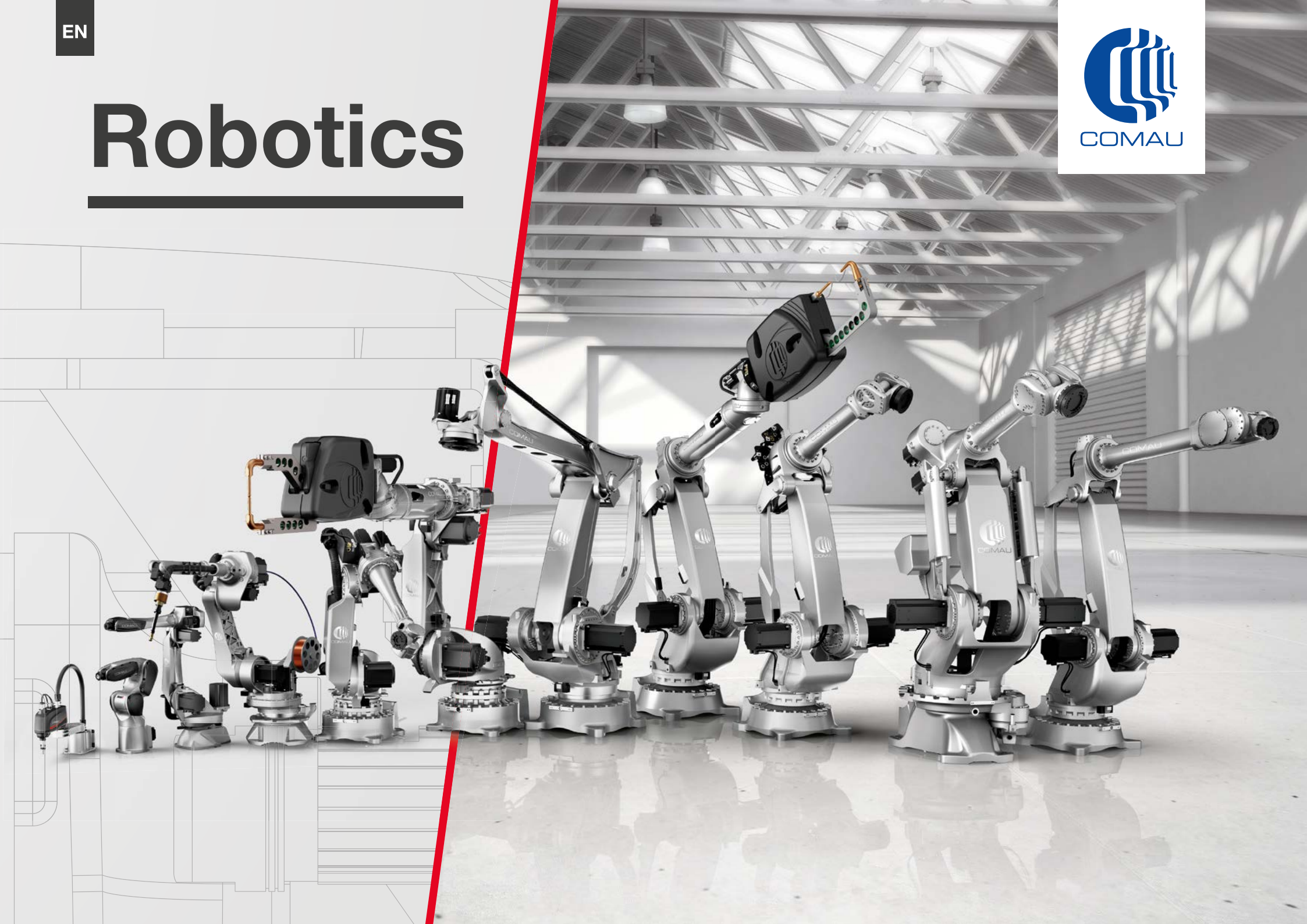
EN

Robotics



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Our Robot Family

The Culture of Automation

Designing advanced automation solutions means thinking about the industry in a new way, developing new scenarios, designing innovative products and creating ways to streamline production processes. It requires more than technical competence; it requires a team of professionals whose vision is rooted in a culture of excellence. It also requires a combination of talent, passion and experience that unite to define new trends in automation.

Here at Comau, our passion for our work reflects who we are.

Meet the Comau robot team

All our robots are characterized by high performance in terms of speed, repeatability, accuracy and flexibility.

Product range extends from small payload robots to the massive capacity of 650 kg.

Each robot model is designed with a reduced footprint, large work envelope, highly precise movements and positioning, great reliability and low maintenance costs.

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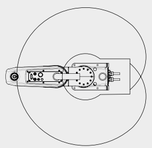
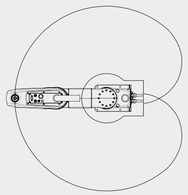
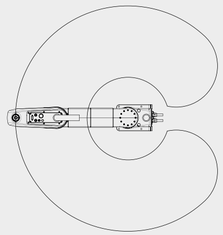
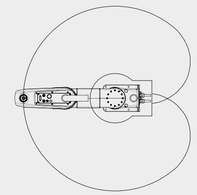
REBEL-S SCARA FAMILY

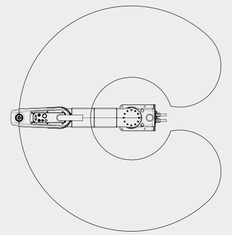
MODEL	Rebel-S6-0.45	Rebel-S6-0.60	Rebel-S6-0.75	Rebel-S6-0.60c	Rebel-S6-0.75c
AXES	4	4	4	4	4
LOAD (kg)	6	6	6	6	6
REPEATABILITY (mm)	0.02	0.02	0.03	0.02	0.03
REACH (mm)	450	600	750	600	750
WEIGHT (kg)	20	20	20	20	20
MOUNTING POSITION	Floor / Wall	Floor / Wall	Floor / Wall	Ceiling / Wall	Ceiling / Wall
PROTECTION CLASS	IP10 (IP54 Option)	IP10 (IP54 Option)	IP10 (IP54 Option)	IP10 (IP54 Option)	IP10 (IP54 Option)











