



Equipements de production
Conseil - Vente - Location - S.A.V



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Winches & Hoists business overview



Ingersoll Rand At-A-Glance

2020 - **Gardner
Denver** + **IR** *Ingersoll Rand*

EXPERIENCE
+ HISTORY

300⁺
YEARS

40⁺
BRANDS

IR
NYSE TICKER

50⁺
COUNTRIES

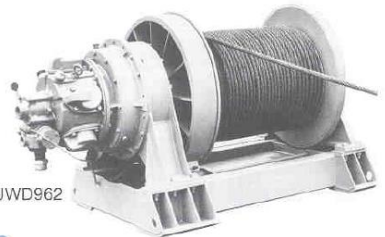
MORE THAN
GLOBAL EMPLOYEES
16,000

IRCO.COM

GLOBAL
CUSTOMERS

100,000

100 years - Material Handling Business History



1924 -

Beebe Bros. Co. Was founded in Seattle, WA.



INGERSOLL-RAND®
MATERIAL HANDLING



1947 -

Samiia Company was founded in France



INGERSOLL-RAND



1987 -

Beebe Bros. Co. Was acquired by Ingersoll-Rand. New range of winches and hoists launched in the market.



INGERSOLL-RAND



1990 -

Samiia was acquired by Ingersoll-Rand. New range of winches and hoists launched in the market.



2010 -

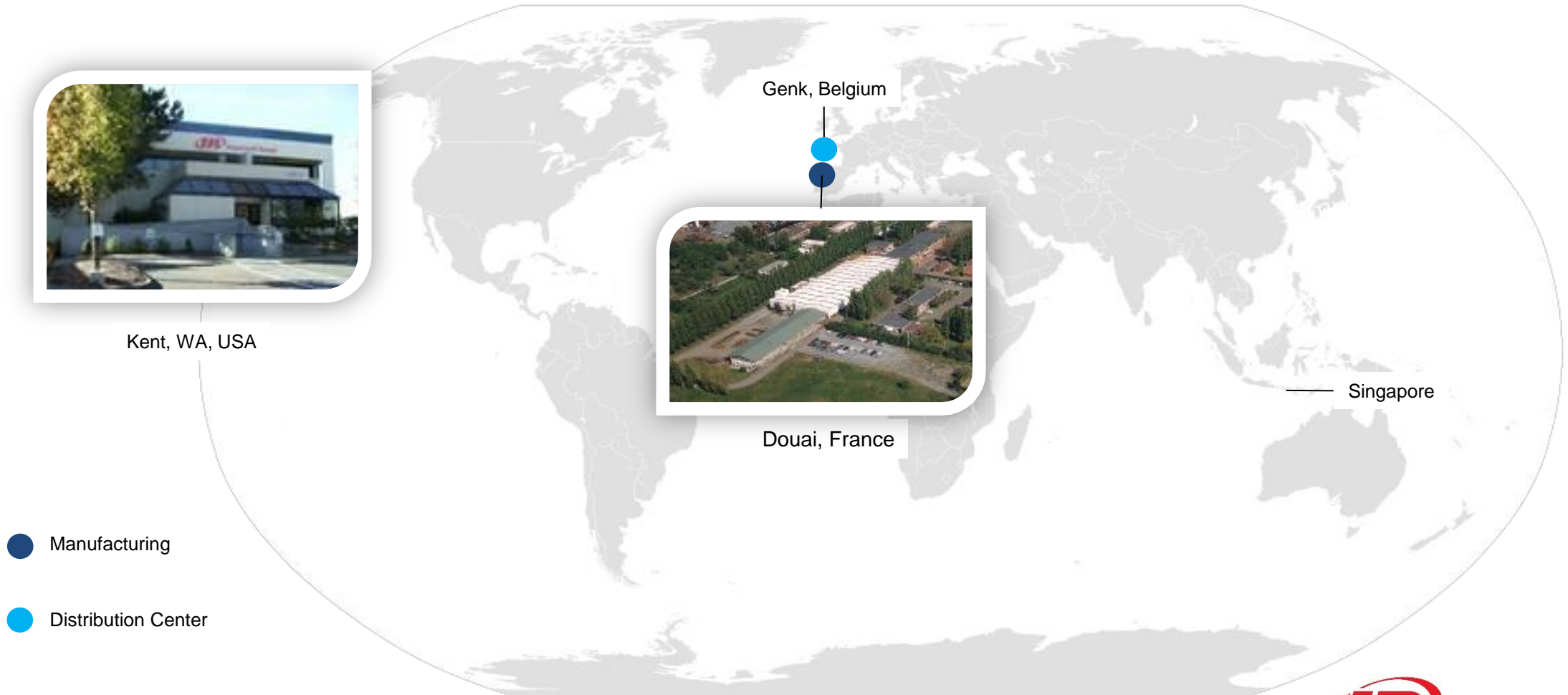


Ingersoll Rand completed forming of global network of distributors and service support system.

