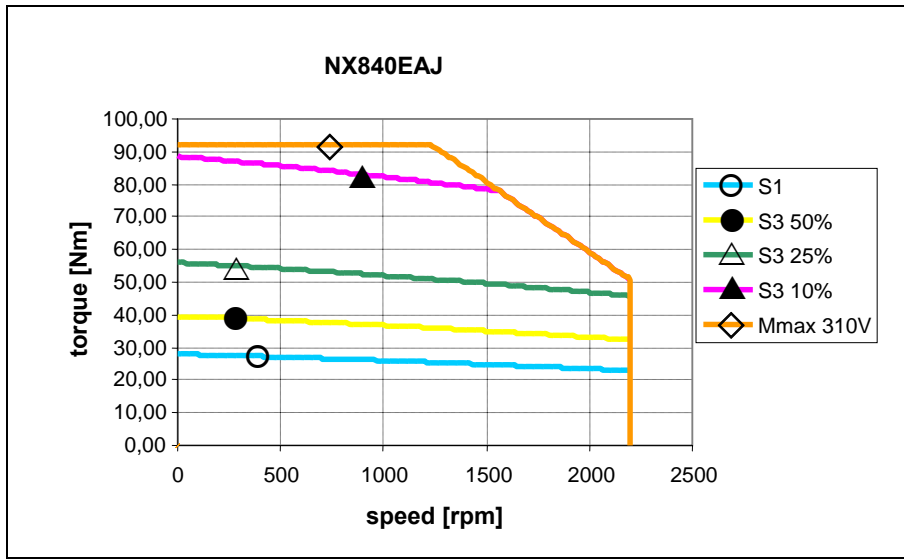
## Torque/Speed Diagrams

### 3.1.6 Motor size 8



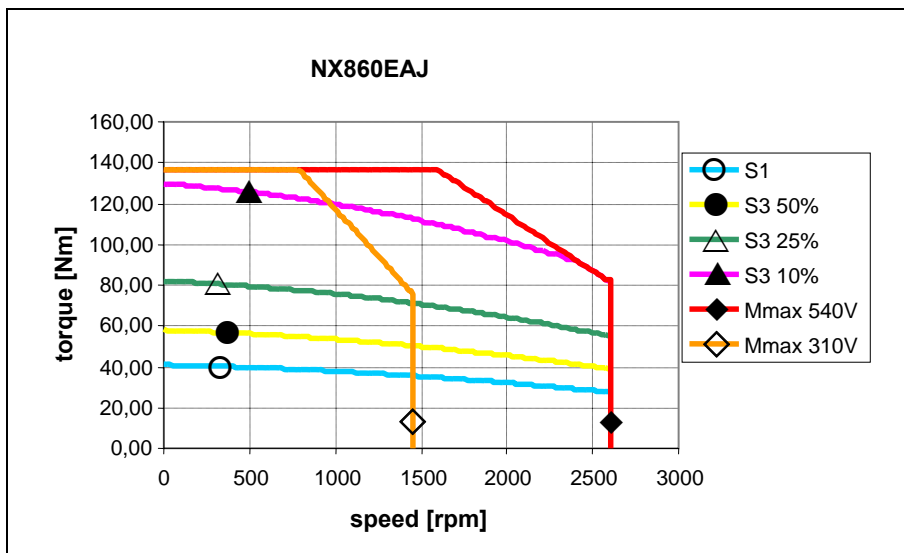
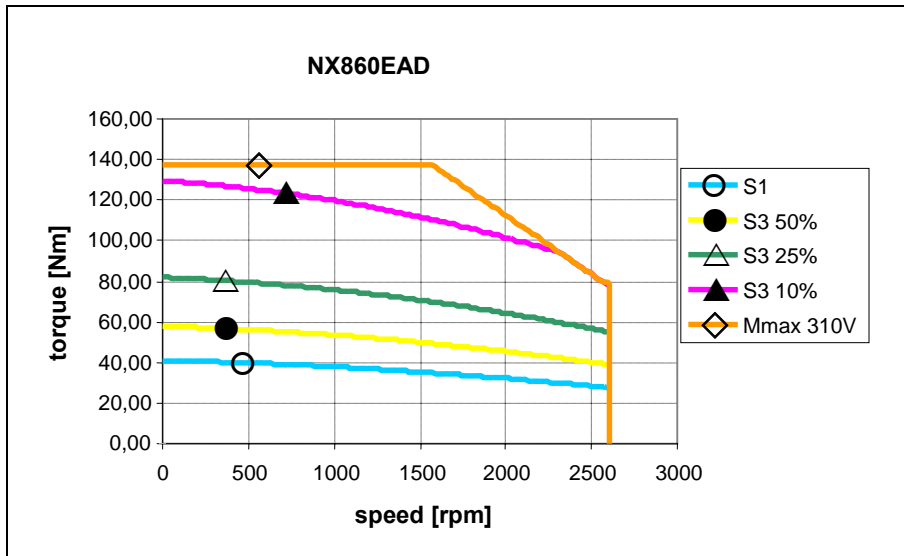
Torque/Speed Diagrams

