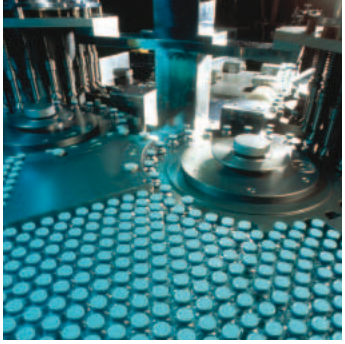
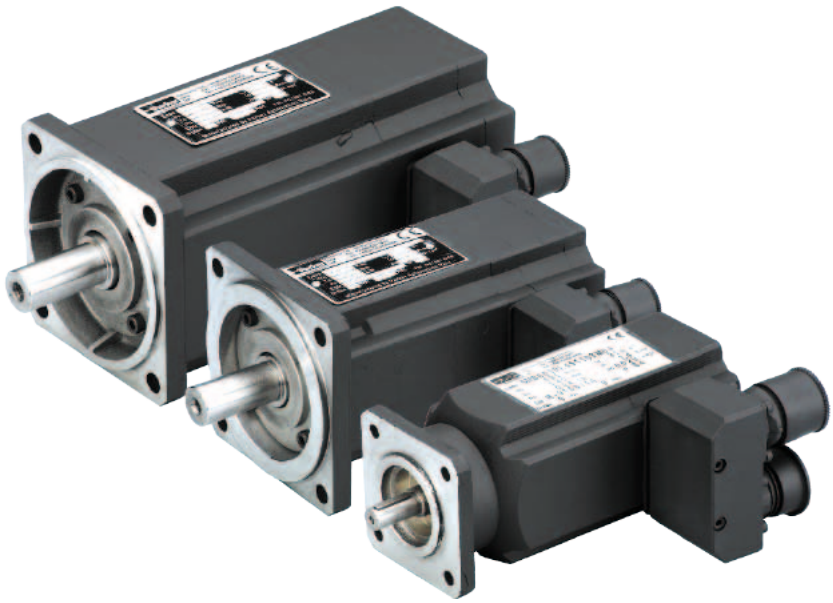
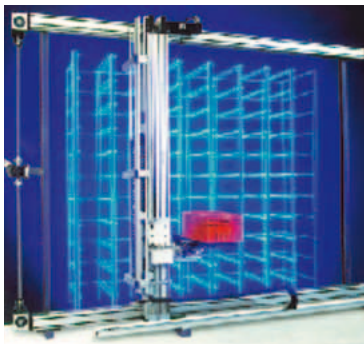


aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



SMB / SMH Series

Low Inertia Servo Motors



Parker

ENGINEERING YOUR SUCCESS.

WARNING — USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Low Inertia Servo Motors - SMB / SMH

Parker Hannifin

The global leader in motion and control technologies

A world class player on a local stage

Global Product Design

Parker Hannifin has more than 40 years experience in the design and manufacturing of drives, controls, motors and mechanical products. With dedicated global product development teams, Parker draws on industry-leading technological leadership and experience from engineering teams in Europe, North America and Asia.

Local Application Expertise

Parker has local engineering resources committed to adapting and applying our current products and technologies to best fit our customers' needs.

Manufacturing to Meet Our Customers' Needs

Parker is committed to meeting the increasing service demands that our customers require to succeed in the global industrial market. Parker's manufacturing teams seek continuous improvement through the implementation of lean manufacturing methods throughout the process. We measure ourselves on meeting our customers' expectations of quality and delivery, not just our own. In order to meet these expectations, Parker operates and continues to invest in our manufacturing facilities in Europe, North America and Asia.

Electromechanical Worldwide Manufacturing Locations

Europe
Littlehampton, United Kingdom
Dijon, France
Offenburg, Germany
Filderstadt, Germany
Milan, Italy

Asia
Wuxi, China
Chennai, India

North America
Rohnert Park, California
Irwin, Pennsylvania
Charlotte, North Carolina
New Ulm, Minnesota

Offenburg, Germany

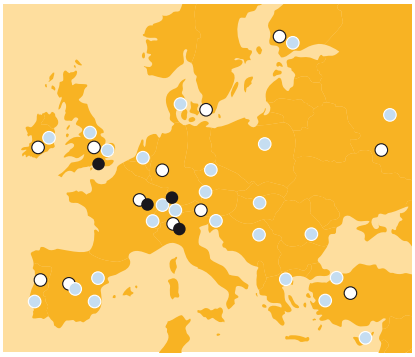
Local Manufacturing and Support in Europe

Parker provides sales assistance and local technical support through a network of dedicated sales teams and authorized technical distributors throughout Europe.

For contact information, please refer to the Sales Offices on the back cover of this document or visit www.parker.com

Milan, Italy

Littlehampton, UK



Electromechanical Manufacturing
Parker Sales Offices
Distributors

Dijon, France

Low Inertia Servo Motors - SMB / SMH

Overview

Description

The SMB / SMH* Series of highly-dynamic brushless servo motors have been design to combine the cutting-edge technology of Parker Hannifin products with an extremely high performance.
Thanks to the innovative "salient pole" technology, the motor's dimensions are considerably reduced with significant advantages in terms of specific torque, overall dimensions and dynamic performance.
Compared to traditional-technology brushless servo motors, the specific torque is approximately 30 % higher, overall dimensions are considerably reduced and, consequently rotor inertias are extremely low.
Thanks to the high quality of Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the SMB/H motors can achieve very high acceleration and withstand high overloads without risk of demagnetisation or detachement of the magnets.
Specific applications for the SMB/H Series include all types especially those for the packaging and handling industry, and all those applications where very high dynamic performances and very low inertias are required.

Features

- High number of feedback options
- Customised windings/voltages
- Increased Inertia option
- Multiple connection options

Application

- Food, Pharma & Beverage
- Packaging Machines
- Material Forming
- Material Handling
- Factory Automation
- Life Science Diagnostic
- Automotive Industry / In-Plant
- Printing Industry
- Textile Machines
- Robotics
- Servo Hydraulic Pumps

Technical Characteristics - Overview

Motor Type	Permanent magnets synchronous servomotor
Rotor Design	Rotor with surface rare earth magnets
Number of poles	10 for SM_ 42 8 for SM_ 60-82-100-115-142-170
Power Range	0.1 – 9.4 kW
Torque Range	0.35 – 60 Nm
Speed Range	0 – 7500 min^{-1}
Mounting	Flange with smooth holes
Shaft End	Plain keyed shaft Plain smooth shaft (option)
Cooling	Natural ventilation
Protection Level (IEC60034-5)	IP64 IP65 (option/standard for SM_170) IP67 (option for SM_170)
Feedback sensor	Resolver Absolute Endat or Hiperface Incremental Encoder
Thermal protection	PTC for SMB and KTY for SMH
Other options	Brake Second shaft Increased inertia
Marking	CE / UL (SM_42 and SM_170 excluded)
Voltage Supply	80 / 230 / 400 VAC other voltage under request
Temperature Class	Class F
Connections	Rotatable connectors Flying cables Terminal Box (see table option for combination) Special connector (under request)