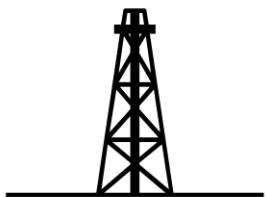


Worldwide Footprint – Winches & Hoists

- World-class manufacturing and assembly centers in key regions



We serve all industrial segments



Oil & Gas
Onshore



Oil & Gas
Offshore



Construction



Refineries &
Petroleum



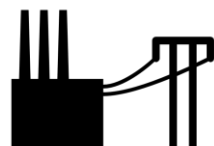
Tunneling



Mining/Natural
Resources



Shipbuilding
& Shipyards



Power
Generation



Subsea



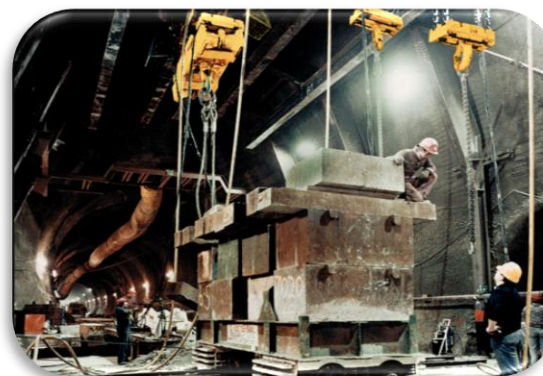
Foundries



General Industry



Cement Plants

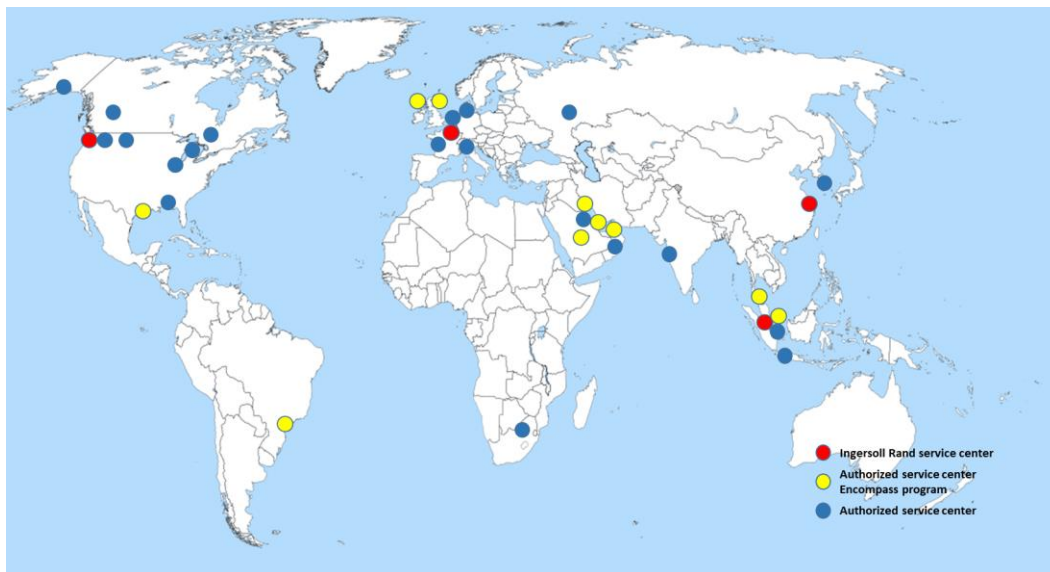


Ingersoll Rand aftermarket business model

Global Aftermarket footprint

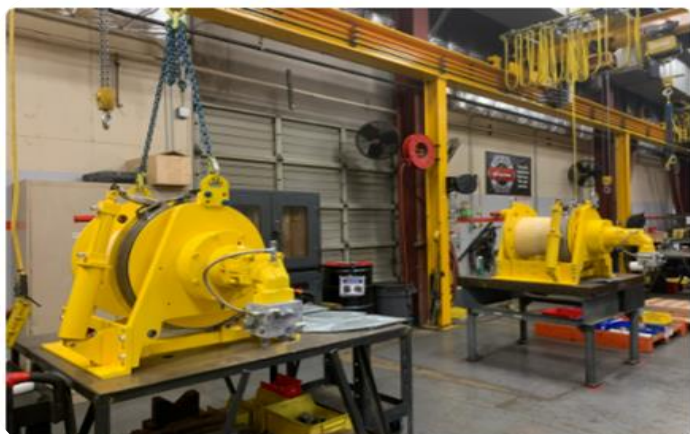
3 Ingersoll-Rand Service Centers:

- Seattle, USA
- Douai, France
- Singapore



Authorized Service Centers

10 Americas
7 Europe
7 ME
1 Africa
6 APAC



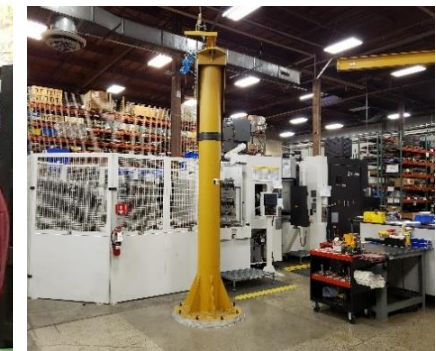
Factories

Kent, Washington

Facility designing and manufacturing standard and Engineering to Order:

- **Winches:** Pneumatic from 150kg to 10 ton. Electric from 1.5 to 20 ton
- **Hoists:** Pneumatic from 12,5 to 100 ton. Electric from 12,5 to 50 ton

On site: 101 employees dedicated to Safety, Quality, Engineering (new product development, Engineering To Order, VAVE), Material management, Maintenance, Technical support Production: Machining, painting, assembly, 100% product testing



