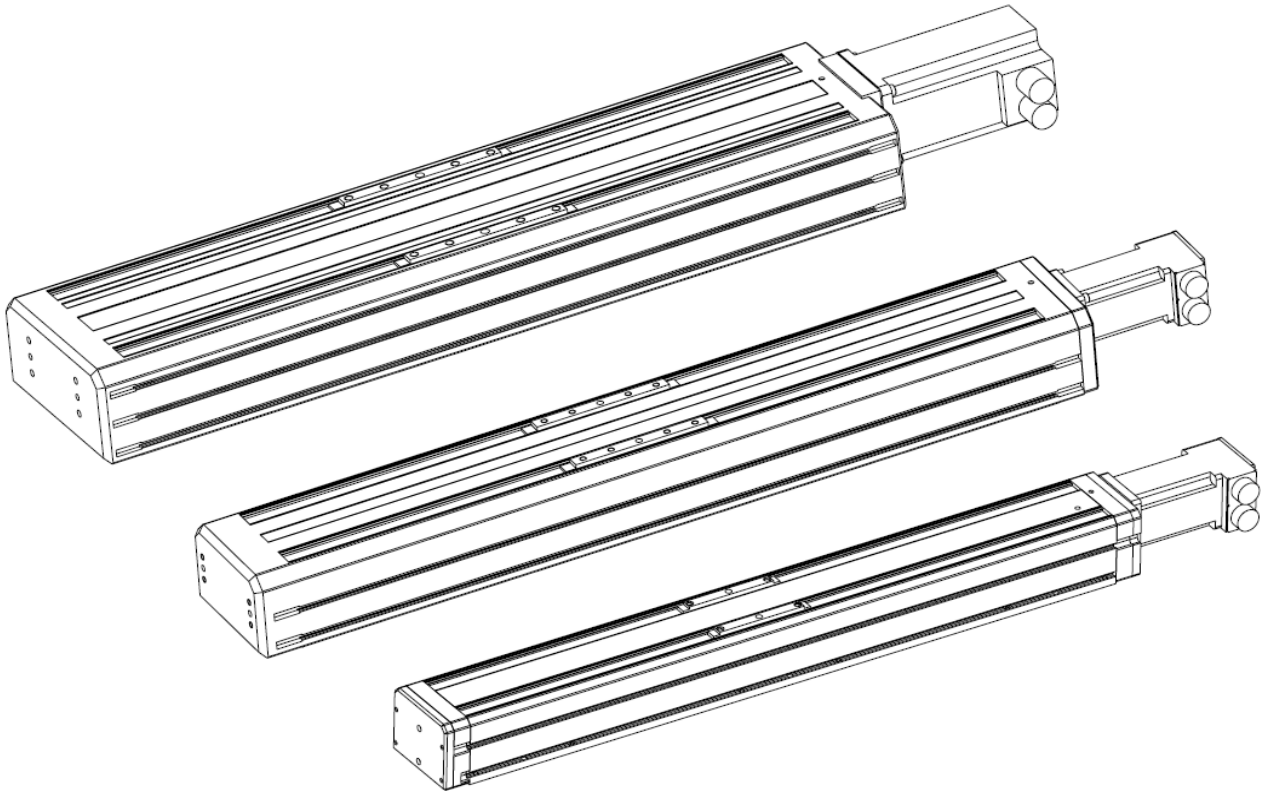
P/N 102-0200-01 REV 2
Effective:MARCH-06
Supercedes: REV1 SEP-05

HD Series Product Manual

HD085/HD125/HD185/HD015



PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
1140 SANDYHILL ROAD IRWIN ,PA 15642

Important User Information

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS 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 and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Since Parker Hannifin Corporation constantly strives to improve all of its products, we reserve the right to change this product manual and equipment mentioned therein at any time without notice.

For assistance contact:
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WWW.PARKERMOTION.COM

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Revision Notes :

REV-2 (3-28-06) :
UPDATED CATALOG CONFIGURABLE OPTIONS
UPDATED EXPLODED BOMS HD125/HD185
HD125 ITEM# 9A/9B CARRIAGE WEAR BARS
HD185 ITEM#9 CARRIAGE WEAR BAR
ITM#18/28 QTY NOW 2(NEW BUMPER ASSEMBLY)
NEW BRAKE ASSEMBLYS 002-2601/002-2611 PG 34/35

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Chapter 1 - Introduction

Product Description

HD series linear table line is a robust industrial positioner that is easy to apply, easy to install, and easy to maintain. The robust design begins with and extruded body and carriage that provide exceptional beam strength and carriage stiffness. The linear bearings and ballscrew are precision components selected for their long life at 100% duty operation, they both employ lube seals which provide maintenance free operation in most applications. The HD series also includes IP30 rated belt seals that protect the interior components from debris.

The HD series is very easy to apply. As part of the configurable number, users can select options such as screw lead, motors, brakes and limit/homes. With motors as part of standard table, system level performance is provided in the form of graphs to enable quick application without the need for a complex motor sizing exercise.

HD series has three distinct sizes allowing for ease of applying to application.

HD085 85mm wide x 70mm tall
HD125 125mm wide x 85mm tall
HD185 185mm wide x 95mm tall
The above sizes make the HD series ideal for applying to applications requiring Cartesian set-ups.

HD series also offers a standard extruded idler/square rail HD015 60mm wide x 62mm tall for use in gantry style applications

Unpacking

Unpacking
Carefully remove the positioner from the shipping crate and inspect the unit for any evidence of shipping damage. Report any damage immediately to your local authorized distributor. Please save the shipping crate for damage inspection or future transportation.

Incorrect handling of the positioner may adversely affect the performance of the unit in its application. Please observe the following guidelines for handling and mounting of your new positioner.

DO NOT allow the positioner to drop onto the mounting surface. Dropping the positioner can generate impact loads that may result in flat spots on bearing surfaces or misalignment of drive components.

DO NOT drill holes into the positioner. Drilling holes into the positioner can generate particles and machining forces that may effect the operation of the positioner. Parker Hannifin Corporation will drill holes if necessary; contact your local authorized distributor.

DO NOT subject the unit to impact loads such as hammering, riveting, etc. Impacts loads generated by hammering or riveting may result in flat spots on bearing surfaces or misalignment of drive components.

DO NOT push in belt seals when removing positioner from shipping crate. Damaging belt seals may create additional friction during travel and may jeopardize the ability of the beltseals to protect the interior of the positioner. If belt seals are pushed in run carriage by hand over entire travel and the belts will reset.

DO NOT submerge the positioner in liquids.

DO NOT disassemble positioner. Unauthorized adjustments may alter the positioner's specifications and void the product warranty.

Return Information

Returns
All returns must reference a "*R*eturn *M*aterial *A*uthorization", *(RMA)*, number. Please call your local authorized distributor or Parker Hannifin Corporation Customer Service Department at 800-245-6903 to obtain a "RMA" number.

Repair Information

Out-of-Warranty Repair
Our Customer Service Department repairs Out-of-Warranty products. All returns must reference a "RMA" number. Please call your local authorized distributor or Parker Hannifin Corporation Customer Service Department at 800-245-6903 to obtain a "RMA" number. You will be notified of any cost prior to making the repair.

Warnings and Precautions

Vertical Operation

Depending upon your load and ballscrew selection the carriage and load may 'backdrive' in power loss situations potentially causing product damage or personal injury. An electro-mechanical brake, which will activate in response to a loss of power (option 'B2'), can be used to prevent potential product damage or personal injury**. Note: Actual maximum load for brake holding is dependent on screw lead.**

Strain Relieve Electrical Components

All electrical components (such as brakes, encoders, and limit/home switches) must be strain relieved. Failure to strain relieve electrical wires or cables may result in component failure and/or possible personal injury.

Specification Conditions and Conversions

Specifications are Temperature Dependent
Catalog Specifications are obtained and measured at 20 Degrees C. Specifications at any other temperature may *deviate* from catalog specifications. Minimum to Maximum continuous operating *temperature range* (with NO guarantee of any specification except motion) of a standard unit before failure is 5 - 70 Degrees C. Certain components can be eliminated or substituted to improve operation at these temperatures. Positioners with low temperature or high temperature components will be handled as specials, contact your local distributor.

Specifications are Mounting Surface Dependent
Catalog Specifications are obtained and measured when the positioner is *fully supported*, *bolted down* (to eliminate any extrusion deviation), and is mounted to a work surface that has a *maximum flatness error of 0.013mm/300mm (0.0005"/ft).*

Specifications are Point of Measurement Dependent
Catalog Specifications and Specifications in this manual are measured in the center of the carriage, 37.5mm above the carriage surface. All measurements taken at any other location may deviate from these values.

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HD085 CONFIGURABLE

Order Example:

HD085 T02 S D02 M020 LH2 B1 R1

Series

85 mm HD085

Travel* 100 mm T01
200 mm T02
300 mm T03
400 mm T04
500 mm T05
600 mm T06
800 mm T08
1000 mm T10
1200 mm T12

Grade Standard ..... S

Drive

5 mm lead* D02
10 mm lead D03
20 mm lead D04

*Maximum travel for D02 (5mm lead) = 800 mm (T08).

Environmental Prep.

R1 IP30 - Maintenance free

Brake*

B1 No Brake

*See motor options

Home/Limit Switch*

LH1 No Sensors
LH2 NPN Std. (NC limits, NO home)
LH3 PNP Std. (NC limits, NO home)
LH4 PNP Std. (NO limits, NO home)

*Includes 5 meter extension cables

Motor Options

Inline	Parallel "A"	Parallel "B"	Description
M000			No motor
M010	M011	M012	Servo w/std. encoder (SM232AE-TPSN)
M020	M021	M022	Servo w/std. encoder, & brake (SM232AE-TPSB)
M110	M111	M112	Servo w/smart encoder (SM232AQ-TPSN)
M120	M121	M122	Servo w/smart encoder, & brake (SM232AQ-TPSB)
M100			Stepper (HV232-02-10) (in-line only)

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HD125 CONFIGURABLE

Order Example:

HD125 T04 S D02 M030 LH2 B1 R1

Series

125 mm HD125

Travel* 200 mm T02
300 mm T03
400 mm T04
500 mm T05
600 mm T06
800 mm T08
1000 mm T10
1200 mm T12
1400 mm T14
1500 mm T15

Grade Standard ..... S

Drive

5 mm lead* D02**
10 mm lead D03
20 mm lead D04

*Maximum travel for D02 (5mm lead) = 800 mm (T08)
Maximum travel for D03 (10mm lead) = 1000 mm (T10)
**D02 only with M01, M11, and M100 motors.

Environmental Prep.

R1 IP30 - Maintenance free

Brake

B1 No Brake
B2 Brake

Home/Limit Switch*

LH1 No Sensors
LH2 NPN Std. (NC limits, NO home)
LH3 PNP Std. (NC limits, NO home)
LH4 PNP Std. (NO limits, NO home)
*Includes 5 meter extension cables

Motor

Inline	Parallel "A"	Parallel "B"	Description
M000			No motor
M010	M011	M012	Servo w/std. encoder (SM232AE-TPSN)
M030	M031	M032	Servo w/std. encoder (SM233AE-TPSN)
M040			Servo w/std. encoder (CMP0921B1E)
M110	M111	M112	Servo w/smart encoder (SM232AQ-TPSN)
M130	M131	M132	Servo w/smart encoder (SM233AQ-TPSN)
M140			Servo w/smart encoder, (CMP0921B3E)
M100			Stepper (HV232-02-10)

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HD185 CONFIGURABLE

Order Example:

HD185 T05 S D02 M030 LH2 B1 R1

Series

185 mm HD185

Travel* 300 mm T03
400 mm T04
500 mm T05
600 mm T06
800 mm T08
1000 mm T10
1200 mm T12
1400 mm T14
1600 mm T16

Grade Standard ..... S

Drive

5 mm lead* D02**
10 mm lead D03
20 mm lead D04

*Maximum travel for D02 (5mm lead) = 800 mm (T08)
Maximum travel for D03 (10mm lead) = 1000 mm (T10)
**D02 only with M01 & M11

Environmental Prep.

R1 IP30 - Maintenance free

Brake

B1 No Brake
B2 Brake

Home/Limit Switch*

LH1 No Sensors
LH2 NPN Std. (NC limits, NO home)
LH3 PNP Std. (NC limits, NO home)
LH4 PNP Std. (NO limits, NO home)

*Includes 5 meter extension cables

Inline	Parallel "A"	Parallel "B"	Description
M000			No motor
M010	M011	M012	Servo w/std. encoder (SM232AE-TPSN)
M030	M031	M032	Servo w/std. encoder (SM233AE-TPSN)
M040	M041	M042	Servo w/std. encoder (CMP0921B1E)
M110	M111	M112	Servo w/smart encoder (SM232AQ-TPSN)
M130	M131	M132	Servo w/smart encoder (SM233AQ-TPSN)Servo
M140	M141	M142	Servo (CMP0921B3E)

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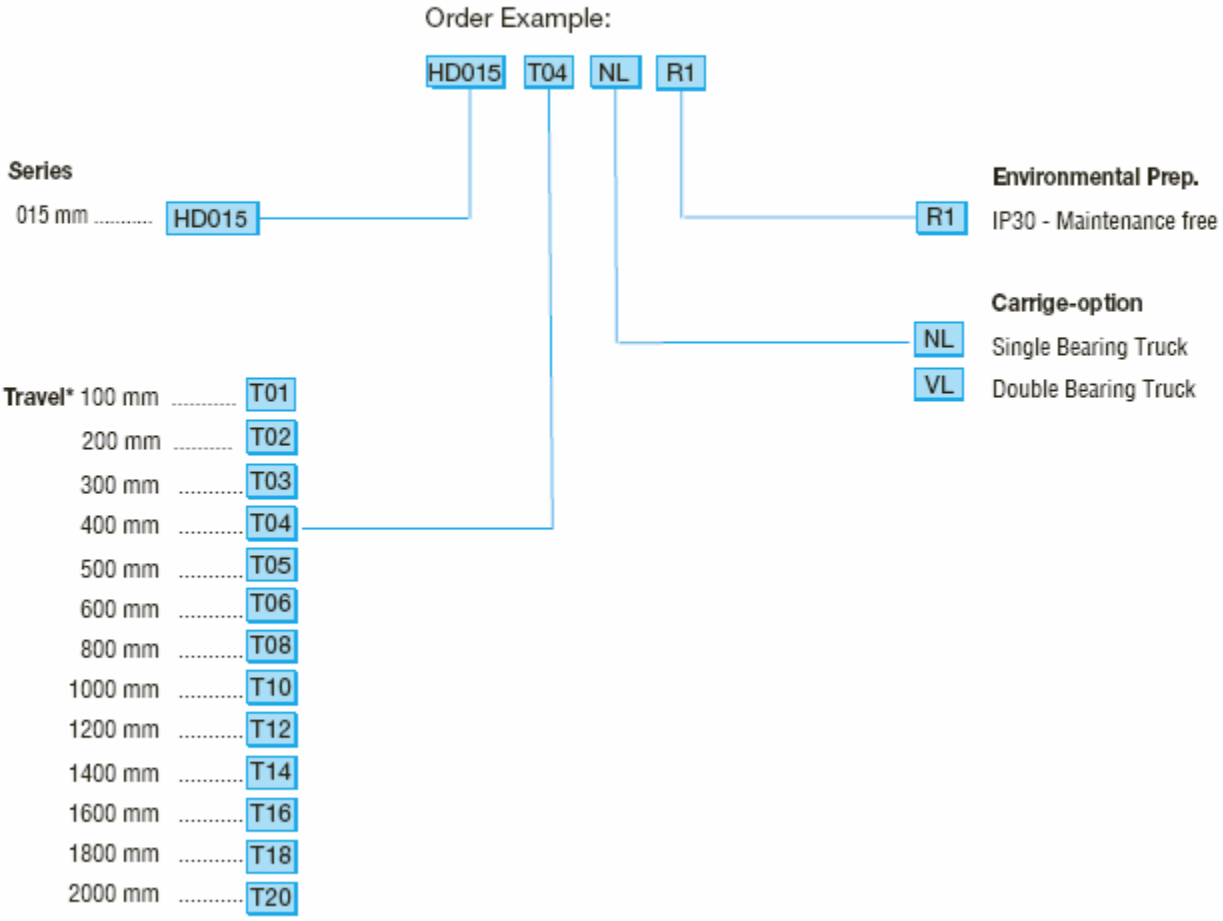
HD015 CONFIGURABLE

HD015 Series - How to Order:



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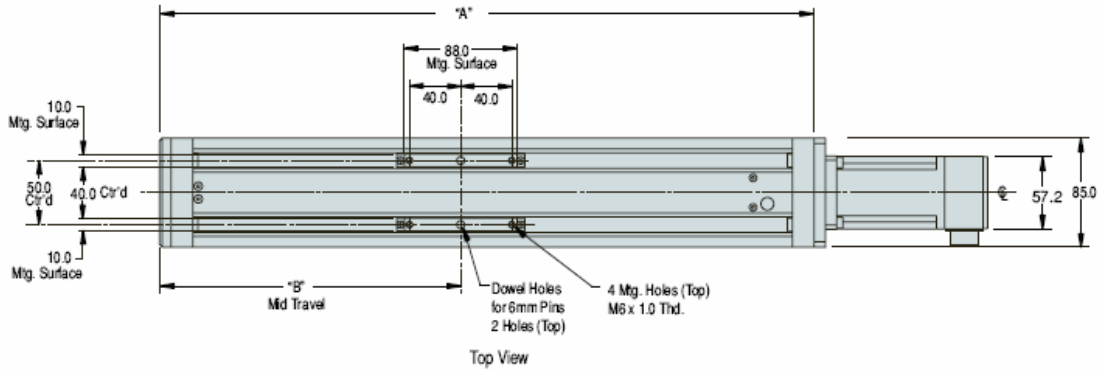
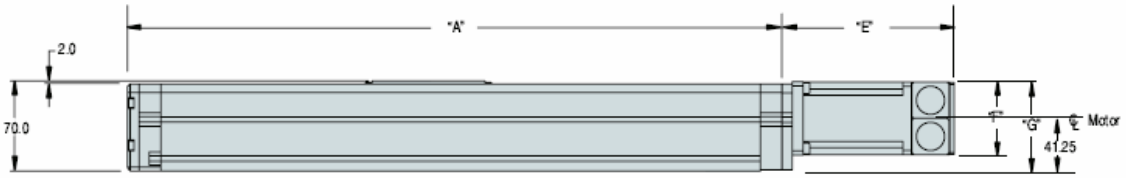
HD085 DIMENSIONAL DRAWINGS

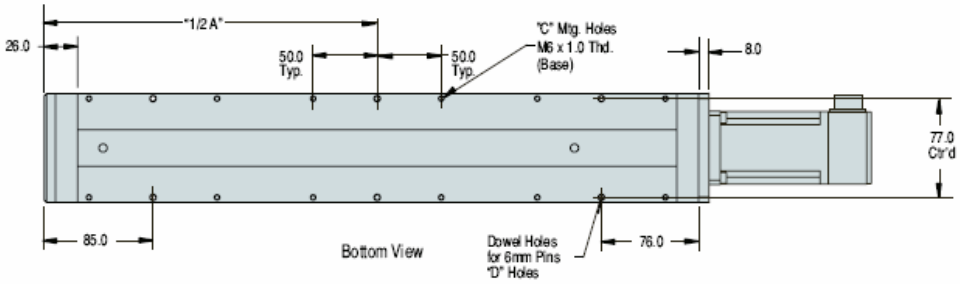
Please refer to Parkermotion.com
for the latest, updated drawings



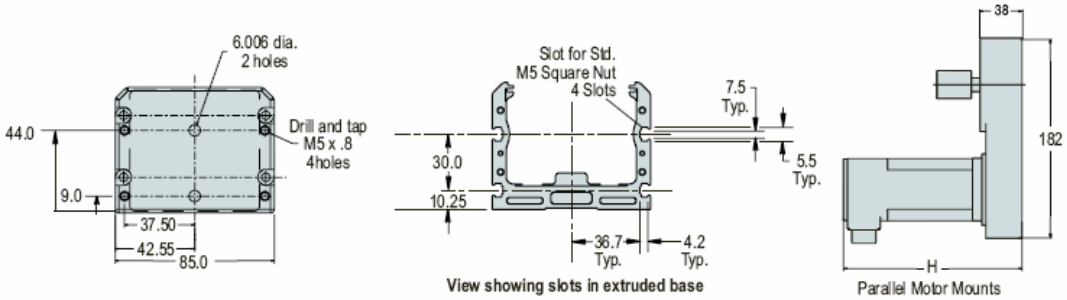
Top View



Front View



Bottom View



View showing slots in extruded base

Parallel Motor Mounts

Model	Travel	A	B	C	D
HD085T01	100	311	135	4	2
HD085T02	200	411	185	12	6
HD085T03	300	511	235	12	6
HD085T04	400	611	285	12	6
HD085T05	500	711	335	12	6
HD085T06	600	811	385	12	6
HD085T07	700	911	435	12	6
HD085T08	800	1011	485	12	6
HD085T09	900	1111	535	12	6
HD085T10	1000	1211	585	12	6
HD085T11	1100	1311	635	12	6
HD085T12	1200	1411	685	12	6

Motor Model		E	F	G	H
M000	No Motor	0	-	-	-
M010	SM232AE-TPSN	134.5	57.2	69.8	163
M020	SM232AE-TPSB	168.0	57.2	69.8	198
M100	HV232-02-10	79.2	57.2	69.8	-
M110	SM232AQ-TPSN	134.5	57.2	69.8	163
M020	SM232AQ-TPSB	168.0	57.2	69.8	198

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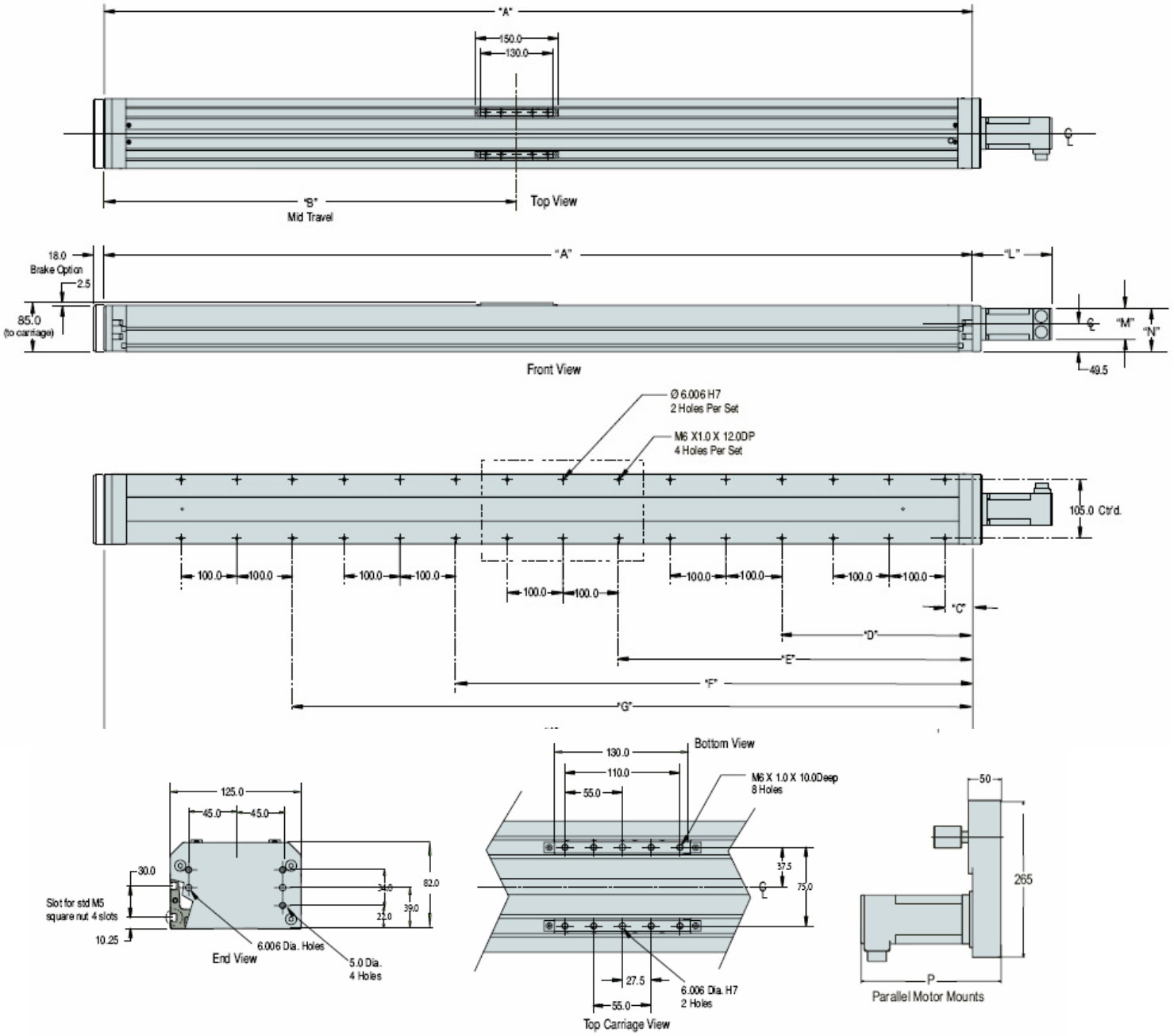
HD125 DIMENSIONAL DRAWINGS