* SMB: for Drives TPD-M, SLVD-N, TWIN-N, SPD-N, Hi-Drive
SMH: for Drive Compax3

Technical Characteristics

Technical Data

230 VAC supply voltage

Model [4]	Size	Stall [1]		Nominal [1]			Peak [1] Torque	Inertia		Ke [2] [3]	Kt [2] [3]
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) [Nm]	I_{065} [A]	T_{n065} [Nm]	n [min^{-1}]	I_{n065} [A]	T_{max} [Nm]	J [$kgmm^2$]	J [$kgmm^2$]	Ke [Vs]	Kt [Nm/A_{rms}]
SM_42 60 0,35	42	0.35 0.45	0.78	0.15	6000	0.38	0.9	13	n.a.	0.29	0.46
SM_60 30 0,55	60	0.55 (0.68)	0.7	0.50	3000	0.66	1.7	18	30.5	0.44	0.76
SM_60 45 0,55			1.0	0.39	4500	0.74				0.30	0.53
SM_60 60 0,55			1.4	0.24	6000	0.60				0.23	0.40
SM_60 16 1,4		1.4 (1.7)	0.95	1.35	1600	0.91	4.4	30	42.5	0.85	1.48
SM_60 30 1,4			1.73	1.20	3000	1.50				0.47	0.81
SM_60 45 1,4			2.37	1.00	4500	1.69				0.34	0.59
SM_60 60 1,4			2.98	0.80	6000	1.70				0.27	0.47
SM_60 75 1,4			3.85	0.15	7500	0.41				0.21	0.36
SM_82 10 03	82	3 (3.7)	1.2	2.9	1000	1.2	9	140	183	1.43	2.48
SM_82 16 03			1.8	2.9	1600	1.7				0.96	1.66
SM_82 30 03			3.1	2.7	3000	2.8				0.55	0.96
SM_82 33 03			3.5	2.4	3300	2.8				0.49	0.85
SM_82 45 03			4.7	2.2	4500	3.4				0.37	0.64
SM_82 60 03			6.1	1.5	6000	3.1				0.28	0.49
SM_82 75 03			7.5	0.6	7500	1.6				0.23	0.40
SM_100 16 06	100	6 (9)	3.7	5.8	1600	3.6	18	336	440	0.92	1.60
SM_100 30 06			5.9	5.0	3000	4.9				0.59	1.02
SM_100 45 06			9.4	3.5	4500	5.5				0.37	0.64
SM_100 55 06			11.8	2.6	5500	5.1				0.29	0.51
SM_100 75 06			14.7	0.6	7500	1.5				0.24	0.41
SM_115 16 10	115	10 (12.5)	6.0	9.0	1600	5.4	32	900	1000	0.96	1.66
SM_115 30 10			10.5	8.0	3000	8.4				0.55	0.95
SM_115 40 10			14.7	7.6	4000	11.2				0.39	0.68
SM_115 54 10			18.2	7.1	5400	12.9				0.32	0.55
SM_142 18 15	142	15 (19)	9.7	13.3	1800	8.6	47	1400	1600	0.89	1.54
SM_142 30 15			16.0	12.5	3000	13.4				0.54	0.94
SM_170 11 35	170	35	13.3	30	1100	11.4	111	2900	4500	1.52	2.6
SM_170 16 35			20	28	1600	11				1.03	1.8
SM_170 30 60			29	26	2500					0.69	1.2

(1) Data referred to motor mounted on a steel flange in horizontal position with resolver and without brake. Stall torques refer to motor turning at 100 min^{-1}
(2) Data measured at 20 °C. When "hot" consider -0.09 %/K derating
(3) Manufacturing tolerance ±10 %
(4) SMB: for Drives TPD-M, SLVD-N, Twin-N, SPD-N, Hi-Drive
SMH: for Drive Compax3

400 VAC power supply

Model [4]	Size	Stall [1]		Nominal [1]			Peak [1] Torque	Inertia		Ke [2] [3]	Kt [2] [3]
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) [Nm]	I_{065} [A]	T_{n065} [Nm]	n [min^{-1}]	I_{n065} [A]	T_{max} [Nm]	J [$kgmm^2$]	J [$kgmm^2$]	Ke [Vs]	Kt [Nm/A_{rms}]
SM_60 30 1,4	60	1.4 (1.7)	0.95	1.2	3000	0.81	4.4	30	42.5	0.81	1.48
SM_60 45 1,4			1.37	1.0	4500	0.98				0.59	1.02
SM_60 60 1,4			1.73	0.8	6000	0.99				0.68	0.81
SM_60 75 1,4			2.15	0.15	7500	0.23				0.38	0.65
SM_82 30 03	82	3 (3.7)	1.8	2.7	3000	1.6	9	140	183	0.96	1.66
SM_82 45 03			2.7	2.2	4500	2.0				0.64	1.11
SM_82 56 03			3.1	1.6	5600	1.7				0.55	0.96
SM_82 60 03			3.5	1.7	6000	2.0				0.49	0.85
SM_82 75 03			4.4	0.6	7500	0.9				0.39	0.68
SM_100 30 06	100	6 (9)	3.7	5.0	3000	3.1	18	336	440	0.92	1.60
SM_100 45 06			5.6	3.5	4500	3.3				0.62	1.07
SM_100 56 06			5.9	2.5	5600	2.4				0.59	1.02
SM_100 75 06			9.4	0.6	7500	0.9				0.37	0.64
SM_115 20 10	115	10 (12.5)	4.5	9.0	2000	4.06	32	900	1000	1.28	2.22
SM_115 30 10			6.0	8.0	3000	4.82				0.96	1.66
SM_115 40 10			8.0	7.6	4000	6.05				0.73	1.26
SM_115 56 10			10.5	6.0	5600	6.30				0.55	0.95
SM_142 20 15	142	15 (19)	6.4	13.0	2000	5.5	47	1400	1600	1.36	2.35
SM_142 30 15			9.7	12.5	3000	8.1				0.89	1.54
SM_142 45 15			14.4	10.9	4500	10.5				0.60	1.04
SM_142 56 15			16.0	9.2	5600	9.8				0.54	0.94
SM_142 10 17		17 (21)	3.5	16.4	1000	3.4	54			2.83	4.90
SM_142 30 17			9.6	14.0	3000	8.1				1.02	1.77
SM_142 56 17			15.8	10.6	5600	9.8				0.62	1.08
SM_170 10 35	170	35	6.8	31	1000	6.1	111	2900	4500	2.95	5.1
SM_170 20 35			13.3	27	2000	10.3				1.52	2.6
SM_170 27 35			18	22	2700	11				1.15	2.0
SM_170 30 35			20	19	3000					1.03	1.8
SM_170 10 60		60	11.7	53	1000	10.4	190	5800	7400	2.95	5.1
SM_170 20 60			22.6	44	2000	16.6				1.53	2.7
SM_170 30 60			35.7	30	3000	17.9				0.97	1.7

(1) Data referred to motor mounted on a steel flange in horizontal position with resolver and without brake. Stall torques refer to motor turning at 100 min^{-1}
(2) Data measured at 20 °C. When "hot" consider -0.09 %/K derating
(3) Manufacturing tolerance data ±10 %
(4) SMB: for Drives TPD-M, SLVD-N, Twin-N, SPD-N, Hi-Drive
SMH: for Drive Compax3

STANDARDS

In compliance with: 2006/95 EC

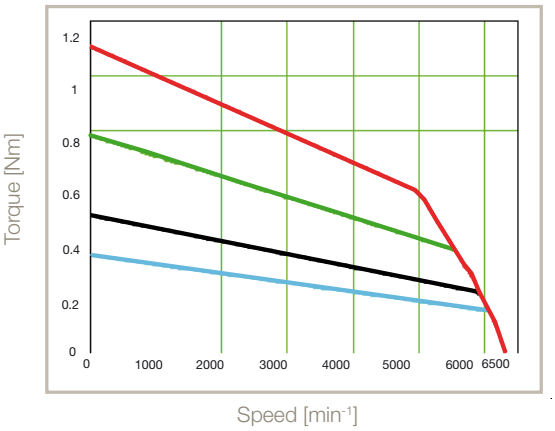
- EN60034-1
- EN60034-5
- EN60034-5/A1

Marked CE **Marked** c UL us (except SM_42 and SM_170)

