



ABB Robotics, 2015

Elevated Rail for the IRB 5500 Overview

Elevated Rail for the IRB 5500

Content

- Differentiated value proposition
- Target & markets
- IRB 5500
- IRB 5400
- Elevated Rail for the IRB 5500
- Data & features
- Rail element specification
- Main dimensions
- Mounting positions
- Layout example
- Added features
- Summary

Differentiated value proposition



- The Elevated Rail for the IRB 5500 from ABB reduces cycle times by as much as 10% on stop and go automotive paint lines.

Targets & markets

- Automotive painting
- Stop&Go line solutions
- Both greenfield and brownfield

Target industry



- An elevated solutions for IRB 5500
- Same application solutions as the fixed IRB 5500 - 6 axis
- 1K, 2K, direct and external charge

Market demand



Most common feedback

- Competitive pricing (overall solution) vs third part rail supply and other robot suppliers
- IRB 5400 covers only parts of the market, opening for the Elevated Rail for the IRB 5500 Solution enables reduced booth width and reduced line length
- Standardized solutions for a global market

IRB 5500



IRB 5500

- Introduced 2006 and has made a significant impact on the painting solutions
 - Very good market reputation
 - Good performance in terms of accuracy and robustness
 - One drawback – no rail option
- With this introduction, the IRB 5500 is capable of providing the flexibility needed to use only one model in most automotive applications

IRB 5400



Rail solution



Floor mounted

IRB 5400

- Introduced in 1997 as a floor mounted robot, with optional Clean Wall Rail or InBooth Rail solutions added later
- A powerful paint robot solution
 - Compact application integration
 - Large working envelope
 - Highest payload capacity in the market
 - Considered to be big and heavy in some applications

Elevated Rail for the IRB 5500



Elevated Rail for the IRB 5500

- Extending the unique features of the IRB 5500 to also utilize a standardized rail solution
- Combined with all application features as a standard IRB 5500; 1K gear pump solution, 2K gear pump solution, CBS solutions for direct charge WB
- Central lubrication, automated calibration (axis 7), protected cable carrier with termination points (upper and lower)
- Based on the more than 30 years of rail experience, this is the 5th generation of ABB rail solutions for Paint

