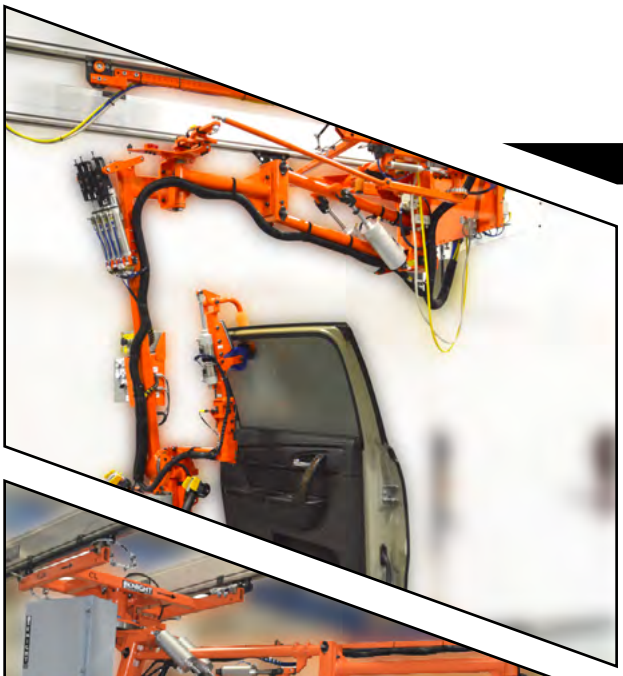
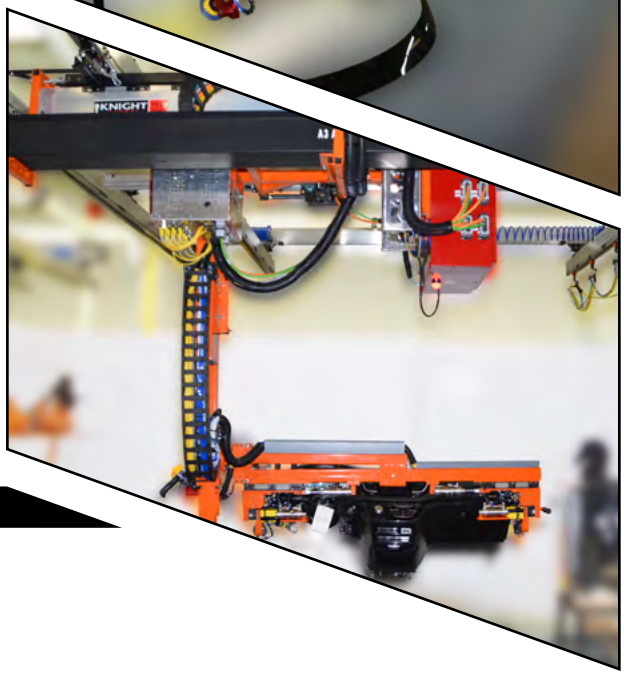
KNIGHT™
GLOBAL

Ergonomic Material Handling Equipment





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KNIGHT™ GLOBAL

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For more detailed information, visit www.knight-ind.com

KNIGHT™ GLOBAL

Knight Global headquarters and facilities is located in Auburn Hills, Michigan. Our turn key ergonomic material handling solutions combine standard and proven product designs with custom development.

Experience: Designing and building ergonomic material handling equipment since 1984.

Design: FEA, Microstation, EPIAN.
State-of-the Art 2D and 3D design software: Includes CATIA, Unigraphics, Solid Works and AutoCAD.

Build: Full CNC, Laser / Plasma / Waterjet Cutting, Robotic Welding Technologies, Paint and Powdercoating Booth.

Controls: Design and build electrical and pneumatic systems in-house for each application.

Service: Stand alone department. Fully trained field service technicians on call 24/7 nationally and internationally.

Quality Assurance: Duty cycle/destructive testing capabilities to conform with industry requirements.

- Ford Q1, ISO9001-2008, ISO14001-2004, CE

Customer Support: National/ International Distributors

Sales Team: Internal and External Sales Force.

Support Staff: Project Management, I.T., Standards,Coordination, Documents/Manuals and Marketing.

We are committed to **Total Customer Satisfaction** through QUALITY, RELIABILITY and EMPLOYEE INVOLVEMENT.

www.knight-ind.com

Servo Systems

Knight Global Servo Hoist Systems are Intelligent Assist Devices (IAD) that provide controlled transfers of workloads with speed, precision, quality and unmatched reliability. The Servos various programmability allows for imparting precision into the applications process.

Knight Servo Hoists enable the operator to precisely locate and/or float a load in the “Z” direction using programmable limits.

Features

- CE Compliant **
- Safety Rating of 125%
- Standard 24 VDC, 2.5 AMPS
- H5 Rated (Continuous Duty Cycle)
- 240 VAC, Single Phase 50/60 Hz
- Illuminated Run/Stop Button
- Programmable Overload Capability
- Fail Safe Braking
- Load Sensing, Pay Load and Handle Load
- Standard Float Mode
- Chain Driven
- Worm Style Gearbox
- Programming/ Diagnostic Communication Ports
- I/O Capabilities (16 In / 8 Out)
- LED Status Indicators
- LED Fault Diagnostics
- Virtual Travel Limits
- Speed Reduction Zones
- Various Chain Lengths
- Active Dampening
- Impact Limiting

** CE compliance is not a standard feature on Knight Global Servo Systems. Please contact us for more details.

Intelligent Assist Devices

Intelligent Assist Devices (IADs) are computer controlled, servo driven tools that enable production workers to lift, move and position payloads quickly, accurately, and with ergonomic safety.

ECO Friendly

Knight Global Servo Systems are environmentally friendly by only consuming as much power as (2) 100watt light bulbs per day and operating on 240VAC.

Ergonomic Safety Advantages

Knight Servo Systems are fully programmable allowing the application to be constantly monitored. Limits can be set to prevent the operator from accidently dropping the load or from crashing the load into the nest when lowering to the set down position.

- Servo handles are load sensor based and do not require the pressing of buttons allowing for the operator to be 100% focused on moving or manipulating the part.
- Sensing will not allow for non-programmed loads to be raised or manipulated.
- Virtual limits can be programmed to prevent any crashes of loads moved into undesirable areas.
- Motion detection ability is available to stop if an operator moves into the path of a Servo Tractor.
- Programmable speeds and limits, to better assist the operator when manipulating a load.

For more detailed information, visit www.knight-ind.com

Single Chain Single Motor

Knight Global’s KSH Series enables an operator to simply grasp the handle and move the load eliminating push buttons. Traditional hoists require the operator to push buttons in order to initiate motion.

The Standard hoist has a lifting capacity of up to 2000 lbs. [907kg] (Reeved Unit) and hoist speeds of up to 241 fpm [73.5mpm].

KSH Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 2,000 lbs. [907kg]	up to 241 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Twin Chain Single Motor

Knight Global’s Twin Chain Servo Hoist incorporates all the features and benefits of a standard servo hoist into a Twin Chain hoist configuration. The Twin Chains help to control and balance unwieldy or long parts.

The two chains are mechanically linked together and can provide spans of up to 36 in. [914mm] in a single housing. The Twin Chain hoist has a maximum lifting capacity of up to 500 lbs. [226kg] and hoist speeds of up to 196 fpm [60mpm].

KSHTC Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 500 lbs. [226kg]	up to 196 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Twin Chain Dual Motor

Knight Global’s Dual Motor Servo Hoists twin chains are electronically synced together and incorporate a Load Monitoring Module (LMM) with Operator Controlled Interface (OCI). The Twin Chain Dual Motor hoist has a maximum lifting capacity of up to 2,000 lbs. [907kg] and hoist speeds of up to 123 fpm [37.5mpm]. We can provide spans of up to 36 in. [914mm] in a single enclosure. Custom configurations are available.

KSHTCDM Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 2,000 lbs. [907kg]	up to 123 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

KNIGHT™ GLOBAL

Articulating Servo Arms

As an extension of an operator's natural movements, Knight Global's Servo Arm technology greatly improves safety, productivity and quality. Servo Arms are available in various overhead and floor mounted configurations.

Knight's KSHCA Overhead Carriage Mounted and KSHFA Floor Mounted Articulating Arm Series allows for an overhead varied reach within a work cell.

KSHFA

KSHCA

KSHFA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fm)
up to 1,500 lbs. [680kg]	up to 98 fpm

KSHCA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fm)
up to 1,500 lbs. [680kg]	up to 98 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Features

- CE Compliant **
- Safety Rating of 125%
- Speeds: Up to 241 ft. per min. [73.5mpm].
- Overhead and Pedestal Mounted Configurations available.
- Maximum Lifting Capacity: Up to 1,500 lbs. [680kg] Reeved.
- Maximum Reach: Up To 48 in. [1,219mm]. (Boom & End Effector length not Included)
- Floor Mounted Pedestal Heights: 8 ft. [2.4m] - 10 ft. [3.0m].
- Chain Lengths: 12 ft. [365cm] - 20 ft. [609cm].
- Heavy Duty Roller Chain Available.
- Fail Safe Brake.
- Sealed Worm Style Gearbox.
- H5 Rated (Continuous Duty Cycle).
- Industry Standard 24 VDC, 2 AMP power.
- Illuminated Run/ Stop Button.
- 240 VAC, Single Phase 50/60 Hz..
- Load Sensing.
- I/O Capabilities.
- LED Status Indicators, Green and Blue Lighted Push buttons.
- LED Fault Indicators, Illuminated Run/ Stop Button.
- Programming and Diagnostic Communication Ports.
- Virtual Travel Limits.
- Speed Reduction Zones.
- Impact Limiting.
- Active Dampening.
- Standard Float Mode.
- Programmable Overload Capability.

** CE compliance is not a standard feature on Knight Global Servo Systems. Please contact us for more details.

Ergonomic Safety Advantages

Knight Servo Arms incorporate Servo Hoist Intelligent Assist Device (IAD) technology into various arm configurations to provide controlled transfers of workloads. The programmability features of the Servo Arm assist your natural movements, by combining safety and ergonomics; it makes heavy loads feel weightless.

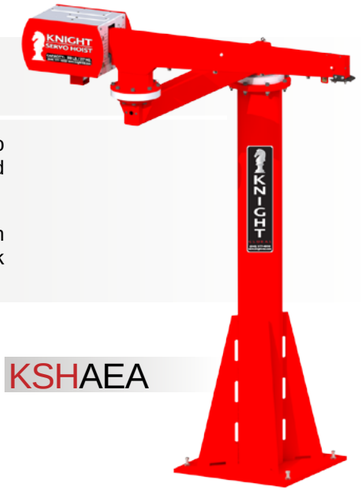
For more detailed information, visit www.knight-ind.com

KNIGHT™ GLOBAL

Extension Servo Arms

Extension Arms enable an operator with a non-linear reach and the capabilities to reach outside the area directly below a rail system. Extension Arms may be mounted to a single bridge, overhead carriage or floor mounted pedestal.