Please refer to Parkermotion.com
for the latest, updated drawings



Model	Travel	A	B	C	D	E	F	G
HD125T02	200	508.0	239.5	NA	NA	135.0	NA	NA
HD125T03	300	608.0	289.5	50.0	NA	185.0	NA	320.0
HD125T04	400	708.0	339.5	50.0	NA	245.0	NA	420.0
HD125T05	500	808.0	385.5	50.0	NA	285.0	NA	520.0
HD125T06	600	908.0	439.5	50.0	NA	335.0	NA	620.0
HD125T08	800	1108.0	539.5	50.0	NA	435.0	NA	820.0
HD125T10	1000	1308.0	639.5	50.0	NA	535.0	NA	1020.0
HD125T12	1200	1508.0	737.0	50.0	342.5	635.0	927.5	1220.0
HD125T15	1500	1808.0	887.0	50.0	417.5	785.0	1152.5	1520.0

Motor Model		L	M	N	P
M000	No Motor	0	-	-	-
M010	SM232AE-TPSN	167	57.2	78.1	208
M030	SM233AE-TPSN	192	57.2	78.1	233
M040	CMP921B1E	195	89.4	94.2	-
M100	HV232-02-10	102	57.2	78.1	-
M110	SM232AQ-TPSN	167	57.2	78.1	208
M130	SM233AQ-TPSN	192	57.2	78.1	233
M140	CMP921B3E	195	89.4	94.2	-

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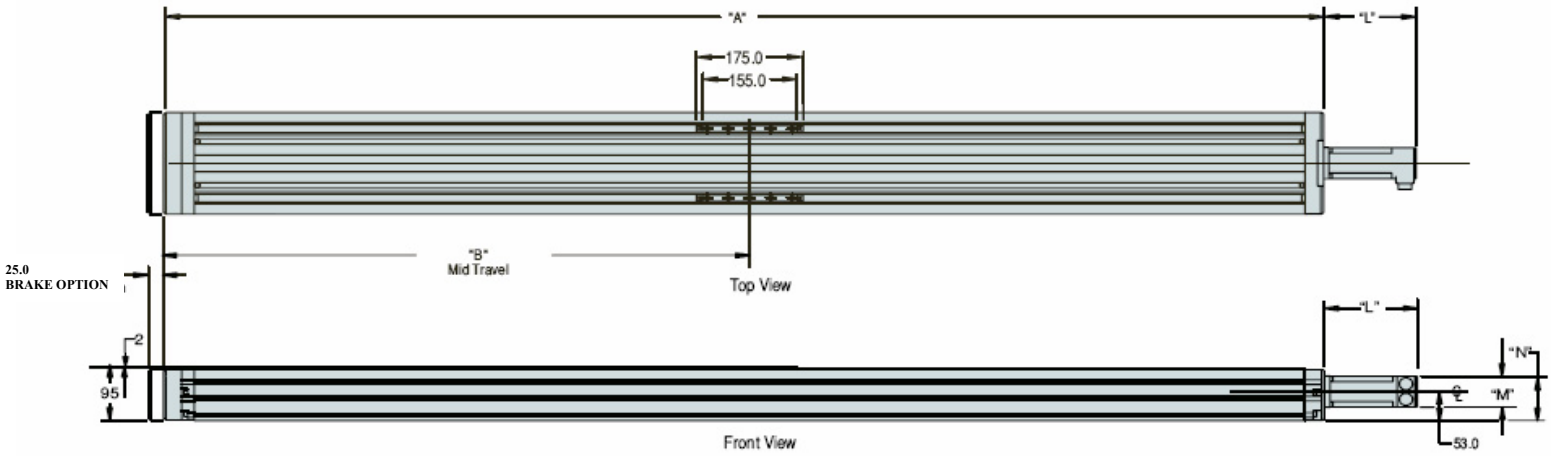
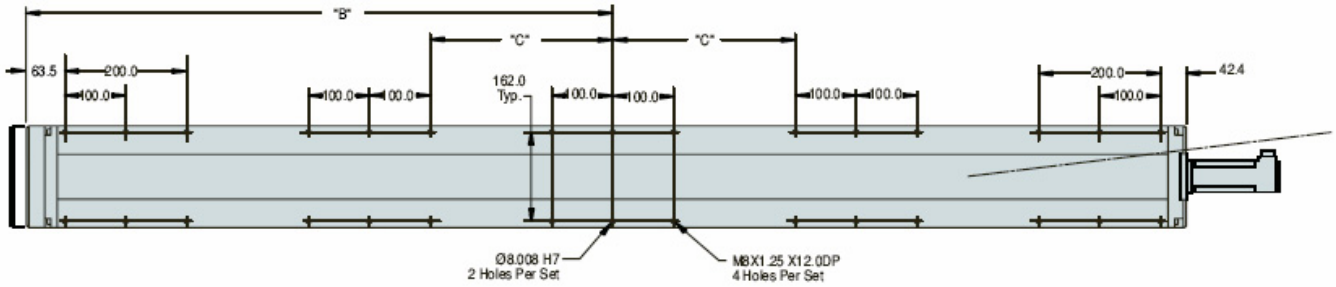
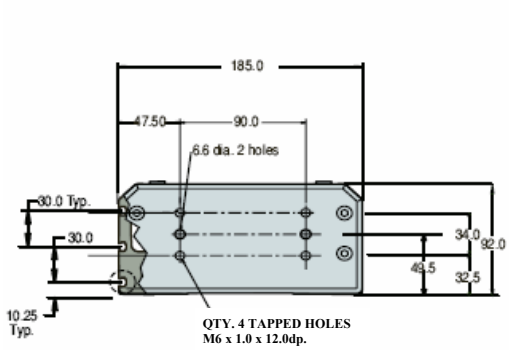
HD185 DIMENSIONAL DRAWINGS

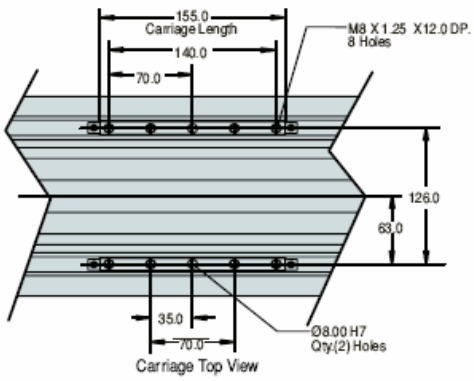
Please refer to Parkermotion.com
for the latest, updated drawings

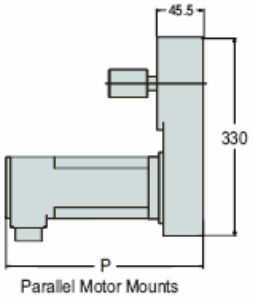






ENDVIEW





Model	Travel	A	B	C
HD185T03	300	585.9	313.5	NA
HD185T04	400	685.9	363.5	NA
HD185T05	500	785.9	413.5	NA
HD185T06	600	885.9	463.5	NA
HD185T08	800	1085.9	563.5	NA
HD185T10	1000	1285.9	663.5	NA
HD185T12	1200	1485.9	763.5	200.0
HD185T14	1400	1685.9	863.0	250.0
HD185T16	1600	1885.9	963.0	300.0

Motor Model		L	M	N	P
M000	No Motor	0	-	-	-
M010	SM232AE-TPSN	126.8	57.2	81.6	208
M030	SM233AE-TPSN	152.2	57.2	81.6	233
M040	CMP921B1E	170.1	89.4	97.7	207
M110	SM232AQ-TPSN	126.8	57.2	81.6	208
M130	SM233AQ-TPSN	152.2	57.2	81.6	233
M140	CMP921B3E	170.1	89.4	91.7	277

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HD015 DIMENSIONAL DRAWINGS

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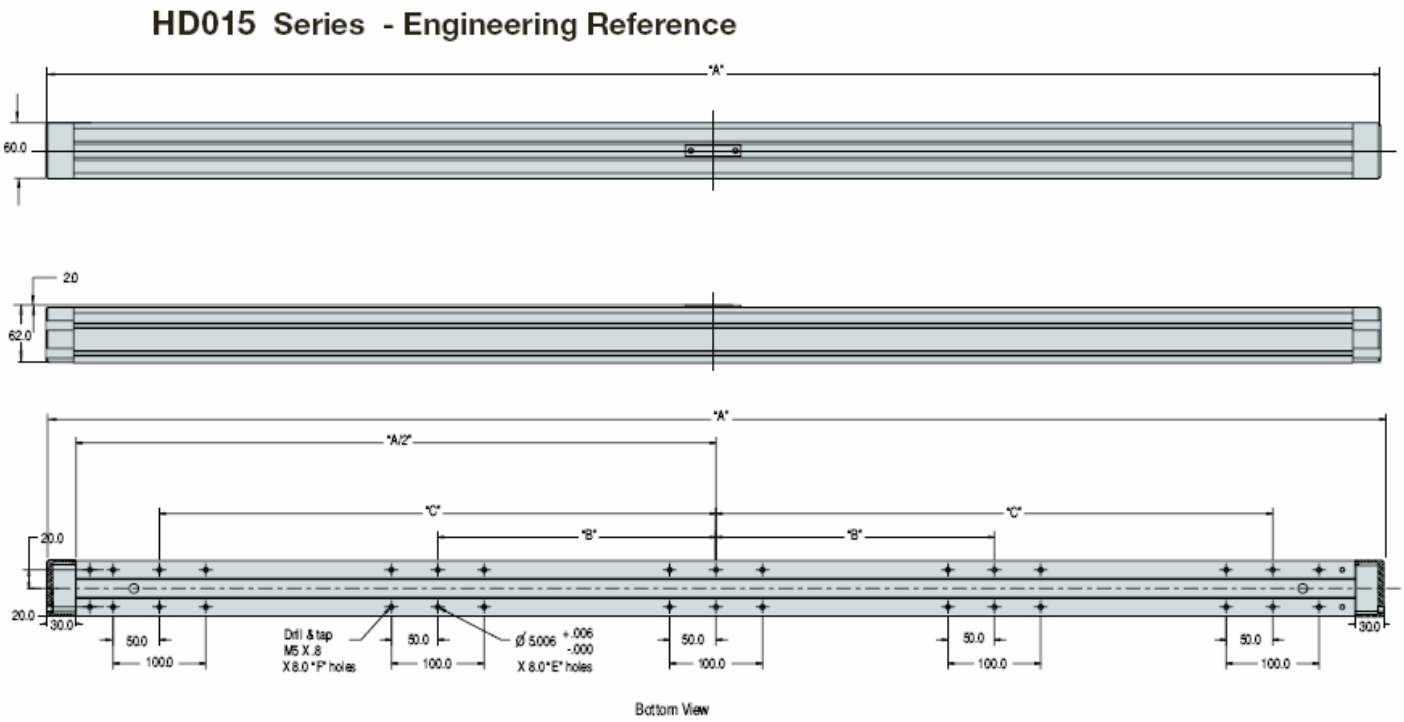
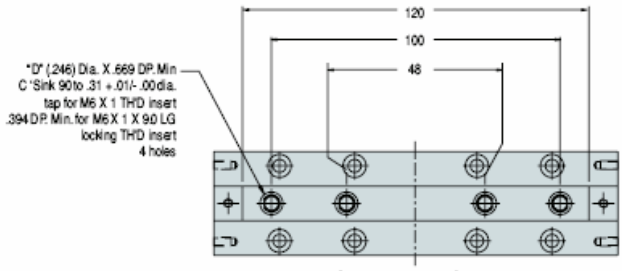
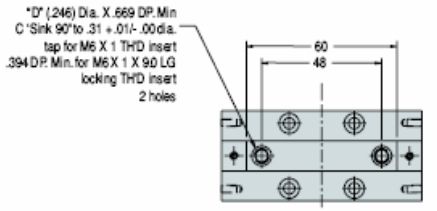


Bottom View

Model	Travel	A	B	C	D	E	F
HD015T01	100	340.0	N/A	N/A	5	2	4
HD015T02	200	440.0	N/A	N/A	6	2	4
HD015T03	300	540.0	N/A	150.0	8	6	12
HD015T04	400	640.0	N/A	200.0	10	6	12
HD015T05	500	740.0	N/A	250.0	11	6	12
HD015T06	600	840.0	N/A	300.0	13	6	12
HD015T07	700	940.0	N/A	345.0	15	6	12
HD015T08	800	1040.0	N/A	400.0	16	6	12
HD015T09	900	1140.0	N/A	450.0	18	6	12
HD015T10	1000	1240.0	N/A	500.0	20	6	12
HD015T11	1100	1340.0	N/A	550.0	21	6	12
HD015T12	1200	1440.0	300.0	600.0	23	10	20
HD015T13	1300	1540.0	325.0	650.0	25	10	20
HD015T14	1400	1640.0	350.0	700.0	26	10	20
HD015T15	1500	1740.0	375.0	750.0	28	10	20
HD015T16	1600	1840.0	400.0	800.0	30	10	20
HD015T17	1700	1940.0	425.0	850.0	32	10	20
HD015T18	1800	2040.0	450.0	900.0	33	10	20
HD015T19	1900	2140.0	475.0	950.0	35	10	20
HD015T20	2000	2240.0	500.0	100.0	36	10	20



VL Option- Long Carriage



NL Option- Short Carriage

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HD085
BILL OF MATERIALS

002-2582-XX CARRIAGE ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
1	101-2106-01	1	CARRIAGE MACHINED HD085
2	003-3821-0	4	BEARING TRUCK
3	100-8106-01	2	CARRIAGE WEAR BAR
4	002-2583-01	2	LIMIT TRIGGER ASSY
5	SCH-M003-0035	4	SOCKET HEAD M3 X 0.5 X 35.0LG
6	SCH-M003-0008	8	SOCKET HEAD M3 X 0.5 X 8.0LG
7	SCL-M003-0005	4	SOCKET LOW HEAD M3 X 0.5 X 5.0LG
002-2581-XX BASE-SQUARE RAIL ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
8	101-2105-XX	1	MACHINED BASE HD085
9	003-3679-XX	2	SQUARE RAIL
10	003-3145-03	2	ALUMINUM DISC STICKER
11	SCH-M003-0008	XX	SOCKET CAP HEAD M3 X 0.5 X 8.0LG
002-2584-01 FIXED BEARING ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
12	101-2103-01	1	FIXED BEARING BLOCK HD085
13	003-1086-18	2	ANGULAR CONTACT BEARING
14	000-0301-01	1	BEARING RETAINER
15	003-3827-02	2	BUMPER HD085
16	003-1200-65	2	ALIGNMENT PIN
17	SCH-,003-0010	2	SOCKET CAP HEAD M3 X 0.5 X 10.0LG
18	SCL-M004-0035	4	SOCKET LOW HEAD M4 X 0.7 X 35.0LG
002-2585-01 END BLOCK ASSY MTR END ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
19	101-2110-01	1	END BLOCK MTR END HD085
20	003-3683-01	4	PULLEY ASSY HD085
22	SCH-M003-0010	2	SOCKET HEAD CAP SCREW M3 X 0.5 X 8.0LG
23	SSH-M005-0008	1	SOCKET HEAD SET SCREW M5 X0.8 X 8.0LG
002-2586-01 ENDBLOCK ASSY RADIAL END HD085			
ITEM#	PART#	QTY	DESCRIPTION
24	101-2111-01	1	ENDBLOCK RADIAL END HD085
25	003-1087-35	1	RADIAL BEARING
26	003-3708-01	1	RETAINER
28	003-3683-01	4	PULLEY ASSEMBLY
29	003-3335-15	1	WAVE SPRING
30	003-3827-02	2	BUMPER HD085
31	SCH-M003-00010	4	SOCKET HEAD SCAP SCREW M3 X 0.5 X 10.0LG
32	SCL-M003-0018	4	SOCKET LOW HEAD SCREW M3 X 0.5 X 18.0LG
002-2587-XX TOP COVER ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
33	101-2107-XX	1	CENTER COVER HD085
34	003-3830-01	1	PLASTIC PLUG
35	SCH-M003-0006		SOCKET CAP HEAD M3 X 0.5 X 6.0LG
36	SBH-M003-0010	4	SOCKET BUTTON HEAD M3 X 0.5 X 8.0 LG
002-2XXX-XX BALL SCREW ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
37	101-2382-XXX	1	BALLSCREW CALL FACTORY
38	003-1279-15	1	THRUSHT WASHER
39	003-3635-50	1	LOCK NUT
40	SCH-M005-0016	4	SOCKET CAP HEAD M5 X 0.8 X 16.0 LG
002-2667-XXX BELT SEAL ASSEMBLY HD085			
ITEM#	PART#	QTY	DESCRIPTION
41	101-2121-XX	2	BELT SEAL
42	101-2117-01	1	BELT SEAL NUT RETAINER
43	SBH-M003-0008	4	BUTTOB HEAD M3 X 0.5 X 8.0 LG
002-2601-04 END PLATE COVER ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
44	101-2112-01	1	COVER PLATE HD 085
45	SCH-M004-0035	4	SOCKET HEAD CAP SCREW M4 X 0.7 X 35.0LG
MOTOR ADAPTER PLATE HD085			
ITEM#	PART#	QTY	DESCRIPTION
46	101-2118-01	1	ADAPTER NEMA23/BE23
	101-2120-01	1	ADAPTER NEMA34/BE34
	101-2124-01	1	ADAPTER MOTOR SMB60
	101-2119-001	1	ADAPTER NEMA16/BE16
COUPLING			
ITEM#	PART#	QTY	DESCRIPTION
47	003-3906-09	1	COUPLING 10MM X 6.35MM
	003-3906-10	1	COUPLING 10MM X 8.0MM
	003-3906-11	1	COUPLING 10MM X 9.525MM
	003-3906-12	1	COUPLING 10MM X 10.0MM

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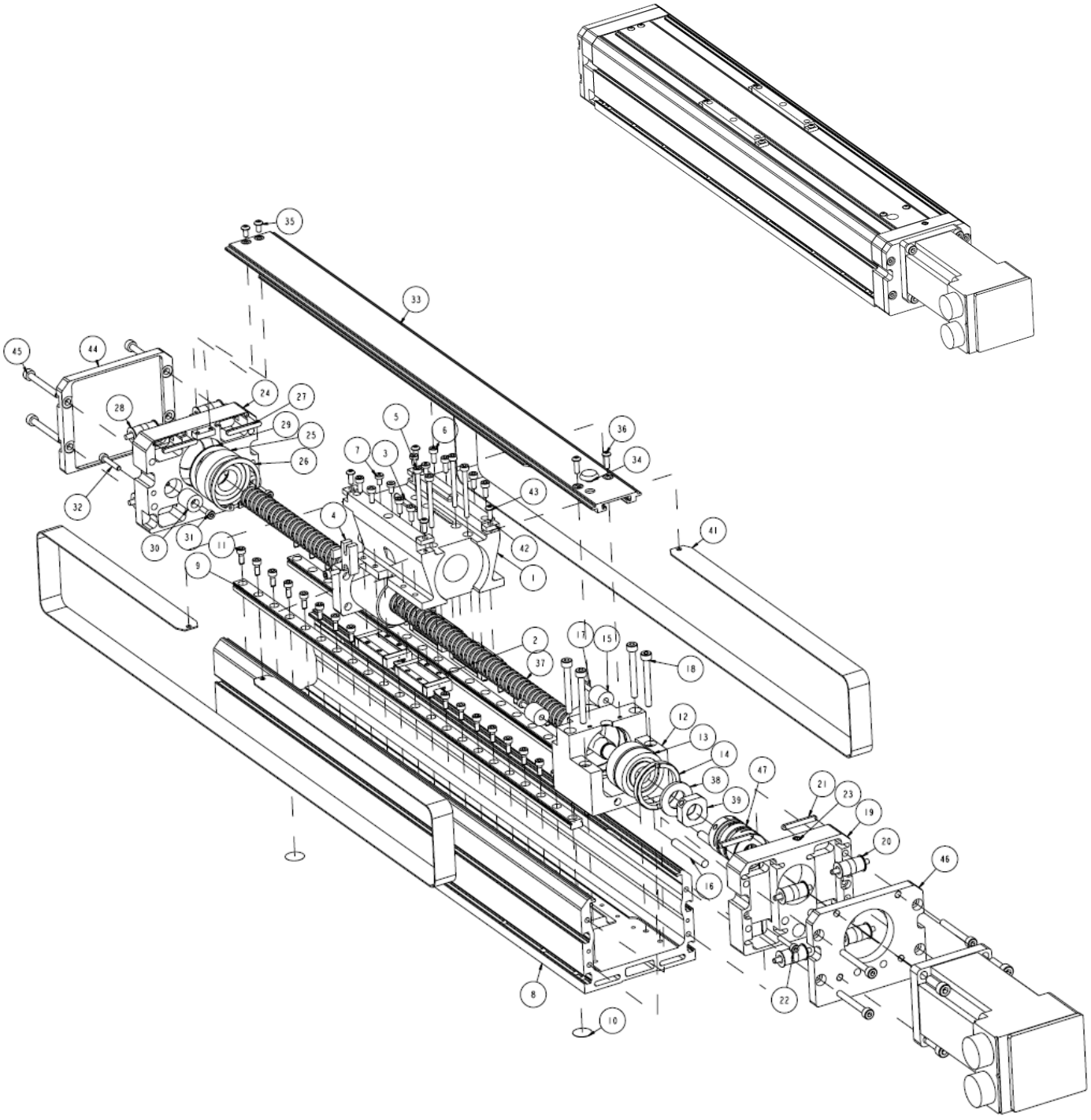
HD085 EXPLODED VIEW