Data & features

Technical overview

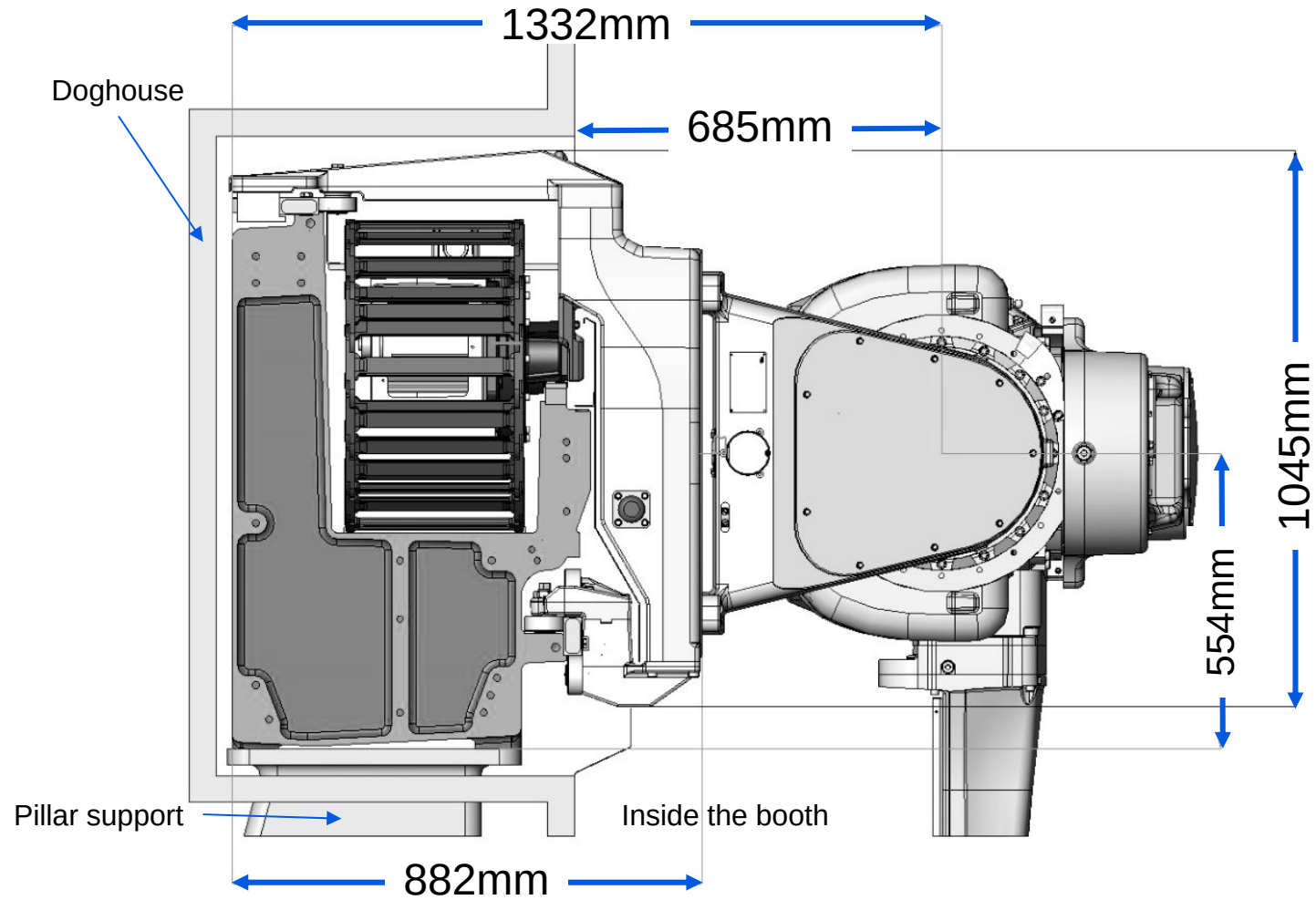
Elevated Rail for the IRB 5500	
Payload (IRB 5500)	13 kg (at 350 mm COG) - same as standard IRB 5500
Reach	2975 mm (at TCP 0) Same as IRB 5500 + from 2 m to 15 m rail (on request). Capable of supporting from 1-4 robots on the same rail (1 & 2 is covered as standard)
Accuracy	Robot: 0.15 mm (on TCP) Trolley: 0,3 mm. ABB dynamic modeling for all axes. Velocity axis 7 (rail axis): 1,4 m/sec
Deflection of rail	< 1 mm (with maximum speed and acceleration of manipulator in vertical direction)
Weight	Manipulator 600 kg. Trolley 370 kg, Rail element 380 kg/meter
Mounting position	Floor or Elevated. Robot: tilted, upright & inverted
Temperature	0 C – 40 C deg
IP Protection	IP 67 as standard (Ex zone 1, Class 1 Div 1)

Rail element specifications

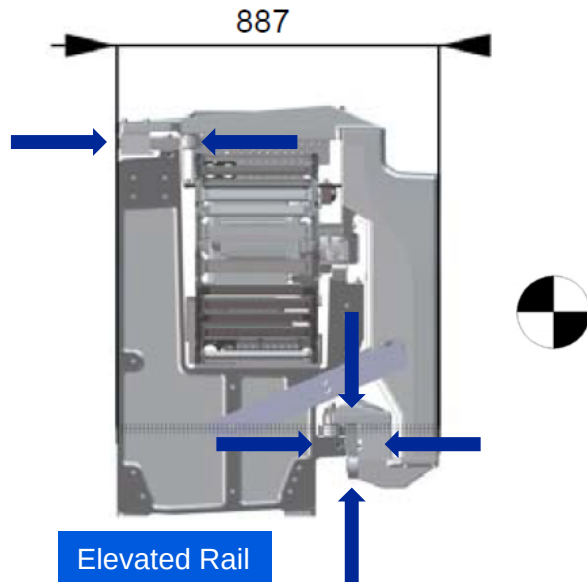
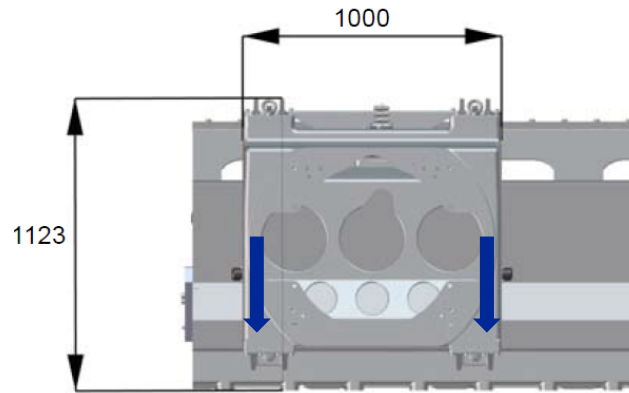


