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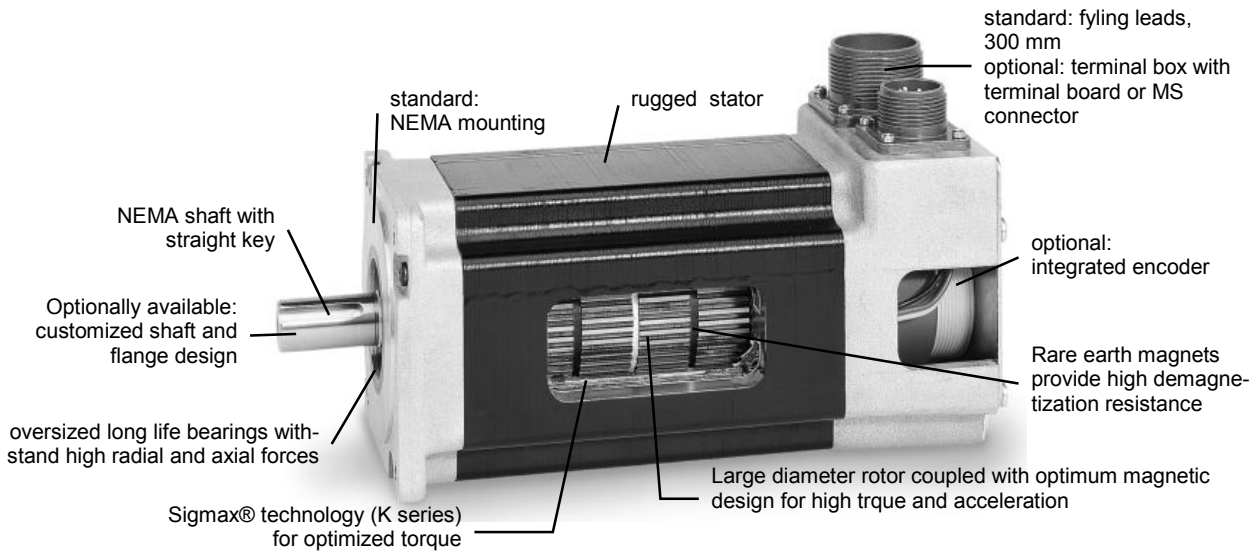
High Performance Stepper Motors **POWERPAC™**



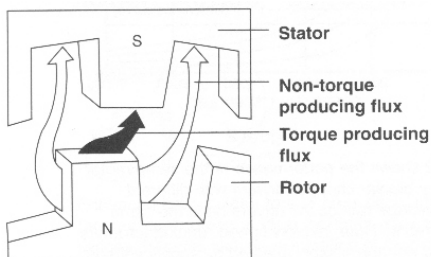
- **2-phase hybrid stepper motor in size NEMA 34 and NEMA 42**
- **Full steps per revolution angle 1,8°**
- **Rugged stator design for holding torques up to over 30Nm**
- **Optimized magnetic design for increased performance**
- **Protection class IP 44 (optional IP 65, with terminal box)**
- **Longlife steel bearing bore in front bell**
- **Optimized housing design for cooling**
- **Several options such as encoder, holding brake and connectors available**

The POWERPAC™ rugged NEMA 34 and NEMA 42 frame hybrid steppers provide an excellent torque to frame size ratio. Optimized magnetics in combination with a new rotor/stator design produce more torque and a higher acceleration. This unique design also features low detent torque for smoother microstepping. Stepper motors equipped with additional magnets in the stator slots for additional torque increase at identical motor size are optionally available (K series, data available separately upon request).

POWERPAC™ Motor Design

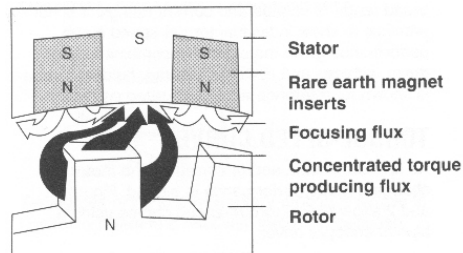


N Series Standard Hybrid Step Motor



Typical path of flux transfer in an energized conventional hybrid step motor. Some flux leakage occurs in normal operation.

K Series Sigmax® Hybrid Step Motor



Patented Sigmax® technology redirects magnetic flux to inhibit leakage and optimize torque production.

Technical Data NEMA 34 - N Series

N31HxFy-LNK-NS-00			H	J	K	L
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	4,5	4,5	4,7	4,6
Rated current per winding (bipolar/parallel)	I	A	2,8	5,5	6,6	8,6
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	3,1	0,84	0,58	0,36
Winding inductance	L _{ph}	mH	12,5	3,5	2,6	1,14
Detent torque	M _P	Nm	0,13	0,13	0,13	0,13
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	0,14	0,14	0,14	0,14
Mass	M	kg	2,3	2,3	2,3	2,3
Length	L	mm	112,8	112,8	112,8	112,8
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

Please replace the y in the item number by the letter of the requested winding.

N32HxFy-LNK-NS-00			J	K	L	M
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	8,4	8,8	8,5	8,6
Rated current per winding (bipolar/parallel)	I	A	5,1	6,1	8,1	10,0
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,27	0,9	0,57	0,35
Winding inductance	L _{ph}	mH	6,5	5,1	2,6	1,8
Detent torque	M _P	Nm	0,25	0,25	0,25	0,25
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	0,27	0,27	0,27	0,27
Mass	M	kg	3,8	3,8	3,8	3,8
Length	L	mm	151,4	151,4	151,4	151,4
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

Please replace the y in the item number by the letter of the requested winding.

