

The leader in crane technology and ergonomic lifting



THE **SMARTEST** WAY TO LIFT:

VSeries G-Force® & Easy Arm®





**ELECTRIC SERVO POWERED INTELLIGENT LIFTING DEVICES** 

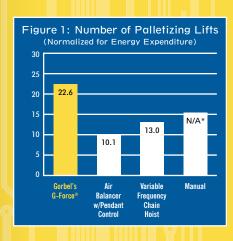
# INTELLIGENT INTEL

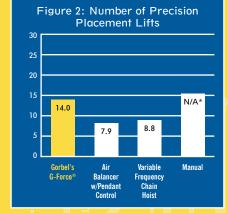
When lifting applications requires more speed, precision and control than traditional electric chain hoists, air balancers and vacuum lifters can offer, an increasing number of facilities are turning to Gorbel's G-Force Intelligent Lifting devices.

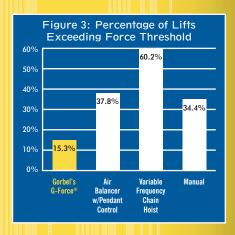
## GORBEL'S G-FORCE® TECHNOLOGY: PROVEN PERFORMANCE

#### **ERGONOMIC STUDY**

The following summary is based on a study performed by the Rochester Institute of Technology. The study compared the performance of Gorbel's 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

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#### FASTEST LIFTING TECHNOLOGY ON THE MARKET 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. **OPERATOR & FACILITY SAFETY** Each of our seven handle configurations has operator present detection which doesn't allow unintentional or accidental movement of the load. CUSTOMIZABLE CAPACITY OVERLOAD Units have a factory setting which prevents them from lifting a SAFET load that exceeds capacity, This is adjustable downward by the operator if a lower limit is desired. **FEATURES** OPERATOR SAFETY & PROTECTION HUMAN CENTERED ERGONOMICS & CONTROL The G-Force and Easy Arm units Gorbel's Intelligent Lifting feature an anti recoil technology that Devices move with the prevent the unit from moving if the operator. They move as fast or load is suddenly dropped reducing the as slow as the operator chooses potential for operator injury. to move. They are ideal for applications that require **OPERATOR & LOAD** high speed at some points in PROTECTION the cycle and slow, precise Featuring a failsafe load braking movements at other points. system that locks the unit in place in the event of a power loss. PRECISION PLACEMENT G-Force and Easy Arm feature float mode which allows the operator to use the part itself for precise orientation and placement of the load. With speeds of less than 1 foot per min the operator is able to control and finesse expensive or fragile parts.

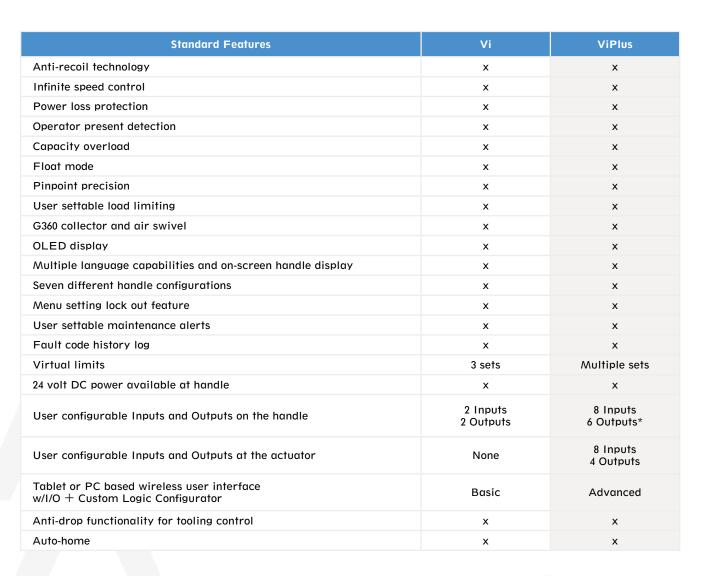
#### CUTTING EDGE CONTROL TECHNOLOGY

The G-Force VSeries is available in two models, the Vi and the ViPlus which feature Gorbel's new Velocity Control Platform. The G-Force VSeries, cutting edge Velocity Control platform is the latest advancement in servo lifting. This technology combined with the unit's proprietary design delivers ultimate stability and responsiveness to seamlessly mimic the user's natural movement.

The Vi has Velocity Controls with features that fit the needs of most applications and the ViPlus offers more configurable I/O points at the handle and in the actuator.







