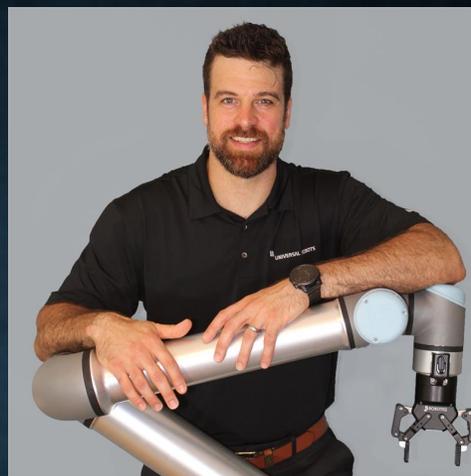


# Getting Started with Cobot Automation in Laser Marking Operations



**Silas Neale**  
*Area Sales Manager  
North America East  
Universal Robots*



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# Agenda

- 1 Introduction to Universal Robots**
- 2 Comparison of traditional industrial robots and collaborative robots**
- 3 Cobot selection**
- 4 Getting started with cobot deployment for Laser Marking**

# Introduction to Universal Robots

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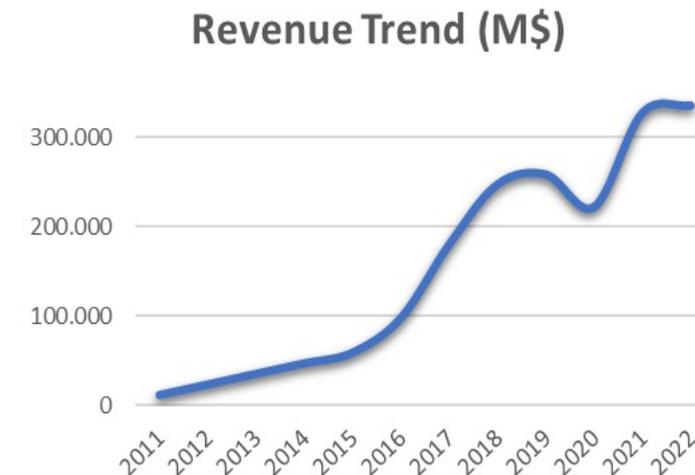
# Company overview



**Kim Povlsen**  
CEO and President

<b>2005</b> Founded in Denmark	<b>2008</b> Introduced first commercially viable cobot
<b>~29%</b> of the cobot market	<b>75,000+</b> cobots sold
<b>1200+</b> Partners in the UR ecosystem	<b>20+</b> offices
<b>~1000</b> employees	Part of <b>Teradyne Inc.</b>

