

# World

# Robotics

## Industrial Robots

---

## 2024



**Statistics, Market Analysis, Forecasts and Case Studies**

# World Robotics Industrial Robots 2024

## World Robotics 2024 – Industrial Robots

Produced by VDMA Services GmbH, Lyoner Str. 18, 60528 Frankfurt, Germany.

The robot statistics are based on consolidated world data reported by robot suppliers as well as on the statistics and support of the national robotics associations of North America (A3), Spain (AER), UK (BARA), People's Republic of China (CRIA), Denmark (DIRA), Japan (JARA), Republic of Korea (KAR), Italy (SIRI), and Sweden (SWIRA).

The cover and the editorial are sponsored by Epson Deutschland GmbH.

Assisting in statistics evaluation, text and charts processing: Nina Kutzbach, IFR

We express our most sincere gratitude to all partners!

Dr. Christopher Müller  
Director  
IFR Statistical Department

Tel: +49 69 66 03-11 91  
E-Mail: [statistics@ifr.org](mailto:statistics@ifr.org)  
Internet: <http://www.worldrobotics.org>

one market

Copyright ©2024 VDMA Services GmbH

All rights reserved.

Suggested citation: Müller, Christopher: World Robotics 2024 – Industrial Robots, IFR Statistical Department, VDMA Services GmbH, Frankfurt am Main, Germany, 2024.

Short citation: World Robotics 2024 – Industrial Robots

No part of this publication may, for sales purposes, be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying or otherwise, without prior permission in writing from VDMA Services GmbH (contact via IFR Statistical Department).

ISBN 978-3-8163-0765-5

# Contents

<b>Foreword</b> .....	<b>3</b>
<b>Editorial</b> .....	<b>5</b>
<b>Contents</b> .....	<b>9</b>
<b>Executive summary World Robotics 2024 Industrial Robots</b> .....	<b>13</b>
<b>1 Introduction: sources and methods</b> .....	<b>20</b>
1.1 Contents, access to data for previous years, and contact .....	20
1.2 Data sources, revisions, reliability, and validity .....	22
1.2.1 Sources .....	22
1.2.2 Quality, reliability, and validity .....	23
1.2.3 Data revisions since the previous edition .....	24
1.3 Compliance .....	25
1.4 Forecasts .....	27
1.5 Definition of “shipments” and “installations” .....	28
1.6 Definition of “operational stock” .....	29
1.7 Definitions: “robot”, “service robot”, “industrial robot”, “medical robot” ....	30
1.7.1 ISO 8373:2012 vocabulary definitions .....	30
1.7.2 Deviations of IFR definitions from ISO definitions and IFR refinements of ISO definitions –industrial robots .....	31
1.7.3 IFR definition: multipurpose industrial robot .....	32
1.8 Scope of IFR industrial robot statistics .....	33
1.9 IFR definition of robot types .....	34
1.10 IFR classification of industries .....	42
1.11 IFR classification of applications .....	44
1.12 IFR geography classification .....	45
1.13 Distribution and sales channels for industrial robots and their impact on IFR data collection .....	48
1.13.1 Definition of the market players .....	49
1.13.2 Distribution channels .....	49
1.13.3 Sales channels .....	50
1.13.4 Data collection for IFR industrial robot statistics .....	51
<b>2 Worldwide distribution of industrial robots</b> .....	<b>54</b>
2.1 Unit installations .....	55
2.2 Worldwide operational stock of industrial robots .....	62
2.3 Worldwide market value of robots from 2018 – 2023 .....	67
2.4 Collaborative robots .....	69
2.5 Analysis of the development of robot density in selected countries/regions .....	72



2.5.1	Definition of robot density and sources of data.....	72
2.5.2	Robot density in the manufacturing industry.....	74
2.5.3	Robot density in the automotive industry and in all other industries.....	78
2.6	Installations and stock of industrial robots from 2018 – 2023 by application areas.....	83
2.7	Installations and stock of industrial robots from 2018 – 2023 by customer industries .....	92
2.8	Comparison between the automotive industry and all other industries .	102
2.9	Installations of industrial robots in 2022 and 2023 by mechanical structure (type) and country/region .....	119
<b>3</b>	<b>Distribution of industrial robots by countries and regions.....</b>	<b>130</b>
3.1	Introduction .....	130
3.2	The Americas.....	131
3.2.1	North America.....	140
3.2.2	Brazil.....	169
3.2.3	Rest of South America .....	179
3.3	Asia/Australia.....	184
3.3.1	The People´s Republic of China.....	193
3.3.2	India.....	210
3.3.3	Indonesia .....	221
3.3.4	Japan.....	231
3.3.5	Republic of Korea .....	246
3.3.6	Malaysia .....	260
3.3.7	Singapore .....	270
3.3.8	Chinese Taipei.....	280
3.3.9	Thailand.....	291
3.3.10	Vietnam .....	301
3.3.11	Other South East Asia.....	311
3.3.12	Australia and New Zealand .....	319
3.4	Europe .....	329
3.4.1	Balkan Countries.....	338
3.4.2	Czech Republic.....	349
3.4.3	Hungary .....	360
3.4.4	Poland .....	370
3.4.5	Romania .....	381
3.4.6	Russian Federation.....	391
3.4.7	Slovakia .....	401
3.4.8	Other Eastern Europe .....	411
3.4.9	Austria .....	418
3.4.10	Belgium and Luxembourg .....	429
3.4.11	France .....	439
3.4.12	Germany.....	450
3.4.13	Italy.....	465
3.4.14	Netherlands .....	476

3.4.15	Portugal .....	486
3.4.16	Spain .....	496
3.4.17	Switzerland .....	507
3.4.18	United Kingdom .....	517
3.4.19	Denmark .....	528
3.4.20	Finland .....	538
3.4.21	Norway .....	548
3.4.22	Sweden.....	557
3.4.23	Türkiye.....	568
3.4.24	All other European Countries .....	579
3.5	Africa .....	584
3.5.1	South Africa .....	584
3.5.2	Rest of Africa .....	594
3.6	Other countries .....	599
<b>4</b>	<b>Forecast of industrial robot installations 2024-2027 .....</b>	<b>602</b>
4.1	General Macroeconomic conditions .....	602
4.2	The main customer industries .....	604
4.3	New markets and new business models .....	608
4.4	Trends in robot technology.....	610
4.5	Conclusion and forecast 2024-2027.....	615
<b>5</b>	<b>Case studies on robots in manufacturing and beyond .....</b>	<b>622</b>
5.1	Introduction .....	622
5.2	Sustainability in robotics.....	625
5.3	Case Study 1 - Committed to the green and sustainable development - Efort photovoltaic industry application solution.....	630
5.4	Case Study 2 - Heismann Drehtechnik GmbH user solution realized together with Epson Robots .....	633
5.5	Case Study 3 - Automation, intelligence empowered lithium industry limit manufacturing .....	637
5.6	Case Study 4 - Fanuc and Recycleye Robotics automate the recycling industry .....	641
5.7	Case Study 5 - KR Quantec against electrical waste .....	644
5.8	Case Study 6 - Pioneering robotic approach for complex assembly process automation using artificial intelligence.....	648
5.9	Case Study 7 - From films and foils to stack: automated production of fuel cells .....	653
5.10	Case Study 8 - Welding robot enables increased production at heating equipment manufacturer .....	657
<b>6</b>	<b>IERA Award .....</b>	<b>662</b>
6.1	Winner of the IERA Award 2024: .....	663
<b>7</b>	<b>Annex.....</b>	<b>670</b>

References ..... 686