Speed Torque Curves

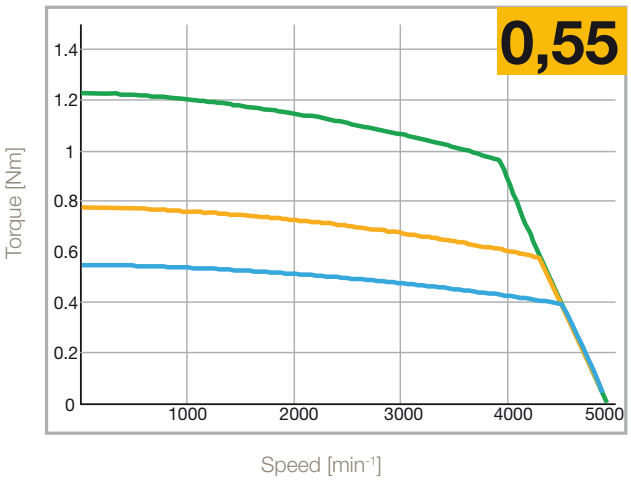
SMB/H42

6000 min^{-1} 230 V

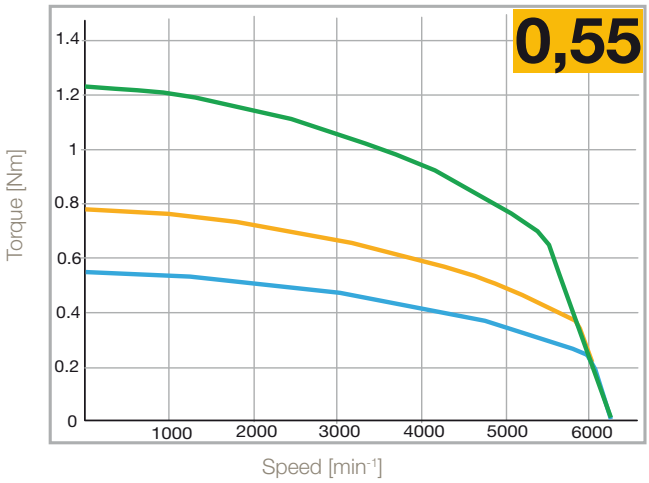


SMB/H60

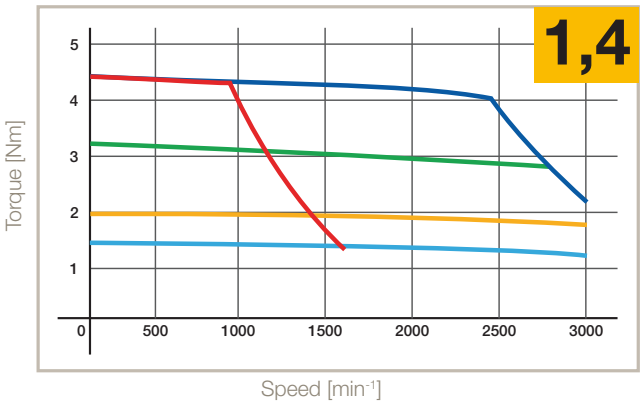
4500 min^{-1} 230 V



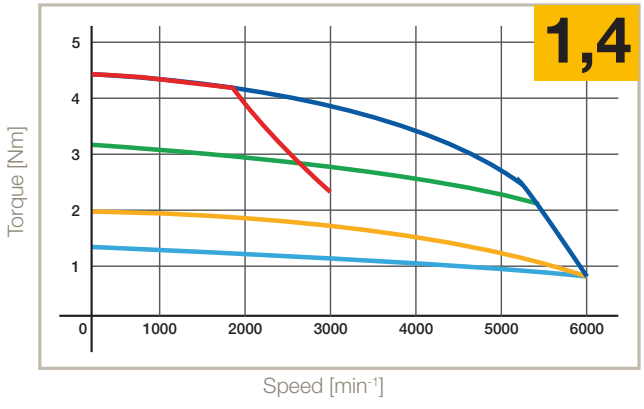
6000 min^{-1} 230 V



1600 min^{-1} 230 V - 3000 min^{-1} 400 V



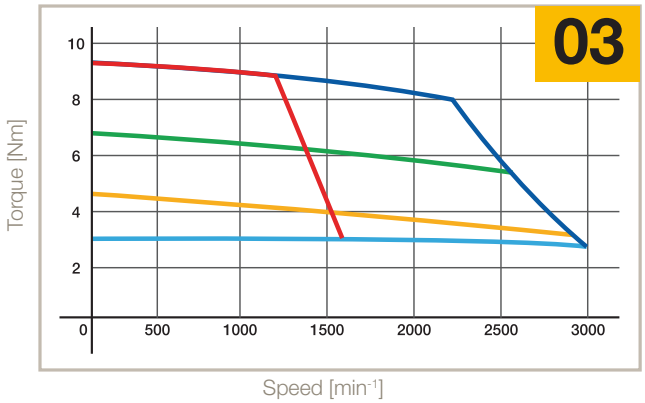
3000 min^{-1} 230 V - 6000 min^{-1} 400 V



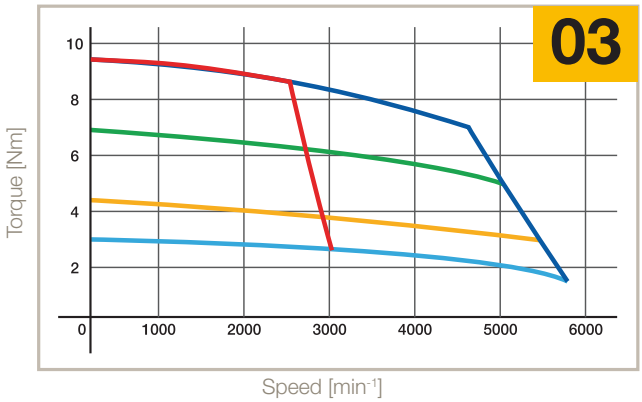
S1 65 K, ΔT
S3 10 %, 5 min, 400 V
S3 50 %, 5 min
S3 10 %, 5 min, 230 V
S3 50 %, 5 min
S3 20 %, 5 min

SMB/H82

1600 min^{-1} 230 V - 3000 min^{-1} 400 V

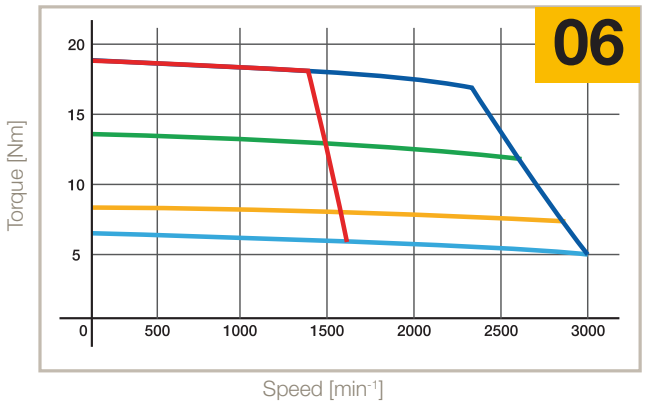


3000 min^{-1} 230 V - 5600 min^{-1} 400 V

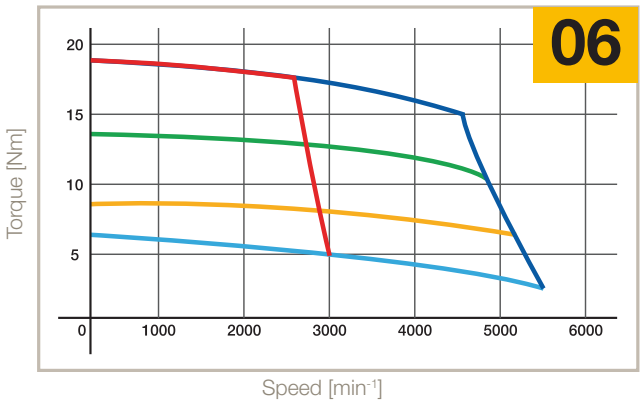


SMB/H100

1600 min^{-1} 230 V - 3000 min^{-1} 400 V

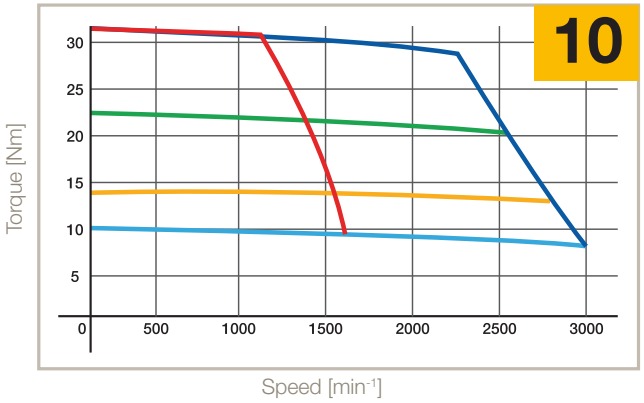


3000 min^{-1} 230 V - 5600 min^{-1} 400 V

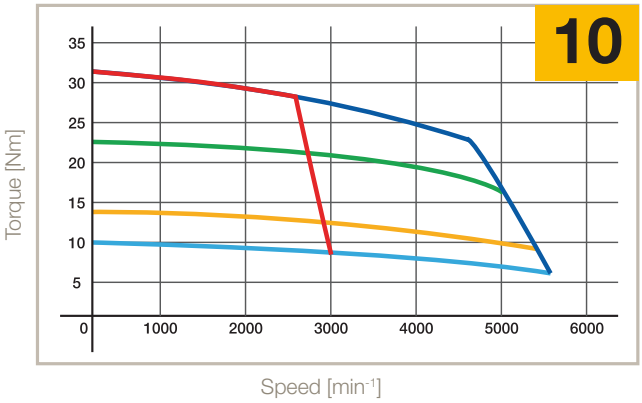


SMB/H115

1600 min^{-1} 230 V - 3000 min^{-1} 400 V



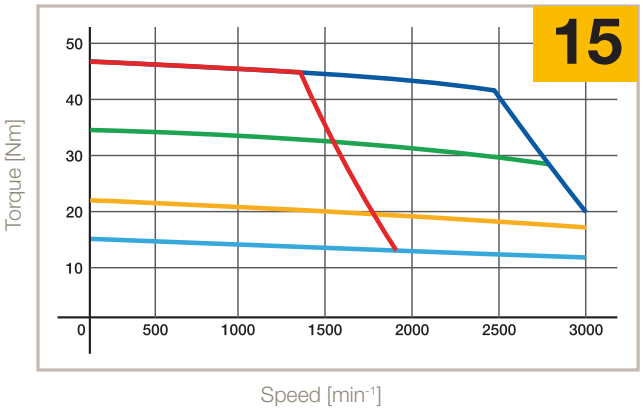
3000 min^{-1} 230 V - 5600 min^{-1} 400 V



