LOADING ARMS FOR LNG APPLICATIONS

EMCO WHEATON®
An Ingersoll Rand Business

EXPERIENCE THE FUTURE OF EFFICIENT & SAFE LNG TRANSFER SOLUTIONS

Turn to the trusted Market Leader!

REQUEST A QUOTE

LIQUEFIED NATURAL GAS (LNG) LOADING SOLUTIONS INTRODUCTION

SAFE AND RELIABLE LEADER IN LNG

With more than 100 years' experience working within the fluid transfer industry, Emco Wheaton has the pedigree, knowledge, innovative attitude and skills required to produce world leading equipment which will solve all your liquefied natural gas transport needs.

With a long history of developing cryogenic marine loading arms, Emco Wheaton has successfully designed, built, and delivered a number of complete loading packages tailored to LNG and other cryogenic applications with the highest safety standards.

THE FUTURE OF LNG

Natural gas is an important cornerstone of our energy supply and the fastest growing major fuel source. Commonly used for both heating and as a fuel, burning natural gas produces less CO2, is more efficient and reliable than renewable energy, and is cleaner than coal and oil. However, transporting gas is not easy and this is where liquefied natural gas comes in.

With the current global LNG demand, Emco Wheaton's LNG Marine Loading Arms can significantly contribute to meeting your project requirements.

THE BENEFITS OF EMCO WHEATON'S LNG LOADING SOLUTIONS

The Emco Wheaton range of LNG loading solutions has been developed based on our extensive experience of working with customers in marine and transport applications for more than 100 years. The resulting loading arms allow liquefied natural gas companies to ensure maximum levels of safety and performance.

MAXIMUM SAFETY

Our Marine Loading Arms are designed to meet the stringent safety and availability requirements of the LNG industry Our arms are designed to ensure the right balance throughout all manoeuvring and connecting positions. Our Emergency Release System (ERS) guarantees safe operation; an integrated safety feature allows for the rapid and automatic release of the loading arm from the ship in the event of an emergency. In addition, Emco Wheaton's ERS is able to simulate an emergency without real disconnection. For truck (un)loading of LNG, we provide bottom loading that takes place on the ground and is inherently safer for the operator.

HIGH QUALITY

Depending on your operational needs, the loading arms can be equipped with a robust high-quality support structure and a range. We use the best materials and components to provide you with a robust and durable marine loading arm.

EASY HANDLING

Our LNG loading arms are designed for easy use and handling.

FULL PROJECT MANAGEMENT SUPPORT

From conceptual design to construction, commissioning and aftermarket services. A dedicated project management team is allocated to every LNG project run by Emco Wheaton. Emco Wheaton has been delivering LNG projects for decades, working with a range of EPC (Engineering, Procurement and Construction) and energy companies on meeting the most demanding technical requirements and unique needs. Project managers take part in the sales negotiation process to ensure they have solid knowledge of the project from start to finish.

MINIMUM MAINTENANCE COSTS

Emco Wheaton's LNG loading arms have a simple and maintenance-friendly design. Our dedicated service team offers you full aftermarket support.

SERVICE SUPPORT

Emco Wheaton is part of the Ingersoll Rand group and with their extensive experience and network of skilled and certified service engineers they have the ability to support any cryogenic application, including LNG requests.

DESIGNED FOR MAXIMUM SAFETY

SPECIFIC CRYOGENIC/LNG SAFETY NEEDS

LNG and the other cryogenic gases generate potential safety problems resulting from the huge difference between their extremely low temperatures and the ambient temperature. As they are turned into gas again, their volume expands rapidly many times. To maintain safety it is crucial to choose reliable loading systems and set up safety procedures to be followed.

DESIGNED TO ADDRESS LNG CHALLENGES

As a cryogen, LNG must be transferred and stored by and in specialized equipment so that it is keptin a liquid state. We ensure a range of provisions are included in our products to guarantee their safe operation.

