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Phone: 877-478-3241
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Fax: 877-IP-Tech2
www.iptech1.com


Motion Without Limits™



HepcoMotion®
SBD
Sealed Belt Drive

BISHOPWISecARVER®

Introduction

The HepcoMotion SBD is an exceptionally rugged, quiet and precise linear unit. It uses super-smooth Hepco LBG caged linear ball guides having such high load capacity that system life is rarely an issue. Drive is provided by a new high strength tooth belt. The unit is housed in an anodized aluminum beam and is completely enclosed with a stainless steel cover to provide excellent protection from dirt and debris. A corrosion resistant version with all external components made in stainless steel or anodized aluminum is an option. A version for use in high specification cleanrooms is also available  5-6.

Stainless Steel Cover

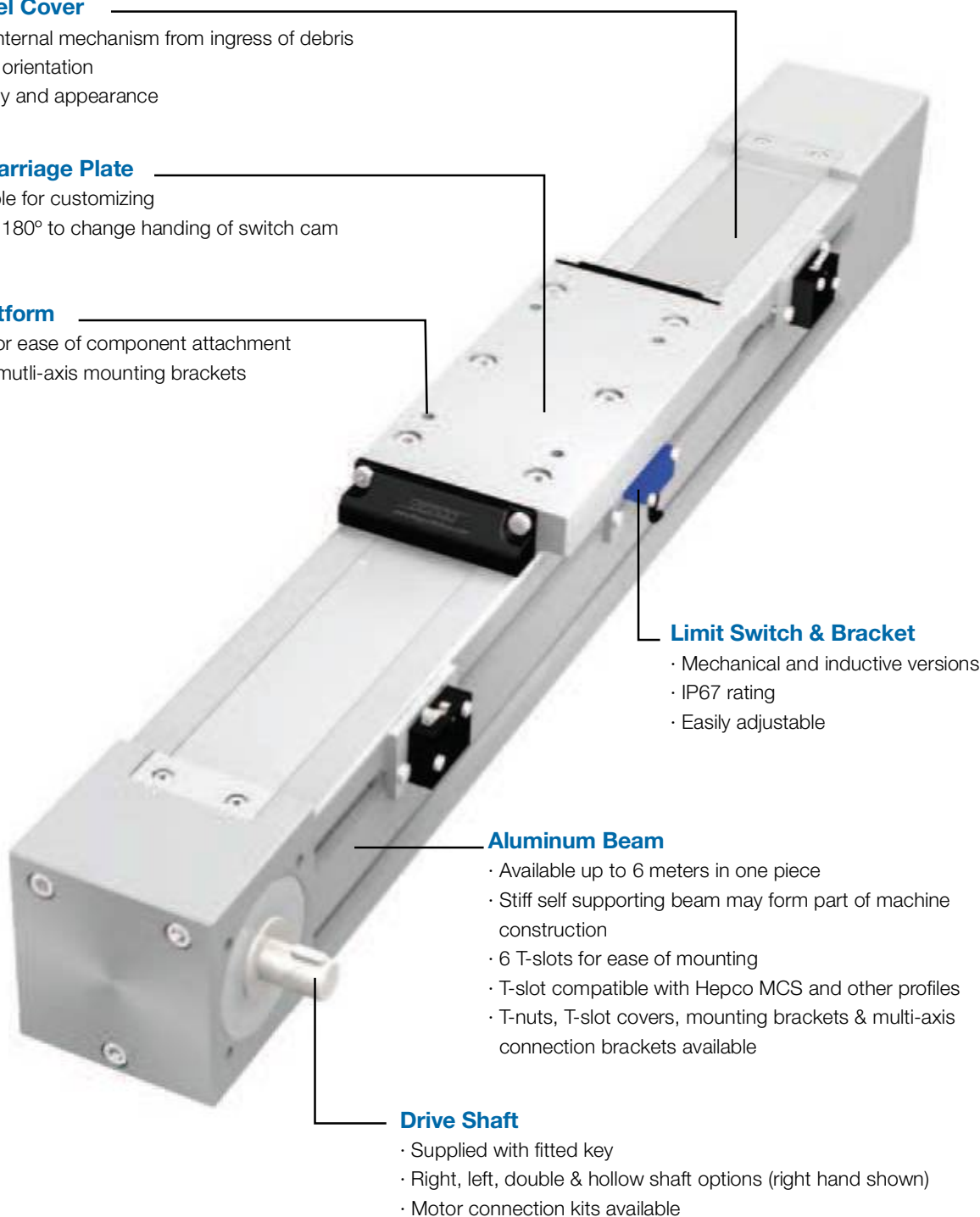
- Helps protect internal mechanism from ingress of debris
- Effective in any orientation
- Enhances safety and appearance

Removable Carriage Plate

- Easily detachable for customizing
- Can be rotated 180° to change handing of switch cam

Mounting Platform

- Tapped holes for ease of component attachment
- Direct fixing of mutli-axis mounting brackets



Limit Switch & Bracket

- Mechanical and inductive versions
- IP67 rating
- Easily adjustable

Aluminum Beam

- Available up to 6 meters in one piece
- Stiff self supporting beam may form part of machine construction
- 6 T-slots for ease of mounting
- T-slot compatible with Hepco MCS and other profiles
- T-nuts, T-slot covers, mounting brackets & multi-axis connection brackets available

