

ARO

Pumps and Solutions
Products Overview & Applications

The Pump Professionals

The ARO pumps benefit from 80 years experience, making them highly reliable and rugged for use in the chemical, process industries and any other difficult environment (explosive, dusty, wetted and heated atmosphere).

Engineering

We consistently deliver best-in class technologies designed by highly skilled engineers who know how you work. We consult with you to identify your needs and customise solutions to best fit them.

Technical Support

No matter what your application or location happens to be, if you have questions or need assistance, our professional, experienced technical support personnel are merely a phone call or e-mail away.

Logistics

With our global manufacturing and distribution network, you're guaranteed to have quick access to the equipment, parts or accessories you need to keep your operation running smoothly.



The heart of your Process

Ingersoll Rand /ARO offers a wide range of Fluid Technologies for today's demanding industries and applications.

- Bulk material transfer and circulation
- Dispensing
- Finishing
- High-pressure cleaning
- Packaging
- Filling
- Formulation
- Lubrication
- Printing flexo/offset

Industries

- Aerospace
- Automotive
- Ceramic
- Chemical Processing
- Machine Builders – Formulation
- Mining and Construction
- Oil / Gas Petrochemical
- Paint and Finishing
- Pharmaceutical & Cosmetics
- Print Shop & Ink Manufacture
- Shipbuilding and Marine

ARO® Diaphragm Pumps

ARO Air operated Diaphragm Pumps are designed for industrial use. They can easily pump from clean, light viscosity fluids to corrosive, abrasive medium viscosity fluids and can transfer large particles without damage. Due to their pneumatic motor, they can be used in potentially explosive areas. Most of the ARO Diaphragm Pumps are ATEX certified (CE ExII 2GD X).

Highly flexible

ARO diaphragm pumps offer the ability to vary the flow outlet and discharge pressure as slow as one litre per minute upto 1040 litres per minute for our larger sizes and adjust fluid pressure upto 8.5 bars, with just using an air filter/regulator and a needle valve.

Self-priming

These pumps are self-priming upto an elevation of 8.3 m (with water) and can operate dry without any damage. If the fluid outlet is closed, the pump stops; it restarts with the reopening of the fluid circuit; no pressure relief valve or bypass is necessary.

Wide range of material configurations

The ARO range of diaphragm pumps offers many material of construction compatible for the chemical industry: our metallic offering consists of aluminium, cast iron, stainless steel and hastelloy. Our non-metallic offering consists of polypropylene, acetal and PVDF.



ARO® Diaphragm Pumps Range and Applications



Compact Pumps, ¼" to ¾" ports

Ideal for OEM and general industrial applications, these pumps feature big performance in a small package. Flow rates upto 56 l/min with a large range of material configurations.

Process Pumps, 1" to 3" ports

ARO's PROCESS Pumps feature the best total cost of ownership of any diaphragm pump on the market. A favourite among process professionals with flow rates upto 1041 l/min and a large range of material configurations.

Specialty Application Pumps

Pumps providing the same high level of performance and satisfaction but in a design tailored for your specific application.

- Productivity:** Maximised flow rates + Minimised pulsation and air consumption = Maximum Performance.
- Versatility:** Multiple porting options available along with interface options allow you to customise this pump specifically to your OEM application.
- Reliability:** Lube free patented differential valve both on major air valve and SimulShift™ (pilot valve) provides reliable worry free operation – fluid on demand every time.
- Environmentally Sound:** Bolted construction in conjunction with a wide range of material options provides maximum chemical and leak resistance.
- Serviceability:** Modular construction, reduced parts count and simple to use repair kits minimise repair time and cost.