**Product portfolio**  
with range of reaches and payloads

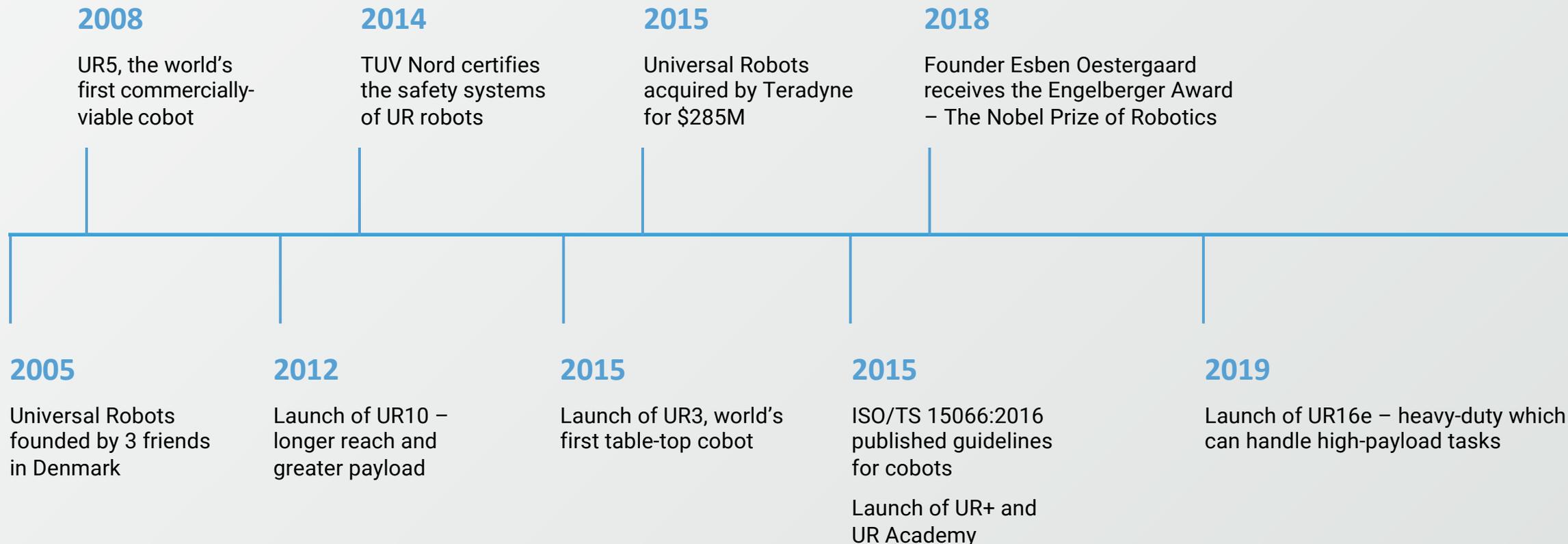


# A global company



# Our journey

to creating a world where people work with robots, not like robots



# Our journey

**2020**

Universal Robots reaches an industry milestone with over 50,000 collaborative robots installed worldwide

**2022**

UR20 is announced – a new 20 kg payload cobot, which is the first of an innovative next generation of cobots

**2023**

75,000 cobots installed around the world

**2021**

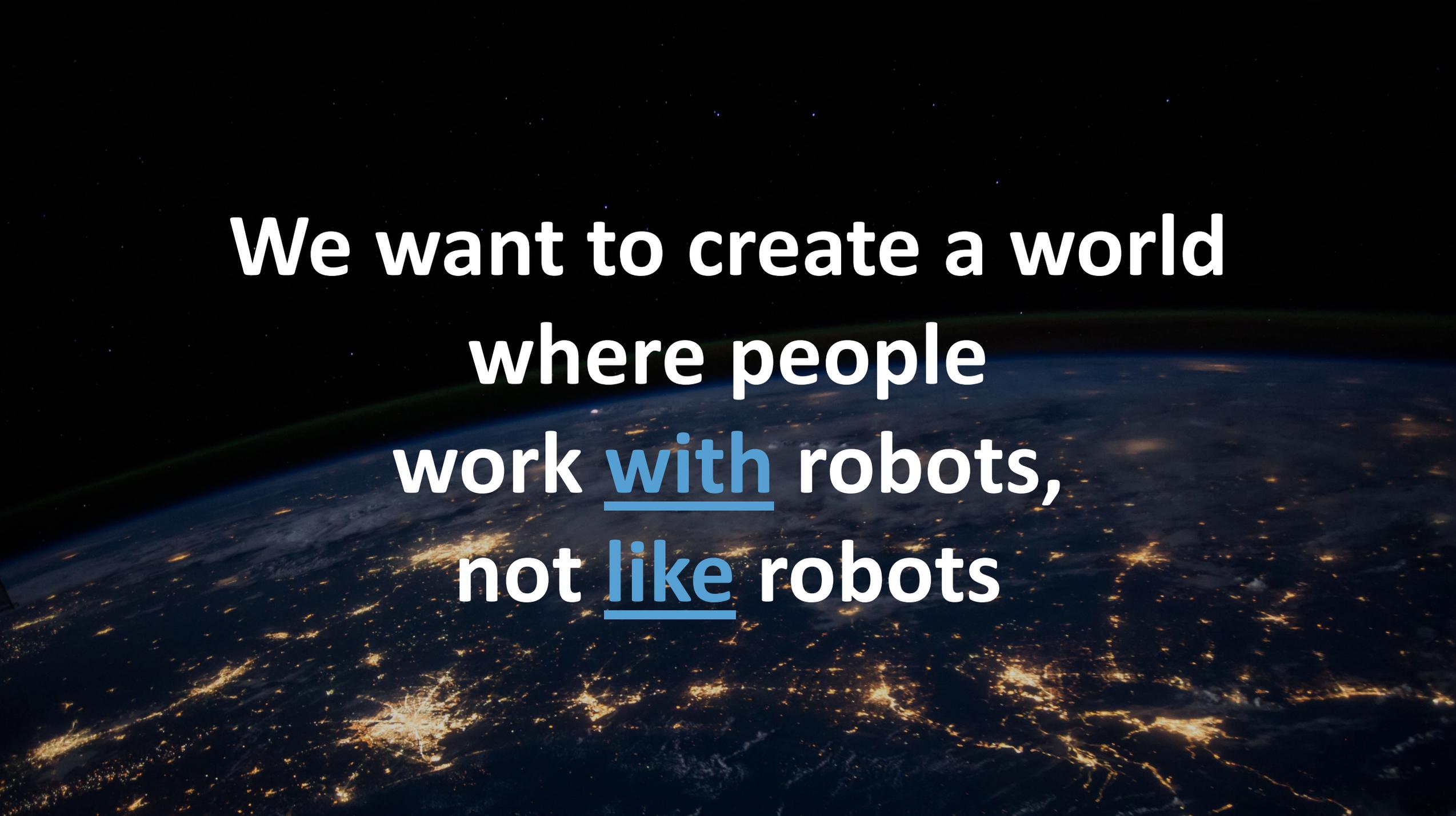
The payload of the UR10e is increased to 12.5 kg (27.55 lbs)

