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Find the *Danaher Motion DS4* at our website: *Click HERE*

www.DanaherMotion.com/DS4

DS4-SERIES POSITIONING TABLES



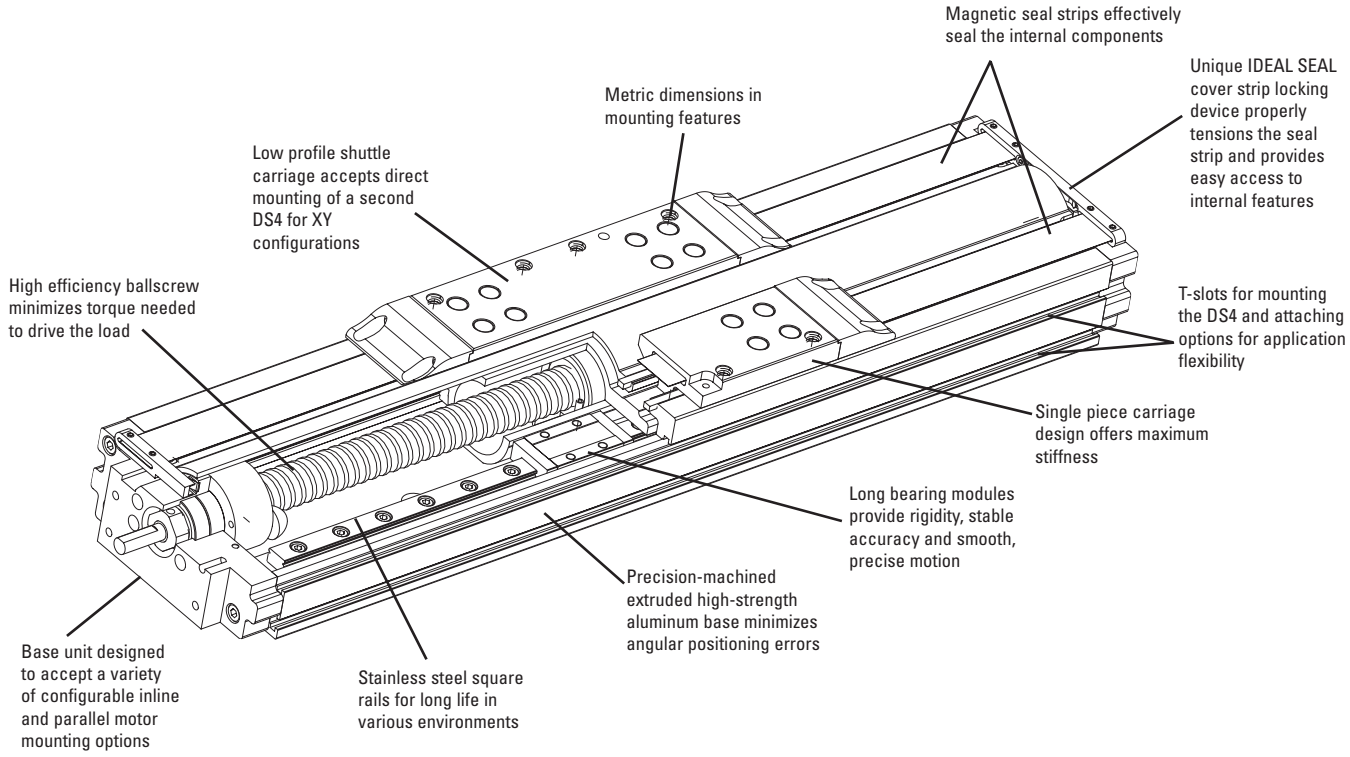
Solutions by DANAHER MOTION

Performance & Versatility
in a compact design

For single- & multi-axis requirements, DS4 is your modular solution.

- **PERFORMANCE**
- **DURABILITY**
- **FLEXIBILITY**
- **VALUE**

The DS4 experience. Precision performance with outstanding industrial durability by means of the IDEAL-SEAL™ system, state-of-the-art web-enabled design tools, and tremendous configuration flexibility, all at commercial grade prices.



DS4 DESIGN FEATURES:

The DS4 is IDC's most versatile and modular line of positioning tables. Following are several features that make the DS4 the positioning table of choice for the most demanding applications:

- Travel lengths from 50 to 600mm cover a wide range of applications.
- Precision ballscrew drive, with 5mm and 10mm leads, offer high speed and efficiency, excellent repeatability and accuracy, and mechanical advantage. The DS4's ballscrews can be driven at up to 80rps, translating into speeds (with the 10mm lead) of up to 800 mm/s.
- Proven magnetic stainless steel seal strip technology effectively seals the internal components of the DS4, protecting the ballscrew and ways from contaminants. This feature also contains ballscrew and way lubrication within the DS4.
- Unique IDEAL-SEAL magnetic cover strip locking device:
  - The seal strip is always properly tensioned, increasing life of the strips.
  - Allows easy access to interior of DS4, for mounting and maintenance.
  - No small hardware or springs to lose, and no exposure to the sharp ends of the strips, which are problems for similar seal end-cap designs.
- Easily configurable modular design and option set including a variety of motor mounting orientations, motor sizes and type, ballscew leads, coupling types and sizes, encoder feedback options, limit/ home sensor types, and shaft brakes allow the DS4 to be customized to meet your specific requirements.