N33HxFy-LNK-NS-00

			J	K	L	M
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	12,1	12,4	13,0	12,1
Rated current per winding (bipolar/parallel)	I	A	5,0	6,1	9,0	9,9
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,65	1,12	0,53	0,44
Winding inductance	L _{ph}	mH	9,0	6,4	3,4	2,3
Detent torque	M _P	Nm	0,38	0,38	0,38	0,38
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	0,4	0,4	0,4	0,4
Mass	m	kg	5,4	5,4	5,4	5,4
Length	L	mm	155,7	155,7	155,7	155,7
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

Please replace the y in the item number by the letter of the requested winding.

N34HxFy-LNK-NS-00

			J	K	L	M
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	15,3	14,36	15,4	15,1
Rated current per winding (bipolar/parallel)	I	A	5,5	6,0	8,7	11,3
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,6	1,35	0,66	0,41
Winding inductance	L _{ph}	mH	11,5	8,1	4,7	2,6
Detent torque	M _P	Nm	0,4	0,4	0,4	0,4
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	0,53	0,53	0,53	0,53
Mass	m	kg	6,8	6,8	6,8	6,8
Length	L	mm	195,1	195,1	195,1	195,1
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

Please replace the y in the item number by the letter of the requested winding.

Technical Data NEMA 42 - N Series

N41HxFy-LNK-NS-00			J	L	M
<i>Motor Data</i>					
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	11,5	11,5	11,7
Rated current per winding (bipolar/parallel)	I	A	5,5	8,7	10,7
<i>Technical Data</i>					
Full steps per revolution				200	
Step angle		°	1,8	1,8	1,8
Angular accuracy		%	3	3	3
Phases			2	2	2
Winding resistance	R _{ph}	Ω	1,16	0,47	0,31
Winding inductance	L _{ph}	mH	10,1	3,4	2,8
Detent torque	M _P	Nm	0,3	0,3	0,3
Insulation class			B	B	B
Insulation inductance				100MΩ @ 500V _{DC}	
Dielectricity test				500V _{DC} 1min	
<i>Mechanical Data</i>					
Rotor inertia	J	Kgm ² *10 ⁻³	0,55	0,55	0,55
Mass	m	kg	5,0	5,0	5,0
Length	L	mm	132,1	132,1	132,1
Ambient temperature		°C		-20 to +40	
Max. surface temperature		°C		95	
Protection class				IP 43	

Please replace the y in the item number by the letter of the requested winding.

N42HxFy-LNK-NS-00			K	L	M	N
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	21,9	21,8	22,2	22,1
Rated current per winding (bipolar/parallel)	I	A	6,4	8,1	9,9	15,8
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,2	0,75	0,51	0,21
Winding inductance	L _{ph}	mH	12,8	7,8	5,5	2,1
Detent torque	M _P	Nm	0,59	0,59	0,59	0,59
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	1,09	1,09	1,09	1,09
Mass	m	kg	8,3	8,3	8,3	8,3
Length	L	mm	183,4	183,4	183,4	183,4
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

Please replace the y in the item number by the letter of the requested winding.

N43HxFy-LNK-NS-00

K L M N

Motor Data

Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	30,6	30,0	30,5	30,8
Rated current per winding (bipolar/parallel)	I	A	6,2	8,0	9,9	15,4

Technical Data

Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	3	3	3	3
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,65	0,99	0,66	0,28
Winding inductance	L _{ph}	mH	19,6	11,0	7,7	3,2
Detent torque	M _P	Nm	0,75	0,75	0,75	0,75
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		

Mechanical Data

Rotor inertia	J	Kgm ² *10 ⁻³	1,62	1,62	1,62	1,62
Mass	m	kg	11,6	11,6	11,6	11,6
Length	L	mm	234,4	234,4	234,4	234,4
Ambient temperature		°C		-20 to +40		
Max. surface temperature		°C		95		
Protection class				IP 43		

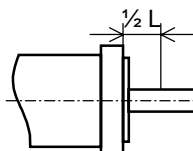
Please replace the y in the item number by the letter of the requested winding.

Standard Version

- NEMA 34 and NEMA 42
- Shaft with straight keyway
- 8 flying leads for serial or parallel connection
- single shaft (version ...-LNN-...)
- alternative with double shaft (version ...-LDN-...)
- CE certification
- UL certification (motor insulation class B, File E03510)

Further types and options for this series as well as stepper drives and other accessories are available upon request.

