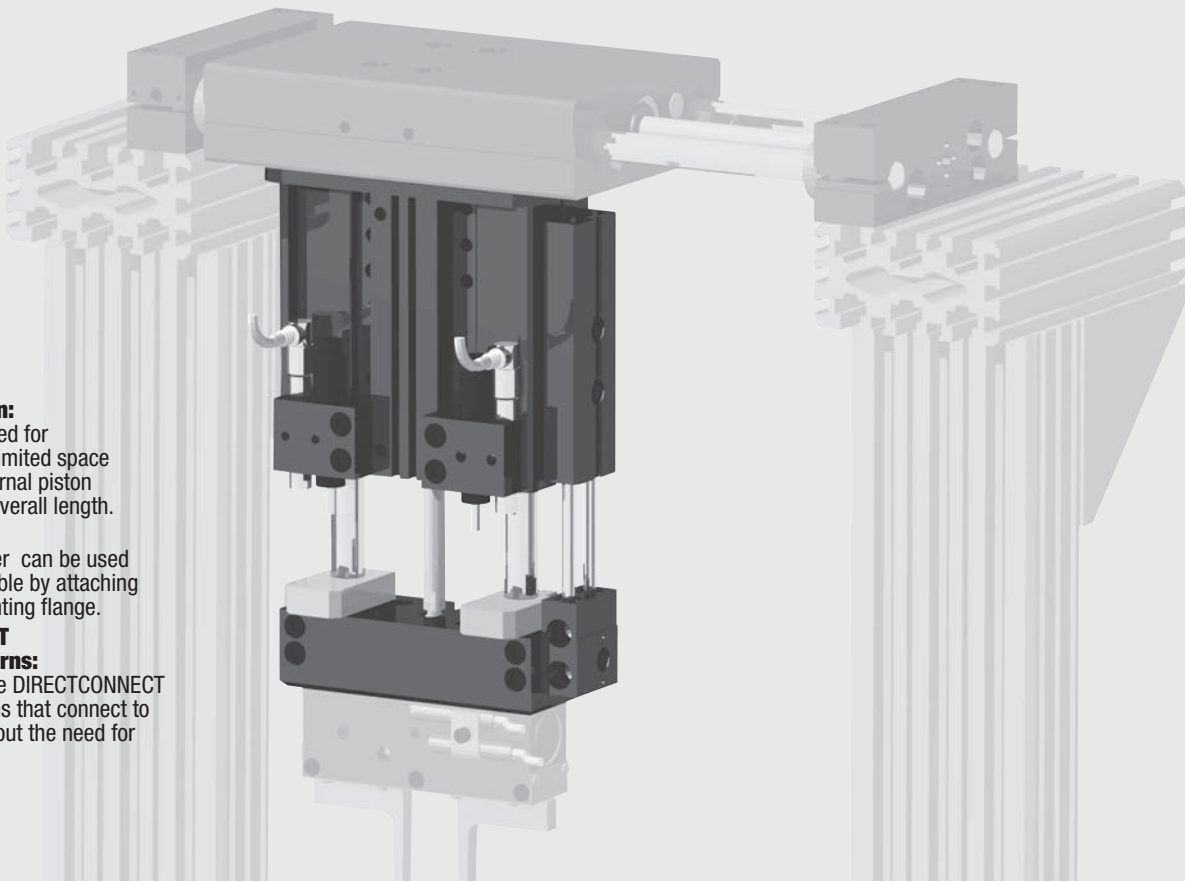


Internally Powered Block Thrusters



Compact design:

This design is used for short strokes in limited space applications. Internal piston design reduces overall length.

Lift table:

The block thruster can be used as a power lift table by attaching an optional mounting flange.

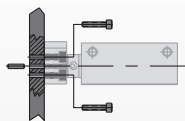
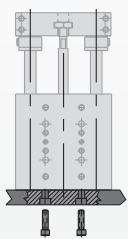
DIRECTCONNECT

mounting patterns:

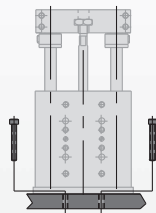
These slides have DIRECTCONNECT mounting patterns that connect to other slides without the need for adapter plates.

Mounting Information:

Mounts and operates in any orientation



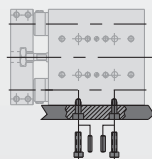
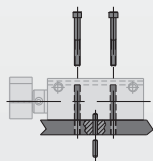
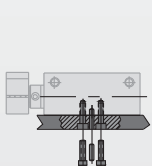
Payload attaches to tooling plate with screws and locates using slip fit dowel pin holes.



Body can end mount on end using optional mounting flange.



Body can be back mounted using DIRECTCONNECT mounting from the back or front of the thruster.



Body mounts with screws and locate with slip fit dowel pin holes on side or bottom using DIRECTCONNECT mounting patterns.

Technical Specifications:

Pneumatic Specifications

Pressure Operating Range*
Cylinder Type
Dynamic Seals
Valve Required to Operate

Imperial	Metric
40-100 psi	3-7 bar
Double Acting	
Internally Lubricated Buna-N	
4-way, 2-position	

Air Quality Requirements

Air Filtration
Air Lubrication
Air Humidity

40 Micron or Better
Not Necessary**
Low Moisture Content (dry)

Temperature Operating Range

Buna-N Seals (standard)
Viton® Seals (optional)

-30°~180° F	-35°~80° C
-20°~300° F	-30°~150° C

Maintenance Specifications†

Expected Life
Normal Application
w/ Preventative Maintenance
Field Repairable
Seal Repair Kits Available

5 million cycles
10+ million cycles†
Yes
Yes

Application Restrictions

Flow controls, shock absorbers and urethane bumpers recommended for nearly all applications.
Use composite bushing in dirty or gritty environments.
Never use silicone based lubricants with composite bushings.

*Higher pressure possible. Consult factory with application details.

**Addition of lubrication will greatly increase service life

† See Maintenance Section

Product Features

Misalignment Coupling
Reduces cylinder wear and increases useful life of cylinder

Urethane Bumpers & Clamp Collars

Precision Ground Shafting
Case hardened to RC60-65. Corrosion resistant optional

Modular Telescoping Airlines
Eliminates flexing air lines. Patented self aligning air tube design extends useful seal life. (2) user air ports per module

Aircraft Quality Aluminum

Magneto Resistive Sensors
Slot mounted sensor with threaded quick disconnect

Sensors Grooves
For mounting Magneto Resistive Sensors

Sensor Magnet
Standard in piston

Universal Mounting Kit
Contains Mounting Bracket, Hardened Steel Target, and hardware. Allows the mounting of Shocks and adjustable Hard Stops. Dual stop & shock capable

Shock Absorbers
with built-in hard stop

Bearing Options
Preloaded linear ball bushings or composite bushings

Inductive Proximity Sensors
8mm diameter, threaded body with quick disconnect

Seal Option
Viton® or self-lubricating Buna-N dynamic seals

Base Flange Kit
Converts thruster into a flange mounted lift table

DIRECTCONNECT Mounting Patterns
Main bodies have tapped and counterbored through holes including slip fit dowel holes on DIRECTCONNECT mounting surface

Operating Principle

End Cap **Piston** **Urethane Bumper** **Piston Rod** **Rod End Cap**

Body **Linear Ball or Composite Bushings** **Shaft** **Urethane Bumper & Clamp Collars** **Tooling Plate**

Pressure **Exhaust**

Exhaust **Pressure**

- A double acting internal cylinder located within the body drives a piston rod that connects to the tooling plate with a misalignment coupling.
- The tooling is attached to two hardened steel shafts which are supported by and move in four linear bushings located in the body.

Designed and manufactured in the USA

Style -B Block Thruster

Size -06M



See Page **4.34**

Style -B Block Thruster

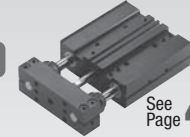
Size -08M



See Page **4.34**

Style -B Block Thruster

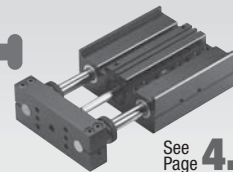
Size -10M



See Page **4.36**

Style -B Block Thruster

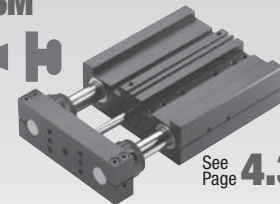
Size -12M



See Page **4.36**

Style -B Block Thruster

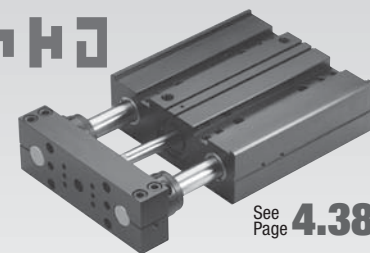
Size -16M



See Page **4.36**

Style -B Block Thruster

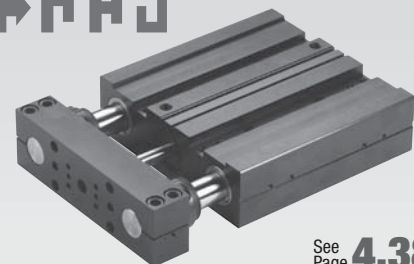
Size -20M



See Page **4.38**

Style -B Block Thruster

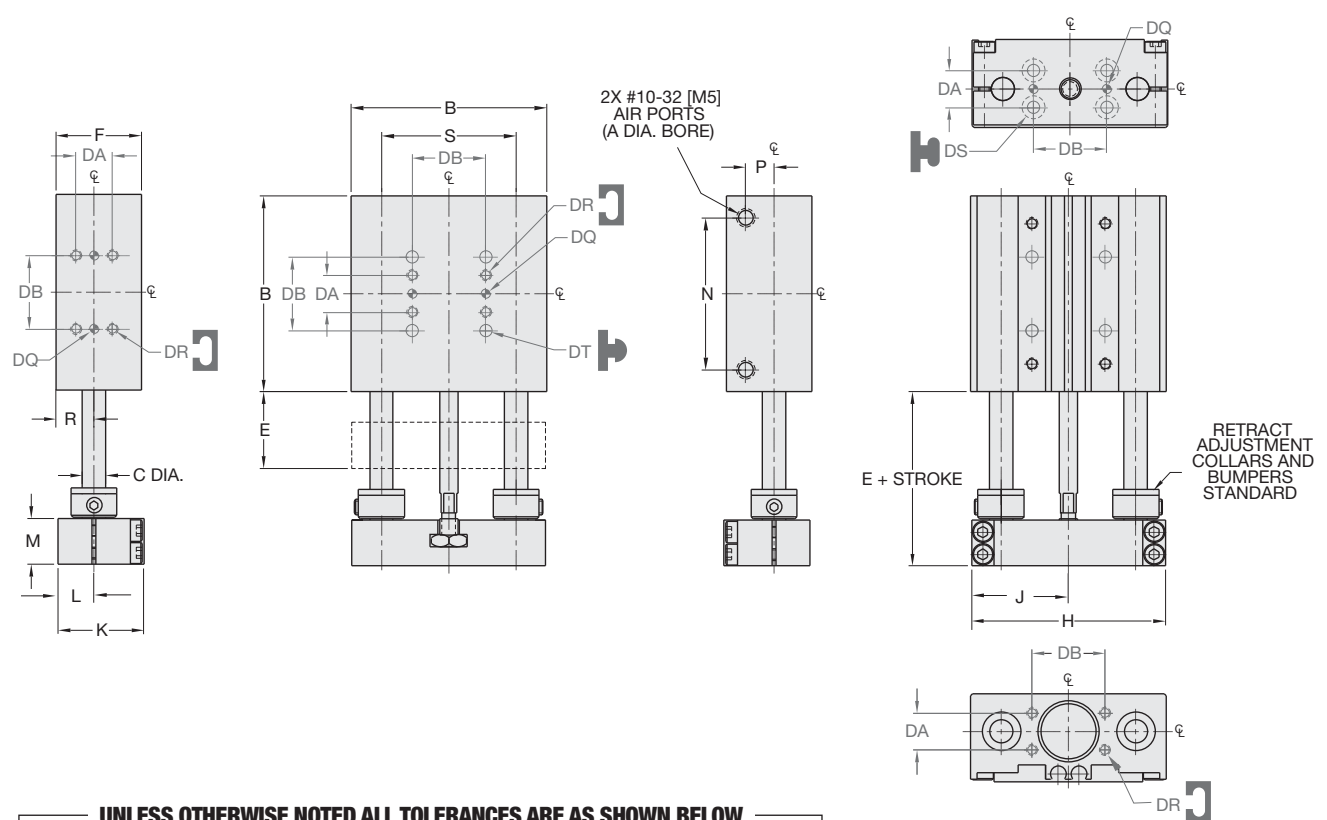
Size -25M



See Page **4.38**



BLOCK THRUSTER DLT -06M, 08M -B BUILT-IN REPAIRABLE CYLINDER



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.									
	A	B	C	E	F	H	J	K	L	M	N	P	R	S
DLT-06	0.563	2.00	0.236	0.783	0.88	1.980	.990	0.875	.365	0.470	1.55	0.29	.390	1.375
DLT-08	0.563	2.50	0.315	0.783	0.88	2.470	1.235	0.875	.365	0.470	2.05	0.29	.390	1.750
DLT-06M	14	50.8	6.0	19.9	22.4	50.3	25.1	22.2	9.3	11.9	39.4	7.4	9.9	34.93
DLT-08M	14	63.5	8.0	19.9	22.4	62.7	31.0	22.2	9.3	11.9	52.1	7.4	9.9	44.45

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clearance for #4	Clearance for M3
DT	Clearance for #4	Clearance for M3

4.34

How to Order: Basic Unit

BASIC MODEL **METRIC** **STYLE** **STROKE** **SHAFTING**

DLT - [] **M** - **B** - **C** - [] - **V** - **S**

SIZE BEARING VITON® SEALS

SIZE 06, 08

METRIC M

STYLE B Block thruster with built-in repairable cylinder

BEARING C Composite bushings

STROKE (inches)
DLT-06 **.25, .5, 1, 1.25**
DLT-08 **.25, .5, 1, 1.5, 1.75**

Custom strokes available. Please consult factory.

STROKE (mm)
DLT-06M **6, 12, 25, 30**
DLT-08M **6, 12, 25, 30, 40, 44**

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

SAMPLE ORDER: DLT-06-B-C-1.5-V
Exc Thruster, Size 06, Block Style, Composite Bushings, 1.5 Inch Stroke, Viton® Seals

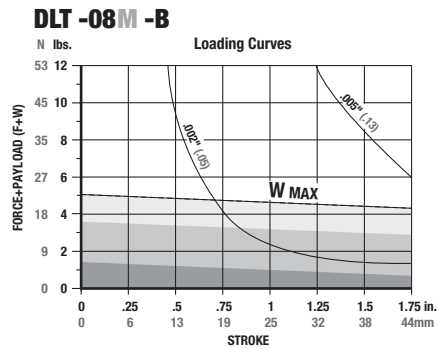
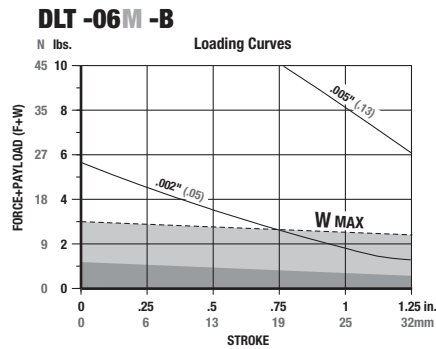
Accessories: (Order Separately)

	DLT-06M	DLT-08M	QTY/THRUSTER
SHOCK/STOP ACCESSORIES			
Universal Mounting Kit (Shock or Stop)	OSAK-069	OSAK-070	1 or 2
Shock Absorber*	SHOK-030	SHOK-030	1 or 2
Adjustable Hard Stop*	DLT-623	DLT-623	1 or 2
INDUCTIVE SENSOR ACCESSORIES †			
Inductive Sensor Mounting Kit	OSMK-076	OSMK-077	1
Inductive Sensor PNP Qk. Disconnect †	OISP-014	OISP-014	1
Inductive Sensor NPN Qk. Disconnect †	OISN-014	OISN-014	1
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	1
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	1
MAGNETIC SENSOR ACCESSORIES ** †			
Magneto Resistive Sensor PNP Qk. Disc. †	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc. †	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	1 or 2
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	1 or 2
PNEUMATIC ACCESSORIES			
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	1 or 2
M5 Adjustable Flow Control	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-108	SLKT-108	1
Viton® Seal Repair Kit	SLKT-108V	SLKT-108V	1
MOUNTING ACCESSORIES			
Base Flange Kit (Imperial & Metric)	ODLT-015	ODLT-016	1

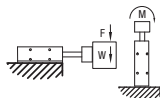
*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard



BLOCK THRUSTER DLT-06M, 08M -B BUILT-IN REPAIRABLE CYLINDER



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

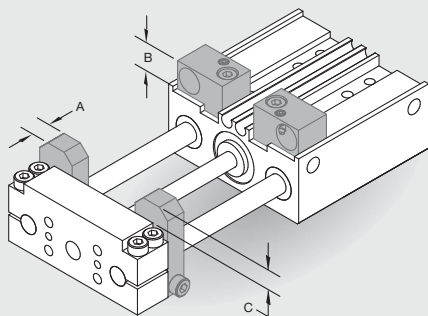
Use **Double Shocks** in both directions Use **Single Shock** in both directions Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-06	DLT-06M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	0.34 lbs.	0.15 kg
Cylinder Bore Diameter	0.563"	14.3 mm
Shaft Diameter	0.236"	6 mm
Max (M) Vertical Motion	5 in.-lbs.	0.6 N-m

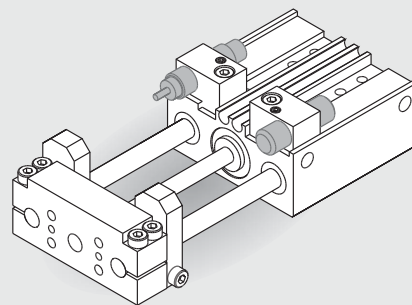
Specifications	DLT-08	DLT-08M
Maximum Air Pressure	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	0.65 lbs.	0.30 kg
Cylinder Bore Diameter	0.563"	14.3 mm
Shaft Diameter	0.315"	8 mm
Max (M) Vertical Motion	10 in.-lbs.	1.1 N-m

Accessory Mounting Technical Data



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions

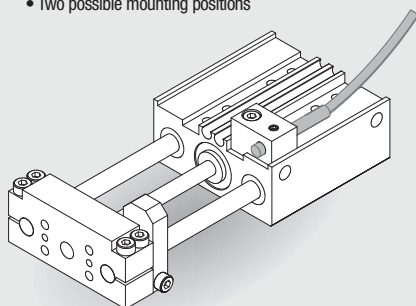


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable

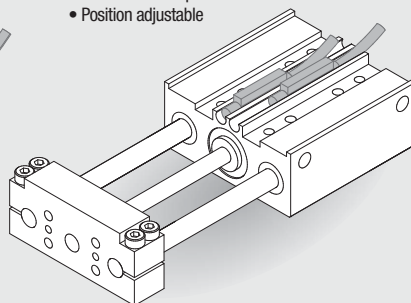


Inductive Proximity Sensors

- 4 mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cables

- Quick disconnect 2M cable Length
- Quick disconnect 5M cable Length

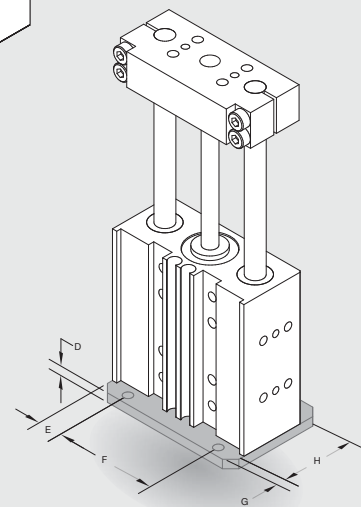


Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Built-in LED output
- PNP and NPN available
- Hard wired 2 meter cable length
- Low profile

Quick Disconnect Cables

- Quick disconnect 2M cable Length
- Quick disconnect 5M cable Length



Base Flange Kit

- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECTCONNECT** mounting pattern on the bottom surface

Flow Controls for Cylinders

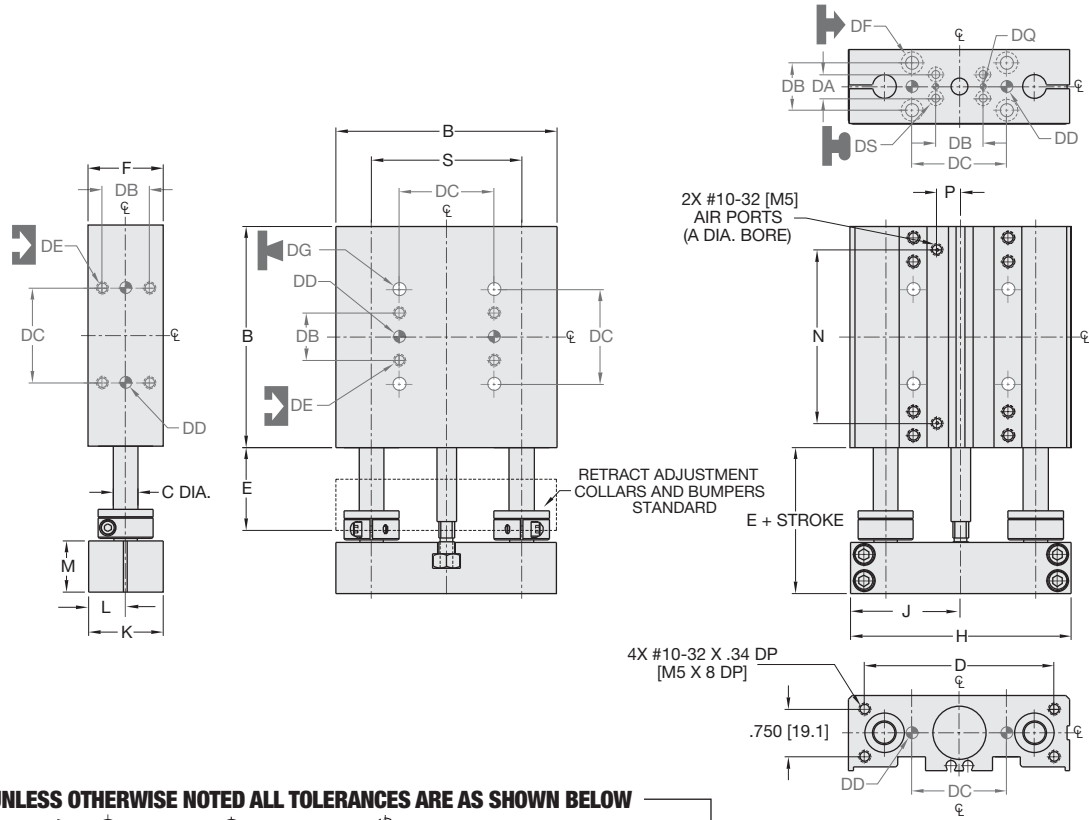
- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads

	A	B	C	D	E	F	G	H
DLT-06	.250"	.310	.270	.125	.313	1.376	.125	1.125
DLT-08	.250"	.310	.270	.125	.563	1.376	.125	1.125
DLT-06M	6.4 mm	7.9	6.7	3.2	8.0	35	3.2	28.6
DLT-08M	6.4 mm	7.9	6.7	3.2	14.3	35	3.2	28.6

BLOCK THRUSTER DLT -10M, 12M, 16M -B BUILT-IN REPAIRABLE CYLINDER

DLT SERIES

4.36



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

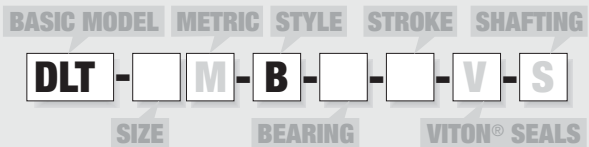
				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or (±.013mm)	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25 DP	5mm H7 x 6 DP
DE	#10-32 x .34 DP	M5 x 8.5 DP
DF	Clearance for #10	Clearance for M5
DG	Clearance for #10	Clearance for M5
DQ	.0940 x .078 DP	3H7 x 2 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3

MODEL #	BORE DIA.		C	BASIC UNIT DIMENSIONS										
	A	B		D	E	F	H	J	K	L	M	N	P	S
DLT-10	1/4	3.50	.375	3.000	1.313	1.19	3.490	1.740	1.178	.584	.813	2.75	0.37	2.375
DLT-12	1	4.00	.472	3.625	1.313	1.63	3.985	1.985	1.615	.802	.813	3.28	0.37	2.750
DLT-16	1	4.75	.630	4.375	1.375	1.63	4.735	2.360	1.615	.802	.813	4.03	0.37	3.250
DLT-10M	19	88.9	9.5	76.2	33.4	30.2	88.6	44.2	29.9	14.8	20.7	69.7	9.4	60.33
DLT-12M	25	101.6	12.0	92.1	33.4	41.4	101.2	50.4	41.0	20.4	20.7	83.3	9.4	69.85
DLT-16M	25	120.7	16.0	111.1	34.9	41.4	120.3	59.9	41.0	20.4	20.7	102.4	9.4	82.55

How to Order: Basic Unit



- SIZE** 10, 12, 16
- METRIC** M
- STYLE** B Block thruster with built-in repairable cylinder
- BEARING** B Linear ball bearings
C Composite bushings
- STROKE** (inches)
DLT-10 .5-2 @ .5" increments
DLT-12 .5-2 @ .5" increments
DLT-16 .5-3 @ .5" increments
Custom strokes available. Please consult factory.
- STROKE** (mm)
DLT-10M 12, 25, 40, 50
DLT-12M 12, 25, 40, 50
DLT-16M 12, 25, 40, 50, 65, 75
- VITON®** V Viton® seals
- SHAFTING** S Corrosion resistant shafting

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-055	OSAK-057	OSAK-059	1 or 2
Shock Absorber*	SHOK-028	SHOK-010	SHOK-010	1 or 2
Adjustable Hard Stop*	DLT-1023	DLT-1023	DLT-1023	1 or 2

INDUCTIVE SENSOR ACCESSORIES†

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	OISP-011	1
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	OISN-011	1
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	CABL-010	1
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	CABL-013	1

MAGNETIC SENSOR ACCESSORIES***

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	CABL-010	1
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	CABL-013	1

PNEUMATIC ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
1/8 NPT Telescopic Airlines (up to 2")	OTAL-037	OTAL-037	OTAL-037	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 3")	OTAL-038	OTAL-038	OTAL-038	1, 2, 3 or 4
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	VLVF-007	1 or 2
G1/8 Telescopic Airlines (up to 50mm)	OTAL-043	OTAL-043	OTAL-043	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 80mm)	OTAL-044	OTAL-044	OTAL-044	1, 2, 3 or 4
M5 Adjustable Flow Control	VLVF-008	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-100	SLKT-102	SLKT-102	1
Viton® Seal Repair Kit	SLKT-100V	SLKT-102V	SLKT-102V	1

MOUNTING ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Base Flange Kit (Imperial)	ODLT-005	ODLT-007	ODLT-009	1
Base Flange Kit (Metric)	ODLT-006	ODLT-008	ODLT-010	1

*Requires Universal Mounting Kit †Sensor and cable sold separately ***Piston magnet standard

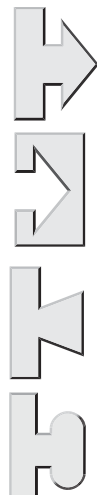
SAMPLE ORDER: DLT-10-B-C-1.5-V

Ex: Thruster, Size 10, Block Style, Composite Bushings, 1.5 inch Stroke, Viton® Seals

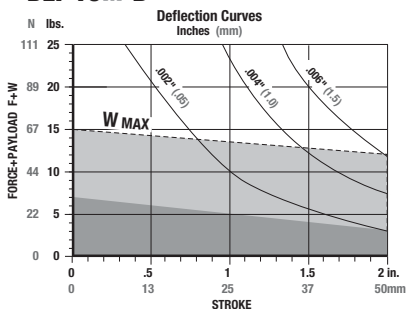
DIRECTCONNECT



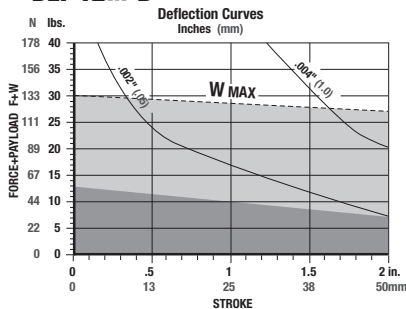
BLOCK THRUSTER DLT -10M, 12M, 16M -B BUILT-IN REPAIRABLE CYLINDER



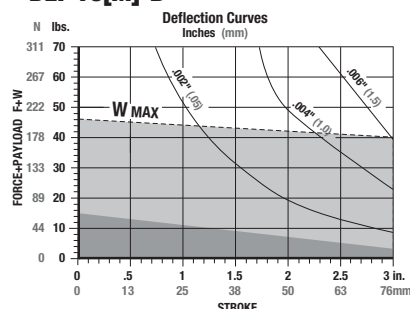
DLT-10M-B



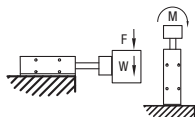
DLT-12M-B



DLT-16[M]-B



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in retract direction (M) in this range use **Bumpers or Cushioned Cylinder**

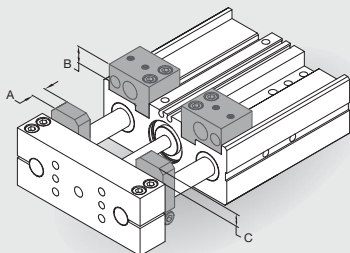
Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-10	DLT-10M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	35 lbs.	155 N
Weight (Basic Unit).....	1.81 lbs.	0.82 kg
Cylinder Bore Diameter	3/4"	19mm
Shaft Diameter	0.375"	9.5mm
Max (M) Vertical Motion.....	25 in-lbs.	2.8N-m

Specifications	DLT-12	DLT-12M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	62 lbs.	275 N
Weight (Basic Unit).....	2.88 lbs.	1.31 kg
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.472"	12mm
Max (M) Vertical Motion.....	50 in-lbs.	5.6N-m

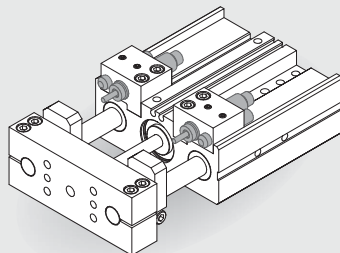
Specifications	DLT-16	DLT-16M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	62 lbs.	275 N
Weight (Basic Unit).....	4.38 lbs.	1.99 kg
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.630"	16mm
Max (M) Vertical Motion.....	100 in-lbs.	11.3N-m

Accessory Mounting Technical Data



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions

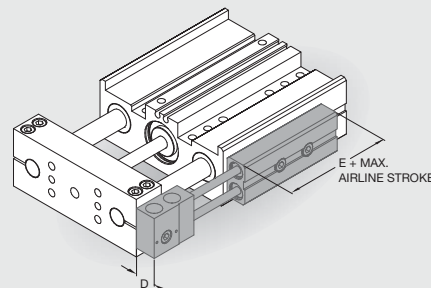


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

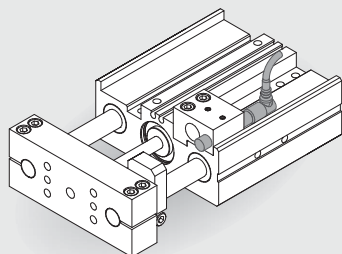
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Allen wrench adjustable



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

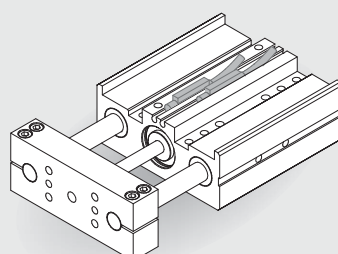


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Magneto Resistive Sensors

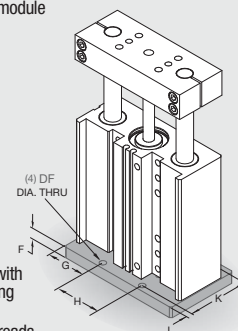
- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

Flow Controls for Cylinders

- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads



Base Flange Kit

- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECTCONNECT** mounting pattern on the bottom surface