Exceeding Expectations
& the competition's specs

DS4-SERIES SPECIFICATIONS

GENERAL SPECIFICATIONS												
Travel (mm)	50	100	150	200	250	300	350	400	450	500	550	600
Overall Height (mm)	47											
Width (mm)	95											
Positional Accuracy (microns)												
Commercial Grade	12	12	14	20	22	24	26	26	28	34	36	40
Precision Grade	8	8	10	12	12	14	14	16	19	21	23	25
Straightness & Flatness (microns)	6	6	9	12	12	14	18	21	23	23	25	25
Bi-directional Repeatability, open loop												
Commercial Grade (microns)	+/- 3											
Precision Grade (microns)	+/- 1.3											
Pitch / Yaw (arc-sec)												
Commercial Grade	20	24	28	36	40	44	47	53	56	61	64	68
Precision Grade	12	14	17	22	25	27	29	33	35	38	40	42
Load Capacity, Normal (kg) (max)	170											
Axial Load Capacity (kg)	95											
Acceleration (max) (m/sec^2)	20											
Moving Mass (kg)	0.75											
Total Mass (kg)	2.7	3.0	3.3	3.6	3.9	4.1	4.4	4.7	5.0	5.3	5.6	5.9
Ballscrew Diameter (mm)	16											
Duty Cycle (%)	100											
Ballscrew Efficiency (%)	90											
Max. Breakaway Torque (oz-in)	18											
Max. Running Torque (oz-in)	16											
Ballscrew Leads Available (mm)	5, 10											
Input Inertia ($x10^{-5}$ $kg-m^2$)	1.17	1.24	1.67	1.93	2.18	2.43	2.68	2.93	3.19	3.44	3.69	3.94
Max. Ballscrew Speed (rev/sec)	80						60		55	50		

All performance specifications are based upon proper mounting procedures, with the DS4 fully supported on a flat surface (flat within 0.008mm/300mm). See Section 4 of the user's manual for proper mounting procedures.

Positional accuracy specifications are for inline motor mount models only.

Above specifications are measured 37.5mm directly above the center of the carriage.

Specifications are based upon operation at 20° C. Contact IDC to discuss your low- and high-temperature applications

DS4 positioning tables are rated for normal loads (load vector directed down onto the surface of the carriage), for axial loads (load vector directed in the direction of travel), and for moment loads (torsional loads caused by loads with an offset center of gravity). The moment loading limits are based on the maximum moment in pitch, roll or yaw including any dynamic components that are move profile dependent. Visit www.DanaherMotion.com/ds4 to use our moment loading calculator.

** The specifications in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of IDC products for a specific application. Specifications are subject to change without notice.*

Easily Configurable
modular design

For single- & multi-axis requirements, DS4 is your modular solution.

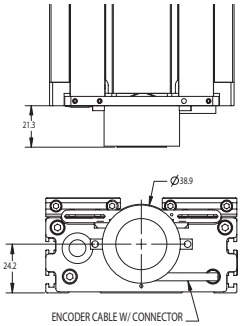
OPTIONS

Rotary Encoder

Rotary encoders are effective, low-cost feedback devices that can confirm ballscrew shaft position or provide positional feedback to a servo motor.



Type	Modular Incremental
Output Format	Square-wave, two-channel quadrature with index
Resolution	1250 lines/rev (5000ppr post quadrature)
Supply Voltage	5 VDC
Current Requirement	135mA
Accuracy	+/- 2 arc-minutes

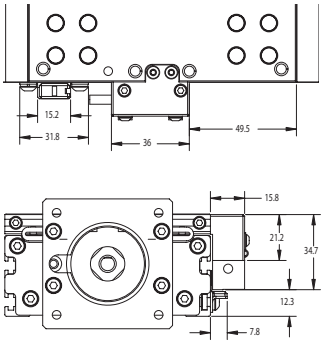


Linear Encoder

Improve positioning performance by directly measuring the carriage position, eliminating errors caused by thermal expansion, mechanical backlash/hysteresis, and inherent ballscrew error.



Type	Modular Incremental
Output Format	Square-wave, two-channel quadrature with index
Resolution	1.0, 0.5, 0.1 microns
Supply Voltage	5 VDC
Current Requirement	120mA
Accuracy	+/- 3 microns with linear slope correction

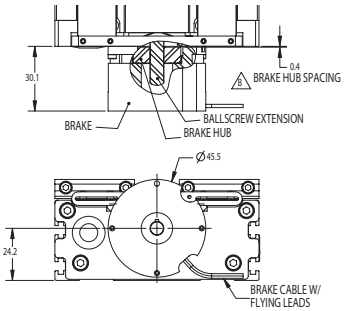


Rotary Brake

Provides a spring-set electrically-released friction (power-off) brake, to prevent backdriving of the DS4 carriage while the unit is at rest, or in the case of power failure.



