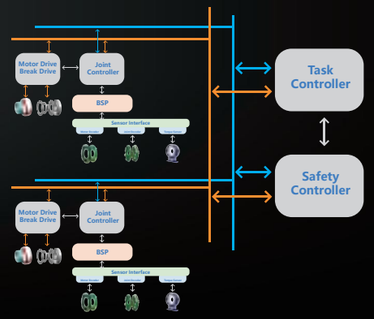
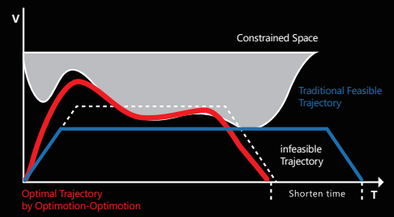
## Extreme Safety

Suction band-type brakes, independently certified safety controllers, more than 21 TÜV functional safety features, and ultrasensitive collision detection by torque sensors, comprehensively ensure a safer human-machine collaboration.



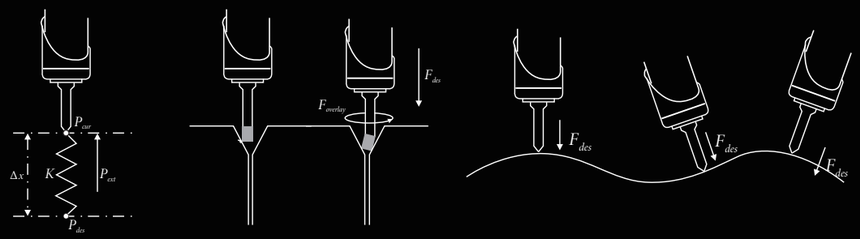

## Superior Performance

Cutting-edge motion control technologies for industrial robots to deliver first-class path accuracy, combined with customized motor drive control systems, create a powerful performance.




## Compliant Flexibility

By adopting force-position hybrid control technology, highly dynamic force control is integrated into robot joints, which provides compliance control close to human hands,
while the force control process kit helps greatly enhance force control task efficiency with no additional extensions required.




## Ease of Use

Fast installation and flexible deployment, direct teaching control, and graphical programming enable greater ease of use. Applicable to a variety of application scenarios by supporting most extensions in the industrial ecosystem.

## Excellent Reliability

IP67 protection, 100+ design verification experiments, and 20+ factory tests, build them into an ideal choice for industrial applications.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A Powerful Yet Flexible All-Rounder

ROKAE

# CR Series

## Flexible Collaborative Robots

**A Powerful Yet Flexible All-Rounder**


xMate

# CR Series

## Flexible Collaborative Robots

**xMate CR** series flexible collaborative robots are built on the force-position hybrid control framework and xCore,a new self-developed high-performance control system for industrial robots.Designed for industrial applications,the robots deliver improved motion performance,force control,safety,ease of use,and reliability.Robot body with IP67 protection rating can adapt to more stringent application scenarios.The independent control cabinet provides richer IO resources and more flexible extensibility.Its built-in independent safety controller,TÜV certified,functional safety meets ISO13849-1:2015 standard,up to PL d/Cat.3 level.

The newly upgraded xMate CR series of flexible cobots further broadens the application scenarios with the characteristics of safer,more flexible and easier to use.The payload capacity has increased to 45kg,with an operating range of up to 2,246 mm.This significantly expands the application scenarios for collaborative robots,allowing them to cover a wide range of industry-specific applications.It comprehensively assists enterprises in enhancing production efficiency and rapidly achieving flexible manufacturing.

## Applications

xMate CR series flexible collaborative robots can undertake a variety of tasks, including

- Compliant assembly
- Screw locking
- Deburring and grinding
- Handling
- Loading and unloading
- Material removal
- Packaging and palletizing
- Welding
- Heavy workpiece handling and palletizing
- New energy assembly
- Flexible machining of large-size parts

Driving improved productivity and flexible automation for companies of all sizes.