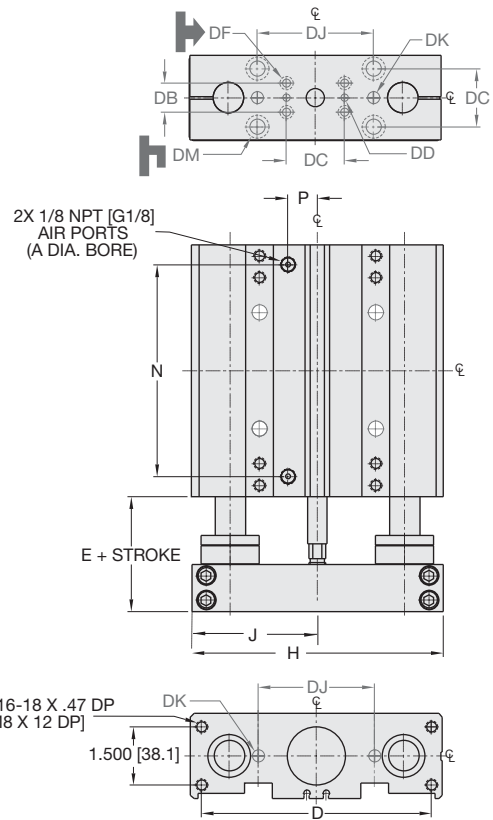
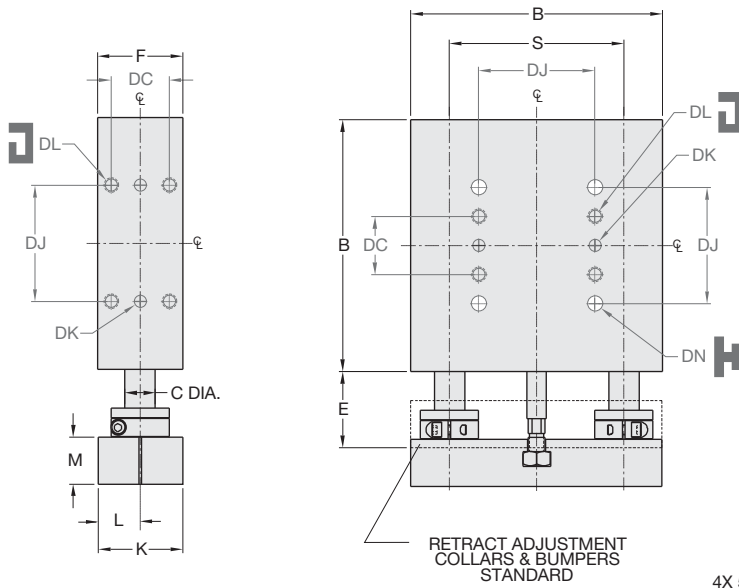
	A	B	C	D	E	F	G	H	J	K
DLT-10	.375"	.480	.320	.577	2.0	.355	1.00	1.500	.188	1.500
DLT-12	.357"	.450	.230	.577	2.0	.355	1.281	1.500	.188	2.000
DLT-16	.437"	.450	.340	.577	2.0	.355	1.656	1.500	.188	2.000
DLT-10M	9.5mm	12.2	8.1	14.7	50.8	9.0	25.4	38.1	4.8	38.1
DLT-12M	9.5mm	11.4	5.8	14.7	50.8	9.0	32.5	38.1	4.8	50.8
DLT-16M	11.1mm	11.4	8.6	14.7	50.8	9.0	42.1	38.1	4.8	50.8

DLT SERIES

4.37

DIRECTCONNECT™

BLOCK THRUSTER DLT-20M, 25M -B BUILT-IN REPAIRABLE CYLINDER



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or ±.013mm	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

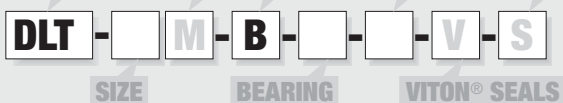
DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	3/8 -16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 3/8	Clearance for M10

MODEL #	BORE DIA.			BODY SIZE			SHAFT DIA.			BASIC UNIT DIMENSIONS									
	A	B	C	D	E	F	H	J	K	L	M	N	P	S					
DLT-20	1/2	6.50	.787	5.938	1.960	2.20	6.480	3.230	2.180	1.080	1.210	5.47	0.77	4.500					
DLT-25	1/2	7.50	.984	6.938	2.170	2.20	7.480	3.730	2.180	1.080	1.420	6.47	0.77	5.250					
DLT-20M	38	165.1	20	150.8	49.8	55.9	164.6	82.0	55.4	27.4	30.7	138.9	19.5	114.30					
DLT-25M	38	190.5	25	176.2	55.1	55.9	190.0	94.7	55.4	27.4	36.1	164.3	19.5	133.35					

How to Order: Basic Unit

BASIC MODEL METRIC STYLE STROKE SHAFTING



SIZE 20, 25

METRIC M

STYLE B Block thruster with built-in repairable cylinder

BEARING B Linear ball bearings
C Composite bushings

STROKE (inches)
DLT-20 .5-4 @ .5" increments
DLT-25 .5-5 @ .5" increments
Custom strokes available. Please consult factory.

STROKE (mm)
DLT-20M 12, 25, 40, 50, 65, 75, 85, 100
DLT-25M 12, 25, 40, 50, 65, 75, 85, 100, 115, 125

VITON® V Viton® seals

SHAFTING S Corrosion resistant shafting

SAMPLE ORDER: DLT-20-B-C-2.5-V

Ex: Thruster, Size 20, Block Style, Composite Bushings, 2.5 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-20M	DLT-25M	QTY/THRUSTER
Universal Mounting Kit			
(Shock, Stop or Sensor)	OSAK-061	OSAK-063	1 or 2
Shock Absorber (adjustable dampening)*	SHOK-029	SHOK-029	1 or 2
Adjustable Hard Stop*	DLT-1023	DLT-1023	1 or 2

INDUCTIVE SENSOR ACCESSORIES†

	DLT-20M	DLT-25M	QTY/THRUSTER
Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	1
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	1
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	1
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	1

MAGNETIC SENSOR ACCESSORIES***

	DLT-20M	DLT-25M	QTY/THRUSTER
Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2 M Cable Length	CABL-010	CABL-010	1
Quick Disconnect 5 M Cable Length	CABL-013	CABL-013	1

PNEUMATIC ACCESSORIES

	DLT-20M	DLT-25M	QTY/THRUSTER
1/8 NPT Telescopic Airlines (up to 4")	OTAL-049	OTAL-049	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 5")	OTAL-050	OTAL-050	1, 2, 3 or 4
1/8 NPT Adjustable Flow Control	VLVF-004	VLVF-004	1 or 2
G1/8 Telescopic Airlines (up to 100mm)	OTAL-051	OTAL-051	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 125mm)	OTAL-052	OTAL-052	1, 2, 3 or 4
G1/8 Adjustable Flow Control	VLVF-005	VLVF-005	1 or 2
Cylinder Seal Repair Kit	SLKT-104	SLKT-104	1
Viton® Cylinder Seal Repair Kit	SLKT-104V	SLKT-104V	1

MOUNTING ACCESSORIES

	DLT-20M	DLT-25M	QTY/THRUSTER
Base Flange Kit (Imperial)	ODLT-011	ODLT-013	1
Base Flange Kit (Metric)	ODLT-012	ODLT-014	1

*Requires Universal Mounting Kit †Sensor and cable sold separately ***Piston magnet standard

DLT SERIES
4.38

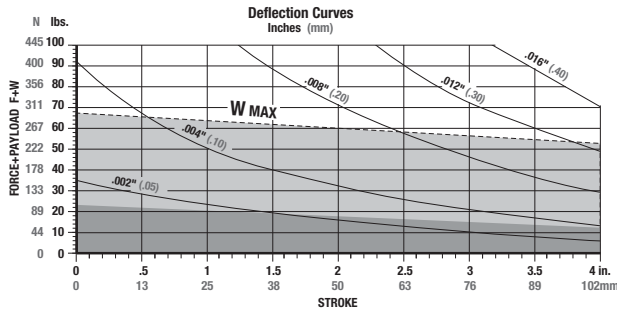
DIRECTCONNECT



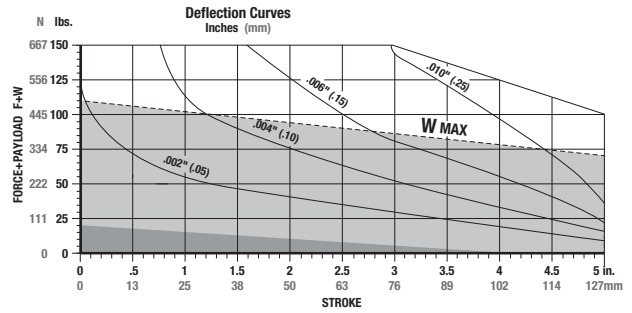
BLOCK THRUSTER DLT-20M, 25M -B BUILT-IN REPAIRABLE CYLINDER



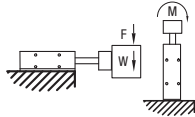
DLT-20M-B



DLT-25M-B



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in retract direction (W) in this range use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	11.2 lbs.	5.1 kg
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.787"	20mm
Max (M) Vertical Motion	250 in.-lbs.	28.2N-m

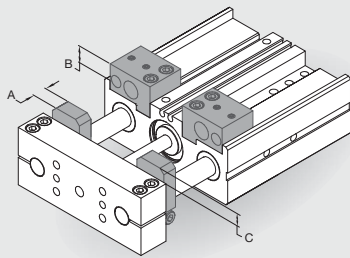
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	15.7 lbs.	7.2 kg
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.984"	25mm
Max (M) Vertical Motion	500 in.-lbs.	56.4N-m

Accessory Mounting Technical Data

DLT SERIES

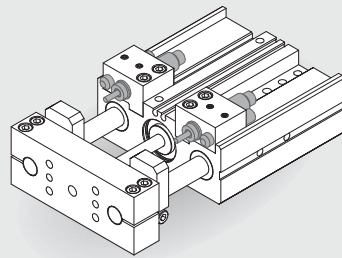
4.39

DIRECTCONNECT™



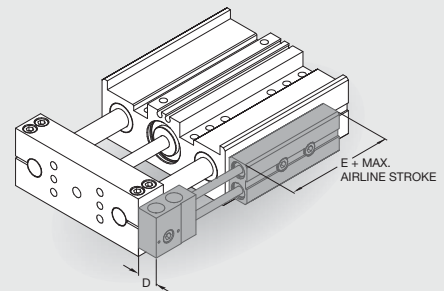
Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Two possible mounting positions



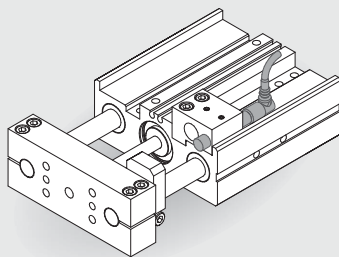
Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
 - Allows for end stop position adjustment independent of shock absorber hard stop
 - Allen wrench adjustable
- ### Shock Absorbers
- Full stroking piston rod
 - Built-in hard stop
 - Position adjustable
 - Adjustable dampening



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

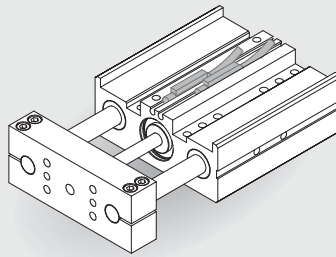


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Magneto Resistive Sensors

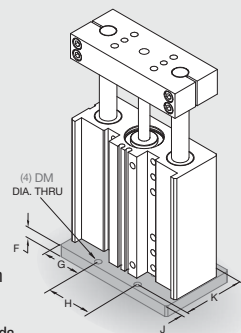
- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

Flow Controls for Cylinders

- Thumb screw adjust with locking nut for adjusting cylinder speed
- #10-32 or M5 pipe threads



Base Flange Kit

- Convert Thruster unit into a Flange mounted Lift Table
- Provides a **DIRECTCONNECT** mounting pattern on the bottom surface

	A	B	C	D	E	F	G	H	J	K
DLT-20	.500"	.92	.67	.577	2.0	.480	1.750	3.000	.375	3.000
DLT-25	.500"	.92	.67	.577	2.0	.480	2.250	3.000	.375	3.000
DLT-20M	12.7mm	23.4	17.0	14.7	50.8	12.2	44.5	76.2	9.5	76.2
DLT-25M	12.7mm	23.4	17.0	14.7	50.8	12.2	57.2	76.2	9.5	76.2

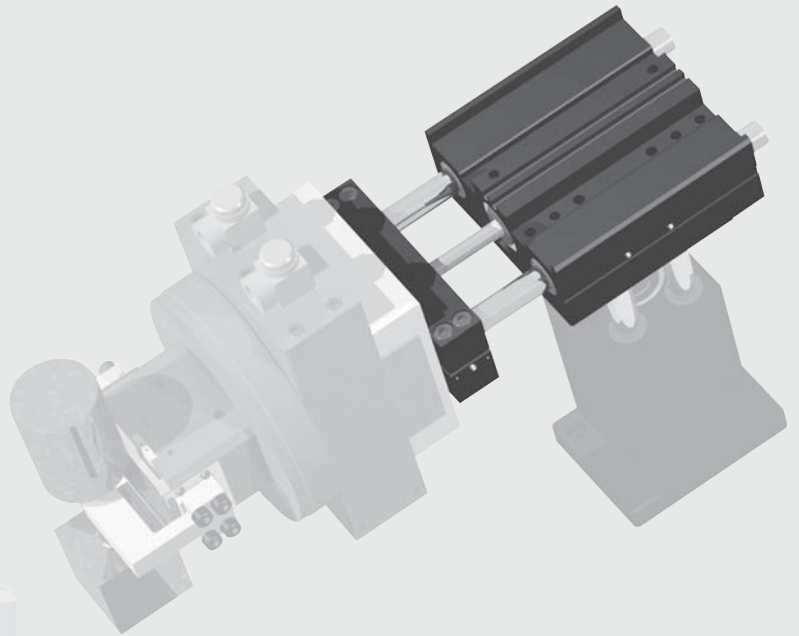
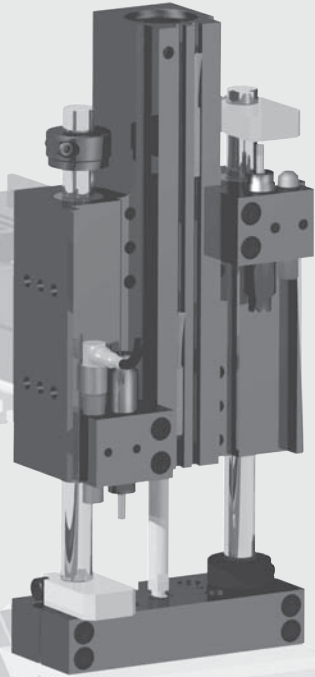
Internally Powered Thruster Slide

DLT SERIES

4.40

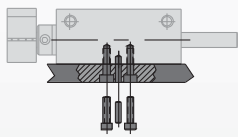
Compact design:
This design is used for short & medium length strokes in limited space applications. Internal air cylinder design reduces overall length to a minimum.

DIRECTCONNECT mounting patterns:
These slides have DIRECTCONNECT mounting patterns that connect to other slides without the need for adapter plates.

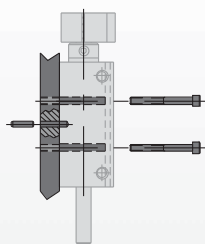


Mounting Information:

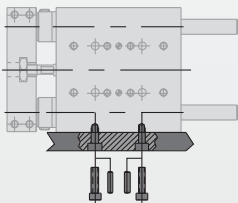
Mounts and operates in any orientation



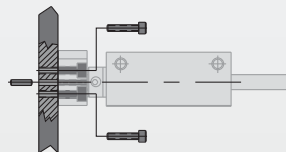
Body can be mounted from the back using the directconnect pattern of threaded mounting and dowel pin holes



Body back mounts with screws from the front using the clearance and counter-bored DIRECTCONNECT pattern and located with dowel holes.



Body mounts with screws and locate with slip fit dowel pin holes on side using DIRECTCONNECT mounting patterns.



Payload attaches to tooling plate directconnect mounting pattern with screws and locates using slip fit dowel pin holes.