Motor size 8



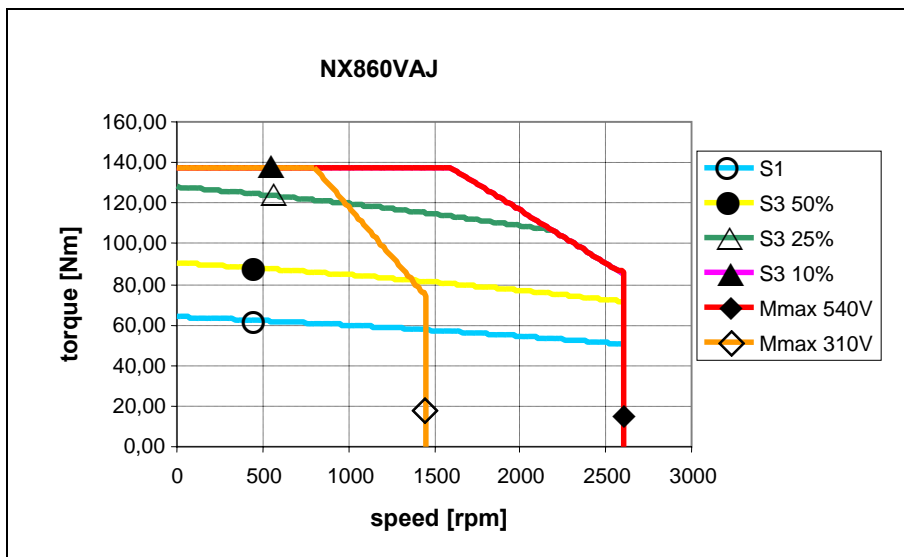
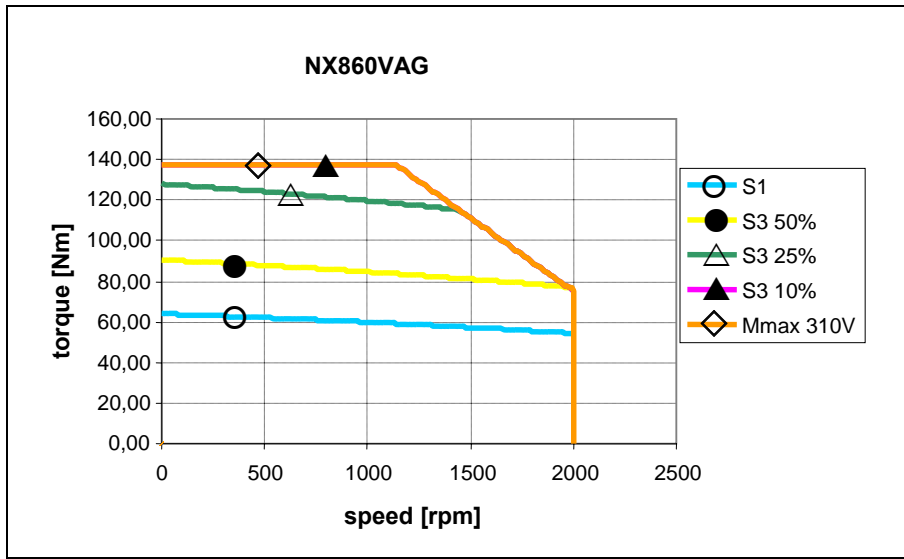
## Torque/Speed Diagrams