\*with optional expansion I/O block











## CONFIGURATIONS AND APPLICATIONS

G-FORCE® Vi AND ViPlus
BRIDGE CRANE MOUNTED
INTELLIGENT LIFTING DEVICE

#### **G-FORCE SUSPENSION OPTIONS:**

- Monorail
- i-beam
- WSC
- Trolley Suspension

#### **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
- Covering larger single work areas







## EASY ARM® Vi AND ViPlus INTELLIGENT LIFTING ARM

The Easy Arm® Intelligent Lifting Arm is a combination of our G-Force® lifting device and an articulating jib crane. It is an ideal solution if you're looking for a turn-key, plug and play lifting solution.

#### CHOOSE FREE STANDING EASY ARM® FOR:

- Smaller work areas that require 14' spans or less
- Capacities of 165, 330, and 660 lbs
- Easy installation: Unit ships assembled and ready to be installed
- No foundation required (some conditions apply, see Installation Manual)
- Easy relocation: the Easy Arm® is simply bolted to the floor



#### CHOOSE UNDER HUNG EASY ARM® FOR:

- Saving valuable floor space
- Hook heights over 11'
- Covering multiple work cells
- 165 lb standard capacity. Contact Gorbel® to inquire about 330 lb unit.

#### **APPLICATIONS:**

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

#### Optional 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 Gorbel dealer to learn more.





## Vi AND ViPlus HANDLE CONFIGURATION OPTIONS

The G-Force® and Easy Arm® were designed to provide flexibility in handle configurations. Your Gorbel distributor or your tooling integrator can help you choose the handle configuration best suited for your application.

See tooling examples on pages 15-16.



#### In-Line Slide Handle

The in-line slide handle allows the operator to get close to the load for more control and precision.



#### 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.



The Force Sensing Handles offer versatility in ergonomic lifting. Compared to standard slide handles, which use displacement of the handle to initiate upward or downward motion, this design senses force applied without any handle motion. This creates a versatile option for tooling, or elongated handles that perfectly serve applications with a wide range of motion.



#### In-Line (FSI)

When very low or very high pick and place points require hand-over-hand lifting. Eliminates the need to bend over to reach into deep bins or dunnage.



#### Hub (FSH)

Provides the most flexibility for custom tooling solutions by allowing a wide range of handle bars (by others) to be mounted to the hub. The hub can also be mounted anywhere on the custom tooling frame. When the operator needs to control up/down motion by applying force to any point on the handle bars or other control fixtures attached at the hub.

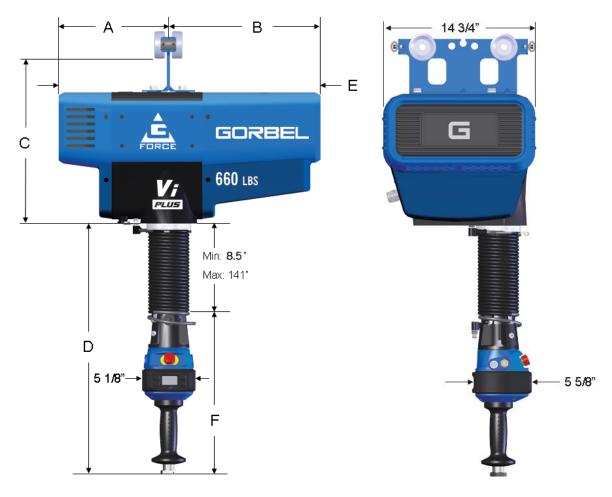


#### Remote mounted (FSR)

Provides the ability to remote mount a 24" or 36" Force Sensing Handle to a tooling frame (by others). This is beneficial for ergonomically reaching high and low pick/place points.



## G-FORCE® Vi AND ViPlus: BRIDGE CRANE MOUNTED LIFTING DEVICE



Capacity	165 lb (75 kg)	330 lb (150 kg)	<b>660 lb</b> (300 kg)
Α	<b>9"</b> (228mm)	10.625" (269mm)	10.625" (269mm)
В	14" (356)	14.625" (372)	14.625" (372)
С	17" (432)	17" (432)	17" (432)
D	26" (660)	<b>26"</b> (660)	26" (660)
Е	23" (584)	25.25" (641)	25.25" (641)
F	16" (406)	16" (406)	16" (406)

C dimension may change according to the track series you're using. Consult factory for actual dimension. D references unit in full up position.