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HD125
BILL OF MATERIALS

002-2603-XX BASE/SQUARE RAIL ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
1	101-2329-XX	1	BASE MACHINED HD125
2	101-2343-XX	2	SQUARE RAIL HD125
3	003-3145-03	2	ALUMINUM DISC STIICKER
4	003-3382-XX	XX	WEAR TAPE
5	SCH-M004-0014	XX	SOCKET HEAD M4 X 0.7 X 14.0LG
002-2604-XX CARRIAGE ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
6	101-2311-01	1	CARRAIGE MACHINED HD125
7	003-3653-01	4	LINEARING BEARING TRUCK
8	SCH-M004-0016	16	SOCKET HEAD M4 X 0.7 X 16.0LG
9A/9B	102-0672-01/02	1/1	CARRIAGE WEAR BAR
10	003-3695-01	2	MAGNET TRIPPER
11	101-2342-XX	1	NUT BRACKET ADAPTER
12	SCH-M005-0014	4	SOCKET HEAD M5 X 0.8 X 14.0LG
002-2605-01FIXED BEARING ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
13	101-2337-01	1	FIXED BEARING BLOCK
14	003-1086-18	2	ANGULAR CONTACT BEARING
15	000-0901-01	1	BEARING RETAINER
16	SCH-M005-0018	6	SOCKET HEAD M5 X 0.8 X 18.0LG
17	003-1200-69	2	DOWEL PIN 5MM X 40.0LG
002-2626-01 END BLOCK ASSY MTR END ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
18	101-2330-01	1	END BLOCK MTR END HD125
19	003-3682-01	4	PULLEY ASSEMBLY HD125/HD185
21	SCH-M005-0030	4	SOCKET HEAD M5 X 0.8 X 30.0LG
22	SSH-M006-0010	1	SOCKET HEAD SET SCREW M6 X 1.0 X 10.0LG
002-2607-01 ENDBLOCK ASSY RADIAL END			
ITEM#	PART#	QTY	DESCRIPTION
23	101-2331-01	1	END BLOCK RADIAL END HD125
24	003-3682-01	4	PULLEY ASSEMBLY HD125
25	003-1087-35	2	RADIAL BEARING
26	003-3708-01	1	SNAP RING
27	002-2609-01	2	BUMPER ASSEMBLY HD 125 RADIAL END
28	SCH-M005-0030	4	SOCKET HEAD M5 X 0.8 X 30.0LG
29	SSH-M006-0010	1	SOCKET HEAD SET SCREW M6 X 1.0 X 10.0LG
002-2608-XX TOP COVER ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
30	101-2341-XX	1	CENTER COVER
31	003-3830-01	2	PLASTIC PLUG
32	SBH-M004-0008	4	SOCKET BUTTON HEAD M4 X 0.7 X 8.0 LG
002-2672-XX BELT SEAL ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
33	003-3651-01	XX	BELT SEAL
34	003-3824-01	4	NUT BELT SEAL RETAINER
35	SBH-M003-0010	4	SOCKET BUTTON HEAD M4 X 0.7 X 8.0 LG
002-267X-XXX BALL SCREW/BUMPER ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
36	CALL FACTIORY		BALLSCREW
37	003-3635-50	1	LOCK NUT
38	003-1279-15	1	THRUSH WASHER
39	SCH-M005-0014	4	SOCKET HEAD CAP SCREW M5 X 0.78 X 14LG
002-2611-04 END PLATE COVER ASSEMBLY HD125			
ITEM#	PART#	QTY	DESCRIPTION
40	101-2332-02	1	COVER PLATE HD 125 NO BRAKE
41	SCH-M005-0018	4	SOCKET HEAD CAP SCREW M5 X 0.8 X 18.0LG

		EXPECTED MOTOR DIMENSIONS			
PART#	MOTOR	PILOT	SHAFT DIA.	SHAFT LENGTH	
HD125-INLINE					COUPLING PART#
101-2615-01	JO70X	60	11	22	003-3906-05
101-2615-01	SMB60-F5S2	60	11	22	003-3906-05
101-2616-01	SM23X-T	38.1	9.525	31.8	003-3906-03
101-2616-01	BE23X	38.1	9.525	31.8	003-3906-03
101-2616-02	SM23X	38.1	9.525	20.8	003-3906-03
101-2616-02	HV23	38.1	6.35	20.8	003-3906-01
101-2617-01/101-2618-01	BE34	73.03	0.5	30.2	003-3906-06
101-2615-01/102-0002-01	MPP92	80	16	39.8	003-3906-08
101-2615-01/101-0002-02	JO92	80	14	30	003-3906-07
101-2615-01/101-0002-02	SMB82-F82-S1	80	14	30	003-3906-07

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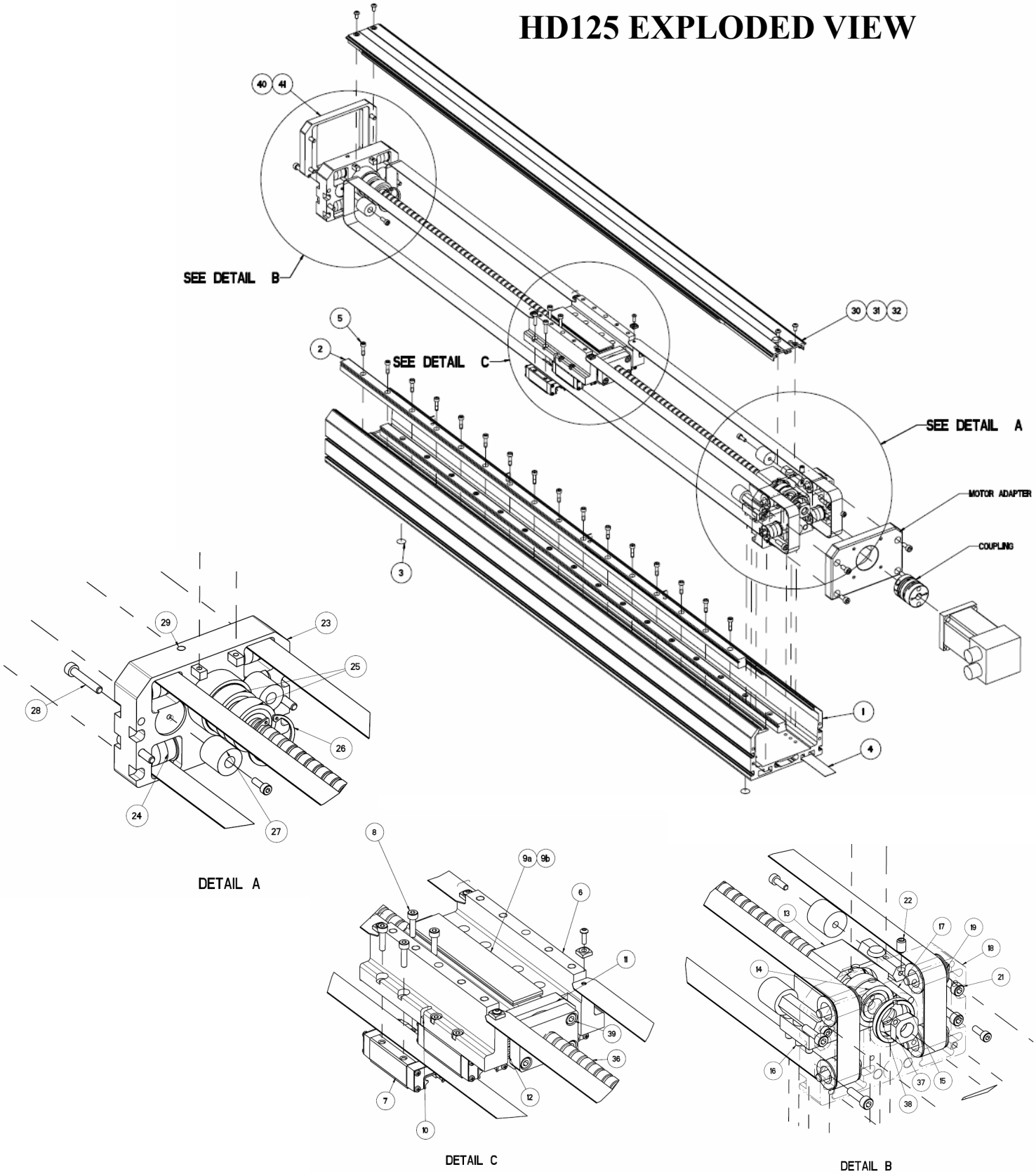
HD125 EXPLODED VIEW



PARKER HANNIFIN CORPORATION
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HD185
BILL OF MATERIALS

002-2593-XX BASE/SQUARE RAIL ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
1	101-2316-XX	1	BASE MACHINED HD185
2	101-2327-XX	2	SQUARE RAIL HD185
3	003-3145-03	2	ALUMINUM DISC STIICKER
4	003-3382-XX	XX	WEAR TAPE
5	SCH-M006-0022	XX	SOCKET HEAD M6 X 1.0 X 22.0LG
002-2594-01 CARRIAGE ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
6	101-2310-01	1	CARRAIGE MACHINED HD185
7	003-3654-01	4	LINEARING BEARING TRUCK
8	SCH-M006-0016	16	SOCKET HEAD M6 X 1.0 X 16.0LG
9	102-0672-03	1	CARRIAGE WEAR BAR
10	003-3695-01	2	MAGNET TRIPPER
11	003-3823-01	4	SOCKET HEAD SET SCREW M6 X 0.75 X 6.0LG
002-2595-01 FIXED BEARING ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
12	101-2323-01	1	FIXED BEARING BLOCK HD185
13	003-1086-18	2	ANGULAR CONTACT BEARING
14	000-0901-01	1	BEARING RETAINER
15	SCH-M006-0025	6	SOCKET HEAD M6 X 1.0 X 25.0LG
16	003-1200-44	2	DOWEL PIN 5MM X 18.0LG
002-2625-00 END BLOCK ASSY MTR END ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
17	101-2604-01	1	END BLOCK MTR END HD185
18	002-2599-01	2	BUMPER ASSY HD185
19	003-3682-01	4	PULLEY ASSEMBLY HD125/HD185
21	SCH-M006-0030	4	SOCKET HEAD M6 X 1.0 X 30.0LG
22	SSH-M006-0006	1	SOCKET HEAD SET SCREW M6 X 1.0 X 6.0LG
002-2597-01 ENDBLOCK ASSY RADIAL END HD185			
ITEM#	PART#	QTY	DESCRIPTION
23	101-2317-02	1	END BLOCK RADIAL END HD185
24	003-3682-01	4	PULLEY ASSEMBLY HD125/HD185
25	003-1087-35	2	RADIAL BEARING
26	003-3708-01	1	SNAP RING
28	002-2599-01	2	BUMPER ASSEMBLY HD 185
29	SCH-M006-0025	4	SOCKET HEAD M6 X 1.0 X 25..0LG
30	SSH-M006-0006	1	SOCKET HEAD SET SCREW M6 X 1.0 X 6.0LG
002-2598-XX TOP COVER ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
31	101-2326-XX	1	CENTER COVER HD185
32	003-3830-01	1	PLASTIC PLUG
33	SBH-M004-0008	4	SOCKET BUTTON HEAD M4 X 0.7 X 8.0 LG
002-2671-XX BELT SEAL ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
34	003-3651-01	XX	BELT SEAL
35	003-3824-01	4	NUT BELT SEAL RETAINER
36	SBH-M003-0010	4	SOCKET BUTTON HEAD M4 X 0.7 X 8.0 LG
002-267X-XXX BALL SCREW/ HD185			
ITEM#	PART#	QTY	DESCRIPTION
37	CALL FACTIORY		BALLSCREW
38	003-3635-50	1	LOCK NUT
39	003-1279-15	1	THRUSH WASHER
40	SCH-M005-0014	4	SOCKET HEAD CAP SCREW M5 X 0.78 X 14LG
002-2601-04 END PLATE COVER ASSEMBLY HD185			
ITEM#	PART#	QTY	DESCRIPTION
41	101-2319-02	1	COVER PLATE HD 185 NO BRAKE
42	SCH-M006-0016	4	SOCKET HEAD CAP SCREW M6 X 1.0X 16.0LG

		EXPECTED MOTOR DIMENSIONS			
MOTOR ADAPTER PART#	MOTOR	PILOT	SHAFT DIA.	SHAFT LENGTH	
HD185-INLINE					COUPLING
N.R.	JO70X	60	11	22	003-3906-05
N.R.	SMB60-F5S2	60	11	22	003-3906-05
101-2606-01	SM23X-T	38.1	9.525	31.8	003-3906-03
101-2606-01	BE23X	38.1	9.525	31.8	003-3906-03
101-2607-01	BE34	73.03	0.5	30.2	003-3906-06
101-2608-02	MPP92	80	16	39.8	003-3906-08
101-2608-01	JO92	80	14	30	003-3906-07
101-2608-01	SMB82-F82-S1	80	14	30	003-3906-07

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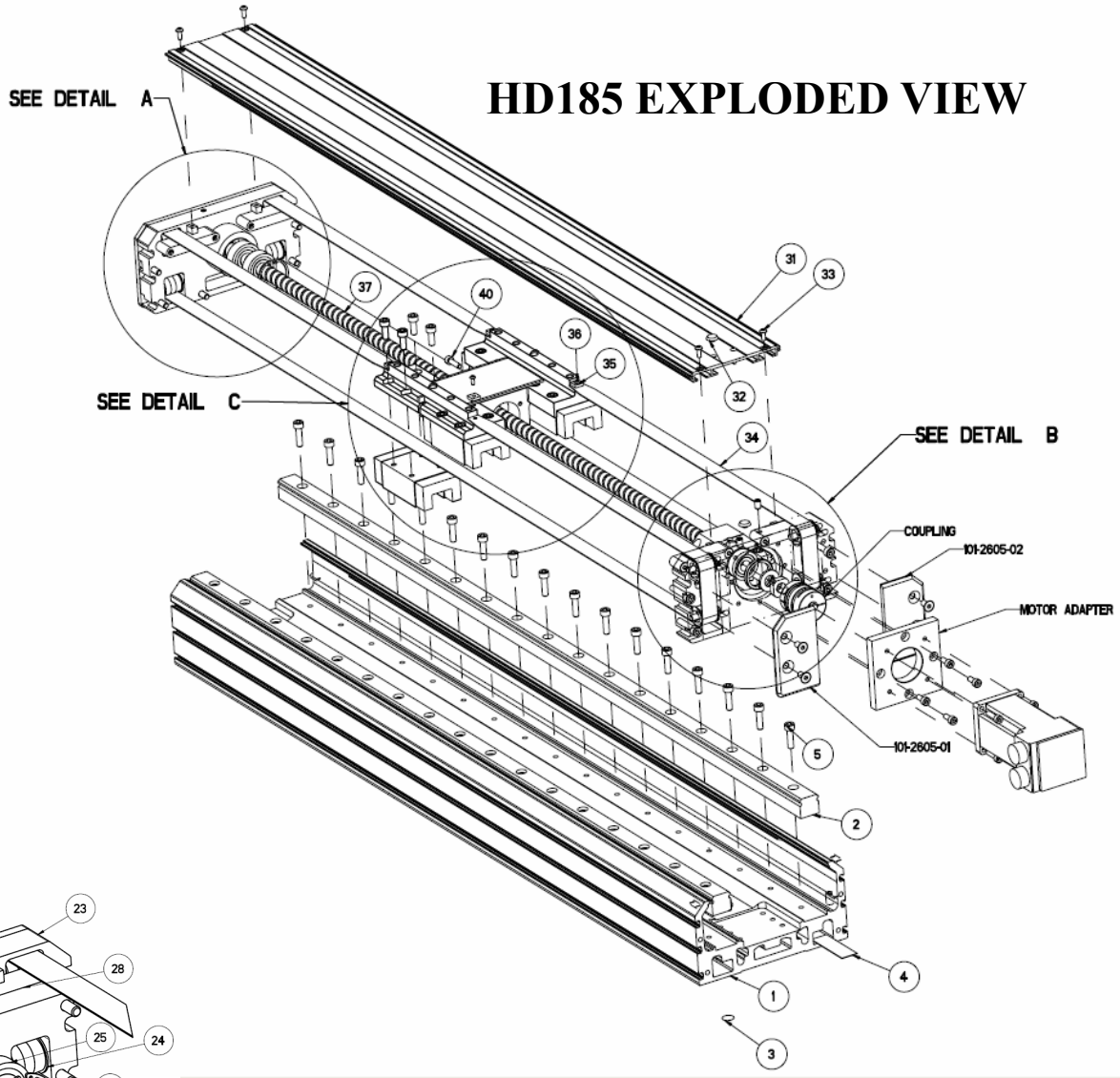
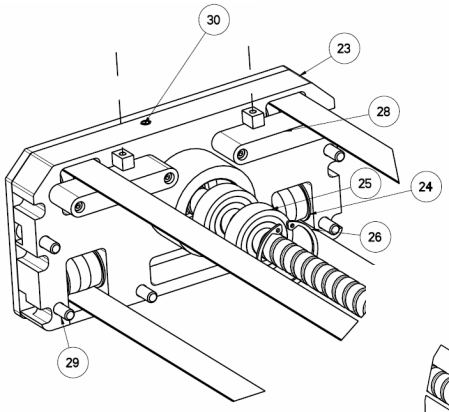
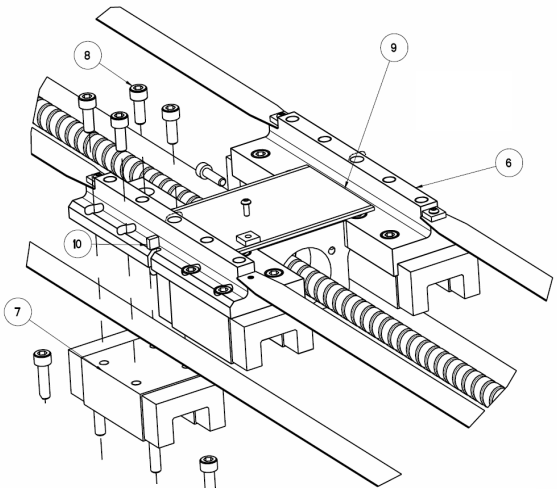
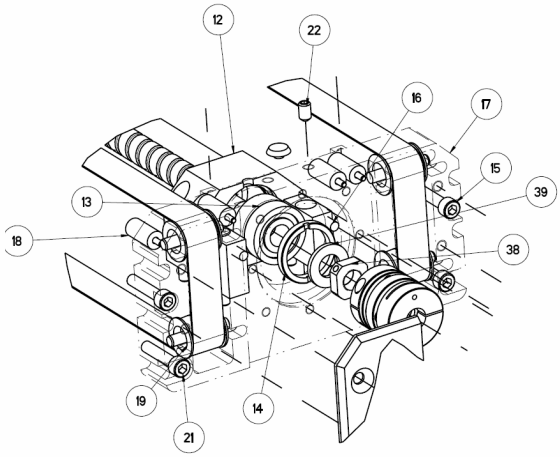
HD185 EXPLODED VIEW





DETAIL A





DETAIL B

PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
1140 SANDYHILL ROAD IRWIN ,PA 15642

HD015 BILL OF MATERIALS

002-2614-XX BASE/SQUARE RAIL ASSEMBLY HD015			
ITEM#	PART#	QTY	DESCRIPTION
1	101-2146-XX	1	BASE MACHINED HD015
2	101-2343-XX	1	SQUARE RAIL HD015
3	SCH-M004-0014	XX	SOCKET HEAD M4 X 0.7 X 14.0LG
4	003-3145-03	2	ALUMINUM DISC STIICKER
002-2615-01 SINGLE CARRIAGE ASSY / 002-2616-01 DOUBLE CARRIAGE ASSY			
ITEM#	PART#	QTY	DESCRIPTION
5	101-2147-01	1	CARRAIGE SINGLE MACHINED HD015
5	101-2148-01	1	CARRIAGE DOUBLE MACHINED HD015
6	003-3653-01	1 / 2	LINEARING BEARING TRUCK
7	003-3827-02	4	BUMPER
8	SCH-M003-0008	4	SOCKET HEAD CAP SCREW M3 X 0.5 X 8.0LG
9	SCH-M004-0010	4 / 8	SOCKET HEAD CAP SCREW M4 X 0.7 X 10.0LG
QTY 2 002-2617-01 END BLOCK ASSEMBLY HD015			
ITEM#	PART#	QTY	DESCRIPTION
10	101-2149-01	1	ENDBLOCK IDLER ASSY
11	003-3682-01	2	PULLEY ASSY
13	101-2150-01	2	PULLEY RETAINER
14	003-3729-01	1	PLUG
15	SCH-M005-0018	2	SOCKET HEAD M5 X 0.8 X 18.0LG
16	SCH-M005-0018	2	SOCKET HEAD M5 X 0.8 X 18.0LG
002-2714-XX BELT ASSY HD015			
ITEM#	PART#	QTY	DESCRIPTION
17	101-2966-XX	2	BELT SEAL HD015
18	003-3824-01	2	NUT BELT SEAL CLAMP
19	SBH-M003-0008	2	SOCKET BUTTON HEAD M003-0008

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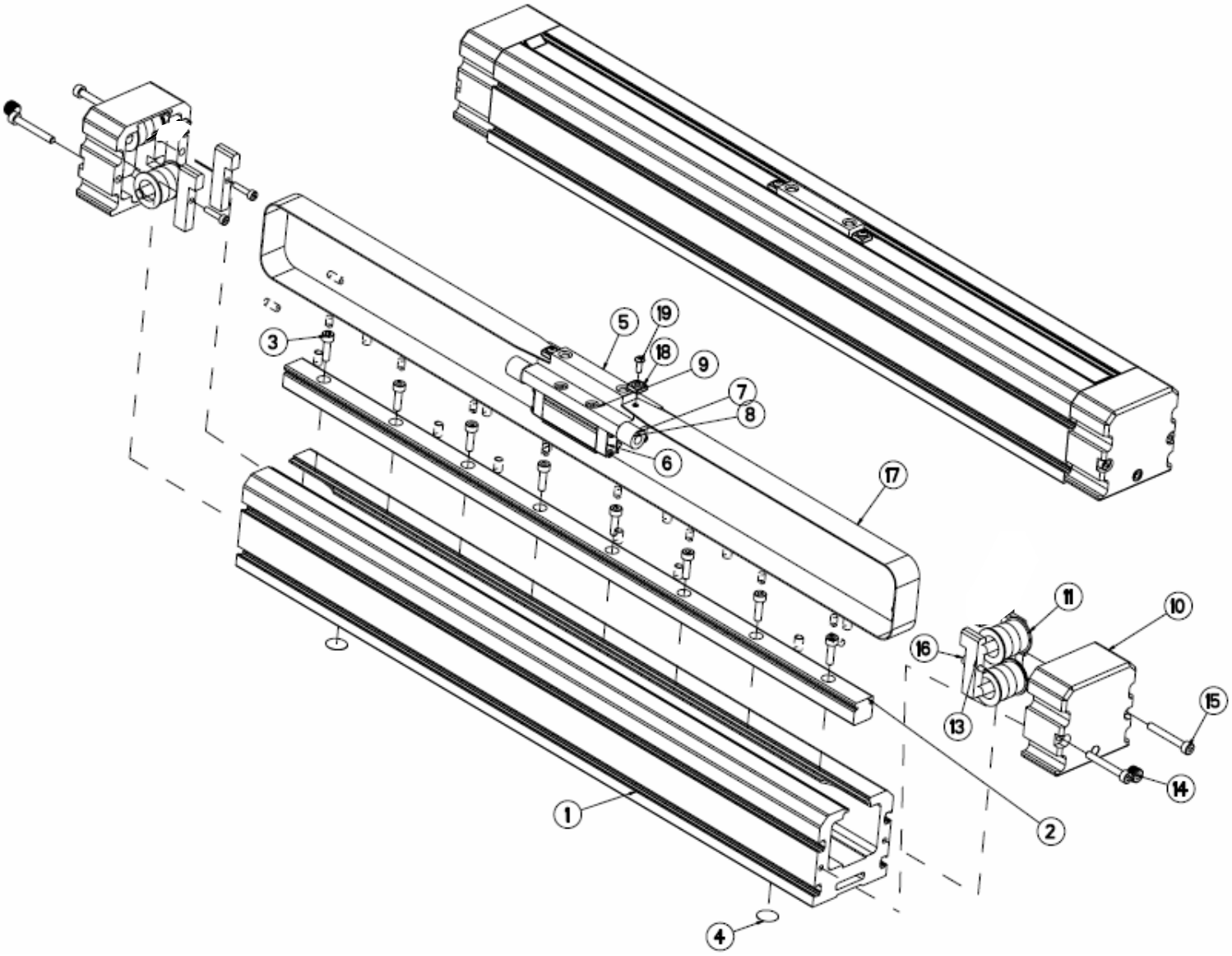
HD015 EXPLODED VIEW