These include:
- The use of emergency release systems
- The use of hydraulic couplers to reduce operator interaction
- The use of robust control systems

QUALITY STANDARDS

Emco Wheaton meets the industry's high standards on safety and reliability. The safety and integrity of our customers' operations are our top priority; this is why our range of products are engineered to meet and exceed the highest levels of quality possible.

LNG MARINE LOADING ARM

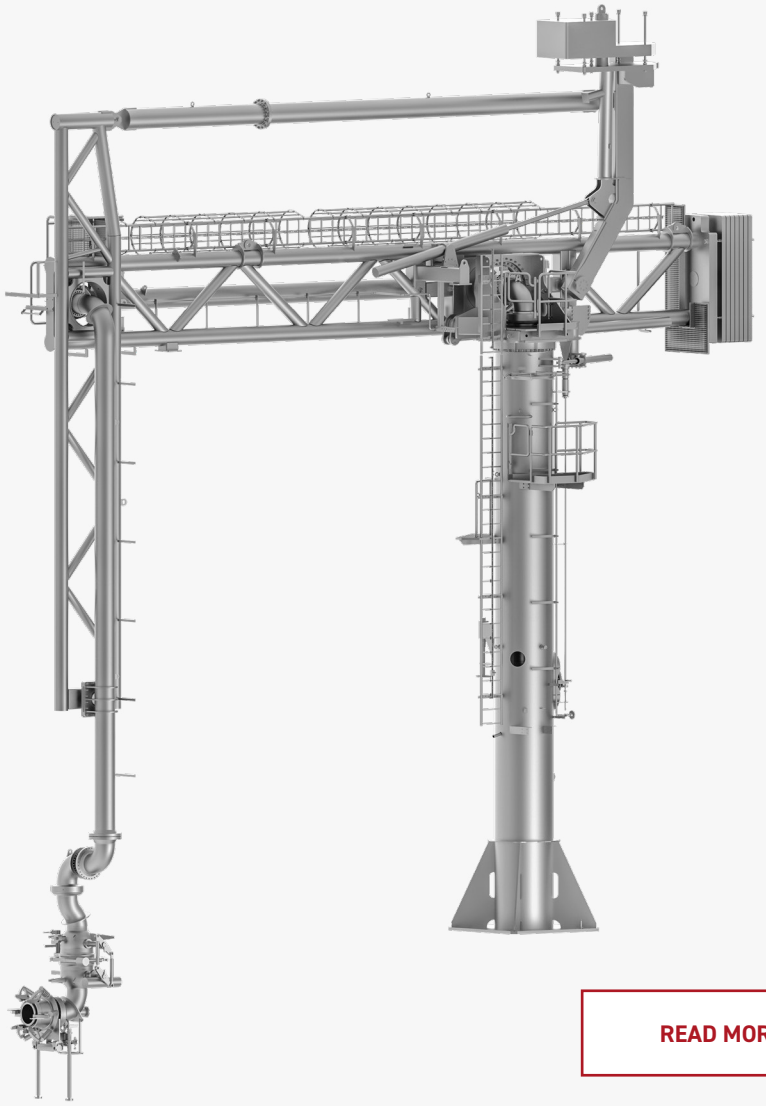
The LNG marine loading arm has been designed for any kind of application where it is essential to keep the product pipe consistently the same size for either economical or technical reasons.
Featuring a self-supporting design that is compatible with a range of ancillary equipment and accessories, the Emco Wheaton LNG marine loading arm maximizes safety and ease of use (both manual and hydraulic) while minimizing maintenance costs.

DESIGNED FOR SAFETY

The LNG design includes a support structure for the standpost, inboard and outboard arm separating any mechanical loads imposed to the product pipe, except the deadweight and the internal pressure loads. This ensures optimum operational safety and low weight of the arm, as well as lowers wind loads imposed to the jetty structure.
The balancing of the arm is achieved by independent double-counterweights with a rigid link pantograph balancing system for precise balancing of the inboard and outboard arms. This system's accurate balance is ensured throughout all maneuvering and connecting positions.