- A special quality of casted iron (Ductile iron) is now introduced for the rail elements.
This provide additional strength and will enable for up to 7.5m rail length with two supporting pillars
- one 1374mm rail section added on each end of the pillar

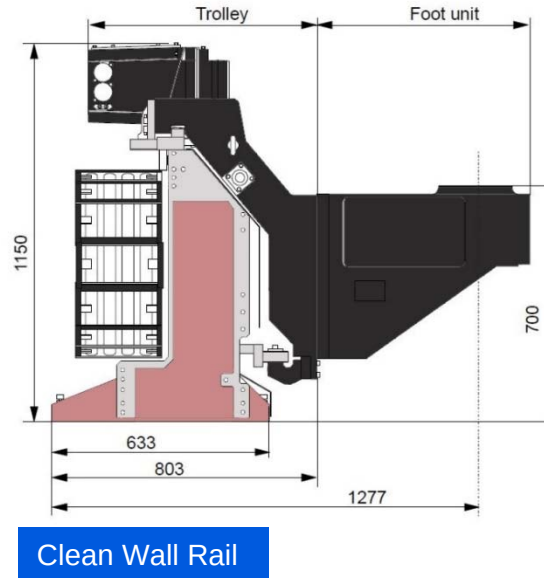
Main dimensions: robot



Main dimensions: trolley

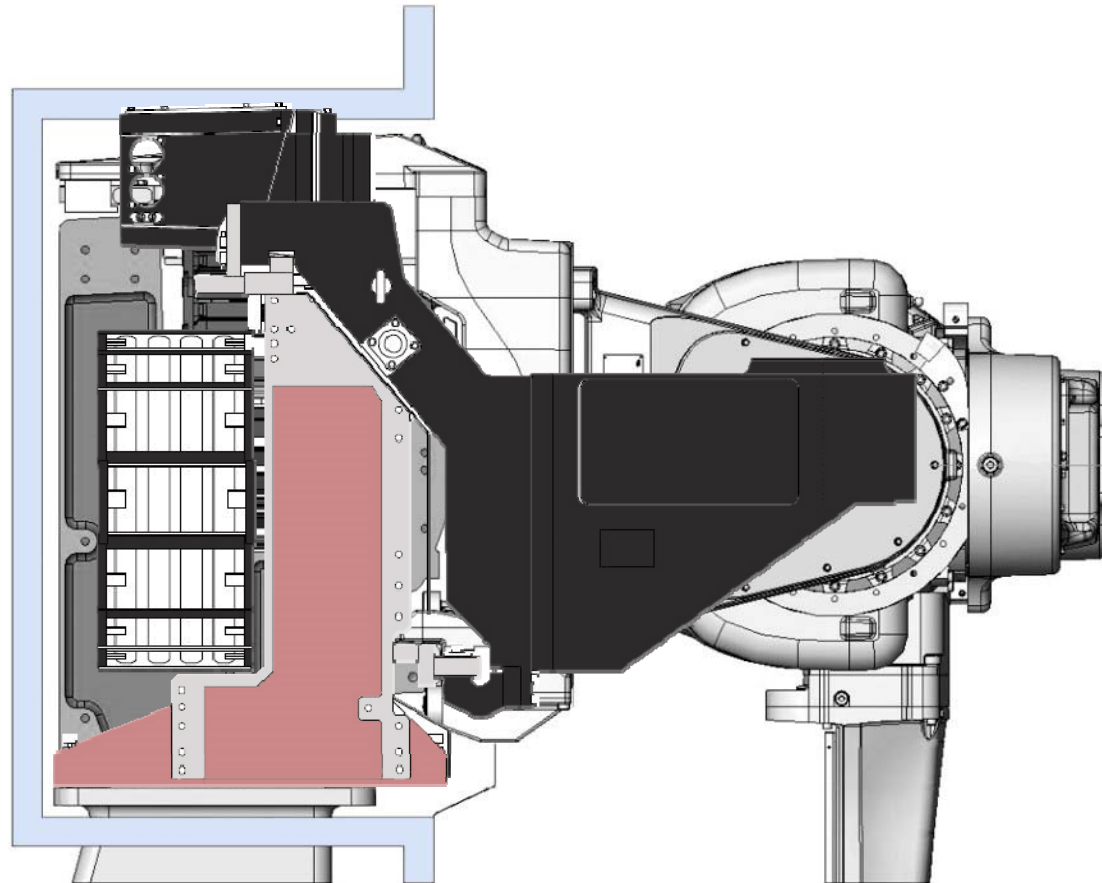


- The trolley uses rollers in each of the four corners for stability and distribution of forces
- ER-elements are design to withstand forces without needing support for each 500mm.