Type	Electromagnetic Power-off
Input Voltage	5 VDC
Current Requirement	125 mA
Holding Torque	1.13Nm

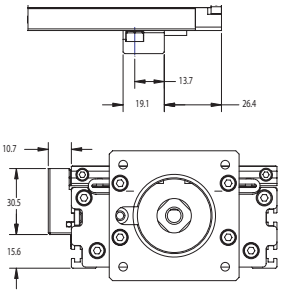


Limit and Home Sensors

Prevent over-travel of the carriage and provide reliable index positions.



Sensor Type	Inductive proximity
Output Logic Types	NPN (sinking), PNP (sourcing)
Switch Types	Normally open, Normally closed
Input Voltage	5 – 30 VDC
Current Capacity	100mA
Repeatability	+/- 8 microns





Application Flexibility
through standard options

Coupling Choices

There are two couplings types available, with different bore sizes for a variety of motor shaft diameters.



Oldham Couplings – The three piece design is ideal for vibration dampening. Typically used in stepper applications and with commercial grade positioning tables.

Bellows Couplings – Provide the most torsional rigidity. Ideal for high speed and high torque applications.

Clean Room Preparation (Class 100)

Standard DS4 positioning tables can be used in applications with clean room requirements down to Class 1000. The DS4 can be specially prepared for use in Class 100 clean rooms for applications that have more stringent clean room requirements.

Multi-Axis Pinning Options

All DS4 tables are provided with standard dowel pin holes for repeatable positioning of tooling or additional axes. IDC offers two multi-axis pinning options with the DS4. The standard option utilizes the standard pin holes to provide 2 arc-min orthogonality for XY configurations. The precision pinning option entails the specific XY or XZ configuration being matched to each other, and provides <30 arc-sec orthogonality.

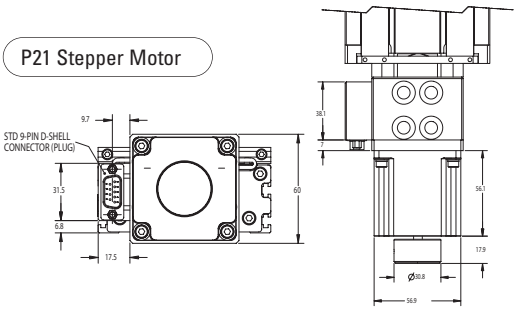
Motor Mounting Options

A variety of motor mounting options are available in both inline and parallel versions.
Refer to pages 7 and 8 for dimensional information.

Standard Motor Choices

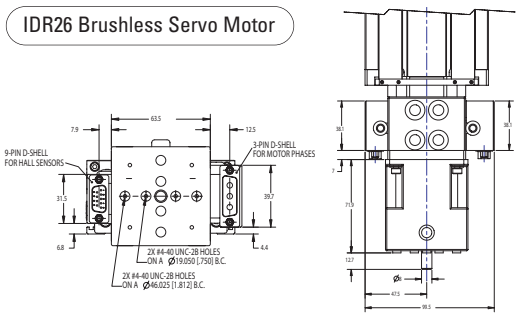
DS4 positioning tables may be purchased with a standard stepper or brushless servo motor mounted to the unit. The wires on each of our standard motors are strain relieved and terminated at the motor mount in D-shell connectors.

P21 Stepper Motor



P21 Motor Parameters		
Holding Torque	0.69 N-m	126 oz-in
Rated Continuous Current / Phase	0.95A	
Phase Inductance (+/-20%)	16.9mH	
Weight	0.703 kg	1.55 pounds
Rotor Inertia	0.0248 x 10^{-3} kg-m^2	0.0034 oz-in-sec^2

IDR26 Brushless Servo Motor



IDR26 Motor Parameters		
Continuous Stall Torque	0.415 N-m	58.8 oz-in
Peak Torque	0.930 N-m	131 oz-in
Torque Sensitivity (+/-10%)	0.078 N-m/A rms	11.2 oz-in/A rms
Black EMF (+/-10%)	5.10 V rms / krpm	
Maximum Speed	6000 rpm	
Weight	0.703 kg	1.55 pounds
Rotor Inertia	17.0 x 10^{-6} kg-m^2	2.44 x 10^{-3} oz-in-sec^2

Precise, Rugged & Sealed
built to perform & last

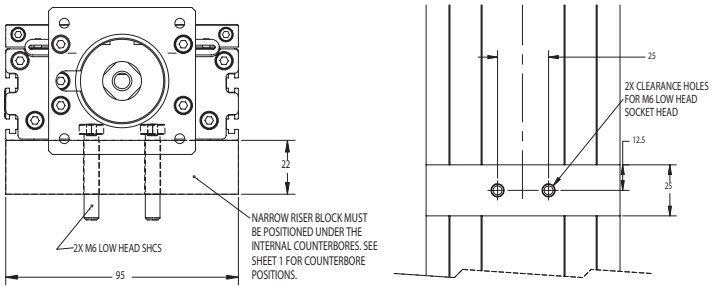
For single- & multi-axis requirements, DS4 is your modular solution.