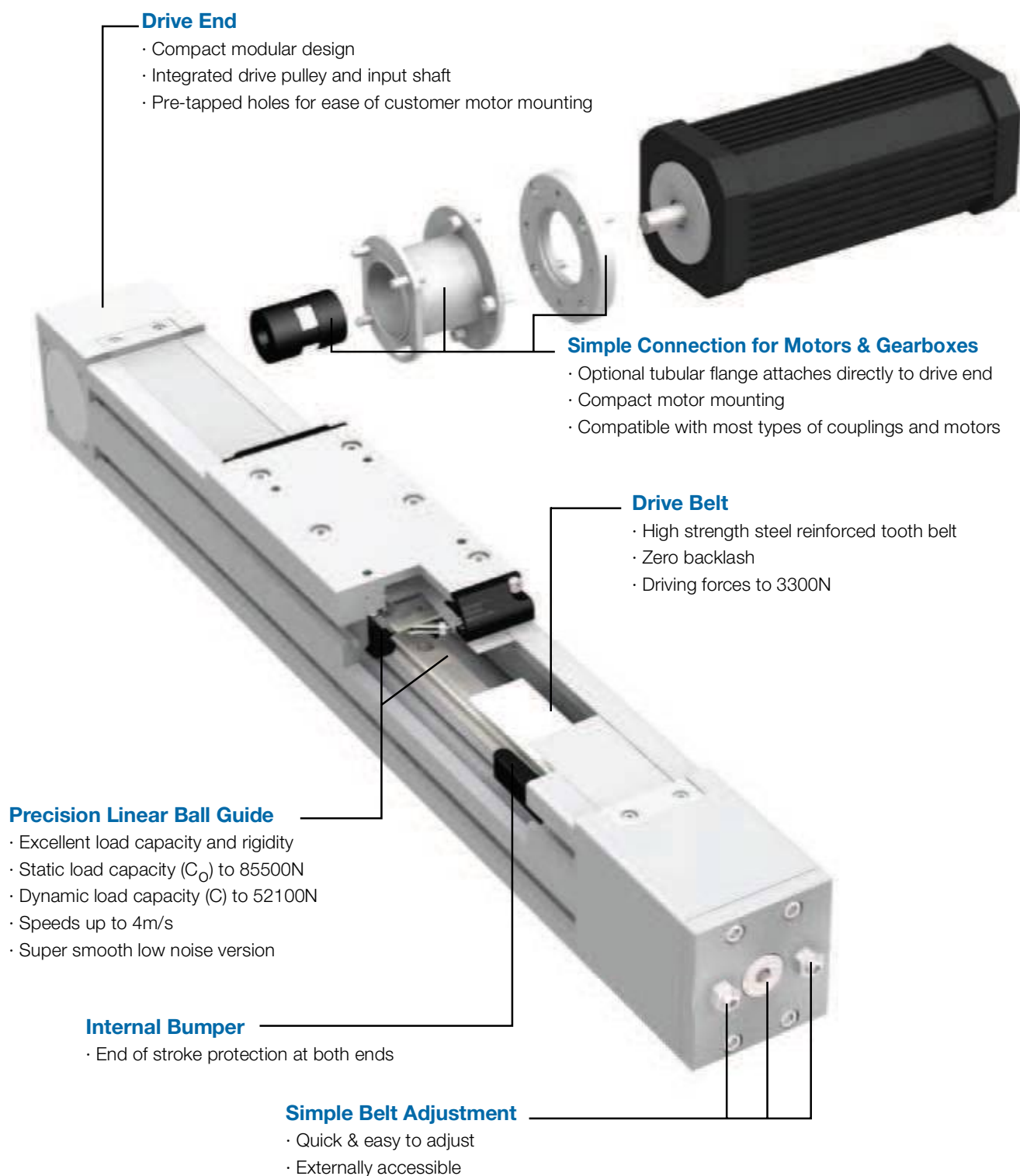
Drive Shaft

- Supplied with fitted key
- Right, left, double & hollow shaft options (right hand shown)
- Motor connection kits available

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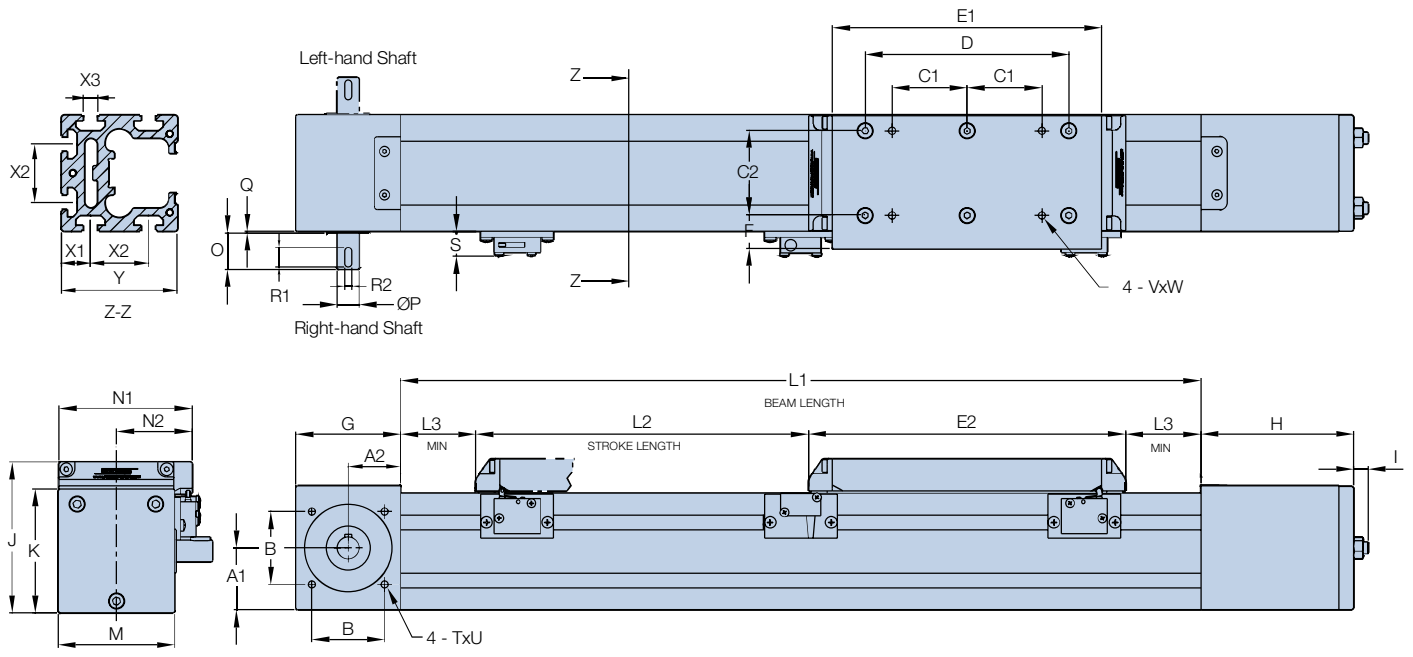
Product Overview