**2022**

Together with its sister company MiR, Universal Robots breaks ground for a new, state-of-the-art headquarters in Odense

**2023**

The UR30 is launched at iREX in Japan on November 29. A more compact and powerful cobot compared to the UR20



**We want to create a world  
where people  
work with robots,  
not like robots**

# Traditional vs. collaborative automation

## Traditional automation



## Collaborative automation



# Robot vs. cobot installation

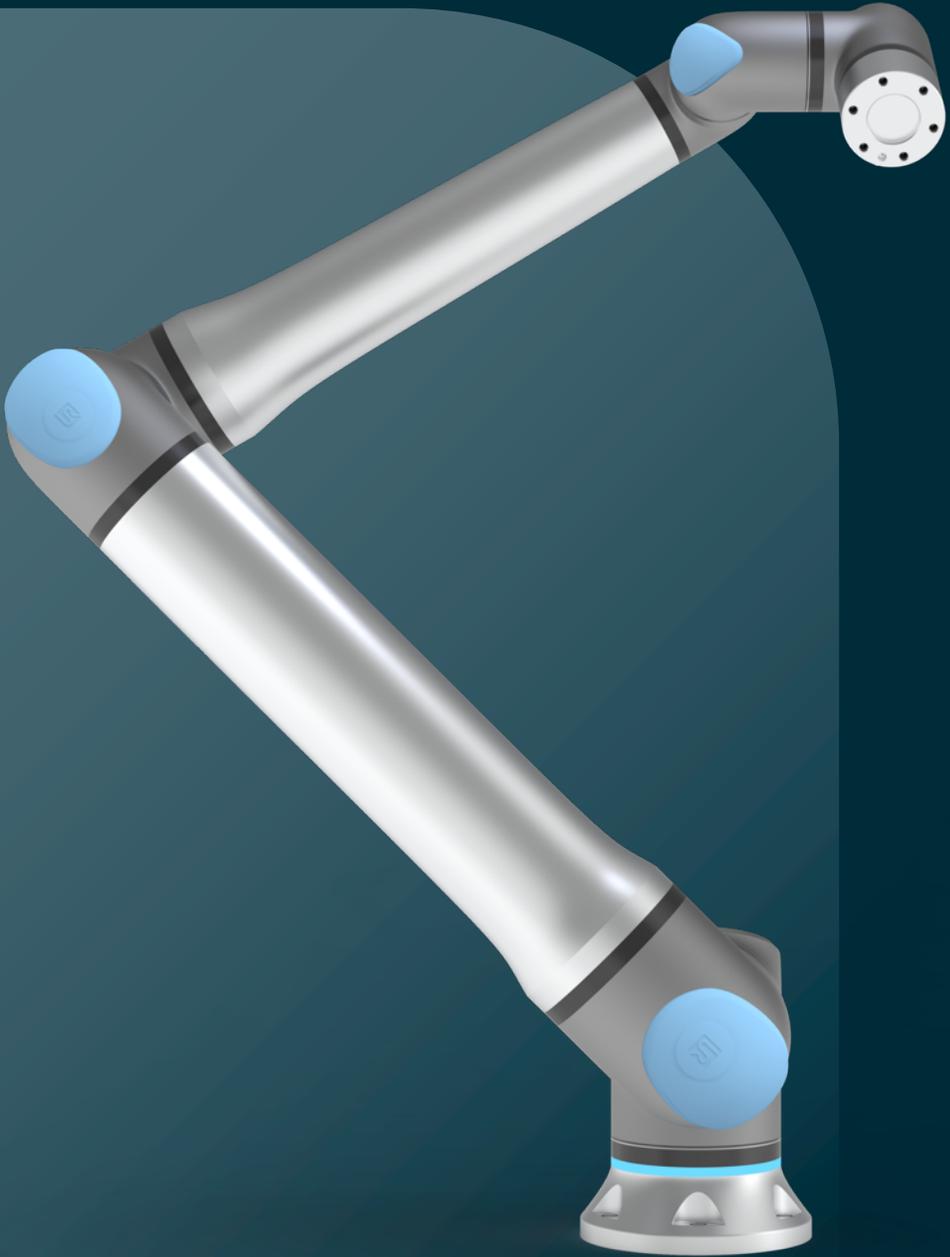
## Typical Robotic System Lead-Time & Installation

