

GORBEL[®]

A CLASS ABOVE

www.gorbel.com

Electric Servo Powered
Intelligent Lifting Devices

THE SMARTER WAY TO

LIFT

Intelligence.
Speed.
Precision.
Strength.



GORBEL'S G-FORCE® AND EASY ARM™ TECHNOLOGY



INTELLIGENT ERGONOMIC LIFTING

Gorbel's G-Force® and Easy Arm™ devices are part of an exciting new family of material handling equipment known as Intelligent Assist Devices (IAD's). They use exclusive patented technology and an industrial processor controlled servo drive systems to deliver unmatched lifting precision and speed. Their fusion of advanced technology and basic human guidance maximizes productivity while minimizing the risk of injury to the operator.

"WE LOOKED AT EVERY LIFTING DEVICE ON THE MARKET. THE G-FORCE WAS BY FAR THE BEST."
- PROCESS SPECIALIST

Since 1977, Gorbel has specialized in overhead material handling solutions, providing the highest quality and the highest performance. We are the leading supplier of Work Station Crane systems, offering near perfect on-time delivery, a focus on customer service, and the industry's best warranty.

Now you'll find that same level of quality in our G-Force® Q and iQ Intelligent Lifting Devices and Easy Arm™ Intelligent Lifting Arms. These innovative units enable operators to lift and maneuver naturally, as if the devices were an extension of their arms. The G-Force® and Easy Arm™ Q and iQ will help improve productivity, reduce the cost of product damage, and minimize work-related injuries.

G-FORCE® AND EASY ARM™ TECHNOLOGY: THE SMARTER WAY TO LIFT

INFINITE SPEED CONTROL

The G-Force® and Easy Arm™ move with the operator. They move as fast or as slow as the operator chooses to move. They are ideal for applications that require high speed at some points in the cycle and slow, precise movements at other points.

Blazing Speeds

With G-Force® speeds reaching 200 fpm (61 mpm) and Easy Arm™ speeds reaching 180 fpm (55 mpm), these devices travel up to 4 times faster than traditional high-end lifting devices currently on the market, making them the fastest, most precise lifting devices on the planet.

Pinpoint Precision

The G-Force® and Easy Arm™ deliver unparalleled precision with speeds of less than 1 fpm (0.3 mpm). This gives the operator the control necessary to finesse expensive or fragile parts.

THE SAFE ALTERNATIVE

Operators want to use the G-Force® and Easy Arm™ because they're easy to learn and easy to use. They are safer than manual lifting and dramatically reduce worker injury cost.

Anti-Recoil Technology

This prevents the G-Force® or Easy Arm™ from moving or recoiling when there is a sudden change in load, reducing the risk of potentially serious injury.

Capacity Overload

The unit will not lift if the load exceeds the rated capacity of the G-Force® or Easy Arm™.

Power Loss Protection

A fail safe load braking system locks the unit in place in the event of a power loss.

Operator Present Function

The handle grip of the G-Force® and Easy Arm™ uses a built-in photo sensor that doesn't allow the unit to move unless the operator initiates the movement.

Float Mode Option

Both the G-Force® and Easy Arm™ offer our versatile Float Mode. With a mere 1/2 lb (227 g) of force on the load itself, operators can precisely orient loads throughout the full stroke range by manipulating the load with their hands.

THE SMART INVESTMENT

G-Force® technology makes your work force more productive by increasing their efficiency and enabling them to perform complex tasks. The G-Force® and the Easy Arm™ are more cost effective than completely robotic solutions and they don't require the costly custom programming that robots need to perform even the simplest tasks.

THE PERFECT SOLUTION

The G-Force® and Easy Arm™ give you the best of both worlds: the responsiveness and flexibility of a human operator plus the power of a machine. And, they incorporate a range of speeds, making them perfect for quick, repetitive motions and slow, precise placements.

MAN MEETS MACHINE

G-Force® technology fills the void between traditional lifting devices and completely automated robotic solutions. These devices use the human's intelligence and adaptability for guidance but the work is done by the device.