Radial and Axial Shaft Loading



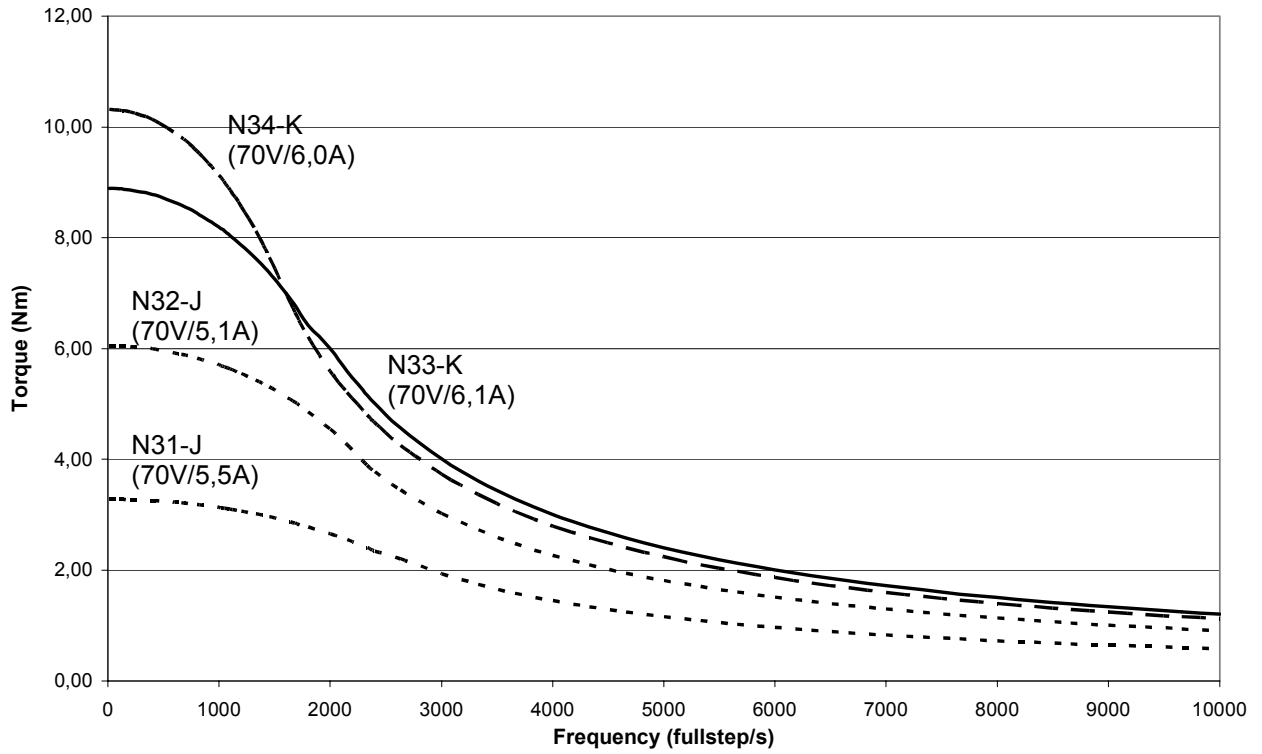
regarding to half the shaft length distance to the bearing

Motor size	Max. axial load	Max. radial load
31, 32	1355N	290N
33, 34	1355N	490N
41	1800N	560N
42, 43	1800N	490N

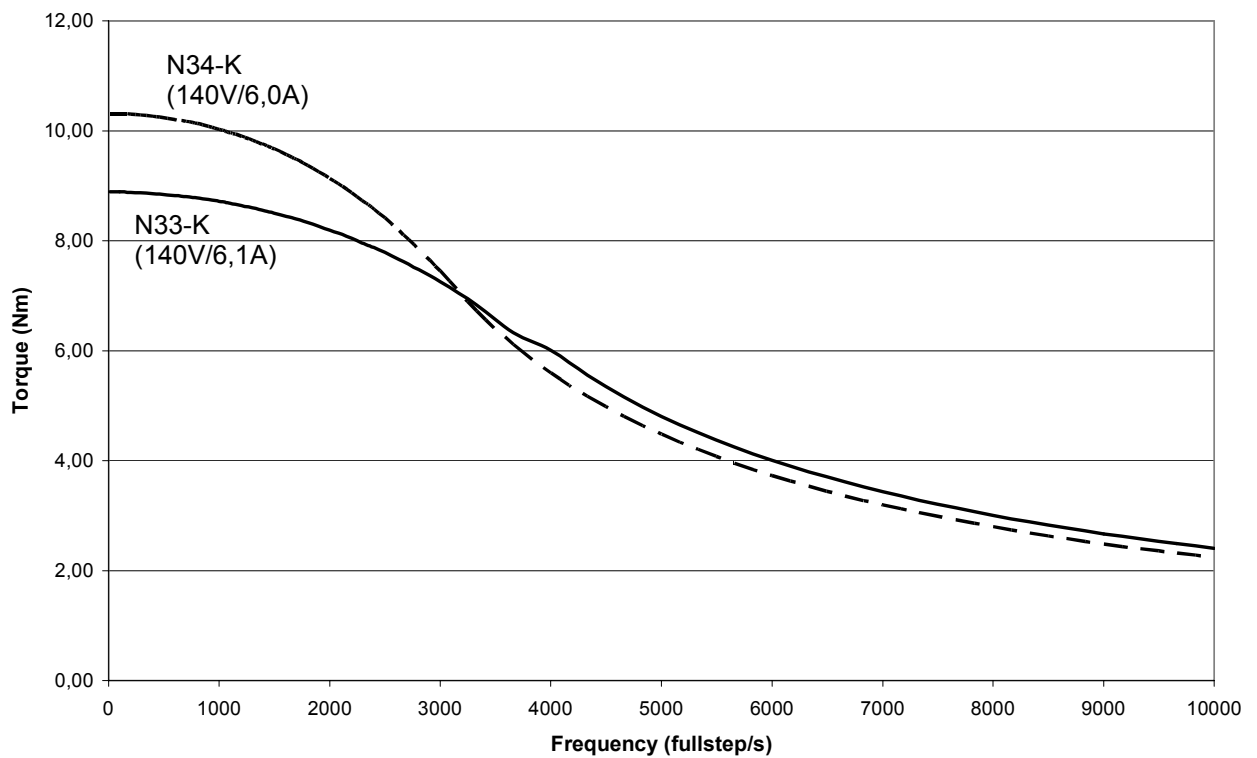
Torque Characteristics

(connection bipolar, parallel)