- 1-12 Weeks ARO for Robot
- 4-18 Weeks ARO for Solution
- Running in 1-4 Weeks After Delivery
- 6-34 Weeks Total (1.5-9 months)

## Typical Collaborative System Lead-Time & Installation

- 5-10 Days ARO for Robot
- 2-4 Weeks ARO for Solution
- Running in 1-5 Days After Delivery
- 3-10 Weeks Total (1-3 months)

*Avg. 50% Faster Implementation Time Overall @ 30% - 50% Less CapEx Than Traditional Industrial Robot*



# Industrial Cobot Basics

## Collaborative & safe

Able to safely operate alongside humans in shared space.

## Easy to program

No previous coding / robotics / automation experience required.

## Fast Setup

120v power, simple out-of-box experience.

## Flexible & Versatile

Easy to redeploy into new applications or new production runs.

## Total System Cost

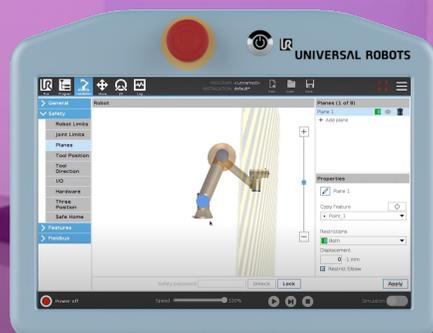
Typically, 1/3 to 1/2 of traditional automation.  
Economically viable in high mix / low volume operations

# Safety Function to Meet Individual Plant Requirements

## 17 safety functions

All EN ISO 13849-1, ISO 10218-1 Cat. 3, PL d, certified by TÜV NORD

- Configurable stopping time & stopping distance
- Joint position limits
- Pose limit, tool orientation limit, safety planes, safety boundaries
- Safe home
- Force limiting (TCP)
- Elbow safety (force, speed, boundary restriction)