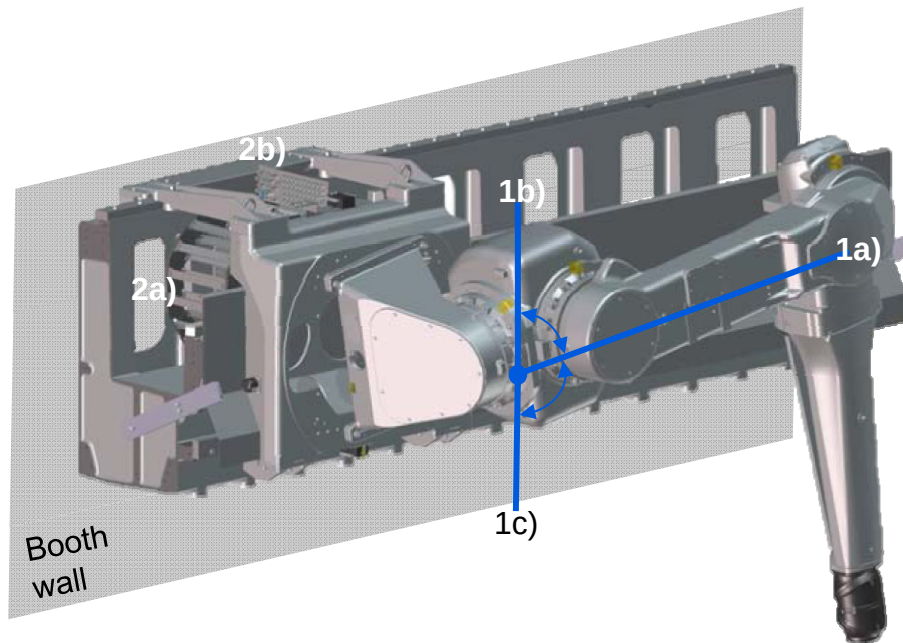


Main dimensions

Comparing sizes: trolley, doghouse, axis 1 position