NOTABLE ADVANTAGES

- Maximum safety levels
- Ease of handling
- Higher availability/flexibility
- Minimum operational cost (cost of ownership)
- Minimal space required for the installation of the loading arms
- Tested and approved according to OCIMF and ISO 16904



READ MORE

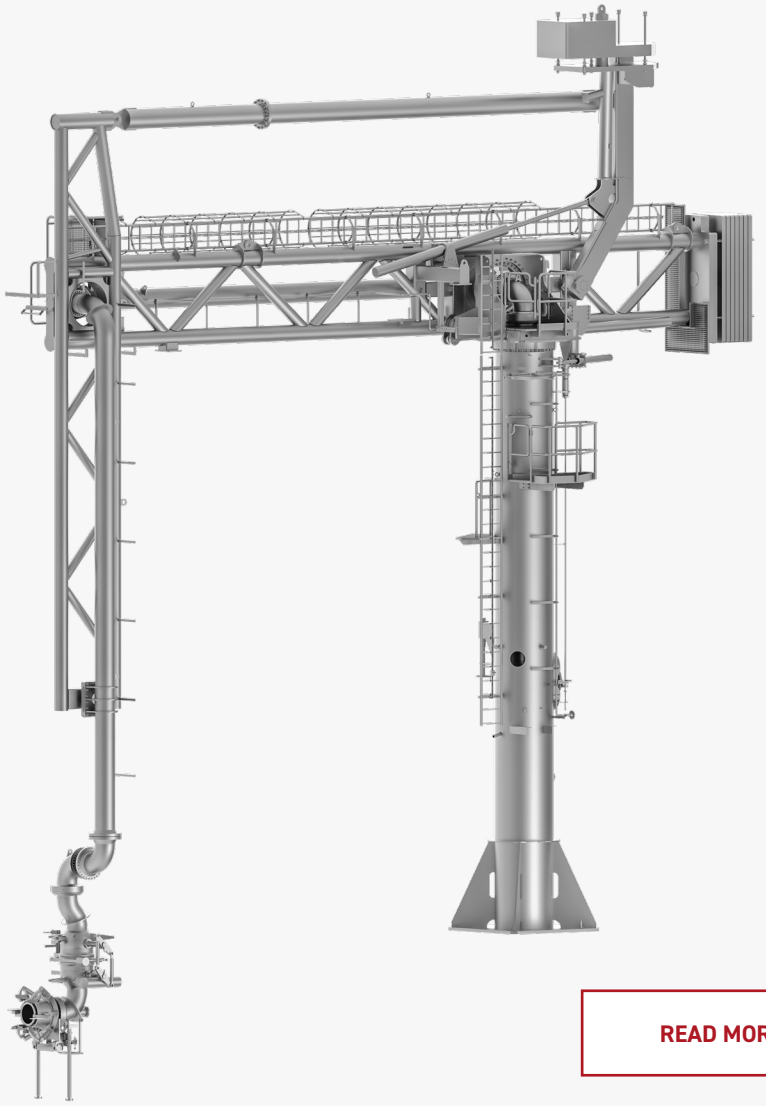
LNG MARINE LOADING ARM

FEATURES

- Sizes from 3" up to 16"
- Pressure ratings from PN 10 up to PN 40
- Temperature range: from -196°C up to +200°C
- Emco Wheaton high performance swivel joints
- Hydraulic operation
- Fully balanced with independent counterweights from inboard and outbord arm
- Special support frame to reduce imposed mechanical loads
- Light weight design thanks to use of high strength materials
- Swivel joints either welded-in or flanged with dedicated purging line