Knight's KSHEA Overhead Carriage Mounted and KSHAEA Floor Mounted Extension Arm Series allows for an overhead extended non-linear reach within a specified work cell. Extension arms may also be mounted to a single bridge.



KSHAEA

KSHAEA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 500 lbs. [226kg]	up to 241 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

KSHEA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 500 lbs. [226kg]	up to 241 fpm

Note: KSHEA overhead carriages are sold separately. Contact a Knight representative for more information.

KSHEA

Extension Boom Servo Arms

Vertical Arms assist and enable an operator to reach underneath and overhead work areas with minimal effects of inertia with heavy loads in a confined work cell.

Knight Global's Overhead Carriage and Floor Mounted Vertical Arm Series creates a stable lifting platform, eliminating the yarding and swinging of chain or cable.

KSHAEB

KSHEB

KSHAEB Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,000 lbs. [453kg]	up to 241 fpm

KSHEB Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,000 lbs. [453kg]	up to 241 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

For more detailed information, visit www.knight-ind.com

Vertical Servo Arms

Vertical Arms assist and enable an operator to reach underneath and overhead work areas with minimal effects of inertia with heavy loads in a confined work cell.

Knight Global's Overhead Carriage and Floor Mounted Vertical Arm Series creates a stable lifting platform, eliminating the yarding and swinging of chain or cable.

KSHVAA

KSHVA

KSHVAA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,000 lbs. [453kg]	up to 241 fpm

KSHVA Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,000 lbs. [453kg]	up to 241 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Note: Shown KSHVA/ KSHVAA overhead carriage and extension arm segments are sold separately. Contact a Knight representative for more information.

Vertical Servo Roller Arms

The roller chain series arm allows for more stroke of the arm, versus the standard chain because the servo is offset to the backside of the arm. The roller chain is a more robust option to the link chain and provides a smoother transition across the sprocket.

Knight Global's Overhead Carriage and Floor Mounted Vertical Arm Series creates a stable lifting platform, eliminating the yarding and swinging of chain or cable.

KSHVAAR

KSHVAR

KSHVAAR Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,500 lbs. [680kg]	up to 131 fpm

KSHVAR Series

Max. Capacity(lbs/kg)	Max. Hoist Speed(fpm)
up to 1,500 lbs. [680kg]	up to 131 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Note: Shown KSHVAR/ KSHVAAR overhead carriage and extension arm segments are sold separately. Contact a Knight representative for more information.

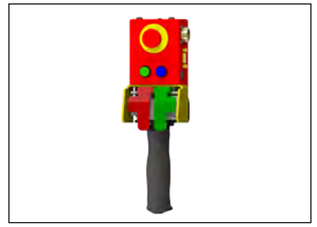
Servo Control Series

To view our full line of Servo Controls visit us at www.knight-ind.com

Inline Trigger

The latest in design that includes our patented load cells with integral amplifier. The actuation trigger prevents the system from unintentional movements and provides more response.

Model# EBA1304 (Shown)



Remote Two Speed w/ OCI

Equipped with the same features as the Inline handles. Available in single or two speed configurations with Operator Controlled Interface (OCI).

Model# EBA1063 (Shown)

Two Speed Pendant

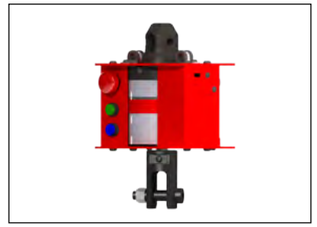
Non-programmable, electrically powered pendant that allows for (2) speed operation by compressing thumb levers.

Model# EPDA9600 (Shown)

Two Speed Pendant w/ Trigger

Non-programmable, electrically powered pendant that allows for (2) speed operation by compressing thumb levers and additional trigger button.

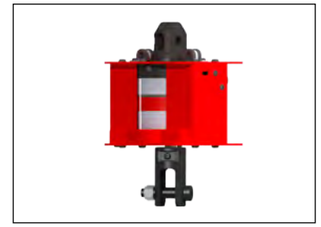
Model# EPDTA9600 (Shown)



Analog LMM / OCI

Fully programmable Load Monitoring Module (LMM) with Operator Controlled Interface (OCI). Mounted inline, and is used when an inline control handle is not a practical solution.

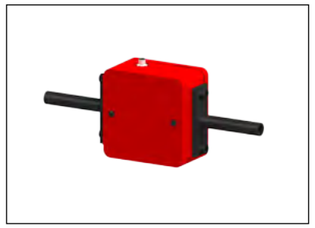
Model# EBA1384 (Shown)



Analog LMM / Pass-Through

Fully programmable Load Monitoring Module (LMM) with Pass Through is a fully programmable analog style load monitoring module.

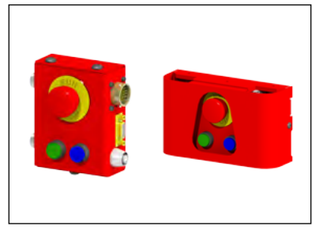
Model# EBA1385 (Shown)



Load Cell Fixture Handle

A fully programmable load sensing handle remotely mounted inline, and is used when an inline control handle is not a practical solution.

Model# EBA1141 (Shown)



Fixture Mounted OCI

A fixture mounted operator controlled interface (OCI) with illuminated buttons and a run-stop button switch. Side and rear cable attachment models available.

Model# EBA1058 & EBA1226 (Shown)

Wireless Remote Control

The EBA1054 Wireless Remote by Enrange FLEX® is used to control Knight Servo Systems where wireless control is preferred.

Model# EBA1054 & EBA1233 (Shown)

Servo Accessories

To view our full line of Servo Accessories visit us at www.knight-ind.com

Shackle

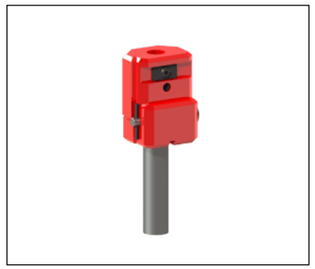
Shackle secures fixtures and loads in-line with the Servo System chain. Used primarily for in-line handle applications.

Model# EBA1213 (Shown)

Swivel Hook Shackle

Shackle secures fixtures and loads in-line with the Servo System chain. Larger opening to accommodate for Knight's Swivel Hook.

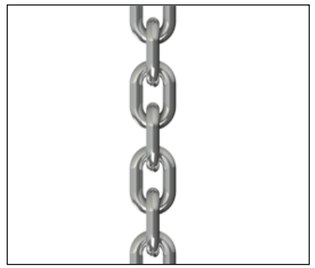
Model# EBA1269 (Shown)



Quick Connect/ Disconnect

Allows for quick connections and dis-connections of fixtures or end effectors. Easily disengages by the simple pull of the release pin.

Model# EBA1183 (Shown)



Replacement Chain

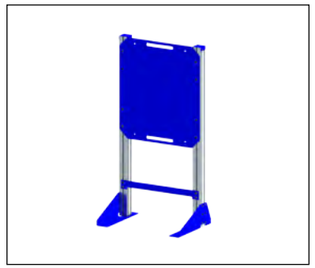
Replacement chain kits are electro gal-vanized blue chromated 4mm Steel Grade (80), Heat Treated Carburized chain.

Model# EBA1171 (Shown)

Replacement Roller Chain

Replacement roller series double strand ANSI 50-2 roller chain that creates a more ergonomic operation condition.

Model# EBD1547 (Shown)



Electrical Disconnect Enclosure Stand

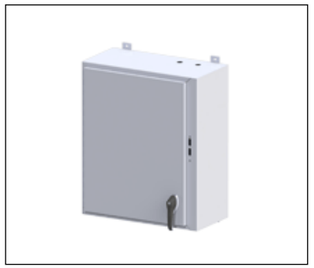
Enclosure Stand is for the mounting of the disconnect enclosures at a ergonomic positioned height. Heights are adjustable.

Model# EBA1145 (Shown)

Electrical Disconnect Enclosures (3 KVA)

Converts 480VAC to 230VAC for powering the servo hoists. Enclosure provides a means to lock out the system.

Model# EBA1003 (Shown)



Electrical Disconnect Enclosures (Dual)

Converts 480VAC to 230VAC for powering the servo hoists. Set up for a dual output for two servo systems.

Model# EBA1086 (Shown)

Electric Coil Cable

19-pin cable provides communication from the (OCI) operator control interface module on the floor level, to the servo controls up on the rail.

Model# EBA1011 (Shown)

For more detailed information, visit www.knight-ind.com

KNIGHT GLOBAL™

Servo System Applications

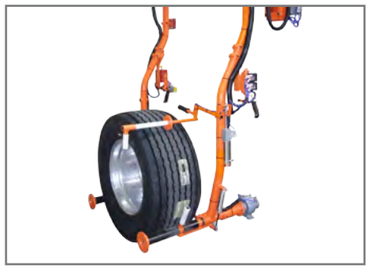
To view more Servo System Applications visit us at www.knight-ind.com

Large Truck Hood Install

Vacuum operated front hood fixture mounted on a custom Knight KSHCA Series Servo Hoist Articulating Arm. Knight Servo Arm assists in the lift and installation of truck hood.

Powertrain Lift Assist

Automated Knight KSH XYZ Servo Hoist and Tractor System that lifts and transfers the entire powertrain assembly from one work cell to another.



Large Tire Install

Nesting style fixture mounted from a Knight Servo Arm. Pneumatic rollers allow for the operator to power rotate tire to the lugs on vehicle.

Large Roll Transfer

Vertical KSHVAR Roller Servo Hoist Arm using a clamp style end effector that clamps, lifts and transfers large roll material within the work cell.

Front Hood Open

Vacuum style end effector operated by a programmable PLC system that controls the Air Balancer and Electric VFD Tractor that automatically attaches and raises the hood to operating level.

Large Pin Install Assist

Vertical KSHVAR XYZ Roller Servo Hoist Arm using a hydraulic clamp style end effector that clamps, lifts 500 lbs. machinery pins and transfers into 300 degree hardening ovens.

Instrument Panel Install

Servo operated clamp style end effector mounted on a vertical KSHVAR Roller Servo Arm that assists the operator in installing the IP unit into the vehicle.

Doors-On Install

Servo Actuator, clamp style end effector operated by a programmable PLC system that controls the precise position and angle of the door for installation onto the vehicle.

Engine Transfer

Hook style end effector operated by a XYZ Servo Hoist and Tractor system. System assists operator in moving the large engine from the line conveyor to the dunnage.

www.knight-ind.com

Tractors

Tractors are devices designed primarily to push, pull, lift and position a load that is suspended from a trolley on an overhead rail system. Tractors significantly overcome ergonomically unfavorable push/pull forces. Available in electric and pneumatic configurations.