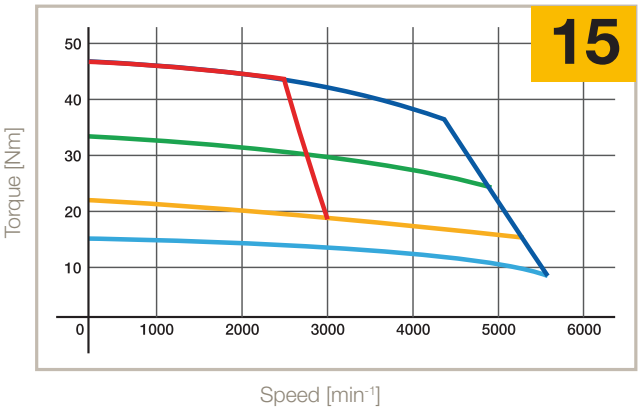
- S1 65 K, ΔT
- S3 10 %, 5 min, 400 V
- S3 50 %, 5 min
- S3 10 %, 5 min, 230 V
- S3 50 %, 5 min
- S3 20 %, 5 min

SMB/H142

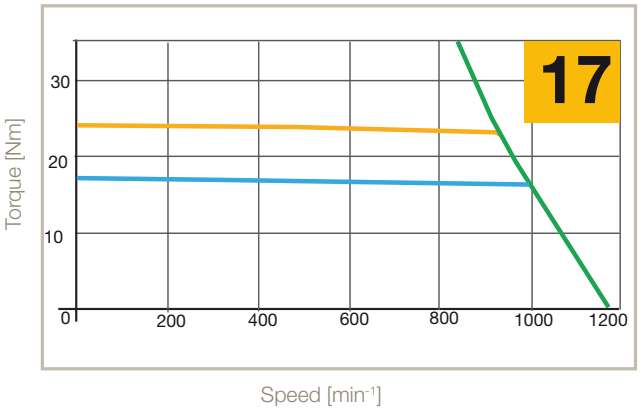
1800 min^{-1} 230 V - 3000 min^{-1} 400 V



3000 min^{-1} 230 V - 5600 min^{-1} 400 V

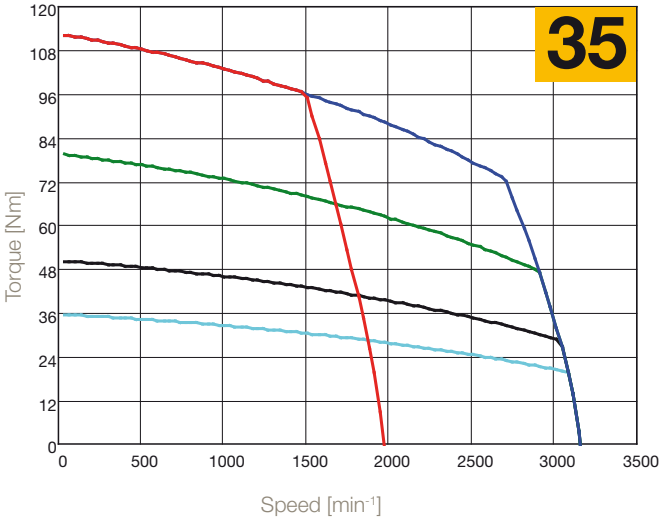


1000 min^{-1} 400 V

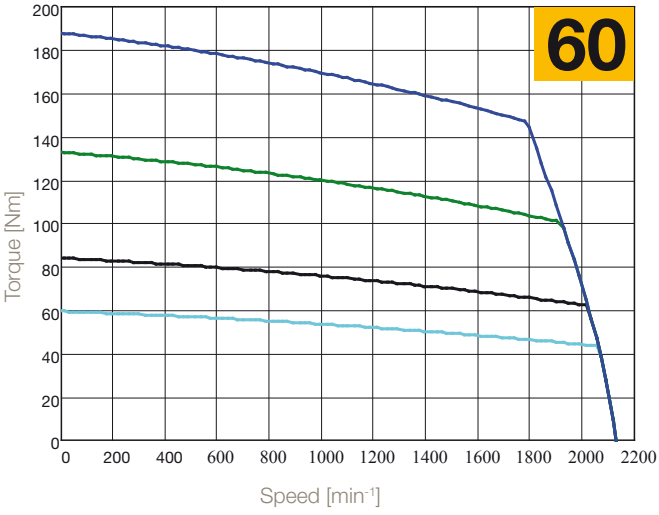


SMB/H170

1600 min^{-1} 230 V - 3000 min^{-1} 400 V

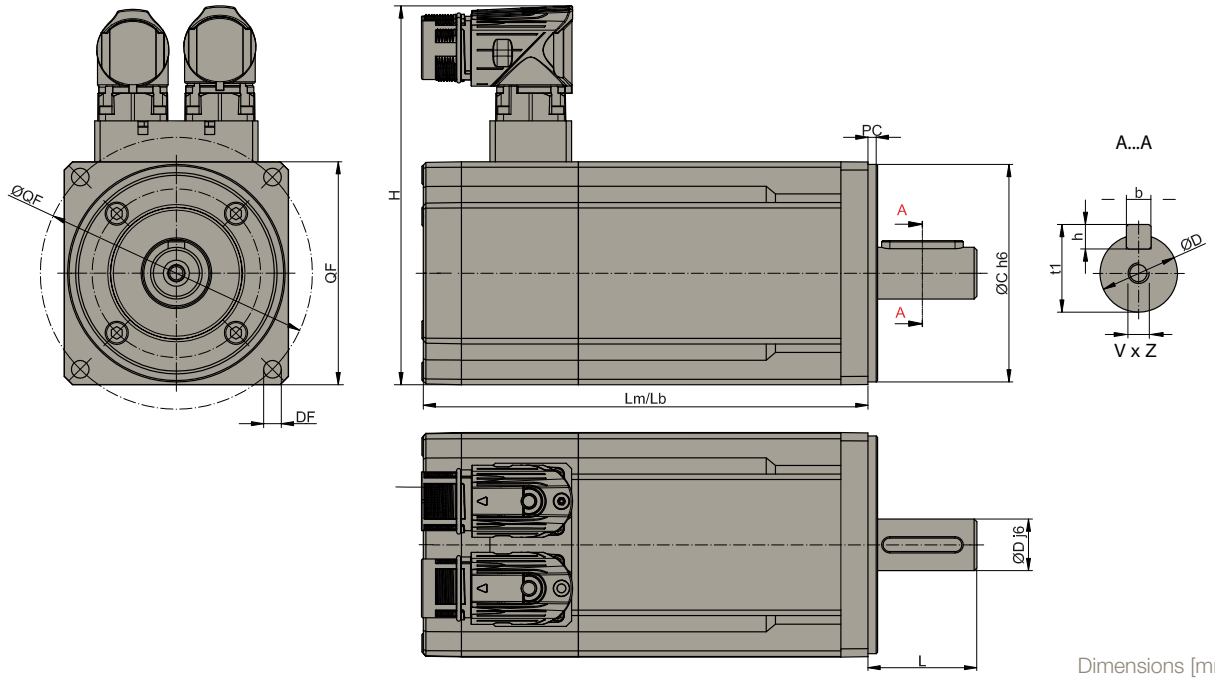


2000 min^{-1} 400 V



S1 65 K, ΔT
S3 10 %, 5 min, 400 V
S3 50 %, 5 min
S3 10 %, 5 min, 230 V
S3 50 %, 5 min
S3 20 %, 5 min