### Motor size 8

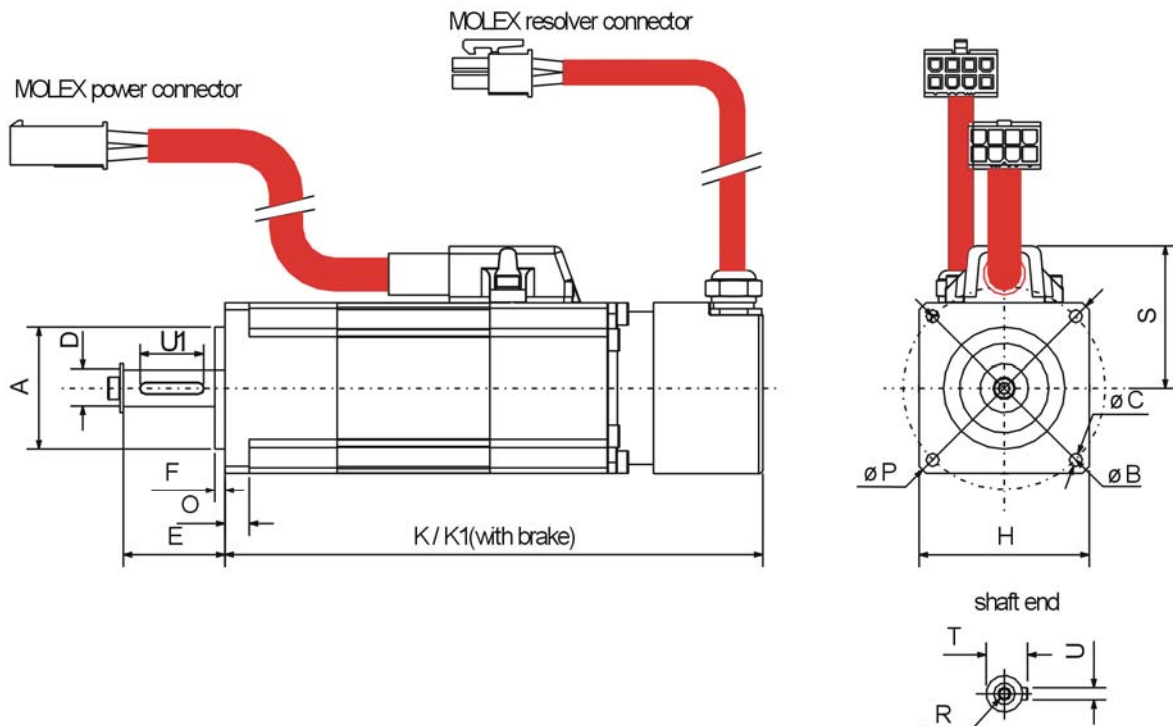


Torque/Speed Diagrams

3.1.6.1 Motor size 8 with ventilation



## 4.1 Standard design motor size NX1 and (option NX2)

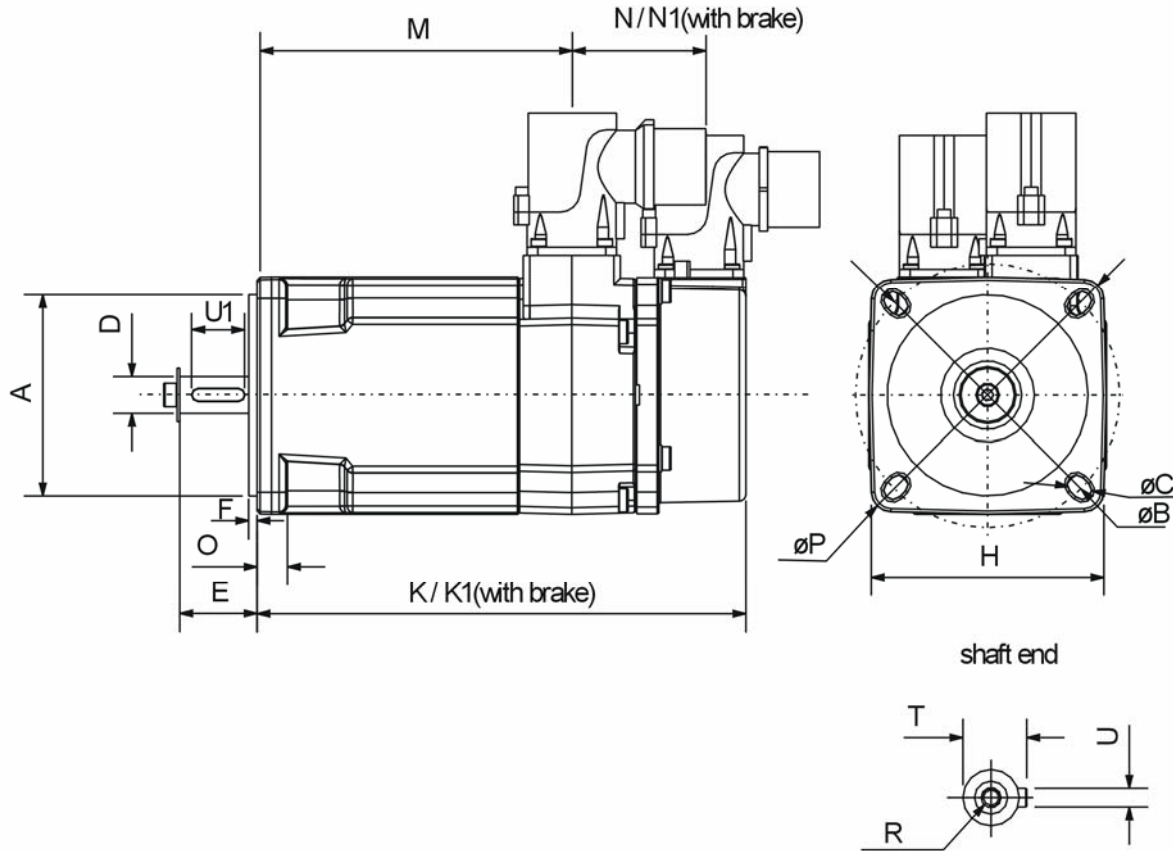


Standard cable length = appr. 30cm.

type	A	B	C	D	E	F	H	K	K1	O	P	R	S	T	U	U1
	j6			k6	$\pm 0,6$										h9	
<b>NX110</b>	30	50	3,2	9	25	2,5	42	133	164	6	57	M3x9	35	10,2	3	16
<b>NX210</b>	40	63	5,5	11	25	2,5	56	137	179	7,2	73	M4x10	42	12,5	4	16

All dimensions in "mm"