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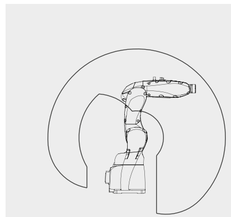
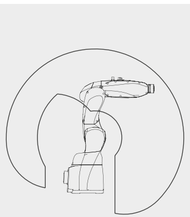
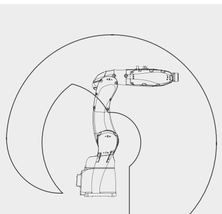
Comau Robotics Product Range

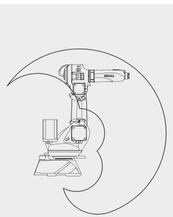
RACER ROBOT FAMILY

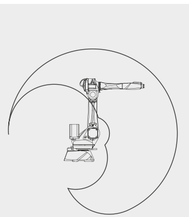
MODEL	Racer3	Racer 5	Racer5-0.80	Racer7-1.0	Racer7-1.4
AXES	6	6	6	6	6
LOAD (kg)	3	5*	5*	7	7
REPEATABILITY (mm)	0.02	0.03	0.03	0.02	0.03
REACH (mm)	630	630	809	999	1436
WEIGHT (kg)	30	32	32	173	180
MOUNTING POSITION	Floor / Ceiling / Wall	Floor / Ceiling / Wall**	Floor / Ceiling / Wall**	Floor / Ceiling / Sloping / Wall	Floor / Ceiling / Sloping (Max 45°)
PROTECTION CLASS	IP54	IP54 (IP65 Option)	IP54 (IP65 Option)	IP65	IP65











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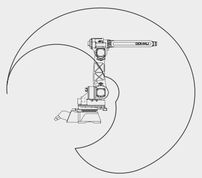
*For Pick&Place 6 kg with a limited stroke of the 5th axis

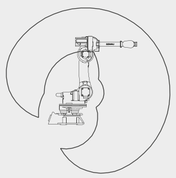
** Allawable with payload limitations

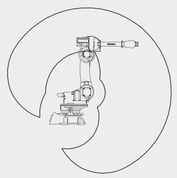
Comau Robotics Product Range

STANDARD ROBOTS

MODEL	SIX	NS 12 - 1.85	NS 16 - 1.65
AXES	6	6	6
LOAD (kg)	6	12	16
REPEATABILITY (mm)	0.05	0.05	0.05
REACH (mm)	1400	1850	1650
WEIGHT (kg)	160	335	335
MOUNTING POSITION	Floor / Ceiling / Sloping (max 45°)	Floor / Ceiling / Sloping (max 45°)	Floor / Ceiling / Sloping (max 45°)
PROTECTION CLASS	IP65	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version







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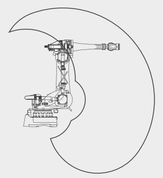
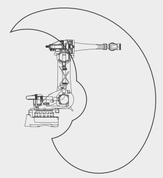
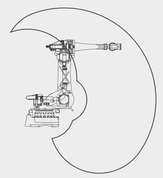
MODEL	NJ 16 - 3.1	NJ 40 - 2.5	NJ 60 - 2.2
AXES	6	6	6
LOAD (kg)	16	40	60
REPEATABILITY (mm)	0.10	0.06	0.06
REACH (mm)	3108	2503	2258
WEIGHT (kg)	680	655	645
MOUNTING POSITION	Floor / Ceiling / Sloping (max 45°)	Floor / Ceiling / Sloping (max 45°)	Floor / Ceiling / Sloping (max 45°)
PROTECTION CLASS	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version

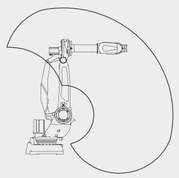


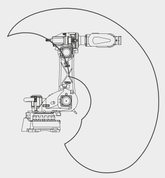


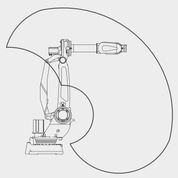


STANDARD ROBOTS

MODEL	NJ 110 - 3.0	NJ 130 - 2.0	NJ 130 - 2.6
AXES	6	6	6
LOAD (kg)	110	130	130
REPEATABILITY (mm)	0.07	0.07	0.07
REACH (mm)	2980	2050	2616
WEIGHT (kg)	1070	740	1050
MOUNTING POSITION	Floor / Ceiling	Floor / Ceiling	Floor / Ceiling
PROTECTION CLASS	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version







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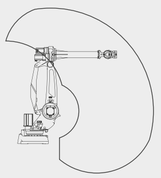
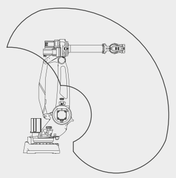
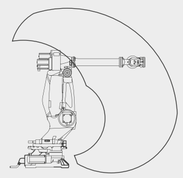
MODEL	NJ 165 - 3.0	NJ 220 - 2.7	NJ 290 - 3.0
AXES	6	6	6
LOAD (kg)	165	220	290
REPEATABILITY (mm)	0.09	0.08	0.15
REACH (mm)	3000	2701	2997
WEIGHT (kg)	1240	1220	2150
MOUNTING POSITION	Floor / Ceiling	Floor / Ceiling	Floor
PROTECTION CLASS	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version

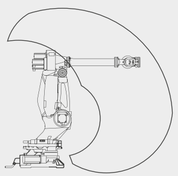


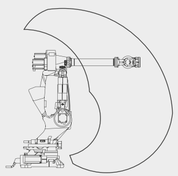


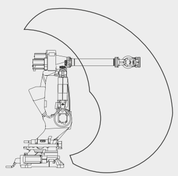


STANDARD ROBOTS

MODEL	NJ 370 - 2.7	NJ 370 - 3.0	NJ 420 - 3.0
AXES	6	6	6
LOAD (kg)	370	370	420
REPEATABILITY (mm)	0.15	0.15	0.15
REACH (mm)	2703	2997	2997
WEIGHT (kg)	2100	2450	2450
MOUNTING POSITION	Floor	Floor	Floor
PROTECTION CLASS	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version