Electric Tractors

VFD (Variable Frequency Drive) Tractors provide the operator with complete control via the ability to program acceleration and deceleration speeds. The VFD Electric Tractor can also be configured to run on different Knight rail as well as different manufactures rail systems.

The Knight VFD Electric Tractor has a modular assembly design that allows easy installation and set-up. They are equipped with Knight's proven pneumatic tractor mechanics using a worm gear reducer that is reliable and maintenance free.

Features

- Dual speed pendant.
- 1/2 HP, 240/480 VAC, Single Phase Inverter Motor.
- Hand clamp to engage/ lock tractor into position with tension adjustments.
- Integral trolley.
- Dual rubber drive wheels that ride on bottom of rail.
- Direct drive with programmable acceleration and deceleration speeds.
- Capability of disengaging wheels to allow for free wheeling. (Pnuematic Model)

Options

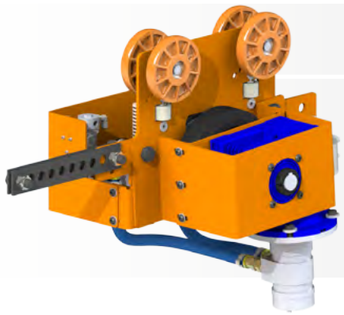
- Complete fixture integration.
- 24 VDC, Drive Clutch.
- Mid-rail and end of rail shock absorbers.
- Programmable return to home position function.
- Over travel limits.
- Power Rail configuration.
- Return to Home.
- Pneumatic engage cylinder for disengaging tractor from the rail.
- Wireless control.

KET Series

Max. Tow Capacity(lbs/kg)	Max. Tow Speed(fpm)
up to 3,000 lbs. [1,360kg]	up to 180 fpm

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

Pneumatic Tractors



Knight's Pneumatic Tractors provide mobility by towing bridges, fixtures and heavier loads. They typically are used to assist an operator to push, pull, or position loads.

Pneumatic Tractors can be integrated with a pneumatic fixture allowing for multiple control configurations such as: automatic return home, conveying of a load to the next position, starting and stopping limits with the use of air logic, etc. Pneumatic Tractors are available in multiple configurations and have maximum towing capacities of up to 2,000 lbs. [907kg].

Lube-Free Tractors

ECO Friendly

Lube-Free Pneumatic Tractors require less maintenance and have a longer expected service life. Available on Knight's TRA Series Only.

TRA Series

Max. Tow Capacity(lbs/kg)	Max. Tow Speed(fps)
up to 2,000 lbs. [907kg]	up to 1.9 fps

TRA Mini Series

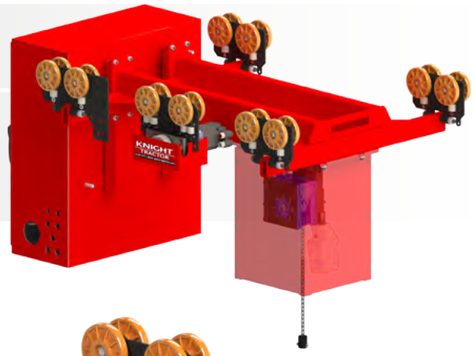
Max. Tow Capacity(lbs/kg)	Max. Tow Speed(fps)
up to 300 lbs. [136kg]	up to 3.5 fps

* Listed capacities and speeds vary by configuration. For more detailed information, please contact a Knight representative.

For more detailed information, visit www.knight-ind.com

Servo Tractor Systems

The Servo Tractor Hoist Series accurately locates, transfers and lifts loads in the X, Y and Z directions. Servo Tractors have Knight Global's Intelligent Assist Device (IAD) Servo Technology incorporated into their design allowing them to provide controlled transfers of workloads with speed and precision.



Servo Tractors

The Servo Tractor offers a continuous contact non-slip rack and pinion design that moves the runway (X Axis) or bridge (Y Axis) in either direction. This continuous contact non-slip design allows for absolute positioning of a load.

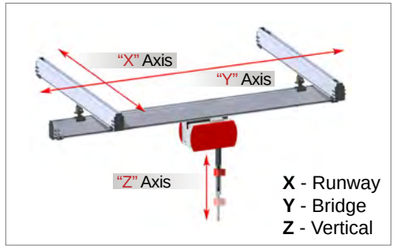
Servo Tractors are programmed to automatically or manually move and stop the runway (X Axis) or bridge (Y Axis) at the intended locations; which will eliminate unnecessary motion. The Servo Tractor will maintain the programmed positioning of the load. The need to return to home position is not required after cycling power.

Input Sensors

Input sensors have an electrical signal that interprets the different weights or forces applied to it from an operator; which controls the movement of the Servo Tractor in the X (runway), Y (bridge) or Z (vertical) axis. Input sensors also coordinate the motion on the system by the movement of the hoist chain.

Features

- Safety Rating of 125%
- Standard 24 VDC
- H5 Rated (Continuous Duty Cycle)
- 480 VAC, Three Phase 50/60 Hz
- Illuminated Run/Stop Button
- Power and Free Drive Wheel
- Programmable Overload Capability
- Fail Safe Braking
- Load Sensing, Pay Load and Handle Load
- Standard Float Mode
- Planetary Gearbox
- Programming/ Diagnostic Communication Ports
- I/O Capabilities (16 In / 8 Out)
- LED Status Indicators
- LED Fault Diagnostics
- Virtual Travel Limits
- Speed Reduction Zones
- Active Dampening
- Impact Limiting



KSHXZ/ or XY Series (Two Axis, One Tractor Combo)

Model	Max Tractor Capacity(lbs)	Max Tractor Hoist Capacity(lbs)	Max Tractor Speed(fpm)	Max Hoist Lift Speed(fpm)	Axis(X/Y/Z)
KSHXZ/XY250	4,000 lbs.	250 lbs.	174.53 fpm	196.85 fpm	X / Z or X / Y
KSHXZ/XY350	4,000 lbs.	350 lbs.	174.53 fpm	241.00 fpm	X / Z or X / Y
KSHXZ/XY750	4,000 lbs.	750 lbs.	174.53 fpm	123.03 fpm	X / Z or X / Y
KSHXZ/XY1000	4,000 lbs.	1,000 lbs.	174.53 fpm	82.02 fpm	X / Z or X / Y

* Max. tractor hoist capacity (lbs) and max. hoist lift speed (fpm) does not apply on KSHXY Series systems.

KSHXYZ Series (Three Axis, Two Tractor Combo)

KSHXYZ250	4,000 lbs.	250 lbs.	174.53 fpm	196.85 fpm	X / Y / Z
KSHXYZ350	4,000 lbs.	350 lbs.	174.53 fpm	241.00 fpm	X / Y / Z
KSHXYZ750	4,000 lbs.	750 lbs.	174.53 fpm	123.03 fpm	X / Y / Z
KSHXYZ1000	4,000 lbs.	1,000 lbs.	174.53 fpm	82.02 fpm	X / Y / Z

KSHXXYZ Series (Three Axis, Three Tractor Combo)

KSHXXYZ250	4,000 lbs.	250 lbs.	174.53 fpm	196.85 fpm	X / X / Y / Z
KSHXXYZ350	4,000 lbs.	350 lbs.	174.53 fpm	241.00 fpm	X / X / Y / Z
KSHXXYZ750	4,000 lbs.	750 lbs.	174.53 fpm	123.03 fpm	X / X / Y / Z
KSHXXYZ1000	4,000 lbs.	1,000 lbs.	174.53 fpm	82.02 fpm	X / X / Y / Z

* Listed servo tractor series specifications and configurations are considered standard systems. Each tractor configuration will be designed specifically to your application. For more detailed information please contact a Knight representative.

Our Knight Global Servo design team will analyze your system requirements in detail and custom design a servo tractor system that fits your specific application needs.

For more detailed information on Knight Global Servo Tractor System features and options, please visit www.knight-ind.com.

KNIGHT GLOBAL™

Balancers

Knight Pneumatic Balancers are designed to assist in transferring loads ergonomically using a variety of Up/Down pendants or Balance “Float” Control options. Pneumatic Balancers provide superior control over standard air hoists when it comes to locating and positioning loads.

Cable/Chain Balancers

Cable Pneumatic Balancers are commonly used when lower weight parts are required to be floated into position. Chain Pneumatic Balancers are recommended when balancing weights in excess of 350 lbs. (*See note below) or when high cycle times are required. Knight balancers have a maximum balancing capacity of up to 700 lbs. [318kg] and travels of up to 110 in. [2794mm].

KBA

KBC

Features

- CE Compliant **
- Hands-Free Operation
- Standard “Float” Mode
- Internal Centrifugal Retract Control.
- Requires Non-Lubricated Clean/Dry Air.
- Multiple configurations.

** CE compliance is not a standard feature on Knight Global Pneumatic Balancers. Please contact us for more details.

Options

- Optional External Retract Controls.
- Optional High Relieving and Feathertouch Controls.
- Optional Up/Down Controls.
- Multiple Suspension Kits available.

KBA Cable Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
KBA100-028 (Tool-Bench Size)	100 lbs. [45kg]	28 in. [711mm]
KBA150-076	150 lbs. [68kg]	76 in. [1930mm]
KBA225-073	225 lbs. [102kg]	73 in. [1854mm]
KBA225-110	225 lbs. [102kg]	110 in. [2794mm]
KBA350-073	350 lbs. [159kg]	73 in. [1854mm]
KBA500-080	500 lbs. [227kg]	80 in. [2032mm]
KBA700-054	700 lbs. [318kg]	54 in. [1371mm]

KBC Chain Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
KBC150-070	150 lbs. [68kg]	70 in. [1778mm]
KBC200-110	200 lbs. [91kg]	110 in. [2794mm]
KBC225-067	225 lbs. [102kg]	67 in. [1701mm]
KBC350-067	350 lbs. [159kg]	67 in. [1701mm]
KBC500-080	500 lbs. [227kg]	80 in. [2032mm]
KBC700-052	700 lbs. [318kg]	52 in. [1320mm]

* Listed balance capacities and travels vary by configuration. For more detailed information, please contact a Knight representative.

Cable Swivel Hook

Knight KBA Cable Series Balancers come equipped with a 1 ton capacity Crosby/Bullard® Golden Gate size 2 Pin-Lok Hook with self closing gate and 360° rotational capabilities.

Chain Shackle

Knight KBC Chain Series Balancers come equipped with a Knight 2 ton capacity Shackle.