"GORBEL'S EASY ARM HAS CLEARLY HAS BEEN INSTRUMENTAL IN THE SUCCESS OF OUR LEAN INITIATIVES SO FAR. AS WE LOOK AT OUR OTHER PROCESSES AND VALUE STREAMS, I'M SURE WE'LL BE PURCHASING MORE OF THEIR PRODUCTS."
- LEAN INTEGRATION LEADER

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800.821.0086



G-FORCE® Q AND IQ BRIDGE CRANE MOUNTED INTELLIGENT LIFTING DEVICE

When precision, strength and speed are necessities, turn to Gorbel's patented G-Force® Intelligent Lifting Device. More precise than hoists, more responsive than air balancers, our bridge crane mounted G-Force® units improve safety, productivity and quality, resulting in a direct increase to your bottom line.

CHOOSE THIS CONFIGURATION FOR:

- Higher capacities: available in 165 lb, 330 lb and 660 lb capacities
- Faster speeds: maximum speeds up to 200 fpm
- More responsive performance: faster acceleration and deceleration
- Covering multiple work cells with one G-Force®
- Covering larger single work areas

APPLICATIONS

- Automotive assembly (engines, transmissions, chassis components)
- Heavy equipment manufacturing
- Tool & Die changeouts
- Natural Gas & Oil Industry (valves, drilling components, etc)
- Repetitive lifting jobs
- Parts assembly
- Machining
- Process equipment maintenance

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G-FORCE® IN ACTION: AUTOMOTIVE

END-USER:

A major automobile manufacturer and parts supplier.

APPLICATION:

Convertible car tops measuring 4' x 6' and weighing 200 lbs are being moved from a conveyor to a pallet lift for inspection, then taken away.

WHY G-FORCE?

They had been using a two-speed chain hoist with a maximum speed of 16 feet-per-minute. "The assembly line was running faster than the workers could offload the product with the chain hoist," said the line supervisor. With speeds up to 200 feet-per-minute, the G-Force® Q is able to perform as fast as the operators can move, and gives them complete control of their load.

RESULTS:

The speed that operators are able to work, and the frequency of loads they are able to handle, has greatly increased. Workers are able to consistently match the assembly line's output of 22 units per hour.

EASY ARM™ Q AND IQ INTELLIGENT LIFTING ARM

The Easy Arm™ Intelligent Lifting Arm is an ideal solution if you're looking for a turn-key, plug and play lifting solution. You get all the strength, precision, and speed of our patented G-Force® lifting technology and processor controlled electric servo drive system in the body of an ergonomic articulating jib crane.

CHOOSE FREE STANDING FOR:

- Easy installation: the unit ships assembled and ready to be installed
- No foundation required
- Smaller work areas that require 14' spans or less
- Capacities of 165 lb and 330 lb
- Easy relocation: the Easy Arm™ is simply bolted to the floor

CHOOSE UNDER HUNG FOR:

- Saving valuable floor space
- Hook heights over 11'
- Covering multiple work cells

APPLICATIONS

- Reaching into a work cell or around obstructions
- Reaching under overhead obstructions like conveyors or exhaust hoods
- Reaching into machines
- High cycle pick and place
- Loading/unloading machined parts



EASY ARM™ IN ACTION: MANUFACTURING

END-USER:

Pressure Technology of Ohio

APPLICATION:

Raw materials weighing up to 250 lbs are loaded into a furnace for heat treatment. During an average shift, an operator may move up to 600 parts.

WHY EASY ARM?

They had been using an overhead crane system and chain hoist, but this was slow and bulky. It was also shared throughout the facility, so operators tended to move parts by hand rather than using the hoist, which concerned the company. The 330 lb Easy Arm™ was perfect for the job, and they didn't have to share it.

