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Gorbel's G-Force® and Easy Arm® devices are part of an exciting new family of material handling equipment known as Intelligent Assist Devices (IADs). They use exclusive patented technology and an industrial processor controlled servo drive system 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.

There are two models of Gorbel Intelligent Lifting Devices 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.



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 ontime 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® 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 Q and iQ model Intelligent Lifting Devices will help improve productivity, reduce the cost of product damage, and minimize work-related injuries.





units improve safety, productivity and quality, resulting in a direct increase to your bottom line.

#### CHOOSE A BRIDGE MOUNTED CRANE CONFIGURATION FOR:

- Higher capacities: available in 165, 330, 660, and 1320 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®

#### **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

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#### **CASE STUDY**

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G-FORCE® Q: DAMAGE AND INJURY RISK "VIRTUALLY" ELIMINATED

**\*\*\*\*\*\*** 

Atlas Copco's
gas and process
division
makes turbo
compressors
and expansion
turbines that
are used for
natural gas
processing
and power

generation. At an assembly

facility where components for these large compressors are assembled, multiple work processes were sharing a single overhead crane system. Workers would often be at a stand-still while a co-worker used the crane, or would forgo the crane altogether and risk injury by lifting heavy parts by hand.

The company decided to target the highthroughput milling applications for a process change, and installed Gorbel work station cranes to eliminate the productivity delays caused by the shared crane. While the new cranes eliminated that problem, finding a lifting device to fit the application was a challenge due to the size of the load and the sensitive machinery it was being placed into.

In this work cell, 5-15" in diameter stainless steel cylinders that range from 15 to 400 pounds are milled down from bell shaped impeller blanks into the finished impeller with razor sharp edges. Moving the parts by hand posed multiple injury risks and a high potential for damage.

"We're lifting very heavy steel cylinders and trying to place them with precision into the milling machine without damaging the part or the machine," said Diehl. "We needed something that gave us a lot of control."

The company selected a 660 pound capacity G-Force<sup>®</sup> Q. Atlas Copco had considered other devices, but felt they would have the most control with the G-Force<sup>®</sup> after seeing a demo of the unit's virtual limits package, Float Mode feature, and overall smooth movement.

An operator now secures the impeller blanks into the tooling grip that Atlas Copco designed, which locks onto the blanks' outer rim. Once secured, the operator engages Float Mode on the G-Force® handle, and then moves the load up and down by holding the gripping tool or the load itself.







#### CHOOSE UNDER HUNG EASY ARM® 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 exhaust hoods
- Reaching into machines
- High cycle pick and place
- Loading/unloading machined parts

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#### **CASE STUDY**



EASY ARM® Q: INCREASES PRODUCTIVITY, LIFTS 5X AS MANY PARTS

**}}}}}** 

A major tier one auto parts supplier stamps round sheet metal blanks into clutch hubs and clutch housings for automatic transmissions.

transmissions.
The thin blanks
range in diameter from 6-14"
and weigh up to 8 pounds each.

They arrive in a bin and were manually loaded into the transfer press.

In order to load the blanks into the press, operators had to bend over the edge of the bin, grab as many blanks as they could hold, and then turn and carry them to the loading turn table. By the end of worker's shift, fatigue would set in and productivity would drop. Many workers complained of back strain and fatigue, while others suffered cuts to the hands, and wrist, plus elbow and shoulder pain.

After a new stamp press was installed, the company looked for a better handling solution. The company installed a 330 pound capacity Easy Arm® Q with an 8' span in the loading bay of their stamp press. The project integrator, Pressline Equipment, worked with Starquip of Ontario, Canada to design a pneumatic gripping tool that enabled operators to reach into the bin, grip about 150 pounds of blanks and effortlessly guide them into the spindles on the loading table. This is about 5-times as many blanks as they were able to lift manually. The result was faster cycle times, less worker fatigue, and no more productivity drop-off near the end of a shift.

"We were very pleased with the initial results," said the company's Environmental, Health & Safety Manager. "We had no more repetitive use injuries among Easy Arm® users, and workers are moving faster with less fatigue. We have older ladies who are able to do this job now with no problems. We wouldn't be buying a second unit if we had any doubts about it."

#### <<< 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.





## Q AND IQ 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. 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.