ACCESSORIES

- Range alarm system
- Drainage connetions
- Emergency realase sytem (ERS)
- Hydraulic or manual coupler
- Insulation flange
- Nitrogen purge line
- Drain line
- Insulated product piping
- Ice fall protection



READ MORE

CRYOGENIC SWIVEL JOINTS

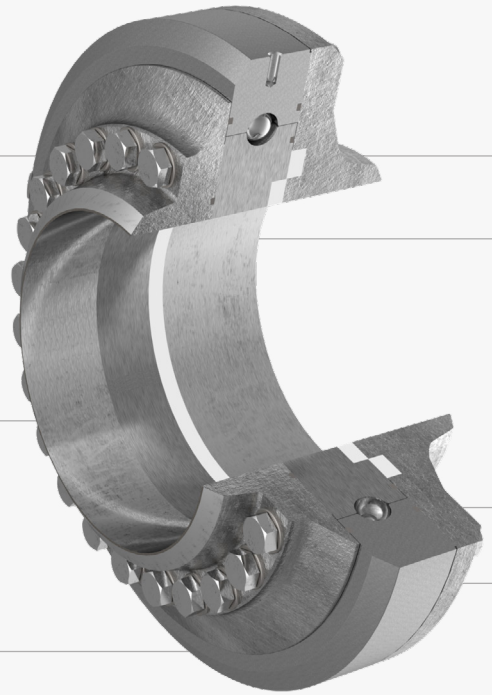
The swivel joints are the heart of our marine loading arms and allow them to adapt to ships movements. They are key articulations for transporting liquefied natural gas, inserted between two pieces of equipment.

The Emco Wheaton swivel joint is specifically designed for cryogenic applications such as LNG. High-strength alloy construction ensures best-in-class performance in regard to mechanical strength in temperatures as low as -196°C. **Thanks to its proven, specialist design, the Emco Wheaton swivel joint offers multiple benefits:**

Low Maintenance
Easy to replace seals (without disassembling the whole loading arm)

Ensuring Compliance
Tested and approved according to **OCIMF and ISO 16904**

High Performance
Best-in-class performance in regard to **mechanical strength**



Safety
Double sealing arrangement

Long Life Expectancy
Extended service life due to cladded and fine machined ball track

Ductility at Low Temperatures
No particular cool-down requirement

Light Design
Compact and lightweight design

READ MORE

HYDRAULIC QC/DC COUPLER FOR LNG – FIT FOR EXTREME COLD

This variant of our hydraulic QC/DC coupler is specifically designed for the transfer of LNG. High-strength alloy construction ensures infallible performance in temperatures as low as -200°C. The coupler can facilitate a secure connection between the loading arm and the tanker manifold within seconds instead of up to twenty minutes as is the case for manually operated products.

Tough conditions require specialistic equipment. We developed the **Quick Connect/Disconnect Coupler for LNG** to be the most secure, reliable and efficient solution for transferring liquefied natural gas. Thanks to its proven, specialist design, the QC/DC for LNG offers multiple benefits:

No Product Loss!

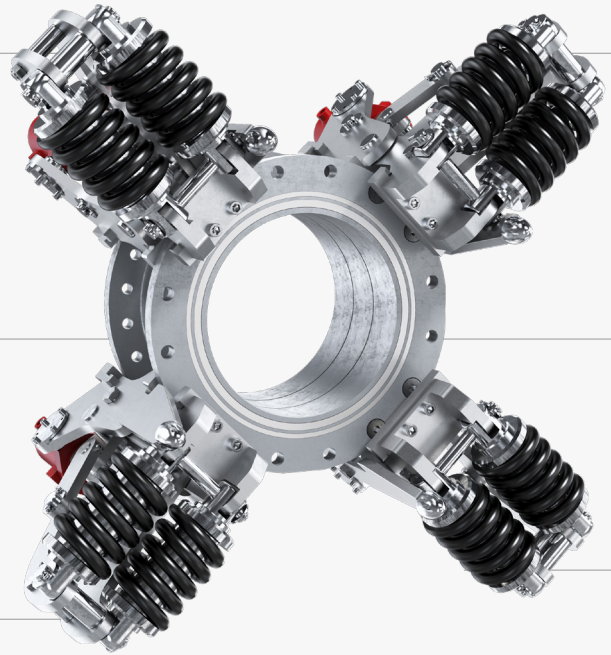
Superior design seals connections regardless of vibration, **protecting them from leakage when connected to the ship.**