Non-Metallic Models - Range and Performance



Metallic Models - Range and Performance

ARO® Diaphragm Pumps

	1/4"	3/8"	1/2"	3/4"	1"	1 1/2"	2"
 Max. (liter/min)	20	40.1	54.5	56	200	465	696
 Max. bar	6.9	6.9	6.9	6.9	8.3	8.3	8.3
 Inlet/ Outlet	1/4" (F)	3/8" (F)	1/2" (F)	3/4" (F)	1" (F)	1 1/2" ANSI/DIN	2" ANSI/DIN
					1" ANSI/DIN		
Material	Polypropyl-ene	Polypropyl-ene	Polypropyl-ene	Polypropyl-ene	Polypropyl-ene	Polypropyl-ene	Polypropyl-ene
	PVDF	PVDF	PVDF		PVDF	PVDF	
	Groundable Acetal	Groundable Acetal	Groundable Acetal		Conductive Polypropyl-ene	Conductive Polypropyl-ene	Conductive Polypropyl-ene
 Max. Solids (mm)	1.6	1.6	2.4	2.4	3.2	6.4	6.4
 ATEX Certified	With Wetted Parts in Groundable Acetal	With Wetted Parts in Groundable Acetal	With Wetted Parts in Groundable Acetal		With Conductive Polypropyl-ene Motor	With Conductive Polypropyl-ene Motor	With Conductive Polypropyl-ene Motor








Specialty Models - Range and Performance



ARO® Diaphragm Pumps



	Powder Pumps				Sanitary Pumps				Pit-boss Dewatering Pumps			High Pressure Pumps			Flap Valve Pumps	Submersible Pumps		UL Approved Fuel Pumps			
	1:1		1:1				1:1			3:1		2:1		1:1	-	-	1:1	1:1	1:1	1:1	
	2"	3"	1/2"	1"	1 1/2"	2"	3"	1 1/2"	2"	3"	1"	1 1/2"	2"	3"	2"	2 1/2"	2"	1"	1 1/2"	2"	
 Liter / min.	Max. Powder density = 800 kg / m³		49.2	198	465	651	1041	302.8	590.5	821.3	50	238	348	605	651	757	870	109	284	284	
 Max. Bar	6.9		6.9	8.3				8.3			6.9		6.9		8.3	6.2		3.4			
 Inlet/Outlet	2" (F)		3" (F)	1 1/2" Tri-clamp	2" Tri-clamp	2 1/2" Tri-clamp	3" Tri-clamp	1 1/2" (F)	2" (F)	3" (F)	1" (F)	1 1/2" (F)	2" (F)	3" (F)	2" (F)	Screened inlet / 2" (F), 2 1/2" (F) Outlet		1" (F)	1 1/2" (F)	2" (F)	
	Aluminium		FDA accepted material				Aluminium			Stainless steel			Stainless steel			Aluminium	Cast iron		Aluminium		
 Max. Solids in mm	6.4		9.5	2.4	3.3	6.4	6.5	9.5	12.7	19.1	25.4	3.2	6.4	6.4	9.5	51 (semi-solids)	6.4	6.4	3.2	6.4	6.4
	All Models		All Models	With aluminium or stainless steel motor				All Models			All Models			All Models			With aluminium or stainless steel motor	-	All Models		




ARO® Piston Pumps

ARO piston pumps provide industry proven dependability, economy and precision control for the delivery of a wide range of flowable materials. Whether you are moving a small amount of low viscosity fluid a few feet or a large amount of high viscosity material a longer distance, ARO has a pump to meet your application needs.

Spray

Extrusion


Transfer & supply



Materials

- Oils
- Coatings
- Paint
- Chemicals

Transfer & supply





Materials

- Paint
- Chemicals
- Varnishes
- Enamels
- Lacquers


Extrusion

Transfer & supply




Materials


- Caulking
- Heavy lubricants
- Mastics
- Sealants
- Inks

**2-ball Pumps**




The most versatile pumps in the ARO line. They are capable of handling applications from simple transfer to the extrusion of low to medium viscosity materials upto 100,000 centipoise (cPs) with fluid delivery upto 68.6 l/min.




**4-ball Pumps**

Designed to transfer high volumes of low and medium viscosity fluids upto 12,500 cPs with fluid delivery upto 124 l/min. A common use involves circulating fluid from the original container, to the point of use, and then back.

**Chop-check Pumps**


The heavy-hitters of the line, ARO chop-check pumps are designed to move medium to high viscosity fluids ranging from 15,000 to more than 1,000,000 cPs, and at delivery rates up to 46.3 l/min.