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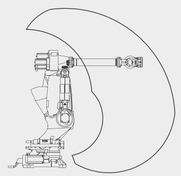
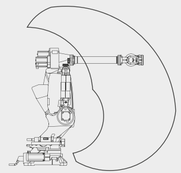
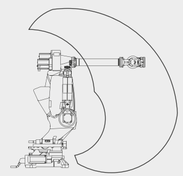
MODEL	NJ 450 - 2.7	NJ 500 - 2.7	NJ 650 - 2.7
AXES	6	6	6
LOAD (kg)	450	500	650
REPEATABILITY (mm)	0.15	0.15	0.15
REACH (mm)	2703	2703	2703
WEIGHT (kg)	2400	2400	2450
MOUNTING POSITION	Floor	Floor	Floor
PROTECTION CLASS	IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version	IP44 / IP65 Wrist

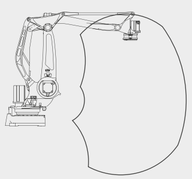


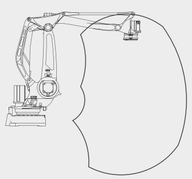


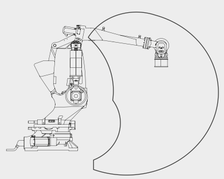


SPECIAL ROBOTS

MODEL	PAL 180 - 3.1	PAL 260 - 3.1	PAL 470 - 3.1
AXES	4	4	5
LOAD (kg)	180	260	470
REPEATABILITY (mm)	0.10	0.10	0.15
REACH (mm)	3100	3100	3100
WEIGHT (kg)	1250	1250	2250
MOUNTING POSITION	Floor	Floor	Floor
PROTECTION CLASS	IP65	IP65	IP65







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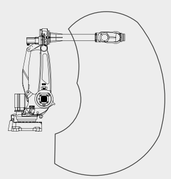
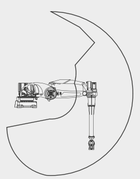
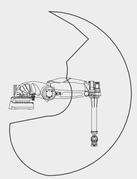
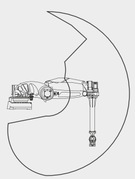
MODEL	NJ 100 - 3.2 PRESS	NJ 130 - 3.7 SH PRESS	NJ 165 - 3.4 SH	NJ 210 - 3.1 SH
AXES	6	6	6	6
LOAD (kg)	100	130	165	210
REPEATABILITY (mm)	0.17	0.20	0.10	0.10
REACH (mm)	3209	3700	3450	3188
WEIGHT (kg)	1250	1515	1430	1470
MOUNTING POSITION	Floor	Shelf	Shelf	Shelf
PROTECTION CLASS	IP44 / IP65 Wrist	IP44 / IP65 Wrist	IP65 / IP67 Foundry Version	IP65



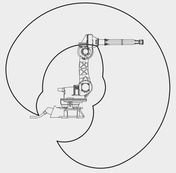


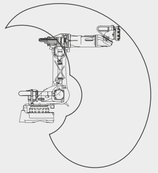


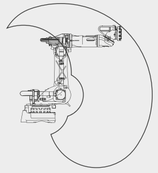


HOLLOW WRIST

MODEL	Arc 4	NJ4 90 - 2.2	NJ4 110 - 2.2
AXES	6	6	6
LOAD (kg)	5	90	110
REPEATABILITY (mm)	0.05	0.07	0.07
REACH (mm)	1951	2210	2210
WEIGHT (kg)	375	685	685
MOUNTING POSITION	Floor / Ceiling / Sloping (max 45°)	Floor / Ceiling	Floor / Ceiling
PROTECTION CLASS	IP65	IP65	IP65







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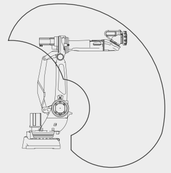
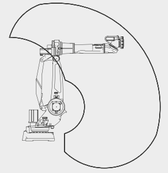
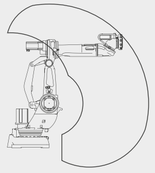
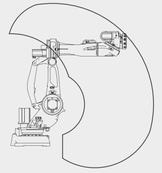
MODEL	NJ4 170 - 2.5	NJ4 170 - 2.9	NJ4 175 - 2.2	NJ4 220 - 2.4
AXES	6	6	6	6
LOAD (kg)	170	170	175	220
REPEATABILITY (mm)	0.10	0.10	0.10	0.15
REACH (mm)	2500	2918	2204	2417
WEIGHT (kg)	1100	1240	1080	1260
MOUNTING POSITION	Floor / Ceiling	Floor / Ceiling	Floor / Ceiling	Floor / Ceiling
PROTECTION CLASS	IP65	IP65	IP65	IP65



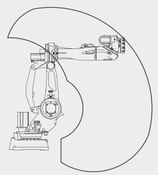


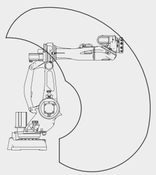


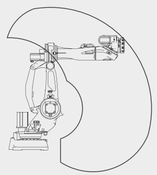


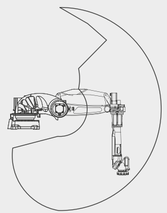
HOLLOW WRIST

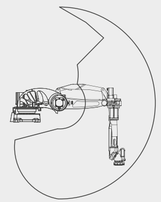
MODEL	NJ4 220 - 2.7	NJ4 220 - 3.0	NJ4 270 - 2.7	NJ4 165 - 3.4 SH	NJ4 210 - 3.1 SH
AXES	6	6	6	6	6
LOAD (kg)	220	220	270	165	210
REPEATABILITY (mm)	0.15	0.15	0.15	0.10	0.10
REACH (mm)	2738	3002	2703	3450	3151
WEIGHT (kg)	1290	2005	1975	1430	1415
MOUNTING POSITION	Floor / Ceiling	Floor	Floor	Shelf	Shelf
PROTECTION CLASS	IP65	IP65	IP65	IP65	IP65