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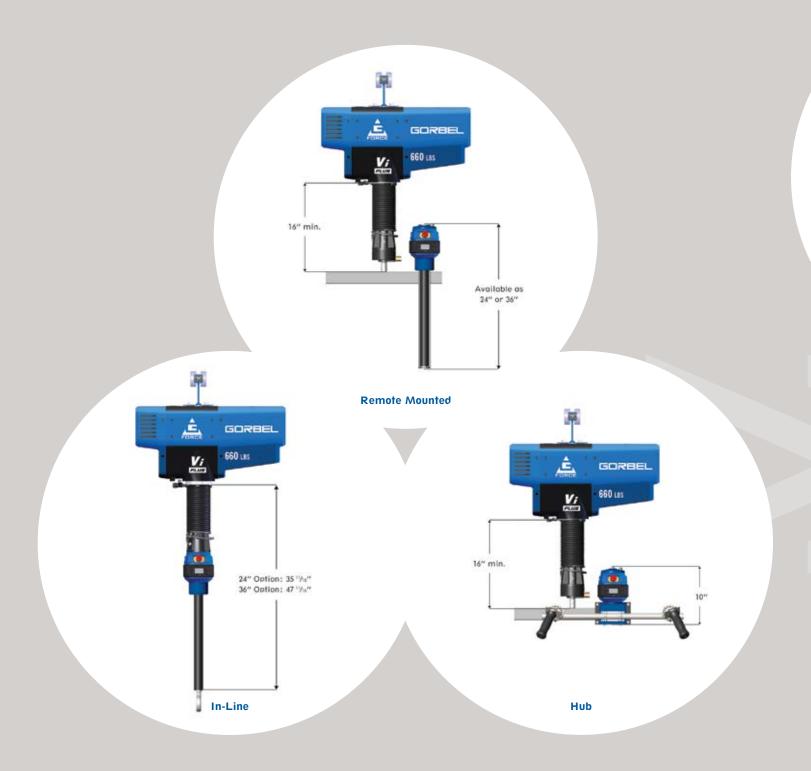
#### HANDLE CONFIGURATION OPTIONS



Dim	Remote Mount Slide	Suspended Pendant Control	Remote Mount Pendant Control		
D	17.5" (445mm)	8.5" (216mm)	17.5" (445mm)		
F	14.25" (362)	14" (356)	14" (356)		



## FORCE SENSING HANDLES



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## 1320 LB. UNIT HANDLE CONFIGURATIONS



In-Line Slide







Remote Slide



Suspended Pendant



Dim	In-Line Slide	Remote Slide	Remote Pendant	Suspended Pendant
Α	10.625" (269mm)	10.625" (269mm)	10.625" (269mm)	10.625" (269mm)
В	14.625" (372)	14.625" (372)	14.625" (372)	14.625" (372)
С	17" (432)	17" (432)	17" (432)	17" (432)
D	30.5" (775)	21.5" (546)	21.5" (546)	17.5" (445)
E	25.25" (641)	25.25" (641)	25.25" (641)	25.25" (641)
F	19.5" (495)	14.25" (362)	14" (356)	14" (356)



#### EASY ARM® Vi AND ViPlus: FREE STANDING LIFTING DEVICE



#### 165 LB (75 KG) UNIT

Span	<b>6′</b> (1829mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)	<b>6′</b> (1829mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14′</b> (4267mm)	<b>6'</b> (1829mm)	<b>8′</b> (2438mm)	<b>10′</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)
нин	JH 6' (1829)			8' (2438)				10′ (3048)							
ОАН	H 109.64" (2785)				133.64" (3395)				157.64" (4004)						
Α	33.84" (860)	45.12" (1146)	56.40" (1433)	<b>67.68"</b> (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	56.40" (1433)	<b>67.68"</b> (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	<b>56.40"</b> (1433)	<b>67.68"</b> (1719)	78.96" (2006)
В	B 105.98" (2692)					129.98" (3301)				153.98" (3911)					
С	97.89" (2486)					121.89 (3096)				145.89" (3706)					
D	24.90" (632)	32.06" (814)	40.03"	48.00" (1219)	<b>56"</b> (1422)	24.90" (632)	32.06" (814)	40.03"	48.00" (1219)	<b>56"</b> (1422)	24.90" (632)	32.06" (814)	40.03"	48.00" (1219)	<b>56"</b> (1422)