Technical Specifications:

Pneumatic Specifications	Imperial	Metric
Pressure Operating Range*	40-100 psi	3-7 bar
Cylinder Type	Double Acting	
Dynamic Seals	Internally Lubricated Buna-N	
Valve Required to Operate	4-way, 2-position	

Air Quality Requirements	40 Micron or Better
Air Filtration	Not Necessary**
Air Lubrication	Low Moisture Content (dry)
Air Humidity	

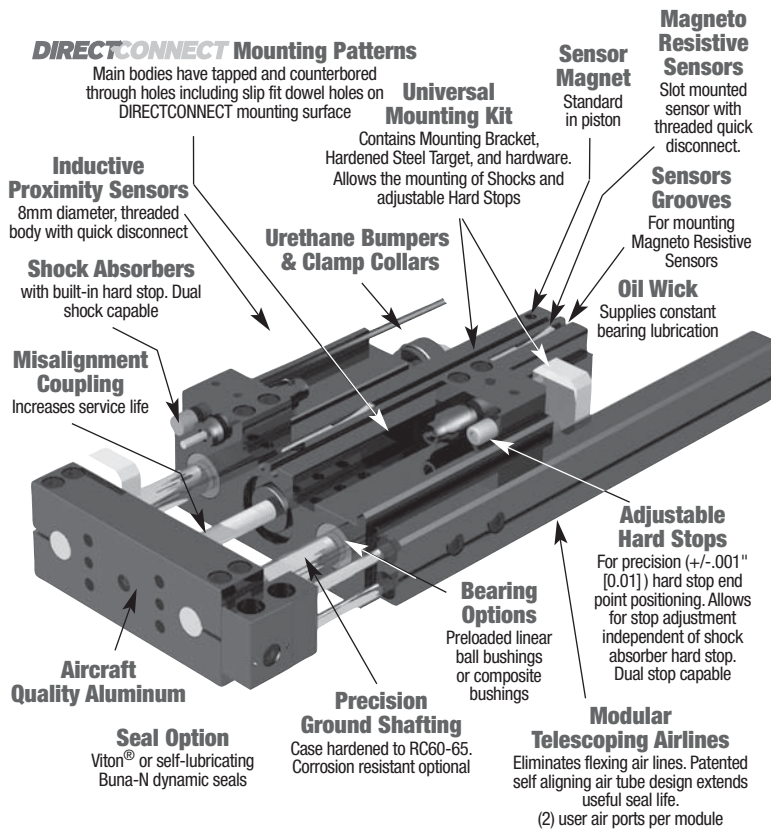
Temperature Operating Range		
Buna-N Seals (standard)	-30°~180° F	-35°~80° C
Viton® Seals (optional)	-20°~300° F	-30°~150° C

Maintenance Specifications†	
Expected Life	5 million cycles
Normal Application	10+ million cycles†
w/ Preventative Maintenance	Yes
Field Repairable	Yes
Seal Repair Kits Available	Yes

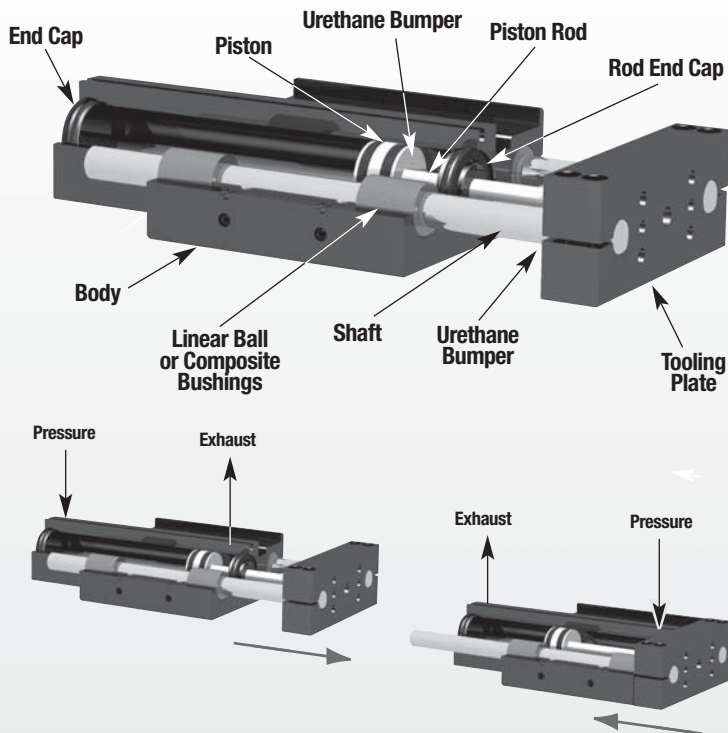
Application Restrictions
Flow controls, shock absorbers and urethane bumpers recommended for nearly all applications.
Use composite bushing in dirty or gritty environments.
Never use silicone based lubricants with composite bushings.

*Higher pressure possible. Consult factory with application details.
**Addition of lubrication will greatly increase service life
† See Maintenance Section

Product Features



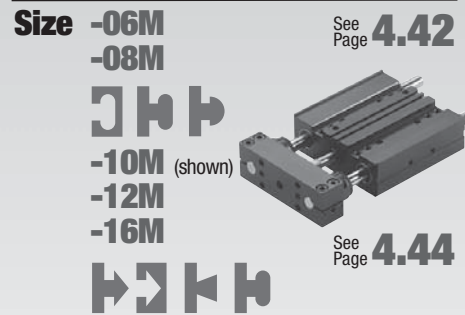
Operating Principle



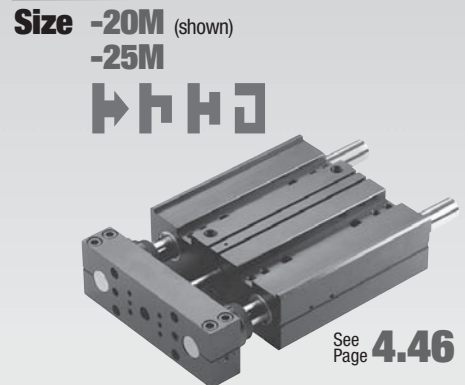
- A double acting internal cylinder located within the body drives a piston rod that connects to the tooling plate with a misalignment coupling.
- The tooling is attached to two hardened steel shafts which are supported by and move in four linear bushings located in the body.

Designed and manufactured in the USA

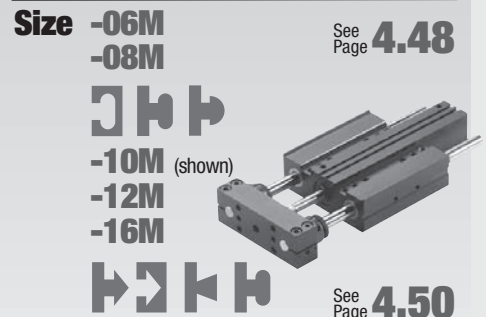
Style -E Short Body Thruster



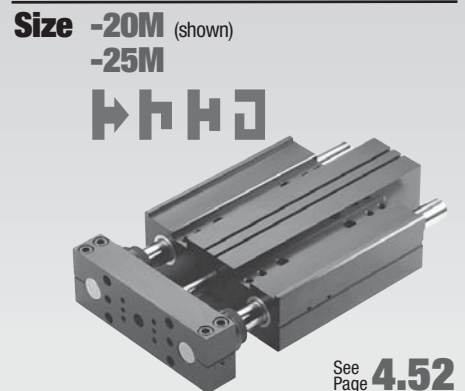
Style -E Short Body Thruster



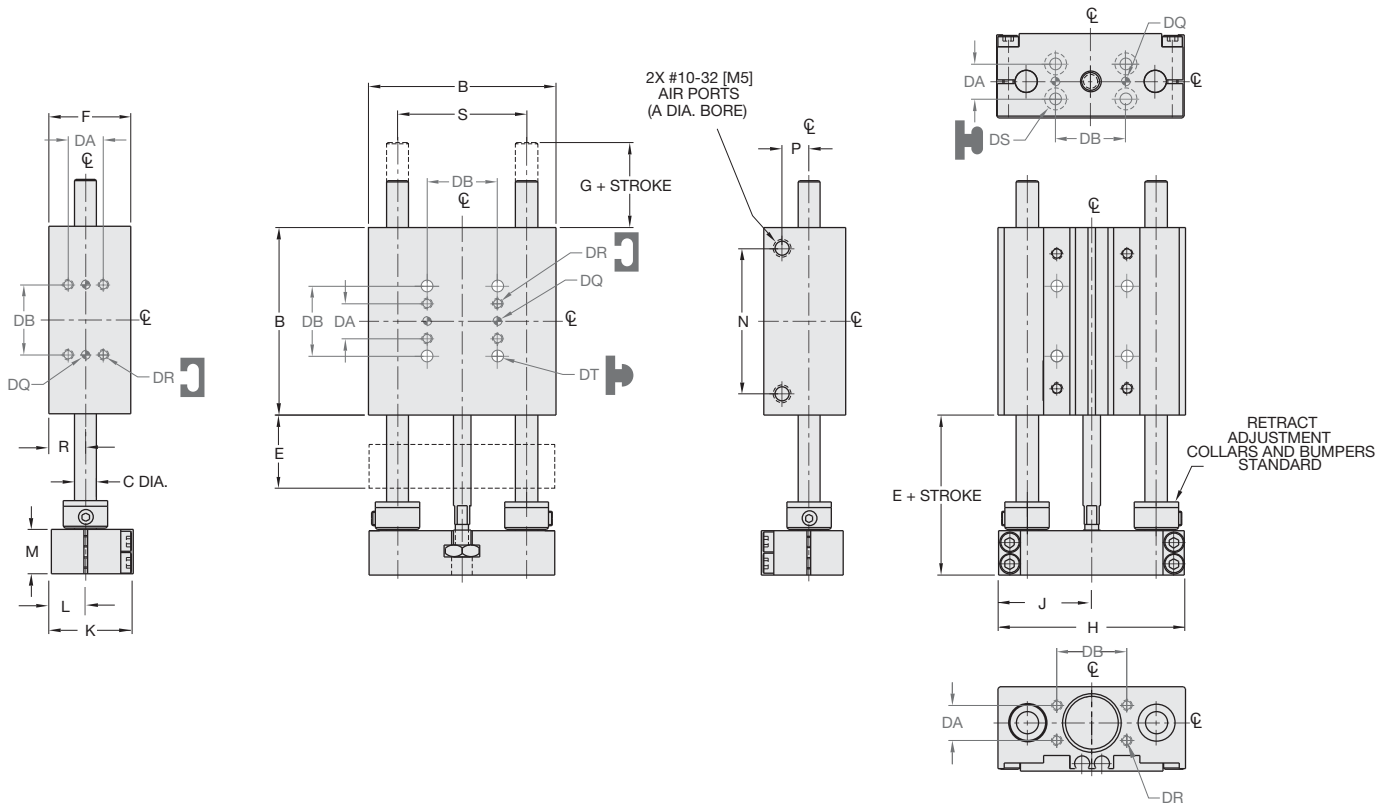
Style -L Long Body Thruster



Style - L Long Body Thruster



SHORT BODY THRUSTER DLT -06M, 08M -E BUILT-IN REPAIRABLE CYLINDER



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or (±.013mm)	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3
DT	Clr & C'bore for #4	Clr & C'bore for M3

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.										
	A	B	C	E	F	G	H	J	K	L	M	N	P	R	S
DLT-06	0.563	2.00	0.236	0.783	0.88	0.66	1.980	.990	0.875	.365	0.470	1.55	0.29	.390	1.375
DLT-08	0.563	2.50	0.315	0.783	0.88	0.41	2.470	1.235	0.875	.365	0.470	2.05	0.29	.390	1.750
DLT-06M	14	50.8	6.0	19.9	22.4	16.8	50.3	25.1	22.2	9.3	11.9	39.4	7.4	9.9	34.93
DLT-08M	14	63.5	8.0	19.9	22.4	10.4	62.7	31.0	22.2	9.3	11.9	52.1	7.4	9.9	44.95

How to Order: Basic Unit

BASIC MODEL METRIC STYLE STROKE SHAFTING

DLT - **M** - **E** - **C** - **V** - **S**

SIZE BEARING VITON® SEALS

SIZE **06, 08**

METRIC **M**

STYLE **E** Short body thruster with built-in repairable cylinder

BEARING **C** Composite bushings

STROKE (inches)
DLT-06 **.25, .5, 1, 1.25**
DLT-08 **.25, .5, 1, 1.5, 1.75**

Custom strokes available.
Please consult factory.

STROKE (mm)
DLT-06M **6, 12, 25, 30**
DLT-08M **6, 12, 25, 40, 44**

VITON® **V** Viton® seals

SHAFTING **S** Corrosion resistant shafting

SAMPLE ORDER: DLT-06-E-C-1.5-V

Ex: Thruster, Size 06, Short Body Style, Composite Bushings, 1.5 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-06M	DLT-08M	QTY/THRUSTER
Universal Mounting Kit (Shock or Stop)	OSAK-069	OSAK-070	1, 2, 3, or 4
Shock Absorber (2 Max. on -06)*	SHOK-030	SHOK-030	1, 2, 3, or 4
Adjustable Hard Stop*	DLT-0623	DLT-0623	1, 2, 3, or 4
Urethane Bumper/Stop Collar Kit	OSAK-067	OSAK-068	1

INDUCTIVE SENSOR ACCESSORIES†

	DLT-06M	DLT-08M	QTY/THRUSTER
Inductive Sensor Mounting Kit	OSMK-076	OSMK-077	1 or 2
Inductive Sensor PNP Qk. Disconnect †	OISP-014	OISP-014	1 or 2
Inductive Sensor NPN Qk. Disconnect †	OISN-014	OISN-014	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**

	DLT-06M	DLT-08M	QTY/THRUSTER
Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

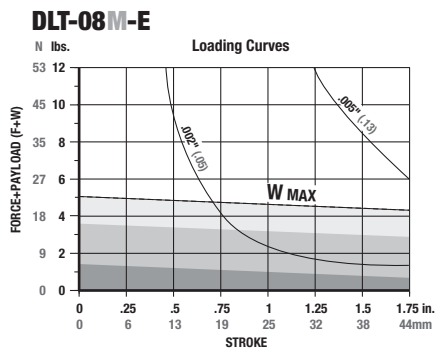
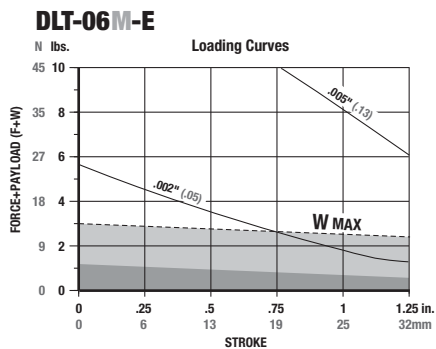
PNEUMATIC ACCESSORIES

	DLT-06M	DLT-08M	QTY/THRUSTER
#10-32 Adjustable Flow Control (Imperial)	VLVF-007	VLVF-007	1 or 2
M5 Adjustable Flow Control (Metric)	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-108	SLKT-108	1
Viton® Cylinder Seal Repair Kit	SLKT-108V	SLKT-108V	1

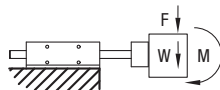
*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard



SHORT BODY THRUSTER DLT -06M, 08M -E BUILT-IN REPAIRABLE CYLINDER



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

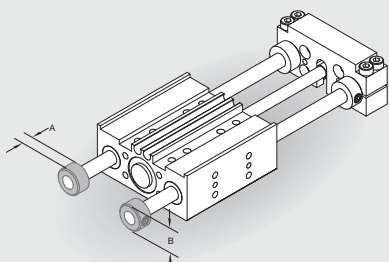
Use **Double Shocks** in both directions Use **Single Shock** in both directions Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-06	DLT-06M
Maximum Air Pressure.....	100 psi	7 bar
Thrust Force @ 80psi/5.5 bar.....	20 lbs.	84 N
Weight (Basic Unit).....	0.34 lbs.	0.15 kg
Cylinder Bore Diameter.....	0.563"	14.3 mm
Shaft Diameter.....	0.236"	6 mm
Max (M) Vertical Motion.....	5 in.-lbs.	0.6 N-m

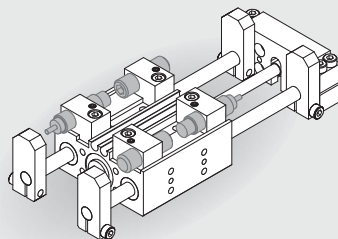
Specifications	DLT-08	DLT-08M
Maximum Air Pressure.....	100 psi	7 bar
Thrust Force @ 80psi/5.5 bar.....	20 lbs.	89 N
Weight (Basic Unit).....	0.65 lbs.	0.30 kg
Cylinder Bore Diameter.....	0.563"	14.3 mm
Shaft Diameter.....	0.315"	8 mm
Max (M) Vertical Motion.....	10 in.-lbs.	1.1 N-m

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

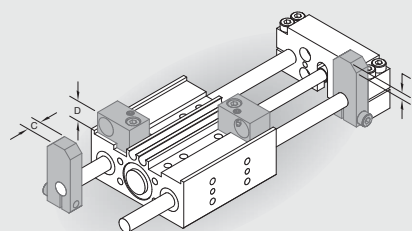


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

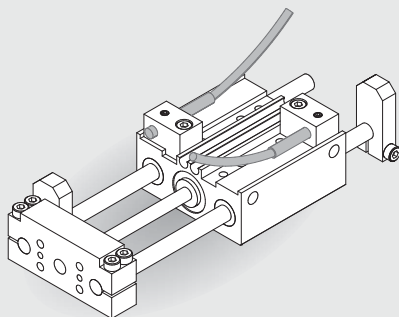
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

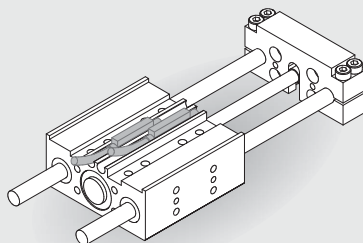


Inductive Proximity Sensors

- 4 mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

	A	B	C	D	E
DLT-06	.236"	.470	.250	.310	.270
DLT-08	.236"	.630	.250	.310	.270
DLT-06M	6mm	12.0	6.4	7.9	6.9
DLT-08M	6mm	16.0	6.4	7.9	6.9