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Rebel S

Innovative Modular & Scalable SCARA

Rebel-S6-0.45
Rebel-S6-0.60
Rebel-S6-0.75

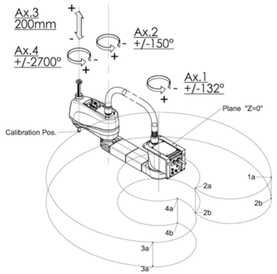
TECHNICAL SPECIFICATIONS

Model		Rebel-S6-0.45	Rebel-S6-0.60	Rebel-S6-0.75
Robot type		SCARA	SCARA	SCARA
Payload		6 kg	6 kg	6 kg
Horizontal reach (radius)		450 mm	600 mm	750 mm
Vertical reach (Z-stroke)		200 mm	200 mm	200 mm
Repeatability (X-Y)		0.02 mm	0.02 mm	0.03 mm
Mounting position		Floor / Wall	Floor / Wall	Floor / Wall
Internal user wiring / piping	Electrical	25 pin-to-pin	25 pin-to-pin	25 pin-to-pin
	Pneumatical	1 x 4 mm & 2 x 6 mm	1 x 4 mm & 2 x 6 mm	1 x 4 mm & 2 x 6 mm
Available protection classes	IP class	IP10 (IP54 Option)	IP10 (IP54 Option)	IP10 (IP54 Option)
	ISO class	ISO	ISO	ISO
Outer diameter of ball-screw-spline		20 mm	20 mm	20 mm
Inner diameter of ball-screw-spline		14 mm	14 mm	14 mm
Z axis down force (long-time)		160 N	160 N	160 N
Robot Weight		20 Kg	20 Kg	20 Kg
Environmental conditions	Temperature	+5° - +45° C	+5° - +45° C	+5° - +45° C
	Relative humidity	5 - 95%*	5 - 95%*	5 - 95%*
Applicable controller		R1C-4	R1C-4	R1C-4

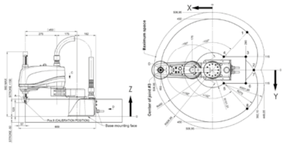
*without condensation

Suggested applications

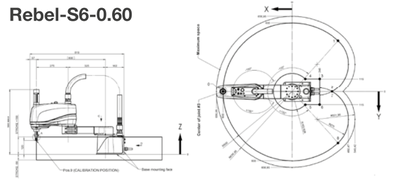
- Assembly
- Handling
- Machine Tending



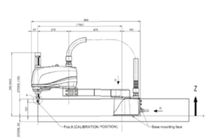
Rebel-S6-0.45

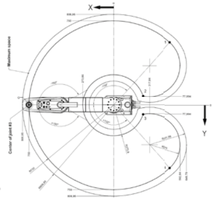


Rebel-S6-0.60



Rebel-S6-0.75





Rebel S

Innovative Modular & Scalable SCARA

Rebel-S6-0.60c
Rebel-S6-0.75c

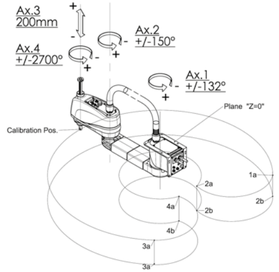
TECHNICAL SPECIFICATIONS

Model		Rebel-S6-0.60c	Rebel-S6-0.75c
Robot type		SCARA	SCARA
Payload		6 kg	6 kg
Horizontal reach (radius)		600 mm	750 mm
Vertical reach (Z-stroke)		200 mm	200 mm
Repeatability (X-Y)		0.02 mm	0.03 mm
Mounting position		Ceiling / Wall	Ceiling / Wall
Internal user wiring / piping	Electrical	25 pin-to-pin	25 pin-to-pin
	Pneumatical	1 x 4 mm & 2 x 6 mm	1 x 4 mm & 2 x 6 mm
Available protection classes	IP class	IP10 (IP54 Option)	IP10 (IP54 Option)
	ISO class	ISO	ISO
Outer diameter of ball-screw-spline		20 mm	20 mm
Inner diameter of ball-screw-spline		14 mm	14 mm
Z axis down force (long-time)		160 N	160 N
Robot Weight		20 Kg	20 Kg
Environmental conditions	Temperature	+5° - +45° C	+5° - +45° C
	Relative humidity	5 - 95%*	5 - 95%*
Applicable controller		R1C-4	R1C-4

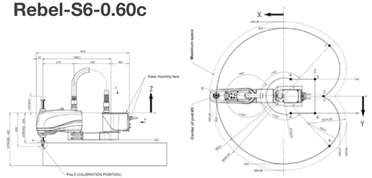
*without condensation

Suggested applications

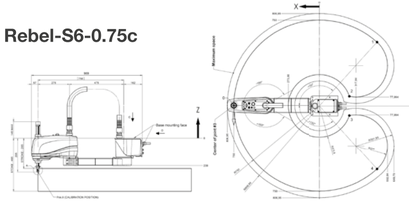
- Assembly
- Handling
- Machine Tending



Rebel-S6-0.60c



Rebel-S6-0.75c



TECHNICAL SPECIFICATIONS

Model		Racer3	Racer5-0.63	Racer5-0.80
Number of axes		6	6	6
Maximum wrist payload		3 kg	5 kg*	5 kg
Additional load on forearm		2 kg	-	-
Maximum horizontal reach		630 mm	630 mm	809 mm
Torque on axis 4		7.36 Nm	8,83 Nm	8,83 Nm
Torque on axis 5		7.36 Nm	8,83 Nm	8,83 Nm
Torque on axis 6		4.41 Nm	4.91 Nm	4.91 Nm
Stroke (Speed)	Axis 1	+/- 170° (430 °/s)	+/- 170° (400°/s)	+/- 170° (360°/s)
	Axis 2	-95°/ +135° (450 °/s)	-95°/ +135° (360°/s)	-95°/ +135° (300°/s)
	Axis 3	-155° / +90° (500 °/s)	-155° / +90° (400°/s)	-155° / +90° (330°/s)
	Axis 4	+/- 200° (600 °/s)	+/- 200° (500°/s)	+/- 210° (500°/s)
	Axis 5	+/- 125° (600 °/s)	+/- 125° (500°/s)	+/- 125° (500°/s)
	Axis 6	+/- 2700° (900 °/s)	+/- 2700° (800°/s)	+/- 2700° (800°/s)
Repeatability		0.02 mm	0.03 mm	0.03 mm
Tool coupling flange		ISO 9409 - 1 - A 40	ISO 9409 - 1 - A 25	ISO 9409 - 1 - A 25
Robot weight		30 kg	30 kg	32 kg
Protection class		IP54	IP54 (IP65 Option)	IP54 (IP65 Option)
Mounting position		Floor / Ceiling / Wall	Floor / Ceiling / Wall**	Floor / Ceiling / Wall**
Operating Areas	A	1081 mm	945 mm	1124 mm
	B	630 mm	630 mm	809 mm
	C	37 mm	37 mm	8 mm
	D	530 mm	530 mm	708 mm
	E	136 mm	136 mm	286 mm