#### 330 LB. (150 KG) UNIT

Span	<b>6′</b> (1829mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)	<b>6'</b> (1829mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)	<b>6'</b> (1829mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12′</b> (3658mm)	<b>14′</b> (4267mm)
нин	H 6' (1829)			8′ (2438)				10′ (3048)							
ОАН	110.38" (2804)				134.38" (3414)				158.38" (4023)						
А	33.84" (860)	<b>45.12"</b> (1146)	56.40" (1433)	<b>67.68"</b> (1719)	78.96" (2006)	33.84" (860)	<b>45.12"</b> (1146)	56.40" (1433)	67.68" (1719)	78.96" (2006)	33.84" (860)	<b>45.12"</b> (1146)	<b>56.40"</b> (1433)	<b>67.68"</b> (1719)	78.96" (2006)
В	106.86" (2714)					130.86" (3324)				154.86" (3933)					
С	97.77" (2483)					121.77" (3093)					14	5.77" (370	3)		
D	24.34"	32.26" (819)	42.70" (1085)	51.48" (1308)	<b>59.76"</b> (1518)	24.34"	32.26" (819)	42.70" (1085)	51.48" (1308)	<b>59.76"</b> (1518)	24.34"	32.26" (819)	<b>42.70"</b> (1085)	51.48" (1308)	<b>59.76"</b> (1518)

#### Please note:

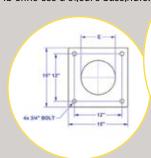
These dimensions are for Easy Arm® units with in-line slide handles only. Units with suspended pendant handles will have different dimensions. Please contact Gorbel at (800) 821-0086 for these dimensions. Other Heights Under Hook are available as special orders; contact factory. Dimensions shown in parentheses are in millimeters.

#### 660 LB. (300 KG) UNIT

Span	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)	<b>8′</b> (2438mm)	<b>10'</b> (3048mm)	<b>12'</b> (3658mm)	<b>14'</b> (4267mm)
нин	H 6' (1829)			8' (2438)				10' (3048)				
ОАН		124.5	(3162)		148.5" (3771)			172.5" (4381)				
Α	45.12" (1146)	<b>56.4"</b> (1433)	67.68" (1719)	78.96" (2006)	45.12" (1146)	<b>56.4"</b> (1433)	67.68" (1719)	78.96" (2006)	45.12" (1146)	56.4" (1433)	<b>67.68"</b> (1719)	78.96" (2006)
В	114.22" (2901)			138.22" (3511)				162.22" (4120)				
С	94.39	(2398)	91.66	(2329)	118.39	(3007)	115.66	(2938)	142.39	(3617)	139.66	(3547)
D	<b>40.1"</b> (1019)	50.1" (1273)	60.1" (1527)	<b>70.1"</b> (1781)	<b>40.1"</b> (1019)	50.1" (1273)	60.1" (1527)	<b>70.1"</b> (1781)	<b>40.1"</b> (1019)	50.1" (1273)	60.1" (1527)	<b>70.1"</b> (1781)

#### **BASEPLATE DIMENSIONS**

Please note: Hex baseplates are used on all 330 lb units, and on 165 lb units with a combined HUH plus span of 18' or more. All other 165 lb units use a square baseplate.

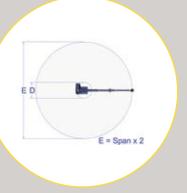




#### HOOK COVERAGE

Arm Rotation:

355° primary arm 320° secondary arm



### **G-FORCE**

## TOOLING

Gorbel G-Force® and Easy Arm® Intelligent Lifting Devices are high speed, high precision, intelligent lifting devices that often require end tooling to complete a total solution that will grip, lift, move, lower and release a load and allowing the full benefit of increased productivity, reduced product damage and superior ergonomics. Choosing the right end-effector tooling to complement your G-Force® and Easy Arm® is the key to maximizing your lifting solution. End-effector tooling engages the load so it can be lifted and manipulated in whatever way your application requires – whether the load needs to be flipped, turned, or rotated. Gorbel dealers utilize our worldwide network of tooling integrators to provide the best solution for your application. This gallery of solutions shows different examples of Gorbel G-Force® and Easy Arm® units with end effectors to help you visualize the range of potential solutions for your lifting applications.





#### **OD GRIPPER**

Remote mounted pendant handle for gripping wheel and tire assemblies. Utilizes anti-drop intelligence feature of iQ model which doesn't allow release of the load in the air.