Dimensions of Standard Motors with Resolver Feedback



Dimensions [mm]

Motors Size			LM LB	Weight [kg]	DxL	bxh	t1	VxZ	H	C	ØQF	DF	PC	QF	Order Code QF
SMB /H	42	0,35	110 140	0.85 1	9x25	3 x 3	10.2	M3x9	67 Layout 0V	30	50	3.2	2.5	42	5
	60	0,55	91.2 137	1 1.3	9x20 11x23	3x3 4x4	10.2 12.5	- M4x10	118 Layout 2I	40 60	63 75	5.5 6	2.5 2.5	60 70	8 5
		1,4	129.5 161	1.5 1.8	9x20 11x23	3x3 4x4	10.2 12.5	- M4x10		40 60	63 75	5.5 6	2.5 2.5	60 70	8 5
	82	03	159 202	3.6 4.3	11x23(2) 14x30	4x4 5x5	12.5 16	M4x10 M5x12.5	140 Layout 2I	60	75	6	2.5	70	7
			163.5 206.5	3.6 4.3	11x23(2) 14x30 19x40(1)	4x4 5x5 6x6	12.5 16 21.5	M4x10 M5x12.5 M6x16		80 95	100 115	6.5 9	3.5 3.5	82 100	8 5
	100	06	191.5 238.5	4.7 5.3	19x40 24x50	6x6 8x7	21.5 27	M6x16 M8x19	157.5 Layout 2I	80 95	100 115	7 9	3.5 3.5	100 100	8 5
	115	10	220 265	7.7 9.7	19x40 24x50 28x60	6x6 8x7 8x7	21.5 27 31	M6x16 M8x19 M10x22	157.5 Layout 2I	95 95 110 130	115 130 130 165	9 9 9 11	3.5 3.5 3.5 3.5	115 115 130 145	9 8 7 5
	142	15	243 293	13 16	19x40 24x50 28x60	6x6 8x7 8x7	21.5 27 31	M6x16 M8x19 M10x22	185 Layout 2I	130	165	11	3.5	142	5
	170	35	306	30	38x80	10x8	41	M12x32	212.3 Layout 2I	180	215	14	4	170	5
		60	409	50	38x80	10x8	41	M12x32	212.3 Layout 2I	180	215	14	4	170	5

LM: Motor's length without brake and with resolver
LB: Motor's length with brake and resolver
DxL: Shaft diameter x shaft lenght
bxh: Key dimension
t1: Overall shaft height
VxZ: Shaft hole depth
C: Centering

H: Height
DF: Fixing holes
ØQF: Interaxis hole
QF: Mounting flange
PC: Centre Depth

1) not available with flange 7
(2) only for torque <2 Nm

Options

Parker SMB / SMH family motors are available with standard and custom options to adapt motor on your application.
If the option for your application is not listed, please consult our technical department.

Holding Brake

All SMB / SMH motors are available with option holding brake.
The fail-safe (supply voltage 24 VDC ±10 %) holding brake is incorporated in the motor at the opposite side of the front flange (SM_170 front side) and is applied when there is no voltage present. Because of the power loss caused by the brake, torque values must be reduced by 5 %. The holding brakes shall be used with the motor at a standstill and not for dynamic braking. For normal uses, they are maintenance free brakes.

Motor	Voltage [V]	Current [A]	Torque @20 °C [Nm]	Added Length with resolver [mm]	Added Weight [kg]	Added Inertia [kgmm²]
SMB / SMH42	24	0.25	0.4	30	0.15	10
SMB / SMH60	24	0.34	2.2	31.5	0.3	12.5
SMB / SMH82	24	0.5	5	43	0.7	43
SMB / SMH100	24	0.67	11	47	0.6	104
SMB / SMH115	24	0.67	11	45	2	100
SMB / SMH142	24	0.75	22	50	3	200
SMB / SMH170	24	7.67	70	-	2	1600

Medium Inertia

Where the application needs different values of inertia, SMB / SMH can provide a standard adder.

Motor	Added inertia [kgmm²]	Added length with resolver [mm]	Added weight [kg]
SMB / SMH60	29	31.5	0.32
SMB / SMH82	270	43	0.91
SMB / SMH100	284	47	0.68
SMB / SMH115	900	45	2.28
SMB / SMH142	690	50	2.49
SMB / SMH170	consult Parker	consult Parker	consult Parker

Feedback

Motors may be eqquiped with various feedback types in order to meet the different requirements for precision, signal that the application needs. The standard motor includes the resolver feedback. Hiperface Encoder, DSL Encoder, EnDat Encoder, Incremental Encoder are available like the following tables.

Resolver

Poles	2
Transformation ratio	0.5
Operating temperature	-50...+150 °C
SM_ associations	All Sizes

Incremental Encoder with Hall Sensor

Code	A1	A2	A3	B3	C4	D3
Resolution [C/T]	2000	2048	4096	2048	5000	5000
Poles	8					
System accuracy	±32"	±32"	±16"	±32"	±13"	±13"
Voltage	+5 VDC ±5 % - 200 mA					
Reference mark	Yes					
Max speed [min⁻¹]	6000					
Output circuit	Line drive differential mode 20 mA					
Operating temperature	-20 °C...+100 °C		-20 °C...+85 °C	-20 °C...+100 °C		-20 °C...+85 °C
SM_ motors associations						
SM_42	N	N	N	N	N	N
SM_60	N	N	N	Y (+17 mm length)	N	Y (+17 mm length)
SM_82	Y	Y	Y	N	Y	N
SM_100	Y	Y	Y	N	Y	N
SM_115	Y	Y	Y	N	Y	N
SM_142	Y	Y	Y	N	Y	N
SM_170	Y	Y	Y	N	Y	N

Hiperface Absolute Encoder

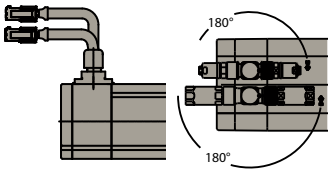
Code	S1	S2	S3	S4	S5	S6
Type	Optical					
Turn	Single	Multi	Single	Multi	Single	Multi
Incremental signals	1 V_{PP}				-	-
Line count	1024		128		-	-
Resolution	32 768 (15 bit)		4096 (12 bit)		262 144 (18 bits)	
Absolute rotation	1	4096	1	4096	1	4096
System accuracy	±45"		±320"		±40"	
Power supply	8 VDC				7...12 VDC	
Max speed [min^{-1}]	6000		12 000	9000		
Temperature	-20 °C...+115 °C		-20 °C...+110 °C		20 °C...+105 °C	
Safety integrity level	SIL2 (IEC 61508), SILCL2 (IEC 62061)				SIL2 (IEC 61508), SILCL2 (IEC 62061)	
SM_ motors associations						
SM_42	N	N	N	N	N	N
SM_60	N		Y (+17 mm length without brake) (+30 mm length with brake)		Y (+17 mm length without brake) (+30 mm length with brake)	
SM_82	Y (+17 mm length without brake) (+30 mm length with brake)		Y	Y	Y	Y
SM_100	Y (+20 mm length)				Y (+20 mm length)	
SM_115	Y	Y	Y	Y	Y	Y
SM_142	Y	Y	Y	Y	Y	Y
SM_170	Y	Y	Y	Y	Y	Y

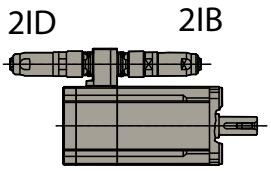
Code	A6	A7	C6	C7	G4
Type	Optical				Capacitive
Turn	Single	Multi	Single	Multi	Multi
Incremental signals	1 V_{PP}				
Line count	1024		128		16
Resolution	32 768 (15 bit)		4096 (12 bit)		
Absolute rotation	1	4096	1	4096	512
System accuracy	±45"		±320"		±288"
Power supply	8 VDC				
Max speed [min^{-1}]	6000		12 000	9000	6000
Temperature	-20 °C...+115 °C		-20 °C...+110 °C		-20 °C...+115 °C
Safety integrity level	Not Available		Not Available		
SM_ motors associations					
SM_42	N	N	N	Y (+17 mm length) (56 mm rear flange)	N
SM_60	N		Y (+17 mm length without brake) (+30 mm length with brake)		
SM_82	Y (+17 mm length without brake) (+30 mm length with brake)		Y	Y	Y
SM_100	Y (+20 mm length)				
SM_115	Y	Y	Y	Y	Y
SM_142	Y	Y	Y	Y	Y
SM_170	Y	Y	Y	Y	Y