*Note: Knight recommends the use of chain instead of cable (Except in Reeved Applications) when balancing weights in excess of 350 lbs. [159kg] and / or high cycle times are encountered. The use of cable under these conditions has a greater tendency to fray or “birdcage” requiring a more specific PM program. Knight Pneumatic Balancers do not require the use of lubricated air.

KNIGHT GLOBAL™

Tandem Pneumatic Balancer

TKBA

TKBC

Tandem Cable or Chain Pneumatic Balancers were designed to provide the weight capacities of a reeved pneumatic balancer application yet incorporate the extended travels of a single cable or chain pneumatic balancer.

Tandem Cable and Chain Pneumatic Balancers double the load capacity of a single balancer without sacrificing vertical travel.

NOTE:
For better performance, Knight Global offers the KSH Series Servo Hoists. These electrically operated servo motor hoists impart precision and control into your process. (See page 1)

TKBA Cable Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
TKBA700-073	700 lbs. [318kg]	73 in. [1854mm]
TKBA1000-080	1,000 lbs. [453kg]	80 in. [2032mm]
TKBA1400-054	1,400 lbs. [635kg]	54 in. [1371mm]

TKBC Chain Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
TKBC700-067	700 lbs. [318kg]	67 in. [1701mm]
TKBC1000-080	1,000 lbs. [453kg]	80 in. [2032mm]
TKBC1400-052	1,400 lbs. [635kg]	52 in. [1320mm]

* Listed balance capacities and travels vary by configuration. For more detailed information, please contact a Knight representative.

Reeved Pneumatic Balancer

A Reeved Pneumatic Balancer increases the mechanical advantage of balancing a product. The pneumatic balancer reeve and pulley offers a second suspension point which gives greater stability to the load. Reeving an pneumatic balancer doubles the balancing capacity.

RKBA

RKBC

RKBA Cable Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
RKBA450-036	450 lbs. [204kg]	36 in. [914mm]
RKBA450-055	450 lbs. [204kg]	55 in. [1397mm]
RKBA700-036	700 lbs. [318kg]	36 in. [914mm]
RKBA1000-040	1,000 lbs. [453kg]	40 in. [1016mm]
RKBA1400-027	1,400 lbs. [635kg]	27 in. [685mm]

RKBC Chain Series

Model	Max. Balance Capacity(lbs/kg)	Max Travel(in./mm)
RKBC400-055	400 lbs. [181kg]	55 in. [1397mm]
RKBC450-033	450 lbs. [204kg]	33 in. [838mm]
RKBC700-033	700 lbs. [318kg]	33 in. [838mm]
RKBA1000-040	1,000 lbs. [453kg]	40 in. [1016mm]
RKBA1400-026	1,400 lbs. [635kg]	27 in. [685mm]

* Listed balance capacities and travels vary by configuration. For more detailed information, please contact a Knight representative.

For more detailed information, visit www.knight-ind.com

Balancer Controls

To view our full line of Balancer Controls visit us at www.knight-ind.com

Up/Down Pendant

Variable speed control for loading and unloading varying weights. The most common used control for balancers. Available in straight or coiled hose.

Model# BCS3017 (Shown)

Tandem Up/Down Pendant

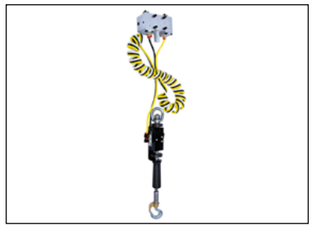
Variable speed control used on Tandem Balancers for loading and unloading varying weights. Available in straight or coiled hose.

Model# BCS3330 (Shown)

High Relieving Single Balancer

Supports a constant weight at zero gravity. Used for near capacity or applications greater than 150 lbs. Available in straight or coiled hose.

Model# BCS2090 (Shown)



Feather Touch Balance

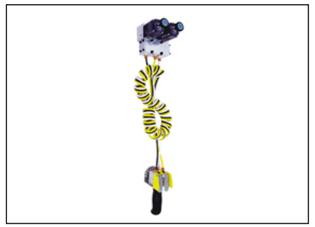
Used for light weight applications. Control is activated by an up/down movement of the control handle. Available in straight or coiled hose.

Model# BCS2214 (Shown)

Single Balance

Supports a constant weight at zero gravity. Recommended for applications less than 150 lbs. [68kg]

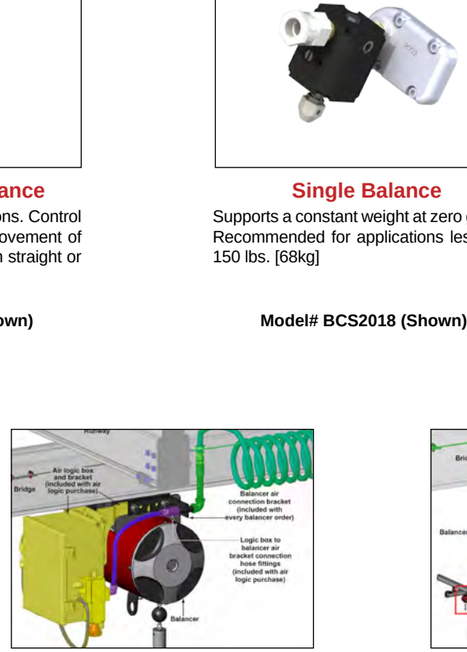
Model# BCS2018 (Shown)



Dual Balance

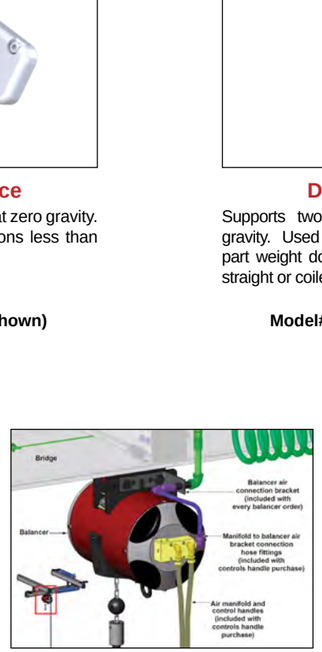
Supports two different weights at zero gravity. Used in applications where the part weight does not change. Available in straight or coiled hose.

Model# BCS2215 (Shown)



Air Connection with Balancer Logic Box

Air logic box, bracket and logic box to balancer air bracket connection hose fittings. Balancer air connection bracket is included with every balancer purchase.

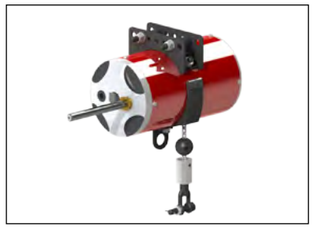


Air Connection with Balancer Manifold

Air Manifold and Manifold to balancer air connection hose fittings are included with every controls handle purchase.

Balancer Accessories

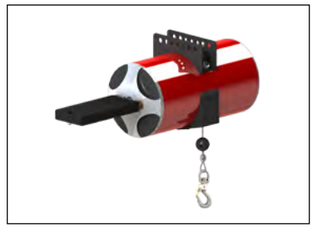
To view our full line of Balancer Accessories visit us at www.knight-ind.com



Balancer Limit Switch

Provides the ability to set upper and lower limits. Eliminates unnecessary movements.

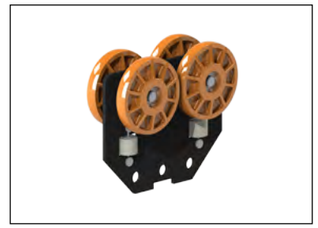
Model# BPA2224 (Shown)



External Retract Control

Hydraulic shocks provide continuous resistance to spool travel. Prevents spool from accelerating if a load is lost.

Model# BPA2089 (Shown)



Balancer Trolleys

Load Trolleys attach the air balancer to various types of aluminum rail systems.

Model# MRTA7706 (Shown)

Balancer Trolleys

(W-Beam/S-Beam)

Load Trolleys attach the air balancer to various types of I-beam rail systems.

Model# RTA2014 (Shown)

Reeved Cable Balancer Pulley

Doubles the overall balancing capacity of a Reeved Cable Air Balancer.

Model# BPA2065 (Shown)

Reeved Chain Balancer Pulley

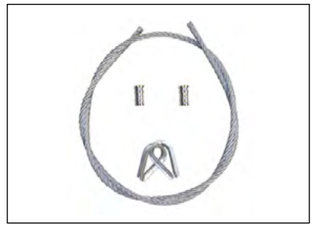
Doubles the overall balancing capacity of a Reeved Chain Air Balancer.

Model# BPA2066 (Shown)

Balancer Safety Cable Kit

Safety Cable Kits prevent Air Balancers or fixtures from separating or falling from overhead sturctures or rail.

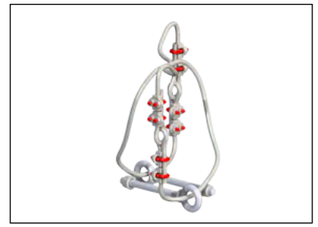
Model# RWA4133 (Shown)



Nycro-Press Safety Cable Kit

Nycro-Press Safety Cable Kits prevent Air Balancers or fixtures from separating or falling from overhead sturctures or rail.

Model# CAMIRWA4133 (Shown)



Eye Bolt Safety Cable Kit

Eye-Bolt Safety Cable Kits prevent Air Balancers or fixtures from separating or falling from overhead sturctures or rail.

Model# FDA4133 (Shown)

www.knight-ind.com

Lift Assists

Knight Global designs tools in accordance with our manufacturing partners. Our engineers work in unison with our customers, creating system layouts which conform to the specifications of each individual facility. We create tools and adjust existing technology to fit the needs of our manufacturing clients. We specialize in custom lift assists and lifting devices for all of your ergonomic situations.

Standard Arms

Knight Pneumatic arms use a parallelogram structure that articulates at the vertical planes. This design allows vertical positioning of a fixture or end effector. Knight Global offers a wide range of arm types, capacities and configurations to handle many types of end tooling.

Pneumatic arms are used to lift, rotate, balance, move and transfer product to and from conveyors, dunnage, assembly lines and more.

AOA7000

AAA6000

Pneumatic Series

Max. Lifting Capacity(lbs/kg)	Max. Travel(in./mm)	Max. Reach(in./mm)
up to 470 lbs. [213kg]	up to 48 in. [1,219mm]	up to 48 in. [609mm]

* Listed capacities, travels and reaches vary by configuration. Listed specifications rated at 100 psi.
For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

BCA1000

Lower Mass Arms

By eliminating the arm bearing and mounting plate, we help to reduce the weight of the overall system. The Lower Mass Arms provide an overall range of motion less than 84° degrees.

The Lower Mass Arms can use a tie-bar and optional locking and latching end pivot mechanisms to improve precision for pick-up and set down.