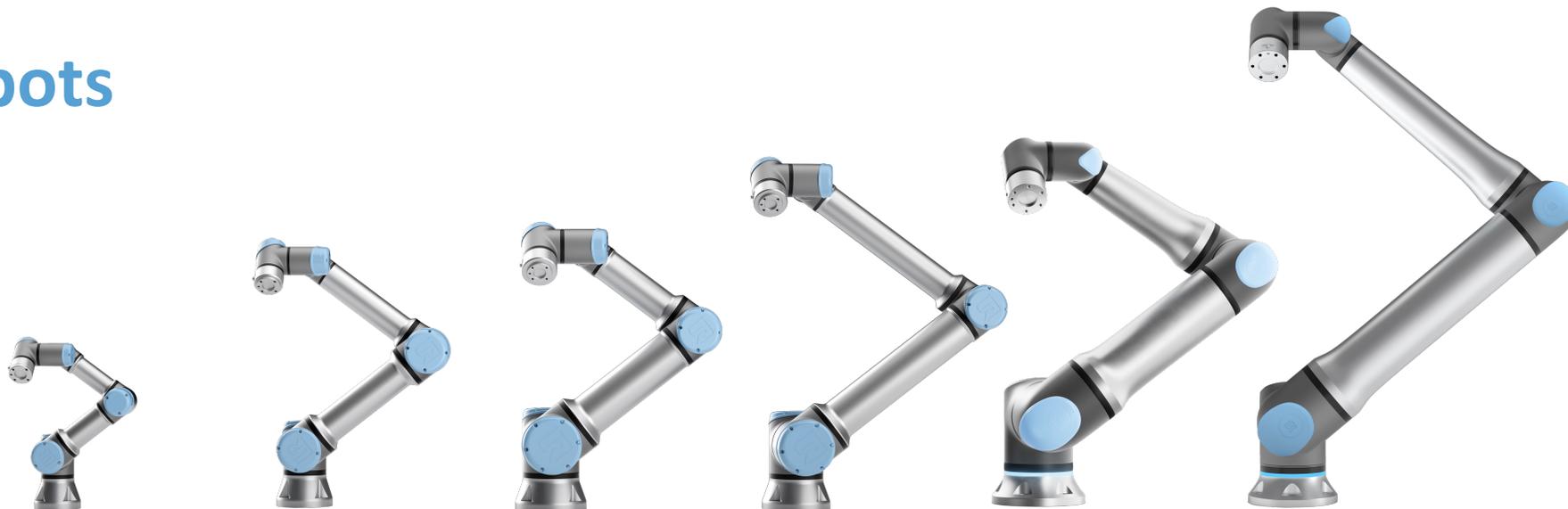
# All-or-nothing VRS Incremental Automation