Factories

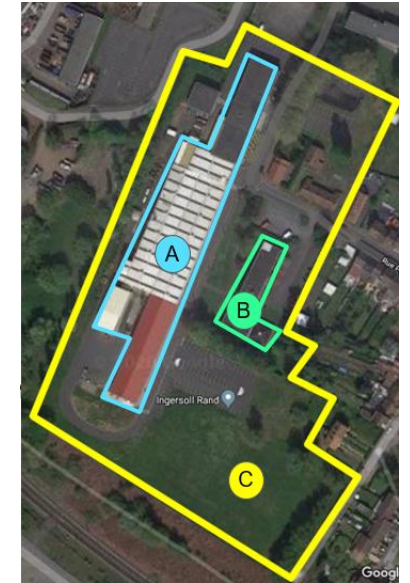
Douai, France

Material Handling facility designing and manufacturing standard and Engineering to Order :

Hoists: pneumatic or hydraulic powered from 1 to 300 ton

Winches: pneumatic and hydraulic powered from 150kg to 10 tons

On site: 82 employees dedicated to Safety, Quality, Engineering (new product development, Engineering To Order, VAVE), Material management, Maintenance, Technical support Production : Machining (core), sandblasting & painting, assembly, 100% product testing



Applied Standards

- ANSI/ASME B30.7 – U.S. Standard (winches)
- ANSI/ASME B30.16 – U.S. Standard (overhead hoists)
- CE (EN 14492-1 (winches) EN 14492-2 (hoists))
- FEM (mechanical classification)
- Explosive atmospheres (NEC, ATEX, IECEx)
- American Bureau of Shipping (ABS)
- Det Norske Veritas (DNV)
- EAC TRCU 010/2011 & 012/2011



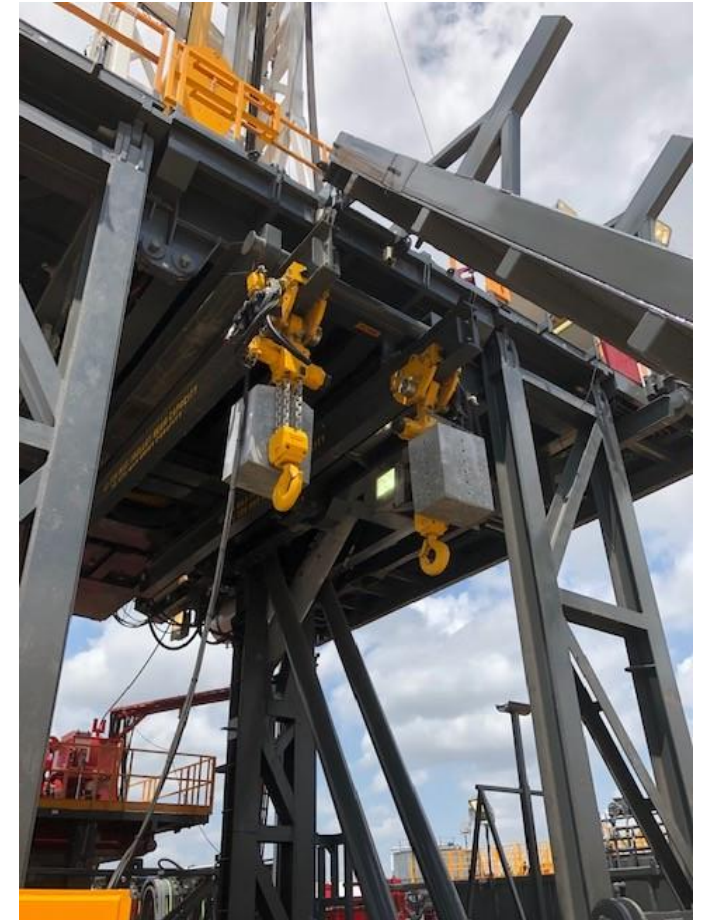
Winch & Hoist Applications

Drilling Rigs / Production Installations

- General utility drill floor
 - 2.5t, 5t, 10t
- Manriding
 - Dual, Dedicated
- Racking board
 - Pipe pullback
- BOP handling systems
 - Chain Hoists
- General utility air hoists