*For Pick&Place 6 kg with a limited stroke of the 5th axis

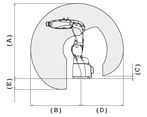
** Allawable with payload limitations

Suggested applications

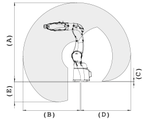
- Assembly
- Cosmetic Sealing
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Polishing / Deburring

Racer3

Racer5-0.63



Racer5-0.80



Racer

Precision and speed meet beauty and passion

Racer7-1.0
Racer7-1.4

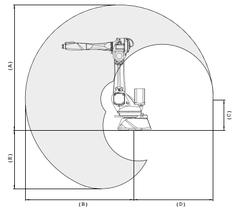
Model		Racer7-1.0	Racer7-1.4
Number of axes		6	6
Maximum wrist payload		7 kg*	7 kg
Additional load on forearm		10 kg	10 kg
Maximum horizontal reach		999 mm	1436 mm
Torque on axis 4		13 Nm	13 Nm
Torque on axis 5		13 Nm	13 Nm
Torque on axis 6		7.5 Nm	7.5 Nm
Stroke (Speed)	Axis 1	+/- 165° (250°/s)	+/- 165° (220°/s)
	Axis 2	-65° / +150° (250°/s)	-85° / +155° (250°/s)
	Axis 3	-37° / -165° (300°/s)	0° / -168° (300°/s)
	Axis 4	+/- 210° (550°/s)	+/- 210° (600°/s)
	Axis 5	+/- 137° (550°/s)	+/- 135° (600°/s)
	Axis 6	+/- 2700° (600°/s)	+/- 2700° (650°/s)
Repeatability		0.02 mm	0.03 mm
Tool coupling flange		ISO 9409 - 1 - A 40	ISO 9409 - 1 - A 40
Robot weight		173 kg	180 kg
Protection class		IP65	IP65
Mounting position		Floor / Ceiling / Sloping / Wall	Floor / Ceiling / Sloping (45° max)
Operating Areas	A	1279 mm	1716 mm
	B	999 mm	1436 mm
	C	904 mm	412 mm
	D	554 mm	1130 mm
	E	385 mm	801 mm

*For Pick&Place 10 kg with a limited stroke of the 5th axis

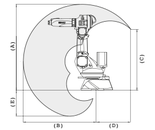
Suggested applications

- Assembly
- Cosmetic Sealing
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Polishing / Deburring

Racer7-1.4



Racer7-1.0



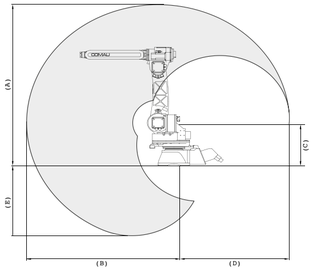
SIX

Precision and reliability

Model		SIX 6 - 1.4	
Number of axes		6	
Maximum wrist payload		6 kg	
Additional load on forearm		10 kg	
Maximum horizontal reach		1400 mm	
Torque on axis 4		11.7 Nm	
Torque on axis 5		11.7 Nm	
Torque on axis 6		5.8 Nm	
Stroke (Speed)	Axis 1	+/- 170°	(140°/s)
	Axis 2	+155° / -85°	(160°/s)
	Axis 3	0° / -170°	(170°/s)
	Axis 4	+/- 210°	(450°/s)
	Axis 5	+/- 130°	(375°/s)
	Axis 6	+/- 2700°	(550°/s)
Repeatability		0.05 mm	
Tool coupling flange		ISO 9409 - 1 - 40 - 4 - M6	
Robot weight		160 kg	
Protection class		IP65	
Mounting position		Floor / Ceiling / Sloping (45° max)	
Operating Areas	A	1700 mm	
	B	1400 mm	
	C	428 mm	
	D	1095 mm	
	E	745 mm	

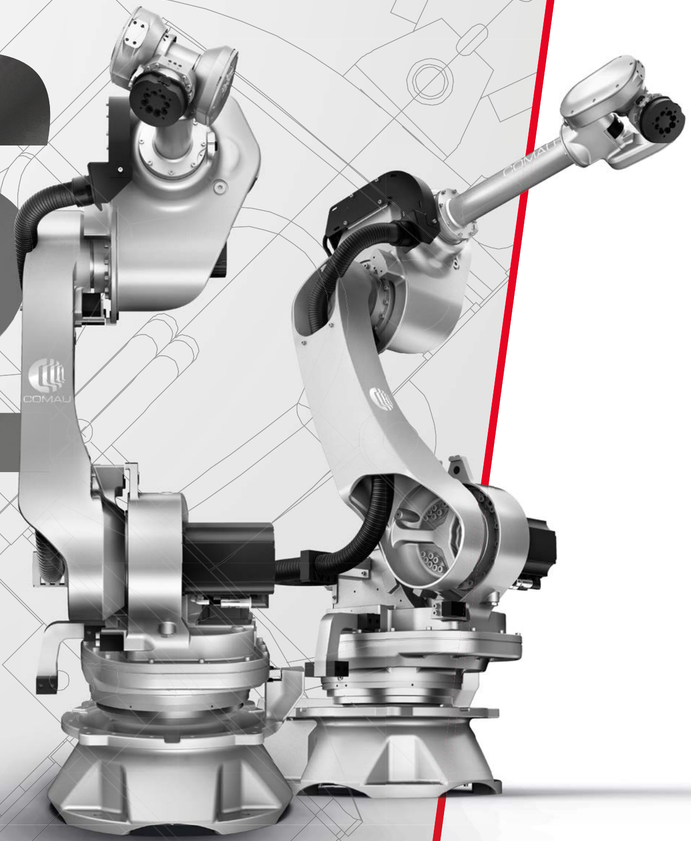
Suggested applications

- Arc Welding
- Assembly
- Cosmetic Sealing
- Dispensing
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Polishing / Deburring