SBD units are available in lengths up to 6m in one piece and unlimited lengths can be achieved with joined beams. Units are factory adjusted and lubricated. Re-lubrication of the linear ball guide is easily achieved via an access hole in the beam. SBD units are suitable for single or multi-axis applications and can be used with a wide range of gearboxes, motors and drives. The beam profiles and T-slots are compatible with HepcoMotion MCS frame building system and its extensive range of accessories, allowing complete machines to be built.



Data & Dimensions

The main dimensions of the SBD unit are shown below. Further details can be obtained from the 3D CAD files available from Bishop-Wisecarver's applications engineers or at www.bwc.com. Units are supplied in increments of 60mm (SBD20-80) and 80mm (SBD30-100) up to 6000mm in one piece ≥ 10 . Longer units are made from more than one piece. The nominal stroke length is calculated with the carriage against the internal bumpers. In practice a clearance should be provided to allow for overrun.

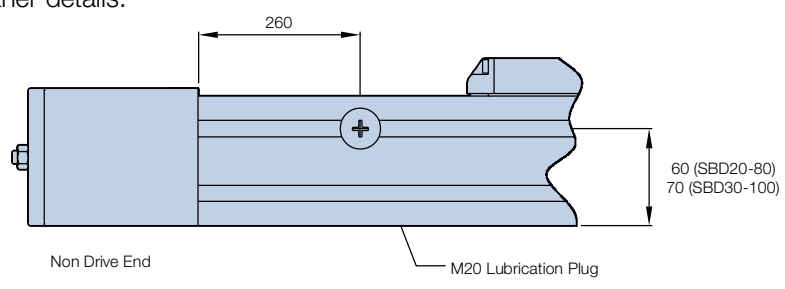


SBD Unit	A1	A2	B	C1	C2	D	E1	E2	F	G	H	I	J	K	L1 (min)	L2 Nominal Stroke	L3 (min)
SBD20-80	42.4	36	50	51.5	58	140	185	218	23	72	105	12	103.5	85	550	L1 - 300	41
SBD30-100	51.6	48	65	65	76	180	235	268	24.5	96	145.5	13	123.5	105	580	L1 - 365	48.5

SBD Unit	M	N1	N2	O	P	Q	R1	R2	S	TxU	VxW	X1	X2	X3	Y
SBD20-80	80	91.5	52	25	15	1	13.5	5	17	M6 x 15	M6 x 9.5	20	40	10	80
SBD30-100	100	112	62.5	36	20	1	22	6	17	M6 x 15	M8 x 9.5	30	40	10	100