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, the new 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)

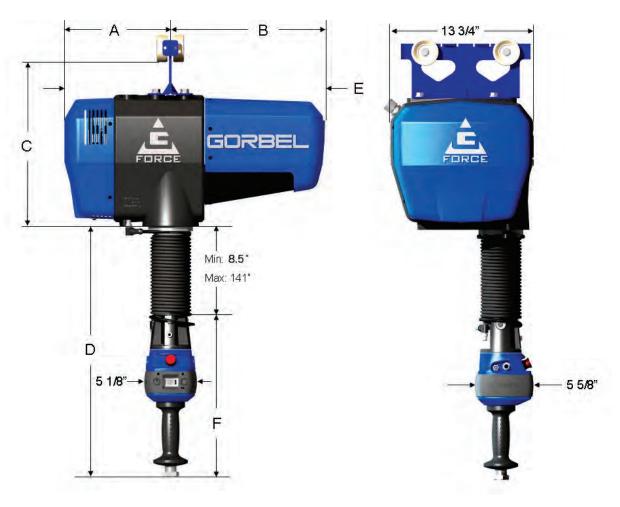
Provides the most flexibility for custom tooling solutions by allowing a wide range of handle bars (by others) to be mounted to the hub. The hub can also be mounted anywhere on the custom tooling frame. When the operator needs to control up/down motion by applying force to any point on the handle bars 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® Q AND IQ: BRIDGE CRANE MOUNTED LIFTING DEVICE



		330 lb (150 kg)	
А	8.625" (219mm)	10.25" (260mm)	10.25" (260mm)
В	14.375" (365)	15" (381)	15" (381)
С	17" (432)	17" (432)	17" (432)
D	26" (660)	26" (660)	26" (660)
Е	23" (584)	25.25" (641)	25.25" (641)
F	16" (406)	16" (406)	16" (406)

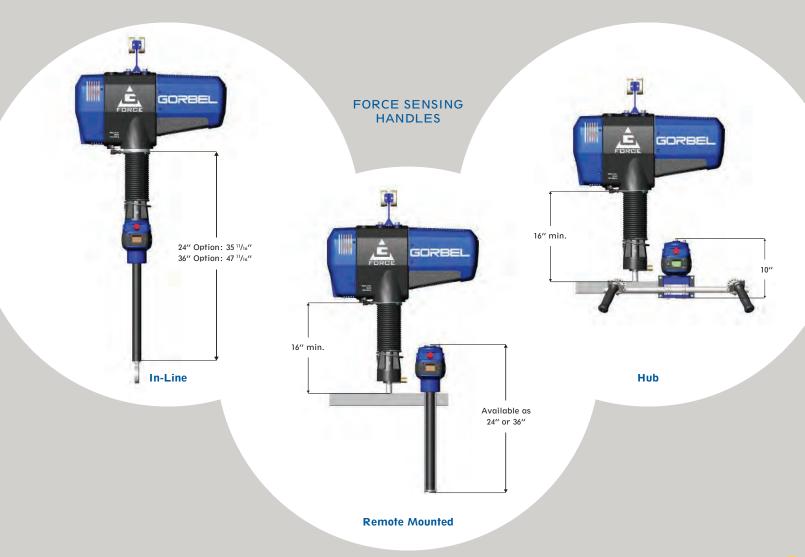
C dimension may change according to the track series you're using. Consult factory for actual dimension. D references unit in full up position.

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#### HANDLE CONFIGURATION OPTIONS



Dim			
D	17.5" (445mm)	8.5" (216mm)	17.5" (445mm)
F	14.25" (362)	14" (356)	14" (356)



#### 1320 LB. UNIT HANDLE CONFIGURATIONS









Remote Slide



Suspended Pendant

Dim				
А	10.25" (260mm)	10.25" (260mm)	10.25" (260mm)	10.25" (260mm)
В	15" (381)	15" (381)	15" (381)	15" (381)
С	17" (432)	17" (432)	17" (432)	17" (432)
D	30.5" (775)	21.5" (546)	21.5" (546)	17.5" (445)
Е	25.25" (641)	25.25" (641)	25.25" (641)	25.25" (641)
F	19.5" (495)	14.25" (362)	14" (356)	14" (356)

#### **CASE STUDY**

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G-FORCE® Q: ERGONOMIC-FRIENDLY, INCREASES PRODUCTIVITY

**}}}}}** 

An international distributor of sustainable, environmentally friendly office space was looking to optimize the safety of its employees in high risk

applications. One of the first

areas targeted was the raw material receiving area, which handles incoming sheets of glass that are usually 3 feet by 6 feet, and weigh about 115 pounds. The sheets are brought in on large A frames, and moved onto carts where they go on to be framed.

Shipments are received a few times each week, and two workers are required to do as many as 80 lifts each shift. It was clear to the management very early that there was too much at risk to leave the application as it was.

"We had a few small injuries," said the manufacturing manager. "We did not have any back injuries yet, but it was coming. We didn't want to wait for it."