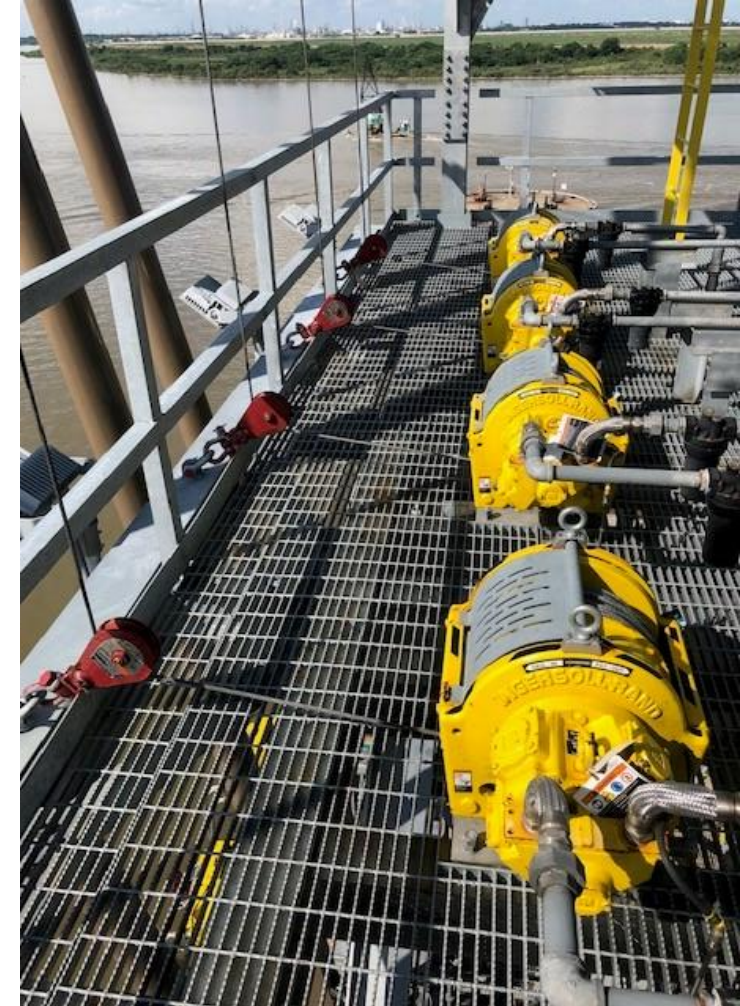


Utility winch on drillfloor



BOP Handling

Applications – Hoses & Pipes Handling, marine operations



Applications - BOP Handling



MOD Salvage & Subsea operations



Applications - Man Riding

Man Riding Application



Applications – Heavy lifting at shipyards

Lifting and handling of heavy propellers and shafts by using the air- & hydraulic chain hoists

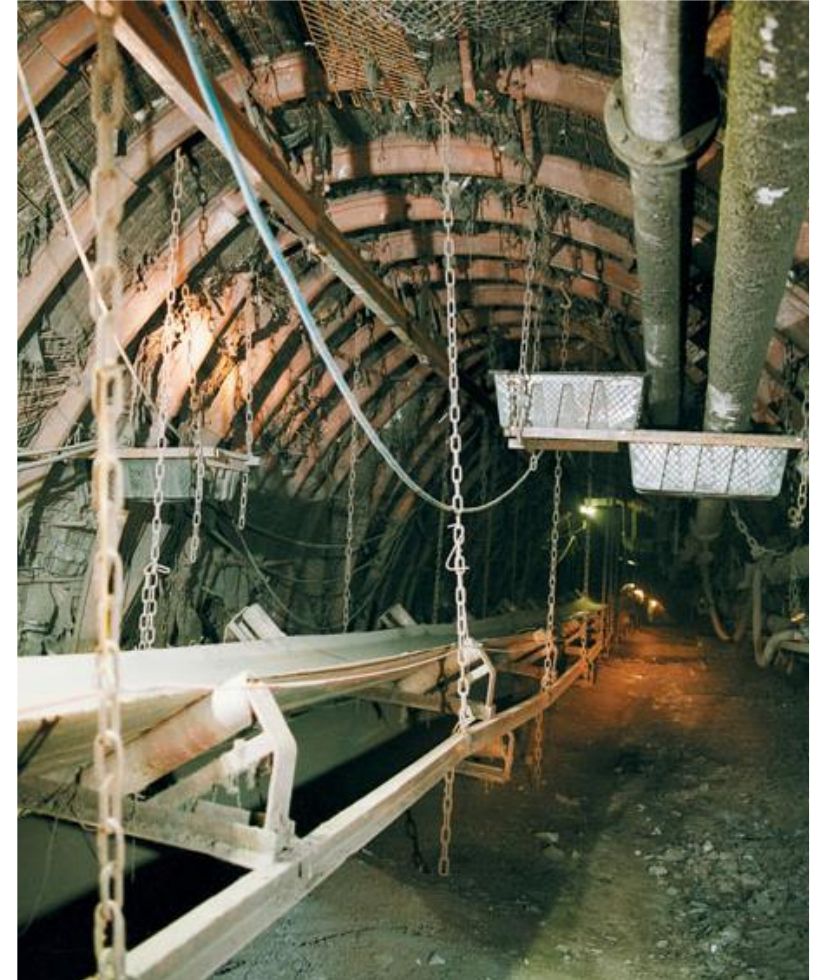


Appication - mining

Applications In Underground Mines

Pulling, tensioning or lifting of:

- Rail wagon
- Maintenance platform
- Drag Line
- Inspection shaft
- Material elevator
- Conveyor Belt
- Scraper
- Also used for rescue applications



General industry



Product overview

Air Winches

Liftstar Series



Liftstar Portable
300-1,500 kg
(660-3,300 lb)



Liftstar Heavy
2,000-5,000 kg
(4,400-16,530 lb)

Pullstar Series - For Pulling Applications



Pullstar Portable
1,000-2,400 kg
(4,400-11,000 lb)



Pullstar Heavy
4,000-10,000 kg
(5,950-16,530 lb)

Third Generation Series



FA2B
1,450 kg
(3,200 lb)



FA2.5A
1,860 kg
(4,100 lb)



FA5A
3,600 kg
(8,000 lb)

Infinity Series



FA2i
2,000 kg
(4,400 lb)



FA2.5i
2,270 kg
(5,000 lb)



FA5i
5,000 kg
(11,000 lb)



FA7i
7,000 kg
(15,400 lb)



FA10i
10,000 kg
(22,000 lb)

Classic Series



BU7A
360 kg
(800 lb)



EU
680 kg
(1,500 lb)

Hydraulic Winches

Liftstar Series



Pullstar Portable
600 kg
(1,320 lb)



Liftstar Heavy
2,000-5,000 kg
(4,409-11,023 lb)

Pullstar Series - For Pulling Applications



Liftstar Portable
1,000 kg
(2,204 lb)



Pullstar Heavy
4,000-10,000 kg
(8,818-22,046 lb)