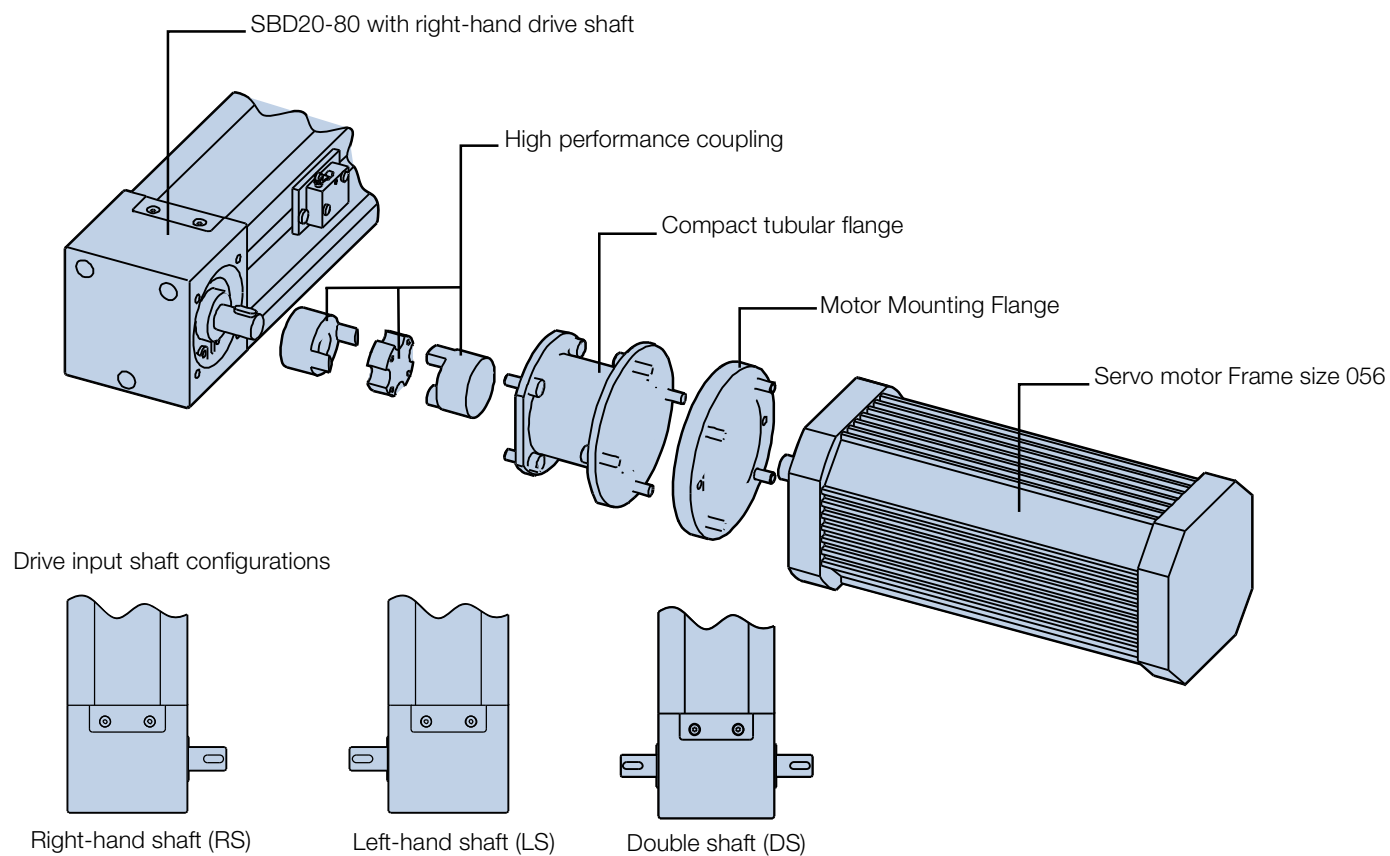
All dimensions in mm

Re-lubrication of the ball guide carriage block is via an access point in the side of the beam (see below), which is closed off with a threaded plug. The lubrication interval depends on length of stroke, speed and duty. Contact Bishop-Wisecarver's technical department for further details.

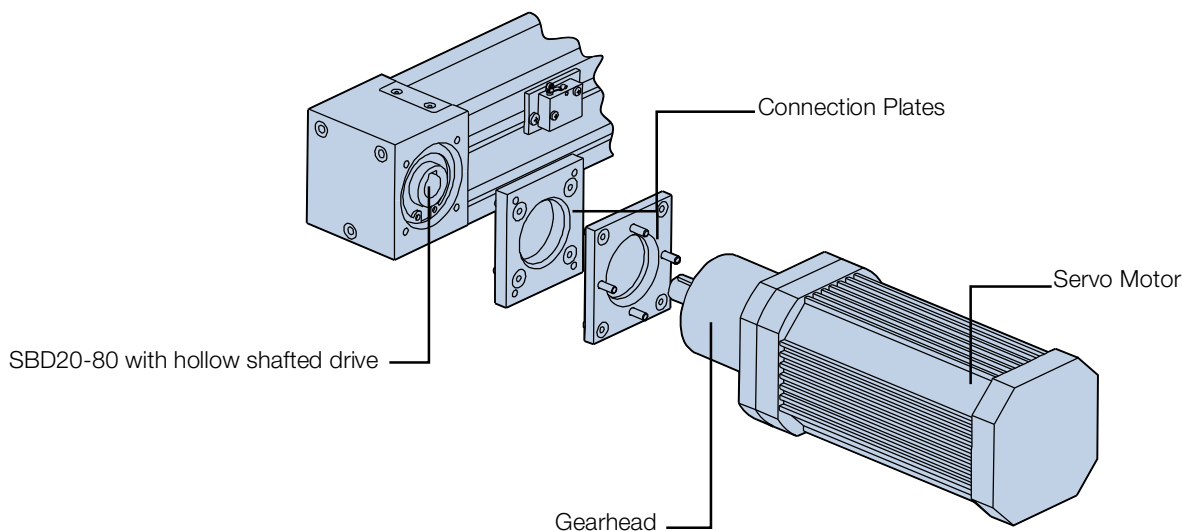


Drive Connections

Connection to motors and gearboxes is quick and simple using one of the fixing kits. Standard kits to suit a range of servo motor frame sizes 036, 056 & 071 are available. Bishop-Wisecarver can offer special connection kits for attachment of customer's motors and gearboxes. Please contact Bishop-Wisecarver for full details and application advice. A typical servo motor arrangement is shown in the illustration below.