ACCESSORIES

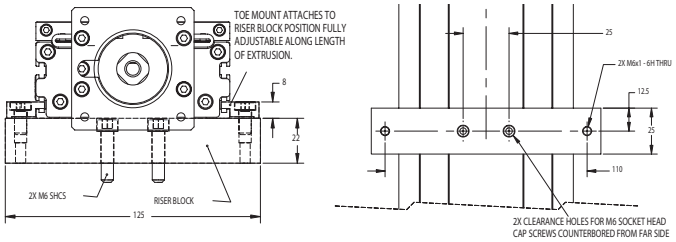
Riser Blocks

To provide clearance for NEMA 23 frame and larger motors, we offer two styles of riser blocks.

Narrow Riser Blocks – Raise the DS4 by 22mm. As they are used in conjunction with the internal mounting holes of the DS4, the location of each riser block is dependent on these mounting holes.

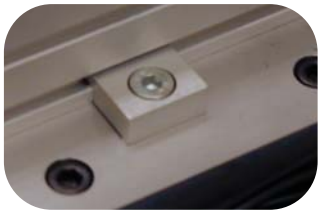


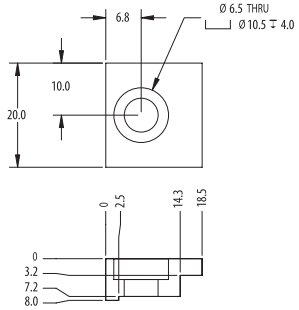
Wide Riser Blocks – Also raise the DS4 by 22mm, but utilize toe clamps that can be positioned along the DS4 independently of the internal mounting holes.



Toe Clamps

Provide a convenient external mounting to a base plate, or to the accessory wide riser blocks.





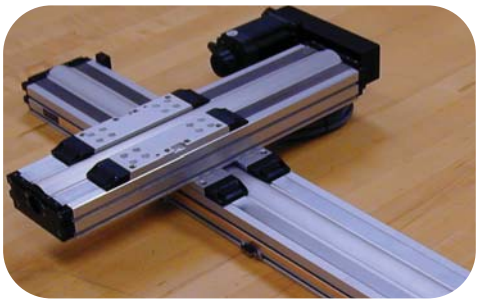
Mounting accessories are ordered separately from the configured DS4.

Recommended Quantity	Toe Clamp Sets*	Wide Riser Blocks*	Narrow Riser Blocks*
PART NO:	12-0129	12-0130	12-0131
DS4-50	2	2	2
DS4-100	3	3	3
DS4-150	3	3	3
DS4-200	4	4	4
DS4-250	4	4	4
DS4-300	5	5	5
DS4-350	5	5	5
DS4-400	6	6	6
DS4-450	6	6	6
DS4-500	7	7	7
DS4-550	7	7	7
DS4-600	8	8	8

** Each set includes necessary hardware.*

MULTI-AXIS CONFIGURATIONS

DS4's can be ordered from the factory in a variety of multi-axis configurations including XY, XZ, and cartesian arrangements. Consult IDC applications engineering for standard and custom configurations. A second option is to order standard multi-axis brackets and assemble the axes yourself.