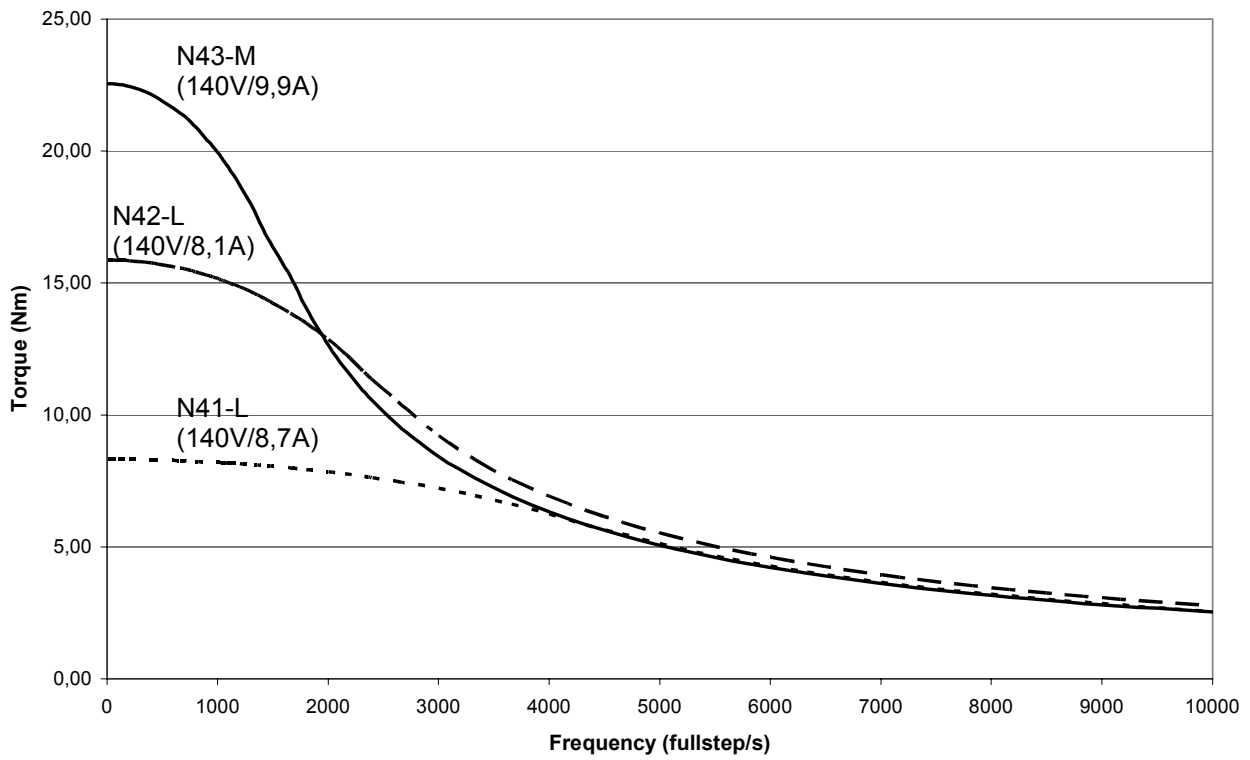
Size N3 (selected windings, at 70V)



Size N3 (selected windings, at 140V)



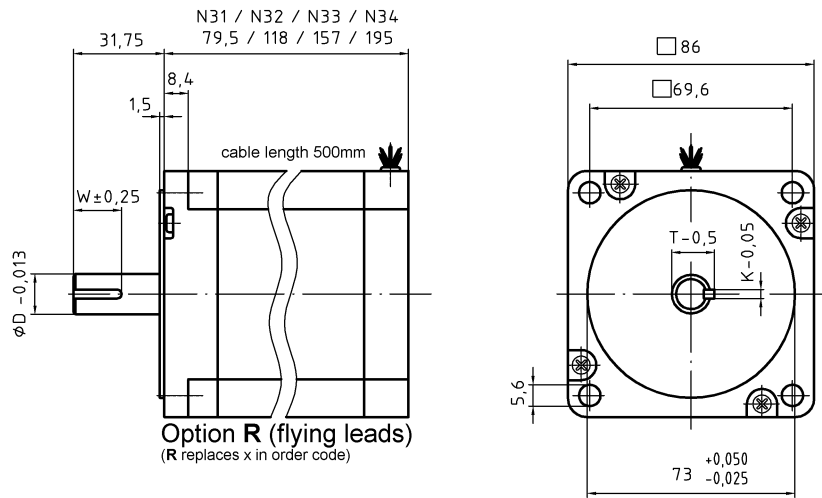
Size N4 (selected windings)



Dimensions Size N3 (NEMA 34)

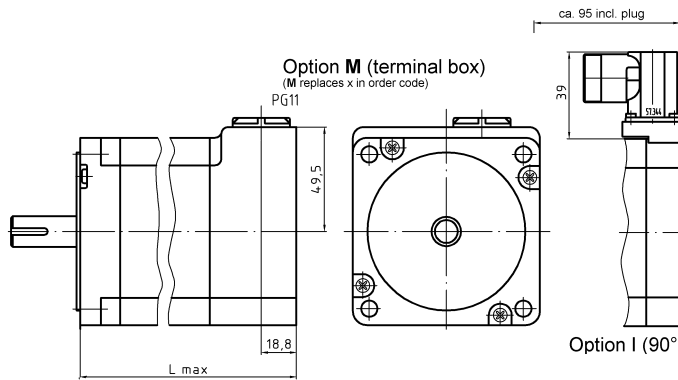
all measures in mm

Standard Version



Option R (flying leads)
(R replaces x in order code)