Safety

Always safe, the coupler maintains secure connection to tanker manifold even in the event of power failure. The QC/DC for LNG doesn't require any manual work from the operator at the manifolds, thus minimizing the risk to on-site safety.

Resilience

The coupler permits some flexibility by compensating for up to 5 mm of unevenness of the nominal mating flange surface, **simplifying operations without compromising security.**



Ensuring compliance

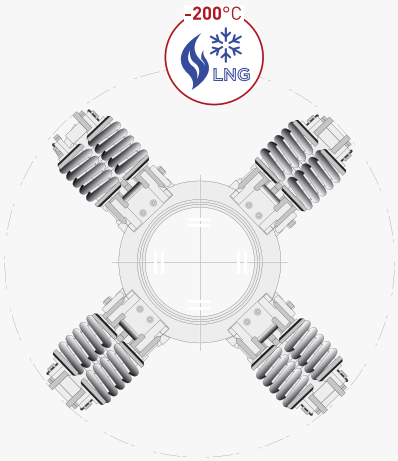
The QC/DC for LNG was designed and tested in accordance with the OCIMF 4th Edition 2019 specification, as well as ISO 16904, and adheres to the highest industry standards.

Flexibility

If required, the QC/DC for LNG can be opened manually. This way, should the power supply fail, the system will remain secure and the loading arm can be safely disconnected.

Durability

Unlike other products of this kind on the market, in addition to stainless steel, the QC/DC for LNG is made of high-strength material, which ensures longevity, even in extreme temperatures.



READ MORE

EMCO WHEATON®
An Ingersoll Rand Business

REQUEST A QUOTE

www.emcowheaton.com
Emco Wheaton | www.facebook.com/EmcoWheaton

ERS (EMERGENCY RELEASE SYSTEM)

At Emco Wheaton, we have developed our own **Emergency Release System (ERS)** for LNG applications*. The ERS is designed for fast and safe disconnection of the LNG Marine Loading Arm before the ship gets out of reach.

It consists of two ball valves, joined together by means of an emergency release coupler (ERC). This system is designed for installation in the vertical upstand of the Triple Swivel Assembly (TSA) of the Marine Loading Arm. **Thanks to its proven, specialist design, the ERS for LNG offers multiple benefits:**

Pressure relief

With the valves in closed position, the special design of the sealing seat arrangement ensures **safe relief of pressure** coming from trapped product (i.e. LNG).

Stable connection

The design of the ERC is based on an overcenter mechanism that grants a **stable connection** independently from hydraulic pressure and/or friction.

Designed for safely

Thanks to the unique design of the drive mechanism, the valves are simultaneously operated and mechanically interlocked with the ERC. Therefore, **it is possible to operate the valves independently** from the ERC and without the activation of the emergency release. Furthermore, the activation of the ERS is only allowed after a complete closure of the valves. **With the Emco Wheaton's ERS it is possible to simulate an emergency without real disconnection**. This feature allows the Owner to perform routine tests during the all life of the equipment, and, if required, before each loading.

Ensuring Compliance

The Emco Wheaton emergency release system is designed and tested according to **OCIMF 4th edition 2019 and ISO 16904**. A patent is pending.

READ MORE

*Currently under patent process.

BOTTOM LOADING ARMS

Emco Wheaton applies the same safety and quality standards to the LNG loading and unloading for Truck and Trains that are applied to the LNG Marine Loading Arms.