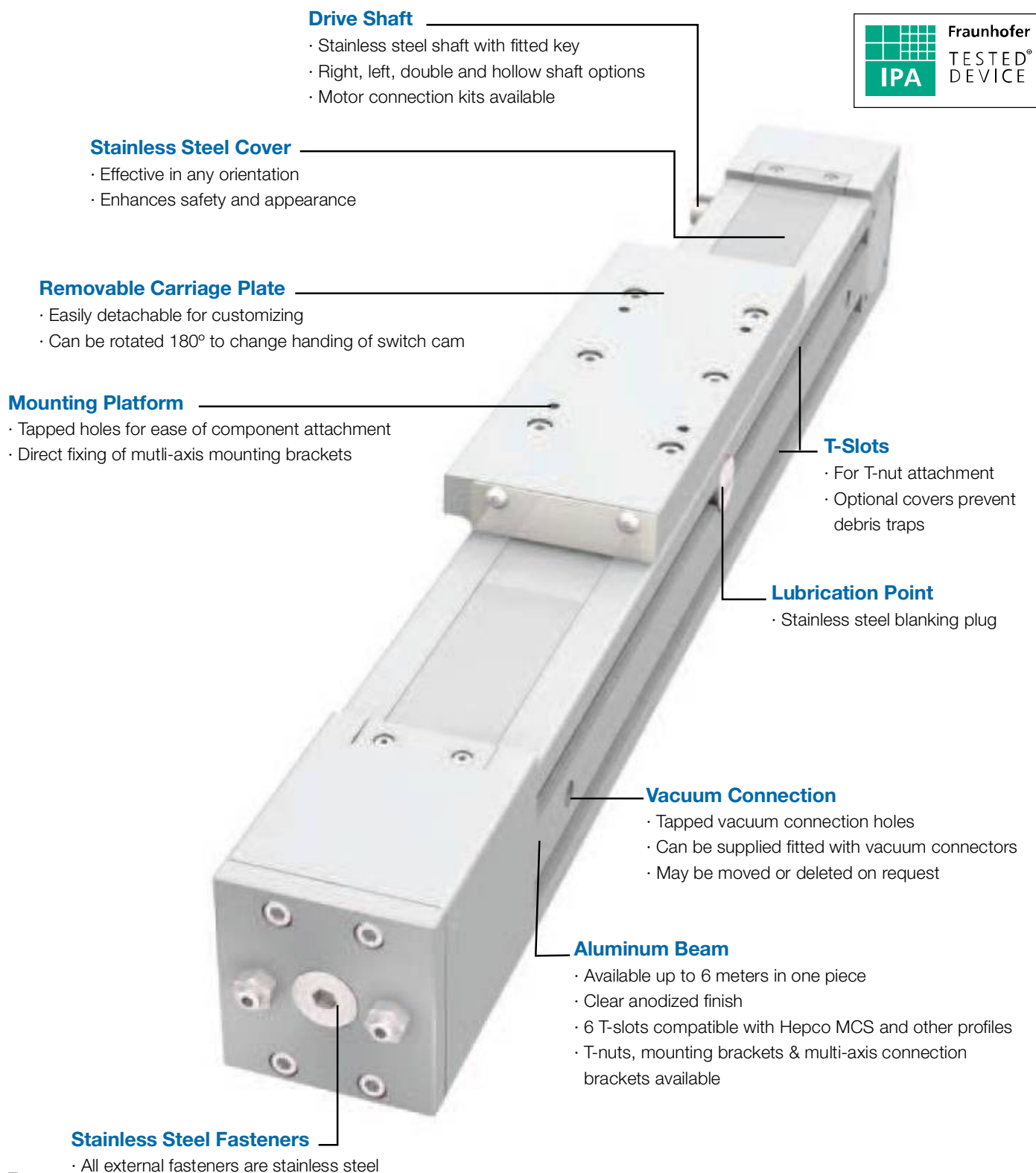


The hollow shafted arrangement may offer a more compact and lower cost means of retro-fitting a motor and/or gearbox onto an SBD. For more information, contact Bishop-Wisecarver.