DLT SERIES

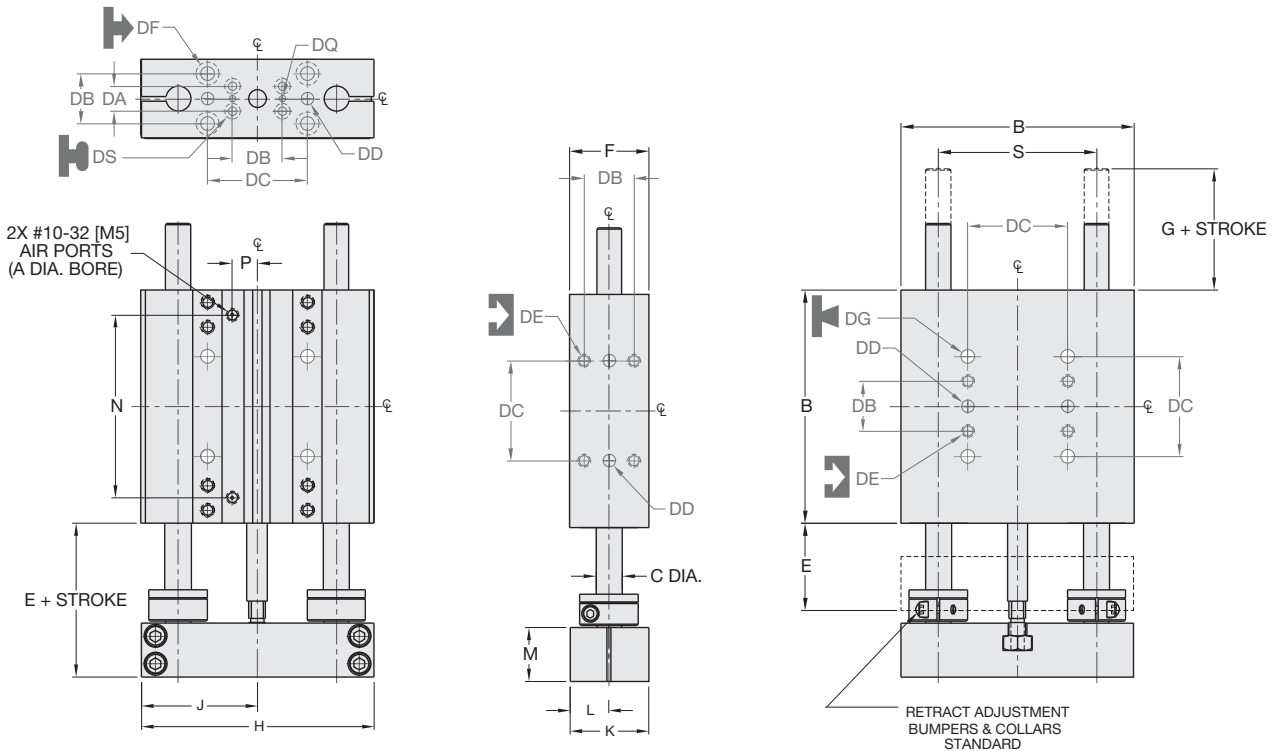
4.43

DIRECTCONNECT™

SHORT BODY THRUSTER DLT -10M, 12M, 16M -E BUILT-IN REPAIRABLE CYLINDER

DLT SERIES

4.44



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

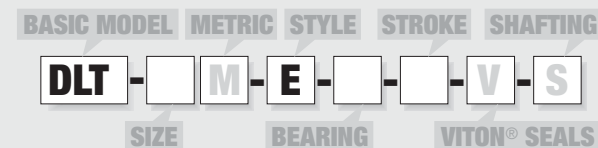
				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or (±.013mm)	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25 DP	5mm H7 x 6 DP
DE	#10-32 x .34 DP	M5 x 8.5 DP
DF	Clearance for #10	Clearance for M5
DG	Clearance for #10	Clearance for M5
DQ	.0940 x .078 DP	3H7 x 2 DP
DS	Clr & C' bore for #4	Clr & C' bore for M3

MODEL #	BORE DIA.			SHAFT DIA.											
	A	B	C	E	F	G	H	J	K	L	M	N	P	S	
DLT-10	1	3.50	.375	1.313	1.19	.82	3.490	1.178	1.740	1.178	.584	.813	2.75	.37	2.375
DLT-12	1	4.00	.472	1.313	1.63	.82	3.985	1.985	1.615	.802	.813	3.28	.37	2.750	
DLT-16	1	4.75	.630	1.375	1.63	.76	4.735	2.360	1.615	.802	.813	4.03	.37	3.250	
DLT-10M	19	88.9	9.5	33.4	30.2	20.8	88.6	44.2	29.9	14.8	20.7	69.7	9.4	60.33	
DLT-12M	25	101.6	12.0	33.4	41.4	20.8	101.2	50.4	41.0	20.4	20.7	83.3	9.4	69.85	
DLT-16M	25	120.7	16.0	34.9	41.4	19.3	120.3	59.9	41.0	20.4	20.7	102.4	9.4	82.55	

How to Order: Basic Unit



- SIZE** 10, 12, 16
- METRIC** M
- STYLE** E Short body thruster with built-in repairable cylinder
- BEARING** B Linear ball bearings
C Composite bushings
- STROKE** (inches)
DLT-10 1-2 @ 1" increments
DLT-12 1-2 @ 1" increments
DLT-16 1-3 @ 1" increments
Custom strokes available. Please consult factory.
- STROKE** (mm)
DLT-10M 25, 50
DLT-12M 25, 50
DLT-16M 25, 50, 75
- VITON®** V Viton® seals
- SHAFTING** S Corrosion resistant shafting

SAMPLE ORDER: DLT-10-E-C-1-V

Ex: Thruster, Size 10, Short Body Style, Composite Bushings, 1 inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-055	OSAK-057	OSAK-059	1,2,3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-056	OSAK-058	OSAK-060	1
Urethane Bumper/Clamp Collar Kit (-10M)	OSAK-065			1
Urethane Bumper/Clamp Collar Kit (-12M)		OSAK-066		1
Shock Absorber*	SHOK-028	SHOK-010	SHOK-010	1,2,3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	DLT-1023	1,2,3 or 4

INDUCTIVE SENSOR ACCESSORIES†

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	OISN-011	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**†

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	OHSN-017	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

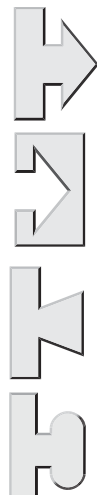
	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
1/8 NPT Telescopic Airlines (up to 2")	OTAL-037	OTAL-037	OTAL-037	1,2,3 or 4
1/8 NPT Telescopic Airlines (up to 3")	OTAL-038	OTAL-038	OTAL-038	1,2,3 or 4
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	VLVF-007	1 or 2
G1/8 Telescopic Airlines (up to 50mm)	OTAL-043	OTAL-043	OTAL-043	1,2,3 or 4
G1/8 Telescopic Airlines (up to 80mm)	OTAL-044	OTAL-044	OTAL-044	1,2,3 or 4
M5 Adjustable Flow Control	VLVF-008	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-100	SLKT-102	SLKT-102	1
Viton® Cylinder Seal Repair Kit	SLKT-100V	SLKT-102V	SLKT-102V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

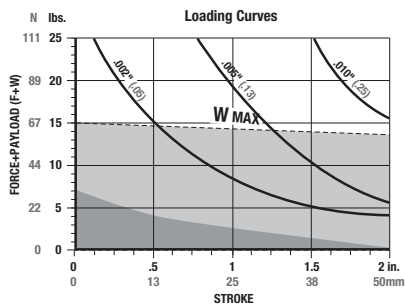
DIRECTCONNECT



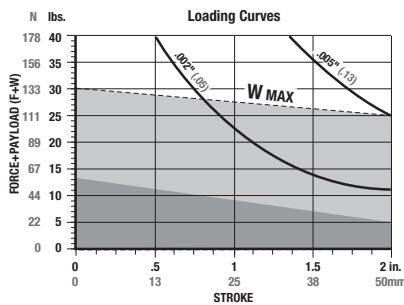
SHORT BODY THRUSTER DLT-10M, 12M, 16M -E BUILT-IN REPAIRABLE CYLINDER



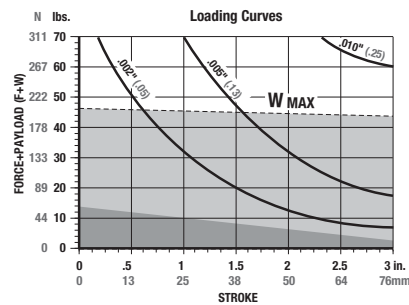
DLT-10M-E



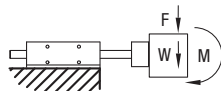
DLT-12M-E



DLT-16M-E



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use Single Shock in both directions

W in this range use Urethane Bumpers

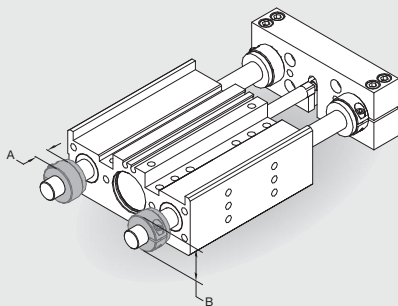
Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-10	DLT-10M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	35 lbs.	155 N
Weight (Basic Unit).....	1.87 lbs.	.84 kg
Additional Weight per Stroke ..	0.08 lbs./in.	1.5g/mm
Cylinder Bore Diameter	3/4"	19mm
Shaft Diameter	0.375"	9.5mm

Specifications	DLT-12	DLT-12M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	62 lbs.	275 N
Weight (Basic Unit).....	2.98 lbs.	1.35 kg
Additional Weight per Stroke ..	0.12 lbs./in.	2.2g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.472"	12mm

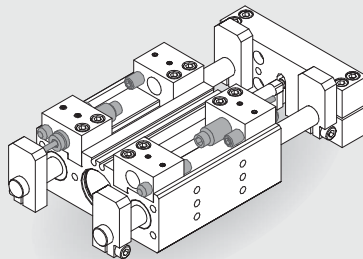
Specifications	DLT-16	DLT-16M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar..	62 lbs.	275 N
Weight (Basic Unit).....	4.56 lbs.	2.07 kg
Additional Weight per Stroke ..	0.20 lbs./in.	3.5g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.630"	16mm

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

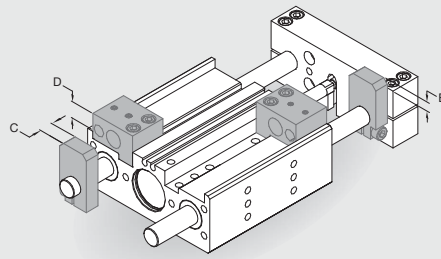


Adjustable Hard Stops

- For precision (+/- .001") end point positioning
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

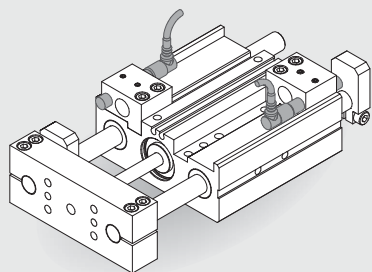
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Allen wrench adjustable



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

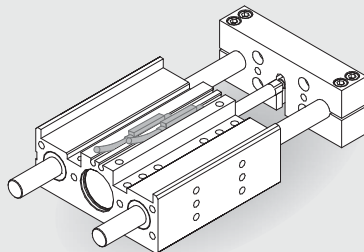


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

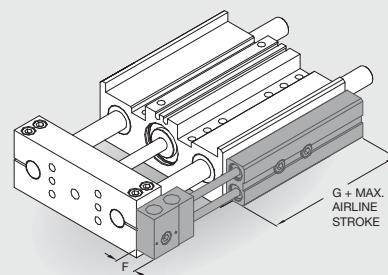


Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

	A	B	C	D	E	F	G
DLT-10	.343"	.87	.375	.480	.320	.577	3.60
DLT-12	.375"	.94	.375	.450	.230	.577	3.60
DLT-16	.437"	1.31	.437	.450	.340	.577	3.60
DLT-10M	8.7mm	22.1	9.5	12.2	8.1	14.7	91.4
DLT-12M	9.5mm	23.9	9.5	11.4	5.8	14.7	91.4
DLT-16M	11.1mm	33.3	11.1	11.4	8.6	14.7	91.4

DLT SERIES

4.45

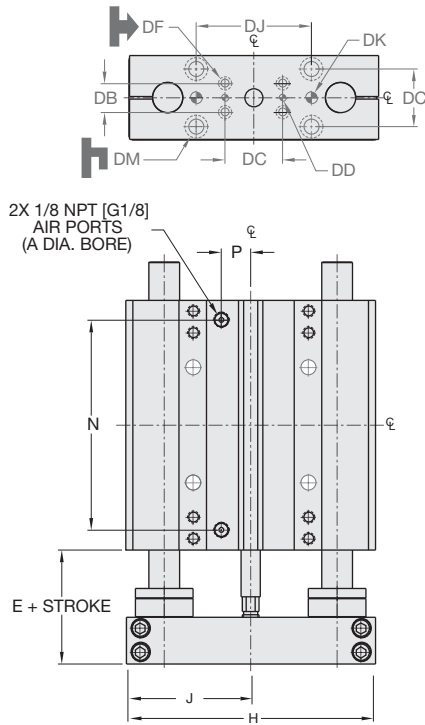


SHORT BODY THRUSTER DLT -20M, 25M -E BUILT-IN REPAIRABLE CYLINDER

DLT SERIES

DLT SERIES

4.46



2X 1/8 NPT [G1/8]
AIR PORTS
(A DIA. BORE)

RETRACT ADJUSTMENT
BUMPERS & COLLARS
STANDARD

UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	3/8 -16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 1/8	Clearance for M10

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.									
	A	B	C	E	F	G	H	J	K	L	M	N	P	S
DLT-20	1/2	6.50	.787	1.960	2.20	.960	6.480	3.230	2.180	1.080	1.210	5.47	.77	4.300
DLT-25	1/2	7.50	.984	2.170	2.20	1.170	7.480	3.730	2.180	1.080	1.420	6.47	.77	5.250
DLT-20M	38	165.1	20	49.8	55.9	24.4	164.6	82.0	55.4	27.4	30.7	138.9	19.5	114.30
DLT-25M	38	190.5	25	55.1	55.9	29.7	190.0	94.7	55.4	27.4	36.1	164.3	19.5	133.35

How to Order: Basic Unit

BASIC MODEL METRIC STYLE STROKE SHAFTING



- SIZE** 20, 25
- METRIC** M
- STYLE** E Short body thruster with built-in repairable cylinder
- BEARING** B Linear ball bearings
C Composite bushings
- STROKE** (inches)
DLT-20 1-4 @ 1" increments
DLT-25 1-5 @ 1" increments
Custom strokes available. Please consult factory.
- STROKE** (mm)
DLT-20M 25, 50, 75, 100
DLT-25M 25, 50, 75, 100, 125
- VITON®** V Viton® seals
- SHAFTING** S Corrosion resistant shafting

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-20M	DLT-25M	QTY/THRUSTER
Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-061	OSAK-063	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-062	OSAK-064	1
Shock Absorber (adjustable dampening)*	SHOK-029	SHOK-029	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES**†

Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	1 or 2
Quick. Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick. Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

1/8 NPT Telescopic Airlines (up to 4")	OTAL-049	OTAL-049	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 5")	OTAL-050	OTAL-050	1, 2, 3 or 4
1/8 NPT Adjustable Flow Control	VLVF-004	VLVF-004	1 or 2
G1/8 Telescopic Airlines (up to 100mm)	OTAL-051	OTAL-051	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 125mm)	OTAL-052	OTAL-052	1, 2, 3 or 4
G1/8 Adjustable Flow Control	VLVF-005	VLVF-005	1 or 2
Cylinder Seal Repair Kit	SLKT-104	SLKT-104	1
Viton® Cylinder Seal Repair Kit	SLKT-104V	SLKT-104V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

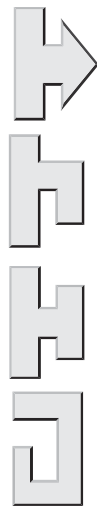
SAMPLE ORDER: DLT-20-E-B-4-V

Ex: Thruster, Size 20, Short Body Style, Linear Ball Bushings, 4 Inch Stroke, Viton® Seals

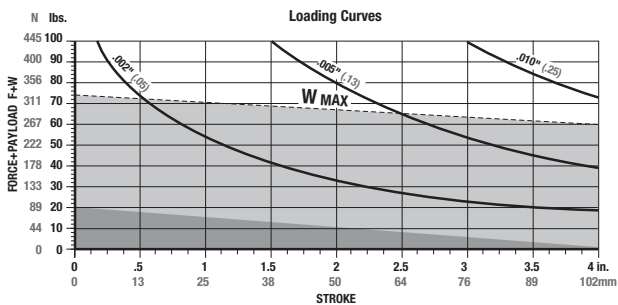
DIRECTCONNECT



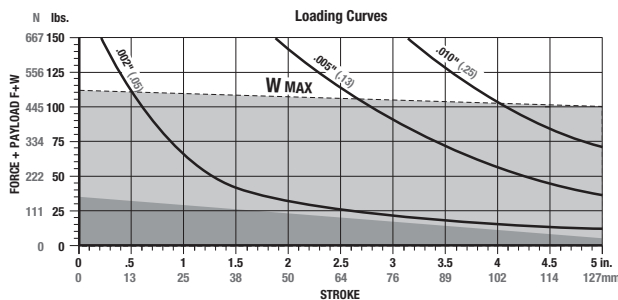
SHORT BODY THRUSTER DLT -20M, 25M -E BUILT-IN REPAIRABLE CYLINDER



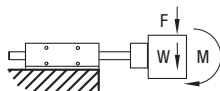
DLT-20M-E



DLT-25M-E



F—Externally applied force (lbs. or N)
W—Weight of payload (lbs. or N)
F+W—Total force (lbs. or N)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in both directions