2-ball Piston Pumps			
	 1 min.	 Max. bar	Material
1:1	18 l/min	0 - 10	Carbon steel
2:1	8.1 l/min	4 - 21	Carbon steel or stainless steel
4:1	8 l/min	8 - 41	Carbon steel or stainless steel
9:1	10.8 l/min	18 - 93	Stainless steel
9:1	10.8 l/min	18 - 93	Carbon steel
10:1	68.6 l/min	20 - 83	Stainless steel
11:1	13.9 l/min	22 - 113	Stainless steel
15:1	68.6 l/min	31 - 93	Stainless steel
18:1	2.3 l/min	35 - 185	Stainless steel
22:1	7.2 l/min	46 - 226	Stainless steel
23:1	14 l/min	46 - 236	Stainless steel
23:1	68.6 l/min	46 - 142	Stainless steel
28:1	1.4 l/min	56 - 288	Stainless steel
30:1	5.4 l/min	63 - 309	Stainless steel
40:1	14 l/min	80 - 332	Stainless steel
45:1	7.3 l/min	95 - 373	Stainless steel
45:1	23.7 l/min	95 - 279	Carbon steel
60:1	5.4 l/min	126 - 414	Stainless steel
65:1	23.7 l/min	130 - 396	Carbon steel

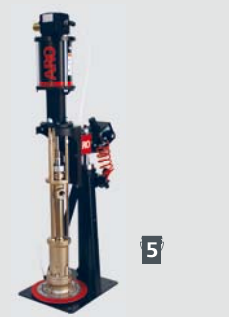
4-ball Piston Pumps			
	 1 min.	 Max. bar	Material
2:1	80.6 l/min	4 - 20.6	Stainless steel
3:1	110.8 l/min	6 - 31	Stainless steel
4:1	80.6 l/min	8.5 - 41	Stainless steel
5:1	124 l/min	10.5 - 42	Stainless steel
7:1	88.8 l/min	14 - 58	Stainless steel
Chop-Check Piston Pumps			
12:1	12.3 l/min	24 - 123	Carbon steel
13:1	46.3 l/min	27 - 108	Carbon steel
20:1	46.3 l/min	40 - 124	Carbon steel
22:1	1.9 l/min	44 - 226	Carbon steel or stainless steel
23:1	6.8 l/min	46 - 237	Carbon steel
23:1	12.3 l/min	46 - 237	Carbon steel
28:1	22.9 l/min	56 - 232	Carbon steel
30:1	46.3 l/min	60 - 186	Carbon steel
43:1	2.8 l/min	86 - 443	Carbon steel or stainless steel
44:1	14.3 l/min	92 - 365	Carbon steel
44:1	22.9 l/min	92 - 273	Carbon steel
46:1	6.8 l/min	92 - 473	Carbon steel
65:1	5.1 l/min	45 - 516	Carbon steel
65:1	22.9 l/min	136 - 403	Carbon steel

ARO Piston Pumps – Application Packages


FINISHING, COATINGS, SEALANTS, INKS, AND ADHESIVES

**TPX Package**


Features a two-post ram, pump, follower plate and controls designed for high-viscosity applications when maximum down force is required. Available in 5- and 55-gal containers.

**SPX Package**


Ideal for medium- to heavy-viscosity extrusion, ARO Fluid Product's single-post ram with pump, follower plate, and controls allows for easy container changeover while providing industry-leading down force during operation.

**CMX Package**

Popular in airless spray applications, these packages feature a high-pressure pump, air control, material filter, and suction hose — all mounted on a heavy-duty cart.


**CLX Package**

When portability is required for light- to medium-viscosity (less than 50K cPs) extrusion, our cart-mounted lift with follower plate allows for easy container changeover.


**ALX Package**

Ideal for finishing and adhesive applications where you need to keep fluid mixed. Includes lift, drum cover, agitator, and air controls.


LUBRICATION

**Oil Dispensing Packages**

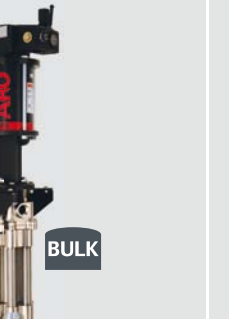
Standard packages with 3:1 ratio oil pump. Digital preset/non-preset flow meters available.