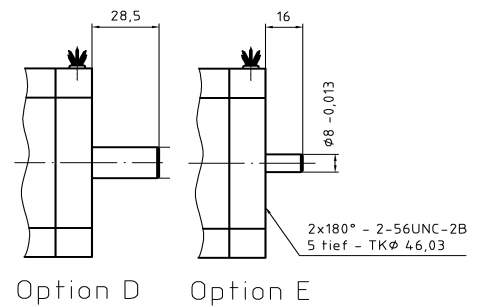
Connector Options



Option M (terminal box)
(M replaces x in order code)

Option I (90°)

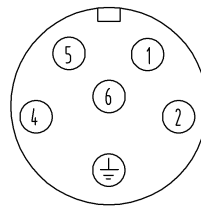
Shaft Options



Option D

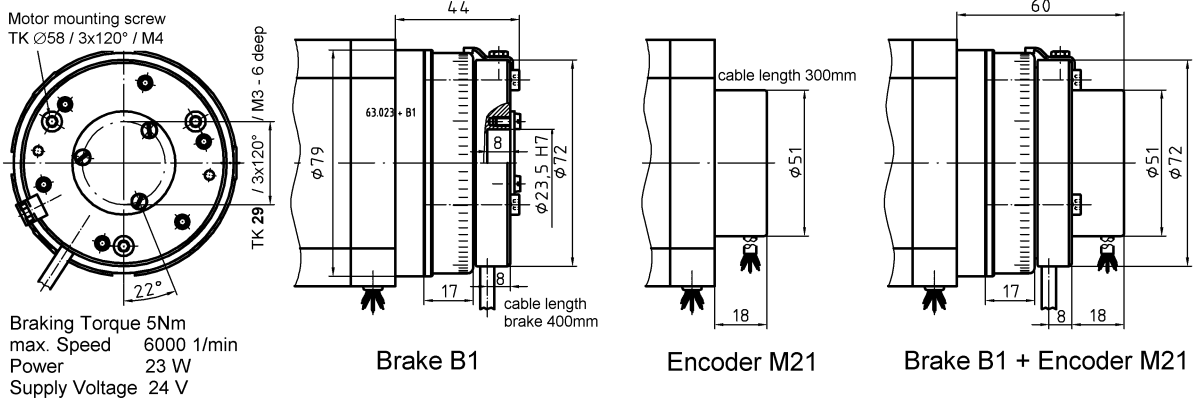
Option E

Type	L _{max}	∅D -0,013	Keyway		
			W	T	K
N31	112,8	12,7	23,82	14,1	3,175
N32	151,4	12,7			
N33	190	15,875	24,61	17,9	4,763
N34	228,4	15,875			



PIN-No.	Wiring	
	parallel	serial
1	black/white + orange	black
2	orange/white + black	orange
4	red/white + yellow	yellow
5	yellow/white + red	red
	PE	PE

Mounting Options



Motor mounting screw
TK ∅58 / 3x120° / M4

Braking Torque 5Nm
max. Speed 6000 1/min
Power 23 W
Supply Voltage 24 V

Brake B1

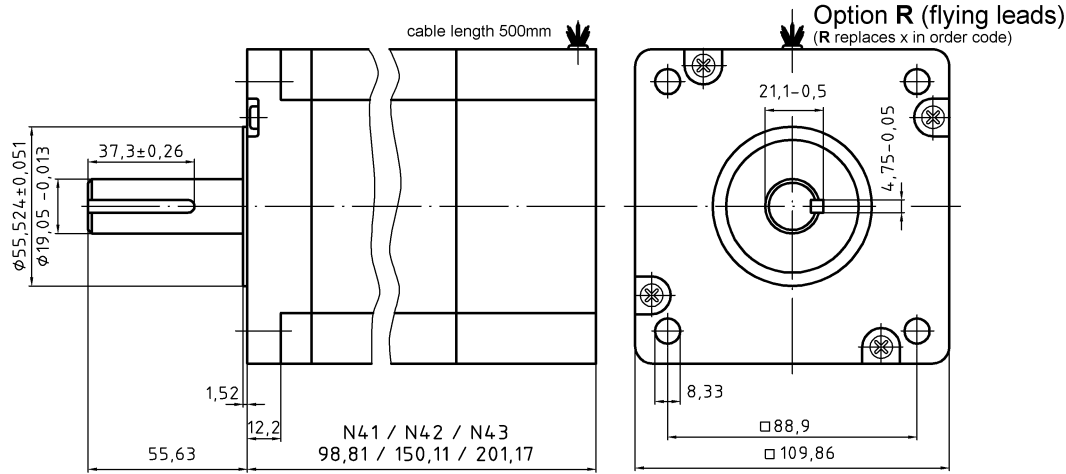
Encoder M21

Brake B1 + Encoder M21

Dimensions Size N4 (NEMA 42)