◀ Standard XY

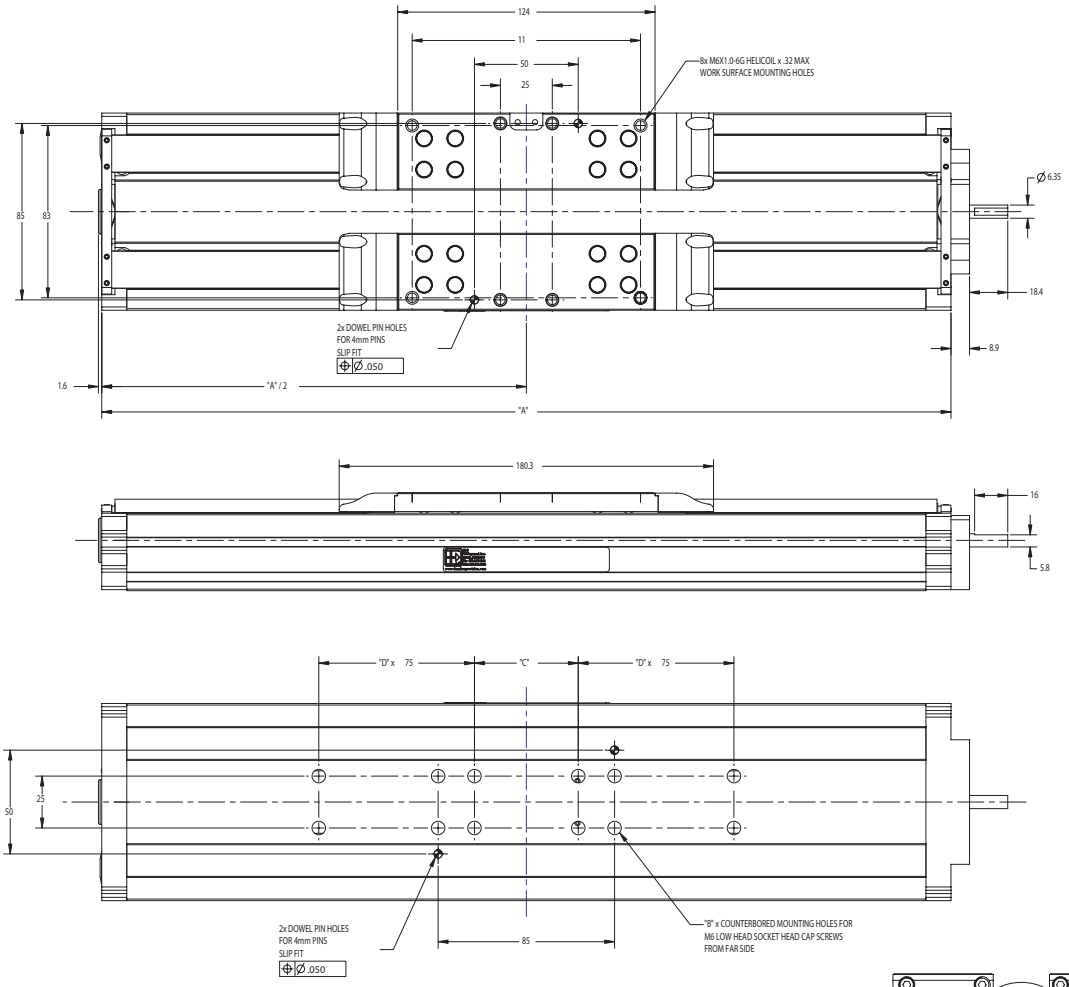
PART NO:	DESCRIPTION
11-0017	Z Bracket (DS4 to DS4)
11-0018	Z Bracket, 90° (DS4 to DS4)
11-0019	Cartesian Bracket (DS4 to DS4)
81-0073	Carriage to Carriage Mounting Plate (DS4 to DS4)

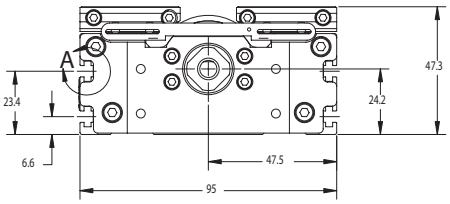
Visit www.danahermotion.com/DS4 for dimensional detail on the mounting brackets.

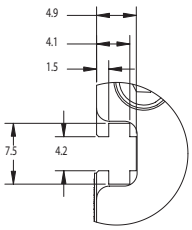
**** All DS4 tables will bolt directly together in a standard XY without modification.***
***** Standard and precision dowel pinning options are available.***

Performance & Versatility
in a compact design

DS4 Dimensional Drawing (Base Unit)

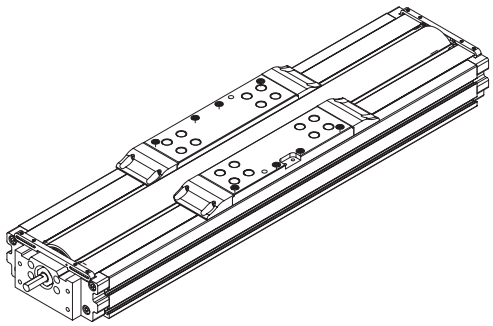






DETAIL A
SCALE 3 : 1

Model#	Travel	A	B	C	D
DS4-050	50	259.1	8	150	0
DS4-100	100	309.1	12	50	1
DS4-150	150	359.1	12	50	1
DS4-200	200	409.1	12	50	1
DS4-250	250	459.1	16	50	2
DS4-300	300	509.1	16	50	2
DS4-350	350	559.1	16	50	2
DS4-400	400	609.1	20	50	3
DS4-450	450	659.1	20	50	3
DS4-500	500	709.1	20	50	3
DS4-550	550	759.1	24	50	4
DS4-600	600	809.1	24	50	4



** all dimensions are in mm*

Modular Design
millions of configurations

For single- & multi-axis requirements, DS4 is your modular solution.

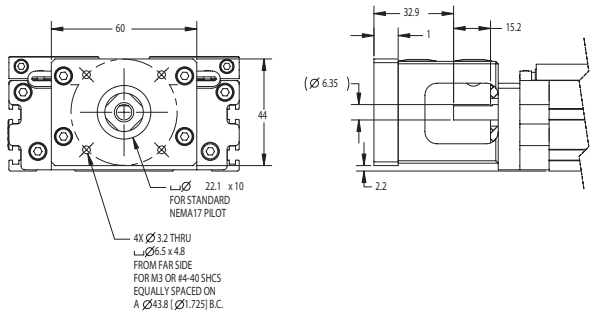
MOTOR MOUNTING OPTIONS

Inline Motor Mounts

The motor is mounted directly to the ballscrew with the appropriate motor coupling.

