

# Ergonomic Handling Systems

Overview of Ingersoll Rand Material Handling Solutions

The rising importance of ergonomics



## Pneumatic Balancers

### The Strength Behind Material Handling Technology

Meeting the needs of today's material handling applications requires an ergonomic lift assist that interacts with the operator. The balancer offers lifting solutions to meet these needs through float and built in safety features.

#### Balancer Advantage

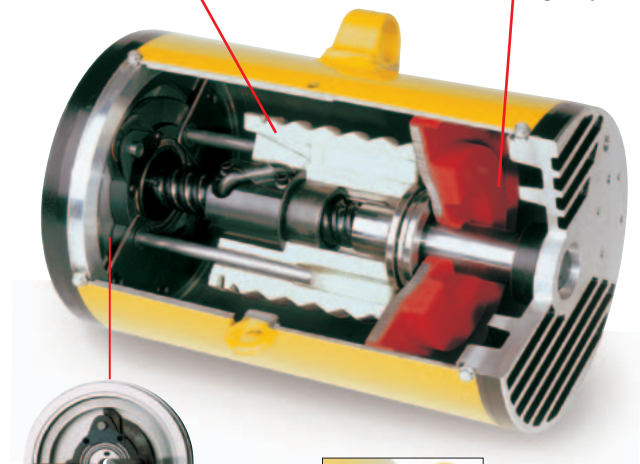
- **Precise, strain-free positioning:** float leaves both hands free to raise, lower, or shift the load with virtually no resistance. No more "hoist control" hit-and-miss positioning.
- **Simple adjustment:** clear access to air-flow calibration controls allows quick, easy adjustment of the float.
- **Low air consumption:** approximately 50 times less than an air hoist, means very low energy costs.
- **Clean, oil-free operation:** pre-lubricated design – eliminates air line lubrication and oil mist exhaust. It's ideal for food processing and clean manufacturing environments.
- **Rugged reliability** for continuous duty with minimal maintenance, the balance air delivers cost effective performance.

#### Safety is Standard

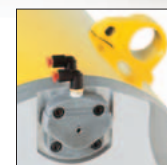
- **Built-in overload protection:** the load being lifted can never exceed the unit's maximum rated capacity for a given air pressure. Maximum capacity is rated at 100 psi and actual capacity is linearly proportional to actual pressure. For example, at 70 psi the unit can only lift up to 70% of its maximum capacity.
- **Minimal cable recoil due to loss of load:** if the load is accidentally lost, a spring-loaded centrifugal brake (Z brake) automatically stops rapid upward cable travel.

**Injection moulded reel:**  
Engineered plastic for excellent durability and wear resistance.

**Air chamber and piston:**  
Forms the heart of the unit. Air entering the chamber pushes the piston to rotate the spool, wind the cable, and lift the load. Exhausting air lowers the load. Regulating this flow balances the load, creating a zero gravity float.

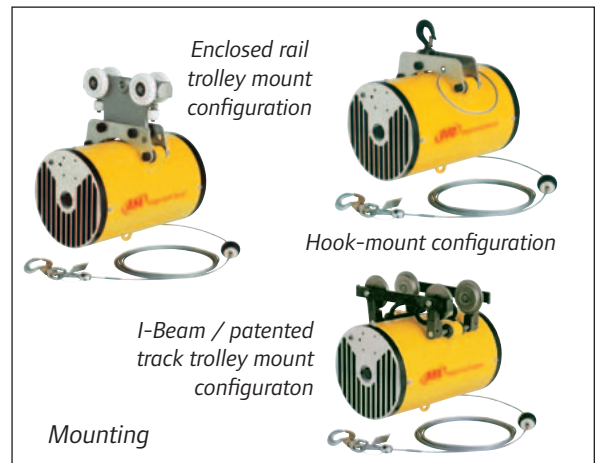
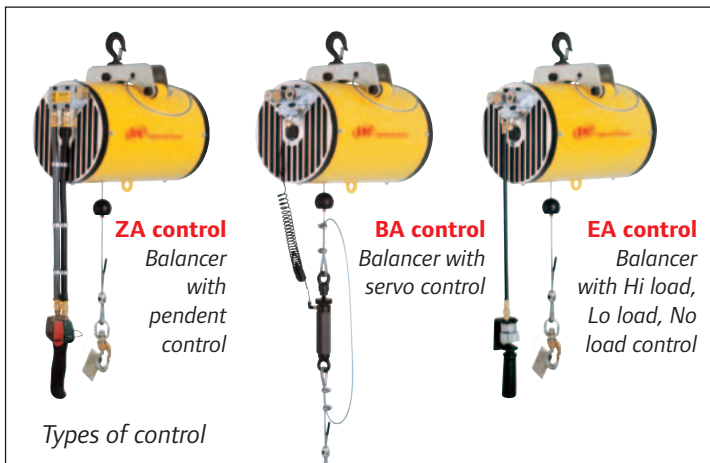