RESULTS:

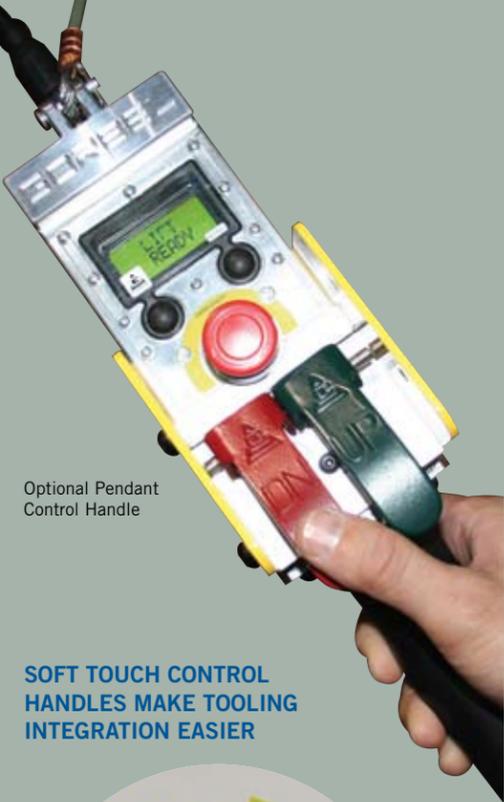
"We are very pleased with the Easy Arm™," said Pressure Technology's Plant Manager. "We are able to get precise part placement using float mode, and it's been a very easy piece of equipment to integrate into the workplace. Since we installed the Easy Arm™, we have eliminated many of our concerns related to product handling."



ADDED INTELLIGENCE FEATURES

There are two G-Force® and Easy Arm™ models to choose from: the Q and the iQ. The Q model is our feature packed base model. It offers the same speed and precision as our higher-end iQ model, but without the added Input/Output features that the iQ offers. The iQ model offers a wealth of additional intelligence features.

The Q and the iQ may look the same on the outside, but under their covers is a different story.



Optional Pendant Control Handle

SOFT TOUCH CONTROL HANDLES MAKE TOOLING INTEGRATION EASIER



Use our Soft Touch Control Handles to control any air or electric powered equipment, such as end-effector tooling for the G-Force® or Easy Arm™. A common handle base for air or electric applications gives you design commonality and flexibility, whether your application requires air valves for direct control of end tooling, or electric switches to activate your G-Force® or Easy Arm™ iQ inputs.

Why choose a Soft Touch Control Handle?

- Flexible design easily integrates into new equipment layouts
- Easy replacement of any standard pneumatic or electric handles
- Engineered for easy use to reduce potential for fatigue and repetitive stress injuries
- Offers more flexibility in tooling choices and the ability to customize tooling for applications
- Costs less than most comparable handles

G-FORCE® AND EASY ARM™ Q AND IQ HANDLE CONFIGURATION OPTIONS

The G-Force® and Easy Arm™ were designed to provide flexibility in handle configurations. Choose from the following four configurations to best fit your application.



In-Line Slide Handle

The in-line slide handle allows the operator to get close to the load for more control and precision. With this handle, the load moves with the motion of the operator's hand.



Remote Mount Slide Handle

This configuration offers the same smooth control as the slide handle, but accommodates set-ups where the operators can't be close to the load.



Suspended Pendant Control Handle

This handle is ideal when you have limited headroom, when the operator can't get close to the load or when the operator needs maximum lifting stroke. This handle can also be used when you expect the load to bounce or tip during lifting.



Remote Mount Pendant Control Handle

Choose this design when the handle is mounted more than one foot from where the wire rope attaches to tooling, or when you expect the load to bounce or tip during lifting.



INNOVATIVE HANDLE DESIGN

1. G 360™ Swivel Assembly

The G-Force® and Easy Arm™ have a combined collector/air swivel that allows the handle to continuously rotate without damaging electrical conductors in the coil cord or optional air coil. This is ideal in applications where the operator is continuously rotating the handle.

2. LCD Display

Backlit display on the handle allows for menu style set up of features like Virtual Limits and Speed Reduction Points. It also communicates valuable information like operation modes, weight readout, diagnostic information, and fault codes.

3. Operator Present Function

The handle grip of the G-Force® or Easy Arm™ uses a built in photo sensor, making it safe and intuitive. This method senses the presence of the operator's hand without a physical lever to depress. The result is safe, smooth operation because the operator is not tempted to use the Operator Present Sensor safety feature as a start/stop control.