NS

Robust and versatile small payload robots

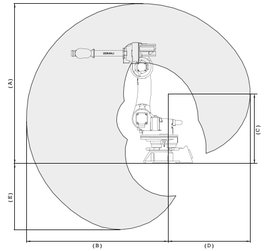


NS 12 - 1.85
NS 16 - 1.65

Model		NS 12 - 1.85		NS 16 - 1.65	
Number of axes		6		6	
Maximum wrist payload		12 kg		16 kg	
Additional load on forearm		10 kg		10 kg	
Maximum horizontal reach		1850 mm		1650 mm	
Torque on axis 4		39 Nm		41 Nm	
Torque on axis 5		39 Nm		41 Nm	
Torque on axis 6		20 Nm		23 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(155°/s)	+/- 180°	(155°/s)
	Axis 2	-60° / +155°	(155°/s)	-60° / +155°	(155°/s)
	Axis 3	-170° / + 110°	(170°/s)	-170° / +110°	(170°/s)
	Axis 4	+/- 2700°	(360°/s)	+/- 2700°	(360°/s)
	Axis 5	+/- 120°	(350°/s)	+/- 120°	(350°/s)
	Axis 6	+/- 2700°	(550°/s)	+/- 2700°	(550°/s)
Repeatability		0.05 mm		0.05 mm	
Tool coupling flange		ISO 9409 - 1 - A63		ISO 9409 - 1 - A63	
Robot weight		335 kg		335 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Floor / Ceiling / Sloping (45° max)		Floor / Ceiling / Sloping (45° max)	
Operating Areas	A	2150 mm		1951 mm	
	B	1850 mm		1651 mm	
	C	950 mm		950 mm	
	D	1157 mm		957 mm	
	E	885 mm		685 mm	

Suggested applications

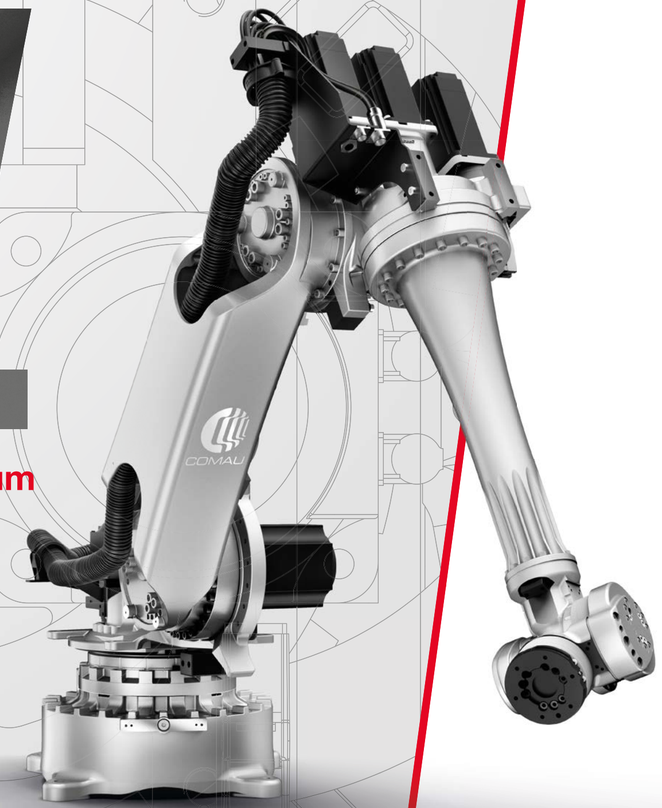
- Arc Welding
- Assembly
- Cosmetic Sealing
- Dispensing
- Foundry
- Handling / Packaging
- Laser Welding / Cutting
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Process Machining
- Wood / Glass Machining



NJ

A perfect solution for medium payload applications

NJ 16 - 3.1
NJ 40 - 2.5
NJ 60 - 2.2

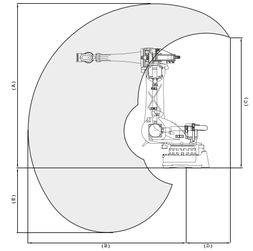


TECHNICAL SPECIFICATIONS

Model		NJ 16 - 3.1		NJ 40 - 2.5		NJ 60 - 2.2	
Number of axes		6		6		6	
Maximum wrist payload		16 kg		40 kg		60 kg	
Additional load on forearm		12 kg		35 kg		20 kg	
Maximum horizontal reach		3108 mm		2503 mm		2258 mm	
Torque on axis 4		43 Nm		167 Nm		221 Nm	
Torque on axis 5		43 Nm		167 Nm		221 Nm	
Torque on axis 6		23 Nm		98 Nm		118 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(170°/s)	+/- 180°	(170°/s)	+/- 180°	(170°/s)
	Axis 2	-60° / +125°	(150°/s)	-60° / +125°	(150°/s)	-60° / +125°	(150°/s)
	Axis 3	0° / -170°	(165°/s)	0° / -165°	(165°/s)	0° / -165°	(165°/s)
	Axis 4	+/- 2700°	(265°/s)	+/- 2700°	(265°/s)	+/- 2700°	(265°/s)
	Axis 5	+/- 120°	(250°/s)	+/- 123°	(250°/s)	+/- 123°	(250°/s)
	Axis 6	+/- 2700°	(340°/s)	+/- 2700°	(340°/s)	+/- 2700°	(340°/s)
Repeatability		0.10 mm		0.06 mm		0.06 mm	
Tool coupling flange		ISO 9409 - 1 - A63		ISO 9409 - 1 - A100		ISO 9409 - 1 - A100	
Robot weight		680 kg		655 kg		645 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Floor / Ceiling / Sloping (max 45°)		Floor / Ceiling / Sloping (max 45°)		Floor / Ceiling / Sloping (max 45°)	
Operating Areas	A	3258 mm		2653 mm		2408 mm	
	B	3108 mm		2503 mm		2258 mm	
	C	2576 mm		2165 mm		1918 mm	
	D	1088 mm		720 mm		686 mm	
	E	1625 mm		1187 mm		941 mm	