**Grease Dispensing Packages**


Grease Packages with 50:1 ratio grease pump. 10, 20, 50 & 200 kg Standard Grease packages available.

**FMX Package**

Ideal for fluid transfer from tanks and piping systems, pumps come with a floor-mountable stand to connect to inlet piping.

**WMX Package**

The compact design of our piston pumps make them ideal for mounting on walls or appropriate structures. This package includes the pump and bracket for vertical mounting on structures.

**WPX**

When it is time to clean up, our wash pump is a great high-power cleaning solution. Includes pump, wall mount bracket, suction tube assembly, and spray wand.

Pump selection made simple

With an ARO piston pump, you're getting the best, most reliable equipment with the least amount of effort, calculation, or hassle on your part. There are basically four factors to take into consideration when selecting the right configuration for your application:

▶ Type of fluid

▶ Viscosity or thickness

▶ Required flow rate

▶ Required output pressure

Pump Type	Viscosity Range (cPs)	Flow Range (gpm)
2-Ball Pumps	10,000 - 100,000	10 - 20
4-Ball Pumps	100,000 - 1,000,000	10 - 20
Chop-Check Pumps	100,000 - 1,000,000	20 - 30

Knowing fluid viscosity and flow rates makes it easier to choose the right pump for your application.

06 | Pumps and Solutions

Pumps and Solutions | 07



Customized Solutions

Industry Expertise Merged with Proven Pump Technologies

For over 80 years ARO has been developing Pumps to meet the unique pumping needs of many Industries.

This has created unmatched application expertise in:

- Finishing
- Coatings
- Sealants & Adhesives
- Printing Inks
- Lubrication
- Bulk Material Transfer and Circulation
- High Pressure Cleaning

This expertise now merged with our Solutions Engineering Centre capability offers customized Solutions for a variety of Industries.

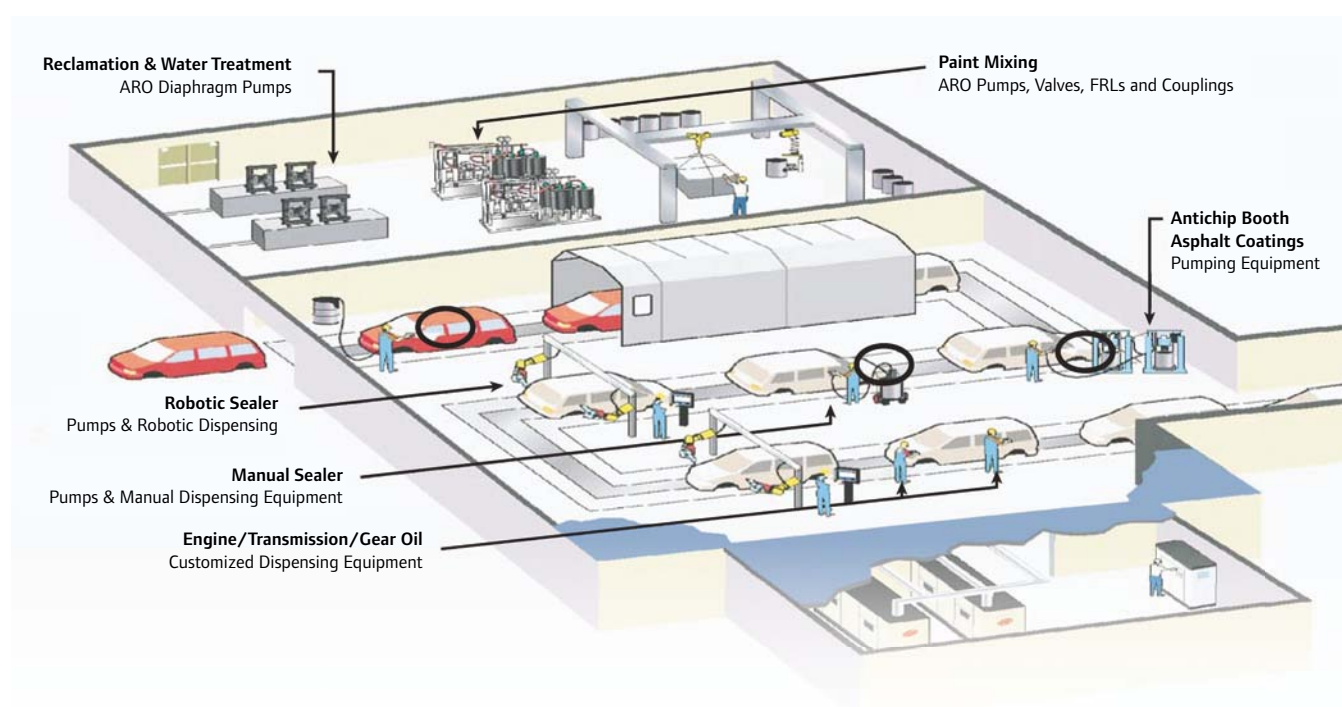
- Automobile Vehicle Manufacturing
- Solar Cell Assembly
- Wind Turbine Manufacturing
- Lubrication Equipment
- Printing Ink Manufacturing & Transfer