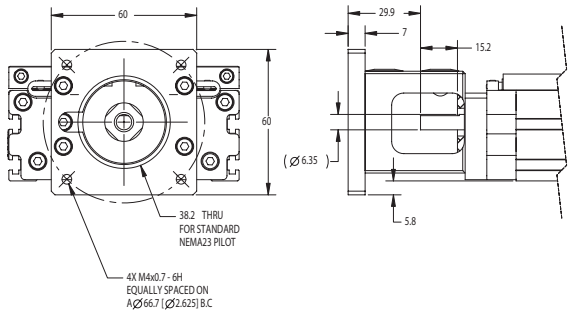
NEMA 17

MAX MOTOR SHAFT LENGTH: 24.9mm (.98")



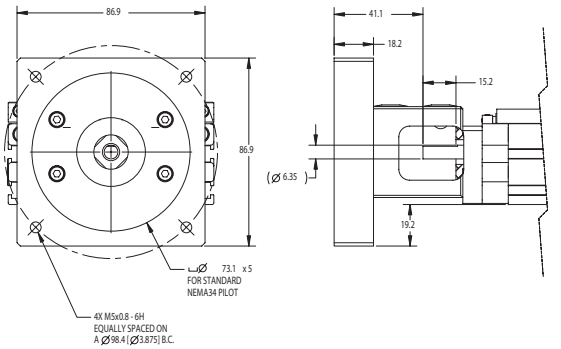
NEMA 23

MAX MOTOR SHAFT LENGTH: 21.9mm (.86")



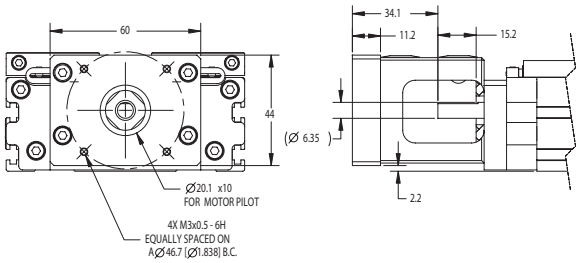
NEMA 34

MAX MOTOR SHAFT LENGTH: 33.1mm (1.30")



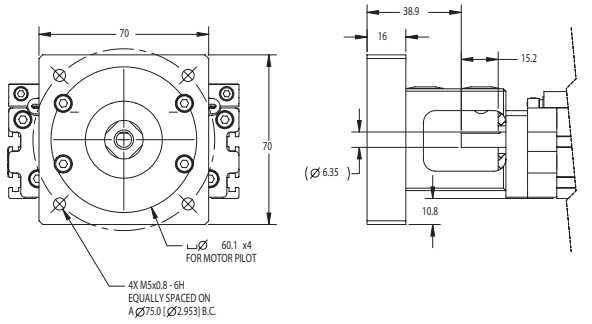
1.6" FRAME

MAX MOTOR SHAFT LENGTH: 26.1mm (1.02")



70 mm FRAME

MAX MOTOR SHAFT LENGTH: 30.9mm (1.21")

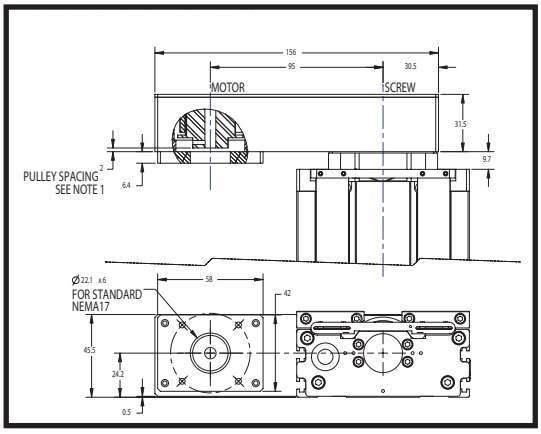


MODELS on DEMAND
3D & 2D
www.DanaherMotion.com/DS4
see page 10 for details

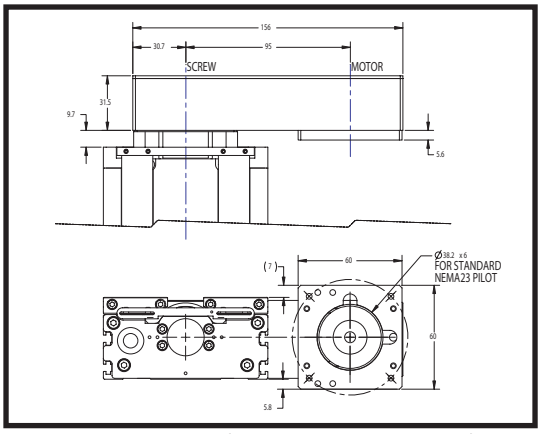
Positioning Table Features
taken to the next level