The most LNG trains and trucks are loaded and unloaded from the bottom of the vehicle.cBottom loading offers benefits which cannot be achieved with top loading designs. As it takes place on the ground, it is inherently safer for the operator.

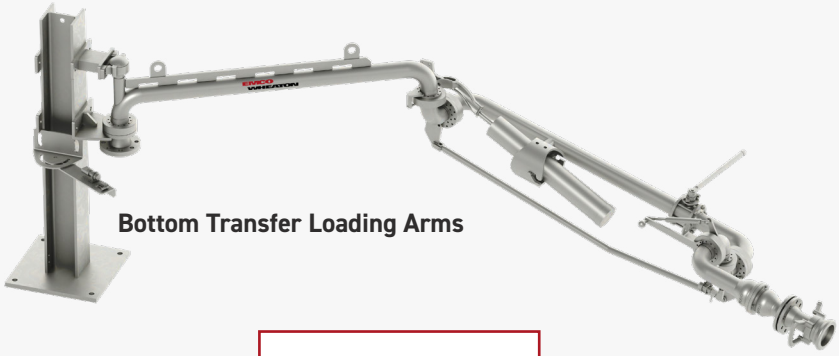
It also allows for the simultaneous loading of several tank compartments, increasing the speed and efficiency of loading. Bottom loading is easily adaptable to vapor recovery systems.

ACCESSORIES

- Ball valve
- Parallel bar
- Gas spring device
- Emergency Release System
- Swivel joints with dedicated purging line
- Stand Post
- Locking device (Parking position)
- Nitrogen purgeline
- Drainline
- Dry break coupler

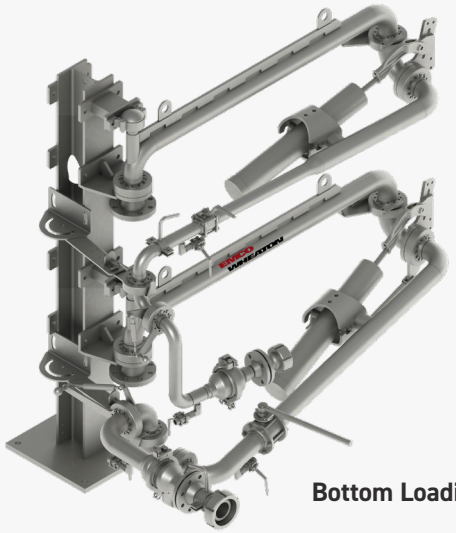
DESIGN

- Material: Stainless Steel
- Size: 2" / 3"
- Inlet flange: ANSI 150 & 300 lbs / EN PN16 & 40
- Design Pressure: 16 bar to 40 bar
- Design Temperature: from -196°C to +80°C (Exact Temperature ranges can varied in regards to material and Product application)



Bottom Transfer Loading Arms

READ MORE



Bottom Loading Station

READ MORE

SERVICE & SUPPORT

At Emco Wheaton our aftermarket expert's engineers provides a range of service and support to ensure your LNG project runs as **safely, efficiently** and **successfully** as possible for your peace of mind.

We work to increase your return on investment by minimizing downtime with minimal maintenance requirements and maximized equipment lifetime. Our team of German factory-trained technicians has a deep knowledge of LNG applications and aims to provide our customers with superior service, ensuring successful installation and long-term operation of the systems and products supplied.

In addition, at Emco Wheaton we are part of the Ingersoll Rand group and it permits us to account with a comprehensive global network of service engineers to support our customers worldwide. Using a comprehensive global network of manufacturing facilities, sales offices, and trading partners, we are able to think globally and act locally, providing our customers with the service and support they need, whenever and wherever they need it.