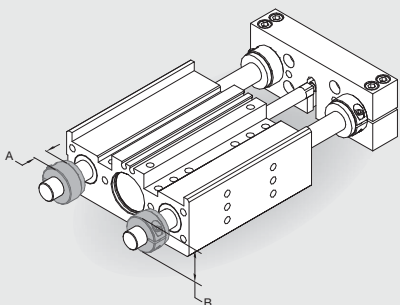
(W) in this range use **Urethane Bumpers**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	11.6 lbs.	5.2 kg
Additional Weight per Stroke	0.31 lbs./in.	5.5g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.787"	20mm

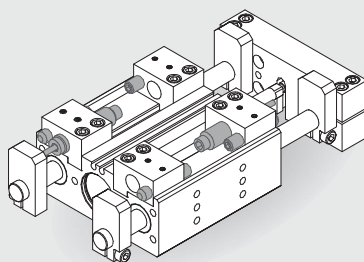
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	16.4 lbs.	7.42 kg
Additional Weight per Stroke	0.47 lbs./in.	8.4g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.984"	25mm

Accessory Mounting Technical Data (For detailed information refer to option specification pages at end of catalog)



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

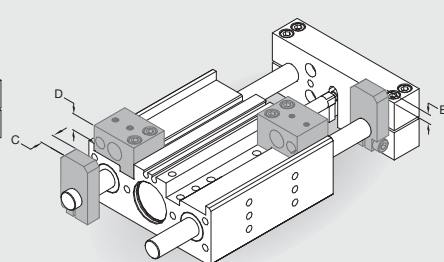


Adjustable Hard Stops

- For precision (+/- .001") end point positioning
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

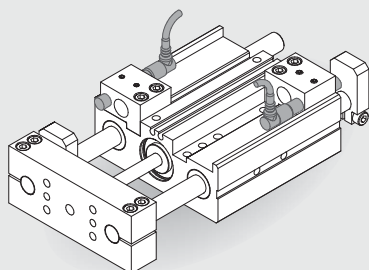
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable
- Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

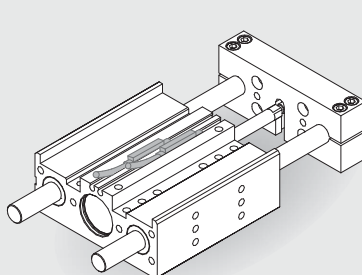


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

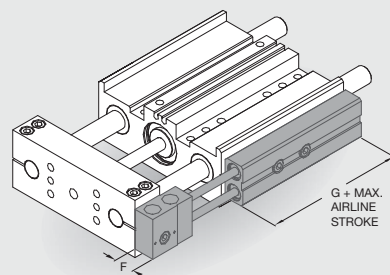
Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length



Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Built-in LED output
- PNP and NPN available
- Quick disconnect cable
- Low profile



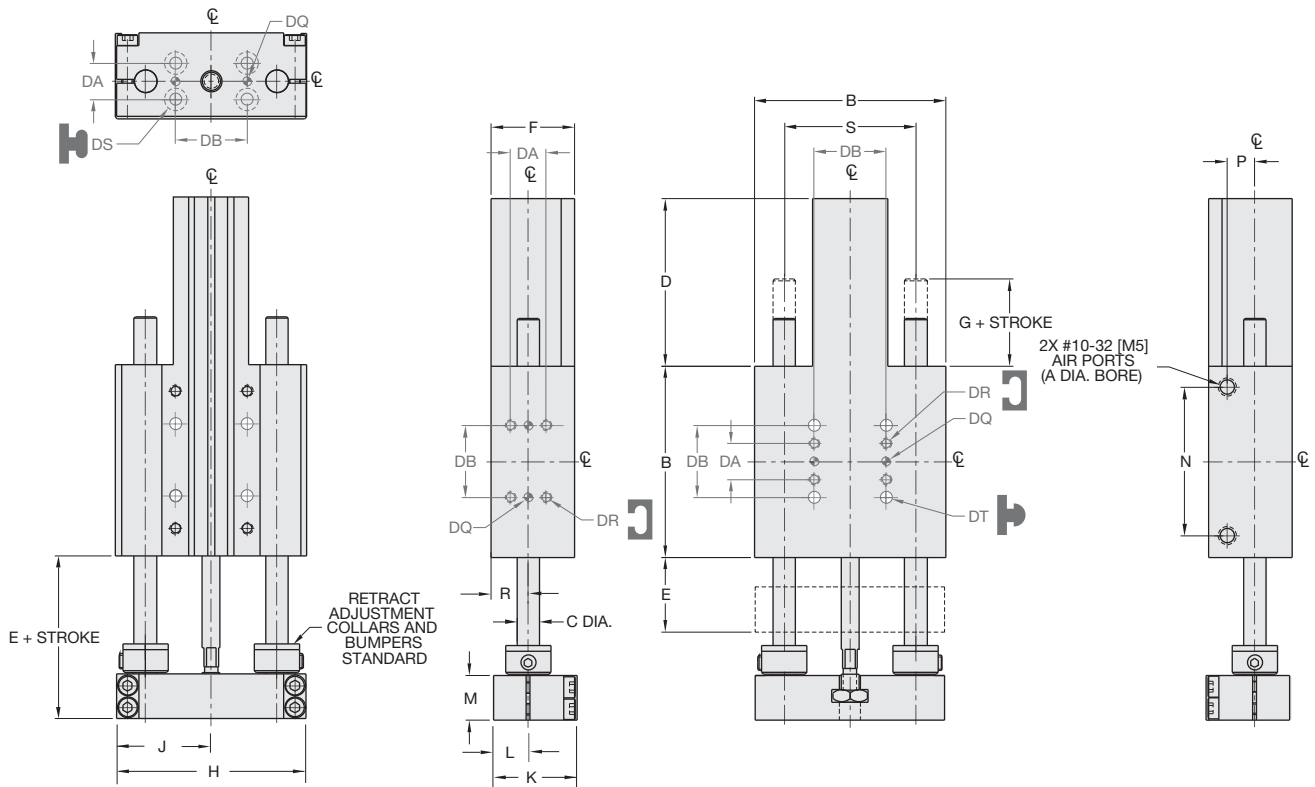
Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

	A	B	C	D	E	F	G
DLT-20	.500"	1.50	.500	.92	.67	.577	3.60
DLT-25	.500"	1.75	.500	.92	.67	.577	3.60
DLT-20M	12.7mm	38.1	12.7	22.4	17.0	14.7	91.4
DLT-25M	12.7mm	44.5	12.7	22.4	17.0	14.7	91.4

DLT SERIES
4.47
DIRECTCONNECT™

LONG BODY THRUSTER DLT-06M, 08M -L BUILT-IN REPAIRABLE CYLINDER



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or ±.013mm	Metric Threads Course Pitch	Imperial in. 0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	Metric [mm] [0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]
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DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

MODEL #	BORE DIA.		BODY SIZE		SHAFT DIA.		BASIC UNIT DIMENSIONS													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S				
DLT-06	0.563	2.00	0.236	1.75	0.783	0.88	0.66	1.980	.990	0.875	.365	0.470	1.55	0.21	.390	1.375				
DLT-08	0.563	2.50	0.315	1.75	0.783	0.88	0.41	2.470	1.235	0.875	.365	0.470	2.05	0.21	.390	1.750				
DLT-06M	14	50.8	6.0	44.4	19.9	22.4	16.8	50.3	25.1	22.2	9.3	11.9	39.4	5.4	9.9	34.93				
DLT-08M	14	63.5	8.0	44.4	19.9	22.4	10.4	62.7	31.0	22.2	9.3	11.9	52.1	5.4	9.9	44.45				

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DQ	.0940 x .078 DP	3H7 x 2 DP
DR	#4-40 x .25 DP	M3 x 6 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3
DT	Clr & C'bore for #4	Clr & C'bore for M3

How to Order: Basic Unit

BASIC MODEL METRIC STYLE STROKE SHAFTING

DLT - **M** - **L** - **C** - - **V** - **S**

SIZE BEARING VITON® SEALS

SIZE **06, 08**

METRIC **M**

STYLE **L** Long body thruster with built-in repairable cylinder

BEARING **C** Composite bushings

STROKE (inches)
DLT-06 **.5, 1, 1.5, 2, 2.5, 3,** Custom strokes available.
DLT-08 **.5, 1, 1.5, 2, 2.5, 3, 3.5** Please consult factory.

STROKE (mm)
DLT-06M **12, 25, 40, 50, 65, 75**
DLT-08M **12, 25, 40, 50, 65, 75, 85**

VITON® **V** Viton® seals

SHAFTING **S** Corrosion resistant shafting

SAMPLE ORDER: DLT-06-M-L-C-50-V

Ex: Thruster, Size 06, Metric, Long Body Style, Composite Bushings, 50mm Stroke, Viton® Seals

Accessories: (Order Separately)

DLT-06M DLT-08M QTY/THRUSTER

SHOCK/STOP ACCESSORIES

Universal Mounting Kit (Shock or Stop)	OSAK-069	OSAK-070	1, 2, 3, or 4
Shock Absorber (2 Max. on -06)*	SHOK-030	SHOK-030	1, 2, 3, or 4
Adjustable Hard Stop*	DLT-0623	DLT-0623	1, 2, 3, or 4
Urethane Bumper/Stop Collar Kit	OSAK-067	OSAK-068	1

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor Mounting Kit	OSMK-076	OSMK-077	1 or 2
Inductive Sensor PNP Qk. Disconnect**	OISP-014	OISP-014	1 or 2
Inductive Sensor NPN Qk. Disconnect**	OISN-014	OISN-014	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

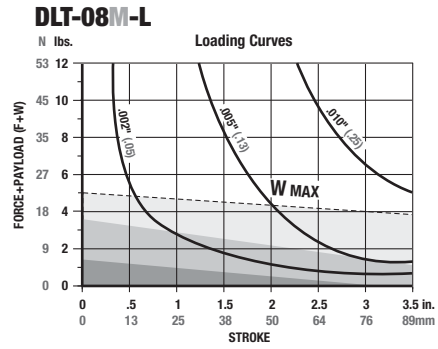
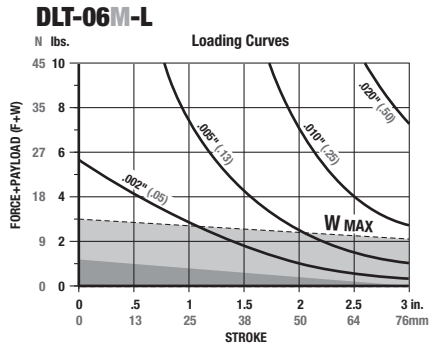
MAGNETIC SENSOR ACCESSORIES**†

Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

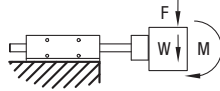
PNEUMATIC ACCESSORIES

#10-32 Adjustable Flow Control (Imperial)	VLVF-007	VLVF-007	1 or 2
M5 Adjustable Flow Control (Metric)	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-108	SLKT-108	1
Viton® Cylinder Seal Repair Kit	SLKT-108V	SLKT-108V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total deflection force (lbs. or N)
M=Maximum moment (in.-lb. or N-m)



Shock Absorbers and Flow Controls are recommended for nearly all applications

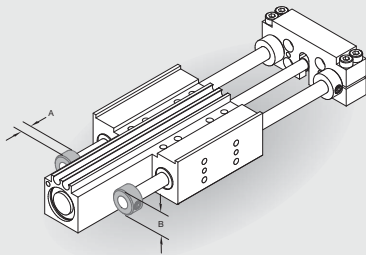
Use **Double Shocks** in both directions Use **Single Shock** in both directions Use **Bumpers or Cushioned Cylinder**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-06	DLT-06M
Maximum Air Pressure.....	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	0.61 lbs.	0.28 kg
Cylinder Bore Diameter	0.563"	14.3 mm
Shaft Diameter	0.236"	6 mm
Max (M) Vertical Motion	5 in.-lbs.	0.6 N-m

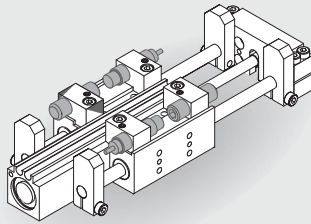
Specifications	DLT-08	DLT-08M
Maximum Air Pressure.....	100 psi	7 bar
Thrust Force @ 80psi/5.5bar	20 lbs.	89 N
Weight (Basic Unit)	0.96 lbs.	0.44 kg
Cylinder Bore Diameter	0.563"	14.3 mm
Shaft Diameter	0.315"	8.0 mm
Max (M) Vertical Motion	10 in.-lbs.	1.3 N-m

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

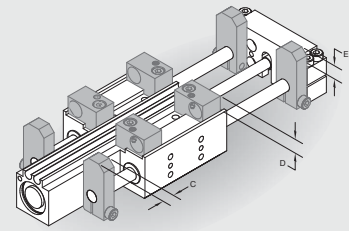


Adjustable Hard Stops

- For precision (+/- .001") end point positioning of retract position
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

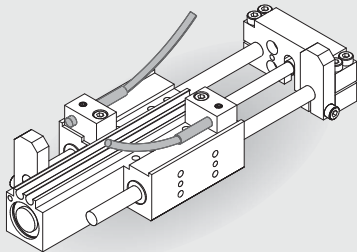
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable
- Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber or (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited retract stroke adjustment (no extend position adjustment). Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

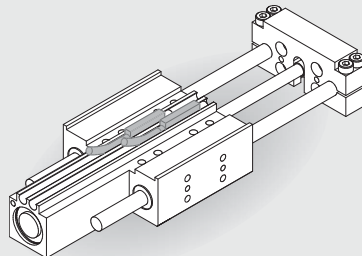


Inductive Proximity Sensors

- 4mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

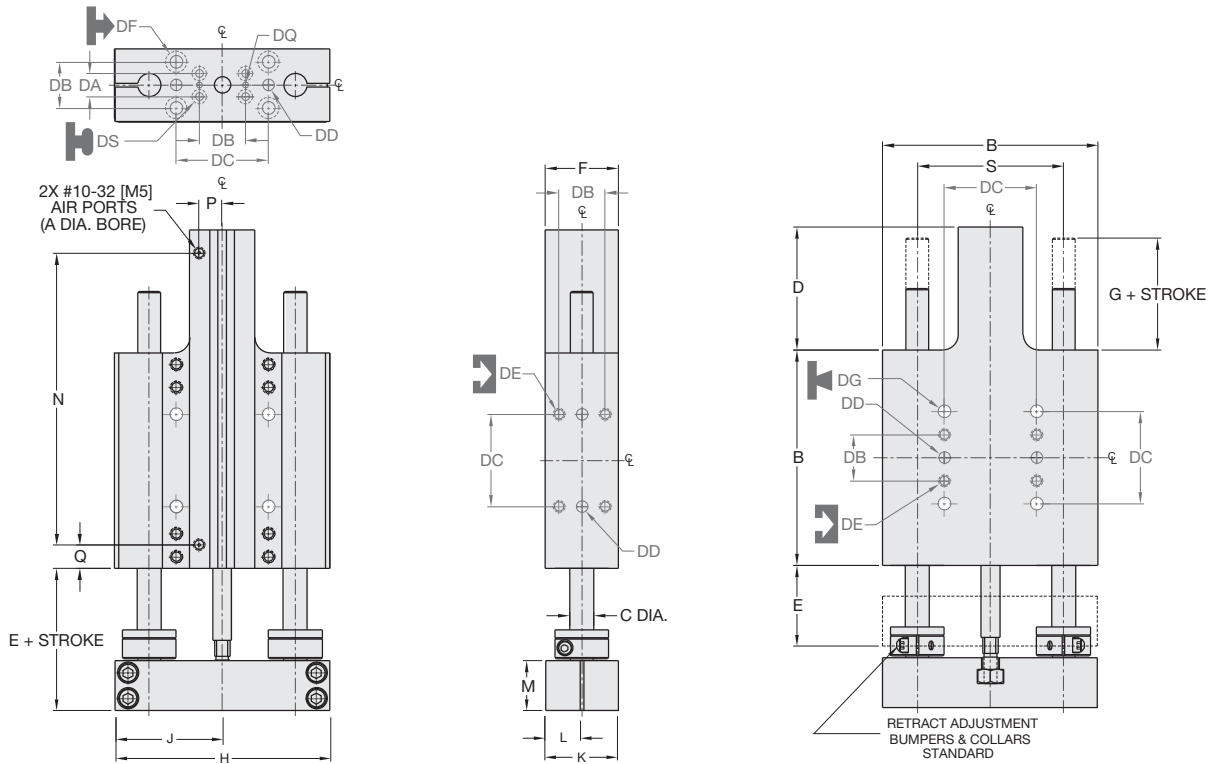
	A	B	C	D	E
DLT-06	.236"	.47	.250	.31	.27
DLT-08	.236"	.63	.250	.31	.27
DLT-06M	6.0 mm	12.0	6.4	7.9	6.9
DLT-08M	6.0 mm	16.0	6.4	7.9	6.9