4.2 Standard design motor size NX2,NX3,NX4,NX6 and NX8 (without ventilation)

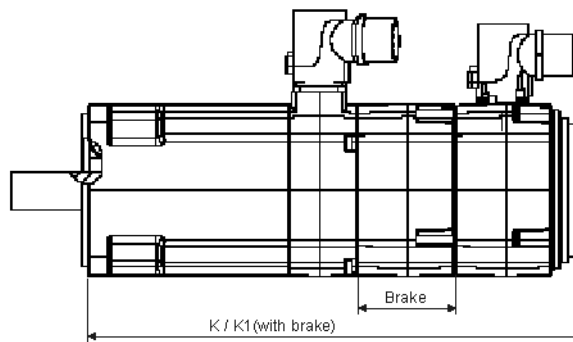


type	A j6	B	C	D k6	E ±0,6	F	H	K	K1	M	N	N1	O	P	R	S	T	U h9	U1
NX210	40	63	5,5	11	25	2,5	56	122	-	97	-	-	18	76	-	71	-	-	-
NX310	60	75-80	5,5	11	23	2,5	71	146	194	94	38	86	8,5	94	M4x10	84	12,5	4	16
NX420	80	100	7	19	40	3	91,5	175	226	120	40	91	10,5	118	M6x16	94	21,5	6	32
NX430	80	100	7	19	40	3	91,5	200	251	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	155	200	266	134	51	117	12	200	M12x28	120	35	10	50
NX840	130	165	12	32	58	3,5	155	260	326	194	51	117	12	200	M12x28	120	35	10	50
NX860	130	165	12	32	58	3,5	155	320	386	254	51	117	12	200	M12x28	120	35	10	50

All dimensions in "mm"

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

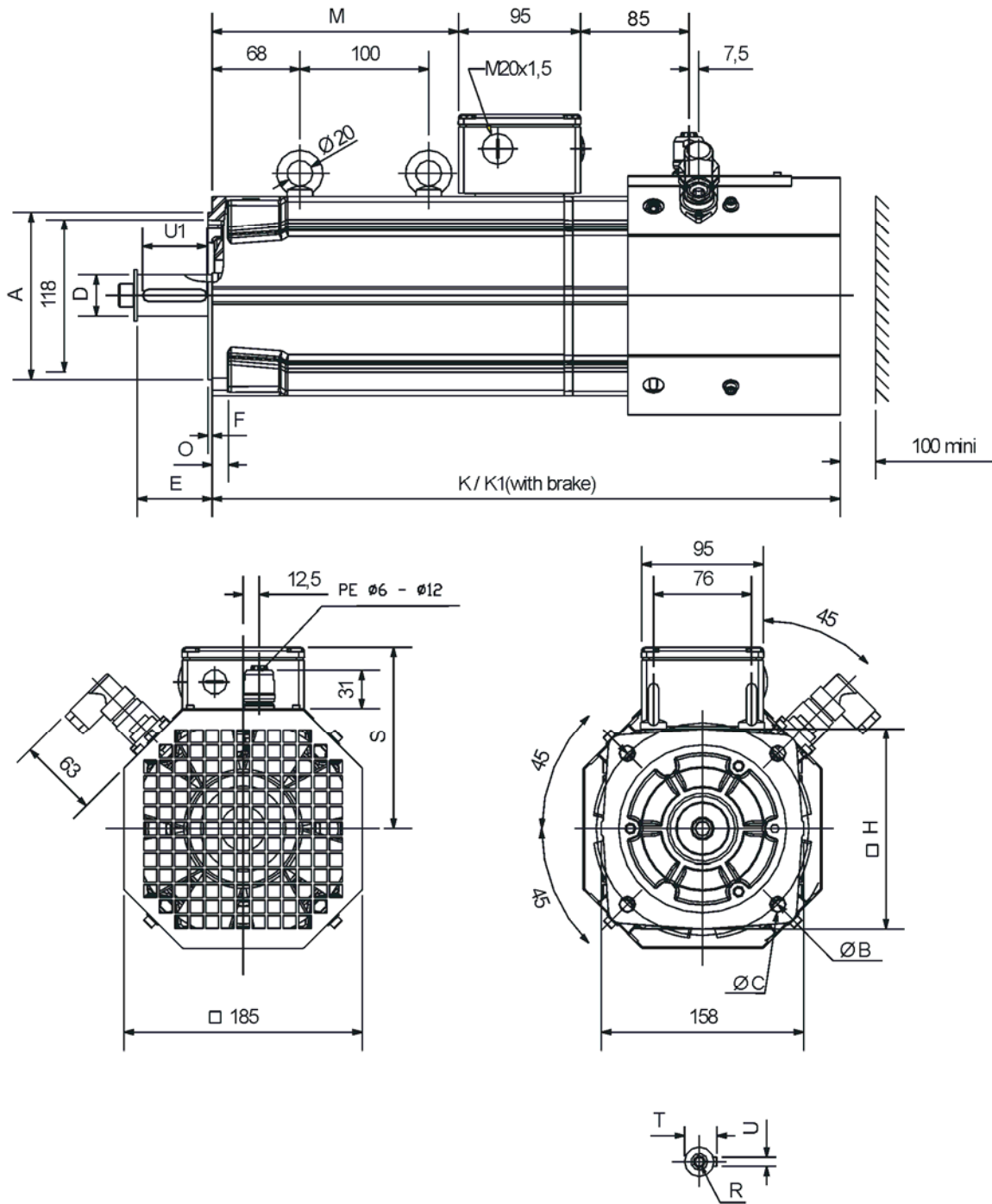
type	K	K1
NX310	173	199
NX420	205	256
NX430	230	281
NX620	214	268
NX630	243	297
NX820	236	282
NX840	296	342
NX860	356	402