PARKER HANNIFIN CORPORATION
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General Table Specifications:

HD085	Units	TRAVEL MM								
		100	200	300	400	500	600	800	1000	1200
Positional Accuracy (1) (1b)	Microns	20	20	25	30	35	40	50	60	70
Straightness & Flatness	Microns	10	15	20	25	30	35	45	55	65
Repeatability (1) (1b)	Microns	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6
Duty Cycle	%	100	100	100	100	100	100	100	100	100
Max Acceleration	m/sec^2	20	20	20	20	20	20	20	20	20
Rated Axial Loading (HD085) (2)	Kgf	90	90	90	90	90	90	90	90	90
Rated Normal Load (HD085) (3)(4)	Kgf	170	170	170	170	170	170	170	170	170
Drive Screw Efficiency	%	90	90	90	90	90	90	90	90	90
Max Breakaway Torque (HD085)	Nm	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Running Torque (HD085)	Nm	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Linear Bearing Cofficent of Friction	na	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Input Inertia (HD085, 5mm lead)	Kg-m^2	0.00001826	0.00002214	0.00002601	0.00002989	0.00003377	0.00003764	0.00004540	n/a	n/a
Input Inertia (HD085, 10mm lead)	Kg-m^2	0.00001925	0.00002313	0.00002701	0.00003088	0.00003476	0.00003864	0.00004639	0.00005414	0.00006190
Input Inertia (HD085, 20mm lead)	Kg-m^2	0.00002322	0.00002710	0.00003097	0.00003485	0.00003873	0.00004260	0.00005036	0.00005811	0.00006586
Carriage Weight (HD085)	Kg	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Table Weight (HD085)	Kg	3.86	4.56	5.26	5.96	6.66	7.36	8.76	10.16	11.56

HD125	Units	TRAVEL MM* (TRAVEL REDUCED BY 50MM WHEN USING 40MM LEAD BALLSCREW FOR TRAVELS <1200MM)								
		200	300	400	500	600	800	1000	1200	1500
Positional Accuracy (1) (1b)	Microns	20	25	30	35	40	50	60	70	85
Straightness & Flatness	Microns	15	20	25	30	35	45	55	65	80
Repeatability (1) (1b)	Microns	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6
Duty Cycle	%	100	100	100	100	100	100	100	100	100
Max Acceleration	m/sec^2	20	20	20	20	20	20	20	20	20
Rated Axial Loading (HD125) (2)	Kgf	90	90	90	90	90	90	90	90	90
Rated Normal Load (HD125) (3)(4)	Kgf	780	780	780	780	780	780	780	780	780
Drive Screw Efficiency	%	90	90	90	90	90	90	90	90	90
Max Breakaway Torque (HD125)	Nm	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.35	0.35
Running Torque (HD125)	Nm	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.32	0.32
Linear Bearing Cofficent of Friction	na	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Input Inertia (HD125 5mm lead)	Kg-m^2	0.00003061	0.00003449	0.00003837	0.00004224	0.00004612	0.00005387	n/a	n/a	n/a
Input Inertia (HD125, 10mm lead)	Kg-m^2	0.00003416	0.00003804	0.00004191	0.00004579	0.00004967	0.00005742	0.00006517	n/a	n/a
Input Inertia (HD125, 20mm lead)	Kg-m^2	0.00004834	0.00005222	0.00005610	0.00005997	0.00006385	0.00007160	0.00007936	0.00021577	0.00025253
Input Inertia (HD125, 40mm lead)	Kg-m^2	0.00014386	0.00015612	0.00016837	0.00018062	0.00019287	0.00021738	0.00024189	0.00027251	0.00030927
Carriage Weight (HD125)	Kg	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Table Weight (HD125)	Kg	11.5	12.75	14	15.25	16.5	19	21.5	24	27.75

HD185	Units	TRAVEL MM										
		300	400	500	600	800	1000	1200	1400	1600	1800(5)	2000(5)
Positional Accuracy (1) (1b)	Microns	25	30	35	40	50	60	70	80	90	360	400
Straightness & Flatness	Microns	20	25	30	35	45	55	65	75	85	95	105
Repeatability (1) (1b)	Microns	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-6	+/-30	+/-30
Duty Cycle	%	100	100	100	100	100	100	100	100	100	100	100
Max Acceleration	m/sec^2	20	20	20	20	20	20	20	20	20	20	20
Rated Axial Loading (HD185) (2)	Kgf	90	90	90	90	90	90	90	90	90	90	90
Rated Normal Load (HD185) (3)(4)	Kgf	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Drive Screw Efficiency	%	90	90	90	90	90	90	90	90	90	90	90
Max Breakaway Torque (HD185)	Nm	0.32	0.32	0.32	0.32	0.32	0.32	0.25	0.38	0.38	0.38	0.38
Running Torque (HD185)	Nm	0.21	0.21	0.21	0.21	0.21	0.21	0.35	0.35	0.35	0.35	0.35
Linear Bearing Cofficent of Friction	na	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Input Inertia (HD185 5mm lead)	Kg-m^2	0.00003446	0.00003833	0.00004221	0.00004609	0.00005384	n/a	n/a	n/a	n/a	n/a	n/a
Input Inertia (HD185, 10mm lead)	Kg-m^2	0.00004174	0.00004562	0.00004949	0.00005337	0.00006112	0.00006888	n/a	n/a	n/a	n/a	n/a
Input Inertia (HD185, 20mm lead)	Kg-m^2	0.00007087	0.00007475	0.00007862	0.00008250	0.00009025	0.00009801	0.00022253	0.00025003	0.00027454	0.00029904	0.00032355
Input Inertia (HD185, 40mm lead)	Kg-m^2	0.00023178	0.00024403	0.00025628	0.00026854	0.00029304	0.00031754	0.00034205	0.00036655	0.00039106	0.00041556	0.00044007
Carriage Weight (HD185)	Kg	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Table Weight (HD185)	Kg	22.9	24.6	26.4	28.2	31.7	35.2	38.7	42.2	45.8	49.3	52.8

(1) Accuracy and Repeatability applies to in-line motors only

(1b) The accuracy and repeatability shown are for mechanics only and assume no error contribution from the motor. With standard 4000 count encoders an additional error must be added to both the accuracy and repeatability. For 5mm lead add 1.25 microns, for 10mm leads add 2.5 microns and for 20mm leads add 5 microns of error to the accuracy and repeatability value stated above.

(2) Axial load capacities assumes a average axial load on a 10mm lead ball screw and a life of 2540 Km. Refer to life/load charts to determine life of your particular application.

(3) Normal load capacities apply to centralized load on the linear bearing to a life of 2540 Km. Refer to life/load charts to determine life of your particular application.

(4) Normal load capacity rating are to be used as a referance of linear bearing load to life rating. This value SHOULD NOT be used as a safe loading value since other application factors (such as mounting) effect the safe load rating.

(2) Axial load capacities assumes a average axial load on a 10mm lead ball screw and a life of 2540 Km. Refer to life/load charts to determine life of your particular application.

(3) Normal load capacities apply to centralized load on the linear bearing to a life of 2540 Km. Refer to life/load charts to determine life of your particular application.

(4) Normal load capacity rating are to be used as a referance of linear bearing load to life rating. This value SHOULD NOT be used as a safe loading value since other application factors (such as mounting) effect the safe load rating.

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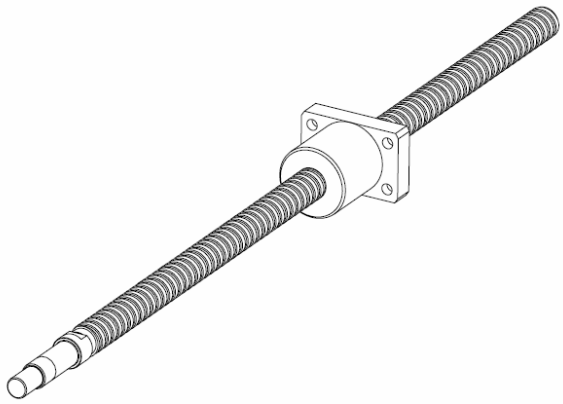
BALLSCREW INFORMATION

Maximum Screw Speed (Revs/Sec)

TRAVEL MM	CRITICAL SPEED(RPS) BALL SCREWS		
	HD085	HD125*	HD185*
100	74	74	74
200	74	74	74
300	74	74	74
400	74	74	74
500	74	63	71
600	52	48	50
700	45	38	42
800	36	31	33
900	29	25	27
1000	24	21	23
1100	20	18	19
1200	17	21	22
1300		18	20
1400		16	17
1500		14	15
1600			13
1700			11
1800			10
1900			9
2000			8

15MM DIA
20MM DIA

***Note:**
When employing 20mm diameter 40mm lead ballscrew maximum rps=56



Maximum Carriage Linear Speed (mm/s)

TRAVEL MM	CARRIAGE LINEAR SPEED (MM/S)											
	5MM LEAD			10MM LEAD			20MM LEAD			40MM LEAD		
	HD085	HD125	HD185	HD085	HD125	HD185	HD085	HD125	HD185	HD085	HD125	HD185
100	370	370	370	740	740	740	1480	1480	1480		2240	2240
200	370	370	370	740	740	740	1480	1480	1480		2240	2240
300	370	370	370	740	740	740	1480	1480	1480		2240	2240
400	370	370	370	740	740	740	1480	1480	1480		2240	2240
500	370	315	355	740	630	710	1480	1260	1420		2240	2240
600	261	240	250	522	480	500	1045	960	1000		1920	2000
700	225	190	210	450	380	420	900	760	840		1520	1680
800	180	155	165	360	310	330	720	620	660		1240	1320
900				290	250	270	580	500	540		1000	1080
1000				240	212	230	480	424	460		848	920
1100				200	180	190	400	360	380		720	760
1200				170			340	420	440		840	880
1300								360	390		720	780
1400								320	340		640	680
1500								280	300		560	600
1600									260			520
1700									220			440
1800									200			400
1900									180			360
2000									160			320

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HD Series Engineering Reference

The following performance information is provided as a supplement to the product specifications pages. The following graphs and formulas are used to establish the table life relative to the applied loads. The useful life of a linear table at full catalog specifications is dependent on the forces acting upon it. These forces include both static components resulting from payload weight, and dynamic components due to acceleration/deceleration of the load. in multi-axes applications, the primary positioner at the bottom of the stack usually establishes the load limits for the combined axes. When determining life/load, it is critical to include the weight of all positioning elements that contribute to the load supported by the primary axis.

Table Life Load Chart : Compression (Normal Load)

This graph provides a "rough cut" evaluation of the support bearing life/load characteristics. The curves show the life/load relationship when the applied load is centered on the carriage, normal (perpendicular) to the carriage mounting surface. For final evaluation of life vs. load, including off center, tension, and side loads refer to the charts and formulas found on our web site www.parkermotion.com

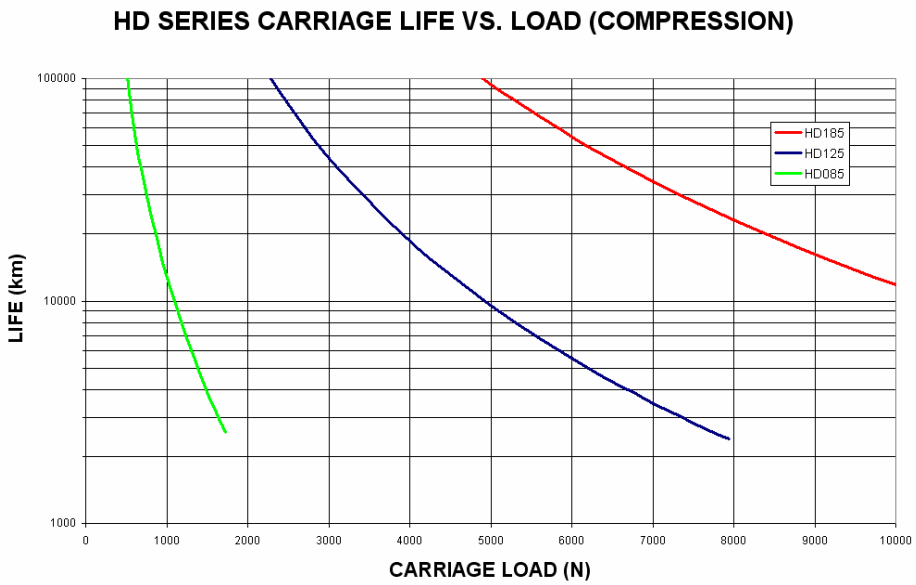
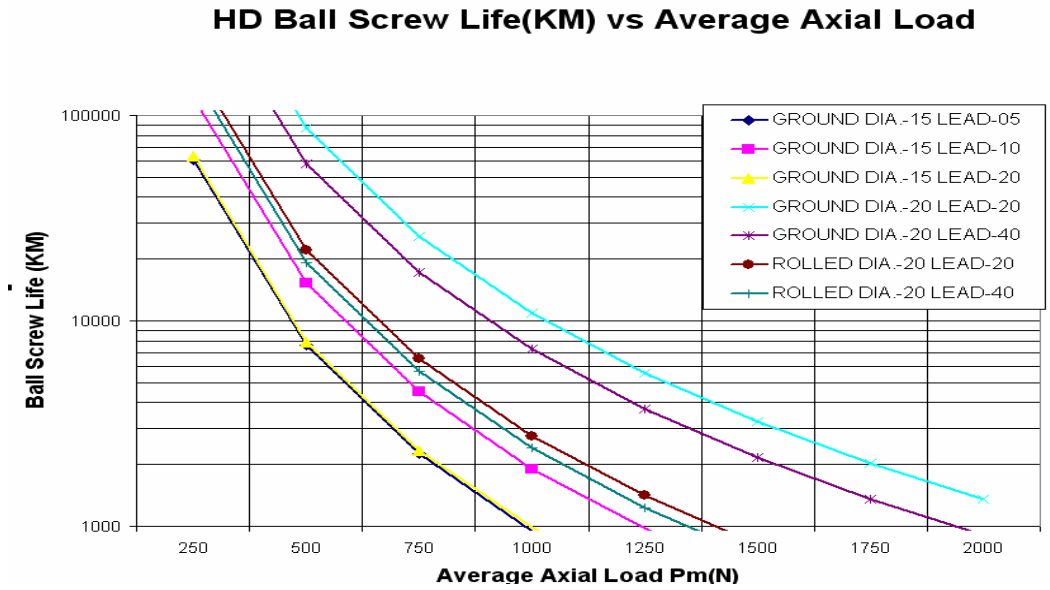


Table Life Load Chart : Thrust(Axial load)

This graph illustrates table ballscrew life relative to average axial load.



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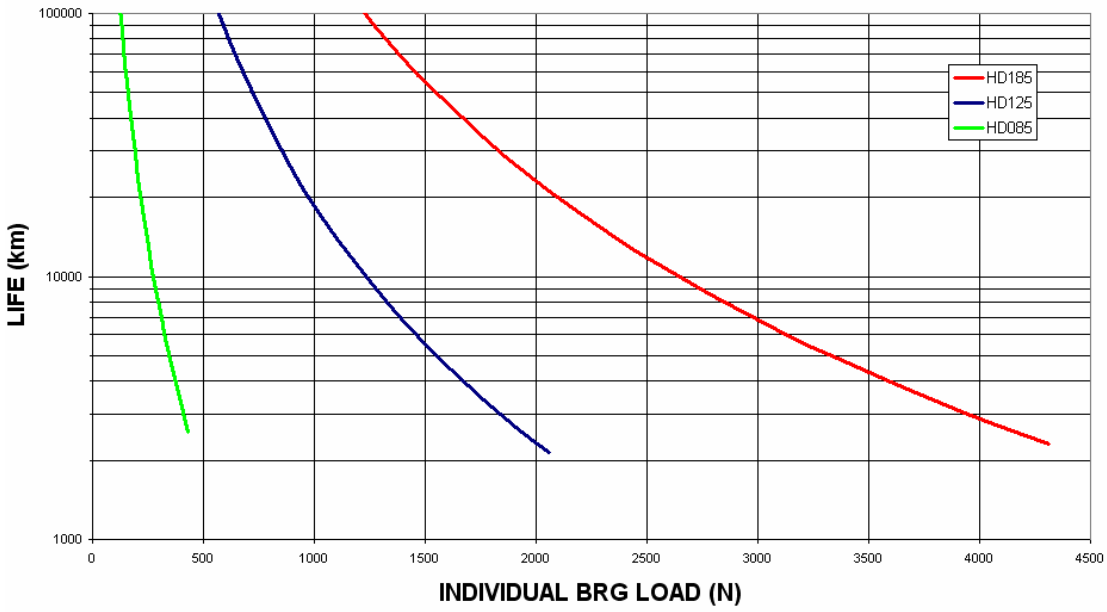
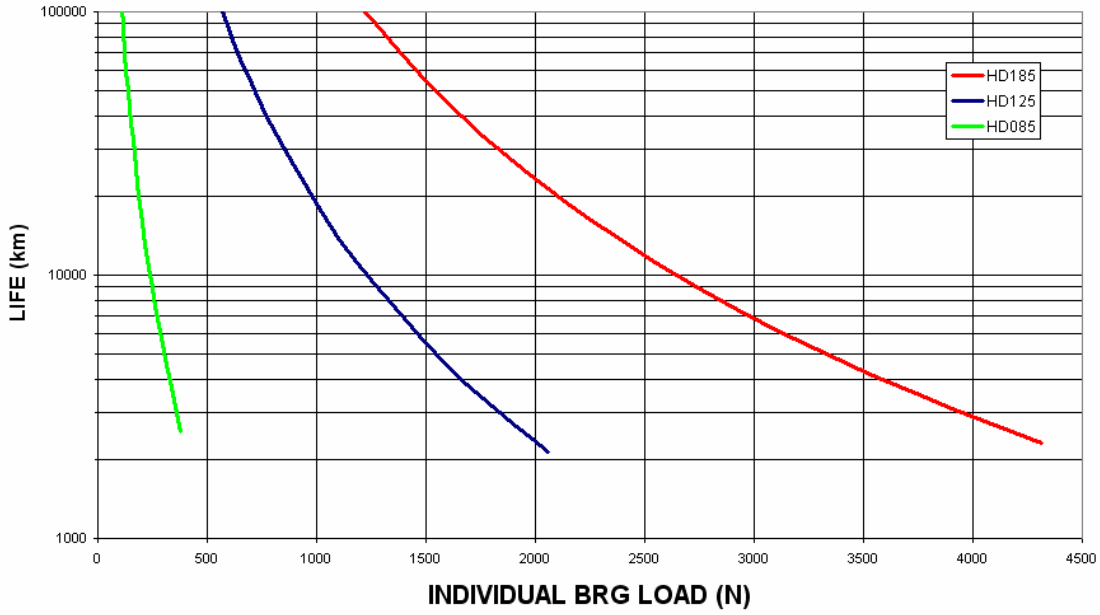
These charts are to be used in conjunction with the corresponding formulas found under Product Information at www.parkermotion.com to establish the life / load for each bearing (4 per table)

TABLE	D1 BEARING CENTERS LONGITUDINAL MM	D2 BEARING CENTERS LATERAL MM	DA RAIL CENTERS TO CARRIAGE MM
HD085	51	42	54
HD125	65	70	57.5
HD185	105	115	42

HD SERIES BRG LIFE VS. LOAD (COMPRESSION/TENSION)



HD SERIES BRG LIFE VS. LOAD (SIDE)



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Horizontal Translation — Normal Load

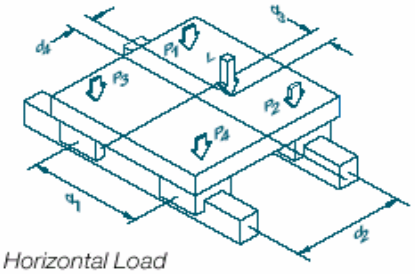

Figure 1: Horizontal Load

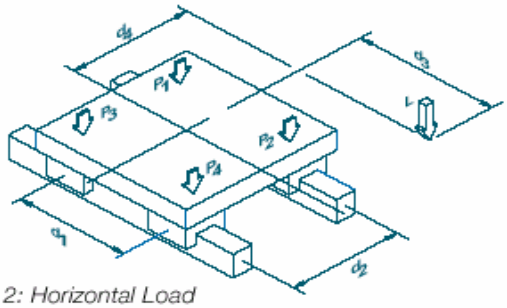

Figure 2: Horizontal Load

$$P_1 = \left[\frac{L}{4}\right] - \left[\frac{L}{2} * \frac{d_3}{d_1}\right] + \left[\frac{L}{2} * \frac{d_4}{d_2}\right]$$

$$P_2 = \left[\frac{L}{4}\right] + \left[\frac{L}{2} * \frac{d_3}{d_1}\right] + \left[\frac{L}{2} * \frac{d_4}{d_2}\right]$$

$$P_3 = \left[\frac{L}{4}\right] - \left[\frac{L}{2} * \frac{d_3}{d_1}\right] - \left[\frac{L}{2} * \frac{d_4}{d_2}\right]$$

$$P_4 = \left[\frac{L}{4}\right] + \left[\frac{L}{2} * \frac{d_3}{d_1}\right] - \left[\frac{L}{2} * \frac{d_4}{d_2}\right]$$

Figure 1 shows a normal load applied to the carriage translating horizontally. The vector L, defined by the CG of the load, is shown applied at a point whose coordinate distances from the center of the carriage are given by distances d3 and d4.

With the positioner at rest or moving with uniform velocity, the loads on each of the four bearing blocks are given by the above equations:

Note that each of the four bearing blocks will experience either compressional or tensional loading; the magnitude of these forces at each bearing is dependent upon the location of the load vector with respect to the center of the positioner carriage. For each bearing, the maximum of the forces in tension and compression is plotted on the load charts for the specific model positioner to determine the life of the table in the application.

The calculations for loads whose CG falls outside the carriage mounting surface area, as shown in Figure 2, are identical to those used with Figure 1. In either case, accelerations and decelerations of the load must be considered in calculating the dynamic forces which determine the life of the system in a particular application.

Horizontal Translation — Side Load

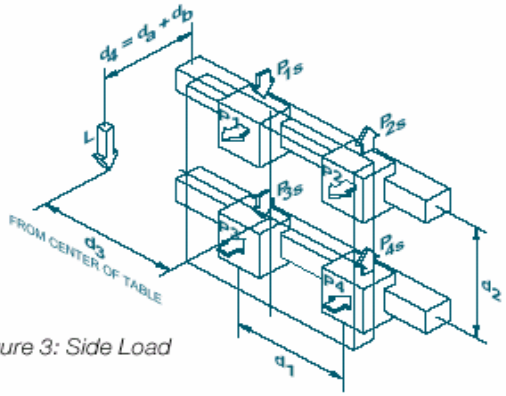

Figure 3: Side Load

$$P_1 = P_2 = \frac{L}{2}\left[\frac{d_4}{d_2}\right]$$

$$P_3 = P_4 = -\frac{L}{2}\left[\frac{d_4}{d_2}\right]$$

$$P_{1s} = P_{3s} = \frac{L}{4} + \left[\frac{L}{2} * \frac{d_3}{d_1}\right]$$

$$P_{2s} = P_{4s} = \frac{L}{4} - \left[\frac{L}{2} * \frac{d_3}{d_1}\right]$$

The previous loading scenarios have involved only normal forces (compressional or tensional) on the bearings. Consider a positioner as shown in Figure 3, which involves a lateral (side) load applied to the carriage which translates horizontally. The load vector (L) is shown applied at a point whose coordinate distances from the center of the carriage bearing system are given by dimensions d3 and d4. Note that d4 is the sum of distance da—the distance between bearing and center and carriage surface which is provided for each linear positioner—plus db, the distance of the load CG from the mounting surface of the carriage.