Knight Lower Mass Arms have a maximum capacity of up to 350 lbs. [158kg], a maximum travel distance of up to 24 in. [609mm] with a maximum reach that varies upon the application.

BCA1000

Lower Mass Arm Series

Max. Lifting Capacity(lbs/kg)	Max. Travel(in./mm)	Max. Reach(in./mm)
up to 350 lbs. [158kg]	up to 24 in. [609mm]	Application Specific

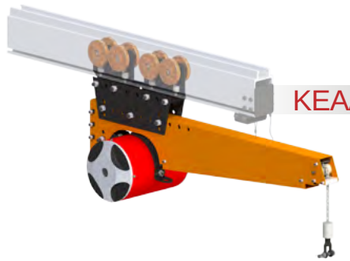
* Listed capacities and travels vary by configuration. Listed specifications are rated at 80 psi. For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

KEAA1000

Extension Arms

Knight Extension Arms enable the operator to extend beyond the working limits of an overhead rail system within a workstation. A Knight Pneumatic Balancer mounts to the extension arm allowing for a controlled lifting and lowering of loads.

KEAA Series Single or Dual Bridge Extension Arms expand the working area of a typical pneumatic hoist. They allow for a 360° rotation of the extension arm and have a (4) four position adjustable reach in 10° UP/DOWN increment adjustments to avoid clearance issues.



KEAA1500

Extension Series

Max. Balance Capacity(lbs/kg)	Max. Travel(in./mm)	Max. Reach(in./mm)
up to 700 lbs. [317kg]	up to 110 in. [2,794mm]	up to 45 in. [1,143mm]

* Listed capacities, travels and reaches vary by configuration. Listed specifications rated at 100 psi.
For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

Servo Arms

Expands the extension of an operator's natural movements, Knight Global Servo Arm technology greatly improves the precision of an arm type application. Servo Arms are available in various Articulating, Extension and Vertical configurations.

Servo arms are available in a Overhead Carriage Mounted or Floor Mounted configurations that allows for an overhead varied reach within a work cell.

KSHVA

KSHFA

KSHEA

Servo Series

Model	Max Capacity(lbs/kg)	Max Hoist Speed(fpm)
KSHCA Series	up to 1,500 lbs. [680kg]	up to 98 fpm
(Overhead Mounted Articulating)		
KSHFA Series	up to 1,500 lbs. [680kg]	up to 98 fpm
(Floor Mounted Articulating)		
KSHEA Series	up to 1,000 lbs. [453kg]	up to 241 fpm
(Overhead Mounted Extension)		
KSHAEA Series	up to 1,500 lbs. [680kg]	up to 241 fpm
(Floor Mounted Extension)		
KSHVA Series	up to 1,000 lbs. [453kg]	up to 241 fpm
(Overhead Mounted Vertical)		
KSHVAA Series	up to 1,000 lbs. [453kg]	up to 241 fpm
(Floor Mounted Vertical)		
KSHVAR Series	up to 1,500 lbs. [680kg]	up to 131 fpm
(Overhead Mounted Vertical)		
KSHVAAR Series	up to 1,500 lbs. [680kg]	up to 131 fpm
(Floor Mounted Vertical)		

* Listed capacities, travels and reaches vary by configuration. For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

Intelligent Assist Devices

ECO Friendly

For more detailed information on Knight Global Servo Arms, please see (Page 3) or visit www.knight-ind.com.

Vertical Mast Arms

ATA4000

ATA4700

Vertical Mast Arms are typically used in applications that require extensive up/down travel. Vertical Arms improve ergonomics by eliminating the need for an operator to bend or reach for the control handles when positioning the part in a specified location.

Allows for end tooling to be mounted to a rigid vertical mast. Vertical travel is achieved with a Knight Pneumatic Balancer or a chain hoist. Vertical Mast Arm handles are in a fixed ergonomic position on the mast. Available with a round mast for direct loads only or a square THK mast for offset/cantilevered loads.

Vertical Series

Max. Capacity(lbs/kg)	Max. Travel(in.)
Application Specific	Determined by Balancer

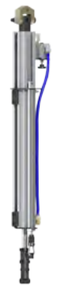
* Listed capacities, torques and travels vary by configuration. Listed specifications rated at 100 psi. For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

Torque Tubes

Torque Tubes are designed to absorb torque reaction from fastening devices and balance the tool. Custom travel distances, heights and tool holders are available. They are available in light, medium and heavy duty pneumatic and spring balancer configurations. Each Torque Tube includes a standard fixed tool holder.

ATA1500

ATA1550-15



ATA2600

ATA2700

ATA1550-25

ATA4500

Torque Tube Series

Model	Max. Capacity(lbs/kg)	Max. Torque(ft. lbs)
ATA1500	up to 60 lbs. [27kg]	up to 74 ft. lbs.
ATA1550-15	up to 15 lbs. [7kg]	up to 74 ft. lbs.
ATA1550-25	up to 25 lbs. [11kg]	up to 74 ft. lbs.
ATA2600	up to 35 lbs. [16kg]	up to 150 ft. lbs.
ATA2700	up to 135 lbs. [61kg]	up to 300 ft. lbs.
ATA4500	up to 500 lbs. [226kg]	up to 853 ft. lbs.

* Listed capacities, torques and travels vary by configuration. Listed specifications rated at 100 psi. For more detailed information, please contact a Knight representative or visit www.knight-ind.com.

Tool Holders

Adjustable Clamp

Model# ASA9500 (Small)
ASA9501 (Large)

360° Rotating Clamp

Model# ASA9518

For more detailed information, visit www.knight-ind.com

KNIGHT GLOBAL™

Quick Build Connectors

END EFFECTOR

WORKSTATION

CUSTOM CART

Modular system of steel or aluminum connectors and tubing used to create custom carts, workstations and end effectors. You can design and build a workstation or fixture to your specific application in no time at all.

The Quick Build Connectors modular design allows for quick and easy assembly without welding. Steel or aluminum connectors and tubing make them a lightweight and strong alternative for designing do it yourself applications.

Straight Connector

T-Connector

L-Connector

Quick Build Series

Type	Aluminum	Steel
Straight Connector (1.0”)	DSAAL1136	DSA1136
Straight Connector (1.5”)	DSAAL1146	DSA1146
T-Connector (1.0”)	DSAAL1137	DSA1137
T-Connector (1.5”)	DSAAL1147	DSA1147
L-Connector (1.0”)	DSAAL1138	N/A
L-Connnector (1.5”)	DSAAL1148	N/A
Spline Tubing (1.0”)	DSD1110	N/A
Spline Tubing (1.5”)	DSD1109	N/A
Spline Tubing (2.0”)	DSD1108	N/A

* For more detailed application usage and specification information, please contact your local Knight Global representative or visit www.knight-ind.com.

Linear Rail Tooling Arm

Linear Rail Mounted Tooling Arms allow for tooling to be mounted on a wall, in a pit or run on the floor. Tooling arm travels on Knight’s RAD6500 and LRD9500 Series engineered aluminum rail.

Compared to traditional products, Knight’s Linear Tool Arms are easier to install, are more ergonomically friendly and have greater side loading capabilities.

* For more detailed application usage and specification information, please contact your local Knight Global representative or visit www.knight-ind.com.

Ergo Positioner

DSA1106

Pneumatic operated pivot locking workstation that allows a part to be adjusted to the operator’s comfort level. The operator can manually adjust the height of the part, then position large or unwieldy parts using the pneumatic foot control to lock and release the part in multiple positions.

Its ability for unlimited 3-axis movement reduces operator strain and improves productivity.

Ergo Positioner Series

Model	Max Capacity(lbs/kg)	Max Vertical Travel(in./mm)
DSA1106	up to 450 lbs. [204kg]	up to 15 in. [381mm]

* For more detailed application usage and specification information, please contact your local Knight Global representative or visit www.knight-ind.com.

End Effectors

Knight designs and manufactures an assortment of custom End Effectors. We specialize in custom lift assists and lifting devices for all of your ergonomic situations. We'll assist you on choosing the correct lift assist system which is best suited for your application by using our detailed analysis of your material handling needs.

End Effectors are classified into five category styles: Clamp, Hook, Magnet, Nest and Vacuum. Our designers will analyze your material handling needs and determine which end effector style will be best suited for your application.

Every End Effector is unique and custom designed to fit your specific application needs.

Bite Line Clamp Fixture

Bite line clamp style fixture with 45° rotating feature. Transfers seat to the assembly station.

End Effector Styles

To view all the End Effector Styles visit us at www.knight-ind.com

O.D. Clamp Fixture

Outside diameter clamp style fixture with rotating feature. Transfers roll from rewind table to dunnage.

Scissor Hook Fixture

Scissor hook style fixture that is suspended by a Knight Pneumatic Balancer. Transfers engine block from assembly line to the inspection workstation.

Magnetic Fixture

Magnetic style fixture operated by a Knight Servo System. Transfers large oil pipe from the dunnage to oil pipe testing area.

Multiple Vacuum Fixture

Multiple vacuum cup style end effector suspended by a Knight Pneumatic Balancer. Transfers the windshield from dunnage to the vehicle.

I.D. Clamp Fixture

Inside diameter clamp style fixture suspended by a Knight Pneumatic Balancer. Transfer large core pipe from mold machine to transfer cart.

Dual J-Hook Fixture

Dual J-hook style fixture operated by a Knight Servo System. Transfers engine from assembly line to the vehicle for installation.

Nesting Clamp Fixture

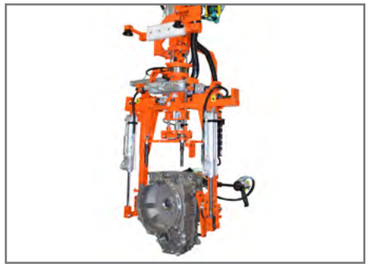
Nesting clamp style fixture suspended by a Knight Pneumatic Balancer. Transfers the hood from dunnage to the vehicle for installation.

I.D. Core Fixture

Inside diameter core style fixture operated by a Knight Servo System. Transfers roll material from dunnage to the unwind wheel station.

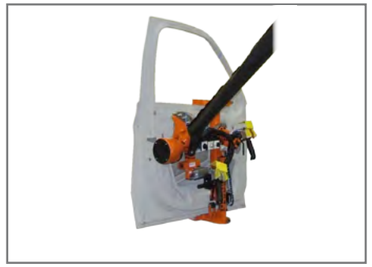
End Effector Applications

To view more End Effector Applications visit us at www.knight-ind.com



Trans Case Lift Assist

Clamp style end effector mounted on a custom vertical mast. End effector lifts and rotates trans case for a different set-down position on the line.



Doors-On Install

Doors-on lift assist using a custom clamping fixture mounted to a Knight AAA6000 Articulating Pneumatic Arm. Arms assists in the installation of the front door.