Hydraulic Force Series™



HF8 & HF12
3,600-5,400 kg
(8,000-12,000 lb)

Electric Winches



Car Puller
700 - 2,000 kg
(1,540 - 4,400 lb)



Fulcrum Winch
2,409-20,727 kg
(5,300-45,600 lb)

Specialty Winches



Guideline Winch
Guideline 1,545 lbs (3,400 lb)
Pod line 4,636 kg (10,200 lb)



Decoker Winch
700 - 5,000 kg
(1,540 - 11,000 lb)



Mining Winch
1,545 lbs
(3,400 lb)



Divided Drum Winch
2,000 - 10,000 kg
(4,400-22,000 lb)



**Air Man Rider®
MR150**
150 kg (330 lb)



**Hydraulic Man Rider®
LS2-150H**
150 kg (330 lb)

Accessories



**Wireless
Pendant Control**
Available for most products



Control Console

PNEUMATIC,
HYDRAULIC,
& ELECTRIC
WINCH
OFFERING



Air Hoists

Liftchain Series



LC2A Series
1.5 - 100 T



LC2A Low Profile
1.5 - 25 T



LC2A Ultra-Low Profile
50 - 100 T

Herculink Series



Hercu-Link
12.5 - 100 T

Hydraulic Hoists

Liftchain Series



LC2H
6 - 100 T



LC2H Low Profile
6 - 25 T

Specialty Hoists



Air Mining Hoist
1.5 - 12 T



Hydraulic Subsea Hoist
6 - 50 T



Air Wire Rope Hoist
1-2 T

BOP Handling Systems - Air or Hydraulic



BS Series
25 - 150 T



BHS Series
50 - 200 T



Ultra Low BS Series (ULBS)
50 - 150 T

**PNEUMATIC,
HYDRAULIC,
AND LIMITED
ELECTRIC
CHAIN HOIST
OFFERING**



Air motor technology

Kent (Seattle) plant:

- **Radial piston:**
 - Higher HP
 - Higher speeds
 - Higher starting torque
 - Robust and reliable

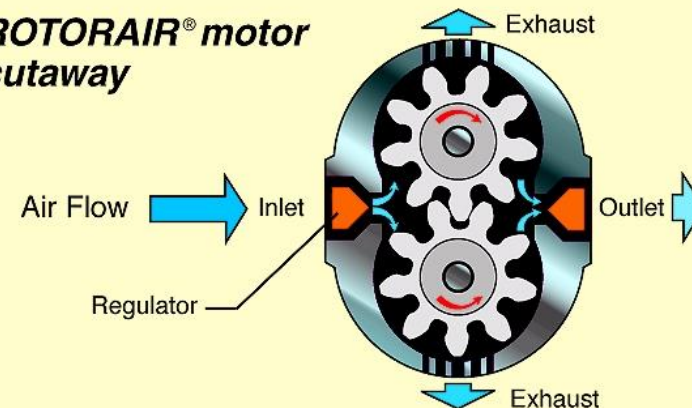


Douai plant:

- **Gear type:**
 - Only two moving parts
 - Composite material
 - Very tolerant of wet, dirty air
 - High starting torque
 - Ideal for smaller winches and compact hoists

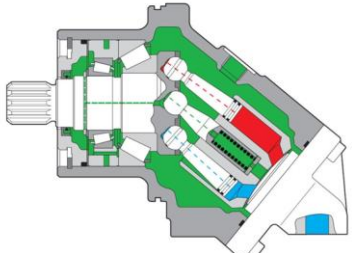


ROTORAIR® motor cutaway



Hydraulic motor technology

A2FE



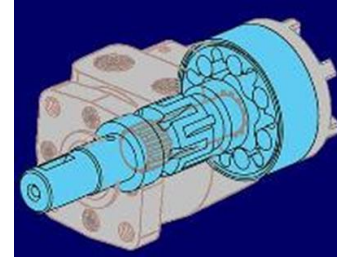
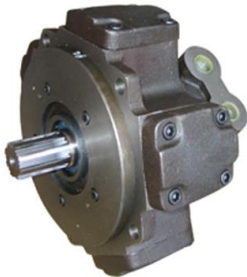
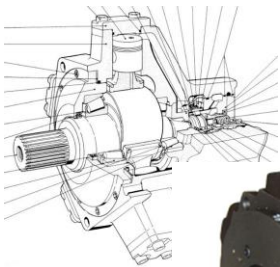
Kent (Seattle) plant:

- **Bent Axis motor (used for hydraulic winches):**

- Stable speed
- Low speed operation
- Robust and reliable

- **Radial piston hydraulic motor:**

- Higher HP
- Higher speeds
- Higher starting torque
- Robust and reliable



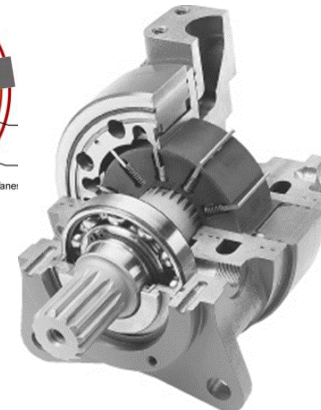
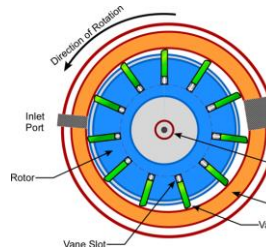
Douai plant:

- **Orbital (gerotor) type:**

- Less moving parts
- Long life cycle
- High starting torque
- Ideal for compact hoists and trolleys.