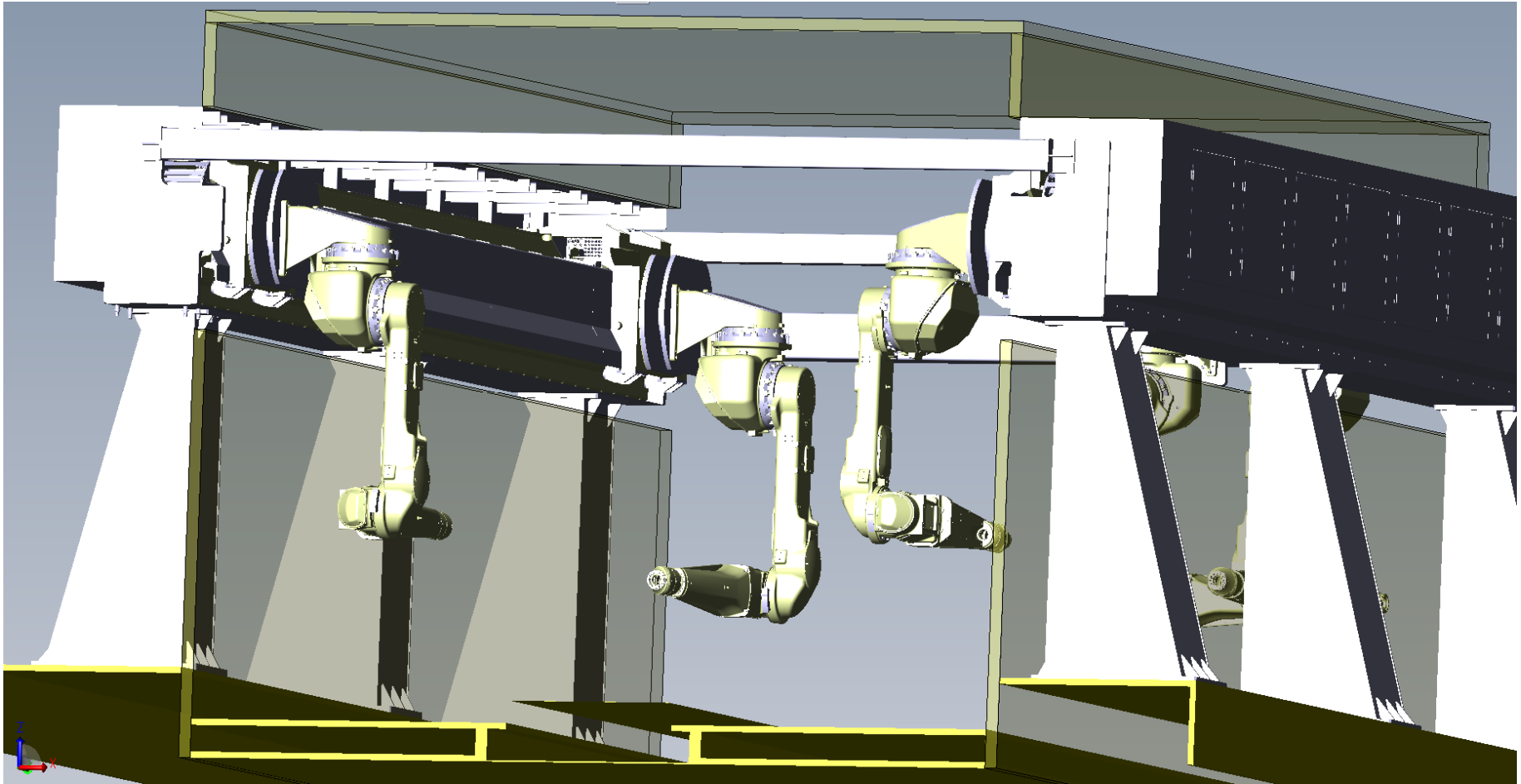


Mounting positions

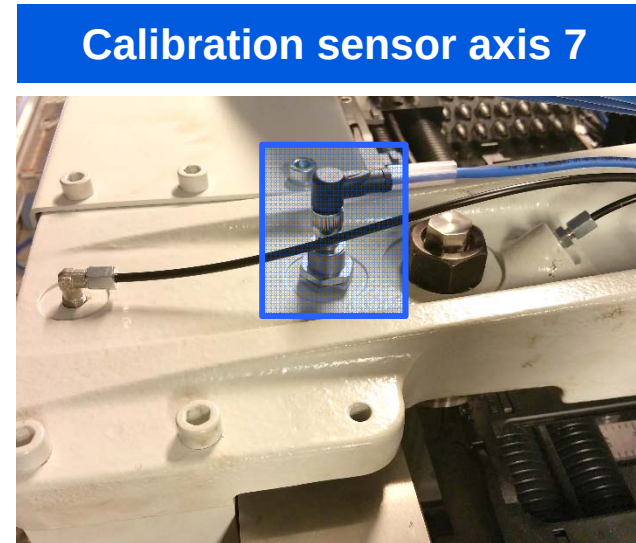
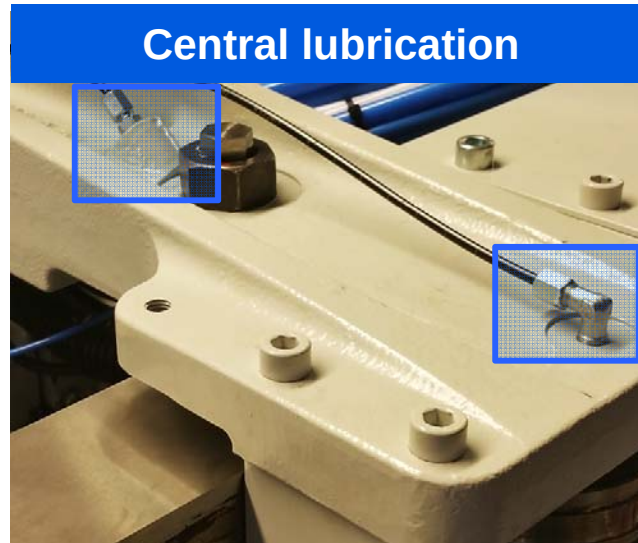