Cleanroom Version

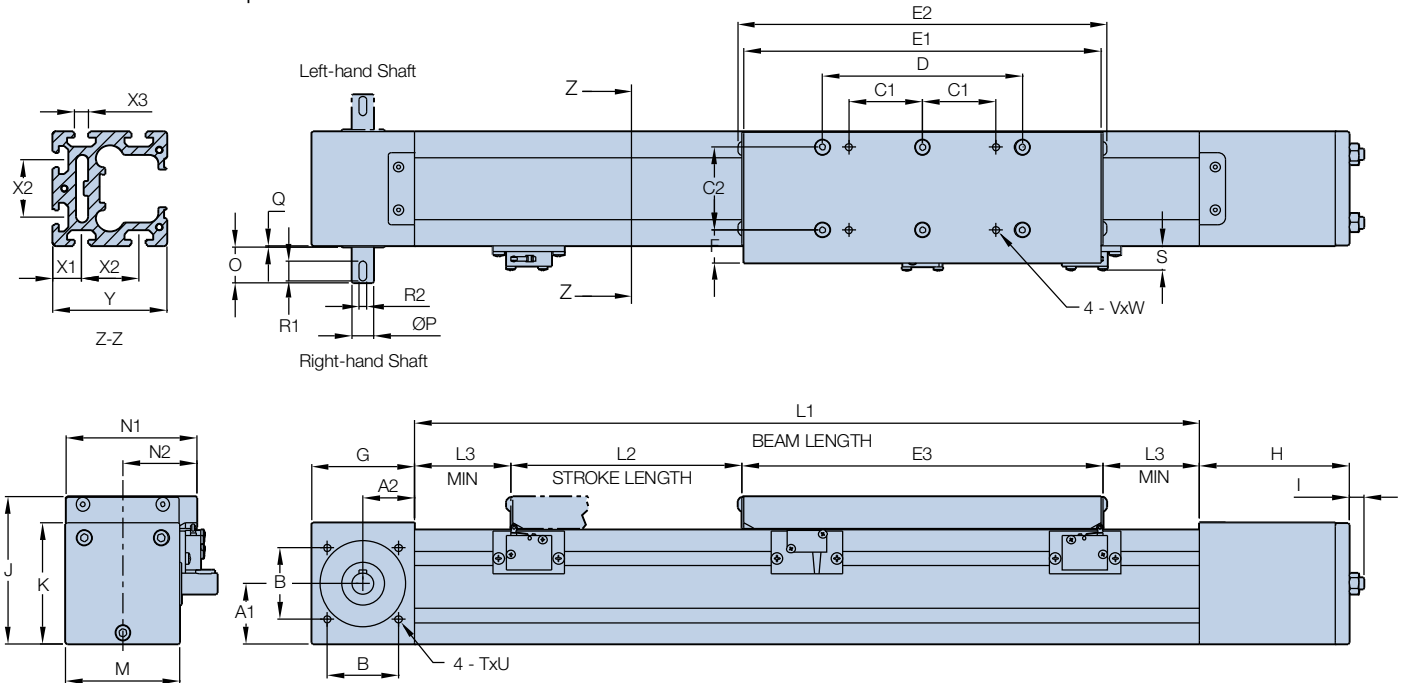
The cleanroom version of the SBD unit has been designed to meet an increasing demand for clean manufacturing processes and environments. This version of the SBD unit is ready for connection to vacuum extraction which minimizes particle emissions. All external parts are made from anodized aluminum or stainless steel. This SBD cleanroom unit is certified by the Fraunhofer IPA Institute for use in cleanroom environments and meets air cleanliness class 3 according to ISO 14644-1.



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Data & Dimensions

The main dimensions of the SBD cleanroom version are shown in the table below. Further details can be obtained from the 3D CAD files available from Bishop-Wisecarver's applications engineers or at www.bwc.com. Units are supplied in increments of 60mm (SBD20-80) and 80mm (SBD30-100) up to 6000mm in one piece ≤ 10 . Longer units are made from more than one piece. The nominal stroke length is calculated with the carriage against the internal bumpers. In practice a clearance should be provided to allow for overrun.

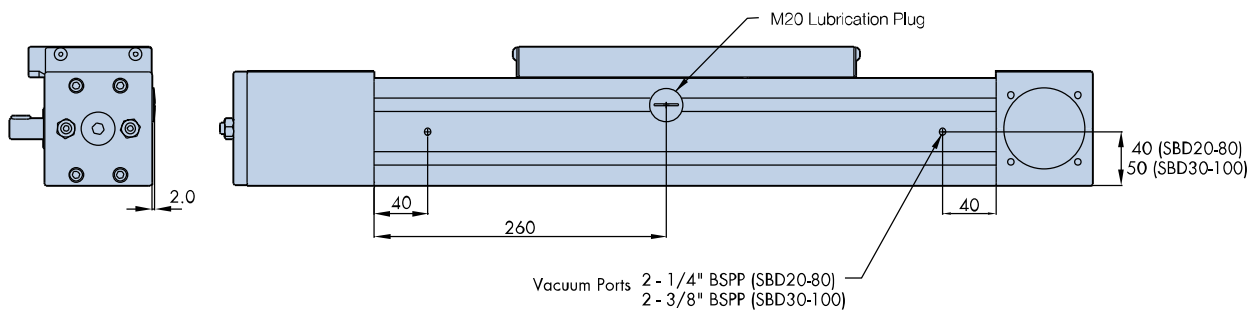


SBD Unit	A1	A2	B	C1	C2	D	E1	E2	E3	F	G	H	I	J	K	L1 (min)	L2 Nominal Stroke	L3 (min)
SBD20-80	42.4	36	50	51.5	58	140	250	259	253	23	72	105	12	103.5	85	550	L1 - 300	23.5
SBD30-100	51.6	48	65	65	76	180	300	309	303	24.5	96	145.5	13	123.5	105	580	L1 - 365	31

SBD Unit	M	N1	N2	O	P	Q	R1	R2	S	TxU	VxW	X1	X2	X3	Y
SBD20-80	80	91.5	52	25	15	1	13.5	5	17	M6 x 15	M6 x 9.5	20	40	10	80
SBD30-100	100	112	62.5	36	20	1	22	6	17	M6 x 15	M8 x 9.5	30	40	10	100