#### **PLATE GRIPPER**

Vertical to horizontal pitch function. In-line slide handle. May be used for steel plate or any other material.



#### **BOX OR BUCKET LIFTER**

Vacuum cups with Force Sensing Hub grips from side and top of boxes or buckets to maintain integrity of the package and allow high and low layer palletizing/ de-palletizing.



#### TWO JAW GRIPPER

Remote pendant handle integrated pneumatic gripper, with manual rotate and adjustable center of gravity. Jaws can be customized to fit the geometry of any part.



#### **TUBE LIFTER**

Permanent magnet with pneumatic release. In-line slide handle. Also works with any round ferrous bar stock or cylindrical objects.



#### PLATE/SHEET LIFTER

Permanent magnet with pneumatic release. In-line slide handle. Size of magnets and configuration of magnet array can be customized to fit larger ferrous plates or sheets.



#### **CASTING LIFTER**

Force Sensing Hub.
Magnetically grips and lifts
coated metal castings from
molds. Also includes a feature
that uses high pressure air to
release part from mold.



#### PLATE PICKER

Extended remote mounted pendant handle allows reaching over a plasma cutting table to remove cut parts or other applications where an extended reach is needed.







#### **DRUM LIFTER**

Force sensing hub vacuum with quick-change adapter and 3 different vacuum heads to lift drums, bags, and cardboard boxes with the same system.



#### **PLATE PICKER**

Magnet gripper with air actuated release and force sensing handle allows lifting and lowering without bending over to pick or place the load.



#### **VACUUM CLAMP**

Two-cup vacuum tool on two linear actuators use both clamping and vacuum to pick or place cabinets, enclosures, or other large box-type loads.



#### SPOOL GRIPPER

Pneumatic OD clamp with remote mounted pendant handle grips spools of wire, cable, or other material. A pitch function positions the spool horizontally or vertically.



#### **ID GRIPPER**

Pneumatic two-jaw ID gripper with automatic (button-less) clamp/unclamp function combines well with the Force Sensing Hub for high speed pick and place applications.



#### WHEEL LIFTER

Remote pendant handle pairs with a pneumatic OD gripper to lift and move car, truck, or heavy equipment wheels.



#### TIRE/WHEEL PICKER

Expanding air bladder is attached to an automatic clamp/unclamp unit with the Force Sensing Hub to pick and place wheels, with or without tires. Dual handles allow ergonomic high/low lifting.



#### PNEUMATIC CLAMP

Versatile clamping tool with in-line slide handle grips any load with flat sturdy sides such as car batteries, blocks, or metal blanks.



#### **BIN LIFTER**

Gripper with remote mounted pendant handle has rotate function to allow lifting and dumping of bins.



#### **ROLL TURNER**

Simple non-powered, mechanical ID roll lifter engages the core of the roll. Combined with the remote mounted slide handle, this unit also effortlessly rotates from vertical to horizontal.



#### **SLEEVE PICKER**

Manually actuated ball-lock pin engages the steel sleeve for lifting. Paired with a remote mount slide handle.



#### MANUAL TONG

Flexible three way tong grab with in-line slide handle allows lifting of a range of different diameter loads.





#### SOFT TOUCH CONTROL HANDLES

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® inputs.

#### MAKE TOOLING INTEGRATION EASIER

- 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



## CASE STUDIES

#### G-FORCE® IN ACTION: PAPER PLANT

This manufacturer of paper products replaced their air balancers with a Gorbel® Easy Arm® to change out roll cores in their plant. The switch has enabled the production process to run smoother and they've increased productivity.



URL: https://www.gorbel.com/ solutions-center/ergonomic-lifting/ paper-manufacturer-benefits-fromintelligent-lifting-solution

#### G-FORCE® IN ACTION: POWDER COATING OPERATION

This powder coating company turned their two person operation into a one person job by replacing a forklift with a G-Force Intelligent Lifting Device.