# Cobot Selection

03

# Universal Robots Portfolio



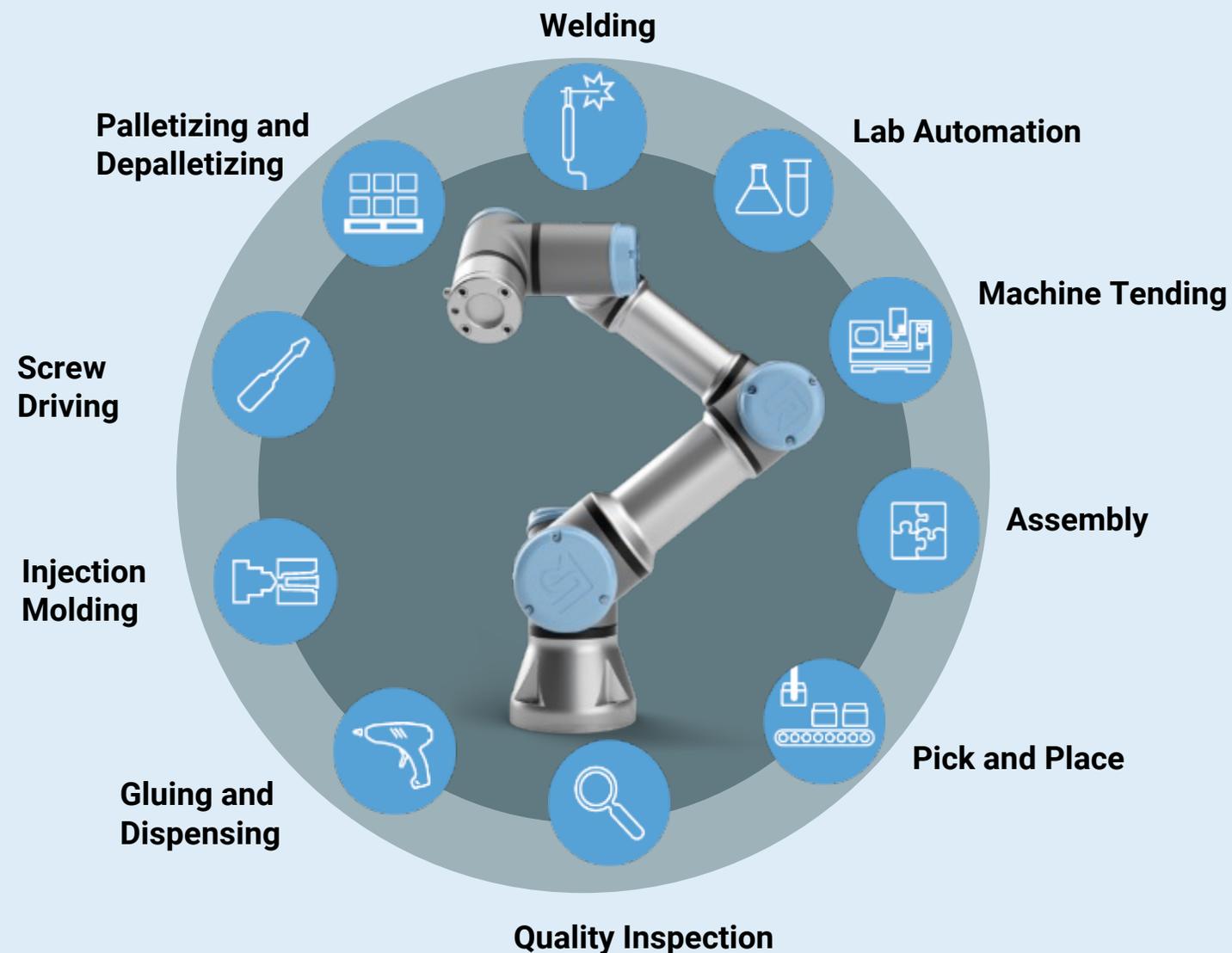
	<b>UR3e</b>	<b>UR5e</b>	<b>UR16e</b>	<b>UR10e</b>	<b>UR30</b>	<b>UR20</b>
 <b>Payload:</b>	3 kg 6.6 lbs	5 kg 11 lbs	16 kg 35.3 lbs	12.5 kg 27.5 lbs	30 kg 66.1 lbs	20 kg 44.1 lbs
 <b>Reach:</b>	500 mm 19.7 in	850 mm 33.5 in	900 mm 35.4 in	1300 mm 51.2 in	1300 mm 51.2 in	1750 mm 68.9 in
 <b>Weight:</b>	11.2 kg 24.7 lbs	20.6 kg 45.4 lbs	33.1 kg 73 lbs	33.5 kg 73.9 lbs	63.5 kg 139.9 lbs	64 kg 141.1 lbs
 <b>Footprint:</b>	Ø 128 mm	Ø 149 mm	Ø 190 mm	Ø 190 mm	Ø 256 mm	Ø 245 mm

# Getting started with cobot deployment

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# Where to Start?

- **Business Challenges**
- **Manufacturing Labor**
- **Motion Classes**
- **Part Presentation**
- **Risk**
- **ROI**



# Find the Business Problem

## Improving the Bottom Line:

- Increase machine utilization, OEE, OLE.
- Avoid buying additional machinery, increasing floor space.
- Reduce Cost-of-Quality
- Reduce overtime & hours worked.  
Avoid adding a 2nd or 3rd shift.
- Lower costs, increase margin or lower prices to gain market share.

## Increasing the Top Line:

- Increase output without increasing manufacturing labor.
- Increase capacity to maintain & grow with current customers.
- Increase capacity to add new customers.
- Expand product lines

# Throughput versus Cycle Time

- Cycle times are important, but total production is what counts
- Collaborative robots are not “*superhuman*”
- Built to preform Human Speeds & Payloads:
  - 6-10 cycles per min or less
  - Payloads Under 66 lbs.
- Production improvements from:
  - Consistent cycle times, quality improvements
  - Unmanned production at breaks, lunches, shift changes, extended work hours

# Parts and Presentation

## Positive Part Locations Preferred!

- Flat tray
- Located Tray
- Pegboard
- Conveyors
- Drawers
- Bowl Feeder
- Blow Feeder
- Re-Gripping Stations



# Where to start: The factory tour

## Human Tasks That Are...

- Dull, Dirty and Dangerous
- Difficult to Staff
- Workers Comp Claims
- Highly Repetitive
- Inconsistent Quality