Parallel Motor Mounts

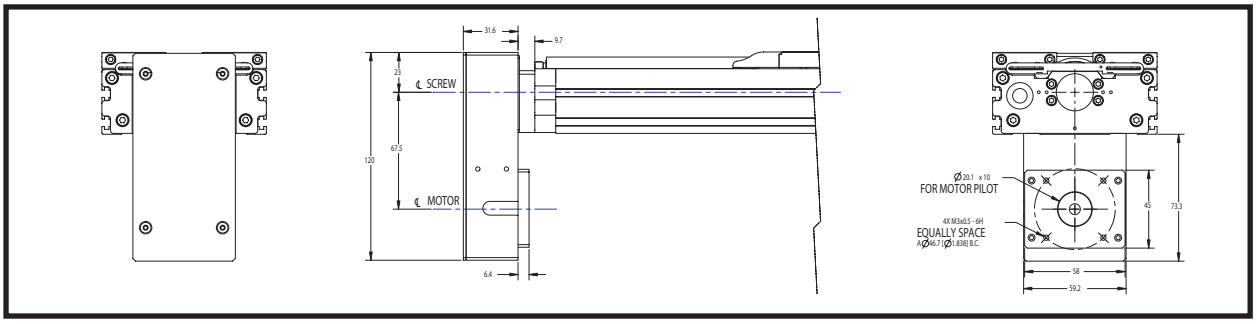
Utilizes a 1:1 belt drive arrangement to provide a shorter overall unit length. Three motor orientations are available, as are several motor mounting flanges.



PARALLEL RIGHT (SHOWN WITH NEMA 17)



PARALLEL LEFT (SHOWN WITH NEMA 23)



PARALLEL UNDER (SHOWN WITH 1.6" MOTOR FRAME)

IDEAL-SEAL™ COVER STRIP LOCKING DEVICE

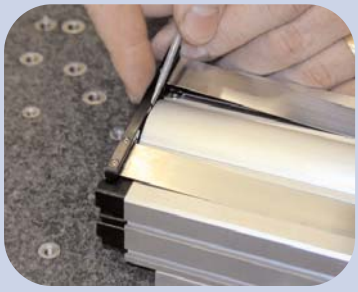
The DS4's unique IDEAL-SEAL takes a proven magnetic seal strip technology to the next level. Installation and maintenance are a "snap". The elegantly simple design ensures extended seal strip life while eliminating the headaches associated with similar designs.

EASE OF INSTALLATION & MAINTENANCE:

- DS4 is the easiest seal-strip protected positioning table to install and maintain.
- Eliminates need for costly "easy lube" option.

ALWAYS ASSEMBLED & PROPERLY TENSIONED:

- The seal strip is always properly tensioned regardless of thermal conditions, increasing life.
- No small hardware pieces to deal with and lose.
- No exposure to sharp edges.





Easily Configurable
modular design

For single- & multi-axis requirements, DS4 is your modular solution.

PART NUMBERING/ORDERING INFORMATION

	Travel	Grade	Ballscrew Lead	Motor	Motor Mount	Coupling/ Orientation and Pulley	Limits	Home	Shaft Option	Linear Encoder	Additional Options
DS4 –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ] –	[ ]
1	2	3	4	5	6	7	8	9	10	11	12

1. Base Unit

DS4

2. Travel

50mm to 600mm in 50mm increments

3. Grade

C	Commercial Grade
P	Precision Grade

4. Ballscrew Lead

5G	5mm Lead
10G	10mm Lead

5. Motor

P21	Stepper, NEMA 23, 130 oz-in, 200 step
IDR26	Brushless Servo, NEMA 23
(Blank if no motor selected)	

6. Motor Mounts

X16	1.6" frame mount
X17	NEMA 17 mount
X23	NEMA 23 mount*
X34	NEMA 34 mount**
X70	70mm frame mount**
* default for P21 and IDR26 motors ** not available in parallel mounts	

7A. Couplings *(inline models)*

OE3	Oldham style, 3/16" bore
OE4	Oldham style, 1/4" bore*
OE5	Oldham style, 5/16" bore
OE6	Oldham style, 3/8" bore**
OE8	Oldham style, 1/2" bore
OM5	Oldham style, 5mm bore
OM8	Oldham style, 8mm bore
OM9	Oldham style, 9mm bore
OM11	Oldham style, 11mm bore
BE3	Bellows style, 3/16" bore
BE4	Bellows style, 1/4" bore*
BE5	Bellows style, 5/16" bore
BE6	Bellows style, 3/8" bore**
BE8	Bellows style, 1/2" bore
BM5	Bellows style, 5mm bore
BM8	Bellows style, 8mm bore
BM9	Bellows style, 9mm bore
BM11	Bellows style, 11mm bore
* Select a 1/4" bore coupling for P21 motor (OE4 or BE4) **Select a 3/8" bore coupling for IDR26 motor	