4. Ergonomic Handle Design

Our long lasting handle was designed with your operator's comfort in mind. Its shape, size, and material were carefully planned to fit comfortably in the curve of your hand, while its rubber, textured coating gives you a positive grip.

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FEATURE COMPARISON	Q	iQ
Teachable Virtual Limits and Speed Reduction Points Virtual limits are specific points in the lifting range where the G-Force® and Easy Arm™ can be programmed to stop or change speeds. Set speed reduction points a few inches above or below a desired location when handling a fragile load. When the operator reaches that point, the units automatically shift to a lower programmed speed and then stop in the desired spot for controlled positioning every time.	Available as a software adder	Standard
Programmable Inputs and Outputs The iQ unit comes standard with 8 Input/Output points in the actuator. Standard "out of box" common functions like an additional set of virtual limits and a maintenance indicator are already assigned to the Input/Output points to reduce the need for custom programming. Flexible and convenient optional Input/Output blocks, each containing 8 Input/Output points, can be added below the G360™ Swivel Assembly to provide just the right functionality for your application. This block includes standard functions such as Auto-Home, Dual Weight Float Mode, and Anti-Drop.	N/A	Standard
Other Features The iQ allows you to control one G-Force® or Easy Arm™ unit with two handles, which is ideal for applications when tooling requires more than one point of control. You can also control two G-Force® units with one handle, which is useful when you want two points of control for large tooling.	N/A	Standard

See G-Force® and Easy Arm™ Q and iQ tooling examples on page 9.



G-FORCE® Q AND IQ BRIDGE CRANE MOUNTED LIFTING DEVICE



CAPACITY	165 lb (75 kg)	330 lb (150 kg)	600 lb (300 kg)
A	8.625" (219mm)	10.25" (260mm)	10.25" (260mm)
B	14.375" (365)	15" (381)	15" (381)
C	10.875" (276)	10.875" (276)	10.875" (276)
D	24.125" (613)	24.125" (613)	24.125" (613)
E	23" (641)	25.25" (641)	25.25" (641)
F	16" (406)	16" (406)	16" (406)

D references the coil cord in full upright position.

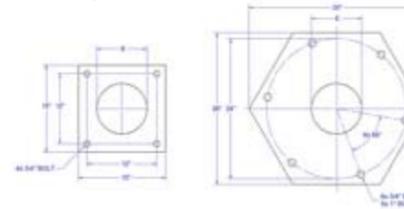
G-FORCE® Q AND IQ HANDLE CONFIGURATION OPTIONS

DIMENSIONS	Remote Slide	Suspended Pendant	Remote Pendant
D	15.5" (394mm)	5.875" (149mm)	15.5" (260mm)
F	14.25" (362)	14.375" (365)	14.375" (365)