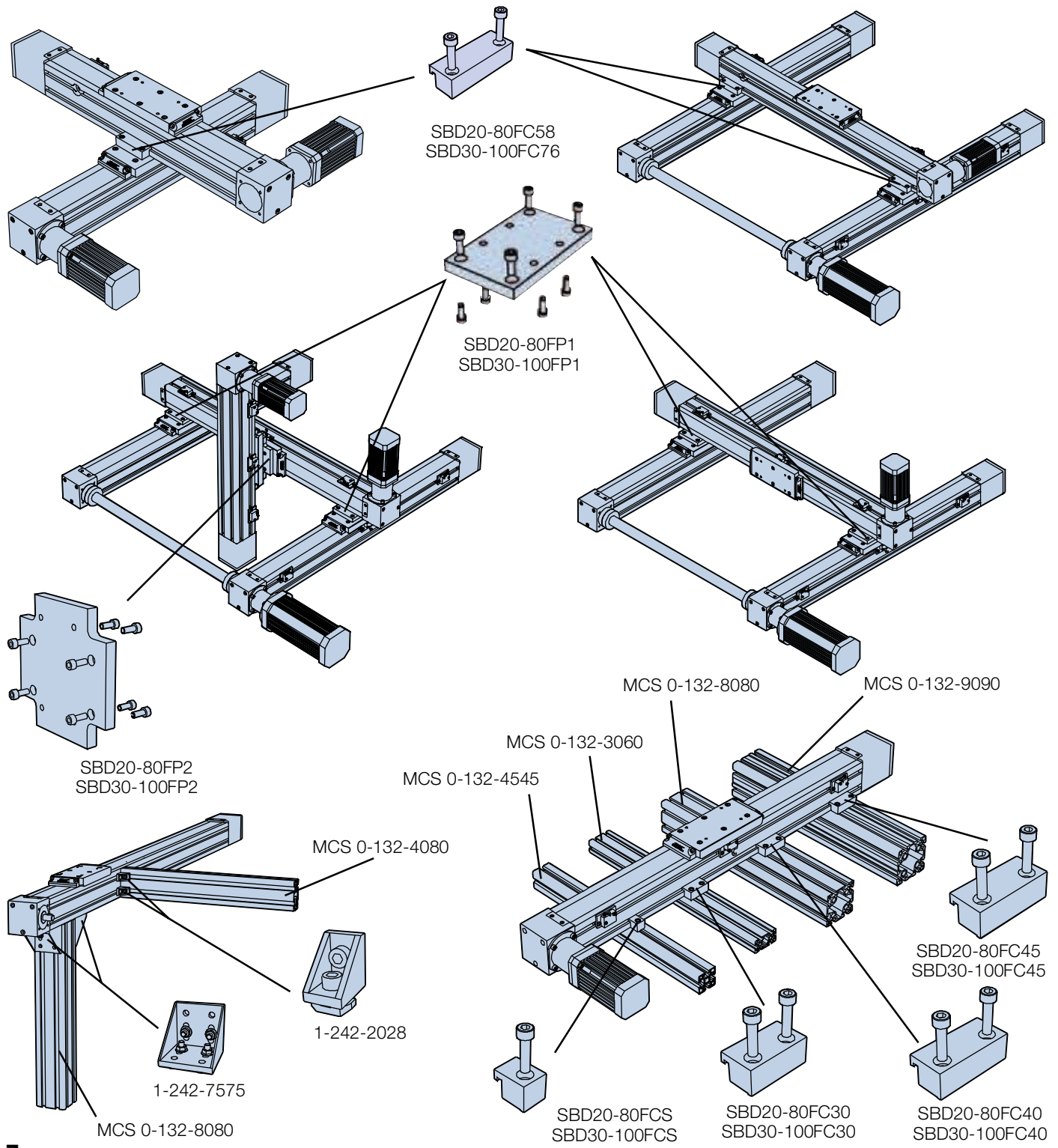
All dimensions in mm

The vacuum extraction connection hole positions together with the lubrication access plug are shown below. Bishop-Wisecarver can supply vacuum connections pre-fitted on request.



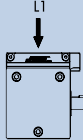
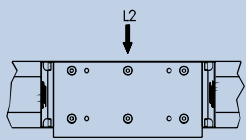
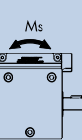
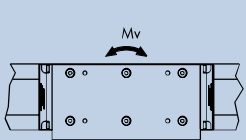
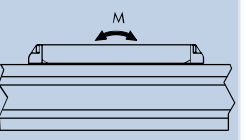
Axis Connections

The SBD design allows for easy construction of multi-axis systems onto MCS and other frames and machine elements. A comprehensive range of mounting kits and accessories is available. Some typical system configurations are shown below to illustrate the versatility of the SBD design. Connection components have been identified together with their part numbers for ease of selection. Bishop-Wisecarver's applications engineers can assist with application inquiries or undertake the design of multi-axis systems.



Load and Life Calculations

The nominal load capacities for the SBD (based on LBG ball guide dynamic load capacity) and a typical load corresponding to 10000km* travel are included in the table below for each of the 5 direct and moment loading directions.

SBD Unit					
SBD20-80	21200N nominal 1813N @ 10000km	21200N nominal 1813N @ 10000km	189Nm nominal 16.2Nm @ 10000km	175Nm nominal 14.9Nm @ 10000km	175Nm nominal 14.9Nm @ 10000km
SBD30-100	52100N nominal 4455N @ 10000km	52100N nominal 4455N @ 10000km	639Nm nominal 54Nm @ 10000km	755Nm nominal 64Nm @ 10000km	755Nm nominal 64Nm @ 10000km

* The tabulated load figures above for 10000km assume a value for variable load factor $f_v = 2$ which is suitable for most applications.

To calculate the life of an SBD unit, first calculate the load factor L_F using the equation below:

$$L_F = \frac{L_1}{L_{1(max)}} + \frac{L_2}{L_{2(max)}} + \frac{M_S}{M_{S(max)}} + \frac{M}{M_{(max)}} + \frac{M_V}{M_{V(max)}} \leq 0.2$$

The life of the system is then calculated using the equation below:

$$\text{System Life (km)} = 50 \times \left(\frac{1}{L_F \times f_v} \right)^3$$

Note: f_v is the variable load factor which takes account of speed and vibration/impact conditions. A value of 2 is appropriate for typical SBD applications, but consult Bishop-Wisecarver for specific advice.