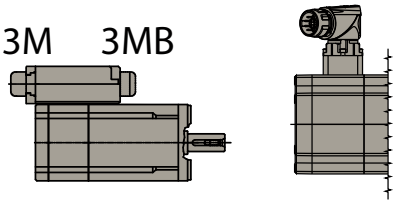
EnDat Absolute Encoder

Code	B9	D5	F2	F4
Type	Inductive	Optical		Inductive
Turn	Multi			
Incremental signals	1 V_{PP}			
Line count	32	512		16
Positions per revolutions	131 072 (17 bit)	8192 (13 bit)		262 144 (18 bit)
Distinguishable revolutions	4096	4096		
System accuracy	±400"	±60"		±480"
Power supply	5 VDC			
Max speed [min^{-1}]	12 000	7000	12 000	
Temperature	-20 °C...+115 °C	-30 °C...+115 °C	-40 °C...+115 °C	-20 °C...+115°C
Absolute position values	EnDat 2.1	EnDat 2.2		EnDat 2.1
Safety integrity level	Not Available			
SM_ motors associations				
SM_42	N	N	N	N
SM_60	N	N	Y (+17 mm length without brake) (+9 mm length with brake)	
SM_82	Y (+22.5 mm length without brake) (+18 mm length with brake)		N	N
SM_100	Y (+20 mm length)		N	N
SM_115	Y	Y	N	N
SM_142	Y	Y	N	N
SM_170	Y	Y	N	N

Layout and Connectors







	200 mm Flying leads with molex plugs 0V	2x Parallel upright connectors 2I	2x Forward facing connectors 2IB	2x Rear facing connectors 2ID	Terminal box rear facing 3M	Terminal box forward facing 3MB	Hiperface DSL® Connector (IZ)
SMB__42	Y	N	N	N	N	N	N
SMB__60	Y	Y	Y	Y	Y	Y	N
SMB__82	N	Y	Y	Y	Y	Y	N
SMB__100	N	Y	Y	Y	Y	Y	N
SMB__115	N	Y	Y	Y	Y	Y	N
SMB__142	N	Y	Y	Y	Y	Y	N
SMH__42	Y	N	N	N	N	N	N
SMH__60	Y	Y	Y	N	N	N	N
SMH__82	N	Y	Y	N	N	N	N
SMH__100	N	Y	Y	N	N	N	N
SMH__115	N	Y	Y	N	N	N	N
SMH__142	N	Y	Y	N	N	N	N
SME__42	Y	N	N	N	N	N	Y
SME__60	N	N	Y	Y	N	N	Y
SME__82	N	N	Y	Y	N	N	Y
SME__100	N	N	Y	Y	N	N	Y
SME__115	N	Y	N	N	N	N	Y
SME__142	N	Y	N	N	N	N	Y
SME__170	N	Y	N	N	N	N	Y

Power connector (0V)

6	5	4
3	2	1

Pin	Description
1	GND - shield
2	Brake 0 VDC
3	Brake +24 VDC
4	W
5	V
6	U

Part number	
CONMOT6M	Female Connector

Resolver connector (0V)

12	11	10	9	8	7
6	5	4	3	2	1

Pin	Description
1	n.c.
2	n.c.
3	n.c.
4	PTC
5	PTC
6	GND - shield
7	SIN +
8	SIN -
9	COS +
10	COS -
11	EXTC -
12	EXTC +

Part number	
CONRES12M	Female Connector

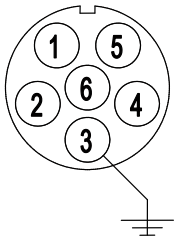
Hiperface connector (0V)

12	11	10	9	8	7
6	5	4	3	2	1

Pin	Description
1	SIN +
2	SIN -
3	RS485 +
4	0 V
5	PTC
6	PTC
7	VDC +
8	COS +
9	COS -
10	RS485 -
11	GND - shield
12	n.c.

Part number	
CONRES12M	Female Connector

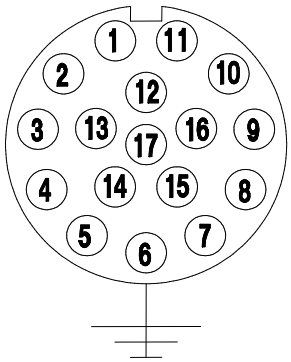
Power connector (2I, 2IB, 2ID)



Pin	Description
1	U
2	V
3	GND - shield
4	Brake +24 VDC
5	Brake 0 VDC
6	W

Part number	
CONMOT82F	Female Connector

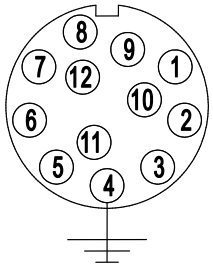
Incremental encoder connector (2I, 2IB, 2ID)



Pin	Description	
1	5 V	
2	0 V	
3	A +	
4	A -	
5	B +	
6	B -	
7	Z +	
8	PTC	KTY -
6	PTC	KTY +
10	Z -	
11	Hall A +	
12	Hall A -	
13	Hall B +	
14	Hall B -	
15	Hall C +	
16	Hall C -	
17	n.c.	

Part number	
CONENCF	Female Connector

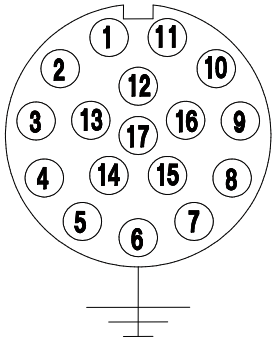
Resolver connector (2I, 2IB, 2ID)



Pin	Description	
1	SIN -	
2	SIN +	
3	n.c.	
4	GND - shield	
5	n.c.	
6	n.c.	
7	EXCT -	
8	PTC	KTY -
9	PTC	KTY +
10	EXCT +	
11	COS +	
12	COS -	

Part number	
CONRES82F	Female Connector

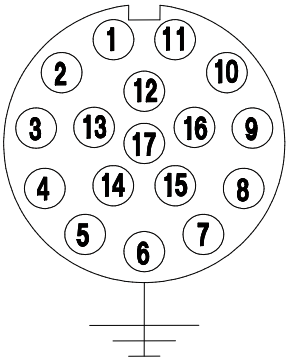
Absolute encoder SINCOS - EnDat (2I, 2IB, 2ID)



Pin	Description	
1	UP Sensor	
2	n.c.	
3	n.c.	
4	0 V Sensor	
5	PTC	KTY -
6	PTC	KTY +
7	UP	
8	CK +	
9	CK -	
10	0 V	
11	GND - shield	
12	B +	
13	B -	
14	Data +	
15	A +	
16	A -	
17	Data -	

Part number	
CONENCF	Female Connector

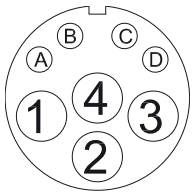
Absolute encoder SINCOS - Hiperface (2I, 2IB, 2ID)



Pin	Description	
1	SIN +	
2	SIN -	
3	RS485 +	
4	n.c.	
5	n.c.	
6	n.c.	
7	GND - shield	
8	PTC	KTY -
9	PTC	KTY +
10	+ VDC	
11	COS +	
12	COS -	
13	RS485 -	
14	n.c.	
15	n.c.	
16	n.c.	
17	n.c.	