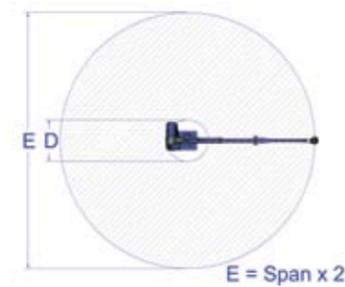


EASY ARM™ Q AND IQ FREE STANDING LIFTING DEVICE

Baseplate Dimensions

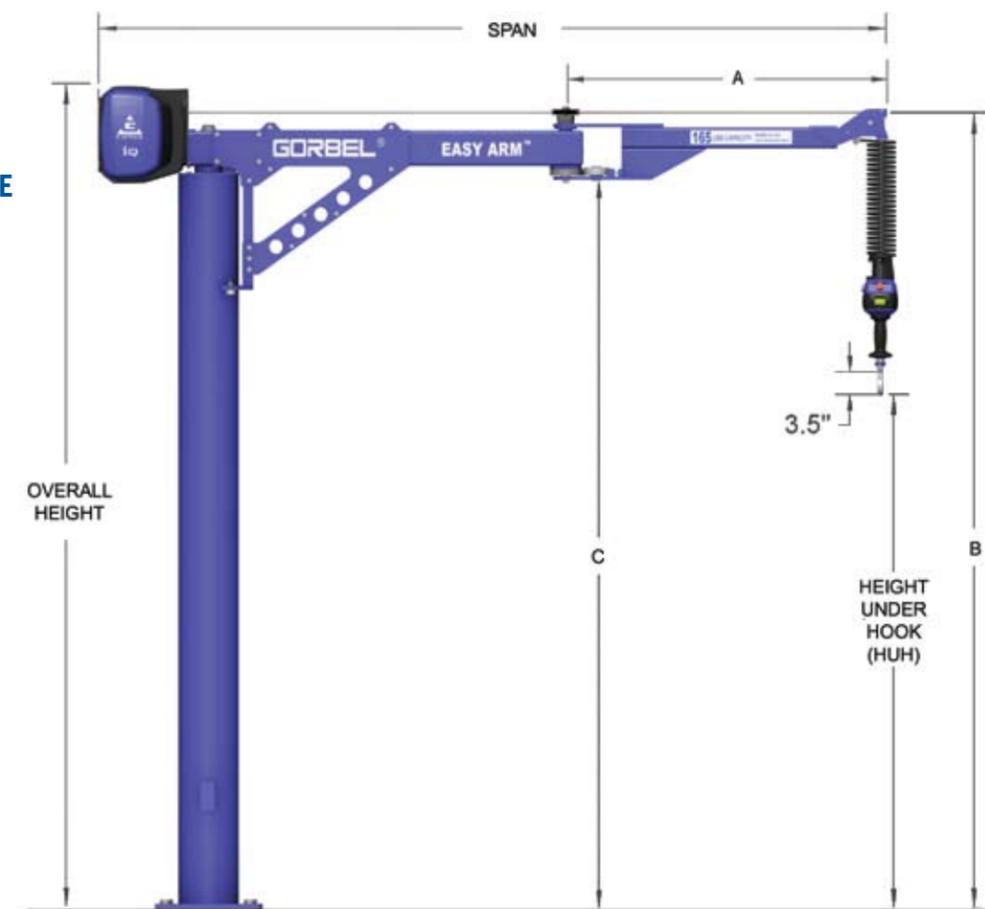


Hook Coverage



Arm Rotation:

355° primary arm, 320° secondary arm



165 lb (75 kg) Unit

Span	6'	8'	10'	12'	14'	6'	8'	10'	12'	14'	6'	8'	10'	12'	14'
Span	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)
HUH	6' (1829)					8' (2438)					10' (3048)				
OAH	109.14" (2772)					133.14" (3382)					157.14" (3991)				
A	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)
B	105.98" (2692)					129.98" (3301)					153.98" (3911)				
C	97.89" (2486)					121.89" (3096)					145.89" (3706)				
D	24.90" (632)	32.06" (814)	40.03" (1017)	48.00" (1219)	56" (1422)	24.90" (632)	32.06" (814)	40.03" (1017)	48.00" (1219)	56" (1422)	24.90" (632)	32.06" (814)	40.03" (1017)	48.00" (1219)	56" (1422)

330 lb. (150 kg) Unit

Span	6'	8'	10'	12'	14'	6'	8'	10'	12'	14'	6'	8'	10'	12'	14'
Span	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)	(1829mm)	(2438mm)	(3048mm)	(3658mm)	(4267mm)
HUH	6' (1829)					8' (2438)					10' (3048)				
OAH	109.88" (2791)					133.88" (3401)					157.88" (4010)				
A	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)
B	106.86" (2714)					130.86" (3324)					154.86" (3933)				
C	97.77" (2483)					121.77" (3093)					145.77" (3703)				
D	24.34" (618)	32.26" (819)	42.70" (1085)	51.48" (1308)	59.76" (1518)	24.34" (618)	32.26" (819)	42.70" (1085)	51.48" (1308)	59.76" (1518)	24.34" (618)	32.26" (819)	42.70" (1085)	51.48" (1308)	59.76" (1518)

Please note:

These dimensions are for Easy Arm™ units with Inline slide handles only. Units with suspended pendant handles will have different dimensions. Please contact Gorbelt at (800) 821-0086 for these dimensions. For Under Hung model dimensions please visit www.gorbelt.com/gforce/easyarm.asp. Other Heights Under Hook are available as special orders; contact factory. Dimensions shown in parentheses are in millimeters.