other dimensions unchanged to standard design without HIPERFACE®



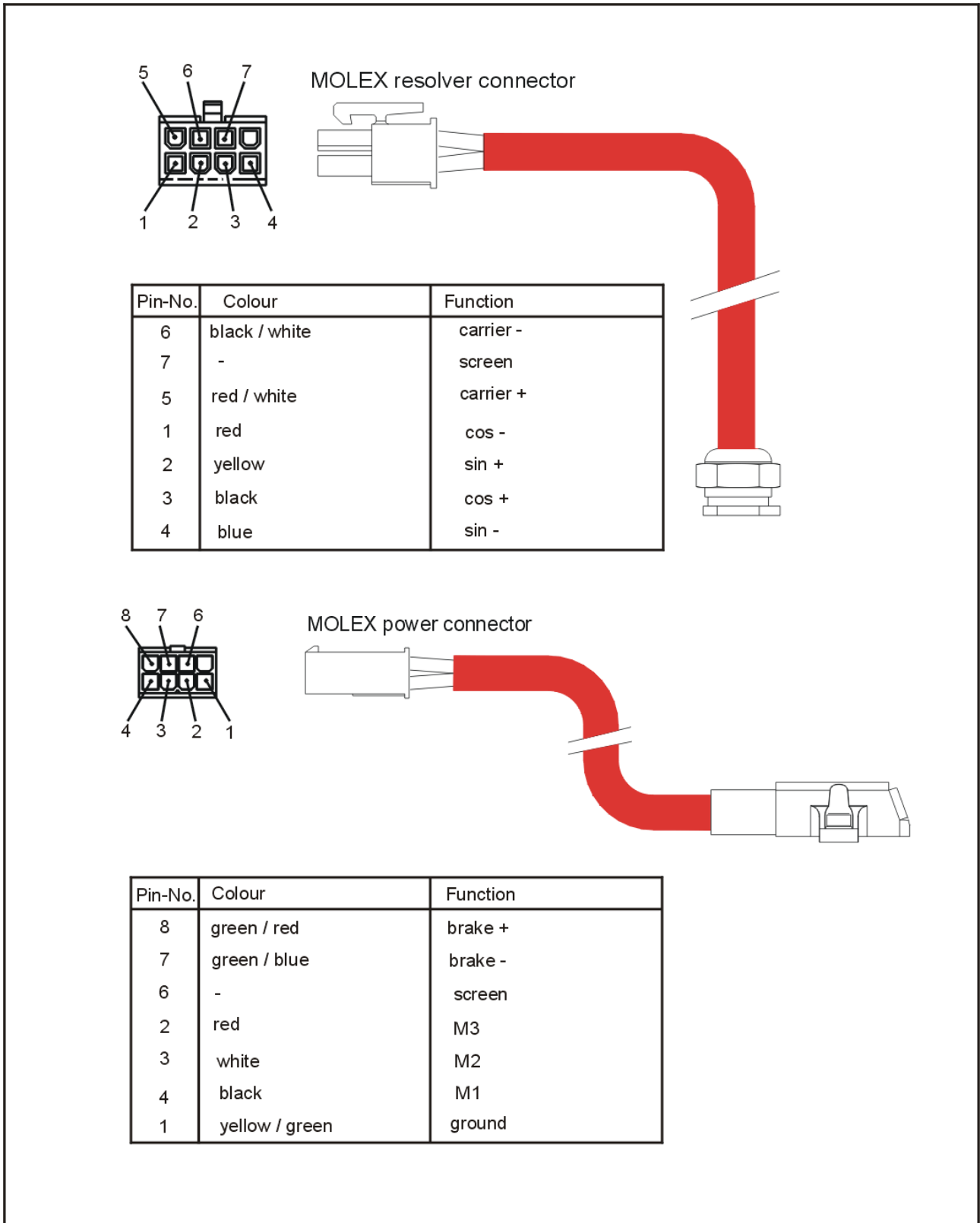
## 4.2.2 Standard design motor size NX8 with ventilation



type	A	B	C	D	E	F	H	K	K1	M	N	O	P	R	S	T	U	U1
NX860V	130	165	12	32	58	3,5	155	424	490	191	117	12	200	M12x28	142	35	10	50

All dimensions in "mm"

5.1 Connector NX1 and (option NX2)



## 5.2 Connector NX2 .. NX6 with resolver

**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 separation is required

				Maßstab / scale:			
				Typ / type:		KK MBT NX 3/6.K-xx.x/O	
				Bezeichnung / designation:		Orange motor cable (compact enclosure) for SSD Parvex standard motors and servo drives from SSD Drives	
				Zeichnungsnummer / drawing No:		Blatt sheet	
				Z-MK-6920-xxxx		1	
Zust. Änderung Datum Name Ursprung				Dateiname / File name: Z-MK-6920-E.cdr			

5.2.1 Connector NX8 with resolver

**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

**Power connector**

**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 separation is required

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

## 5.3 Connector NX2 .. NX6 with HIPERFACE® - encoder

**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

**Power connector**

**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	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 separation is required

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

5.3.1 Connector NX8 with HIPERFACE® - encoder

**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		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	connection not on terminal
B		blue	brake 0V DC	
C		brown	temperature	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 separation is required