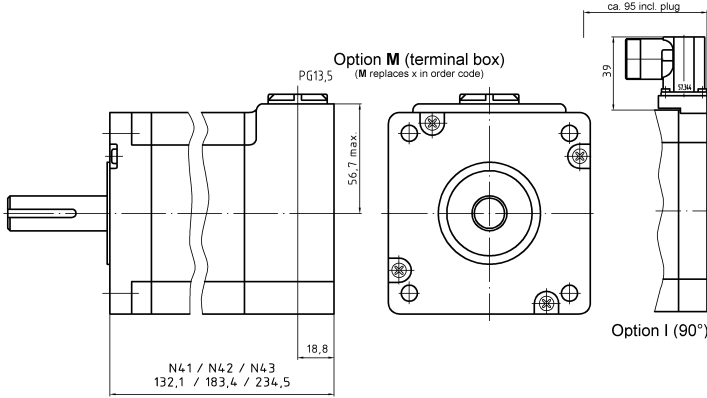
all measures in mm

Standard Version

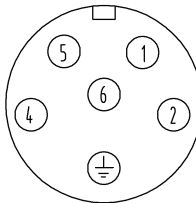
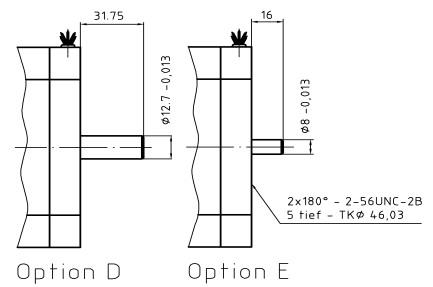


Option R (flying leads)
(R replaces x in order code)

Connector Options

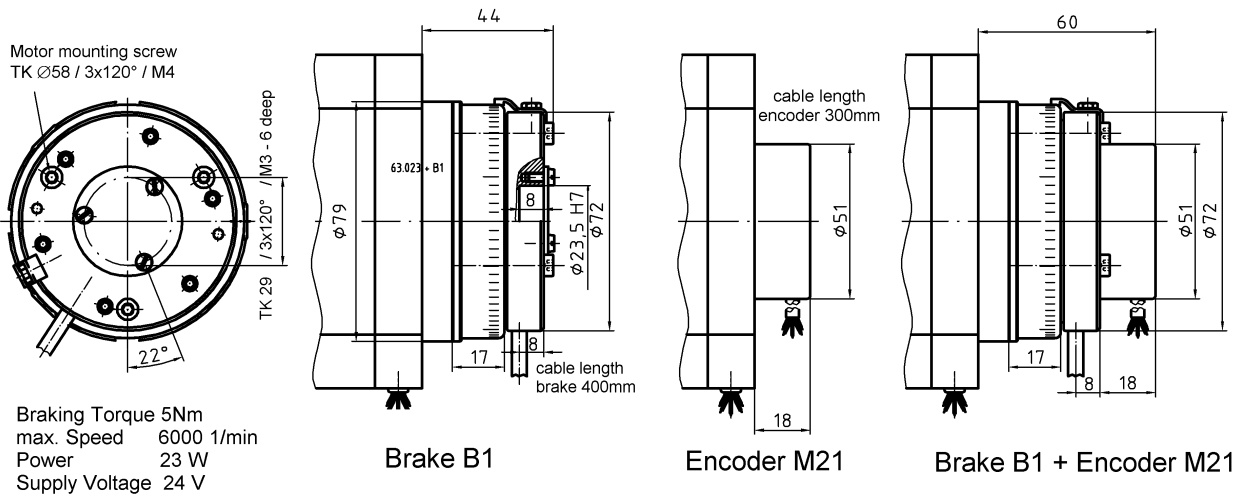


Shaft Options



PIN-No.	Wiring	
	parallel	serial
1	black/white + orange	black
2	orange/white + black	orange
4	red/white + yellow	yellow
5	yellow/white + red	red
	PE	PE