Wire Harness Load

Clamp style fixture mounted on a vertical mast arm that loads, opens and spreads out the wire harness bag inside the vehicle cab.

Hybrid Battery Install

KSH Servo Hoist and pneumatically clamping hybrid battery end effector. Knight End effector positions large tray for hybrid battery cell pack installation.

Front Cab Lift Assist

Custom Knight Front Cab End Effector that securely assists in the lifting of the large front cab assembly.

Transformer Lift Assist

Clamp style end effector mounted on an vertical mast arm. End effector clamps the transformer unit and assists in moving it from one conveyor to another work cell.

Foundry Mold Transfer

Rotating clamping end effector suspended from a Knight ATA4500 Heavy Duty Vertical Torque Arm. Fixture removes mold from furnace oven and transfers it to the dunnage rack for cooling.

Canister Lift Assist

3-Cup vacuum end effector suspended from a Knight KBA Series Pneumatic Balancer. Fixture assists in the loading and unloading of the weapon into the container.

Wheel Assembly Install

Nesting and manual clamp end effector mounted on an ATA4000 vertical mast arm. Fixture assists operator in picking up wheel assembly and rotates tire for install.

Control Handles

Knight Global offer's seven types of control handles with various configurations. The control handle series are designed to ensure an ergonomically correct hand position for the operator. Control handle levers are marked according to customer specifications and can be customized to fit each applications need.

Levers can be customized with stamped callouts for identification and ease of use. Callouts are available in different languages. Angled levers are used for optimum ergonomics. Up (Green) and Down (Red) levers are standard colors. Custom colors can be applied according to customer specification. Control Handle Trigger levers can be mounted on the back of the handle for optimum ergonomics or as an additional button.

Pneumatic Control Handles

To view all the Control Handle styles visit us at www.knight-ind.com

One (1) Button
Model# BPA9400 (Shown)

Two (2) Button
Model# BPA9100 (Shown)

Three (3) Button
Model# BPA9430 (Shown)

Four (4) Button
Model# BPA9310 (Shown)

Electric Control Handles

One (1) Button
Model# EPA9500 (Shown)

Two (2) Button
Model# EPA9600 (Shown)

Three (3) Button
Model# EPA9650 (Shown)

Four (4) Button
Model# EPA9660 (Shown)

Electric/ Pneumatic Control Handles

Two (2) Button
Model# EPPA9450 (Shown)

Three (3) Button
Model# EPPA9460 (Shown)

Four (4) Button
Model# EPPA9160 (Shown)

Four (4) Button
Model# EPPA9464 (Shown)

For more detailed information, visit www.knight-ind.com

Pneumatic Control Handles with Trigger Levers

One (1) Button
Model# BPTA9400 (Shown)

Two (2) Button
Model# BPTA9100 (Shown)

Three (3) Button
Model# BPTA9410 (Shown)

Four (4) Button
Model# BPTA9414 (Shown)

Electric Control Handles with Trigger Levers

One (1) Button
Model# EPTA9500 (Shown)

Two (2) Button
Model# EPTA9600 (Shown)

Three (3) Button
Model# EPTA9560 (Shown)

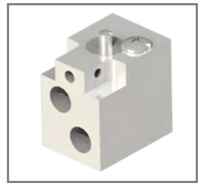
Four (4) Button
Model# EPTA9660 (Shown)

Standard Collar Mounts

Standard Collar Mounts allow Control Handles to be mounted in a fixed rotational position and are equipped with hole patterns that allow for the 360° rotation of the control handle around a vertical axis.

Model	Inner Diamter(I.D.)
BPD1119	0.88 in. [22.2mm] I.D.
BPD1120	1.00 in. [25.4mm] I.D.
BPD1121	1.25 in. [31.7mm] I.D.

Valve Block Replacement Kits

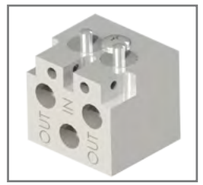


BPA9111 Valve Block Assembly

Knight's BPA9111 Pneumatic Valve Block Assembly has 3-Way valves used for sending common pilot signals.

- Each BPA9111 Valve Block replacement kit Includes: (1) Plunger Assembly #CS-2993, (1) 6mm x 10mm FHPH and (1) tube of lubricant, (1) 6mm x 10mm B.H.C.S, (1) Nylon Ball.

Replacement Kit# BPA2139

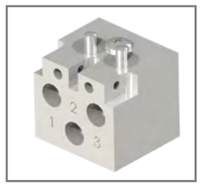


BPA9001 Valve Block Assembly

Knight's BPA9001 Pneumatic Valve Block Assembly has 3-Way valves used for sending common pilot signals.

- Each BPA9001 Valve Block replacement kit Includes: (2) Plunger Assembly #CS-2993, (1) 6mm x 10mm FHPH and (1) tube of lubricant, (2) 6mm x 10mm B.H.C.S, (2) Nylon Ball.

Replacement Kit# BPA2141



BPA9050 Valve Block Assembly

Knight's BPA9050 Pneumatic Valve Block Assembly has 2-Way valves used for only a single acting air balancer or lift assist used for UP/ DOWN movement.

- Each BPA9050 Valve Block replacement kit Includes: (2) Plunger Assembly #CS-2992, (1) 6mm x 10mm FHPH and (1) tube of lubricant, (2) 6mm x 10mm B.H.C.S, (2) Nylon Ball.

Replacement Kit# BPA2140

For more detailed information, visit www.knight-ind.com

Workstation Cranes/ Rails

Knight Global Rail Systems form the foundation of your material handling system. Whether you choose our Lightweight, High Performance Aluminum Rail or Power Rail, you can be confident you have the highest quality and safest product available. Knight's enclosed track design reduces dirt and grime buildup on the running surface which improves long term performance.

Aluminum Rail

Knights' lightweight aluminum enclosed track rail is the ideal solution; whether your load is located directly under the system or cantilevered off to the side.

Knight offers (14) fourteen series of aluminum rail that is available in multiple configurations. The lightweight rail eases installation and reduces overhead loads. Each aluminum rail series load capacity varies by size and length of the hanger spans.

Aluminum Enclosed Track Rail Series

The enclosed track rail series is extruded from high strength aluminum alloy that allows for the trolley to travel inside the rail. The enclosed track series is offered in four (4) sizes:

Model	Size(in./mm)	Max Capacity(lbs/kg)	Deflection Ratio
RAD7510	8 in. [203mm]	3,000 lbs. [1,360kg]	1:350 *
RAD6110	6 in. [152mm]	1,600 lbs. [725kg]	1:350 *
RAD4110	4 in. [101mm]	1,100 lbs. [499kg]	1:350 *
TR2000	2 in. [51mm]	500 lbs. [250kg]	1:350 *

* Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.

Backer Rail Series

The backer rail series is an enclosed track design that is extruded from a lightweight high strength aluminum alloy with a extruded aluminum backer to reduce rail deflection under heavy loads. The rigid rail series is available with an 6” or 8” aluminum backer.

Model	Backer(in. /mm)	Max Capacity(+ %)	Deflection Ratio
RAA4439	8 in. [203mm]	+ 60%	1:350 *
RAA4438	6 in. [152mm]	+ 50%	1:350 *

Note: With the addition of the backer on the RAD7510 series rail, the load capacity increases by the above percentage over the maximum RAD7510 capacity of 3,000 lbs. [1,360kg]. Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.

* Knight Global follows material handling industry standards in determining the capacity and safety factor ratings for enclosed track overhead workstation crane systems. Every rail component (e.g. rail, hangers, trolleys,etc.) is individually tested to establish its ultimate failure point. From this number, a safe working load is then assigned to the component. Each rail span length is then tested to determine the maximum single point load required to achieve a predetermined deflection based on a 1:350 ratio (1” of deflection for each 350” of length) or a 1:450 ratio (1” of deflection for each 450” of length). Each rail or rail system is then assigned its capacity and safety factor rating. For more information on the recommended rated capacities, please contact your local Knight representative or visit www.knight-ind.com.

Curved Rail Series

The curved rail series has a curved radius enclosed track design that is extruded from a lightweight high strength aluminum alloy. Its curved design allows loads to travel around corners and stationary objects. Curved rail is available in overhead mounted configurations.

Size(in./mm)	Max Capacity(lbs/kg)	Min/Max Radius(ft)	Deflection Ratio
8 in. [203mm]	3,000 lbs. [1,360kg]	5 ft. - 8 ft.	1:350 *
6 in. [152mm]	1,600 lbs. [725kg]	4 ft. - 8 ft.	1:350 *
4 in. [101mm]	1,100 lbs. [499kg]	3 ft. - 8 ft.	1:350 *

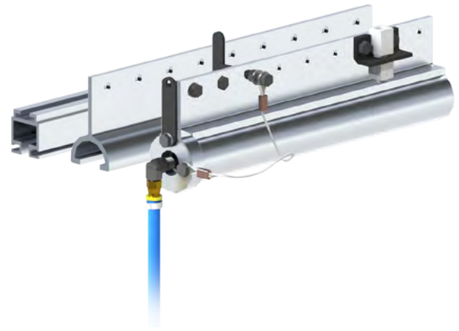
* Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.

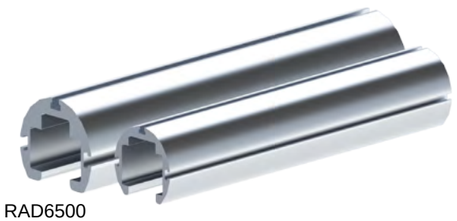
Tool Rail Series

HAD Series rail is easily installed on C-Channel or angle iron structures. The HAD3000 series chambered rail can be used as a fluid power distribution system for water, air, oil and other non-caustic fluids. The TR2000 series offers the greatest weight capacity and can mount to anything; even on the side of larger rail. It allows for festooning trolleys and utilities to be attached.

Model	Size(in./mm)	Max Capacity(lbs/kg)	Deflection Ratio
HAD3500 (Half)	2 in. [51mm]	Application Specific	1:350 *
HAD3000 (Round)	2 in. [51mm]	Application Specific	1:350 *
TR2000 (Square)	2 in. [51mm]	550 lbs. [250kg]	1:350 *

* Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.





Engineered Round Rail Series

Engineered round rail series is for low friction vertical or horizontal linear movements. It is capable of handling direct or offset loads as well as high torque applications. Round rail is designed to be more ergonomically friendly when compared to traditional linear motion products.

Model	Size(in./mm)	Max Capacity(lbs/kg)
RAD6500	6 in. [152mm]	Application Specific
RAD4700	4 in. [101mm]	Application Specific

* Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.