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

## 5.4 X50 - connector NX2 .. NX6 with resolver

### X50 - connector

**motor side**

SSD Parvex - motor size 2...6

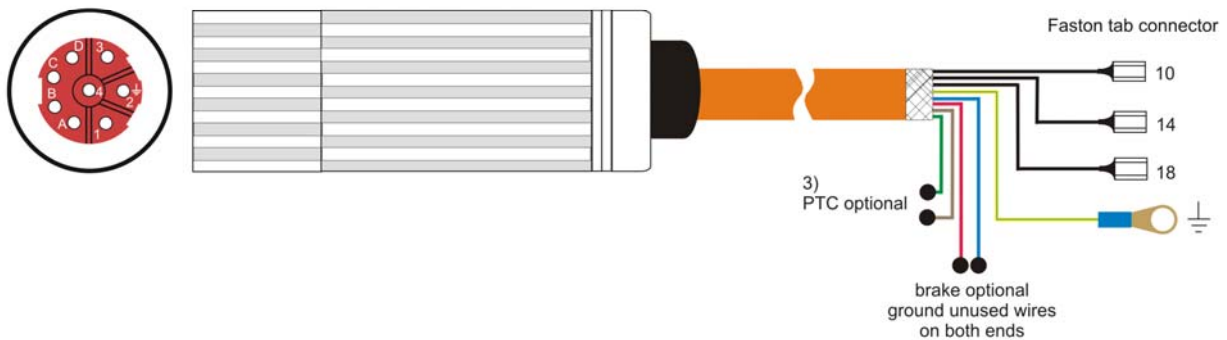
Type: NX ...

**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 separation is required

4)  
not in the scope of delivery

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

## 5.4.1 X50 - connector NX8 with resolver

### X50 - connector

**motor side**

SSD Parvex - motor size 8

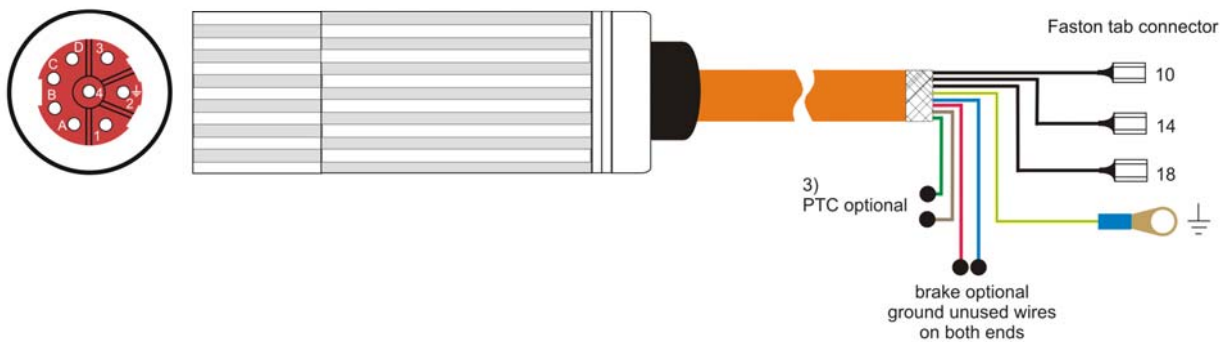
Type: NX ...

**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 separation 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			
Gep. 05.02.04 EH		Orange motor cable (plugs/terminal strip) for standard NX 8 motors and SSD Drives servo drives					
Norm		Zeichnungsnummer / drawing No: Z-MK-6931-xxxx					
Zust		Änderung		Datum		Name	
Ursprung		Dateiname / File name: Z-MK-6931-E.cdr		Blatt sheet		1	



## 5.5 X50 - connector NX2 .. NX6 with HIPERFACE® - encoder

**motor side**

SSD Parvex - motor size 2...6

Type: NX ...with HIPERFACE

**X50 - connector**

**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 separation is required

4) not in the scope of delivery

				Maßstab / scale:												
				Typ / type:		KK H MBT NX 3/6.R-xx.x/O										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Bear.</td> <td>22.10.04</td> <td>DL</td> </tr> <tr> <td>Gep.</td> <td>22.10.04</td> <td>EH</td> </tr> <tr> <td>Norm</td> <td></td> <td></td> </tr> </table>				Bear.	22.10.04	DL	Gep.	22.10.04	EH	Norm			Bezeichnung / designation:		Orange motor cable (plugs/terminal strip)for HIPERFACE NX motors and servo drives from SSD Drives	
				Bear.	22.10.04	DL										
				Gep.	22.10.04	EH										
Norm																
Zeichnungsnummer / drawing No:		Z-MK-6941-xxxx		Blatt sheet 1												
Dateiname / File name:		Z-MK-6941-E.cdr														