- **Vane type:**

- Very simple design
- Long life cycle
- Tolerant to shocks
- Ideal for compact hoists and trolleys.



Air winches (Douai, France)

Medium capacity (portable) range:



LS2-300R – SWL 300 kg.
LS2-600R – SWL 600 kg.
LS2-1500R – SWL 1500 kg.

Liftstar series (for lifting operations)

High capacity range:



LS2000R – SWL 2 t.
LS5000R – SWL 5 t.

PS2-1000R – pulling 1000 kg.
PS2-2400R – pulling 2400 kg.

Pullstar series (for pulling operations)

PS4000R – pulling 4 t.
PS10000R – pulling 10 t.



Main features:

CE / ATEX compliance
2 sizes of the drum
Double brake system
Auto spooling device
Controls options: throttle lever & remote pendent
Etc..



Hydraulic winches (Douai, France)

Medium capacity (portable) range:



LS2-600H – SWL 600 kg.

High capacity range:



LS2000H – SWL 2 t.
LS5000H – SWL 5 t.

Liftstar series (for lifting operations)

PS2-1000H – pulling 1000 kg.

Pullstar series (for pulling operations)

PS4000H – pulling 4 t.
PS10000H – pulling 10 t.



37 | Material Handling

Main features:

- CE / ATEX compliance
- 2 sizes of the drum
- Double brake system
- Auto spooling device
- Controls options: throttle lever & remote pendant
- Etc..



Air winches (Kent, USA)

Infinity Series winches (for lifting operations)

FA2i - SWL 2 t.
FA2.5i - SWL 2.5 t.
FA5i - SWL 5 t.
FA7i - SWL 7 t.
FA10i - SWL 10 t.

Main features:

CE / ATEX compliance
6 sizes of the of the drum
Double brake system (automatic & manual)
Air treatment system
Grooved drums
Easy spooling drive
Auto spooling device
Mufflers
Controls options: throttle lever, remote pendent, radio, etc.
Etc..



Air & Hydraulic chain hoists (Douai, France)

Liftchain L2CA/LC2H (industrial) series Air Chain Hoists:

- Capacity from 1 to 25 tons
- Unique pneumatic gear motor
- Robust & compact design
- Hook mount or trolley mount
- Special Mining models
- Reliable hydraulic motors
- Wide range of upper suspensions



Air & Hydraulic chain hoists (Douai, France)

Upper suspension types



1. Hook mount



2. Fixed lug



3. Plain trolley
(not motor – you can move
the trolley manually by
pulling the load chain)



4. Gear-drive trolley



5. Gear/Vane
types of motors



6. Low headroom

Air & Hydraulic high capacity chain hoists (Douai, France)

- Type of motors: Gear, Piston, Hydraulic gear motor
- Hook mount or trolley mount types
- Capacity up to 100 ton



25 t Hydraulic Hoist with motorised trolley



50 t Air Hoist, hook mounted



100 t Air Hoist, hook mounted

Air & Hydraulic low headroom chain hoists (Douai, France)

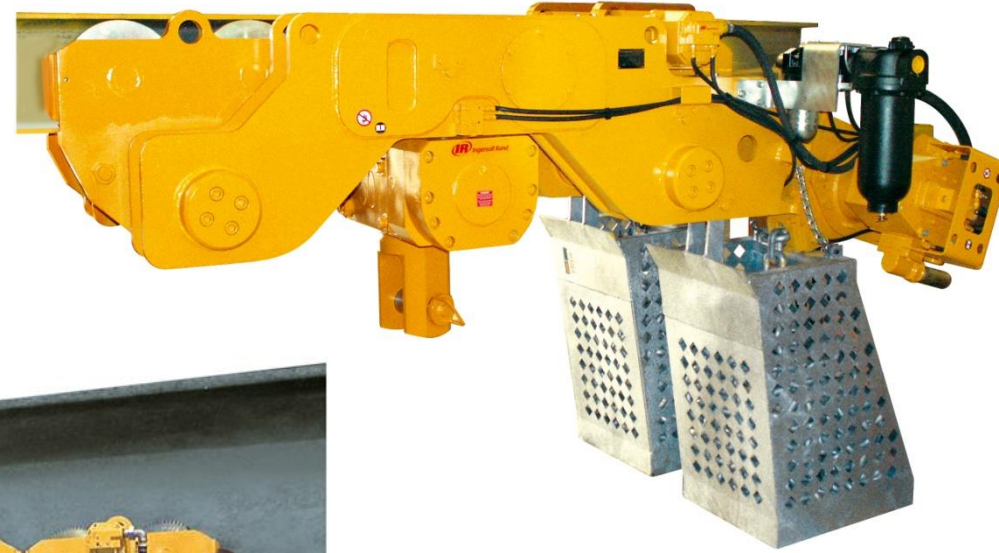
- Capacities up to 100 ton
- Ideally suited for areas with height restrictions



Low Headroom Trolley Hoist.
SWL 25 ton



loist. SWL 50 ton



Hoists – special solutions

"ARCTIC" series hydraulic hoists

- System Capacity from 10 up to 100 ton
- Hydraulic powered
- Designed for operation at -45°C
- ATEX and CE compliance



Subsea hydraulic hoists

- System Capacity from 6 up to 50 ton
- Hydraulic powered
- Designed for operation at 100 m depth



Engineering-to-order (ETO) – special solutions

INGERSOLL RAND is opened for design and production individual customized products :



Electric winches with speical design



Explosion-proof radio control station



Hydraulic hoists installed on mining truck

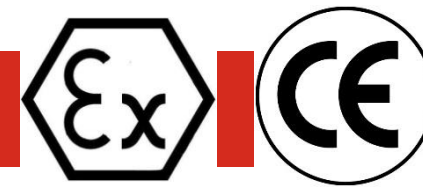


Electric hoists w/motorized trolley (ATEX).