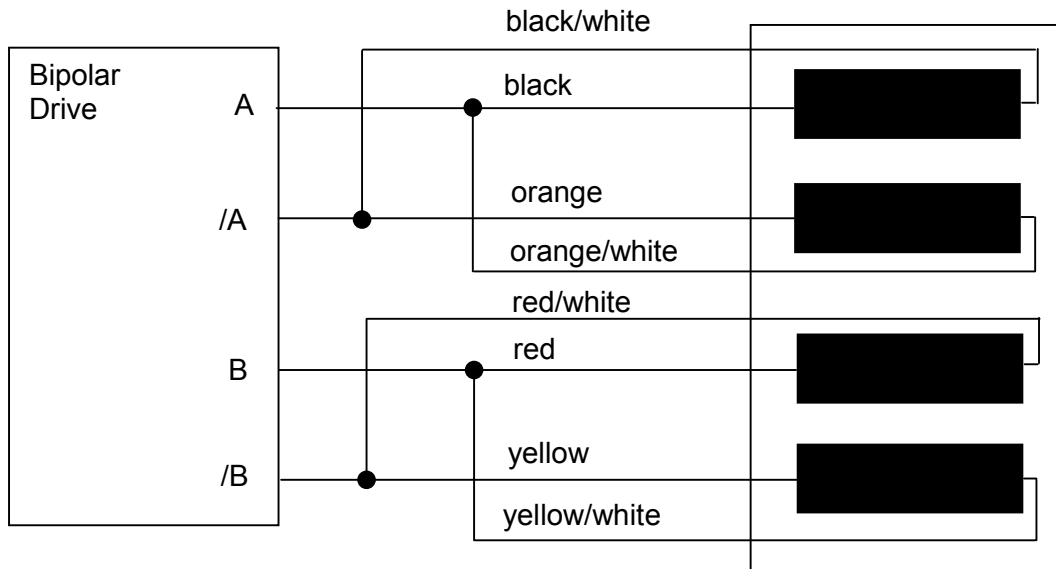
Mounting Options



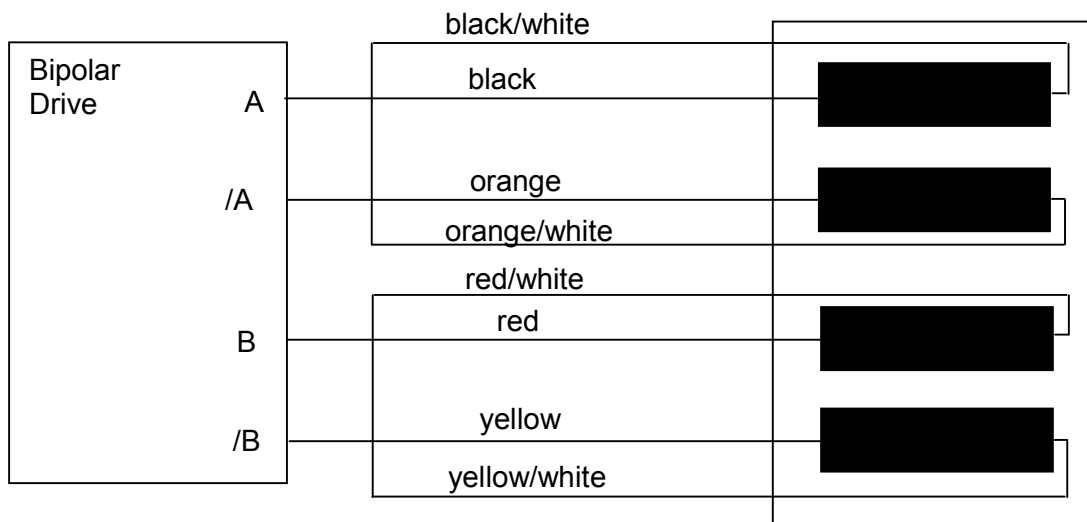
Braking Torque 5Nm
max. Speed 6000 1/min
Power 23 W
Supply Voltage 24 V

Terminal Assignment

8 Leads parallel:



8 Leads seriell:



Note: At motors with 4 leads only the black, orange, red and yellow leads are coming out of the motor.

Sales and Service

We are committed to quality customer service. In order to serve you in the most effective way please contact your local sales representative for assistance.

If you do not know the local sales representative please contact our customer support.

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Visit the european Danaher Motion Website at www.DanaherMotion.net for further information about Danaher Motion and our product range.

Technical Data (Standard Types)

Edition 11/2003

Powerpac-K-GB-1103.doc

POWERPAC™ K Series (SIGMAX®)

Supplementary Sheet for Powerpac-GB-1103

Technical Data K Series (SIGMAX®) - NEMA 34

K31HxFy-LNK-NS-00			FH	FJ	FK	FL	HP
<i>Motor Data</i>							
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	5,7	5,8	6,0	5,9	5,9
Rated current per winding (bipolar/parallel)	I	A	2,8	5,5	6,6	8,6	2,8
Rated voltage	U _{DC}	V	170	170	170	170	325
<i>Technical Data</i>							
Full steps per revolution					200		
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	3,1	0,84	0,58	0,36	1,55
Winding inductance	L _{ph}	mH	10,2	2,8	2,1	1,2	10,2
Detent torque	M _P	Nm	0,18	0,18	0,18	0,18	0,18
Insulation class			B	B	B	B	B
Insulation inductance					100MΩ @ 500V _{DC}		
Dielectricity test					500V _{DC} 1min		
<i>Mechanical Data</i>							
Rotor inertia	J	Kgm ² *10 ⁻³	0,14	0,14	0,14	0,14	0,14
Mass	m	kg	2,3	2,3	2,3	2,3	2,3
Length	L	mm	112,8	112,8	112,8	112,8	112,8
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		
K32HxFy-LNK-NS-00			FJ	FK	FL	FM	HP
<i>Motor Data</i>							
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	10,7	11,15	10,7	10,8	10,7
Rated current per winding (bipolar/parallel)	I	A	5,1	6,1	8,1	10,0	3,3
Rated voltage	U _{DC}	V	170	170	170	170	325
<i>Technical Data</i>							
Full steps per revolution					200		
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	1,27	0,9	0,52	0,35	1,5
Winding inductance	L _{ph}	mH	5,1	4,0	2,0	1,4	11,8
Detent torque	M _P	Nm	0,35	0,35	0,35	0,35	0,35
Insulation class			B	B	B	B	B
Insulation inductance					100MΩ @ 500V _{DC}		
Dielectricity test					500V _{DC} 1min		
<i>Mechanical Data</i>							
Rotor inertia	J	Kgm ² *10 ⁻³	0,27	0,27	0,27	0,27	0,27
Mass	m	kg	3,8	3,8	3,8	3,8	3,8
Length	L	mm	151,4	151,4	151,4	151,4	151,4
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		

K33HxFy-LNK-NS-00

FJ FK FL FM HP

Motor Data

Holding torque (bipolar/parallel 2 phases on)	M _H	Nm	15,1	15,6	16,5	15,2	15,1
Rated current per winding (bipolar/parallel)	I	A	5,0	6,1	9,0	9,9	3,7
Rated voltage	U _{DC}	V	170	170	170	170	325

Technical Data

Full steps per revolution				200			
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	1,65	1,12	0,53	0,44	1,5
Winding inductance	L _{ph}	mH	7,0	5,0	2,6	1,2	14,9
Detent torque	M _P	Nm	0,53	0,53	0,53	0,53	0,53
Insulation class			B	B	B	B	B
Insulation inductance					100MΩ @ 500V _{DC}		
Dielectricity test					500V _{DC} 1min		