Part number	
CONRES82F	Female Connector

Hiperface DSL® Connector (IZ)



Pin	Description
1	U
2	GND
3	V
4	W
A	Brake +
B	Brake -
C	Signal +
D	Signal -

Part number	
CONMOT2IZF	Female Connector

Associated Drives

Motor	Rated Speed [min^{-1}]	Stall Current [A]	SLVD-N (230V) SPD/TWIN (400V)	TPD-M	Compax3	638
	230 VAC supply voltage					
SM_42 60 0,35	6000	0.78	SLVD1N…	TPD-M02…	C3S025V2…	638A-01-3-F…
SM_60 30 0,55	3000	0.7	SLVD1N…	TPD-M02…	C3S025V2…	638A-01-3-F…
SM_60 45 0,55	4500	1	SLVD1N…	TPD-M02…	C3S025V2…	638A-01-3-F…
SM_60 60 0,55	6000	1.4	SLVD2N…	TPD-M02…	C3S025V2…	638A-02-3-F…
SM_60 16 1,4	1600	0.95	SLVD1N…	TPD-M02…	C3S025V2…	638A-01-3-F…
SM_60 30 1,4	3000	1.73	SLVD2N…	TPD-M02…	C3S025V2…	638A-02-3-F…
SM_60 45 1,4	4500	2.37	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_60 60 1,4	6000	2.98	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_60 75 1,4	7500	3.85	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_82 10 03	1000	1.2	SLVD2N…	TPD-M02…	C3S025V2…	638A-02-3-F…
SM_82 16 03	1600	1.8	SLVD2N…	TPD-M02…	C3S025V2…	638A-02-3-F…
SM_82 30 03	3000	3.1	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_82 33 03	3300	3.5	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_82 45 03	4500	4.7	SLVD5N…	TPD-M05…	C3S063V2…	638A-06-3-F…
SM_82 60 03	6000	6.1	SLVD7N…	TPD-M08…	C3S063V2…	638B-08-3-F…
SM_82 75 03	7500	7.5	SLVD7N…	TPD-M08…	C3S100V2…	638B-08-3-F…
SM_100 16 06	1600	3.7	SLVD5N…	TPD-M05…	C3S063V2…	638A-04-3-F…
SM_100 30 06	3000	5.9	SLVD7N…	TPD-M08…	C3S063V2…	638A-06-3-F…
SM_100 45 06	4500	9.4	SLVD10N…	TPD-M10…	C3S100V2…	638B-10-3-F…
SM_100 55 06	5500	11.8	SLVD15N…	TPD-M15…	C3S150V2…	638B-15-3-F…
SM_100 75 06	7500	14.7	SLVD15N…	TPD-M15…	C3S150V2…	638B-15-3-F…
SM_115 16 10	1600	6	SLVD7N…	TPD-M08…	C3S063V2…	638A-06-3-F…
SM_115 30 10	3000	10.5	SLVD10N…	TPD-M10…	C3S100V2…	638B-10-3-F…
SM_115 40 10	4000	14.7	SLVD15N…	TPD-M15…	C3S150V2…	638B-15-3-F…
SM_115 54 10	5400	18.2	n.a.	TPD-M30…	n.a.	n.a.
SM_142 18 15	1800	9.7	SLVD10N…	TPD-M10…	C3S100V2…	638B-10-3-F…
SM_142 30 15	3000	16	SLVD17N…	TPD-M30…	n.a.	n.a.
SM_170 11 35	1100	13.3	SLVD15N…	TPD-M15…	C3S150V2…	638-B-15-3-F…
SM_170 16 35	1600	20	n.a.	TPD-M30…	C3S300V2…	n.a.
SM_170 25 35	2500	29	n.a.	TPD-M30…	n.a.	n.a.
	400 VAC supply voltage					
SM_60 30 1,4	3000	0.95	SPD2N.. / TWIN2N	TPD-M02..	C3S015V4..	638B-03-6-F…
SM_60 45 1,4	4500	1.37	SPD2N.. / TWIN2N	TPD-M02..	C3S015V4..	638B-03-6-F…
SM_60 60 1,4	6000	1.73	SPD2N.. / TWIN2N	TPD-M02..	C3S038V4..	638B-03-6-F…
SM_60 75 1,4	7500	2.15	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-03-6-F…
SM_82 30 03	3000	1.8	SPD2N.. / TWIN2N	TPD-M02..	C3S038V4..	638B-03-6-F…
SM_82 45 03	4500	2.7	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F…
SM_82 56 03	5600	3.1	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F…
SM_82 60 03	6000	3.5	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F…
SM_82 75 03	7500	4.4	SPD5N.. / TWIN5N	TPD-M05..	C3S075V4..	638B-05-6-F…
SM_100 30 06	3000	3.7	SPD5N.. / TWIN5N	TPD-M05..	C3S038V4..	638B-05-6-F…
SM_100 45 06	4500	5.6	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F…
SM_100 56 06	5600	5.9	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F…
SM_100 75 06	7500	9.4	SPD16N..		C3S150V4..	638B-10-6-F…
SM_115 20 10	2000	4.5	SPD5N.. / TWIN5N	TPD-M05..	C3S075V4..	638B-05-6-F…
SM_115 30 10	3000	6.0	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F…
SM_115 40 10	4000	8.0	SPD8N.. / TWIN8N	TPD-M08..	C3S150V4..	638B-10-6-F…
SM_115 56 10	5600	10.5	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F…
SM_142 20 15	2000	6.4	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F…
SM_142 30 15	3000	9.7	SPD16N..	TPD-M10..	C3S150V4..	638B-10-6-F…
SM_142 45 15	4500	14.4	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F…
SM_142 56 15	5600	16	SPD16N..	TPD-M30..	C3S300V4..	n.a.
SM_170 10 35	1000	6.8	SPD8N.. / TWIN8N	TPD-M08..	C3S075V4..	638B-08-6-F…
SM_170 20 35	2000	13.3	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F…
SM_170 27 35	2700	18	n.a.	TPD-M30..	C3S300V4..	n.a.
SM_170 30 35	3000	20	n.a.	TPD-M30..	C3S300V4..	n.a.
SM_170 10 60	1000	11.7	SPD16N..	TPD-M15..	C3S150V4..	638B-15-6-F…
SM_170 20 60	2000	22.6	n.a.	TPD-M30..	C3S300V4..	n.a.
SM_170 30 60	3000	35.7	n.a.	n.a.	C3H050V4	n.a.

Order Code

Serie SMB / SME *

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Order example	**SMB**	**A**	**60**	**30**	**1,4**	**5**	**9**		**2I**		**64**	**A6**	**M**	**2**

1	**Type Of Motor (mandatory field)**	
	SME	Standard Motor with Encoder SME Series
	SMB	Standard Motor with Resolver SMB Series
2	**Brake Option**	
	empty field	No Brake Option
	A	Motor with Holding Brake
3	**Motor Frame Size (mandatory field)**	
	42	Torque 0.35 Nm
	60	Torque range 0.55 or 1.4 Nm
	82	Torque 3 Nm
	100	Torque range 6 Nm
	115	Torque range 10 Nm
	142	Torque range 15 or 17 Nm
	170	Torque range 35 or 60 Nm
4	**Winding (mandatory field)**	
	nn	min^{-1} (x100) see "Technical Data" (page 6)
5	**Motor Torque (mandatory field)**	
	nn	Torque [Nm] see "Technical Data" (page 6)
6	**Flange (mandatory field)**	
	5	All sizes
	7	Only for Size 82 and 115
	8	Only for Size 60, 82, 100 and 115
	9	Only for Size 115
7	**Shaft (mandatory field)**	
	9	9x25 mm for size 42 - 9x20 mm for size 60
	11	11x23 mm for size 60
	14	14x30 mm for size 82
	19	19x40 mm for size 82/100/115/142
	24	24x50 mm for size 100/115/142
	28	28x60 mm for size 115/142
	38	38x80 mm for size 170
8	**Key Shaft option**	
	empty field	Shaft with Key
	S	Shaft without key
9	**Layout - Connectors (mandatory field)**	
	0V	Cable exit and Molex Flying connectors - 200 mm above
	2I	Rotatable Interconnectron receptacles
	2IB	90° Interconnectron receptacles - forward facing
	2ID	90° Interconnectron receptacles - rear facing
	3M	Terminal box rear facing
	3MB	Terminal box forward facing

10	**Female connectors option**	
	empty field	With Female / flying connectors
	W	Without Female / flying connectors
11	**Protection Degree (mandatory field)**	
	64	IP64
	65	IP65 (standard for SMB170)
	67	IP67 (optional for SMB170)
12	**Feedback**	
	empty field	Standard Resolver [SMB]
	A1	Encoder 1024 ppr + Hall - TAMAGAWA OIH48
	A2	Encoder 2048 ppr + Hall - TAMAGAWA OIH48
	A3	Encoder 4096 ppr + Hall - TAMAGAWA OIH48
	A6	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50/52
	A7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50/52
	B3	Encoder 2048 ppr + Hall - TAMAGAWA OIH35
	B9	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1331
	C4	Encoder 5000 ppr + Hall - TAMAGAWA OIH48
	C6	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36
	C7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36
	D3	Encoder 5000ppr + Hall - TAMAGAWA OIH35
	D5	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1325
	F2	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQN1125
	F4	SinCos EnDat Encoder Multi-Turn - HEIDENHAIN EQI1130
	G4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL37
	S1	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S, SIL2
	S2	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRS50S, SIL2
	S3	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36S, SIL2
	S4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36S, SIL2
	S5	32768 steps/rev Single Turn Hiperface DSL® Encoder Feedback SIL2
	S6	32768 steps/rev x 4096 Multi Turn Hiperface DSL® Encoder Feedback SIL2