**Z brake safety retraction system:**  
Prevents violent retraction in the event of a sudden release or loss of load. The brake will also eliminate excessive upward acceleration of a no load hook when the "up" button is employed to full depression. This system is available on all units equipped with either cable or chain (except on 22 kg model).



**Z stop:** The optional Z Stop is a patent pending device that will eliminate the down-drift of suspended loads or tools during shut down or at night when the air supply is shut off. The Z stop will stop drift within 150 mm and put the balance air into a mechanically locked position preventing damage to tools or objects below the suspended load. Available for use on all 254 mm diameter units.

# Pneumatic Balancers



- **A wide range of capacities:** balancers are rated from 22 to 450 kg, with lower capacity units adjustable for loads as low as 0.9 kg (see BAW005060 below).
- **Cable travel:** the range of up/down movement varies from 1 to 3 m depending on the model.
- **Controls:** ZA (pendent) controls let you handle varying loads; a BA (single) balance control is ideal for a constant load, and an EA for 2 loads.
- **Mounting:** suspension kits for Ingersoll Rand and other enclosed track manufacturers as well as I-Beam, patented track, and hook mount.

**intelift™**  
Intelligent Lifting Systems

**Intelligent Lifting System**

Ingersoll Rand Intelift™ air balancers combine the industry's finest, thoroughly proven mechanical balancing technology with the intelligence of precise, reliable electronic controls. This innovative combination is the first in a new series of intelligent lifting systems, and provides operators with a safe, ergonomically beneficial, and highly flexible solution that can enhance productivity and cost savings. The Intelift™ unit covers a capacity range of 68 kg (150 lbs) to 450 kg (1,000 lbs), with durability suited for 100 % duty cycle and vertical speed capability of 1.5 m per second.

## BAW005060 Air Balancer

This air unit offers an incredible 0.9 to 22 kg (2 to 50 pound) load capacity, a range our competitors achieve only with numerous models designed for individual load weight.

This balancer offers numerous other benefits over spring operated units, including our exclusive flotation feature.



- *Float action provides ease of vertical travel, eliminating tension on load making positioning capability far superior.*
- *No need to change model when making tool change; one model covers entire 0.9-22 kg range.*
- *Only 508 mm headroom*
- *Simple adjustment in seconds by means of external regulator.*
- *Can be sequenced via air signal to perform timed or "stepped" operation.*

# Rails Systems

## Lowest Rolling Friction Ever Obtained

Thanks to the quality of the rolling surfaces, the guidance of the trolleys and the articulated suspensions, Ingersoll Rand systems allow you to move loads with a maximum starting force of 1.5% of the total load (bridge plus load). Furthermore, the rolling effort required during displacement is less than 1% – even if the load is pushed far away from the centre of the bridge (see sketches).

## Facilitates Quick, Precision Positioning

The extremely low rolling effort required with the Ingersoll Rand system means that you can position loads very quickly – without having to move the bridge back and forth several times to achieve accurate positioning.

Low manual effort for quick, precision positioning is the key to reducing operator fatigue during the day. To move a 500 kg load 100 times per day with an Ingersoll Rand system, an operator will have to provide a total pushing effort of 500 kg.