01	Size 2	04.11.04	DL	
Zust	Änderung	Datum	Name	Ursprung

5.5.1 X50 - Anschlussleiste NX8 with HIPERFACE® - encoder

X50 - connector

motor side

SSD Parvex - motor size 8

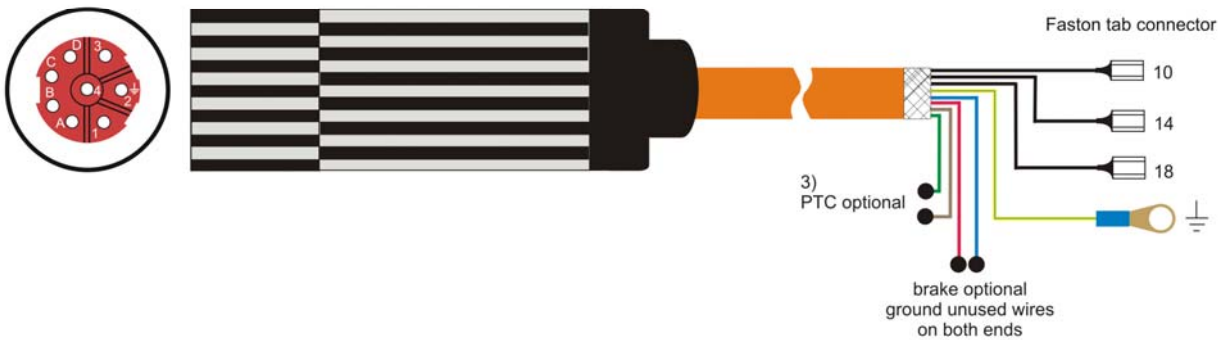
Type: NX ...with HIPERFACE

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 <sup>4)</sup>	
PIN - Nr.	colour	function	-
1	black 1	motor connection	10 12
2	<sup>1)</sup> yellow / green	ground connection	Ground
3	black 2	motor connection	18 20
4	black 3	motor connection	14 16
A	red	brake +24V DC <sup>2)</sup>	-
B	blue	brake 0V DC	-
C	brown	temperature <sup>3)</sup>	-
D	green	temperature	-
case	<sup>1)</sup>		case

<sup>1)</sup> The screen is connected at the connector pin and also to the connector shell



<sup>2)</sup> **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 separation is required

<sup>4)</sup> not in the scope of delivery

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

## 5.6 Resolver connector

### Resolver connector

**motor side**

SSD Parvex - motor size 2...8

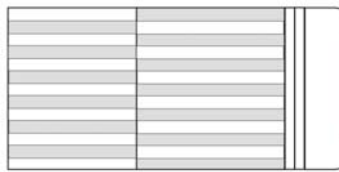
Type: NX ...

**regulator side**

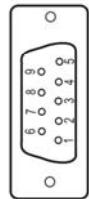
SSD Drives - servo drives

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

**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

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

5.6.1 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

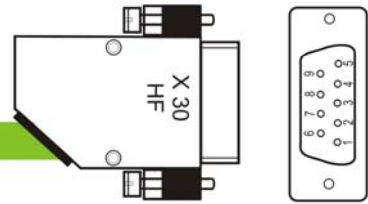
keying



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	
				Bear.	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:		Blatt sheet 1
01	keying	13.10.04	DL				Z-RK.8930.xxxx		
Zust	Änderung	Datum	Name	Ursprung	Dateiname / File name: Z-RK-8930-E.cdr				

## 5.7 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 valves 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 circuited on them with high frequency. Connect unused wires in cables on both ends to the equipment ground conductor.
7. Unshielded cables of a circuit, 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 valves. 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 aeriels.
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 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 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.

## 5.8 Plug designation

### 5.8.1 Mating plugs for motor- and brake connections

Size	Plug designation	Item - No.
NX1 and NX2	Molex	-
NX3...8	S MB GM2n Rn BG03/-C+L	ST.0100.3001

### 5.8.2 Mating plugs for resolver connection

Size	Plug designation	Item - No.
NX1 and NX2	Molex	-
NX2...8	SIR	ST.0200.0001

### 5.8.3 Mating plugs for HIPERFACE connection

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

## 5.9 Cable designation

### 5.9.1 Motor-cable

Size	Cable designation	Item - No.
NX1 and NX2	on request	-
NX2...6	KMBT BG0/2-O-K-ULSA	KA.0003.6305
NX8	KMBT BG3-O-K-ULSA	KA.0003.6306

### 5.9.2 Resolver and HIPERFACE cable

Size	Cable designation	Item - No.
NX1 and NX2	on request	-
NX2...8	KIR - G - UL	KA.0001.6302

**optional**

holding brake	motor size	holding torque	max. current	moment of inertia	weight
Typ:	BG	M <sub>BrH</sub> (20° C)	I <sub>max</sub>	J <sub>Br</sub>	m <sub>Br</sub>
	( - )	(Nm)	(A)	(kg cm <sup>2</sup> )	(g)
NX1	1	0,75	0,25	0,0034	65
NX2	2	1,50	0,33	0,0170	170
NX3	3	2,50	0,46	0,0680	180
NX4	4	5,50	0,50	0,1800	300
NX6	6	9,00	0,75	0,5400	460
NX8	8	36,00	0,83	5,5600	3500