Portable Base

Instead of bolting your free standing unit to the floor, our optional portable base gives you a stable base that you can move anywhere in your facility. The base shown is for smaller Easy Arms. Larger units may require a different portable base. Contact your Gorbelt dealer to learn more.

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G-FORCE® AND EASY ARM™ Q AND IQ TECHNOLOGY: PROVEN PERFORMANCE

ERGONOMIC STUDY

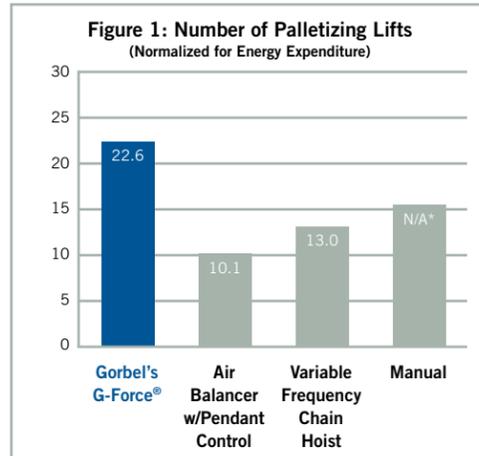
The following summary is based on a study performed by the Rochester Institute of Technology. The study compared the performance of Gorbels G-Force® Intelligent Lifting Device to other lifting devices. It focused on High Cycle Applications and Precision Placement Applications. To read the whole study, go to: <http://www.gorbel.com/pdfs/study/gforceergostudy.pdf>.

High Cycle Test

Operators were:

- 124% more productive with the G-Force® than with air balancers
- 74% more productive with the G-Force® than with variable frequency drive hoists

* Manual: 75% of the subjects could not complete 10 minutes of lifting & still maintain safe heart rates.

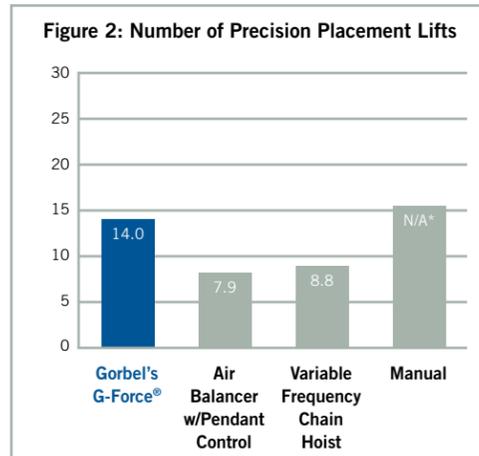


Precision Placement Test

Operators were:

- 76% more productive with the G-Force® than with air balancers
- 59% more productive with the G-Force® than with variable frequency drive hoists

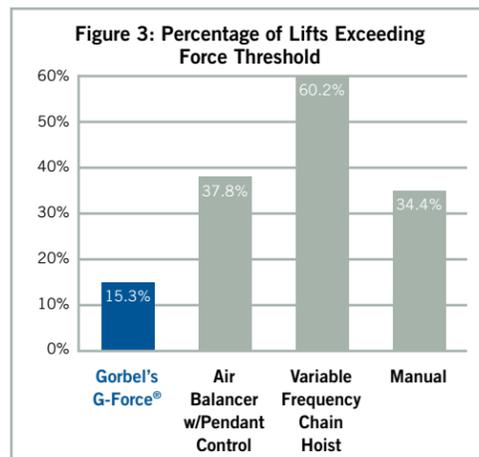
* Manual: None of the subjects could complete 10 minutes of lifting w/o exceeding safe heart rates.



Force of Placement

The G-Force® was:

- 2.5x less likely to damage the load than the air balancer with pendant control
- 3.3x less likely to damage the load than the variable frequency drive hoists
- 2.2x less likely to damage the load than manual



G-FORCE® AND EASY ARM™ Q AND IQ TOOLING EXAMPLES

EASE OF TOOLING INTEGRATION

The G-Force® and Easy Arm™ units were designed with tooling integration in mind. Optional handle auxiliary control brackets allow pneumatic valves or electric switches to be integrated with the G-Force® control handles. Choose one of these three handle configurations to meet the needs of your applications.