Compare this to a typical system, where the operator would have to provide a pushing effort of 3000 kg – in addition to the effort required to position the bridge and the load.

## Safety First

Ingersoll Rand's primary and vital concern is safety.

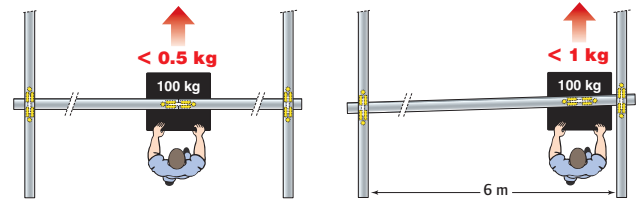
**Safety factor:** all components are rated at a 5 to 1 safety factor based on meticulous tests performed at independent testing laboratories.

**Deflection:** Ingersoll Rand rail is designed to not exceed 1/450 of span, in accordance with ANSI B30.11 Monorail and Underhung Cranes.

**Safety cables:** we require the use of safety cables at all moving (hanger and end-truck) suspension points.

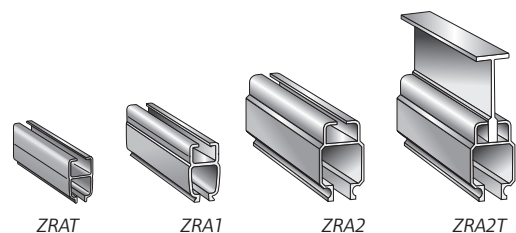
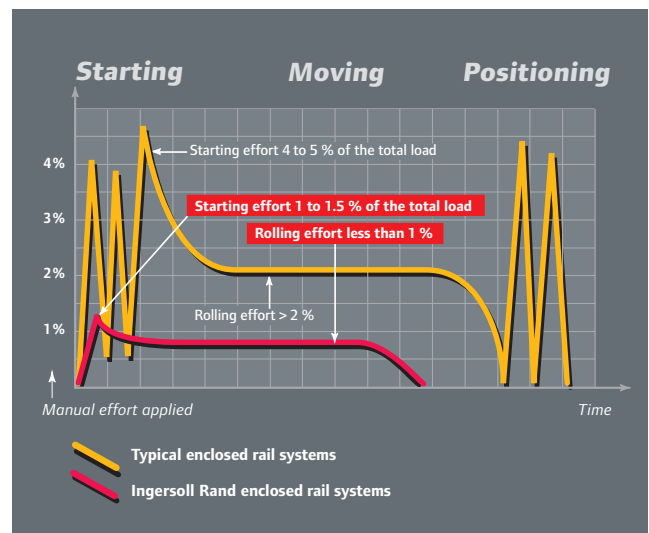
**Redundant end stops:** available for extra safety.

**Load ratings:** clearly marked on both sides of bridges rails.



**Pushing force in the centre**  
Rolling effort less than 0.5 kg (1.1 lb)  
for a load of 100 kg (220 lb)

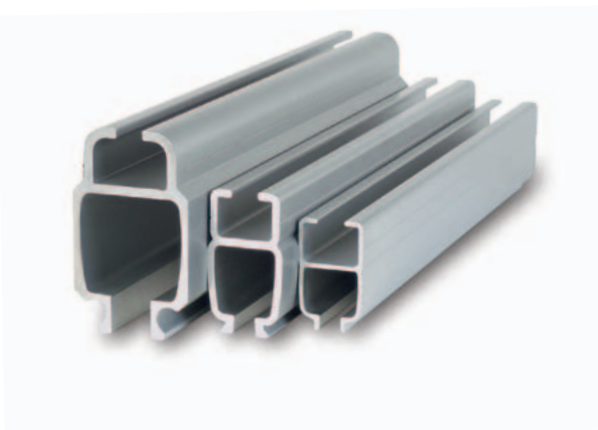
**Pushing force on one side**  
Rolling effort less than 1 kg (2.2 lb)  
for a load of 100 kg (220 lb)



## Aluminium Rails

Lightweight and available for long spans, these rails are extruded (from aluminium alloy 6061-T51) and clear anodized for a smooth, clean, corrosive-free surface.