The loading felt by each of the four bearing blocks when the positioner is stationary or moving with uniform velocity is given by the above equations:

Here P1, P2, P3 and P4 are the normal loads (tensional and compressional) and P1S, P2S, P3S and P4S are the side loads. For each bearing, the largest side loads and normal loads in both tension and compression are identified for calculating the positioner life in the application.

For round rail/ball bushing type bearings, the forces are plotted individually on the appropriate curves to determine the service life.

For linear motion guide bearing positioners, an "equivalent load per bearing" is calculated for the life determination. Equations listed in Table A, page 22, apply for the Daedal positioners which incorporate linear motion guide bearings. As shown in Table A, this "equivalent load" is plotted on the indicated load/life graph to determine the positioner's service life.

Again, accelerations and decelerations of the load must be considered in calculating the dynamic forces which determine the life of the system in a particular application.

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Vertical Translation

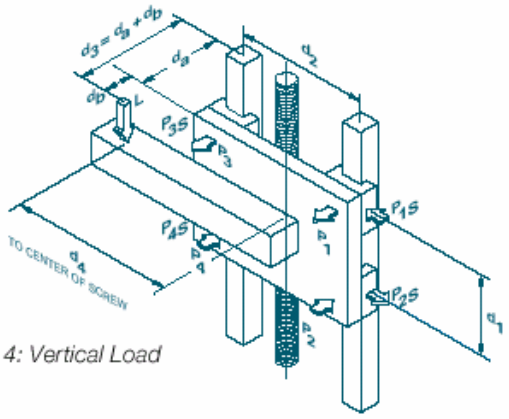

Figure 4: Vertical Load

$$P_1 = P_3 = \frac{L}{2}\left[\frac{d_3}{d_1}\right]$$

$$P_2 = P_4 = -\frac{L}{2}\left[\frac{d_3}{d_1}\right]$$

$$P_{1s} = P_{3s} = \frac{L}{2}\left[\frac{d_4}{d_2}\right]$$

$$P_{2s} = P_{4s} = -\frac{L}{2}\left[\frac{d_4}{d_2}\right]$$

Figure 4 shows a load applied to the positioner carriage which translates vertically. The load vector (L) is shown applied at a point whose coordinate distances from the center of the carriage bearing system are given by distances d3 and d4. Note that here d3 is the sum of distance da, which is given for the particular linear positioner plus db, the distance of the load CG from the mounting surface of the carriage. d4 is the horizontal distance of the load vector (L) from the carriage centerline.

The loading felt by each of the four bearing blocks when the positioner is stationary or moving with uniform velocity is given by the above equations:

P1 through P4 and P1S through P4S are respectively the normal and side loads on each bearing block. For each bearing, the largest side loads and normal loads in both tension and compression are determined and, for linear motion guides, "equivalent loads" are computed from the equations in Table A (below) following the same procedure described in the preceding section for *Horizontal Translation with Side Load* to calculate the positioner life in the applications.

Once more, accelerations and decelerations of the load must be considered in calculating the dynamic forces which determine the life of the system in a particular application.

Table A - **Linear Motion Guide Bearing Load/Life Computation**

Positioner	Loads	Compute*	Evaluate Life On
HD SERIES	Side & tension Ps > Pt Side & tension Ps ≤ Pt	Pe = (0.5 * Pt) + Ps Pe = (0.5 * Ps) + Pt	Side load chart Tension chart
	Side & compression Ps > Pc Side & compression Ps ≤ Pc	Pe = (0.5 * Pc) + Ps Pe = (0.5 * Ps) + Pc	Side load chart Compression chart

Example Computations

Example 1

Horizontal Translation with Side Loads, HD125 Positioner

L = 100 Kgf
50 mm from carriage surface;
130 mm from carriage center.

Figure 3 (PAGE 28) this configuration with dimensions given here.

d1 = 65 mm
db = 50 mm
d2 = 70 mm
d3 = 130 mm
da = 57.5 mm
d4 = da + db = 107.5 mm

The normal and side force components on each bearing block are computed from the equations as shown:

$$P_1 = P_2 = \frac{L}{2}\left[\frac{d_4}{d_2}\right] = 77.0 \text{ Kgf (TENSION)}$$

$$P_3 = P_4 = -\frac{L}{2}\left[\frac{d_4}{d_2}\right] = -77.0 \text{Kgf (COMPRESSION)}$$

$$P_{1s} = P_{3s} = \frac{L}{4} + \left[\frac{L}{2} * \frac{d_3}{d_1}\right] = 125.0 \text{ Kgf}$$

$$P_{2s} = P_{4s} = \frac{L}{4} - \left[\frac{L}{2} * \frac{d_3}{d_1}\right] = -75 \text{ Kgf}$$

Life for each bearing needs to be evaluated independently. For bearings with a side load, refer to the combined equivalent loading factors (Table A).

Example:

Bearing 1 has P1=1 77.0 Kgf (TENSION) P1s= 125.0 Kgf SIDE LOAD

P1s>Pt⇛Pe=(0.5Pt+Ps)= 163.5 Kgf(1603N)

Refer to side load chart PAGE 27

Life @1603N =4500km

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REFLECTED INERTIAS

PLEASE NOTE : ONE MUST ADD THE ADDITIONAL EFFECTS OF CUSTSOMER LOAD

$J_{LOAD}=MASS(LEAD/2\pi)^2$

WHERE:

MASS(KG)

LEAD(M)

JLOAD(KG-M^2)

HD085 TRAVEL(MM)	LEAD(M)	INLINE INERTIA REFLECTED(KG-M^2)	WRAP 1:1 INERTIA REFLECTED(KG-M^2)
100	0.005	1.822703E-05	2.573249E-05
200	0.005	2.210371E-05	2.960916E-05
300	0.005	2.598038E-05	3.348584E-05
400	0.005	2.985706E-05	3.736251E-05
500	0.005	3.373374E-05	4.123919E-05
600	0.005	3.761041E-05	4.511587E-05
700	0.005	4.148709E-05	4.899254E-05
800	0.005	4.536377E-05	5.286922E-05
100	0.010	1.911992E-05	2.662538E-05
200	0.010	2.299660E-05	3.050206E-05
300	0.010	2.687328E-05	3.437873E-05
400	0.010	3.074995E-05	3.825541E-05
500	0.010	3.462663E-05	4.213208E-05
600	0.010	3.850331E-05	4.600876E-05
700	0.010	4.237998E-05	4.988544E-05
800	0.010	4.625666E-05	5.376211E-05
900	0.010	5.013333E-05	5.763879E-05
1000	0.010	5.401001E-05	6.151547E-05
1100	0.010	5.788669E-05	6.539214E-05
1200	0.010	6.176336E-05	6.926882E-05
100	0.020	2.269150E-05	3.019695E-05
200	0.020	2.656817E-05	3.407363E-05
300	0.020	3.044485E-05	3.795030E-05
400	0.020	3.432152E-05	4.182698E-05
500	0.020	3.819820E-05	4.570366E-05
600	0.020	4.207488E-05	4.958033E-05
700	0.020	4.595155E-05	5.345701E-05
800	0.020	4.982823E-05	5.733368E-05
900	0.020	5.370491E-05	6.121036E-05
1000	0.020	5.758158E-05	6.508704E-05
1100	0.020	6.145826E-05	6.896371E-05
1200	0.020	6.533493E-05	7.284039E-05

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REFLECTED INERTIAS CONTINUED:

HD125 TRAVEL(MM)	LEAD(M)	INLINE INERTIA REFLECTED(KG-M^2)	WRAP 1:1 INERTIA REFLECTED(KG-M^2)
100	0.005	2.661867E-05	1.161312E-04
200	0.005	3.049535E-05	1.200079E-04
300	0.005	3.437203E-05	1.238846E-04
400	0.005	3.824870E-05	1.277612E-04
500	0.005	4.212538E-05	1.316379E-04
600	0.005	4.600206E-05	1.355146E-04
700	0.005	4.987873E-05	1.393913E-04
800	0.005	5.375541E-05	1.432679E-04
100	0.010	2.981029E-05	1.193228E-04
200	0.010	3.368697E-05	1.231995E-04
300	0.010	3.756364E-05	1.270762E-04
400	0.010	4.144032E-05	1.309528E-04
500	0.010	4.531700E-05	1.348295E-04
600	0.010	4.919367E-05	1.387062E-04
700	0.010	5.307035E-05	1.425829E-04
800	0.010	5.694703E-05	1.464595E-04
900	0.010	6.082370E-05	1.503362E-04
1000	0.010	6.470038E-05	1.542129E-04
1100	0.010	6.857705E-05	1.580896E-04
100	0.020	4.257676E-05	1.320893E-04
200	0.020	4.645344E-05	1.359660E-04
300	0.020	5.033011E-05	1.398426E-04
400	0.020	5.420679E-05	1.437193E-04
500	0.020	5.808347E-05	1.475960E-04
600	0.020	6.196014E-05	1.514727E-04
700	0.020	6.583682E-05	1.553493E-04
800	0.020	6.971349E-05	1.592260E-04
900	0.020	7.359017E-05	1.631027E-04
1000	0.020	7.746685E-05	1.669794E-04
1100	0.020	8.134352E-05	1.708560E-04
1200	0.020	2.138804E-04	3.033929E-04
1300	0.020	2.261326E-04	3.156451E-04
1400	0.020	2.383848E-04	3.278973E-04
1500	0.020	2.506370E-04	3.401495E-04
50	0.040	1.240458E-04	2.135584E-04
150	0.040	1.362980E-04	2.258106E-04
250	0.040	1.485503E-04	2.380628E-04
350	0.040	1.608025E-04	2.503150E-04
450	0.040	1.730547E-04	2.625672E-04
550	0.040	1.853069E-04	2.748194E-04
650	0.040	1.975591E-04	2.870716E-04
750	0.040	2.098113E-04	2.993238E-04
850	0.040	2.220635E-04	3.115760E-04
950	0.040	2.343157E-04	3.238283E-04
1050	0.040	2.465679E-04	3.360805E-04
1200	0.040	2.649463E-04	3.544588E-04
1300	0.040	2.771985E-04	3.667110E-04
1400	0.040	2.894507E-04	3.789632E-04
1500	0.040	3.017029E-04	3.912154E-04

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REFLECTED INERTIAS CONTINUED:

HD185 TRAVEL(MM)	LEAD(M)	INLINE INERTIA REFLECTED(KG-M^2)	VRAP 1:1 INERTIA REFLECTED(KG-M^2)
100	0.005	2.646024E-05	1.159728E-04
200	0.005	3.033691E-05	1.198494E-04
300	0.005	3.421359E-05	1.237261E-04
400	0.005	3.809027E-05	1.276028E-04
500	0.005	4.196694E-05	1.314795E-04
600	0.005	4.584362E-05	1.353561E-04
700	0.005	4.972029E-05	1.392328E-04
800	0.005	5.359697E-05	1.431095E-04
100	0.010	3.301445E-05	1.225270E-04
200	0.010	3.689113E-05	1.264037E-04
300	0.010	4.076780E-05	1.302803E-04
400	0.010	4.464448E-05	1.341570E-04
500	0.010	4.852116E-05	1.380337E-04
600	0.010	5.239783E-05	1.419104E-04
700	0.010	5.627451E-05	1.457870E-04
800	0.010	6.015118E-05	1.496637E-04
900	0.010	6.402786E-05	1.535404E-04
1000	0.010	6.790454E-05	1.574171E-04
1100	0.010	7.178121E-05	1.612937E-04
100	0.020	5.923131E-05	1.487438E-04
200	0.020	6.310798E-05	1.526205E-04
300	0.020	6.698466E-05	1.564972E-04
400	0.020	7.086134E-05	1.603739E-04
500	0.020	7.473801E-05	1.642505E-04
600	0.020	7.861469E-05	1.681272E-04
700	0.020	8.249136E-05	1.720039E-04
800	0.020	8.636804E-05	1.758806E-04
900	0.020	9.024472E-05	1.797572E-04
1000	0.020	9.412139E-05	1.836339E-04
1100	0.020	9.799807E-05	1.875106E-04
1200	0.020	2.216449E-04	3.111574E-04
1300	0.020	2.338971E-04	3.234096E-04
1400	0.020	2.461493E-04	3.356618E-04
1500	0.020	2.584015E-04	3.479141E-04
1600	0.020	2.706537E-04	3.601663E-04
1700	0.020	2.829060E-04	3.724185E-04
1800	0.020	2.951582E-04	3.846707E-04
1900	0.020	3.074104E-04	3.969229E-04
2000	0.020	3.196626E-04	4.091751E-04
100	0.040	1.917380E-04	2.812505E-04
200	0.040	2.039902E-04	2.935027E-04
300	0.040	2.162424E-04	3.057549E-04
400	0.040	2.284946E-04	3.180072E-04
500	0.040	2.407468E-04	3.302594E-04
600	0.040	2.529991E-04	3.425116E-04
700	0.040	2.652513E-04	3.547638E-04
800	0.040	2.775035E-04	3.670160E-04
900	0.040	2.897557E-04	3.792682E-04
1000	0.040	3.020079E-04	3.915204E-04
1100	0.040	3.142601E-04	4.037726E-04
1200	0.040	3.265123E-04	4.160248E-04
1300	0.040	3.387645E-04	4.282771E-04
1400	0.040	3.510167E-04	4.405293E-04
1500	0.040	3.632690E-04	4.527815E-04
1600	0.040	3.755212E-04	4.650337E-04
1700	0.040	3.877734E-04	4.772859E-04
1800	0.040	4.000256E-04	4.895381E-04
1900	0.040	4.122778E-04	5.017903E-04
2000	0.040	4.245300E-04	5.140425E-04

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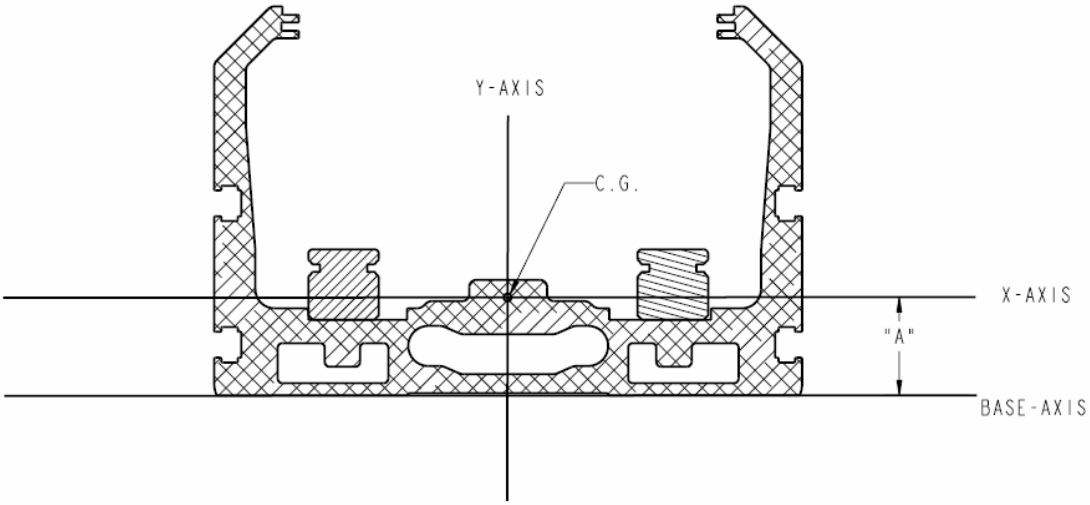
CARRIAGE STIFFNESS:

	CARRIAGE STIFFNESS		
	PITCH ARC-SEC/N-M	ROLL ARC-SEC/N-M	YAW(ARC-SEC/N-M)
HD085	1.593	2.567	3.009
HD125	0.531	1.505	0.912
HD185	0.266	0.266	0.124

BASE/RAIL ASSEMBLY MONMENTS OF INERTIAS:

	BASE EXTRUSION/SQUARE RAIL MOMENT INTERIAS WITH RESPECT TO CG*			
	IXX(MM^4)	IYY(MM^4)	JP(MM^4) (POLAR MOMENT)	CG LOCATION"a"(MM)
HD085	6.40192E+05	1.56442E+06	2.20461E+06	10.3
HD125	1.30631E+06	5.63901E+06	6.94532E+06	28.0
HD185	2.88496E+06	2.37461E+07	3.31149E+07	32.6



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EXTERNAL BRAKE INFORMATION :

NOTE : OFFERED ON HD125/HD185 SERIES ONLY
HD085 OFFERS ON MOTOR

	HD125/HD185
BRAKE TYPE	ELECTROMAGNETIC
INPUT POWER	24VDC , 0.25 AMP
HOLDING TORQUE	2.0 N-M (18 IN-LBS) (STATIC)
BACKLASH	1 DEGREE MAX.

BRAKE PART#	DESCRIPTION	
002-2611-02	BRAKE ASSY HD125	NOTE: DOES NOT INCLUDE COVER PLATE 101-2333-01
002-2601-02	BRAKE ASSY HD185	NOTE: DOES NOT INCLUDE COVER PLATE 101-2320-01

NOTE :

ANALYSIS OF REQUIRED BRAKING TORQUE SHOULD BE DONE.

THE REQUIRED BRAKING TORQUE SHOULD BE MULTIPLIED BY A SERVICE FACTOR OF 1.5 TO 4.0 DEPENDING ON THE APPLICATION

CONSULT FACTORY FOR MORE DETAILED INFORMATION

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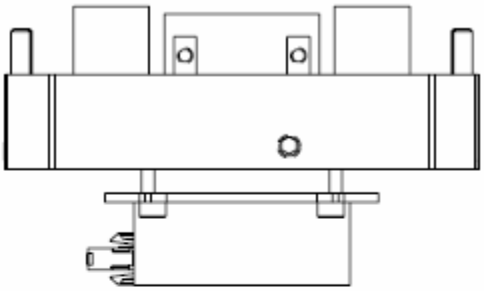
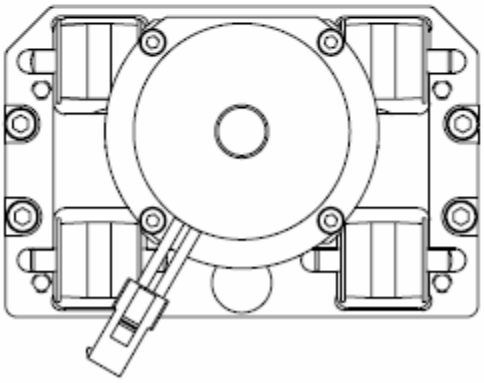
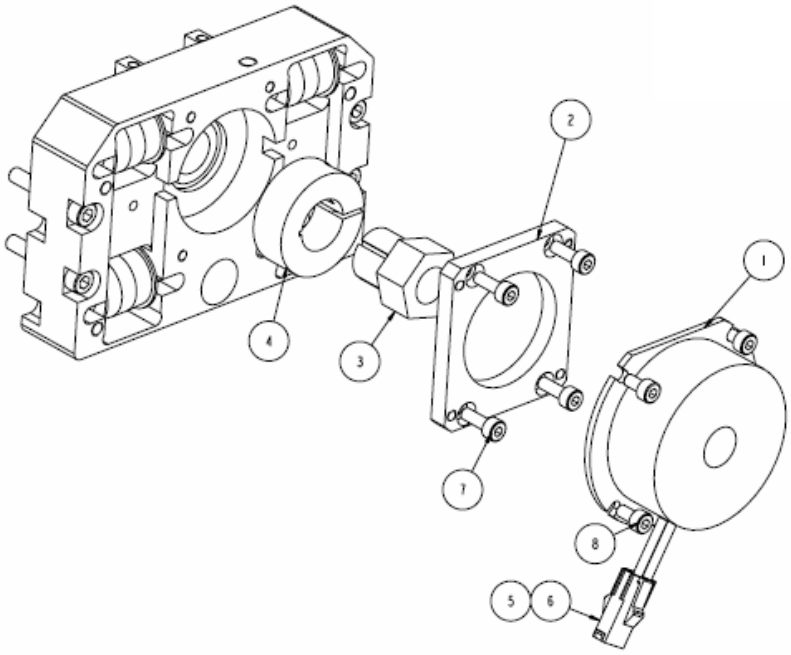
HD125 BRAKE ASSY (002-2611-02) MOUNTING INSTRUCTIONS

MOUNTING INSTRUCTIONS:

1. MOUNT CLAMP COLLAR (ITEM#4) ON HEX HUB(ITEM#3)
2. MOUNT CLAMP COLLAR AND HEX HUB ONTO SCREW SHAFT
   BE SURE TO BOTTOM OUT HEX HUB ON SCREW AND TIGHTEN
   THE CLAMP COLLAR SCREW.(ACCESS THRU BLOCK)
3. MOUNT ADAPTER PLATE (ITEM#2) TO ENDBLOCK USING ITEM#7 QTY.4 M4 X 0.7 X 12.0LG
4. MOUNT BRAKE (FLAT ON TOP) TO ADAPTER PLATE USING ITEM#8 M4 X0.7 X 8.0LG
   (ALIGNMENT OF BRAKE DISC HEX INPUT IS REQUIRED.)







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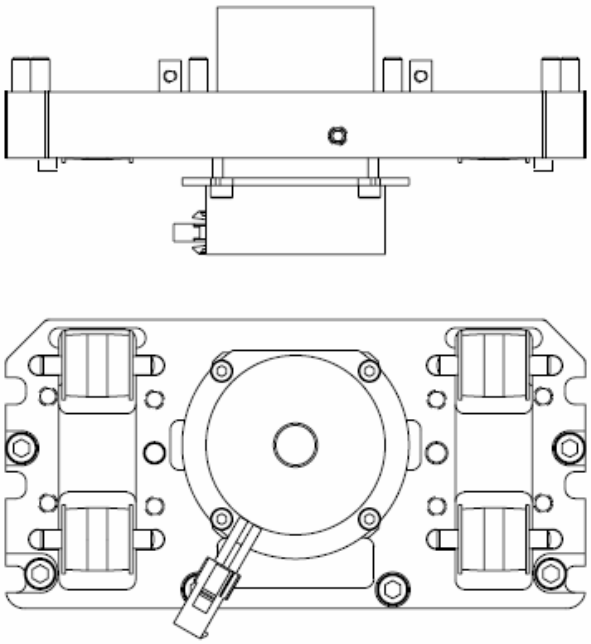
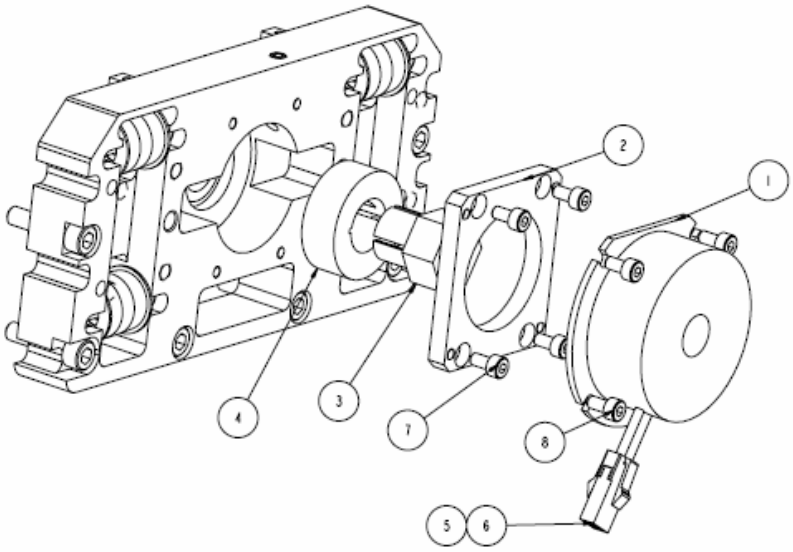
HD185 BRAKE ASSY (002-2601-02) MOUNTING INSTRUCTIONS

MOUNTING INSTRUCTIONS:

1. MOUNT CLAMP COLLAR (ITEM#4) ON HEX HUB(ITEM#3)
2. MOUNT CLAMP COLLAR AND HEX HUB ONTO SCREW SHAFT
   BE SURE TO BOTTOM OUT HEX HUB ON SCREW AND TIGHTEN
   THE CLAMP COLLAR SCREW.(ACCESS THRU BLOCK)
3. MOUNT ADAPTER PLATE (ITEM#2) TO ENDBLOCK USING ITEM#7 QTY.4 M4 X 0.7 X 12.0LG
4. MOUNT BRAKE (FLAT ON TOP) TO ADAPTER PLATE USING ITEM#8 M4 X0.7 X 8.0LG
   (ALIGNMENT OF BRAKE DISC HEX INPUT IS REQUIRED.)