# Coarse vs. Fine Movement

## Coarse Movement

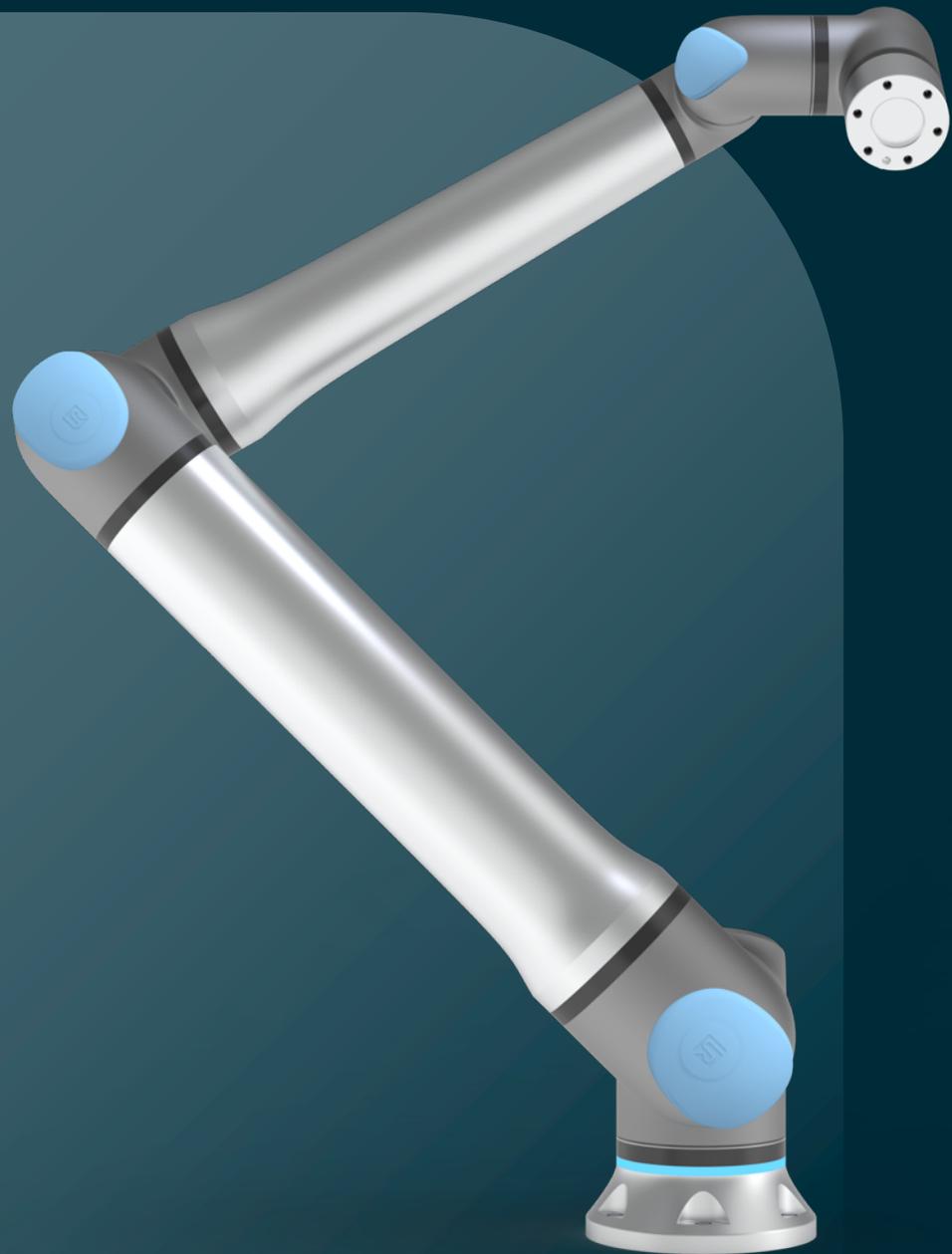
- Gross Motor Skill Movements, Large Muscles, Arms, Legs, Torso etc.
- Moving Boxes, Holding Torque & Glue Guns, Stacking, Packing, Transferring etc.

## Fine Movement

- Small Movements, Small Muscles, Fingers, Toes, Wrists etc.
- Tying, Threading, Sewing, Folding, Wrapping, Manipulating Flimsy or Compliant Material To Fit

## Primary Targets? *Coarse Movement*





# Thank you!

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