TOOLING EXAMPLES:



GORBEL'S G-FORCE® Q AND IQ TECHNOLOGY TECHNICAL SPECIFICATIONS

Bridge Mounted G-Force® Q and IQ Quick Facts

	Q	iQ	Q	iQ	Q	iQ
Maximum Capacity (Load & Tool)	165 lb 75 kg		330 lb 150 kg		600 lb 330 kg	
Maximum Lifting Speed Unloaded	200 ft/min 61 m/min		100 ft/min 30 m/min		50 ft/min 14.94 m/min	
Maximum Lifting Speed Fully Loaded	125 ft/min 38 m/min		75 ft/min 23 m/min		42 ft/min 12.80 m/min	
Maximum Float Mode (Option) Lifting Speed	103 ft/min 31 m/min		65 ft/min 20 m/min		38 ft/min 11.58 m/min	
Maximum Lift Range	11 ft 3.35 m		11 ft 3.35 m		11 ft 3.35 m	
Maximum Lift Stroke	8 ft 2.44 m		8 ft 2.44 m		8 ft 2.44 m	

Free Standing Easy Arm™ Q and IQ Quick Facts

Easy Arm™	Q	iQ	Q	iQ
Maximum Capacity (Load & Tool)	165 lb 75 kg		330 lb 150 kg	
Maximum Lifting Speed Unloaded	180 ft/min 55 m/min		90 ft/min 27 m/min	
Maximum Lifting Speed Fully Loaded	125 ft/min 38 m/min		75 ft/min 23 m/min	
Maximum Float Mode (Option) Lifting Speed	103 ft/min 31 m/min		65 ft/min 20 m/min	
Maximum Lift Range	11 ft 3.35 m		11 ft 3.35 m	
Maximum Lift Stroke	8 ft 2.44 m		8 ft 2.44 m	

G-Force®/Easy Arm™ Q and IQ Technical Specs

G-Force® & Easy Arm™	Q	iQ
Primary Lift Voltage (VAC)	220 +/- 10%	
Maximum Current (Amps)	10	
Duty Cycle	H5	
Operating Temperature Range	41 - 122° F 5 - 50° C	
Operating Humidity Range (Non-Condensing)	35 - 90%	
Power Available for Tooling	Not Available	24VDC @ 0.5A
Virtual Limits (Upper Limit, Power Limit, Speed Reduction)	Optional	Standard

iQ Specific Information

I/O Actuator (iQ Only)	iQ
Number of Inputs, Type	8, Sinking
Input Current @ 24 VDC	6ma
Number of Outputs, Type	8, FET
Continuous Current/Channel (Amps)	0.5
Module Maximum Current (Amps)	0.5
Handle with I/O Module (iQ Only)	
Number of Inputs, Type	8, Sinking
Input Current @ 24 VDC	4ma
Number of Outputs, Type	8, FET
Continuous Current/Channel (Amps)	0.5
Module Maximum Current (Amps)	0.5

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FOR MORE INFORMATION

Your authorized Gorbel dealer can give you more information on what makes Gorbel's Ergonomic Work Station Cranes and other material handling products "A Class Above."

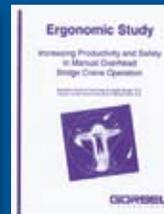
BRIDGE CRANES



FREE STANDING



CEILING MOUNTED

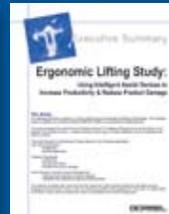


ERGONOMIC STUDY

ERGONOMIC LIFTING



G-FORCE® & EASY ARM™



ERGONOMIC STUDY

JIB CRANES



JIB CRANES



GANTRY CRANES



WORK STATION JIBS



ARTICULATING JIBS

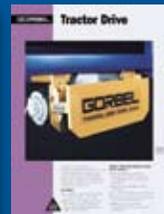
SPECIALTY PRODUCTS



SEISMIC ZONE IV



TELESCOPING



TRACTOR DRIVES



INTERLOCK/TRANSFER

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