* SMB: for Drives TPD-M, SLVD-N, TWIN-N, SPD-N, Hi-Drive

13	Option Inertia
empty field	Standard Inertia
M	Medium Inertia
14	**Voltage**
0A	24 VDC
0B	34 V
0C	48 VDC
0D	50 V
0E	60 V
0L	60 VDC
0F	72 VDC
0G	74 V
0	80 V
0I	95 V
0H	96 V
1A	108-110 VDC
1D	120 VDC
1B	125 V
1C	150 VDC
1	180 V
1E	185 VDC
2B	200 VDC
2	220-230 V
2A	222 V
3	330 V
4	380-400 V
4A	425 VDC
4C	460 V
4B	490 V

Order Code

Serie SMH*

	1	2	3	4	5	6	7	8	9	10	11	12	13
Order example	**SMH**	**A**	**60**	**30**	**1,4**	**5**	**9**		**2I**	**64**	**A6**	**M**	**2**

1	**Type Of Motor (mandatory field)**	
	SMH	Standard Motor with Resolver SMH Series
2	**Brake Option**	
	empty field	No Brake Option
	A	Motor with Holding Brake (brakes when the supply voltage is 0)
3	**Motor Frame Size (mandatory field)**	
	42	Torque 0.35 Nm
	60	Torque range 0.55 or 1.4 Nm
	82	Torque 3 Nm
	100	Torque range 6 Nm
	115	Torque range 10 Nm
	142	Torque range 15 or 17 Nm
	170	Torque range 35 or 60 Nm
4	**Winding (mandatory field)**	
	nn	min^{-1} (x100) see "Technical Data" (page 6)
5	**Motor Torque (mandatory field)**	
	nn	Torque [Nm] see "Technical Data" (page 6)
6	**Flange (mandatory field)**	
	5	B5 Flange
	7	Only for Frame 82 and 115
	8	Only for Frame 60, 82, 100 and 115
	9	Only for Frame 115
7	**Shaft (mandatory field)**	
	9	9x25 mm for size 42 - 9x20 mm for size 60
	11	11x23 mm for size 60
	14	14x30 mm for size 82
	19	19x40 mm for size 82/100/115/142
	24	24x50 mm for size 100/115/142
	28	28x60 mm for size 115/142
	38	38x80 mm for size 170
8	**Key Shaft option**	
	empty field	Shaft with Key
	S	Shaft without key
9	**Layout - Connectors (mandatory field)**	
	0V	Cable exit and Molex Flying connectors - 200 mm above
	2I	Rotatable Interconnectron receptacles
	2IB	90° Interconnectron receptacles - forward facing
	2ID	90° Interconnectron receptacles - rear facing
10	**Protection Degree (mandatory field)**	
	64	IP64
	65	IP65 (standard for SMB170)
	67	IP67 (optional for SMB170)
11	**Feedback**	
	A6	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50/52
	A7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRM50/52
	C6	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36
	C7	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36
	G4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL37
	G5	SinCos Hiperface Encoder Multi-Turn - STEGMANN SEL52
	S1	SinCos Hiperface Encoder Single-Turn - STEGMANN SRS50S, SIL2
	S2	SinCos Hiperface Encoder Multi-Turn - STEGMANN SRM50S, SIL2
	S3	SinCos Hiperface Encoder Single-Turn - STEGMANN SKS36S, SIL2
	S4	SinCos Hiperface Encoder Multi-Turn - STEGMANN SKM36S, SIL2
12	**Option Inertia**	
	empty field	Standard Inertia
	M	Medium Inertia
13	**Voltage**	
	2	220-230 V
	4	380-400 V

* SMH: for Drive Compax3

Order Code

Motor Power Cable for SMB Motors

	1	2	3	4	5	6	7
Order example	**CAVOMOT**	**A**	**1,5x**	**5**	**PM**	**I**	**40**

1	**CAVOMOT**	
	CAVOMOT	Power cable drive - motor
2	**Brake wire**	
	empty field	without brake wire
	A	Brake wire
3	**Section [mm²]**	
	1,5x	1,5 mm²
	2,5x	2,5 mm²
	4x, 6x, 10x,	4 mm², 6 mm², 10 mm²,
	25x	25 mm² (not for "PM" type)
4	**Length [m]**	
	1, ...*	Length in metre
5	**Application Type**	
	PF-	Standard cable
	PM-	High flex cable
6	**Motor Connector**	
	I	Interconnectron Connector [all layout]
	3	Terminal Connection Box [all layout except 3M/3MB/3MC/3MA]
	S	Terminal Connection Box [layout 3M/3M/3MC/3MA]
	F	Faston Connector [layout SMB42 0V]
7	**Motor Size**	
	40..265	Motor Size

* Available lenghts in meter: 1,2,5,10,15,20,30,40 50

Motor Cable for Hiperface DSL®

	1	2	3	4	5	6	7
Order example	**CAVODSL**	**1,5x**	**3**	**PM-**	**TPD-**	**A00-**	**C**

1	**Cable**	
	CAVODSL	Motor Cable for Single Cable Servo Drive System based on Hiperface DSL®
2	**Section [mm²]**	
	1,5x	1,5 mm²
	2,5x	2,5 mm²
	4x, 6x, 10x, 25x	4 mm², 6 mm², 10 mm², 25 mm²
3	**Length [m]**	
	1, ...	Length in metre (max. 50 m)
4	**Application Type**	
	PM-	Moving Application
5	**Drive Type**	
	TPD-	TPD Drive
6	**Option**	
	...	Special customer drawing Internal table code
7	**Connector**	
	C	Mating connector Mating connector in the motor package

Feedback Cable for SMB Motors

	1	2	3	4	5
Order example	**CAVORESX**	**4**	**PM**	**I**	**SLVDN**

1	**Signal Cable type**	
	CAVORESX	Resolver
	CAVOENCX	Incremental encoder
	CAVOABSX	Absolute Encoder EnDat+SinCos
	CAVOHIPX	Absolute Encoder Hiperface+SinCos
	CAVOSINX	SinCos Encoder
	CAVOHALX	SinCos Encoder + Hall sensor
2	**Length [m]**	
	1, ...*	Length in metre
3	**Application Type**	
	PM-	Moving Application
4	**Motor Connector**	
	I	Interconnectron Connector [all layout]
	S	Terminal Connection Box layout 3M/3M/3MC/3MA and motor MBX
	F	Faston Connector [layout SMB40 0V]
5	**Drive Type**	
	SLVDN	SLVD-N Drive
	TPD	TPD-M
	SPD/TWIN	TWIN_N e SPD_N Drive or wire without connector drive side
	HIDRIVE	Hi-Drive

Order Code

Motor Power Cable for SMH Motors

	1	2
Order example:	**MOK**	**55/02**

1	**Cable**	
	MOK	Motor cable [2]
2	**Type**	
		for SMH / MH56 / MH70 / MH105 [3]
	55/....[1]	1,5 mm²; up to 13,8 A
	54/....[1]	1,5 mm²; up to 13,8 A Moving application
	56/....[1]	2,5 mm²; up to 18,9 A
	57/....[1]	2,5 mm²; up to 18,9 A Moving application

MOK55 and MOK54 are also possible for linear motors LXR406, LXR412 and BLMA.

Feedback Cable for SMH Motors

	1
Order example:	**REK42/02**

1	**Zubehör**	
		for MH/SMH-Motors
	REK42/....[1]	Resolver cable [2]
	REK41/....[1]	Resolver cable [2] Moving application
	GBK24/....[1]	SinCos© Feedback cable [2] Moving application
	GBK38/....[1]	EnDat 2.1 Feedback cable [2] Moving application
	GBK23/....[1]	Encoder cable [2]

Length code for cables

[1] Length code 1 (Example: SSK01/09 = length 25 m)

Length [m]	1,0	2,5	5,0	7,5	10,0	12,5	15,0	20,0	25,0	30,0	35,0	40,0	45,0	50,0
Order code	01	02	03	04	05	06	07	08	09	10	11	12	13	14

[2] Color according to DESINA
[3] with motor connector
[4] with cable eye for motor terminal box