LONG BODY THRUSTER DLT-10M, 12M, 16M -L BUILT-IN REPAIRABLE CYLINDER

DLT SERIES

4.50

DIRECTCONNECT



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

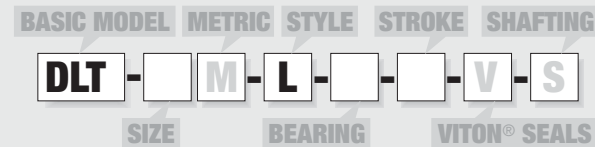
				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

DIRECTCONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DA	.375	9.5
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25 DP	5mm H7 x 6 DP
DE	#10-32 x .34 DP	M5 x 8.5 DP
DF	Clearance for #10	Clearance for M5
DG	Clearance for #10	Clearance for M5
DQ	.0940 x .078 DP	3H7 x 2 DP
DS	Clr & C'bore for #4	Clr & C'bore for M3

MODEL #	BORE DIA.			BASIC UNIT DIMENSIONS												
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S
DLT-10	.75	3.50	.375	2.00	1.313	1.19	0.82	3.490	1.740	1.178	.584	.813	4.75	0.38	0.38	2.375
DLT-12	1	4.00	.472	2.50	1.313	1.63	0.82	3.985	1.985	1.615	.802	.813	5.78	0.37	0.36	2.750
DLT-16	1	4.75	.630	2.75	1.375	1.63	0.76	4.735	2.360	1.615	.802	.813	6.78	0.37	0.36	3.250
DLT-10M	19	88.9	9.5	50.8	33.4	30.2	20.8	88.6	44.2	29.9	14.8	20.7	120.7	9.6	9.6	60.33
DLT-12M	25	101.6	12.0	63.5	33.4	41.4	20.8	101.2	50.4	41.0	20.4	20.7	146.8	9.4	9.1	69.85
DLT-16M	25	120.7	16.0	69.9	34.9	41.4	19.3	120.3	59.9	41.0	20.4	20.7	172.2	9.4	9.1	82.55

How to Order: Basic Unit



- SIZE** 10, 12, 16
- METRIC** M
- STYLE** L Long body thruster with built-in repairable cylinder
- BEARING** B Linear ball bearings
C Composite bushings
- STROKE** (inches)
DLT-10 1-4 @ 1" increments
DLT-12 1-5 @ 1" increments
DLT-16 1-6 @ 1" increments
Custom strokes available. Please consult factory.
- STROKE** (mm)
DLT-10M 25, 50, 80, 100
DLT-12M 25, 50, 80, 100, 125
DLT-16M 25, 50, 80, 100, 125, 150
- VITON®** V Viton® seals
- SHAFTING** S Corrosion resistant shafting

SAMPLE ORDER: DLT-10M-L-C-25-V

Ex: Thruster, Size 10 Metric, Long Body Style, Composite Bushings, 25mm Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-055	OSAK-057	OSAK-059	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-056	OSAK-058	OSAK-060	1
Urethane Bumper/Clamp Collar Kit (-10M)	OSAK-065			1
Urethane Bumper/Clamp Collar Kit (-12M)		OSAK-066		1
Shock Absorber*	SHOK-028	SHOK-010	SHOK-010	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES†

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	OISN-011	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES†**

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

	DLT-10M	DLT-12M	DLT-16M	QTY/THRUSTER
1/8 NPT Telescopic Airlines (up to 3")	OTAL-038	OTAL-038	OTAL-038	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 6")	OTAL-039	OTAL-039	OTAL-039	1, 2, 3 or 4
#10-32 Adjustable Flow Control	VLVF-007	VLVF-007	VLVF-007	1 or 2
G1/8 Telescopic Airlines (up to 80mm)	OTAL-044	OTAL-044	OTAL-044	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 160mm)	OTAL-045	OTAL-045	OTAL-045	1, 2, 3 or 4
M5 Adjustable Flow Control	VLVF-008	VLVF-008	VLVF-008	1 or 2
Cylinder Seal Repair Kit	SLKT-100	SLKT-102	SLKT-102	1
Viton® Cylinder Seal Repair Kit	SLKT-100V	SLKT-102V	SLKT-102V	1

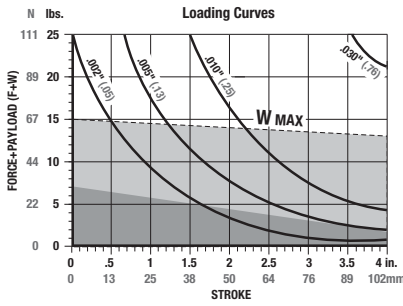
*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard



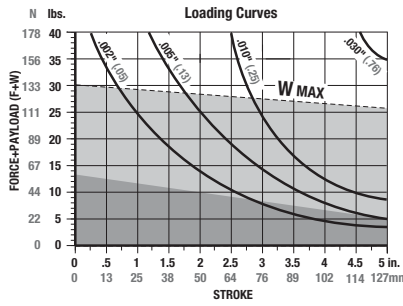
LONG BODY THRUSTER DLT-10M, 12M, 16M -L BUILT-IN REPAIRABLE CYLINDER



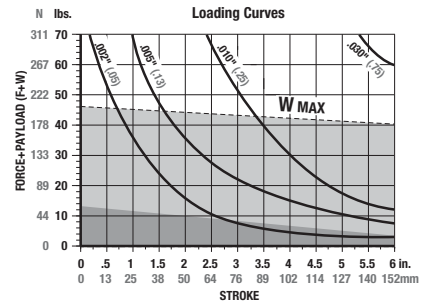
DLT-10M-L



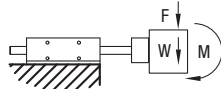
DLT-12M-L



DLT-16M-L



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use Single Shock in both directions

W in this range use Urethane Bumpers

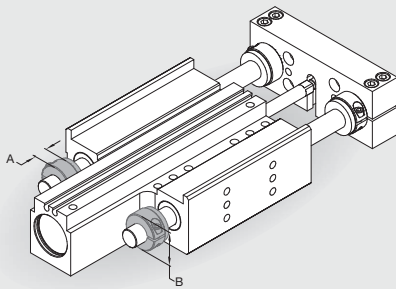
Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-10	DLT-10M
Maximum Air Pressure.....	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar.....	35 lbs.	155 N
Weight (Basic Unit).....	1.95 lbs.	0.88 kg
Additional Weight per Stroke..	0.08 lbs./in.	1.4g/mm
Cylinder Bore Diameter	3/4"	19mm
Shaft Diameter	0.375"	9.5mm

Specifications	DLT-12	DLT-12M
Maximum Air Pressure.....	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar.....	62 lbs.	275 N
Weight (Basic Unit).....	3.21 lbs.	1.46 kg
Additional Weight per Stroke ...	0.12 lbs./in.	2.2g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.472"	12mm

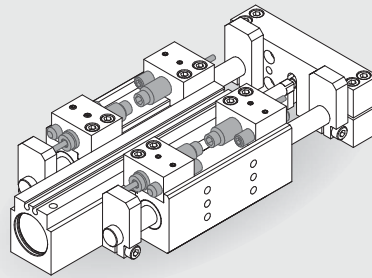
Specifications	DLT-16	DLT-16M
Maximum Air Pressure.....	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar.....	62 lbs.	275 N
Weight (Basic Unit).....	4.81 lbs.	2.03 kg
Additional Weight per Stroke ...	0.20 lbs./in.	3.5g/mm
Cylinder Bore Diameter	1"	25mm
Shaft Diameter	0.630"	16mm

Accessory Mounting Technical Data



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for extend (kit for retract comes standard)

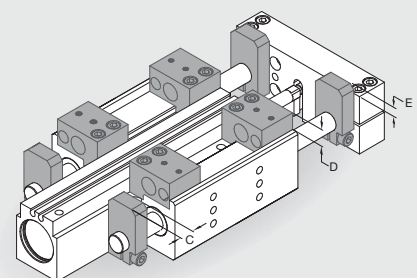


Adjustable Hard Stops

- For precision (+/- .001") end point positioning
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

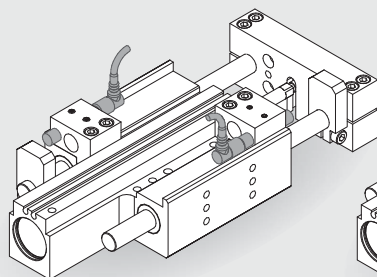
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Allen wrench adjustable



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes (1) Mounting Bracket, (1) Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

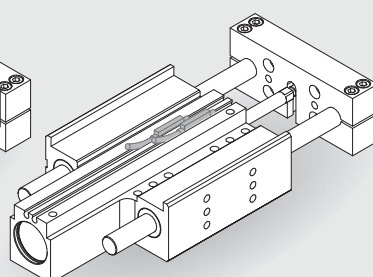


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

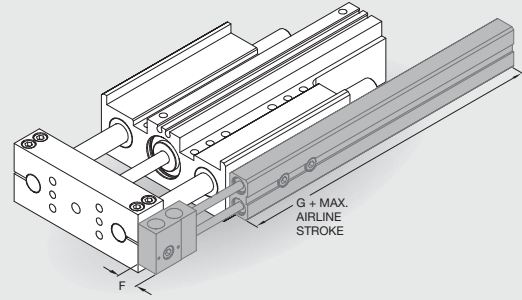


Magneto Resistive Sensors

- No mounting kit required (slot mounted)
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



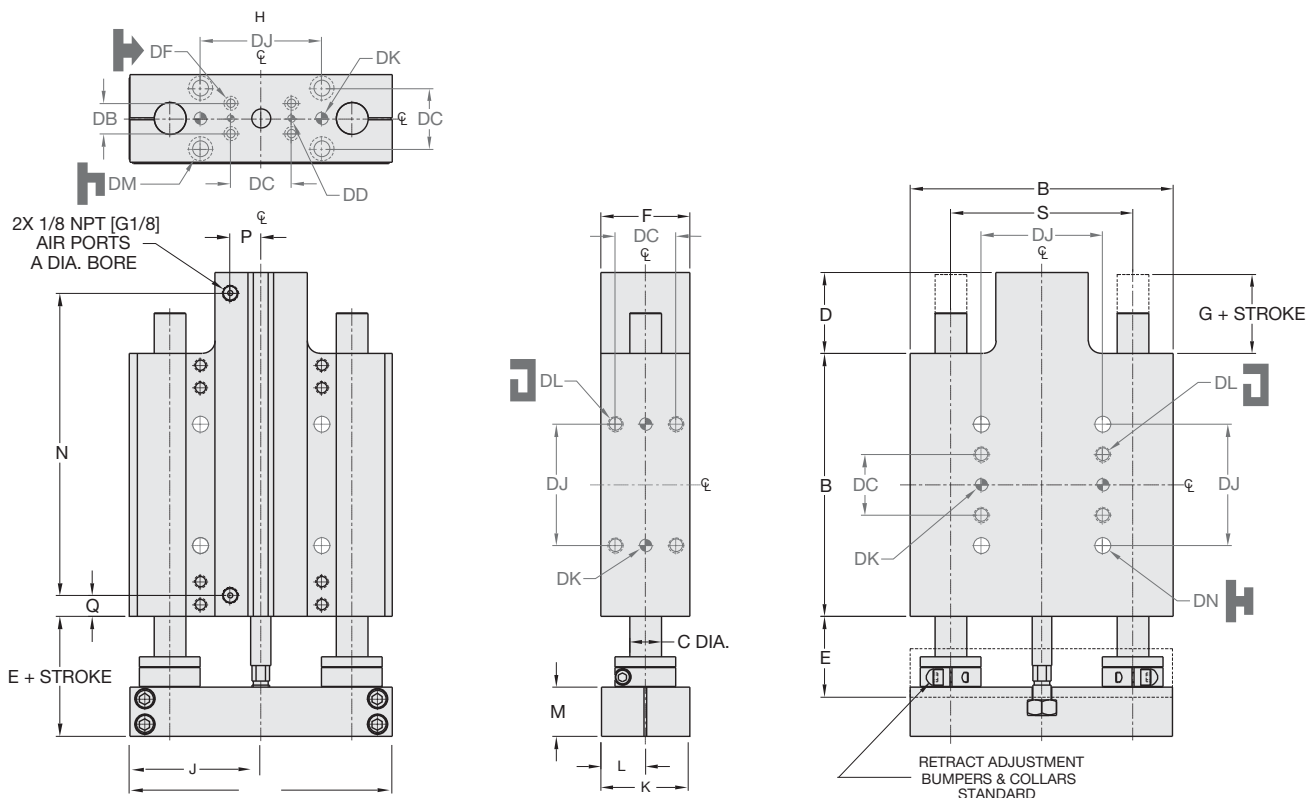
Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

	A	B	C	D	E	F	G
DLT-10	.343"	.87	.375	.480	.320	.577	3.60
DLT-12	.375"	.95	.375	.450	.230	.577	3.60
DLT-16	.437"	1.31	.437	.450	.340	.577	3.60
DLT-10M	8.7mm	22.1	9.5	12.2	8.1	14.7	91.4
DLT-12M	9.5mm	23.9	9.5	11.4	5.8	14.7	91.4
DLT-16M	11.1mm	33.3	11.1	11.4	8.6	14.7	91.4

LONG BODY THRUSTER DLT-20M, 25M -L BUILT-IN REPAIRABLE CYLINDER

DLT SERIES



UNLESS OTHERWISE NOTED ALL TOLERANCES ARE AS SHOWN BELOW

				Imperial in.	Metric [mm]
Dimensions are symmetrical about centerline	Third Angle Projection	All Dowel Holes are SF (Slip Fit). Locational Tolerance ±.0005" or [±.013mm]	Metric Threads Course Pitch	0.00 = ±.01 0.000 = ±.005 0.0000 = ±.0005	[0.] = [±.25] [0.0] = [±.13] [0.00] = [±.013]

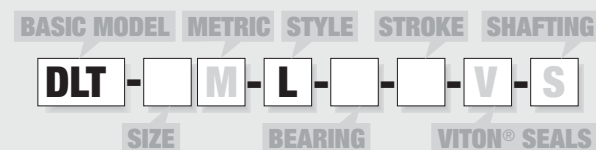
4.52

DIRECT CONNECT DIMENSIONS STANDARD MOUNTING PATTERN FOR ALL SIZES

	Imperial (inches)	Metric (mm)
DB	.750	19.1
DC	1.500	38.1
DD	.1880 x .25DP	5mm H7 x 6DP
DF	Clearance for #10	Clearance for M5
DJ	3.000	76.2
DK	.3130 x .37 DP	8mm H7 x 9.4 DP
DL	1/8 -16 x .56 DP	M10 x 14.2 DP
DM	Clearance for 3/8	Clearance for M10
DN	Clearance for 1/8	Clearance for M10

MODEL #	BORE DIA.		BODY SIZE										SHAFT DIA.			
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	S
DLT-20	1/2	6.50	.787	2.00	1.960	2.20	.960	6.480	3.230	2.180	1.080	1.210	7.469	.77	.52	4.500
DLT-25	1/2	7.50	.984	2.00	2.170	2.20	1.170	7.480	3.730	2.180	1.080	1.420	8.468	.77	.52	5.250
DLT-20M	38	165.1	20	50.8	49.8	55.9	24.4	164.6	82.0	55.4	27.4	30.7	189.7	19.4	13.1	114.30
DLT-25M	38	190.5	25	50.8	55.1	55.9	29.7	190.0	94.7	55.4	27.4	36.1	215.1	19.4	13.1	133.35

How to Order: Basic Unit



- SIZE 20, 25**
- METRIC M**
- STYLE L** Long body thruster with built-in repairable cylinder
- BEARING B** Linear ball bearings
C Composite bushings
- STROKE (inches)**
DLT-20 **1-6** @ 1" increments
DLT-25 **1-7** @ 1" increments
Custom strokes available. Please consult factory.
- STROKE (mm)**
DLT-20M **25, 50, 75, 100, 125, 160**
DLT-25M **25, 50, 75, 100, 125, 160, 175**
- VITON® V** Viton® seals
- SHAFTING S** Corrosion resistant shafting

SAMPLE ORDER: DLT-20-L-B-2-V

Ex: Thruster, Size 20, Long Body Style, Linear Ball Bushings, 2 Inch Stroke, Viton® Seals

Accessories: (Order Separately)

SHOCK/STOP ACCESSORIES

	DLT-20M	DLT-25M	QTY/THRUSTER
Universal Mounting Kit (Shock, Stop or Sensor)	OSAK-061	OSAK-063	1, 2, 3 or 4
Urethane Bumper/Clamp Collar Kit	OSAK-062	OSAK-064	1
Shock Absorber (adjustable dampening)*	SHOK-029	SHOK-029	1, 2, 3 or 4
Adjustable Hard Stop*	DLT-1023	DLT-1023	1, 2, 3 or 4