Engineered Linear Rail Series

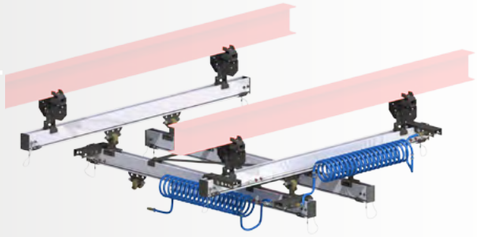
LRD Series Engineered linear rail is for floor mounted or wall mounted low friction horizontal movements. Capable of handling direct or offset loads. Linear rail is a lower maintenance alternative to hardened ground rail and bearing blocks. The LRD Series binding is significantly reduced due to its flexible tolerances. The linear rail is mounted in horizontal configurations.

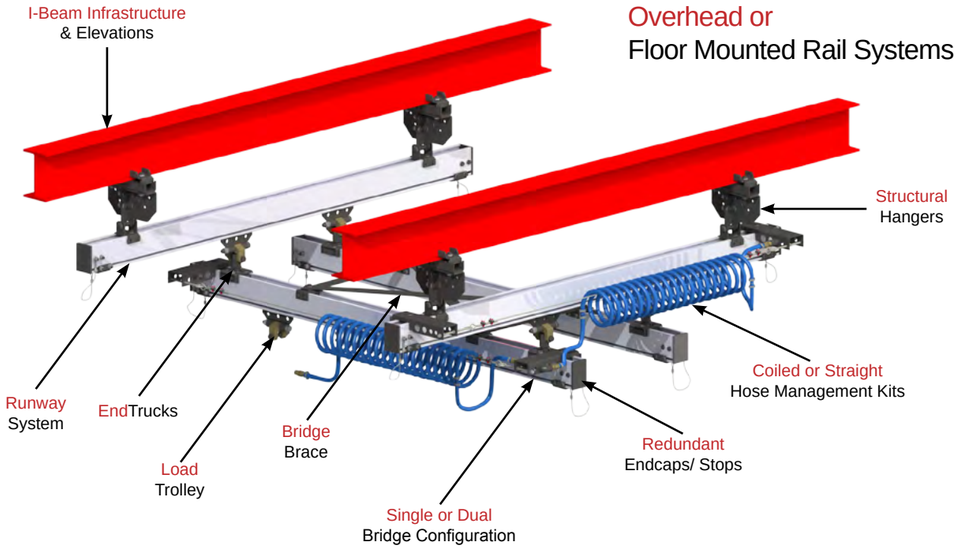
Model	Size(in./mm)	Max Capacity(lbs/kg)
LRD9500	9 in. [228mm]	Application Specific

* Knight Global rail deflection ratios are predetermined. For more detailed information on size, capacities and lengths, contact your local Knight Global representative or visit www.knight-ind.com.

Rail Systems

Knight suspension rail systems include an enclosed trolley track that resists dirt build-up for a smoother, quieter operation. A Knight representative will assist you in selecting, developing and designing your rail system. Overhead and Floor Mounted Rail Suspension Systems are available in single or dual bridge configurations.





Rail Systems are designed to provide a safe, efficient solution to your ergonomic challenges. A wide range of options are available to meet all your specific engineering and application requirements.

Structural Hangers

Structural hangers are used to suspend Knight's rail series from overhead steel I-beam infrastructures and elevations.

Endtrucks

End Trucks carry the bridge along the runways of a rail system. Available in a variety of different configurations.

Load Trolleys

Load trolleys transfer loads along the horizontal axis and suspends Knight air balancers and fixtures.

Redundant End Caps

Combination of an end cap and a mid-rail stop that prevents load trolleys or end trucks from exiting the rail.

Splice Kits

Splice kits join runways or monorails together.

Bridge Braces

Adjustable bridge braces are used to secure parallel rails at specific distances.

Hose Management Kits

Hose management kits supply air to pnuematic balancers, tractors, tooling or fixtures.

For more detailed information, visit www.knight-ind.com

Floor Mounted Post Systems

Knight Global's Floor Mounted Rail System Posts utilize engineered Lindapters® to quickly and securely attach the heavy duty posts to W-Beams.

* Beams can also be pre-drilled for a bolted together system.

Model	Max Capacity(lbs)	Bridge Type	Rail Type
FMRS1400	Application Specific	Single/ Dual	RAD4110
FMRS1700	Application Specific	Single/ Dual	RAD7510
FMRS2700	Application Specific	Single/ Dual	RAD7510

* For more detailed information on rail systems, capacities, bridge types and rail types, contact your local Knight Global representative or visit www.knight-ind.com.

Aluminum Floor Mounted Post System

Knight's Aluminum Floor Mounted Post System is an easy to assemble lightweight alternative to the traditional steel four post system. The channels in the extruded aluminum posts can be used to mount torque monitors, tool holders, keyboards, television screens, tables and more.

Model	Max Capacity(lbs)	Bridge Type	Rail Type
AFMRS1000	Application Specific	Single/ Dual	RAD7510

* For more detailed information on rail systems, capacities, bridge types and rail types, contact your local Knight Global representative or visit www.knight-ind.com.

Cantilevered Rail System

Knight's Cantilevered Rail Systems are designed to eliminate the need for a four post floor structure system. It provides an alternative to workstations with minimal floor space.

A wide range of options are available with each system to meet all your specific engineering and application requirements. A Knight Representative will assist you in selecting and developing alternatives when designing your rail system.

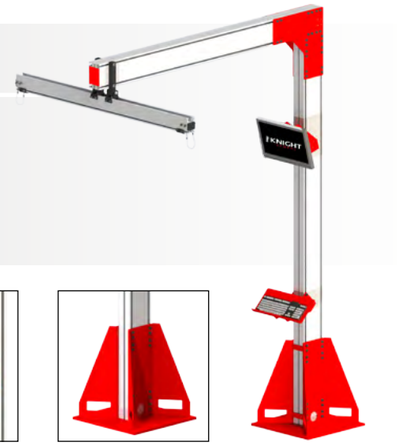
Additional columns and runway backers can be added to the two post system to achieve greater load capacities and minimize system deflection.

Model	Max Capacity(lbs)	Bridge Type	Rail Type
CMRS1000	Application Specific	Single/ Dual	RAD7510

* For more detailed information on rail systems, capacities, bridge types and rail types, contact your local Knight Global representative or visit www.knight-ind.com.

KNIGHT GLOBAL™

Cantilevered Workstation



Knight's Cantilevered Workstation is the perfect light weight aluminum solution for work spaces and assembly stations. The WSA1000 rail design allows for custom designed accessory mounts to be attached and postioned into various locations.

Knight's WSA1000 is custom designed to your application. The WSA1000 is available in various configurations.

The Cantilevered Workstation can be installed on the back side of a conveyor and allow secure tools to be within operators reach to fasten bolts/nuts.

It can also be used to mount torque monitors, keyboards, television screens, tables or whatever the customer deems necessary.

Adjustable Height Accessory Mounts

Steel Column Mounts

* Pictured computer moniter, keyboard, accessory mounts and bridge rail not included.

Cantilevered Workstation

Model	Max Capacity(lbs)	Max. Under Rail Heights(ft/m)	Max. Boom Lengths(ft/m)
WSA1000	Application Specific	up to 16 ft. [4.87m]	up to 16 ft. [4.87m]

* For more detailed information on the catilevered workstation capacities, accessories and custom options, contact your local Knight Global representative or visit www.knight-ind.com.

Rail Accessories

To view our full line of Rail Accessories visit us at www.knight-ind.com

Model# MRAS4454

Redundant End Caps

Combination of an end cap and a mid-rail stop that prevents load trolleys or end trucks from exiting the rail.

Model# MRAA4805

End Caps with Shock

Dampens the impact of a load trolley striking the end cap.

Model# MRES7717

End Trucks

End Trucks carry the bridge along the runways of a rail system. Available in a variety of different configurations.

Model# MRES7528

Same Plane End Truck

Designed to elevate bridge to the same height as the runway. System stack-up heights can be reduced by as much as 11.5 inches.

Model# MRES7905

Single or Dual Bridge Rigid End Truck

Eliminates bridge skew for applications that will require added stability.

Model# MRHS40381

Rigid Hanger

I-beam flange hanger used for kick-up loads such as arms or offset loads. Adjustable up to 1.5 inches vertically in 1/4 in. increments.

Model# MRHA4035

C-Channel Bolt-on Hanger

Non-adjustable hanger used for cantilevered or direct loads.

Model# MRHS40361

Rod and Ball Hanger

Used for direct loads such as hoists or balancers. Fits I-beam flange widths 2-11 inches. Recommended for light duty use only.

Model# MRMA6160

Inspection Gate

Allows for removal, insertion and inspection of a trolley or end truck without having to remove it from the end of the rail system.

Model# MRES4322

Telescoping Rail

Extends the reach beyond the working limits of a bridge.

For more detailed information, visit www.knight-ind.com

KNIGHT GLOBAL™

Jib Cranes

Jib Cranes offer a large tool coverage area with a single rotating rail on a floor mounted pedestal. Knight cranes are ideal for short transfer applications and are designed to move effortlessly while still carrying large loads. Jib cranes allow for maximum hoist height on low head room applications or when the overhead working space cannot accommodate a rail system. Jib Cranes' two component design makes installation and set-up simple.

Jib Cranes have Timken® Tapered Roller bearings that provide a smooth 360° rotation. Max. boom lengths are available up to 20 ft. [6m] with max. under rail clearance heights of up to 15 ft. [4.5m]. Jib Crane booms can be extended by adding a telescoping rail.

MJBA2600

Jib Crane Series

Model	Max. Capacity(lbs/kg)	Max. Under Rail Heights(ft/m)	Max. Boom Lengths(ft/m)
MJBA2000	up to 30 lbs. [13kg]	up to 6 ft. [1.8m]	up to 5 ft. [1.5m]
MJBA2050	up to 50 lbs. [23kg]	up to 12 ft. [3.7m]	up to 10 ft. [3m]
MJBA2100	up to 149 lbs. [68kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]
MJBA2200	up to 800 lbs. [363kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]
MJBA2300	up to 1,150 lbs. [522kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]
MJBA2600	up to 1,150 lbs. [522kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]
MJBA3000	up to 2,000 lbs. [907kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]
MAJBA4000	up to 2,000 lbs. [907kg]	up to 15 ft. [4.5m]	up to 20 ft. [6.1m]

* For more detailed information on jib crane capacities, heights and lengths, contact your local Knight Global representative or visit ww.knight-ind.com.