Model **CR20-17/2.0-5**
Payload **17 kg**
Reach **2,047 mm**

Model **CR20-25/1.8-5**
Payload **25 kg**
Reach **1,798 mm**

Model **CR20-20/1.8**
Payload **20 kg**
Reach **1,798 mm**

Model **CR18-18/1.0**
Payload **18 kg**
Reach **1,062 mm**

Model **CR7-7/0.98**
Payload **7 kg**
Reach **988 mm**

Model **CR12-12/1.4**
Payload **12 kg**
Reach **1,434 mm**

Model **CR12-20/1.4**
Payload **20 kg**
Reach **1,434 mm**

Model **CR35-45/1.9**
Payload **45 kg**
Reach **1,947 mm**

Model **CR35-35/2.2**
Payload **35 kg**
Reach **2,246 mn**

## Specifications

| | CR7-7/0.98 | CR12-12/1.4 | CR12-20/1.4 | CR18-18/1.0 | CR20-20/1.8 | CR20-25/1.8-5 | CR20-17/2.0-5 | CR35-35/2.2 | CR35-45/1.9 |
|---|---|---|---|---|---|---|---|---|---|
| Payload | 7 kg | 12 kg | 20 kg | 18 kg | 20 kg | 25 kg | 17 kg | 35 kg | 45 kg |
| Reach | 988 mm | 1,434 mm | 1,434 mm | 1,062 mm | 1,798 mm | 1,798 mm | 2,047 mm | 2,246 mm | 1,947 mm |
| Weight | About 25 kg | About 41 kg | About 41 kg | About 38 kg | About 71 kg | About 69 kg | About 71 kg | About 165 kg | About 161 kg |
| Degrees of freedom | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 6 | 6 |
| MTBF | > 80,000 h* | > 80,000 h* | > 80,000 h* | > 80,000 h* | > 80,000 h* | > 80,000 h* | > 80,000 h* | —— | —— |
| Power supply | 48VDC | 48VDC | 48VDC | 48VDC | 48VDC | 48VDC | 48VDC | —— | —— |
| Programming | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Direct teaching control and graphical interface | Graphical interface | Graphical interface |

## Performance

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Typical Power | 300 w | | 500 w | | 500 w | | 600 w | | 1,000 w | | 900 w | | 600 w | | —— | —— |
| Safety | Over 21 adjustable safety features including collision detection, virtual walls, and collaboration mode (Optional for models 35kg and above) | | | | | | | | | | | | | | | |
| Certification | EN ISO 13849-1, EN ISO 10218-1/ PL d, Cat. 3; ISO 15066, and EU CE marking requirements,KCs marking requirements,EAC marking requirements | | | | | | | | | | | | | | | |
| Force sensing (tool flange) | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | Force，x-y-z | Torque，x-y-z | —— | —— |
| Torque sensor resolution | 0.1N | 0.02Nm | 0.1N | 0.02Nm | 0.1N | 0.02Nm | 0.1N | 0.02Nm | 0.1N | 0.02Nm | 0.1N | 0.02Nm | 0.1N | 0.02Nm | —— | —— |
| Adjustable range of Cartesian stiffness | 0~6000N/m，0~1000Nm/rad | | 0~18000N/m，0~2500Nm/rad | | 0~18000N/m，0~2500Nm/rad | | 0~18000N/m，0~2500Nm/rad | | 0~18000N/m，0~2500Nm/rad | | 0~18000N/m，0~2500Nm/rad | | 0~18000N/m，0~2500Nm/rad | | —— | —— |