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

**Fail-safe holding brake**

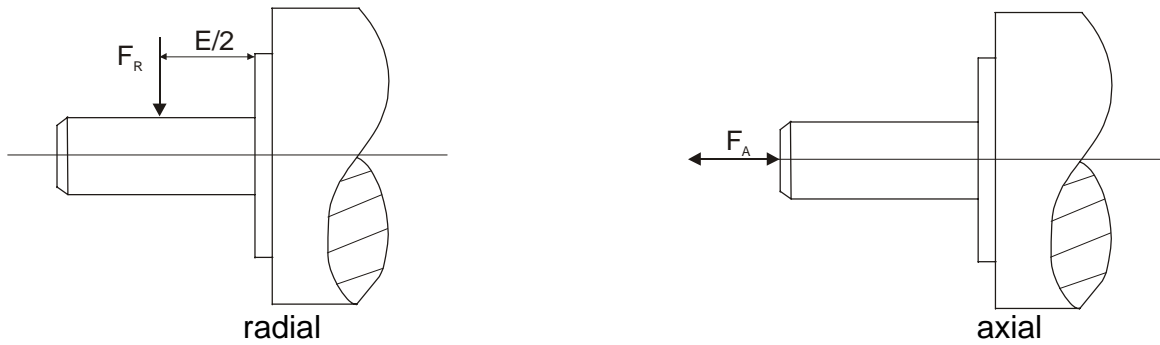
- 24 VDC +/-10% supply voltage
- Static use: Motor locking in the stopped position
- Dynamic use: For emergency stopping only. Dynamic torque is approximately half the holding torque and the number of switching operations is limited.

**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 Notation of definition



### 7.2 Technical data of the max. radial $F_R$ (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	60
NX210..	300	175
NX310..	360	200
NX420..	720	240
NX430..	820	240
NX620..	820	520
NX630..	860	540
NX820..	1500	380
NX840..	1550	440
NX860..	1600	470

The specifications refer to 20000 hours of operation !

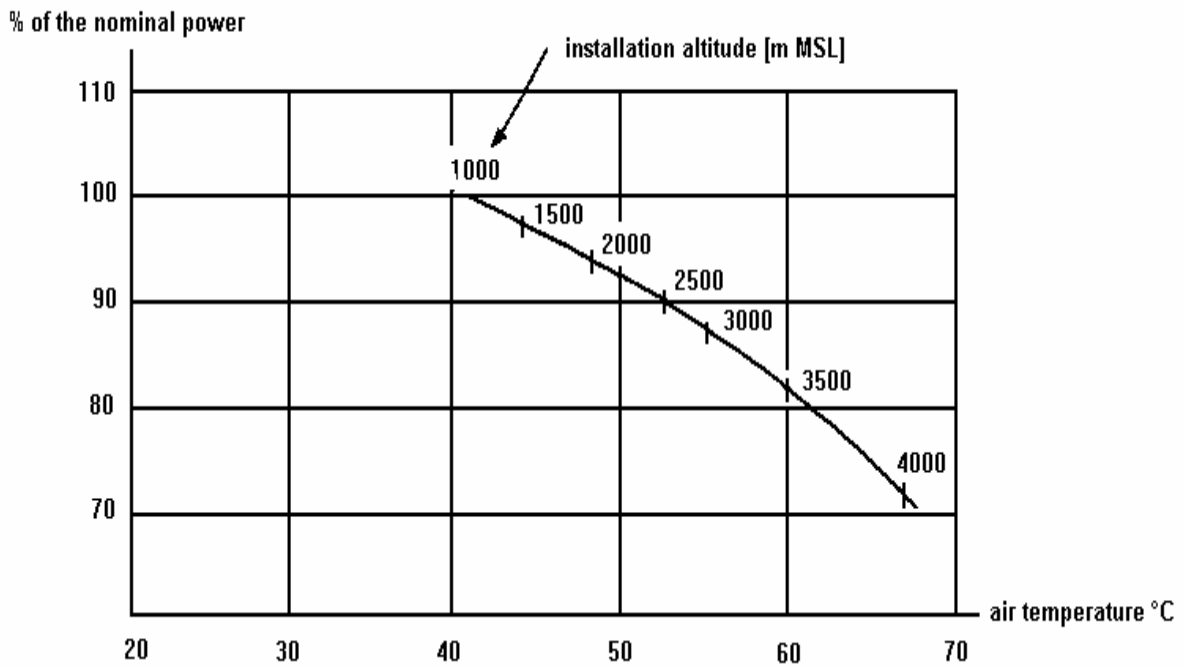


When selecting an adequate motor the following is to be considered:

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

Page 1 of 2



*Issued to:* **PARVEX S A**  
 8 AVE DU LAC  
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*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**

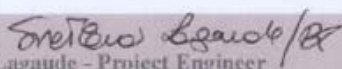
*Additional Information:*

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.

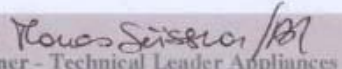
The UL Recognized Component Mark for the U.S. generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark:  may be used in conjunction 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

Any information and documentation provided to you involving UL Mark services are provided in behalf of Underwriters Laboratories Inc.  
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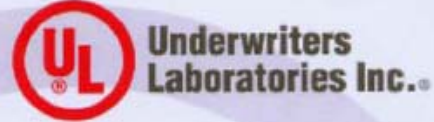
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## Certificate of Compliance

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

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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-	2 2	3.3 4.6 2.2	7600 100
	480		3.1	7600 100
NX420	230 400-	4 4	5.8 7.7 4	6000 100
	480		5.3	6000 100
NX430	230 400-	5.5 5.5	8 10.6 5.1	6000 100
	480		6.7	6000 100
NX620	230 400-	8 8	8.7 14 5 11	6000 100
	480			6000 100
NX630	230 400-	12 12	10 14 5.7	6000 100
	480		14	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).

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 Svetlana Lagaude - Project Engineer  
 UL International France SA  
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Reviewed by: *Thomas Sussner*  
 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

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