ATEX Directive definitions 2014/34/EU

(Replacing 94/9/EC)

***Equipment for use in explosive
atmospheres***



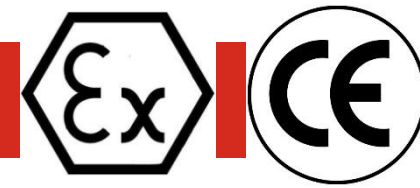
Equipment for use in explosive atmospheres

What is Ex-equipment / areas?

- Electrical or non-electrical equipment used in an area where there is a risk of presence of a flammable atmosphere (gas or dust) - are popular called “Ex- equipment” or equipment for use in Hazardous Areas

Ex-equipment are typically used in places like:

- The chemical industry
- Oil refineries
- Off shore installations (platforms)
- Filling stations
- Tunnels / drains
- Milling industry/ printing-house / painting industry
- Mining industry



Scope

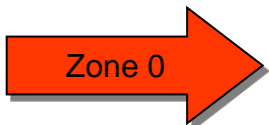
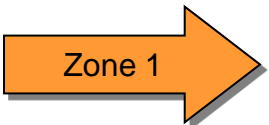
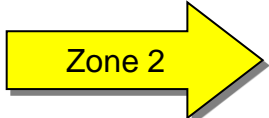
The Directive covers Electrical and Non-Electrical equipment!

- "Equipment": Machines, apparatus, instruments, fixed or mobile devices, control components and so on.
- "Protective systems": e.g. equipment that can stop or delay an explosion
- "Components": Essential parts for the safety but with no autonomous function.
- Safety control and regulation equipment intended to be used outside the Ex-area - but with a function that secures the safety in the Ex-area



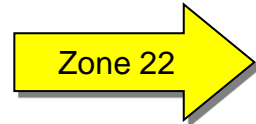
ATEX Directive 2014/34/EU

Zone Classification

THERE ARE 3 ZONES FOR GAS AND VAPOURS

 Zone 0	Explosive atmosphere is present continuously, for long periods or frequently
 Zone 1	Explosive atmosphere likely to occur occasionally in normal operation
 Zone 2	Explosive atmosphere not likely to occur in normal operation but if it does will persist for a short period only

THERE ARE 3 ZONES FOR DUST

 Zone 20	Dust cloud is present continuously, for long periods or frequently
 Zone 21	Dust cloud is likely to occur occasionally in normal operation
 Zone 22	Dust cloud not likely to occur in normal operation but if it does will persist for a short period only

ATEX Directive 2014/34/EU

Gas Atmosphere Zone

◆ Zone 0

- Closed Process Vessels
- Storage Tanks
- Closed Containers
- Areas Containing Open Tanks of Volatile / Flammable Liquids

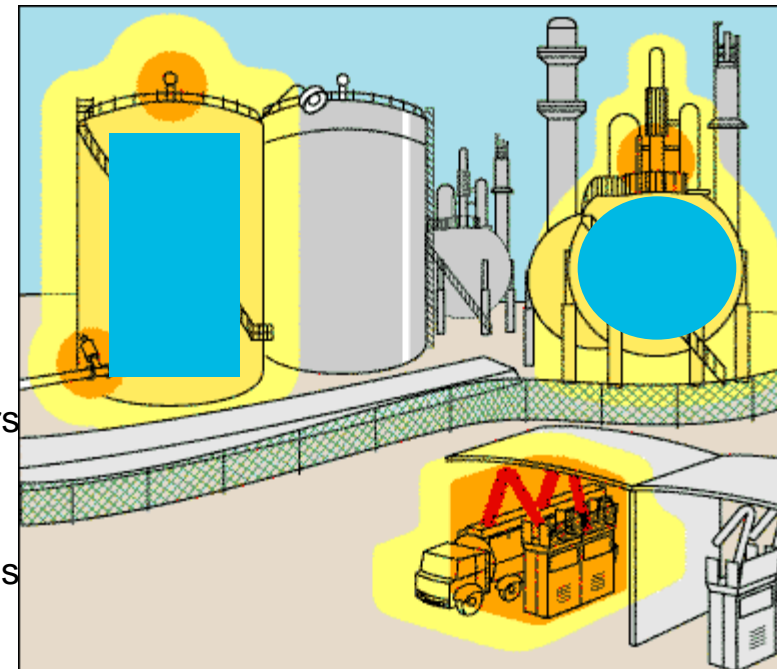
◆ Zone 1

- Loading / Unloading Areas of Hazardous Products
- Inadequately Ventilated Pumps Rooms for Flammable Gas or Volatile / Flammable Liquids
- Oily Waste Water Sewer / Basin
- Piping System (containing valves / meters / screwed or flanged fittings) is in an Inadequately Ventilated Area
- Elevated Structure that Flammable Liquids / Vapors may Accumulate