"A very similar application in another facility used a crane as well, but they had a chain hoist to lift the glass. It was very slow, not smooth enough, and operators didn't feel they had enough control to set the glass down gently. Eventually the workers pushed it off to the side."

For this facility, the company purchased a Gorbel G Force® Q with 330 pound lifting capacity and a remote mounted handle integrated with a Schmalz vacuum lifter. The tooling allows a single user to grip the sheet of glass and tilt it into position. The range of motion of the G Force® allows the users to maintain a fast working pace while still carefully placing each sheet of glass onto the carts. Since installing the G Force®, the management is very satisfied with the results, and the workers were also very happy to have the new lifting method.

"I am very happy with it," said one of the operators. "Especially on the larger pieces of glass, it saves us a lot of personnel time. We're able to run things a lot smoother, able to move from job to job and not worry about maneuvering the a frames because of the different sizes of glass."



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#### EASY ARM® Q AND IQ: FREE STANDING LIFTING DEVICE



#### 165 LB (75 KG) UNIT

нин			6' (1829)			8′ (2438)					10′ (3048)				
ОАН	109.14" (2772)						13	33.14" (338	32)			15	7.14" (399	1)	
А	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)	67.68" (1719)	78.96" (2006)
В		10	)5.98" (269	92)		129.98" (3301)					153.98" (3911)				
С		9	7.89" (248	5)		121.89 (3096)					145.89" (3706)				
D	24.90" (632)	32.06" (814)	40.03"	48.00" (1219)	56" (1422)	24.90"	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

нин			6' (1829)			8′ (2438)					10′ (3048)				
ОАН		10	9.88" (279	71)		133.88" (3401)					157.88" (4010)				
А	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)	67.68" (1719)	78.96" (2006)	33.84" (860)	45.12" (1146)	<b>56.40"</b> (1433)	67.68" (1719)	78.96" (2006)
В		10	06.86" (271	4)		130.86" (3324)					154.86" (3933)				
С		9	7.77" (248	3)		121.77" (3093)			145.77" (3703)						
D	24.34" (618)	32.26"	<b>42.70</b> " (1085)	<b>51.48</b> " (1308)	<b>59.76"</b> (1518)	24.34"	32.26" (819)	42.70" (1085)	51.48" (1308)	<b>59.76"</b> (1518)	24.34" (618)	32.26" (819)	<b>42.70"</b> (1085)	<b>51.48"</b> (1308)	<b>59.76"</b> (1518)

#### Please note:

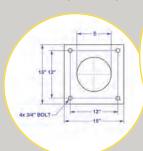
These dimensions are for Easy Arm® units with in-line slide handles only. Units with suspended pendant handles will have different dimensions. Please contact Gorbel at (800) 821-0086 for these dimensions. Other Heights Under Hook are available as special orders; contact factory. Dimensions shown in parentheses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

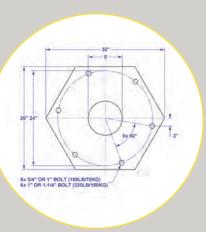
#### 660 LB. (300 KG) UNIT

нин		6' (	1829)			8′ (	2438)		10' (3048)			
ОАН		122"	(3099)			146"	(3708)			170"	(4318)	
А	45.12" (1146)	<b>56.4"</b> (1433)	67.68" (1719)	78.96" (2006)	45.12" (1146)	<b>56.4"</b> (1433)	<b>67.68"</b> (1719)	78.96" (2006)	45.12" (1146)	<b>56.4"</b> (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	40.1" (1019)	50.1" (1273)	60.1"	<b>70.1"</b> (1781)	40.1"	50.1" (1273)	60.1"	<b>70.1"</b> (1781)	40.1"	50.1" (1273)	60.1"	<b>70.1"</b> (1781)

#### **BASEPLATE DIMENSIONS**

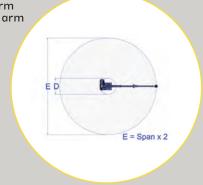
Please note: Hex baseplates are used on all 330 lb units, and on 165 lb units with a combined HUH plus span of 18' or more. All other 165 lb units use a quare baseplate.





#### HOOK COVERAGE

Arm Rotation: 355° primary arm 320° secondary arm



# TOOLING

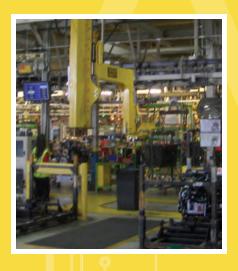
#### EASE OF TOOLING INTEGRATION

#### GORBEL'S G-FORCE® TOOLING EXAMPLES

The Q and iQ 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.