## Motion

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Repeatability | ±0.02 mm | | ±0.03 mm | | ±0.05 mm | | ±0.03 mm | | ±0.05 mm | | ±0.05 mm | | ±0.05 mm | | ±0.05 mm | | ±0.05 mm | |
| Motion joint | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed | Working range | Maximum speed |
| Axis 1 | ±360° | 180°/s | ±360° | 120°/s | ±360° | 90°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 163°/s | ±360° | 163°/s |
| Axis 2 | ±360° | 180°/s | ±360° | 120°/s | ±360° | 90°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 120°/s | ±360° | 163°/s | ±170° | 163°/s |
| Axis 3 | ±360° | 234°/s | ±360° | 180°/s | ±360° | 112°/s | ±165° | 180°/s | ±170° | 120°/s | ±170° | 120°/s | ±165° | 120°/s | ±168° | 135°/s | ±168° | 135°/s |
| Axis 4 | ±360° | 240°/s | ±360° | 234°/s | ±360° | 146°/s | ±360° | 180°/s | ±360° | 180°/s | ±360° | 234°/s | ±360° | 234°/s | ±360° | 155°/s | ±360° | 155°/s |
| Axis 5 | ±360° | 240°/s | ±360° | 240°/s | ±360° | 200°/s | ±360° | 180°/s | ±360° | 234°/s | ±360° | 234°/s | ±360° | 234°/s | ±360° | 199°/s | ±360° | 199°/s |
| Axis 6 | ±360° | 240°/s | ±360° | 240°/s | ±360° | 200°/s | ±360° | 180°/s | ±360° | 234°/s | —— | | —— | | ±360° | 228°/s | ±360° | 228°/s |
| Maximum speed at tool end | ≤3.2m/s | | ≤3.0m/s | | ≤3.0m/s | | ≤3.0m/s | | ≤3.5m/s | | ≤3.5m/s | | ≤4.0m/s | | ≤6.0m/s | | ≤6.0m/s | |

## Physical properties

| | | |
|---|---|---|
| IP rating | IP67 | IP67 |
| ISO cleanroom class | 5 | 5 |
| Noise | ≤ 70 dB(A) | ≤ 85 dB(A) |
| Operating ambient temperature | 0℃~50℃ | 0℃~40℃ |
| Humidity | ≤ 93% RH (non-condensing) | ≤ 93% RH (non-condensing) |
| Robot installation | At any angle | At any angle |
| Tool I/O ports | 2 Digital outputs, 2 Digital inputs, 2 Analog inputs | 2 Digital outputs, 2 Digital inputs, 2 Analog inputs |
| Tool communication interface | RS485(Alternative with two analog input pins, can not be used simultaneously) | RS485(Alternative with two analog input pins, can not be used simultaneously) |
| Tool I/O power supply | 12V/24V 1A (rated) | 12V/24V 1A (rated) |

Considering the upgrade of the product, the actual parameters of the product shall be subject to the corresponding hardware installation manual
*Note: If you have any questions about the status of product certification, please contact the manufacturer. Please refer to the corresponding product manual for more details

## Controller

| Name | xMate Control Cab (MCC ) | xMate Control Cab Mix(MCCM) |
|---|---|---|
| Applicable models | CR Series models below 35kg | CR Series models 35kg and above |
| IP rating | IP54 | IP54 |
| Operating ambient temperature | 0℃~50℃ | 0℃~50℃ |
| Humidity | ≤93% RH (Non-condensing) | ≤93% RH (Non-condensing) |
| Input power | Single-phase 90V ~ 264VAC, 47-63Hz，Single-phase 180V ~ 264VAC, 47-63Hz (CR20 Series) | 110V~260V AC，50~60Hz |
| Dimensions | 450 mm x 250 mm x 350 mm | 480 mm×325 mm×360 mm |
| Weight* | About 15 kg | About 15 kg |
| User IO | 16 inputs and 16 outputs (standard) | 16 inputs and 16 outputs (standard) |
| Communication | 5 safety inputs, 4 safety outputs (all dual-redundant channels) | 5 safety inputs, 4 safety outputs (all dual-redundant channels) |
| Power output | RS232*1; Gigabit Ethernet RJ45*1;USB3.0*2; HDMI*1; EtherCAT*1 | RS232*1; Gigabit Ethernet RJ45*1;USB3.0*2; HDMI*1; EtherCAT*1 |
| Optional extension | General Digital I/O module; Analog I/O module; Incremental encoder signal acquisition module, etc. | General Digital I/O module; Analog I/O module; Incremental encoder signal acquisition module, etc. |

## Teach Pendant

| Name | xPad2 |
|---|---|
| Dimensions | 290 mm×170 mm×80 mm |
| Weight | About 840g ( excluding cable ) |
| Cable length | 5 m/7 m/15 m/22 m |
| Display | 10.1-in LCD with a resolution of 1,920×1,200 |
| IP rating | IP54 |

*Note: There will be some differences in the weight of the control cabinet in different configurations.