Mechanical Data

Rotor inertia	J	Kgm ² *10 ⁻³	0,4	0,4	0,4	0,4	0,4
Mass	m	kg	5,4	5,4	5,4	5,4	5,4
Length	L	mm	155,7	155,7	155,7	155,7	155,7
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		

K34HxFy-LNK-NS-00

FJ FK FL FM HP

Motor Data

Holding torque (bipolar/parallel 2 phases on)	M _H	Nm	19,6	18,2	19,7	19,2	19,2
Rated current per winding (bipolar/parallel)	I	A	5,5	6,0	8,7	11,3	3,7
Rated voltage	U _{DC}	V	170	170	170	170	325

Technical Data

Full steps per revolution				200			
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	1,6	1,35	0,66	0,41	1,8
Winding inductance	L _{ph}	mH	8,9	6,3	3,6	2,0	18,4
Detent torque	M _P	Nm	0,5	0,5	0,5	0,5	0,5
Insulation class			B	B	B	B	B
Insulation inductance					100MΩ @ 500V _{DC}		
Dielectricity test					500V _{DC} 1min		

Mechanical Data

Rotor inertia	J	Kgm ² *10 ⁻³	0,53	0,53	0,53	0,53	0,53
Mass	m	kg	6,8	6,8	6,8	6,8	6,8
Length	L	mm	195,1	195,1	195,1	195,1	195,1
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		

Technical Data K Series (SIGMAX®) - NEMA 42

K41HxFy-LNK-NS-00			FJ	FL	FM	HP
<i>Motor Data</i>						
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	14,8	14,8	15,1	15,0
Rated current per winding (bipolar/parallel)	I	A	5,5	8,7	10,7	3,4
Rated voltage	U _{DC}	V	170	170	170	325
<i>Technical Data</i>						
Full steps per revolution				200		
Step angle		°	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5
Phases			2	2	2	2
Winding resistance	R _{ph}	Ω	1,16	0,47	0,31	1,47
Winding inductance	L _{ph}	mH	7,8	3,1	2,2	20,1
Detent torque	M _P	Nm	0,46	0,46	0,46	0,46
Insulation class			B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}		
Dielectricity test				500V _{DC} 1min		
<i>Mechanical Data</i>						
Rotor inertia	J	Kgm ² *10 ⁻³	0,55	0,55	0,55	0,55
Mass	m	kg	5,0	5,0	5,0	5,0
Length	L	mm	132,1	132,1	132,1	132,1
Ambient temperature		°C			-20 to +40	
Max. surface temperature		°C			95	
Protection class					IP 43	

K42HxFy-LNK-NS-00			FK	FL	FM	FN	HP
<i>Motor Data</i>							
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	28,0	27,8	28,4	28,2	28,1
Rated current per winding (bipolar/parallel)	I	A	6,4	8,1	9,9	15,8	4,1
Rated voltage	U _{DC}	V	170	170	170	170	325
<i>Technical Data</i>							
Full steps per revolution				200			
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	1,2	0,75	0,51	0,21	1,47
Winding inductance	L _{ph}	mH	9,8	6,0	4,2	1,6	23,0
Detent torque	M _P	Nm	0,69	0,69	0,69	0,69	0,69
Insulation class			B	B	B	B	B
Insulation inductance				100MΩ @ 500V _{DC}			
Dielectricity test				500V _{DC} 1min			
<i>Mechanical Data</i>							
Rotor inertia	J	Kgm ² *10 ⁻³	1,09	1,09	1,09	1,09	1,09
Mass	m	kg	8,3	8,3	8,3	8,3	8,3
Length	L	mm	183,4	183,4	183,4	183,4	183,4
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		

K43HxFy-LNK-NS-00			FK	FL	FM	FN	HP
<i>Motor Data</i>							
Holding torque (bipolar/parallel 2 phases on)	M_H	Nm	39,9	39,0	39,7	40,23	40,1
Rated current per winding (bipolar/parallel)	I	A	6,2	8,0	9,9	15,4	4,9
Rated voltage	U _{DC}	V	170	170	170	170	325
<i>Technical Data</i>							
Full steps per revolution				200			
Step angle		°	1,8	1,8	1,8	1,8	1,8
Angular accuracy		%	1,5	1,5	1,5	1,5	1,5
Phases			2	2	2	2	2
Winding resistance	R _{ph}	Ω	1,65	0,99	0,66	0,28	1,33
Winding inductance	L _{ph}	mH	15,2	8,5	5,9	2,5	24,9
Detent torque	M _p	Nm	0,83	0,83	0,83	0,83	0,83
Insulation class			B	B	B	B	B
Insulation inductance					100MΩ @ 500V _{DC}		
Dielectricity test					500V _{DC} 1min		
<i>Mechanical Data</i>							
Rotor inertia	J	Kgm ² *10 ⁻³	1,62	1,62	1,62	1,62	1,62
Mass	m	kg	11,6	11,6	11,6	11,6	11,6
Length	L	mm	234,4	234,4	234,4	234,4	234,4
Ambient temperature		°C			-20 to +40		
Max. surface temperature		°C			95		
Protection class					IP 43		

Please replace the y in the item number by the letter of the requested winding.
 Please replace the x in the item number by the letter of the required connection described in POWERPAC-GB-0703.

Characteristic curves for the K series motors are available upon request..

For all other information please refer to our data sheet **“High Performance Stepper Motors POWERPAC™”** (Powerpac-GB-0703).

Sales and Service

We are committed to quality customer service. In order to serve you in the most effective way please contact your local sales representative for assistance.
 If you do not know the local sales representative please contact our customer support.

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