7B. Motor Orientation & Pulley Bore *(parallel models)*

PRxx*	Parallel Right motor mount
PLxx*	Parallel Left motor mount
PUxx*	Parallel Under motor mount
*select pulley bore diameter below	
xx3E	3/16" pulley bore diameter
xx4E	1/4" pulley bore diameter
xx5E	5/16" pulley bore diameter
xx6E	3/8" pulley bore diameter
xx5M	5mm pulley bore diameter
xx8M	8mm pulley bore diameter
xx9M	9mm pulley bore diameter



The Designer Friendly DS4
is the ideal solution

8. Limit Sensors (Qty. 2)

L0	No End-of-Travel Limits
LN1	Limits, NPN type Normal Open
LN2	Limits, NPN type Normal Closed
LP1	Limits, PNP type Normal Open
LP2	Limits, PNP type Normal Closed

9. Home Switch

H0	No Home Sensor
HN1	Home, NPN type Normal Open
HN2	Home, NPN type Normal Closed
HP1	Home, PNP type Normal Open
HP2	Home, PNP type Normal Closed

10. Shaft End Options

BS	Brake on ballscrew, 24VDC Power-off
ES	Rotary encoder on ballscrew, 1250 line

Note: Shaft brake and rotary encoder options can not be used in conjunction with each other.

11. Linear Encoders

E0	No linear encoder
E1	1 micron resolution linear encoder
E2	0.5 micron resolution linear encoder
E3	0.1 micron resolution linear encoder

12. Additional Options

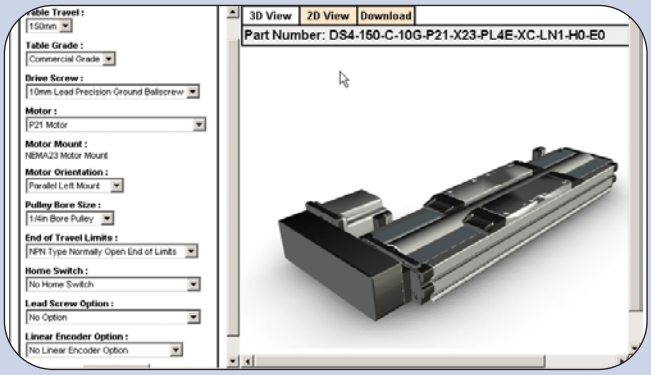
P1	Standard Pinning of x-axis carriage
P2	Precision Pinning of x-axis carriage, matched to y-axis or z-axis base
P3	Precision Pinning of y-axis base, matched to x-axis carriage
P4	Precision Pinning of z-axis base, matched to x-axis carriage
CLN	Cleanroom Prep – Class 100

DESIGNER-FRIENDLY WEB-ENABLED TOOLS

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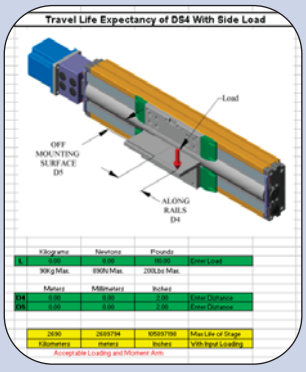
MODELS ON DEMAND: Leading edge system for configuring and downloading 3D solid models and 2D drawings.

- Configure DS4 to specific requirements including travel, motor mounting, brake, encoder and limit options.
- Rules-based system prevents misconfiguring a model.
- Currently offers fifty-two downloadable CAD formats (3D/2D).
- View 3D model online with zoom, pan and rotate features.
- Real-time downloads (no large emails or FTP sites).

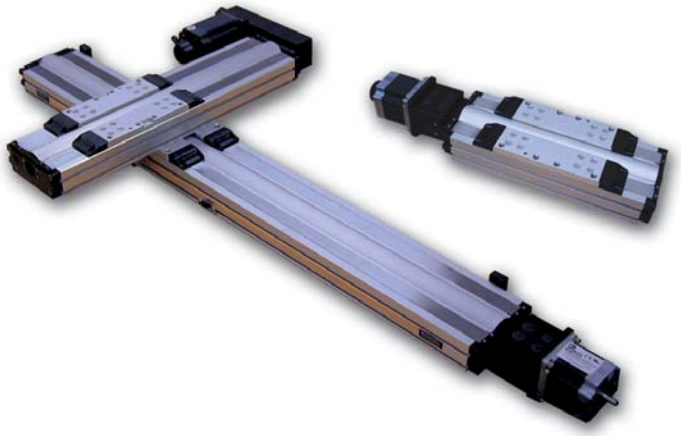


DS4 MOMENT LOADING CALCULATOR:

- Instant verification of load suitability.
- Eliminates need for manual calculations.
- Simply enter the mass and relative location of the load.
- Linear bearing life automatically calculated.



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DBS is a team-based approach founded on the principles of Kaizen that allow us to continuously and aggressively eliminate waste in every aspect of our business. DBS focuses our entire organization on achieving breakthrough results that create competitive advantage in quality, delivery and performance. The results bring the DS4 experience to you.

** The specifications in this publication are believed to be accurate and reliable. However, it is the responsibility of the product user to determine the suitability of IDC products for a specific application. Specifications are subject to change without notice.*

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