MAJBA4000

MJBA3000

MJBA2600

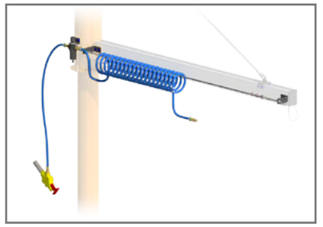
MJBA2300

MJBA2200

MJBA2050 MJBA2000

Jib Crane Accessories

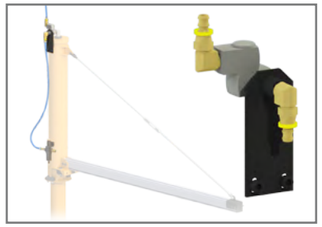
To view our full line of Jib Crane Accessories visit us at www.knight-ind.com



Hose Management

Supplies air to the tooling. Includes the brackets, fittings, regulator, air lock-out and messenger cable. Available for coiled and straight hose systems (Hose sold separately).

Model# JSA9135 (Shown)



360° Rotate Air Fitting Assembly

Allows for the 360° continuous rotation of the air supply line.

Model# JSA9137 (Shown)

MJBA3000 Rail Mount Kit

Attaches underneath the I or S-Beam of a Knight Jib Crane. Allows for a Knight low friction load trolley to move the load on the rail.

Model# MRHS40821 (Shown)

Tables, Shuttles and Carts

Knight Lift Tables incorporate the use of pneumatic control technologies, which makes table operation cleaner, simplifies spare parts inventories and reduces general maintenance. Our exclusive Knight Global air bag design offers high durability and resistance to wear.

Lift Tables are available in a variety of configurations to accommodate every applications needs. All lift tables come equipped with hydraulic steel fittings and a Continental “Flexagrip” hose/ fitting system. Stainless steel braided hydraulic hosing for increased durability is optional. Polished chrome shafts are used at all slide and pivot points to minimize the wear and prolong component life.

Maintenance Lock-Out Bar design that physically locks out the lift table are standard on all Knight Global Lift Tables. All tables are inspected and tested before they leave our facility.

Lift Table Series

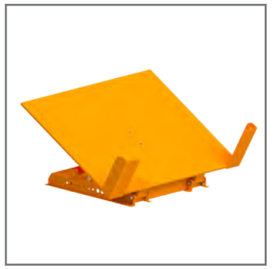
To view our full line of Lift Tables visit us at www.knight-ind.com

Standard Lift

Lift table raises loads to the proper ergonomic height for the operator. Lifting capacity up to 8,000 lbs. [3,629kg].

Lift and Rotate

Rotate table raises loads to the proper ergonomic height and provides up to 360° of rotation. Lifting capacity up to 8,000 lbs. [3,629kg].



Standard Tilt

By tilting container forward, the table positions dunnage for easy loading or unloading. Lifting capacity up to 8,000 lbs. [3,629kg].

Lift and Tilt

Lift and Tilt table will raise loads to ergonomic heights and provides a tilting table top. Lifting capacity up to 6,000 lbs. [2,722kg].

Low Profile Lift and Rotate

The low profile design lowers the table top to 8.5 in. [215mm] off the floor. Lifting capacity up to 6,000 lbs. [2,722kg].

Slide and Tilt

Slide action prevents the table from entering the operators work space. Lifting capacity up to 8,000 lbs. [3,629kg].

Cart Lift

Cart lift systems position the cart and content in an ideal ergonomic position so workers are more productive. They are equipped with cart to table interlock systems.

Stationary/ Portable Cart Lift

Fork-free lift that raises smaller carts to operator working level. Rear wheels allow operator to easily transfer the cart lift to multiple locations.

For more detailed information, visit www.knight-ind.com

Lift Table Series (Cont.)

To view our full line of Lift Tables visit us at www.knight-ind.com

Double Scissor Lift

When extra lift is needed to raise loads to a higher and safe ergonomic height. Capacity up to 2,000 lbs. [907kg].

Turntables

Supplies loads continuously to an assembly station with one, two or four position configurations. Capacity up to 8,000 lbs. [3,629kg].

Portable Lift Table

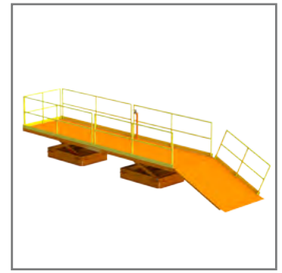
Custom portable lift table is mounted to a cart for mobile use. Deck size and lift height will be customized to your application. Capacities vary by application.

Load Sensor Lift

Maintains loads at a safe ergonomic working height during varying weight load exchanges. Capacity up to 4,500 lbs. [2,041kg].

Air/ Hydraulic/ Electric Lift and Rotate

Air or electric operated for the applications that need the rigid actuation that hydraulic provides.



Platform Lift

Platform lifts the position of the operator in an ergonomic manner within a workstation. Pneumatic or hydraulic lifts available. Capacity up to 2,000 lbs. [907kg].

Zero Loader

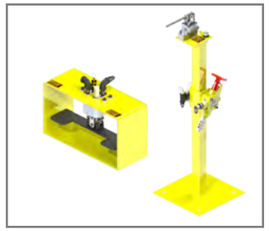
Designed for ground level loading, lifting and tilting with a pallet jack when fork truck access is limited. Capacity up to 4,000 lbs. [1,814kg].

Zero Lift/ Tilt Loaders

Combines the convenience of ground level loading with the footprint of a standard lift table. Capacity up to 4,000 lbs. [1,814kg].

Table Accessories

To view our full line of Tables Accessories visit us at www.knight-ind.com



Hand and Foot Controls

Table controls are available in a pedestal mounted or floor mounted configuration.

Bellows Skirting

Protective covering that serves as a barrier for the operator. Skirting keeps debris from entering the table.

Motion Stabilizer

Stabilizes loads traveling upward/ downward in a smooth, consistent manner. Typically used for loads that are greater than 4,000 lbs. [1,814kg]

Steel Riser

The steel reinforced construction ensures a safe, sturdy mounting base. Standard and custom risers are available.

Note: Table, Shuttles and Carts are available with a variety of accessories, safety features and equipment. Optional Safety Equipment including but not limited to; perimeter fence guarding, bellows skirting, safety mats, audible signals, light signals, toe guards, special control guarding, etc. are not included unless otherwise stated in the product descriptions. Please check with your state, local or plant safety for requirements. Please contact your local Knight Global representative or visit www.knight-ind.com (Tables, Shuttles and Carts) for more detailed information. Knight Global will be happy to quote any and all safety equipment needed to meet your requirements.

KNIGHT™ GLOBAL

Accumulators/ Shuttles/ Conveyors/ Custom

Accumulators, Shuttles and Conveyors present customer product and allow the operator to continuously work without the need to stop for customer product reload. Knight shuttles and accumulators are custom designed to your specific application.

Knight Accumulators, Shuttles and Conveyors are available with Lift, Tilt, Lift and Rotate or Lift and Tilt features. They have a adjustable gravity feed with manual actuations to completely automate systems. Available in Pneumatic only, Pneumatic and Electric or an Electric only operated system. Optional docking system for fork-free incentive tugger carts.

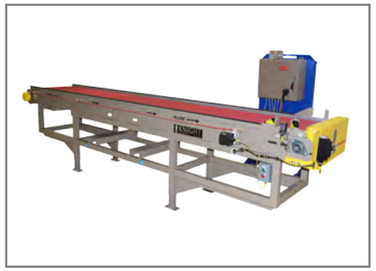
To view our full line of Shuttles and Accumulators visit us at www.knight-ind.com

Powered Accumulators

Powered Accumulators transfer parts between two workstations and offer an accumulation of parts. They are designed to your specific application needs. Loading capacity up to 50 lbs. per ft. [22kg].

Custom Built Shuttles

Custom shuttles are designed to your applications need and with a variety of design options available; the shuttle system is ideal for the transferring of products to and from workstations.



Powered Conveyors

Powered or Gravity Conveyors transfer parts between two workstations. They can be used in many types of material handling applications. They are designed to your specific needs.

* Custom Built

Gravity Over Under

The Gravity Over-Under is an efficient way to transfer parts between areas for assembly applications. No power source is required making it a very cost effective and maintenance free system.

* Custom Built

Workstation Tables

Workstation tables are designed to your applications need and with a variety of design options available. They can be incorporated with your existing tooling application.

* Custom Built

Lid Stack-n-Store

The Lid Stack-n-Store, will store large, heavy and cumbersome container lids at a common location without manual handling. It is an efficient way to save space and organize a workstation at the same time.

KNIGHT™ GLOBAL

For more detailed information, visit www.knight-ind.com

Carts/ Smart Carts

Knight Global Carts are designed to be customized to handle a wide variety of material handling needs. Each cart is tailored to the customer's specific application. Knight Carts are also designed to be integratable with Knight Lift Tables.

Carts are the ideal choice for transporting, lifting and/ or rotating products to an ergonomically correct position when portability is required. Knight Global Cart Systems are available in manual and electric (Smart Cart) operated configurations.

Small Engine Block Rollover

Smart Carts are custom designed to the customer's specific application. The Smart Cart is ideal when an off the shelf cart will not work with your application. We can also design and build a custom end effector for your Smart Cart application.

Carts/ Smart Cart Series

To view our full line of Carts visit us at www.knight-ind.com

Custom Carts

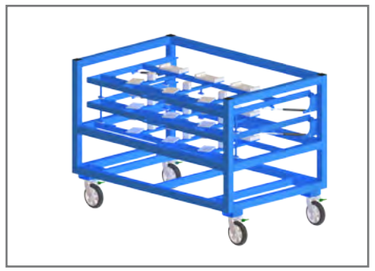
Designed per application. Open or fully enclosed with vinyl covers or solid doors. Available in a variety of configurations such as: Static Carts, Rotational Carts, Tilt Carts, Transfer Carts, Corral Carts and more.

Forkless Tugger Carts

Forkless cart systems allow you to link the carts together and tow several carts at once. The carts brake automatically disengages when the tongue comes down. Manually operated foot brake also included with cart.

Push Carts

Forkless carts are available in either push or tugger configurations. Can be configured with a rotational or static top. Capacity up to 1,500 lbs. [680kg].

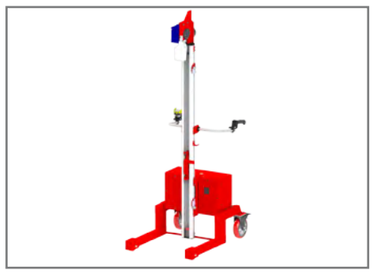


Dunnage Rack Carts

Dunnage Racks are custom designed to store and transfer parts. Every rack is custom designed to your application. Multiple options and sizes are available.

Controlled Drain Carts

Controlled drain cart and nestings are used in the assembly or disassembly of transmissions and other components. Carts are designed to your application with or without a wet cart self contained oil drainage storage system.



Smart Carts

The Smart Cart is ideal when portable powered manipulation is required for an application. Options include various end effectors such as I.D. roll grippers, clamps, suction cups, etc. Capacity up to 400 lbs. [181kg].

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