◆ Zone 2

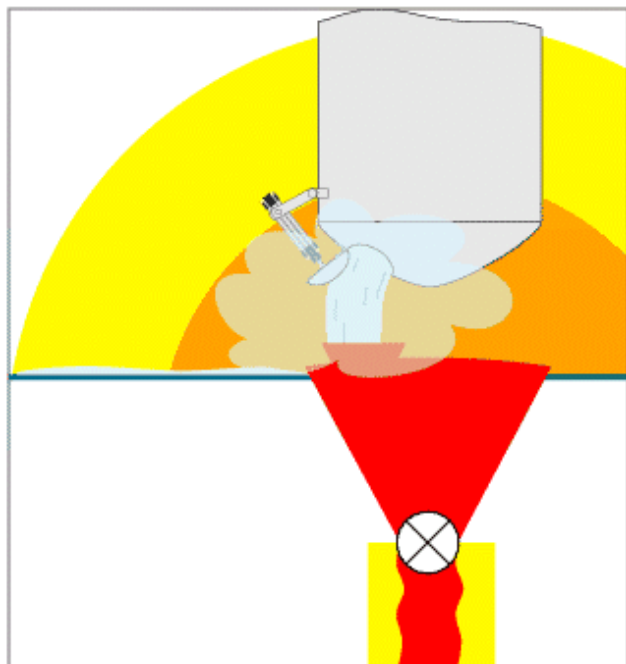
- The System Handling Flammable Liquid or Vapor is in an Adequately Ventilated Area
- Locations Adjacent to Zone 1 Areas

Colour	Zones	Presence of gas/dusts
Red	0	Continuously present (or for long periods)
Orange	1	Likely to occur occasionally
Yellow	2	Accidentally present - short time only



ATEX Directive 2014/34/EU

Dust Atmosphere Zone



◆ Zone 20

- Cloud of combustible dust in air is present continuously, or frequently
- Inside of containers or pipelines and enclosed conveying equipment

◆ Zone 21

- Cloud of combustible dust in air is likely to occur in normal operation occasionally
- Discharging and Filling equipment.

◆ Zone 22

- Cloud of combustible dust in air is not likely to occur in normal operation but - if it does occur - will persist for a short period only.
- Areas in which dust escapes and forms deposits are included in this category

Colour	Zones	Presence of gas/dusts
Red	0	Continuously present (or for long periods)
Orange	1	Likely to occur occasionally
Yellow	2	Accidentally present - short time only

ATEX Directive 2014/34/EU

Product Marking Example of Ingersoll Rand air hoist marking



Gas	Ex II 3G Ex h IIB T4 Gb X
Dust	Ex II 3D Ex h IIIC T135°C Db X



II

3

G D

c

IIB

135°C

X

EU Explosive atmosphere Symbol	Equipment Group	Equipment Category	Atmosphere	Protection Type	Gas group	Temperature Class	Special Conditions of use
	I : Underground Mining application	M1 = Energized M2 = De-Energized	G = Gas D = Dust	c = by construction	IIA = Propane (representative Gas) IIB = Ethylene (representative Gas) IIC = Hydrogen (representative Gas)	T1 = 500°C T2 = 300°C T3 = 200°C T4 = 135°C T5 = 100°C T6 = 85°C	X = read the documentation for special conditions of use
	II : Surface Industry application	1 = Zone 0 (Gas) or Zone 20 (Dust) area in which an explosive mixture is continuously present or for long periods 2 = Zone 1 (Gas) or Zone 21 (Dust) area in which an explosive mixture is likely to occur in normal operation 3 = Zone 0 (Gas) or Zone 20 (Dust) area in which an explosive mixture is continuously present or for long periods					

ATEX Directive 2014/34/EU





Equipment category description	Availability
M1 (Mining Energized)	Not offered by IR
M2 (Mining De-Energized)	Hoists: „Miner“ series of air hoists with CE mark. Winches: available with disc brakes only. Manual band brakes cannot be used.
Category 1 is intended for use in places classified as zone 0 or 20 (defined in standard EN 1127-1) in which explosive atmospheres are present continuously.	Not offered by IR
Category 2 is intended for use in places classified as zone 1 or 21 (defined in standard EN 1127-1) in which explosive atmospheres are only likely to occur. Protection is ensured during normal use and in the event of frequently occurring disturbances or normal equipment faults.	Hoists: available – with T1 option and CE mark. Winches: available for all models as standard.
Category 3 is intended for use in places classified as zone 2 or 22 (defined in standard EN 1127-1) in which explosive atmospheres are only unlikely to occur. Protection is ensured during normal use.	Available for winches and hoists as standard, with CE mark.

ATEX Directive 2014/34/EU

Ingersoll Rand ATEX Certified Products

Air Chain hoists



- **As standard:** Certified to  II 3 G/D (For Zone 2)

- **With special spark resistant package (option T1):**
Certified to  II 2 G/D (For Zone 1)
Option T1 includes:
 - copper/brass wheels on trolleys
 - bronze bottom & upper hooks
 - cast iron pendent control unit

ATEX Directive 2014/34/EU

Ingersoll Rand ATEX Certified Products

Utility winches, dedicated Man-Riding winches

- Certified to  II 2 GD (For Zone 1 and 2)
- Certifies to  I M2 (for mining, category M2)

ATEX Directive 2014/34/EU

Main benefits pneumatic ATEX products

- Pneumatic winches and hoists are categorized as non-electrical product. No need to pass full certification process at 3rd party. Only self-certification.
- Lower price of equipment (air motor, controls, etc.)
- Less cost of installation and maintenance.
- Longer life cycle.
- Less government regulations on non-electric ATEX machines.



Equipements de production
Conseil - Vente - Location - S.A.V



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