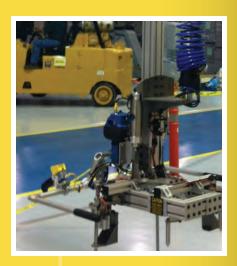
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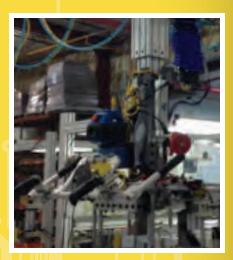
# SOFT TOUCH CONTROL HANDLES MAKE TOOLING INTEGRATION EASIER

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

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

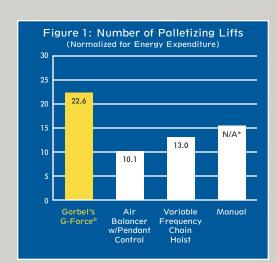
#### **ERGONOMIC STUDY**

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:

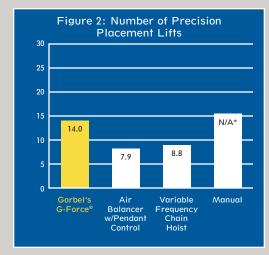
- 124% more productive with the G-Force® than with air balancers
- 74% more productive with the G-Force® than with variable frequency drive hoists
- \* Manual: 75% of the subjects could not complete 10 minutes of lifting & still maintain safe heart rates.



#### **Precision Placement Test**

Operators were:

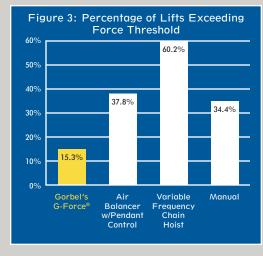
- 76% more productive with the G-Force® than with air balancers
- 59% more productive with the G-Force® than with variable frequency drive hoists
- \* Manual: None of the subjects could complete 10 minutes of lifting w/o exceeding safe heart rates.



#### Force of Placement

The G-Force  $^{\mbox{\tiny B}}$  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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# GORBEL'S Q AND IQ TECHNOLOGY: TECHNICAL SPECIFICATIONS

#### BRIDGE MOUNTED G-FORCE® Q AND IQ QUICK FACTS

	Q	iQ	Q	iQ	Q	iQ	Q	iQ
Maximum Capacity	165	lb	330	lb	660	lb	132	0 lb
(Load & Tool)	75	kg	150	kg	300	kg	600	kg
Maximum Lifting Speed	200 ft/min		100 ft/min		50 ft/min		25 fpm	
Unloaded	61 m/min		30 m/min		14.94 m/min		7.47 m/min	
Maximum Lifting Speed	125 f	/min	75 ft	/min	42 ft	/min	21 1	pm
Fully Loaded	38 m	/min	23 m	/min	12.80 r	m/min	6.4 n	n/min
Maximum Float Mode	103 ft/min		65 ft/min		38 ft/min		19 fpm	
Lifting Speed	31 m	/min	20 m/min		11.58 m/min		5.79 m/min	
Maximum Lift Range	11 ft		11 ft		11 ft		5.5 ft	
Muximoni Lin Range	3.35	i m	3.3	ī m	3.35	5 m	1.6	8 m

#### FREE STANDING EASY ARM® Q AND IQ QUICK FACTS

	Q	iQ	Q	iQ	
Maximum Capacity (Load & Tool)	165 75	ib kg		lb kg	
Maximum Lifting Speed Unloaded		t/min <sub>l/min</sub>	90 ft/min 27 m/min		
Maximum Lifting Speed Fully Loaded		t/min <sub>/min</sub>	75 ft. 23 m		
Maximum Float Mode Lifting Speed		t/min <sub>/min</sub>	65 ft. 20 m		
Maximum Lift Range		ft 5 m		f† 5 m	

#### Q AND IQ TECHNICAL SPECS

	Q	iQ
Primary Lift Voltage (VAC)	220 +	/- 10%
Maximum Current (Amps)	1	0
Duty Cycle	Н	15
Operating Temperature Range	41 - 1 5 - 5	
Operating Humidity Range (Non-Condensing)	35 -	90%
User Accessible Power	Not Available	
Virtual Limits (Upper Limit, Power Limit, Speed Reduction)	Standard	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)	iQ
Number of Inputs, Type	8, Sinking
Input Current @ 24 VDC	4ma
Input Current @ 24 VDC  Number of Outputs, Type	4ma 8, FET



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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."

PROUDLY DISTRIBUTED BY:



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#### **OVERVIEW**



#### **BRIDGE CRANES**







Work Station Cranes Cleveland Tramrail

Ergonomic Study

#### **ERGONOMIC LIFTING**





G-Force® & Easy Arm®

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#### **JIB CRANES**



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#### FALL PROTECTION



Fall Arres