Suggested applications

- Arc Welding
- Assembly
- Cosmetic Sealing
- Dispensing
- Handling / Packaging
- Laser Welding / Cutting
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Press to Press
- Process Machining
- Wood / Glass Machining



NJ

A light kinematic structure for better performance

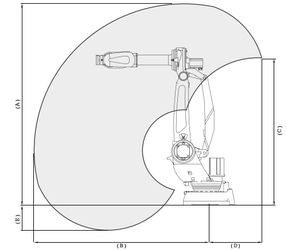
NJ 110 - 3.0
NJ 130 - 2.0
NJ 130 - 2.6

TECHNICAL SPECIFICATIONS

Model		NJ 110 - 3.0		NJ 130 - 2.0		NJ 130 - 2.6	
Number of axes		6		6		6	
Maximum wrist payload		110 kg		130 kg		130 kg	
Additional load on forearm		50 kg		50 kg		50 kg	
Maximum horizontal reach		2980 mm		2050 mm		2616 mm	
Torque on axis 4		638 Nm		638 Nm		638 Nm	
Torque on axis 5		638 Nm		638 Nm		638 Nm	
Torque on axis 6		291 Nm		314 Nm		314 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(110°/s)	+/- 180°	(155°/s)	+/- 180°	(110°/s)
	Axis 2	+95° / -75°	(110°/s)	-60° / +125°	(105°/s)	-75° / +95°	(110°/s)
	Axis 3	-10° / -256°	(110°/s)	0° / -165°	(150°/s)	-10° / -256°	(110°/s)
	Axis 4	+/- 280°	(190°/s)	+/- 280°	(200°/s)	+/- 280°	(190°/s)
	Axis 5	+/- 120°	(190°/s)	+/- 120°	(190°/s)	+/- 120°	(190°/s)
	Axis 6	+/- 2700°	(230°/s)	+/- 2700°	(230°/s)	+/- 2700°	(230°/s)
Repeatability		0.07 mm		0.07 mm		0.07 mm	
Tool coupling flange		ISO 9409 - 1 - A 125		ISO 9409 - 1 - A 125		ISO 9409 - 1 - A 125	
Robot weight		1070 kg		740 kg		1050 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Floor / Ceiling		Floor / Ceiling / Sloping		Floor / Ceiling	
Operating Areas	A	3460 mm		2200 mm		3097 mm	
	B	2980 mm		2050 mm		2616 mm	
	C	2642 mm		1690 mm		2261 mm	
	D	757 mm		720 mm		824 mm	
	E	783 mm		733 mm		404 mm	

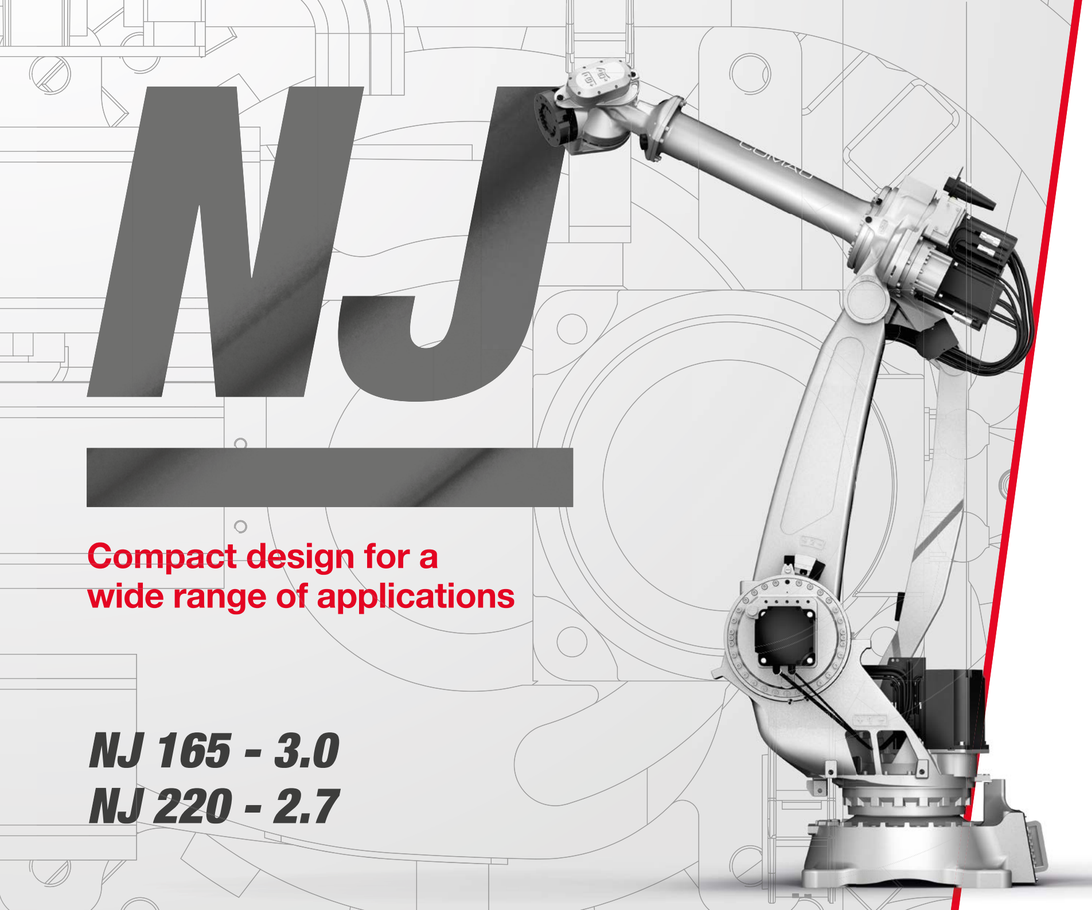
Suggested applications

- Assembly
- Cosmetic Sealing
- Dispensing
- Handling / Packaging
- Laser Welding Cutting
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Press to Press
- Process / Machining
- Spot Welding
- Wood / Glass Machining