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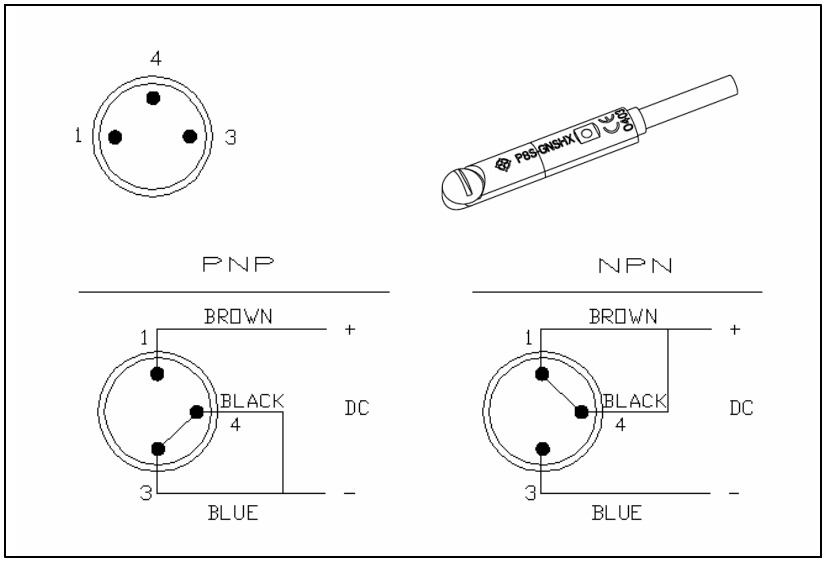
LIMIT HOME SENSORS

PART #	NPN/PNP	NO/NC
006-1994-01	NPN	NO
006-1994-02	PNP	NO
006-1994-03	NPN	NC
006-1994-04	PNP	NC

TECHNICAL DATA	
OPERATING VOLTAGE	10-30 VDC
VOLTAGE DROP	≤2.5V
CONTINUOUS CURRENT	≤100mA
REPEATABILITY	≤0.1mT(1GAUSS)
SHORT CIRCUIT PROTECTION	YES
REVERSE POLARITY PROTECTION	YES
POWER UP PULSE SUPRESSION	YES
ENCLOSURE RATING	IP67
AMBIENT TEMPERATURE	25'C -75'C
HOUSING MATERIAL	PLASTIC

PART #	
003-2918-01	5M EXTENSION CABLE

PIN	WIRE	FUNCTION
1	BROWN	10-30VDC
4	BLACK	OUTPUT SIGNAL
3	BLUE	0V



MOUNTING:
INSERT INTO UPPER MOST T-SLOT AND POSITION WHERE REQUIRED.
TIGHTEN SCREW TO FIX. POSITION.
NOTE : MAGNET TRIPPER CENTERED INTERNALLY ON CARRIAGE (BOTH SIDES)

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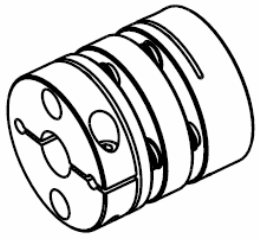
COUPLINGS:



PART#	BORE 1(MM)	BORE 2(MM)	TABLE	DYNAMIC TORQUE RATING	MISALGNMENT CAPACITY PARALLEL(MM)	ANGULAR(DEGREE)	AXIAL(MM)	TORSIONAL STIFFNESS(NM/RAD)
003-3906-01	10.00	6.35	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-02	10.00	8.00	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-03	10.00	9.53	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-04	10.00	10.00	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-05	10.00	11.00	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-06	10.00	12.70	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-07	10.00	14.00	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-08	10.00	16.00	HD125/185	3.0 N-M	0.17	1°	0.4	1300
003-3906-09	10.00	6.35	HD085	1.5 N-M	0.15	1°	0.3	500
003-3906-10	10.00	8.00	HD085	1.5 N-M	0.15	1°	0.3	500
003-3906-11	10.00	9.53	HD085	1.5 N-M	0.15	1°	0.3	500
003-3906-12	10.00	10.00	HD085	1.5 N-M	0.15	1°	0.3	500

	CLAMP SCREW TIGHTENING TORQUE
HD085	1.0 N-M (9 IN-LBS)
HD125	1.5 N-M (13 IN-LBS)
HD185	1.5 N-M (13 IN-LBS)

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Mounting Surface Requirements

***Proper mounting* of the HD SERIES is *essential* to optimize product performance.**
All specifications are based on the following conditions:

The positioner must be bolted down along its entire length.

The positioner must be mounted to a flat, stable surface with a flatness error less than or equal 0.020mm/300mm.
Catalog Specifications may deviate for positioners mounted to surfaces that do not meet the above conditions.
If the surface does not meet these specifications the surface can be shimmed to comply with these requirements.

If mounting conditions require that the table base is *overhung*, table specifications will not be met over that portion of the table. Additionally, in *X-Y Systems* the *overhung* portion of the Y-axis may not meet specifications due to the additional error caused by deflection and non-support of the base. Contact Parker Hannifin Corporation for guidelines on specifications of overhang applications

Base Mounting Methods

The HD series can mounted via two ways:

1. **Tapped holes in the base.**
   Reference the dimensional drawings on pages 11-14

2. **Toe Clamping**

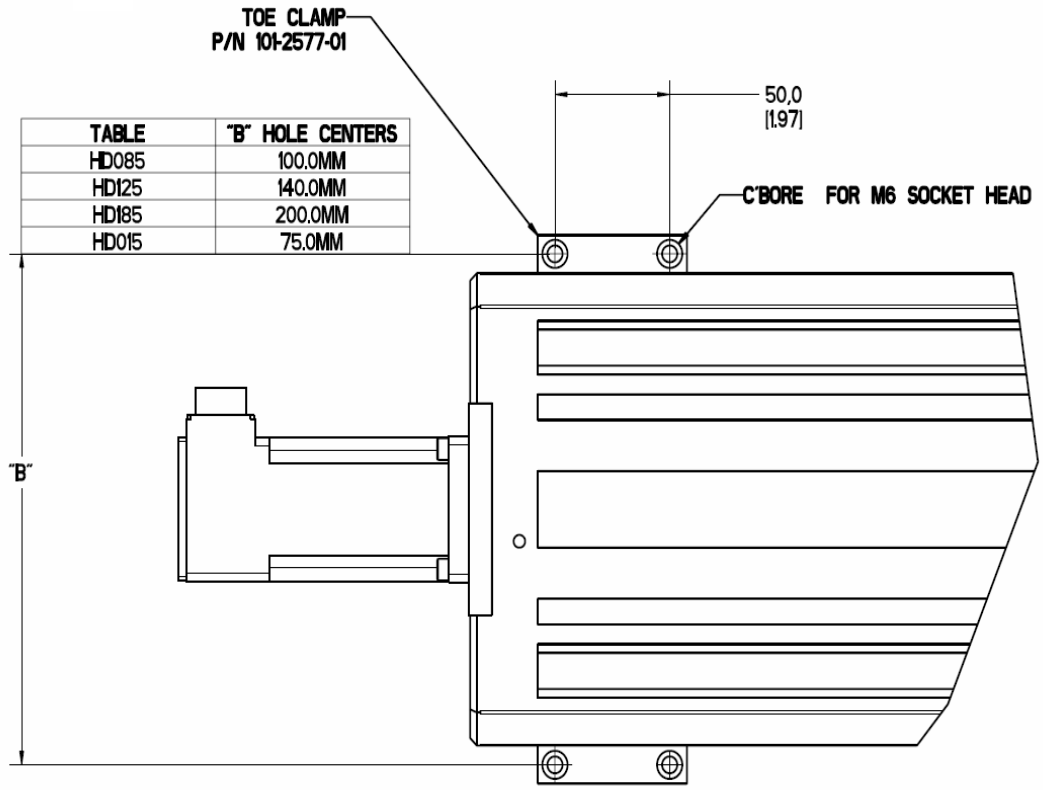

TABLE	"B" HOLE CENTERS
HD085	100.0MM
HD125	140.0MM
HD185	200.0MM
HD015	75.0MM

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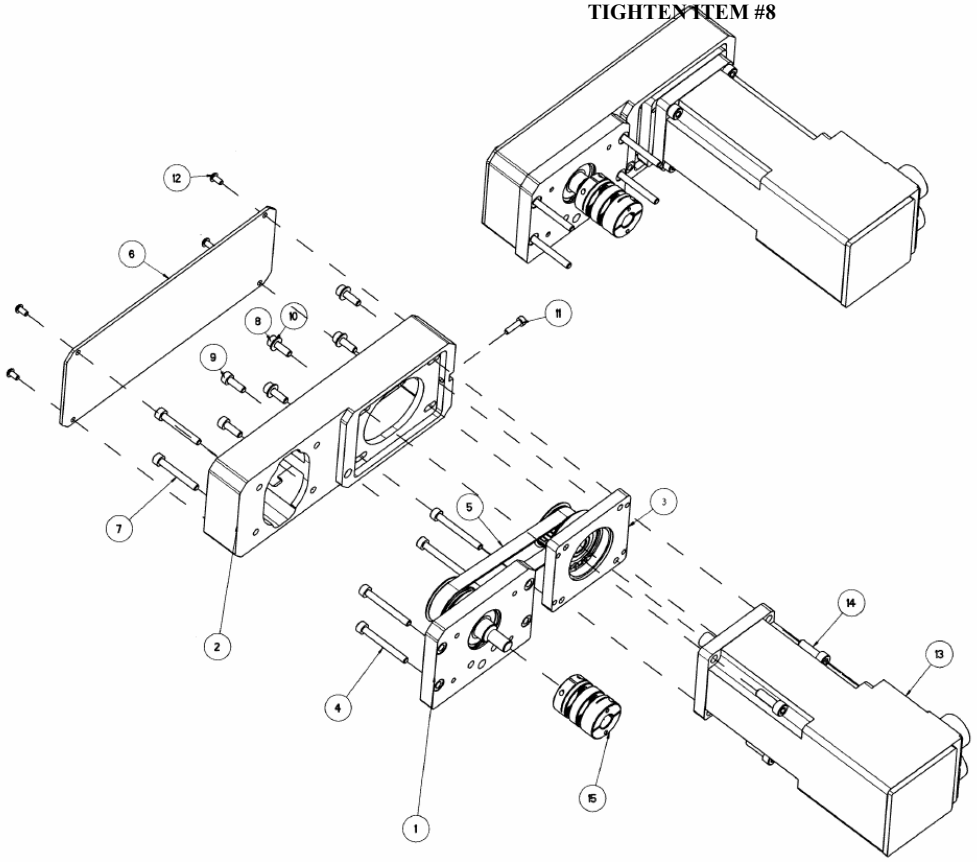
HD085 WRAP AROUND

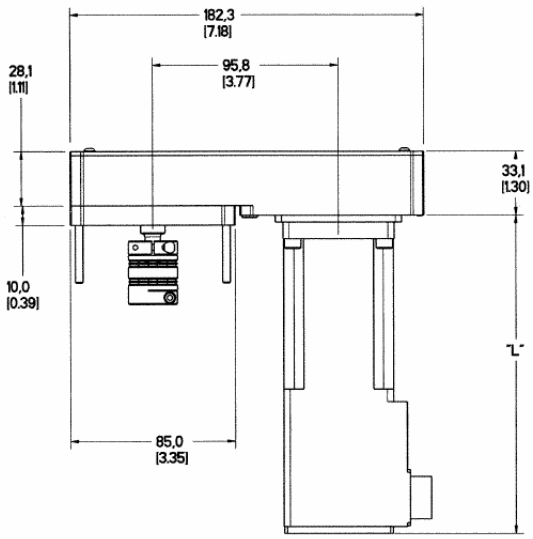
HD085 WRAP ASSY			
ITEM#	PART#	QTY	DESCRIPTION
1	002-2634-01	1	TBL MNT PULLEY WRAP ASSY HD085 1:1
2	101-2137-01	1	HOUSING WRAP HD085
3	002-2681-01	1	MTR MOUNT PULLEY ASSY HD085-SM23
4	SCH-M004-0035	4	SOCKET HEAD CAPSCREW M4 X 0.4 X 35.0
5	003-3777-01	1	BELT 3MR 282 MM LENGTH
6	101-2127-01	1	COVER HOUSING WRAP HD085
7	SCH-M004-0030	4	SOCKET HEAD CAPSCREW M4 X 0.4 X 30.0
8	SCH-M004-0012	4	SOCKET HEAD CAP SCREW M4 X 0.7 X 12.0
9	SCH-M004-0012	2	SOCKET HEAD CAP SCREW M4 X 0.7 X 12.0
10	WRS-M004-0000	4	WASHER 4MM
11	SCH-M003-0012	1	SOCKET HEAD CAP SCREW M3 X 0.5 X 12.0
12	SBH-M003-0006	4	SOCKET BUTTON HEAD M5 X0.8 X 14.0
13	MOTOR	1	
14	SCH-M005-0014	4	SOCKET CAP HEAD M5 X0,.8 X 14.0
15	003-3906-10	1	COUPLING 10MM X 8MM

MOTOR	L(MM)
SM232 NO BRAKE	130
SM232 W BRAKE	165

BELT TENSIONING:

LOOSEN ITEM #9 ALLOWING ITEM 3 TO SLIDE FREELY.
USE ITEM #11 TO TIGHTEN/LOOSEN TENSION.
MEASURE BELT TENSION WITH BELT TENSION METER.
(FOR MORE INFORMATION CONTACT FACTORY)
BELT TENSION SHOULD MEASURE 75N-95N
TIGHTEN ITEM #8





HD085 WRAP

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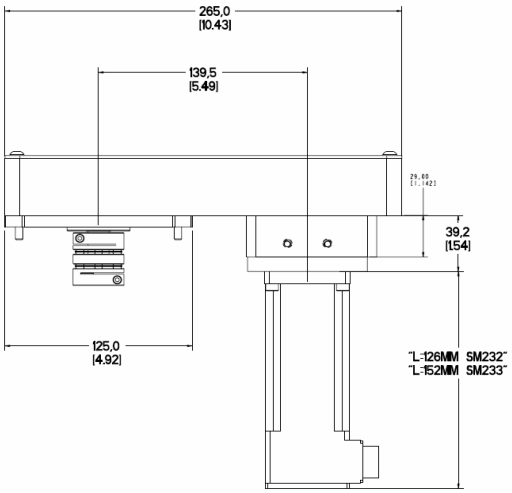
HD125 WRAP AROUND

HD125 WRAP ASSY			
ITEM#	PART#	QTY	DESCRIPTION
1	002-2654-01	1	TBL MNT PULLEY WRAP ASSY HD125 1:1
2	101-2681-02	1	HOUSING WRAP HD125
3	101-2787-01	1	PULLEY MACHINED 5MM GT 30 TOOTH 14MM KEYED
4	002-2683-02	1	MTR MNT/BRG/TENSION ASSY HD/125185 BE23
5	003-3777-02	1	BELT 5MR 425 MM LENGTH
6	101-2683-02	1	COVER HOUSING WRAP HD125
7	003-3906-07	1	COUPLING 14MM X 10MM
8	SCH-M005-0025	4	SOCKET HEAD CAP SCREW M5 X 0.8 X 25.0
9	WRS-M005-0000	4	WASHER 5MM
10	SCH-M005-0014	4	SOCKET HEAD CAP SCREW M5 X 0.8 X 14.0
11	SCH-M003-0016	1	SOCKET HEAD CAP SCREW M3 X 0.5 X 16.0
12	SBH-M005-0010	2	SOCKET BUTTONHEAD M5 X0.8 X 14.0
13	SCH-M005-0014	4	SOCKET CAP HEAD M5 X0,.8 X 14.0
15	101-2878-01	1	ADAPTER PLATE MTR SM23 HD125/185 WRAP
16	SCH-M005-0012	4	SOCKET CAP HEAD M5 X0,.8 X 12.0

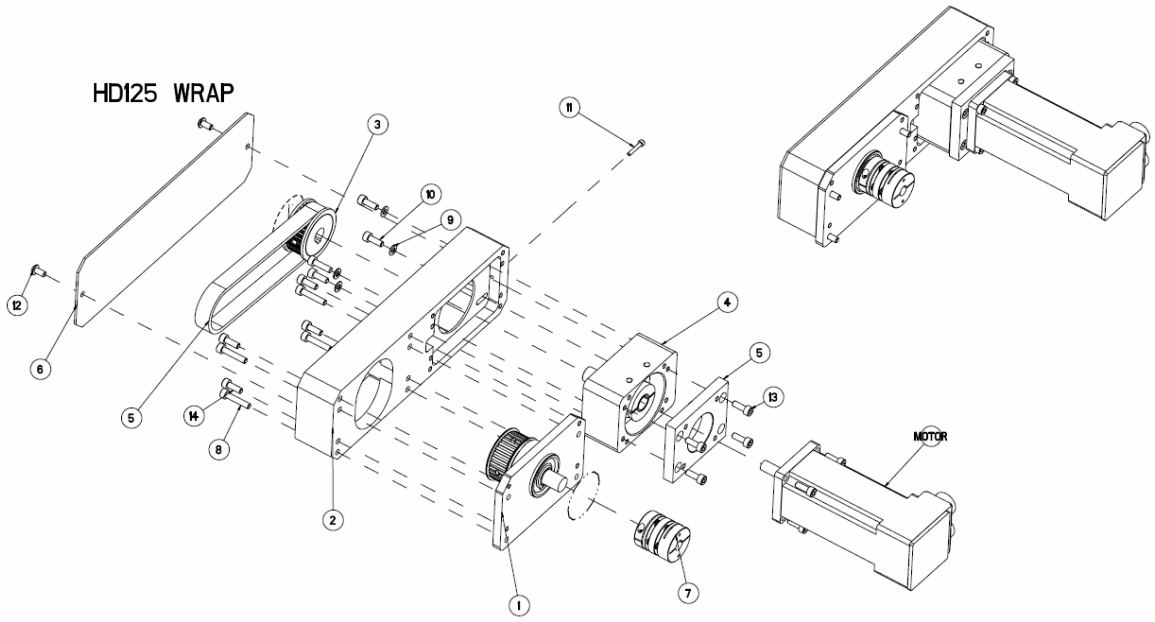


BELT TENSIONING:

LOOSEN ITEM #10 ALLOWING ITEM 4 TO SLIDE FREELY.
USE ITEM #11 TO TIGHTEN/LOOSEN TENSION.
MEASURE BELT TENSION WITH BELT TENSION METER.
(FOR MORE INFORMATION CONTACT FACTORY)

BELT TENSION SHOULD MEASURE 110N-130N

TIGHTEN ITEM #9



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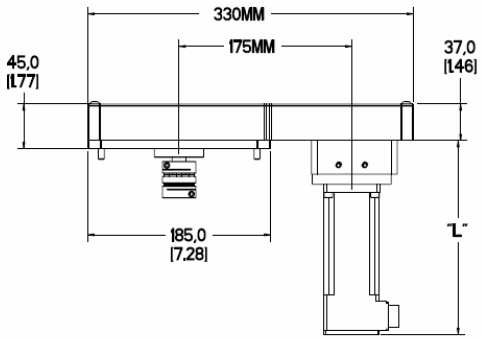
HD185 WRAP AROUND

HD185 WRAP ASSY			
ITEM#	PART#	QTY	DESCRIPTION
1	002-2657-01	1	TBL MNT PULLEY WRAP ASSY HD185 1:1
2	101-2689-02	1	HOUSING WRAP HD185
3(SM23X)	101-2787-01	1	PULLEY MACHINED 5MM GT 30 TOOTH 14MM KEYED
3(MPP92)	101-2787-03	1	PULLEY MACHINED 5MM GT 30 TOOTH 16MM KEYED
4(SM23X)	002-2683-02	1	MTR MNT/BRG/TENSION ASSY HD/125185 SM23
4(MPP92)	N.R		NOT REQURED FOR MPP92 MOTOR (DIRECT DRIVE)
5	003-3777-03	1	BELT 5MR 500MM LENGTH
6	101-2690-02	1	COVER HOUSING WRAP HD185
7	003-3906-07	1	COUPLING 14MM X 10MM
8	SCH-M006-0022	4	SOCKET HEAD CAP SCREW M6 X 1.0 X 22.0
9	WRS-M005-0000	4	WASHER 6MM
10	SCH-M005-0014	4	SOCKET HEAD CAP SCREW M5 X 0.8 X 14.0
11	SCH-M003-0016	1	SOCKET HEAD CAP SCREW M3 X 0.5 X 16.0
12	SBH-M005-0010	2	SOCKET BUTTON HEAD M5 X0.8 X 14.0
15(SM23X)	101-2878-01	1	ADAPTER PLATE MTR SM23 HD125/185 WRAP
15(MPP92)	102-0061-01	1	ADAPTER PLATE MOTORMPP92
16(SM23X)	SCH-M005-0012	4	SOCKET CAP HEAD M5 X0,.8 X 12.0
16(MPP92)	SCH-M006-0016	4	SOCKET CAP HEAD M6 X 1.0 X 16.0