2 Axis Sealant Dispensing for Engine Cover



Pump Applications in Automobile Vehicle Assembly



Robotic Sealant Dispensing in Engine Assembly Plant



ARO Piston Pumps in Automobile Paint Kitchen



4 Colour Ink Dispensing for Newspaper Printing



Hydraulic Oil Dispensing System in Railway Workshop



Robotic Sealant Dispensing System for Windshield

Customized Solutions for the Industry

Our Sahibabad Solutions Centre has been working closely with customers to develop customized Fluid Transfer & Dispensing Systems for their ever demanding applications. Some of the applications include:

Automobile Vehicle Assembly

- Mastic & Hemming Sealant Dispensing for Body Shop
- Glass Sealant Dispensing
- Sealant for LED Headlamps
- Roof Sealant Dispensing
- Engine Gasket Dispensing
- RTV Sealant Dispensing for Engine & Transmission Lines
- Metered Grease Dispensing for Hub & Axle
- Oil Dispensing – Engine Oil, Transmission Oil, Gear Oil, Steering Oil, Axle Oil
- Coolant Dispensing
- Petrol / Diesel Dispensing

Automobile Ancillaries

- Metered Grease Dispensing for Axle, Bearing, Steering gear

Bearing Manufacturing

- Metered Grease Dispensing
- Grease Filling Machine

Newspaper Printing

- Automatic Ink Dispensing System

General Manufacturing Industry

- Metered Oil Dispensing
- Metered Grease Dispensing

... And many more

ARO® Peristaltic (Hose) Pump

Simple in design but the perfect solution for your pumping applications.

Why use high maintenance pumps like progressive cavity, rotary lobe, and other positive displacement pumps when you can use the ARO peristaltic pump?

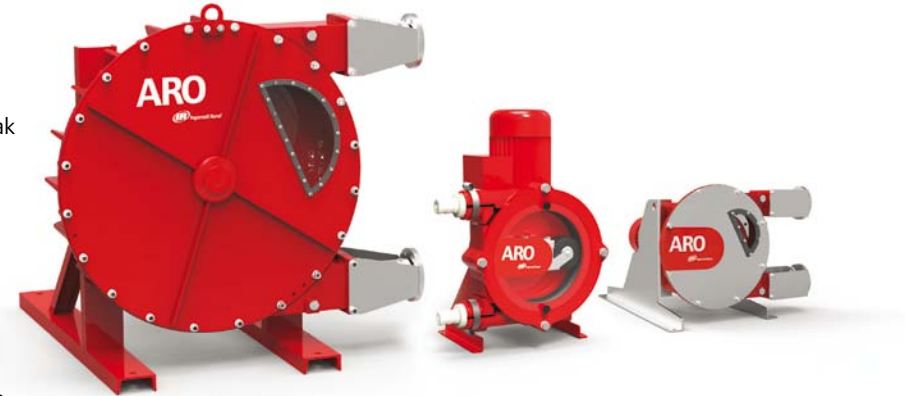
These pumps provide the following benefits over other types of pumps:

Simply safe

- Only the hose contacts the fluid, reducing the risk of failure due to material selection
- Hose is contained in a housing that has an optional leak detector to prevent environmental contamination
- Can run dry without damage
- Low sound level: less than 70 dB at 1 meter
- ATEX versions available

Simply designed

- Ease of maintenance, low cost of ownership
 - » Seal-less design with no packings or seals to replace
 - » Hose is the only wearing part
- Reversible rotation ideal for emptying lines or removing blockages
- Excellent solids handling capability
 - » Upto 10% sludge handling capability
 - » Upto 80% solids handling capability



ARO H-Series (High Pressure) Pumps

Operating Data	
Capacity	upto 88 m³/h
Viscosity	upto 100000 cps
Temperature of pumped liquid	upto 100° C
Differential pressure	upto 15 bar
Discharge pressure	upto 15 bar
Available suction	upto 0,9 bar

Pump Model	Hose ID	Maximum Flow	Maximum RPM	Maximun Pressure	Pump Weight
H005	5 mm	20,41 ltr/h	60	8 bar	25 kg
H012	10 mm	70 ltr/h	70	8 bar	25 kg
H013	10 mm	180 ltr/h	120	8 bar	25 kg
H015	15 mm	600 ltr/h	120	8 bar	35 kg
H020	20 mm	1020 ltr/h	120	8 bar	35 kg
H025	25 mm	2.8 m³/h	140	15 bar	80 kg
H032	32 mm	5.25 m³/h	140	15 bar	130 kg
H040	38 mm	8.19 m³/h	140	15 bar	145 kg
HX40	40 mm	9.6 m³/h	120	15 bar	210 kg
H050	51 mm	15.75 m³/h	90	15 bar	315kg
H065	60 mm	20.7 m³/h	90	15 bar	335 kg
HX80	80 mm	27.5 m³/h	50	15 bar	650 kg
H080	80 mm	35 m³/h	50	15 bar	930 kg
H100	100 mm	54 m³/h	45	15 bar	1250 kg
H125	125 mm	88 m³/h	40	15 bar	1750 kg

Material	Typical Application	Operating Temperatures °C	Industry Approvals
Natural Rubber NR	General All Purpose	-20 to +80	-
NBR	Oily/Fatty Products	-20 to +80	-
NBR Food	Food/Hygienic Products	-20 to +80	FDA
EPDM	Corrosive Chemicals	-20 to +100	-
CSM	Highly Corrosive	-20 to +85	-
FKM (Viton™)	Highly Corrosive	-20 to +85	-

• Variable Electric Drives available on request • Replacement Hoses for major brands available

Ingersoll Rand's Other Products Solutions

Tools

Service technicians and industry crew workers around the globe reach for the power and reliability of Ingersoll Rand tools. Advanced engineering and innovation make our tools the benchmark for productivity, durability, safety and award-winning design.



Services Tools

- Complete line of Impacttools™, ratchets, drills/drivers and surface preparation tools to meet all needs
- Complete offering of professional-grade cordless tools and kits for use in a variety of applications including garages and the Vehicle Service industry



Industrial Tools

- Wide range of Impacttools™, surface finishing and construction tools for product and maintenance applications
- Ergonomically designed for increased productivity and safety
- Most advanced tools of their type in the world for the size, weight and power output



Assembly Tools

- Air and electric screwdrivers, nut runners, drills and accessories for all types of assembly
- Products deliver the best torque accuracy in the industry, with award-winning ergonomic design
- Full range of torque verification and calibration equipment to ensure accurate performance



Precision Fastening

- Precision air and electric assembly equipment and fastening control systems for consistent and precise tool performance
- Superior user-oriented ergonomics and process control for reliability
- Custom configurations and engineering available to meet unique needs

Material Handling

Ingersoll Rand has been serving the material handling needs of the toughest industries around the globe for nearly a century. We apply R&D expertise to introduce new products and technologies which integrate the latest electronics and controls. By using Ingersoll Rand solutions you can expect improved productivity and operator performance as well as reduced downtime.