We offer a **comprehensive portfolio of maintenance service packages** and programs that include:

- Operational & Systems Audits
- In Depth System Evaluation by a Service Engineer
- Asset Management
- Preventative Maintenance Inspections
- In-house Testing
- Preferred Field Service Technician Scheduling
- Inventory Assessment for Gaps and Upgrades
- Operational & Maintenance Training
- Priority Shipments on Parts
- MIB Technician for Coupler Seal Change
- HPU & Control System Engineer

EMCO WHEATON®
An Ingersoll Rand Business

REQUEST A QUOTE

www.emcowheaton.com
Emco Wheaton | www.facebook.com/EmcoWheaton

INGERSOLL RAND ENGINEERED SOLUTIONS (IRES)

Emco Wheaton forms part of Ingersoll Rand Engineered Solutions (IRES), **a business line of Ingersoll Rand focused on delivering the most reliable engineered to order solutions in the market.**

IRES' mission is to design, develop and deliver and help to manage complex projects with the most trustworthy engineering solutions allowing our customers to succeed.

At IRES, our products include **compressors and vacuum pumps** for both air and gas with different technologies and **loading arms**. They enable mission critical processes in **oil & gas, power generation, environmental, chemical & petrochemical, mining, pulp & paper, general industry** and many other key sectors.

STRATEGIC BRANDS
Ingersoll Rand Engineered Solutions has been created by four prestigious leading brands with great reputations – **Emco Wheaton, Nash, Garo** and **Ingersoll Rand Engineered Project Solutions (EPS)** – which together boast of more than 300 years of experience.

Ingersoll Rand Engineered Solutions

LEARN MORE

EMCO WHEATON

Emco Wheaton combines expertise and knowledge, with an innovative attitude and unmatched skills, to produce world leading fluid transfer equipment.

Garo

Garo has been a manufacturer of liquid ring compressors since 1947. They are the heart of our custom-designed gas compression systems for the oil & gas, petrochemical and chemical industries.

NASH

Nash is the inventor and market-leading manufacturer of highly engineered liquid ring vacuum and compressors systems as well as Dry vacuum systems that stand out through their high reliability and low total cost of ownership.

Ingersoll Rand

Engineering Project Solutions (EPS) has been supplying engineered compressed air nitrogen and oxygen generation packages globally for the last 60 years.

Manufacturing facility

Emco Wheaton GmbH
Emcostraße 2,
35274 Kirchhain,
Germany
Phone +49 6422 84-0
Fax +49 6422 5100

Sales offices

Emco Wheaton GmbH
Emcostraße 2,
35274 Kirchhain,
Germany
Phone +49 6422 84-0
Fax +49 6422 5100

Gardner Denver France
Emco Wheaton
ZA du Château d'eau,
70 avenue Albert Einstein
77551 Moissy-Cramayel Cedex
Phone +33 (0)6 72 93 40 98
+(00) 33 (0)6 85 91 84 84

Emco Wheaton Asia Pacific
Lot 4881, Jalan SS13/2,
47500 Subang Jaya,
Selangor D.E
MALAYSIA
Phone +6012 291 5673

Emco Wheaton USA, Inc.
8825 North Sam Houston,
Pkwy West,
Houston, TX 77064
Phone +1 281 856-1300
Fax +1 281 856-1325

Gardner Denver Austria GmbH
Emco Wheaton
Hofherr-Schrantz-Gasse 4
1210 Wien,
Austria
Phone +43 (1) 2701199-35
Fax +43 (1) 2701199-11

Gardner Denver
International Ltd
PO Box 30804
Diraz, Manama
Bahrain
Phone +973 17813187
Fax +973 17813186

Ingersoll Rand/Emco Wheaton
10F, Tower B,
City Center of Shanghai,
No. 100 Zunyi Road,
Shanghai 200051, China
Phone +86 18653323938
+86 18521382161

EMCO WHEATON®
An Ingersoll Rand Business

REQUEST A QUOTE

www.emcowheaton.com
Emco Wheaton | www.facebook.com/EmcoWheaton