- Model **ZRAT**: available in lengths up to 9 metres (20 ft).
- Model **ZRA1**: available in lengths up to 9 metres (30 ft).
- Model **ZRA2**: available in lengths up to 9 metres (30 ft).
- Strongbacking available for increased capacities (Model **ZRA2T**).



# Rails Systems

Ingersoll Rand rails systems are designed for perpendicular or parallel to header steel installations.

## Hangers

Ingersoll Rand offers a wide variety of hangers to attach to virtually any type of overhead steel. Available in either rigid (anti-compression) or pivoting styles to match the material handling operation, the hangers come in fixed or adjustable lengths for all rails. For extra safety, Ingersoll Rand requires that all hangers with a drop of 600 mm (24") or greater have cross-bracing for stability.

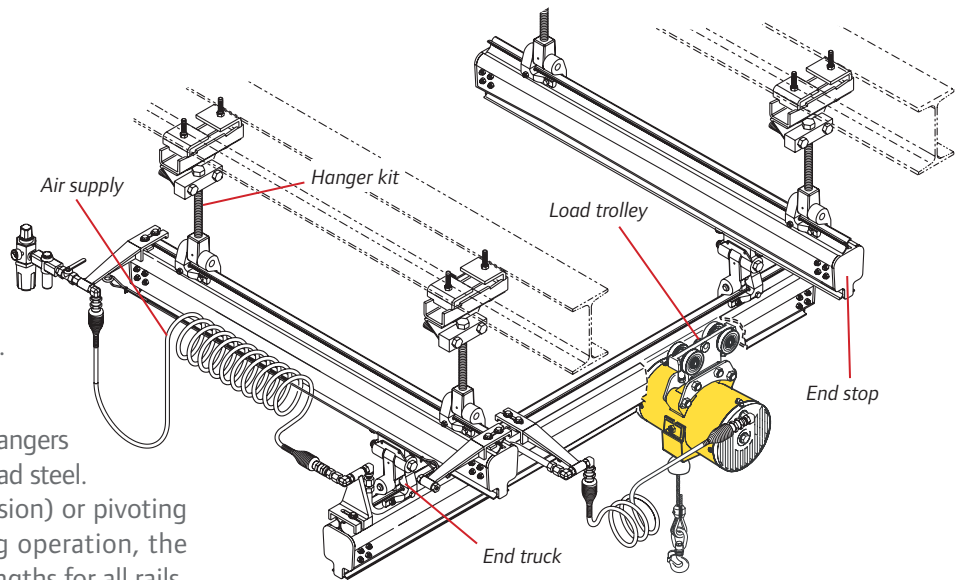
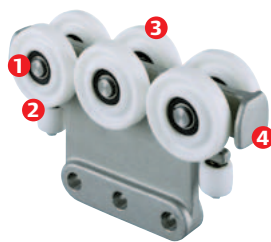
## End Trucks

While Ingersoll Rand offers both articulating and rigid end trucks to match the material handling application, the primary system sold utilises the articulating end truck. This feature maximises the ability of the operator to precisely position loads, by allowing him to move only the portion of the bridge crane near the load. This results in dramatic improvements over typical rigid end truck systems, which require the user to move the entire mass of the bridge crane for each operation.

## Enclosed Rail Trolleys

Ingersoll Rand trolleys are designed to offer minimum rolling resistance and maximum safety. They are primarily made from high-strength almag castings. Also available in steel and stainless steel stampings.

- 1 Sealed precision bearings in wheels and side guide rollers provide long life and reduced maintenance.
- 2 Injection moulded wheels in Delrin® provide for clean, wear-free operation that resists flattening.
- 3 Third "reaction" anti-kick up wheels for cantilevered loads (optional)
- 4 End stops prevent the body of the trolley from being pulled through the enclosed track rail.



## Accessories

A wide range of accessories including air supply, curved rail, track switches, bridge extensions and custom designed components are available to enhance any crane or monorail system.



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