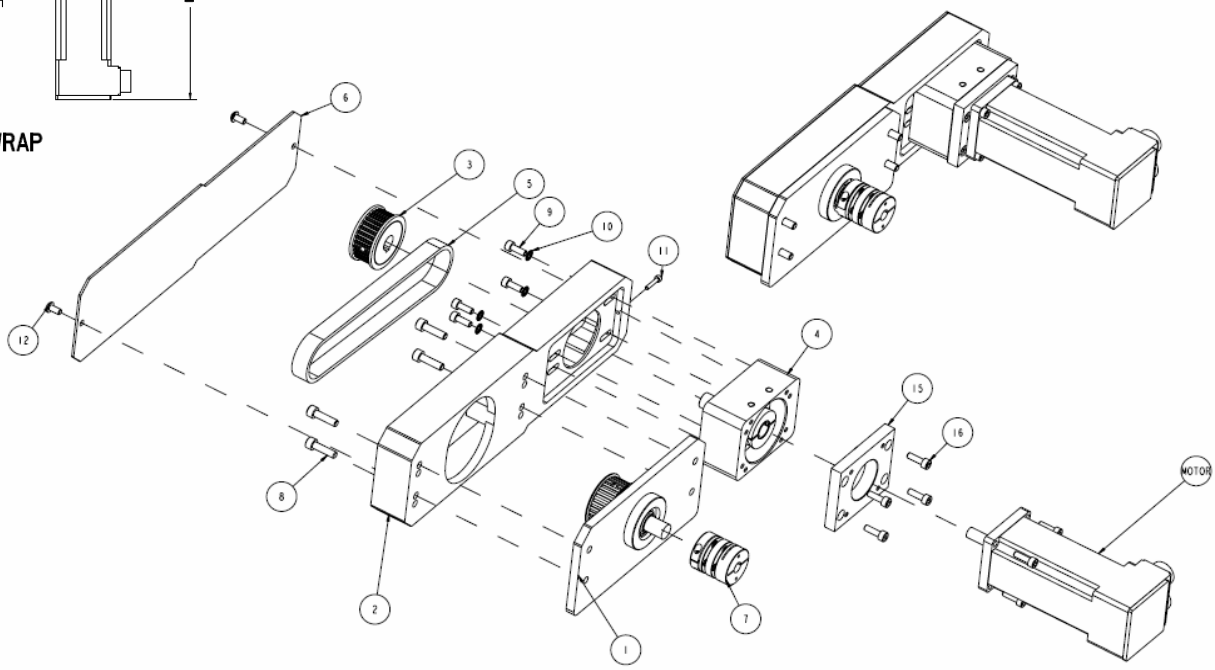
MOTOR	L(MM)
SM232	171
SM233	197
MPP92	162



HD185 WRAP

BELT TENSIONING:

LOOSEN ITEM #10 ALLOWING ITEM 4 TO SLIDE FREELY. USE ITEM #11 TO TIGHTEN/LOOSEN TENSION.
MEASURE BELT TENSION WITH BELT TENSION METER.
(FOR MORE INFORMATION CONTACT FACTORY)
BELT TENSION SHOULD MEASURE 110N-130N
TIGHTEN ITEM #9



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Belt Seal Information :
Qty 2 belt seals per table (except HD015)

HD085 BELT SEALS	
PART#	DESCRIPTION
101-2121-01	BELT SEAL HD085 100MM TRAVEL
101-2121-02	BELT SEAL HD085 200MM TRAVEL
101-2121-03	BELT SEAL HD085 300MM TRAVEL
101-2121-04	BELT SEAL HD085 400MM TRAVEL
101-2121-05	BELT SEAL HD085 500MM TRAVEL
101-2121-06	BELT SEAL HD085 600MM TRAVEL
101-2121-07	BELT SEAL HD085 700MM TRAVEL
101-2121-08	BELT SEAL HD085 800MM TRAVEL
101-2121-09	BELT SEAL HD085 900MM TRAVEL
101-2121-10	BELT SEAL HD085 1000MM TRAVEL
101-2121-11	BELT SEAL HD085 1100MM TRAVEL
101-2121-12	BELT SEAL HD085 1200MM TRAVEL

HD125 BELT SEALS	
PART#	DESCRIPTION
101-2423-50	BELT SEAL HD125 100MM TRAVEL
101-2423-51	BELT SEAL HD125 200MM TRAVEL
101-2423-52	BELT SEAL HD125 300MM TRAVEL
101-2423-53	BELT SEAL HD125 400MM TRAVEL
101-2423-54	BELT SEAL HD125 500MM TRAVEL
101-2423-55	BELT SEAL HD125 600MM TRAVEL
101-2423-56	BELT SEAL HD125 700MM TRAVEL
101-2423-57	BELT SEAL HD125 800MM TRAVEL
101-2423-58	BELT SEAL HD125 900MM TRAVEL
101-2423-59	BELT SEAL HD125 1000MM TRAVEL
101-2423-60	BELT SEAL HD125 1100MM TRAVEL
101-2423-61	BELT SEAL HD125 1200MM TRAVEL
101-2423-62	BELT SEAL HD125 1300MM TRAVEL
101-2423-63	BELT SEAL HD125 1400MM TRAVEL
101-2423-64	BELT SEAL HD125 1500MM TRAVEL

HD185 BELT SEALS	
PART#	DESCRIPTION
101-2423-01	BELT SEAL HD185 100MM TRAVEL
101-2423-02	BELT SEAL HD185 200MM TRAVEL
101-2423-03	BELT SEAL HD185 300MM TRAVEL
101-2423-04	BELT SEAL HD185 400MM TRAVEL
101-2423-05	BELT SEAL HD185 500MM TRAVEL
101-2423-06	BELT SEAL HD185 600MM TRAVEL
101-2423-07	BELT SEAL HD185 700MM TRAVEL
101-2423-08	BELT SEAL HD185 800MM TRAVEL
101-2423-09	BELT SEAL HD185 900MM TRAVEL
101-2423-10	BELT SEAL HD185 1000MM TRAVEL
101-2423-11	BELT SEAL HD185 1100MM TRAVEL
101-2423-12	BELT SEAL HD185 1200MM TRAVEL
101-2423-13	BELT SEAL HD185 1300MM TRAVEL
101-2423-14	BELT SEAL HD185 1400MM TRAVEL
101-2423-15	BELT SEAL HD185 1500MM TRAVEL
101-2423-16	BELT SEAL HD185 1600MM TRAVEL
101-2423-17	BELT SEAL HD185 1700MM TRAVEL
101-2423-18	BELT SEAL HD185 1800MM TRAVEL
101-2423-19	BELT SEAL HD185 1900MM TRAVEL
101-2423-20	BELT SEAL HD185 2000MM TRAVEL

PARKER HANNIFIN CORPORATION
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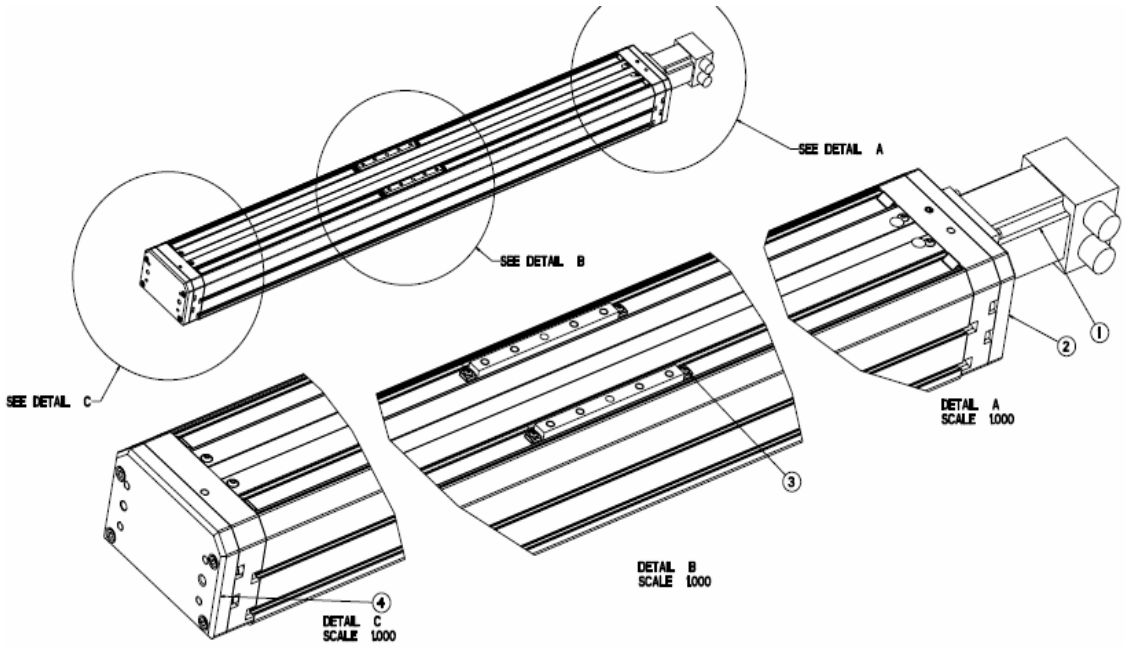
HD015 BELT SEALS	
PART#	DESCRIPTION
101-2966-01	BELT SEAL HD015 SINGLE CARRIAGE 100MM TRAVEL
101-2966-02	BELT SEAL HD015 SINGLE CARRIAGE 200MM TRAVEL
101-2966-03	BELT SEAL HD015 SINGLE CARRIAGE 300MM TRAVEL
101-2966-04	BELT SEAL HD015 SINGLE CARRIAGE 400MM TRAVEL
101-2966-05	BELT SEAL HD015 SINGLE CARRIAGE 500MM TRAVEL
101-2966-06	BELT SEAL HD015 SINGLE CARRIAGE 600MM TRAVEL
101-2966-07	BELT SEAL HD015 SINGLE CARRIAGE 700MM TRAVEL
101-2966-08	BELT SEAL HD015 SINGLE CARRIAGE 800MM TRAVEL
101-2966-09	BELT SEAL HD015 SINGLE CARRIAGE 900MM TRAVEL
101-2966-10	BELT SEAL HD015 SINGLE CARRIAGE 1000MM TRAVEL
101-2966-11	BELT SEAL HD015 SINGLE CARRIAGE 1100MM TRAVEL
101-2966-12	BELT SEAL HD015 SINGLE CARRIAGE 1200MM TRAVEL
101-2966-13	BELT SEAL HD015 SINGLE CARRIAGE 1300MM TRAVEL
101-2966-14	BELT SEAL HD015 SINGLE CARRIAGE 1400MM TRAVEL
101-2966-15	BELT SEAL HD015 SINGLE CARRIAGE 1500MM TRAVEL
101-2966-16	BELT SEAL HD015 SINGLE CARRIAGE 1600MM TRAVEL
101-2966-17	BELT SEAL HD015 SINGLE CARRIAGE 1700MM TRAVEL
101-2966-18	BELT SEAL HD015 SINGLE CARRIAGE 1800MM TRAVEL
101-2966-19	BELT SEAL HD015 SINGLE CARRIAGE 1900MM TRAVEL
101-2966-20	BELT SEAL HD015 SINGLE CARRIAGE 2000MM TRAVEL
101-2966-101	BELT SEAL HD015 DOUBLE CARRIAGE 100MM TRAVEL
101-2966-102	BELT SEAL HD015 DOUBLE CARRIAGE 200MM TRAVEL
101-2966-103	BELT SEAL HD015 DOUBLE CARRIAGE 300MM TRAVEL
101-2966-104	BELT SEAL HD015 DOUBLE CARRIAGE 400MM TRAVEL
101-2966-105	BELT SEAL HD015 DOUBLE CARRIAGE 500MM TRAVEL
101-2966-106	BELT SEAL HD015 DOUBLE CARRIAGE 600MM TRAVEL
101-2966-107	BELT SEAL HD015 DOUBLE CARRIAGE 700MM TRAVEL
101-2966-108	BELT SEAL HD015 DOUBLE CARRIAGE 800MM TRAVEL
101-2966-109	BELT SEAL HD015 DOUBLE CARRIAGE 900MM TRAVEL
101-2966-110	BELT SEAL HD015 DOUBLE CARRIAGE 1000MM TRAVEL
101-2966-111	BELT SEAL HD015 DOUBLE CARRIAGE 1100MM TRAVEL
101-2966-112	BELT SEAL HD015 DOUBLE CARRIAGE 1200MM TRAVEL
101-2966-113	BELT SEAL HD015 DOUBLE CARRIAGE 1300MM TRAVEL
101-2966-114	BELT SEAL HD015 DOUBLE CARRIAGE 1400MM TRAVEL
101-2966-115	BELT SEAL HD015 DOUBLE CARRIAGE 1500MM TRAVEL
101-2966-116	BELT SEAL HD015 DOUBLE CARRIAGE 1600MM TRAVEL
101-2966-117	BELT SEAL HD015 DOUBLE CARRIAGE 1700MM TRAVEL
101-2966-118	BELT SEAL HD015 DOUBLE CARRIAGE 1800MM TRAVEL
101-2966-119	BELT SEAL HD015 DOUBLE CARRIAGE 1900MM TRAVEL
101-2966-120	BELT SEAL HD015 DOUBLE CARRIAGE 2000MM TRAVEL

Replacing/Installing Belt Seals

1. LOOSEN COUPLING ON MOTOR SHAFT.
2. REMOVE MOTOR AND MOTOR ADAPTER (ITEM#1 &2)
3. REMOVE RADIAL COVER PLATE (ITEM#4)
4. REMOVE BUTTON HEAD AND CLAMPING NUT FROM CARRIAGE
5. REMOVE BELT SEAL
6. RUN NEW BELT THROUGH CHANNEL IN
7. EXTRUSION
8. ATTACH TO CARRIAGE
9. RUN CARRIAGE OVER FULL STROKE LENGTH TO SEAT IN CENTER COVER AND BASE



PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
1140 SANDYHILL ROAD IRWIN ,PA 15642

MAINTENANCE AND LUBRICATION:

HD series linear table line is a robust industrial positioner that is easy to apply, easy to install, and easy to maintain. The robust design begins with and extruded body and carriage that provide exceptional beam strength and carriage stiffness. The linear bearings and ballscrew are precision components selected for their long life at 100% duty operation, they both employ lube seals which provide maintenance free operation in most applications. The Lube Seals provide maintenance free operation for **5years/20KM of Life**

Recommended replacement lube:
Kyodi Yushi MULTITEMP PS2 grease HD085
SHELL ALVANIA RL2 GREASE HD125/HD185

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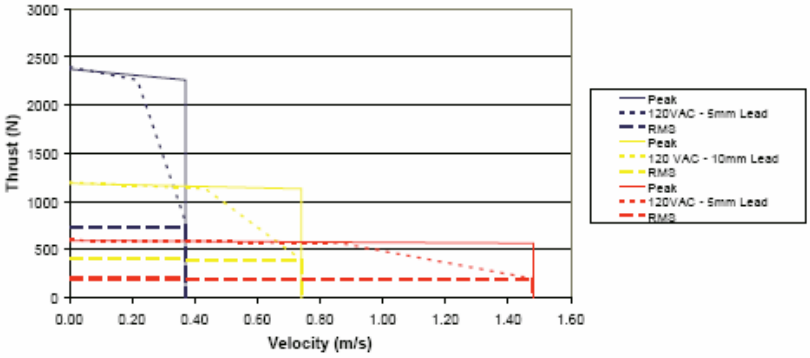
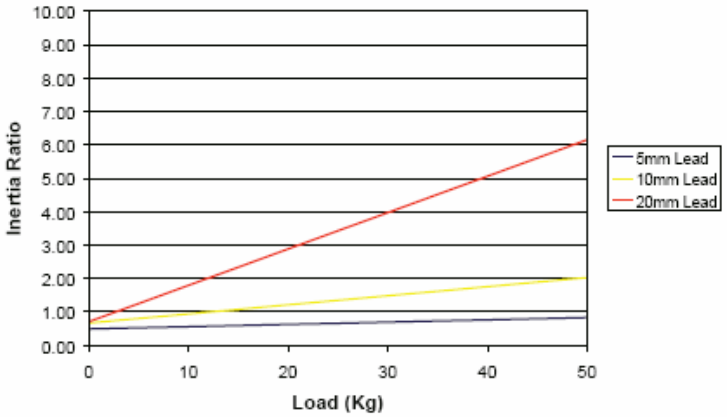
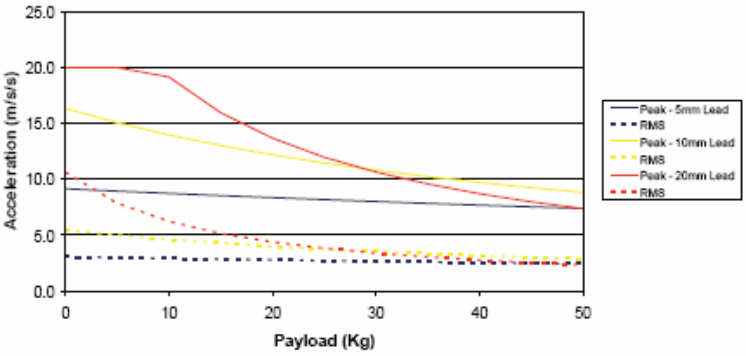
HD085 Thrust versus Velocity



HD085 Inertia Ratios



HD085 Acceleration Rates



Motor Characteristics

	M01x M02x SM232AE	M11x M12x SM232AQ	M100 Series* HV232	M100 Parallel* HV232
Max. Voltage	340	340	170	170
Peak Current	8.3	8.3	1.38	2.76
RMS Current	2.0	2.0	1.38	2.76
Resistance	7.50	7.50	3.41	0.85
Inductance	2.90	2.90	12.28	3.07
Recommended Drive	S025	AR-04	E-AC	E-AC

* Series/Parallel denotes wiring of step motor to drive

PARKER HANNIFIN CORPORATION
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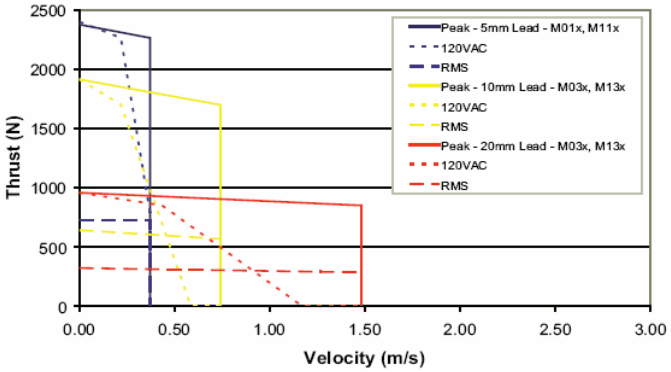
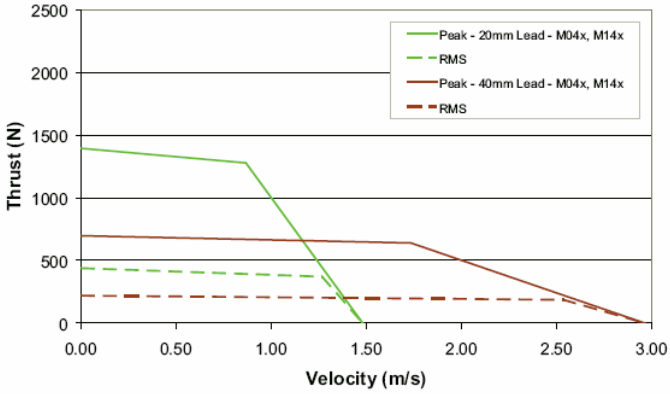
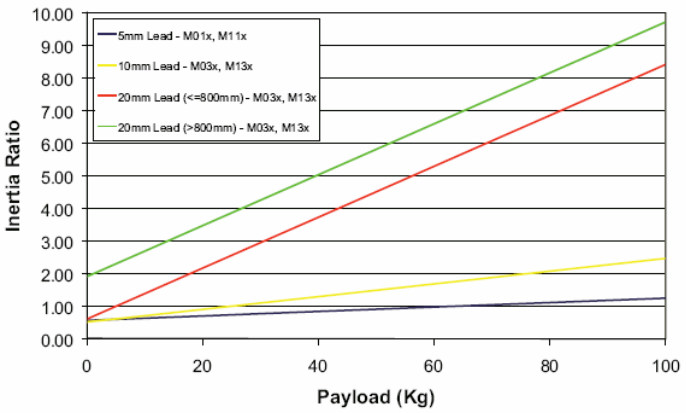
HD125/HD185 Thrust versus Velocity



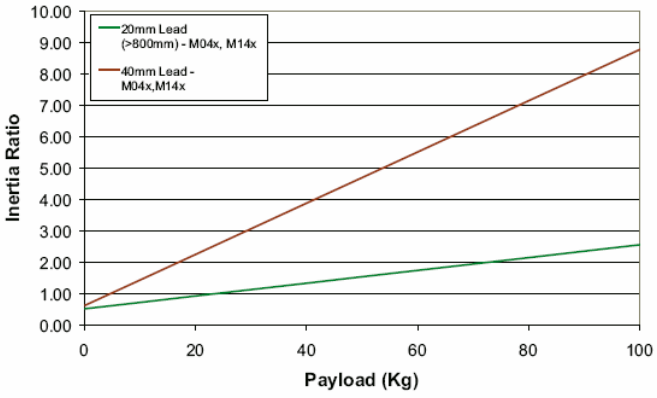
HD125/HD185 Thrust versus Velocity



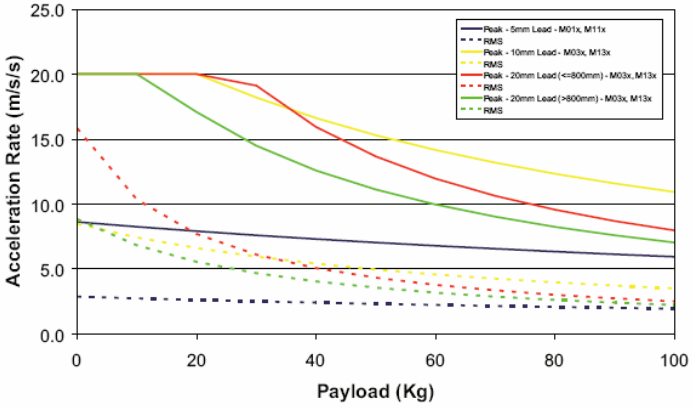
HD125 Inertia Ratios



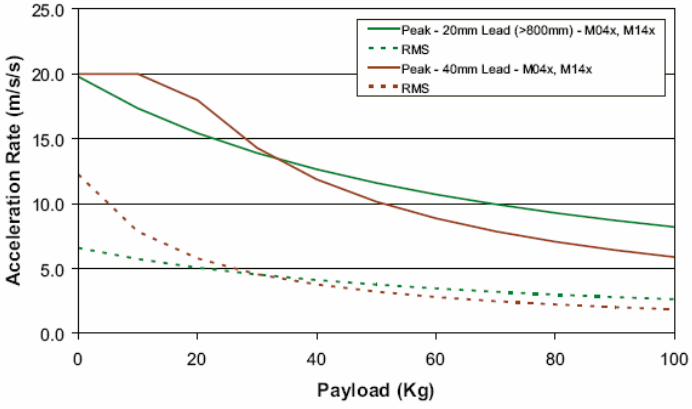
HD125 Inertia Ratios



HD125 Acceleration Rates



HD125 Acceleration Rates



Motor Characteristics

	M01x SM232AE	M11x SM232AQ	M03x SM233AE	M13x SM233AQ	M04x MPP921B	M14x MPP921B
Max. Voltage	340	340	340	340	340	340
Peak Current	8.3	8.3	8.1	8.1	7.0	7.0
RMS Current	2.0	2.0	1.9	1.9	1.8	1.8
Resistance	7.50	7.50	9.65	9.65	11.0	11.0
Inductance	2.90	2.90	4.08	4.08	47.0	47.0
Drive	S025	AR-04	S025	AR-04	S025	AR-04

PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
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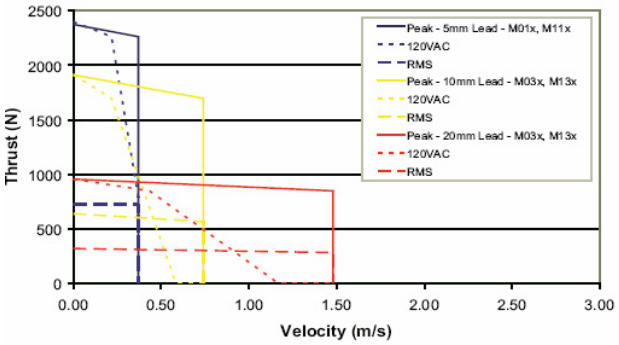
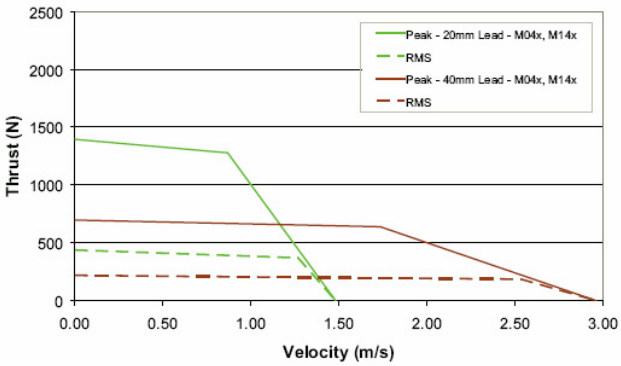
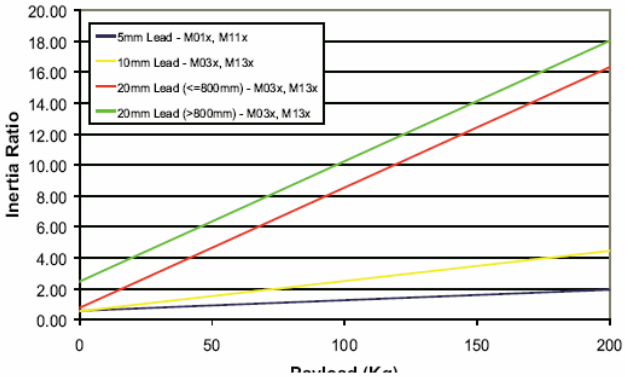
HD125/HD185 Thrust versus Velocity



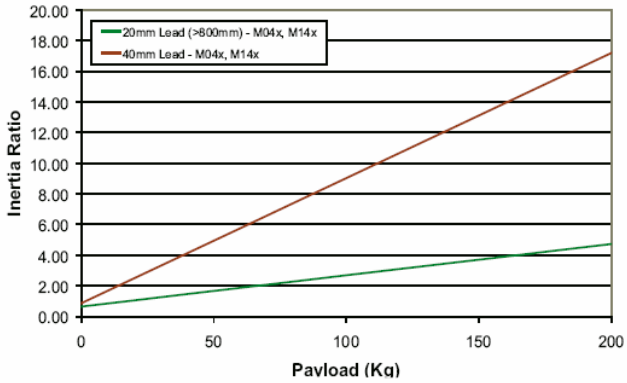
HD125/HD185 Thrust versus Velocity



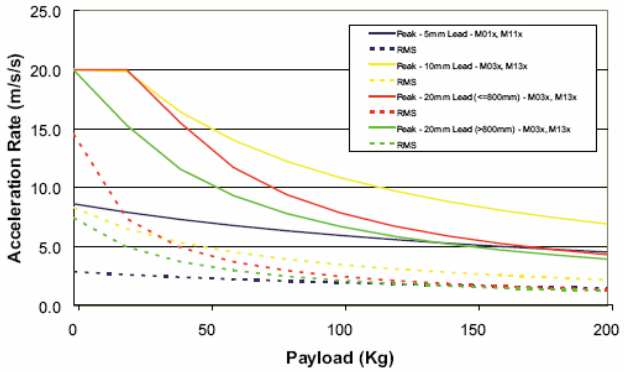
HD185 Inertia Ratios



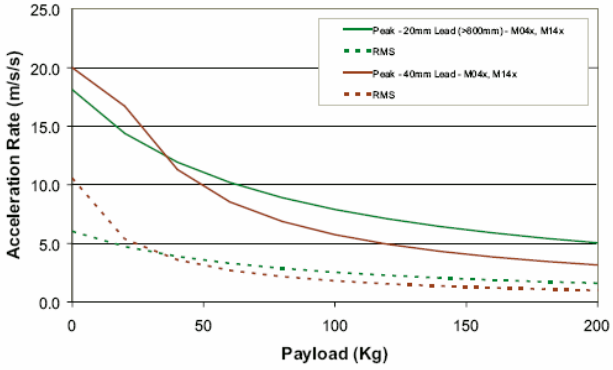
HD185 Inertia Ratios



HD185 Acceleration Rates



HD185 Acceleration Rates



Motor Characteristics

	M01x SM232AE	M11x SM232AQ	M03x SM233AE	M13x SM233AQ	M04x MPP921B	M14x MPP921B
Max. Voltage	340	340	340	340	340	340
Peak Current	8.3	8.3	8.1	8.1	7.0	7.0
RMS Current	2.0	2.0	1.9	1.9	1.8	1.8
Resistance	7.50	7.50	9.65	9.65	11.0	11.0
Inductance	2.90	2.90	4.08	4.08	47.0	47.0
Drive	S025	AR-04	S025	AR-04	S025	AR-04

PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
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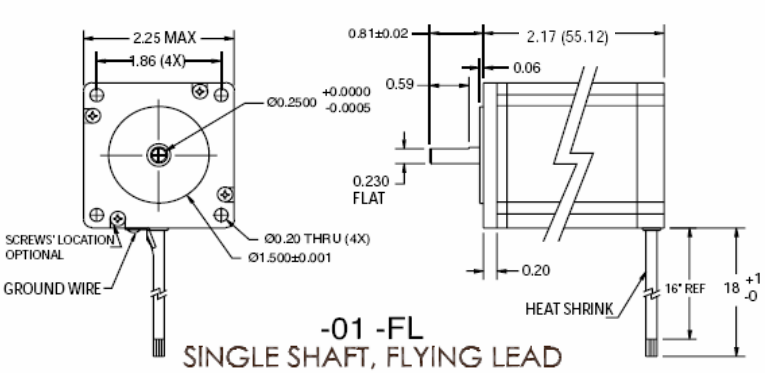
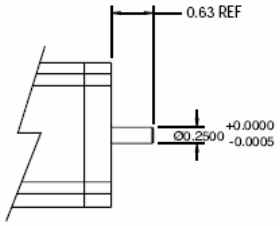
HV232 STEPPER MOTOR TECHNICAL INFORMATION

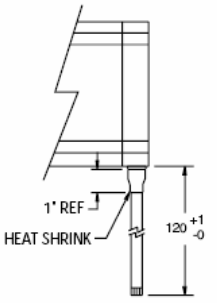
HV 23



-01 -FL
SINGLE SHAFT, FLYING LEAD



-02
DOUBLE SHAFT

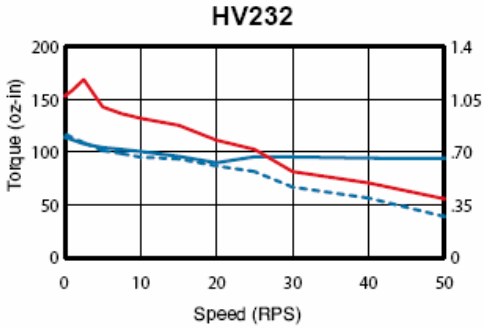


-10
10' ATTACHED CABLE

Parameter	Units	HV232
Static Torque	oz-in Nm	166 1.17
Rotor Inertia	oz-in^2 kg-cm^2	1.5 0.275
Drive Current Series Parallel	A (pk) A (rms) A (pk) A (rms)	1.38 0.98 2.76 1.95
Phase Inductance Series Parallel	mH mH	12.28 3.07
Resistance Series Parallel	Ohms Ohms	3.41 0.85
Detent Torque	oz-in Nm	5.1 0.036
Thrust Load	lb kg	13 5.91
Radial Load (0.79" from face)	lb kg	15.0 6.82
Motor Weight	lb kg	1.50 0.68
Certifications	CE - LVD CE - EMC UL	No No No

LV & HV Wiring - E-DC, E-AC, ZETA & Gemini

Series Wiring Model	Frame	A+	A-	B+	B-	Notes
LV	11, 14	Red	Black	White	Green	Internally wired in series
LV & HV	17, 23, 34	Red	Black	White	Green	Link Yellow and Blue, Link Orange and Brown
Parallel Wiring Model						
LV	11, 14	NA	NA	NA	NA	Internally wired in series, parallel wiring not available
LV & HV	17, 23, 34	Red/ Blue	Black/ Yellow	White/ Brown	Orange/ Green	None



PARKER HANNIFIN CORPORATION
ELECTROMECHANICAL AUTOMATION DIVISION
1140 SANDYHILL ROAD IRWIN ,PA 15642

SM232AE-TPSN/SM233AE-TPSN MOTOR TECHNICAL INFORMATION WITH 'PS' CONNECTORS

Parameter	Symbol	Units	SM232A	SM233A
Stall Torque Continous[1]	T_{cs}	lb-in	6.6	10.1
		oz-in	106	161
		Nm	0.74	1.13
Stall Current Continuous[3,4,8]	I_{cs}(sine)	Amps Peak	2.8	2.7
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.4	2.4
Peak Torque[6]	T_{pk}	lb-in	19.8	30.2
		oz-in	316	483
		Nm	2.21	3.38
Peak Current[4,5,6]	I_{pk}(sine)	Amps Peak	8.3	8.1
Peak Current[5,7]	I_{pk}(trap)	Amps DC	7.2	7.1
Rated Speed[2]	ω_r	rpm	7500	5800
Current@Rated Speed	I_r(sine)	Amps	2.3	2.4
Current@Rated Speed	I_r(trap)	Amps	2.0	2.0
Torque@Rated Speed	T_r	lb-in	5.1	8.1
		oz-in	81	129
		Nm	0.57	0.90
Shaft Power@Rated Speed	P_o	watts	449	553
Voltage Constant[3,4]	K_b	Volts/rad/s	0.310	0.484
Voltage Constant[3,4]	K_e	Volts/KRPM	32.46	50.68
Torque Constant[3]	K_t(sine)	oz-in/Amp Peak	38.02	59.35
		Nm/Amp Peak	0.266	0.415
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	43.90	68.53
		Nm/Amp DC	0.307	0.480
Resistance[3]	R	Ohms	7.50	9.65
Inductance[5]	L	mH	2.90	4.08
Maximum Bus Voltage	V_m	Volts DC	340	340
Therm. Resistance Wind-Amb	R_{th} w-a	°C/watt	1.54	1.25
Motor Constant	K_m	oz-in/√watt	16.03	22.06
		Nm/√watt	0.112	0.154
Viscous Damping	B	oz-in/Krpm	0.360	0.540
		Nm/Krpm	2.52 E-3	3.78 E-3
Static Friction	T_f	oz-in	0.70	1.00
		Nm	4.90 E-3	7.00 E-3
Motor Thermal Time Constant	τ_{th}	minutes	21.6	23.3
Electrical Time Constant	τ_{elec}	millisecs	0.39	0.42
Mechanical Time Constant	τ_{mech}	millisecs	7.2	5.4
Intermittent Torque Duration[10]	T_{2s}	seconds	18	20
Peak Torque Duration[11]	T_{2s}	seconds	6	7
Rotor Inertia	J	lb-in-sec²	8.2 E-4	1.2 E-3
		kg-m²	9.3 E-5	1.3 E-4
Number of Poles	Np		4	4
Weight	#	lbs	3.0	3.9
		kg	1.4	1.8
Winding Class			H	H

* SE Series not available with resolver.

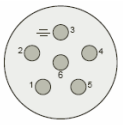
1 @ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate, @40°C ambient derate phase currents and torques by 12%.
2 Maximum speed is 7500RPM. For higher speed operation please call the factory.
3 Measured Line to Line, ±10% line-to-line
4 Value is mesured peak of sine wave.
5 ±30%, Line-to-Line, inductance bridge measurement @ 1 kHz
6 Initial winding temperature must be 60°C or less before peak current is applied.
7 Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.
8 Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.
9 Maximum Time duration with 2 times rated applied with initial winding temp at 60°C.
10 Maximum Time duration with 3 times rated applied with initial winding temp at 60°C.

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

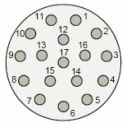
Motor Power/Brake

Designation	1.0 Connector Pin No.
Phase A	1
Phase B	2
Phase C	6
Ground	3
Shield	3
Brake	4
Brake	5

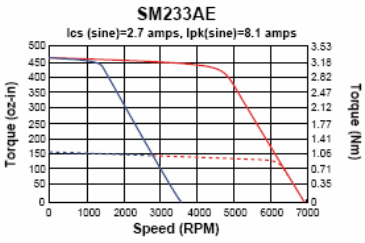
Designation	Motor Feedback Connector Pin N
Encoder (or Smart Encoder)	
Vcc	8
Ground	7
CH A+	2
CH A-	1
CH B+	11
CH B-	12
Index + (or Data +)	15
Index - (or Data -)	16
Temperature Sensor	
Temp	13
Temp	9
Hall Effect (not applicable with smart encoder)	
Hall Gnd	7
Hall +5	8
Hall 1 (or CLK+)	4
Hall 2	5
Hall 3 (or CLK-)	6

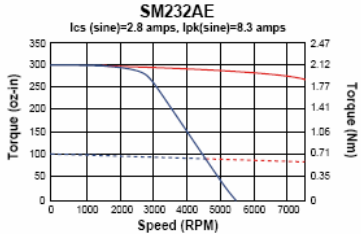


Size 1.0 Motor Connector
43-024091-01
(Mating Conn.# 43-021659-01)



Feedback Connector
43-025367-01
(Mating Conn.# 43-021660-01)

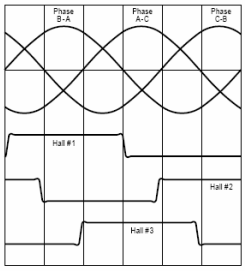




Encoder Specifications

Mechanical	Accuracy	±2 min of arc
Electrical	Input power	5 VDC ±5%, 135 mA
	Operating frequency	100 kHz max
	Output device	26LS31
	Sink/Source, nominal	20 mA
	Suggested user interface	26LS32

Commutation Chart



Hall-Effect Specifications

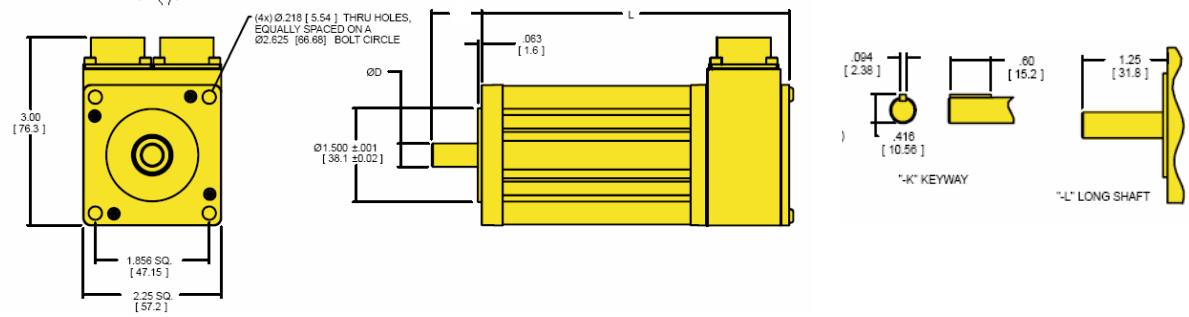
Electrical	Input power	5 VDC ±5%, 80 mA
	Output device (open collector)	LM339
	Maximum pull up	12 VDC
	Sink	16 mA

Motor Sizes

Model	Motor Length "L"	Shaft Diameter "D"
SM232	4.98 [126.5]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]
SM233	5.98 [151.9]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]

Size 23, Dimensional Drawing

Dimensions in inches (mm)



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ELECTROMECHANICAL AUTOMATION DIVISION
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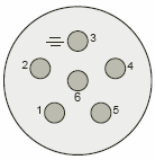
MOTOR INFORMATION:
CMP0921B1E-200008 CUSTOM MPP0921B1E

Motor Power/Brake

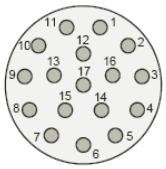
Designation	1.0 Connector Pin No.	1.5 Connector Pin No.
Phase A	1	U
Phase B	2	V
Phase C	6	W
Ground	3	⏚
Shield	3	⏚
Brake	4	+
Brake	5	–



Size 1.0 Motor Connector
43-024091-01
(Mating Conn.# 43-021659-01)

Incremental Encoder/ Hall Feedback (Type 1E, 3E)

Designation	Motor Feedback Connector Pin No.
Encoder (or Smart Encoder)	
Vcc	8
Ground	7
CH A+	2
CH A-	1
CH B+	11
CH B-	12
Index + (or Data +)	15
Index - (or Data -)	16
Temperature Sensor	
Temp	13
Temp	9
Hall Effect (not applicable with smart encoder)	
Hall Gnd	7
Hall +5	8
Hall 1 (or CLK+)	4
Hall 2	5
Hall 3 (or CLK-)	6



Feedback Connector
43-025367-01
(Mating Conn.# 43-021660-01)

Parameter	Symbol	Units	0921B
Stall Torque Continuous[1,2,3]	T_{cs}	Nm	1.55
		lb-in	13.8
		oz-in	220
Stall Current Continuous[1,2,3]	I_{cs}(rms)	Arms/ph	1.8
Stall Current Continuous[1,2,3]	I_{cs}(trap)	Amps DC	2.2
Peak Torque	T_{pk}	Nm	4.93
		lb-in	43.6
		oz-in	698
Peak Current	I_{pk}(rms)	Arms/ph	6.7
Peak Current	I_{pk}(trap)	Amps	8.2
Rated Speed[1,2,3]	S_r	rpm	3801
Rated Torque[1,2,3]	T_r	Nm	1.31
		lb-in	11.6
		oz-in	184
Shaft Power @ Rated Speed[1,2,3]	P_{out}	kW	0.5
Current @ Rated Speed[1,2,3]	Ir	Arms	1.6
Voltage Constant[4]	K_b	V/rad/s	0.70
Voltage Constant[4]	K_e	Vrms/krpm	51.63
Torque Constant[4]	K_t	Nm/Arms/ph	0.854
Torque Constant[4]	K_t	oz-in/Amp DC	98.7
Resistance[3,4]	R	Ohm	11.00
Inductance[3,5]	L	mH	47
Maximum DC bus Voltage[6]	V_{mbus}	VDC	340
Maximum AC Voltage[6]	V_s	VAC	240
Thermal Res Wind-Amb[6]	R_{th}w-a	°C/W	1.30
Ambient Temp at Rating	T_{amb}	°C	25
Max Winding Temp	T_{max}	°C	150
Winding Temp at Rating[7]	T_{wr}	°C	125
Motor Thermal Time Constant[6]	t_{th}	minutes	30.0
Rotor Shaft Viscous Damping[6]	B	Nm/krpm	0.0141
Rotor Shaft Dynamic Friction[6]	T_f	Nm	0.0085
Rotor Inertia[6]	J	kg-m²	0.0003322
		lb-in-sec²	0.0029400
Number of rotor maget poles[6]	Np	#poles	8
Motor Weight[6]	#	kg	2.7
		lb	5.9
Winding Class	F	UL class	H
Winding Number			w00549
Environmental Protection Rating[8]	IP		IP40 - IP65

1 *Assumes motor is mounted to an aluminum plate with dimensions of 10" X 10" X 1/4" aluminum plate for 70mm motor frames or smaller, 12" X 12" X 1/2" for 92mm to 115mm, 12" X 12" X 1" for 142mm to 230mm motor frames, and 21"x21"x1" for 270mm to 320mm motor frames.*
2 *Maximum winding temperature is 155° C. Thermal protection device threshold may be at a lower temperature.*
3 *These ratings are valid for Parker drives. Other drives may not achieve the same ratings.*
4 *+ 10%*
5 *+- 30% @ 1kHz*
6 *Reference only*
7 *The winding temperature at the motor rated speed may be lower than the winding maximum due to feedback or amplifier limitations.*
8 *Refer to the product part number configurator for the IP rating character. All servo motors with a "V" designator in the part number for the shaft seal option are rated IP65. All other motors are rated for IP64, provided the feedback device is encased in an aluminum housing. Motors that have exposed feedback devices are rated at IP40.*

Incremental Encoder Specifications (Type 1E, 3E)

Parameter	Value
Accuracy	±2 min of arc
Input power	5 VDC ±5%, 135 mA
Operating frequency	250 kHz max
Output device	26LS31
Sink/Source, nominal	20 mA
Suggested user interface	26LS32

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

Feedback Cables

Drive	Feedback Type	Part Number
Compax 3	Encoder - Incremental	F-2C1-xx
Aries	Encoder - Incremental	F-1A1-xx

Power Cables

Motor Current	Motor P/N	Cable Part Number
Up to 6 A rms 230 volts only	MPP0921B	P-1A1-xx Size 1.0 PS Connector

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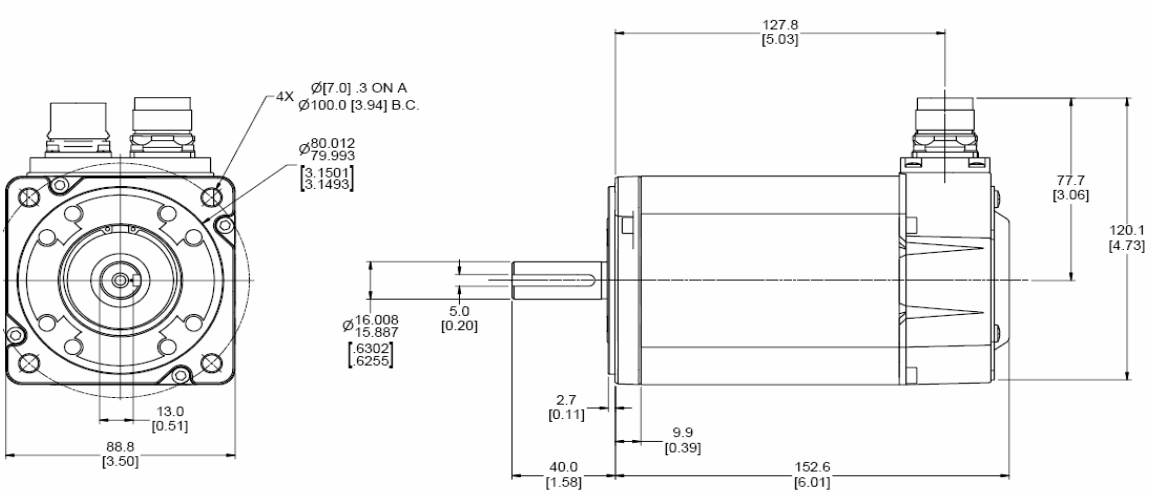
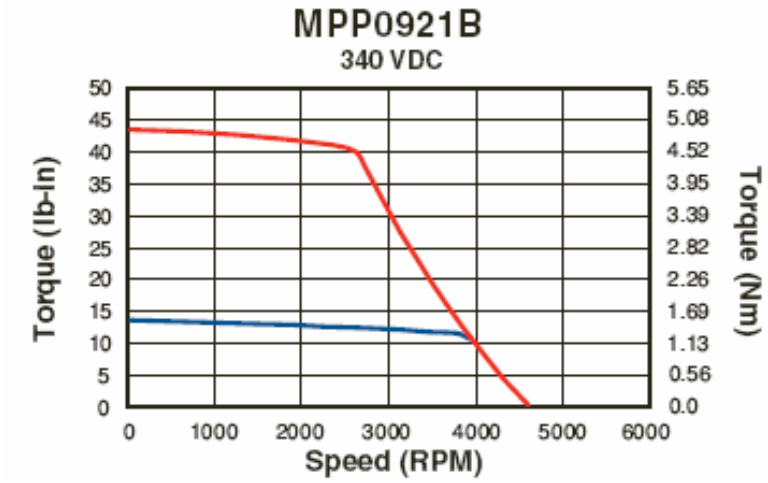
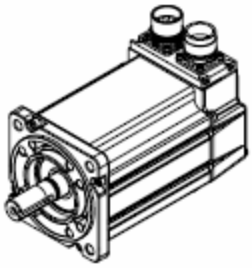
MOTOR INFORMATION:
CMP0921B1E-200008 CUSTOM MPP0921B1E







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