Technical Data

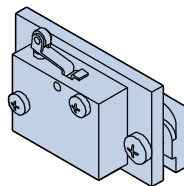
The table below includes the parameters necessary to calculate the performance and duty of an SBD system.

Parameter			SBD20-80		SBD30-100	
			Standard	Cleanroom	Standard	Cleanroom
Mass of carriage	Mc	kg	1.4	1.6	3.6	3.9
Mass of belt per m	Mb	kg/m	0.12		0.34	
Mass of SBD unit	Mu	kg	9.7 x L + 6.0	9.7 x L + 6.2	15.7 x L + 12.2	15.7 x L + 12.5
Pulley radius	r	cm	2.39		3.5	
Drive efficiency			0.9		0.9	
Break away friction	Fba	N	25	10	35	25
Coefficient of friction	μ		0.01		0.01	
Beam moment of inertia*	I_{x-x}	mm ⁴	1500000		3700000	
	I_{y-y}		1800000		4600000	
Max linear force (belt)	Fmax	N	1000		3300	
Linear movement per shaft rev		mm	150		220	
Belt tooth pitch		mm	5		10	
LBG carriage basic load rating (dynamic)	C	N	21200		52100	

* The beam moment of inertia figure is used in the calculation of beam deflection, with a high figure corresponding to a stiff beam.

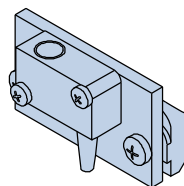
Optional Components

Limit switch assembly includes mechanical switch, bracket, fixing screws and T-nuts.



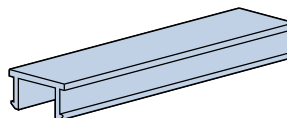
SBD20-80-V3SWA-M
SBD30-100-V3SWA-M

Limit switch assembly includes inductive switch, bracket, fixing screws and T-nuts.



SBD20-80-V3SWA-I
SBD30-100-V3SWA-I

Plastic T-slot cover supplied fitted in each of the T-slots in the beam.



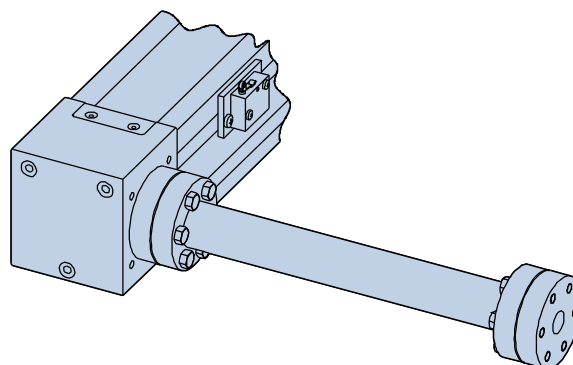
1-242-1016

The quick fit type T-nut can be inserted into T-slot and rotated through 90° to engage. T-nuts are available threaded M4, M5, M6 and M8.



M4 = 1-242-1029
M5 = 1-242-1030
M6 = 1-242-1001
M8 = 1-242-1002

Drive shafts in a number of sizes and designs are available. Contact Bisop-Wisecarver for details.





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Ordering Details

The ordering information below is given to assist communication, but you are recommended to discuss your application with Bishop-Wisecarver first so that we can help to specify the best unit configuration to suit your needs. A step-by-step application data sheet is available at www.bwc.com/appdatasheet.php.

Main Unit

SBD **20-80** **L1750** **C2** **RS**

SBD = product range _____

Size of unit : Choose **20-80** or **30-100** _____

Beam Length. Beam lengths are available in increments of 60mm from 550mm for SBD20-80 and increments of 80mm from 580mm for SBD30-100, 3 & 6

Unit Type: **C1** = corrosion resistant 1; **C2** = cleanroom 5; leave **blank** for standard units 1

Drive shaft: **LS** for left-hand; **RS** for right-hand; **DS** for double shaft 4 _____

Notes

Bishop-Wisecarver Corporation: Manufacturer of the original DualVee® guide wheel and industry leader in guided motion technology, and exclusive North and Central American partner and distributor for HepcoMotion products since 1984.

BISHOPWISECARVER®

Bishop-Wisecarver

DualVee® Guide Wheels
LoPro® Linear Motion System
MinVee® Linear Slide System
QuickTrak® Linear Motion System
SRX-150 Linear Motion System
UtiliTrak® Linear Motion Guide



HepcoMotion®

DAPDU2 Double Acting Profile Driven Unit
DLS Driven Linear System
DTS Driven Track System
GV3 Linear Guidance and Transmission System
HDCB Heavy Duty Compact Beam
HDCS Heavy Duty Compact Screw
HDLS Heavy Duty Driven Linear System
HDRT Heavy Duty Ring Slides and Track System
HDS Heavy Duty Slide System
MHD Heavy Duty Track Roller Guidance System
MCS Machine Construction System
PDU2 Profile Driven Unit
PRT Precision Ring and Track System
PSD120 Profile Screw Driven Unit
SBD Sealed Belt Drive
Simple-Select®
SL2 Stainless Steel Based Slide System

PRODUCT ORDERS

Please call Bishop-Wisecarver with your specific length requirements or for additional ordering assistance. Our technical staff is available to assist with information specific to your application.

Bishop-Wisecarver provides a written one year limited warranty assuring the customer that its products conform to published specifications and are free from defects in material or workmanship.

Complete terms and conditions and warranty information is available at www.bwc.com/about_conditions.vp.html