INDUCTIVE SENSOR ACCESSORIES†

Inductive Sensor PNP Qk. Disconnect*	OISP-011	OISP-011	1 or 2
Inductive Sensor NPN Qk. Disconnect*	OISN-011	OISN-011	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

MAGNETIC SENSOR ACCESSORIES†**

Magneto Resistive Sensor PNP Qk. Disc.†	OHSP-017	OHSP-017	1 or 2
Magneto Resistive Sensor NPN Qk. Disc.†	OHSN-017	OHSN-017	1 or 2
Quick Disconnect 2M Cable Length †	CABL-010	CABL-010	1 or 2
Quick Disconnect 5M Cable Length †	CABL-013	CABL-013	1 or 2

PNEUMATIC ACCESSORIES

1/8 NPT Telescopic Airlines (up to 6")	OTAL-039	OTAL-039	1, 2, 3 or 4
1/8 NPT Telescopic Airlines (up to 12")	OTAL-040	OTAL-040	1, 2, 3 or 4
1/8 NPT Adjustable Flow Control	VLVF-004	VLVF-004	1 or 2
G1/8 Telescopic Airlines (up to 160mm)	OTAL-045	OTAL-045	1, 2, 3 or 4
G1/8 Telescopic Airlines (up to 300mm)	OTAL-046	OTAL-046	1, 2, 3 or 4
G1/8 Adjustable Flow Control	VLVF-005	VLVF-005	1 or 2
Cylinder Seal Repair Kit	SLKT-104	SLKT-104	1
Viton® Cylinder Seal Repair Kit	SLKT-104V	SLKT-104V	1

*Requires Universal Mounting Kit †Sensor and cable sold separately **Piston magnet standard

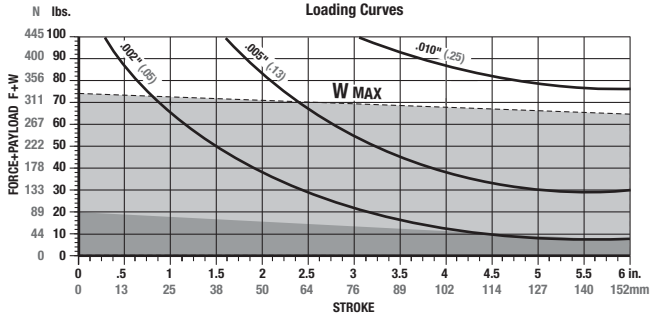
DIRECTCONNECT



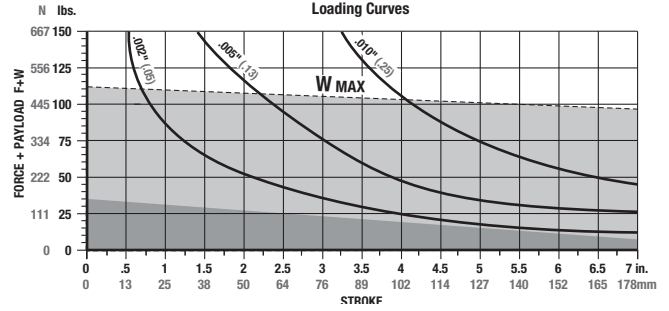
LONG BODY THRUSTER DLT-20M, 25M -L BUILT-IN REPAIRABLE CYLINDER



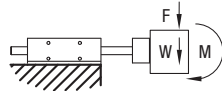
DLT-20M-L



DLT-25M-L



F=Externally applied force (lbs. or N)
W=Weight of payload (lbs. or N)
F+W=Total force (lbs. or N)



Shock Absorbers and Flow Controls are recommended for nearly all applications

(W) in this range use **Single Shock** in both directions

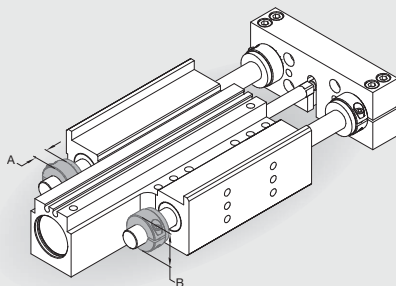
(W) in this range use **Urethane Bumpers**

Shaded shock absorption ranges of horizontal payload (W) @ 80psi, flow controls fully open. For vertical applications do not exceed 1/2 of the recommended payload due to the additional acceleration effect of gravity.

Specifications	DLT-20	DLT-20M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	12.0 lbs.	5.5 kg
Additional Weight per Stroke	0.31 lbs./in.	5.5g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.787"	20mm

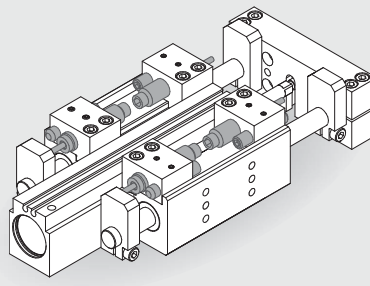
Specifications	DLT-25	DLT-25M
Maximum Air Pressure	100 psi	6.9 bar
Thrust Force @ 80psi/5.5bar	140 lbs.	622 N
Weight (Basic Unit)	17.4 lbs.	7.9 kg
Additional Weight per Stroke	0.47 lbs./in.	8.4g/mm
Cylinder Bore Diameter	1-1/2"	38mm
Shaft Diameter	0.984"	25mm

Accessory Mounting Technical Data (For detailed information refer to option specification pages at end of catalog)



Urethane Bumpers & Clamp Collars

- Urethane Bumpers for shock absorption and noise dampening
- Adjustable Clamp Collars for end of stroke position adjustment
- Kit contains (2) Collars and (2) Shock Pads for adjustment of travel in one direction
- (1) Kit required for retract (kit for extend standard)

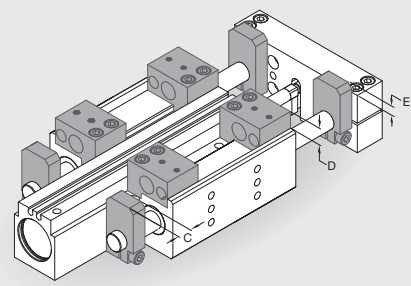


Adjustable Hard Stops

- For precision (+/- .001") end point positioning
- Allows for end stop position adjustment independent of shock absorber hard stop
- Allen wrench adjustable

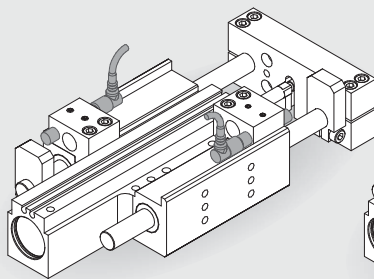
Shock Absorbers

- Full stroking piston rod
- Built-in hard stop
- Position adjustable
- Adjustable dampening



Universal Mounting Kit

- Kit mounts (1) Shock Absorber and (1) Inductive Proximity Sensor or (1) Shock and (1) Adjustable Hard Stop
- Kit includes Mounting Bracket, Hardened Tool Steel Target and Hardware
- Target allows for unlimited stroke adjustment. Fine adjustment is achieved using Adjustable Hard Stop or Shock Absorber
- Mounting Bracket keys into body for secure positioning and excellent rigidity
- Four possible mounting positions

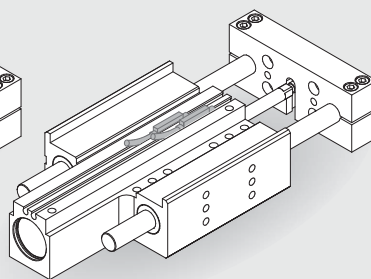


Inductive Proximity Sensors

- 8mm diameter
- Threaded quick disconnect with built-in LED output
- PNP and NPN available

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length

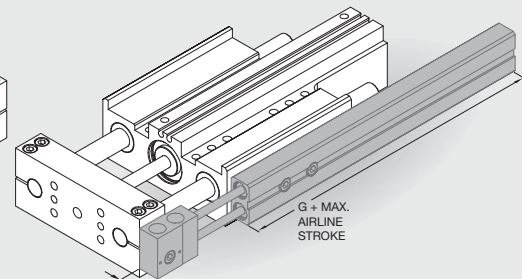


Magneto Resistive Sensors

- No mounting kit required
- Threaded quick disconnect with built-in LED output
- PNP and NPN available
- Low profile

Quick Disconnect Cable

- Threaded coupling with knurled head for secure electrical connections
- 2 meter cable length
- 5 meter cable length



Telescoping Airlines

- Eliminate flexing air lines
- Self aligning air tube design extends useful seal life
- Modular stackable design. Up to (4) modules can be stacked
- 1/8 NPT or G1/8 pipe threads
- (2) user air ports per module

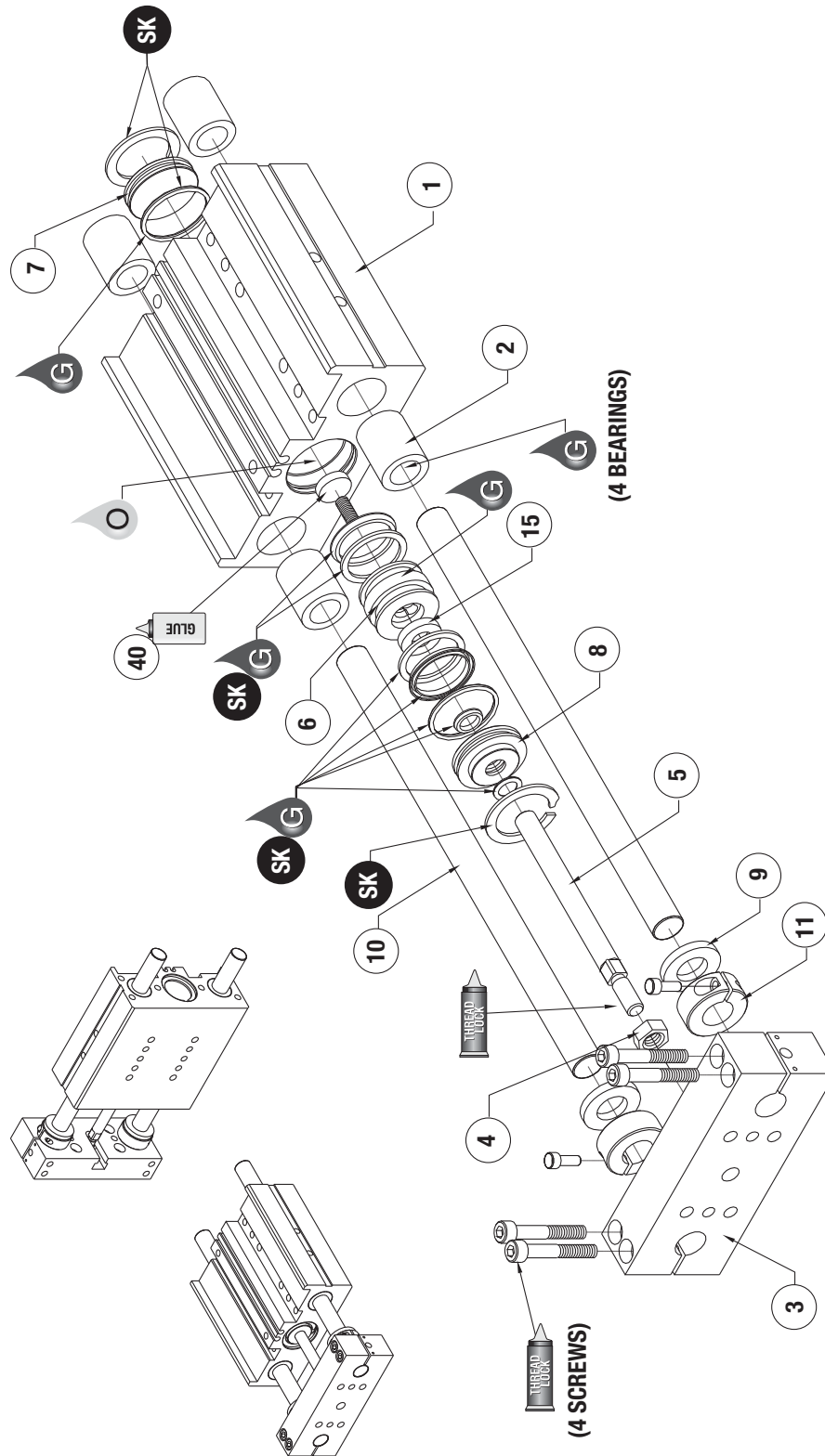
	A	B	C	D	E	F	G
DLT-20	.500"	1.50	.500	.92	.67	.577	3.60
DLT-25	.500"	1.75	.500	.92	.67	.577	3.60
DLT-20M	12.7mm	38.1	12.7	23.4	17.0	14.7	91.4
DLT-25M	12.7mm	44.5	12.7	23.4	17.0	14.7	91.4

DLT SERIES

4.53

DIRECTCONNECT™

DLT-B, E, L SERIES EXPLODED VIEW



Item	Qty	Name
01	1	Body
02	4	Bushing
03	1	Tooling Plate
04	1	Nut, Stover
05	1	Piston Rod
06	1	Piston
07	1	Cap, Plug End
08	1	Cap, Rod End
09	2	Shock Pad,Urethane
10	1	Guide Shaft
11	2	Collar, Split
15	1	Shock Pad, Urethane
40	1	Magnet

NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.

Assembly Procedure

- 1) Lubricate and install seals.
- 2) Attach piston to piston shaft.
- 3) Install magnet on piston.
- 4) Install plug endcap and retaining ring into body.
- 5) Attach piston, piston shaft, and rod end cap to body and install retainer ring.
- 6) Install bearings and shafts into body.
- 7) Attach shock pads and clamp collars to rod end of shafts.
- 8) Install tool plate on rod end of shafts, and attach cylinder rod to plate.
- 9) Adjust clamp collars and fasten them in desired position.

SK Seal Repair Kit Order #'s See Product Data Sheets

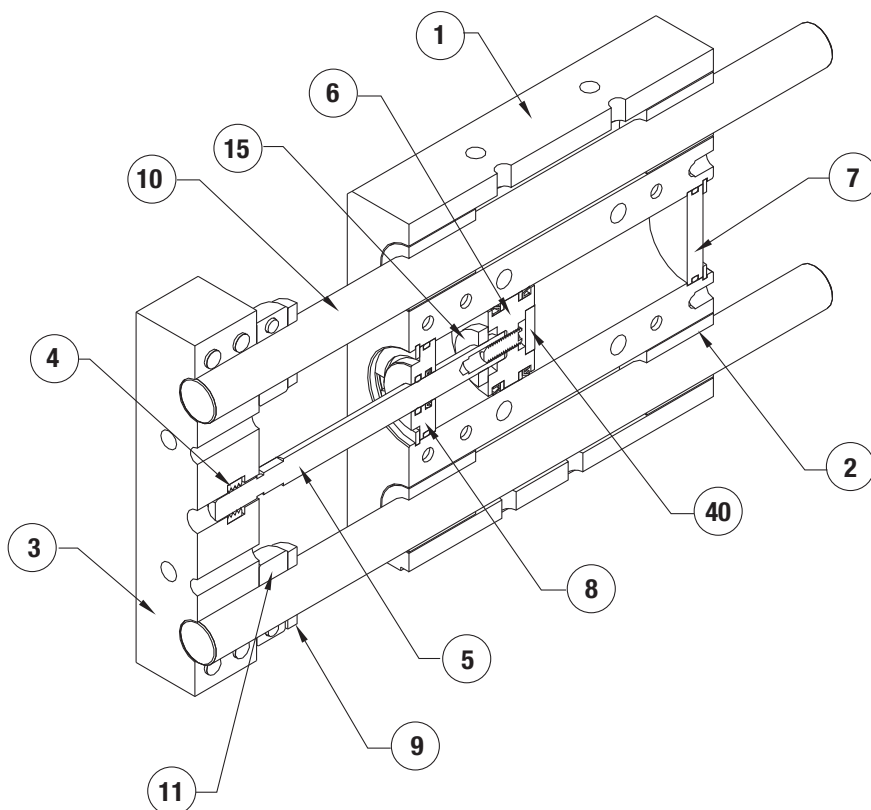
DLT B, E, L
SERIES
MAINTENANCE
4.54

Seal Kit Items	Thread Locker	Krytox™ Lubricant	Lightweight Machine Oil	Teflon™ Based Grease	Super Bonder	Third Angle Projection



DLT-B, E, L SERIES ASSEMBLED VIEW

Item	Qty	Name
01	1	Body
02	4	Bushing
03	1	Tooling Plate
04	1	Nut, Stover
05	1	Piston Rod
06	1	Piston
07	1	Cap, Plug End
08	1	Cap, Rod End
09	2	Shock Pad,Urethane
10	1	Guide Shaft
11	2	Collar, Split
15	1	Shock Pad, Urethane
40	1	Magnet



NOTE: Contact the Robohand Sales Department for a complete spare parts list with order numbers and prices.
NOTE: For accessory mounting, see product data sheets

DLT-B, E, L SERIES MAINTENANCE 4.55

Seal Kit Items	Thread Locker	Krytox™ Lubricant	Lightweight Machine Oil	Teflon™ Based Grease	Super Bonder	Third Angle Projection