1. Manipulator mounting positions
 - a) Tilted (as picture shows)
 - b) Upright
 - c) InvertedAll with the same trolley
2. Protected cable chain:
 - a) 300mm standard cable chain integrated into the rail elements. Supporting 26 colors with full re-circulation
 - b) Left or right direction, containing the main cables (2) and supply lines and return lines. Termination plates (upper and lower) are prepared in combination with PAP/GAPs

Layout example



Added features



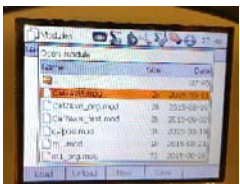
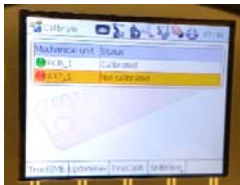
Central lubrication

- Lubricate track rails and gear rack
- Lubricate trolley rollers

Automatic calibration sequence, axis 7

- Using position sensor to detect the calibration position.
No calibration tooling needed

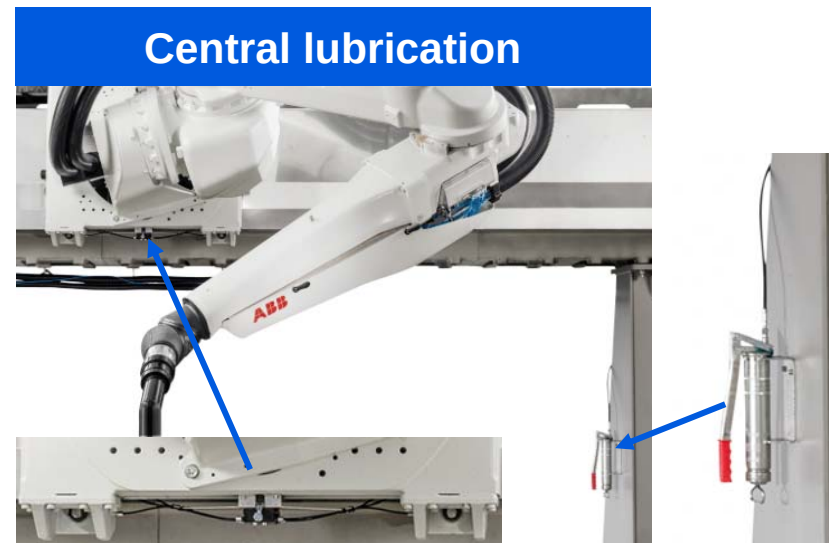
Added features



- In order to calibrate axis 7, the operator need the P-TPU and to know the approximate position of the proximity bracket (can be located anywhere along the rail)
- Run the prepared instruction (program), wait for the calibration sensor to be found, press 'FineCalib'
- Done.



Added features



Brake release box, axis 7

- For customers require a simple way to release the brake of the robot in order to reposition the robot for cleaning or inspection. Some personnel do not have the authorization to use the P-TPU for brake release

Central lubrication pump and manifold

- Distribution unit located under the trolley
- A manual grease pump or an automatic pump can be used

Summary



- The Elevated Rail for the IRB 5500 enables increased flexibility, especially for Stop&Go lines
 - To reposition the robot into the best painting position and for better backup solution
 - On length configurations
 - On robot mounting positions
 - In robot programming (fully integrated dynamic model)
- Designed for only two pillars in most length configurations
- Prepared with stainless steel covers facing into the booth, automatic calibration, central lubrication, brake release box, additional limit switches and serial purging that allow for a combination with CBS-II

Power and productivity
for a better world™