URL: https://www.gorbel.com/ solutions-center/ergonomic-lifting/ powder-coating-g-force-intelligentlifting-device-reduces-labor-costsand-provides-safe-solution









## GORBEL'S Vi AND ViPlus TECHNOLOGY: TECHNICAL SPECIFICATIONS

#### BRIDGE MOUNTED G-FORCE® Vi AND ViPlus QUICK FACTS

G-Force® Vi & ViPlus Actuator									
Max Capacity	165 lb   75 kg	330 lb   150 kg	660 lb   300 kg	1320 lb   600 kg					
Max Lifting Speed Unloaded	195 ft/min   59 m/min	95 ft/min   29 m/min	45 ft/min   14 m/min	25 fpm   8 m/min					
Max Lifting Speed Fully Loaded	120 ft/min   37 m/min	60 ft/min   18 m/min	40 ft/min   12 m/min	20 fpm   6 m/min					
Max Float Mode Lift Speed	110 ft/min   34 m/min	55 ft/min   17 m/min	40 ft/min   12 m/min	20 fpm   6 m/min					
Maximum Lift Range	11 ft/min   3.4 m/min	11 ft/min   3.4 m/min	11 ft/min   3.4 m/min	5.5 ft/min   1.7 m/min					
Maximum Lift Stroke	8 ft/min   2.4 m/min	8 ft/min   2.4 m/min	8 ft/min   2.4 m/min	5.5 ft/min   1.7 m/min					
Lifting Media	3/16" dia. 19x7 Preformed Stainless Steel Wire Rope	3/16" dia. 19x7 Preformed Stainless Steel Wire Rope	1/4" dia. 19x7 Preformed Stainless Steel Wire Rope	1/4" dia. 19x7 Preformed Stainless Steel Wire Rope					
Duty Cycle	H5	H5	H4	H3					

#### FREE STANDING EASY ARM® VI AND VIPIUS QUICK FACTS

Easy Arm® Vi & ViPlus			
Max Capacity (Load & Tool)	165 lb   75 kg	330 lb   150 kg	660 lb   300 kg
Maxi Lifting Speed Unloaded	175 fpm   53 mpm	85 fpm   26 mpm	40 fpm   12 mpm
Max Lifting Speed Fully Loaded	108 fpm   33 mpm	54 fpm   16 mpm	36 fpm   11 mpm
Max Float Mode Lifting Speed	99 fpm   30 mpm	49 fpm   15 mpm	36 fpm   11 mpm
Max Lift Range	11 ft   3.4 m	11 ft   3.4 m	11 ft   3.4 m
Max Lift Stroke	8 ft   2.4 m	8 ft   2.4 m	8 ft   2.4 m
Max Arm Span	14 ft   4.3 m	14 ft   4.3 m	14 ft   4.3 m

#### Vi AND ViPlus TECHNICAL SPECS

G-Force® and Easy Arm®	Vi ViPlus
Primary Lift Voltage (VAC)	220 +/- 10%
Maximum Current (Amps)	6
Operating Temperature Range	41 - 104° F 5 - 40° C
Operating Humidity Range	
(Non-Condensing)	35 - 90%
Available Tooling Power	24VDC @ 0.5A
Environmental Rating	NEMA 5
Weight Display Accuracy	+/- 1% Rated Capacity
UL/CSA Certified	Yes
CE Certified	Yes

#### www.gorbel.com **800.821.0086**



#### Vi AND ViPlus SPECIFIC INFORMATION

I/O Actuator (ViPlus only)									
Inputs, Type	8, Sinking								
Input Current @24VDC	3mA								
Outputs, Type	4, Sourcing								
Continuous Current/Channel	0.15A								
Module Max Current	0.5A								
Outputs, Type	2, Relay								
Continuous Current/Channel	0.5A								
Rated Relay Voltage	200VDC								
Handle with I/O Block Module (ViPlus Only)									
Inputs, Type	8, Sinking								
Input Current (max) @24VDC	3mA								
Outputs, Type	6, Sourcing								
Continuos Current / Channel	0.5A								
Total Continuous Current	0.5A								
Handle with Standard I/O (	Vi Model)								
Inputs, Type	2, Sourcing								
Input Current (max) @24VDC	60mA								
Outputs, Type	2, Relay								
Max Switch Current	0.5A								
Max Available Current	0.5A								



www.gorbel.com

#### 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."



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.

You'll find that same level of quality in our VSeries G-Force® and Easy Arm® Intelligent Lifting Devices. These innovative units enable operators to lift and maneuver naturally, as if the devices were an extension of their arms. Our Vi and ViPlus model Intelligent Lifting Devices will help improve productivity, reduce the cost of product damage, and minimize workrelated injuries.

#### GORBEL

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#### **OVERVIEW**



#### **BRIDGE CRANES**







**Work Station Cranes** 

Cleveland Tramrail

Ergonomic Study

#### **ERGONOMIC LIFTING**





Ergonomic Study

#### **JIB CRANES**



Jib Cranes

#### **FALL PROTECTION**