Air, Electric & Hydraulic Utility Winches

- Available in a wide range of capacities from 300-10,000 kg (660-22,000 lbs)
- Top reliability with our Liftstar®, Pullstar®, BU, EU, Force 5® Third Generation and Infinity winch series
- Lifting, pulling and positioning applications for the world's toughest industries



ManRider Winches

- Available in capacities from 150-3,125 kg (330-6,875 lbs)
- LS2-150RLP, FA150KGi, Force 5® Third Generation and Infinity winch series ensure your personnel gets lifted safely
- Meeting the toughest personnel lifting requirements in the offshore industry



Balancers & Air, Electric & Hydraulic Hoists

- Balancers, CLK, MLK, HLK, ARO, Quantum, Liftchain®, Hercu-Link® and BOP Handling Systems that can handle load capacities from 0.12-200 tons
- Air balancers with float to position load by hand for precision spotting
- Hoists for high-speed production, food grade applications and the harshest industrial, underground and marine environments



Manual Hoists

- Manual and lever chain hoists from 0.5-25 ton capacity
- Overload protection to reduce downtime and repair costs
- Versatility to be used in construction, maintenance and rigging applications



Workstation Bridge & Jib Cranes (Support Structures)

- Overhead and floor supported enclosed track workstation cranes with <1% rolling resistance and articulation for maximum ease of use
- Standard low profile enclosed track rail jib cranes with 220 and 360 degree coverage
- Standard and custom applications with bridge cranes upto 1,360 kg (3,000 lbs) and jib cranes upto 907 kg (2,000 lbs)



Handling Devices

- Custom and standard solutions and devices including clamping, vacuum, probing rotary action handlers and hook/trap action to overcome your material handling challenges
- Vacuum load capacities from 27-136 kg (60-300 lbs) and clamp load capacities from 27-45 kg (60-100 lbs)



Quality and performance on the toughest jobs.

Safety is Our top priority.



Ingersoll Rand (NYSE:IR) advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Schlage®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings, transport and protect food and perishables, secure homes and commercial properties, and increase industrial productivity and efficiency. Ingersoll Rand products range from complete compressed air systems, tools and pumps to material handling systems. The diverse and innovative products, services and solutions enhance our customers' energy efficiency, productivity and operations. Ingersoll Rand is a \$14 billion global business committed to a world of sustainable progress and enduring results.



Ingersoll Rand Industrial Products (P) Ltd.

37-A, Site IV Sahibabad Industrial Area, Ghaziabad - 201010

Phone : (0120) 438 9200 / 438 9400

Fax : (0120) 438 9444

E-mail : airsolutionsindia@irco.com

www.ingersollrandproducts.com

www.ingersollrand.co.in

Customer Support Center 1-800-102-7926

customersupportindia@irco.com

Regional Offices' Phone Numbers

WEST	Mumbai : (022) 61540500, Nagpur/Raipur : (0712) 2533697/2533386, Pune : (020) 41005400, Surat : (0261) 2350064/3917335, Indore : (0731) 2435622
EAST	Kolkata : (033) 24011224/24014258, Jamshedpur : (0657) 2233128/129
SOUTH	Bangalore, Karnataka : (080) 22166001, Chennai, TN & Kerala : (044) 28523362/28520900, Coimbatore : (0) 9344601020, Secunderabad, AP : (040) 27849813/16/24
NORTH	Chandigarh : (0172) 3247151/2664334, Gurgaon : (0124) 6729000, Haridwar : (0) 9358631990

Ingersoll Rand, IR and the IR logo are trademarks of Ingersoll Rand, its subsidiaries and/or affiliates.

Nothing contained within this brochure is intended to extend any warranty or representation, expressed or implied, regarding the products described herein. Any such warranties or other items or conditions of sale of products shall be in accordance with Ingersoll Rand's standard terms and conditions of sale for such products, which are available upon request. Product improvement is a continuing goal at Ingersoll Rand. Designs and specifications are subject to change without notice or obligation.