NJ

Compact design for a wide range of applications

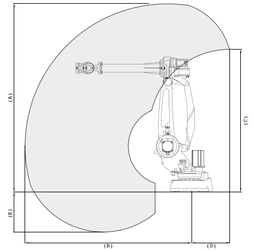


NJ 165 - 3.0
NJ 220 - 2.7

Model		NJ 165 - 3.0	NJ 220 - 2.7
Number of axes		6	6
Maximum wrist payload		165 kg	220 kg
Additional load on forearm		50 kg	50 kg
Maximum horizontal reach		3000 mm	2701 mm
Torque on axis 4		1230 Nm	1230 Nm
Torque on axis 5		1230 Nm	1230 Nm
Torque on axis 6		712 Nm	712 Nm
Stroke (Speed)	Axis 1	+/- 180° (100°/s)	+/- 180° (100°/s)
	Axis 2	-95° / +180° (90°/s)	-95° / +75° (90°/s)
	Axis 3	-10° / -256° (110°/s)	-10° / -256° (110°/s)
	Axis 4	+/- 2700° (130°/s)	+/- 2700° (130°/s)
	Axis 5	+/- 125° (130°/s)	+/- 125° (130°/s)
	Axis 6	+/- 2700° (195°/s)	+/- 2700° (195°/s)
Repeatability		0.09 mm	0.08 mm
Tool coupling flange		ISO 9409 - 1 - A 160	ISO 9409 - 1 - A 160
Robot weight		1240 kg	1220 kg
Protection class		IP65 / IP67 Foundry Version	IP65 / IP67 Foundry Version
Mounting position		Floor / Ceiling	Floor / Ceiling
Operating Areas	A	3430 mm	3131 mm
	B	3000 mm	2701 mm
	C	2600 mm	2286 mm
	D	730 mm	786 mm
	E	738 mm	425 mm

Suggested applications

- Assembly
- Cosmetic Sealing
- Dispensing
- Handling / Packaging
- Laser Welding Cutting
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Press to Press
- Process Machining
- Spot Welding
- Wood / Glass Machining



NJ

Robust mechanics and the best-in-class payload / reach ratio

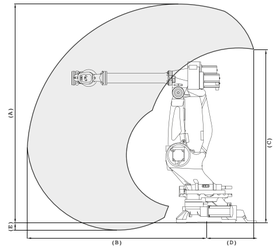
NJ 290 - 3.0
NJ 370 - 2.7
NJ 370 - 3.0

TECHNICAL SPECIFICATIONS

Model		NJ 290 - 3.0		NJ 370 - 2.7		NJ 370 - 3.0	
Number of axes		6		6		6	
Maximum wrist payload		290 kg		370 kg		370 kg	
Additional load on forearm		50 kg		50 kg		50 kg	
Maximum horizontal reach		2997 mm		2703 mm		2997 mm	
Torque on axis 4		1668 Nm		2109 Nm		2109 Nm	
Torque on axis 5		1668 Nm		2109 Nm		2109 Nm	
Torque on axis 6		1177 Nm		1177 Nm		1569 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(90°/s)	+/- 180°	(85°/s)	+/- 180°	(85°/s)
	Axis 2	+/- 75°	(90°/s)	+75° / - 60°	(85°/s)	+75° / - 60°	(85°/s)
	Axis 3	0° / -220°	(90°/s)	-10° / - 231°	(85°/s)	-10° / - 231°	(85°/s)
	Axis 4	+/- 2700°	(105°/s)	+/- 2700°	(90°/s)	+/- 2700°	(90°/s)
	Axis 5	+/- 125°	(105°/s)	+/- 125°	(90°/s)	+/- 125°	(90°/s)
	Axis 6	+/- 2700°	(160°/s)	+/- 2700°	(120°/s)	+/- 2700°	(120°/s)
Repeatability		0.15 mm		0.15 mm		0.15 mm	
Tool coupling flange		ISO 9409 - 1 - 200 - 6 - M12		ISO 9409 - 1 - 200 - 6 - M12		ISO 9409 - 1 - 200 - 6 - M12	
Robot weight		2150 kg		2100 kg		2450 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Floor		Floor		Floor	
Operating Areas	A	3680 mm		3680 mm		3680 mm	
	B	2997 mm		2997 mm		2997 mm	
	C	3195 mm		3195 mm		3195 mm	
	D	433 mm		433 mm		433 mm	
	E	-118 mm		-118 mm		-118 mm	

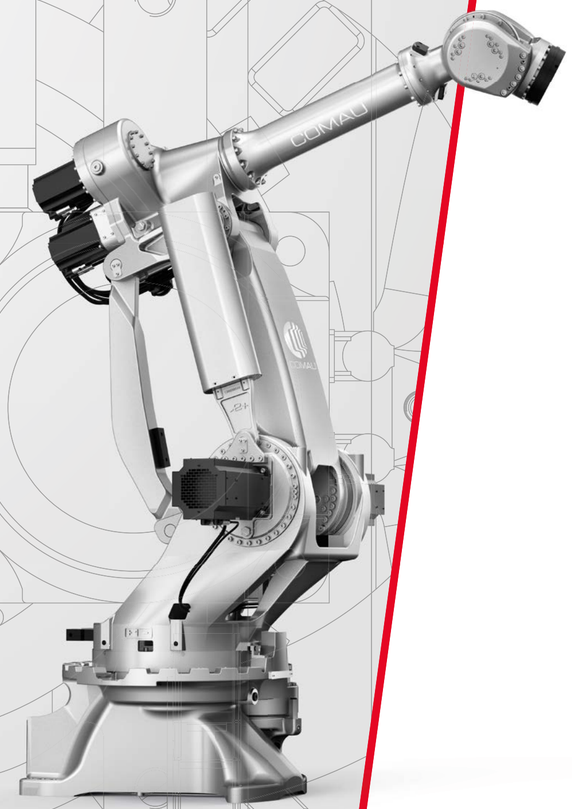
Suggested applications

- Assembly
- Foundry
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Process Machining
- Spot Welding
- Wood / Glass Machining



NJ

High payload models for the most demanding applications



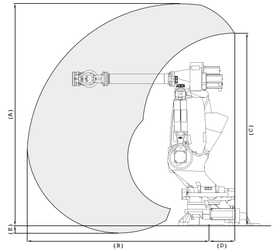
NJ 420 - 3.0
NJ 450 - 2.7

TECHNICAL SPECIFICATIONS

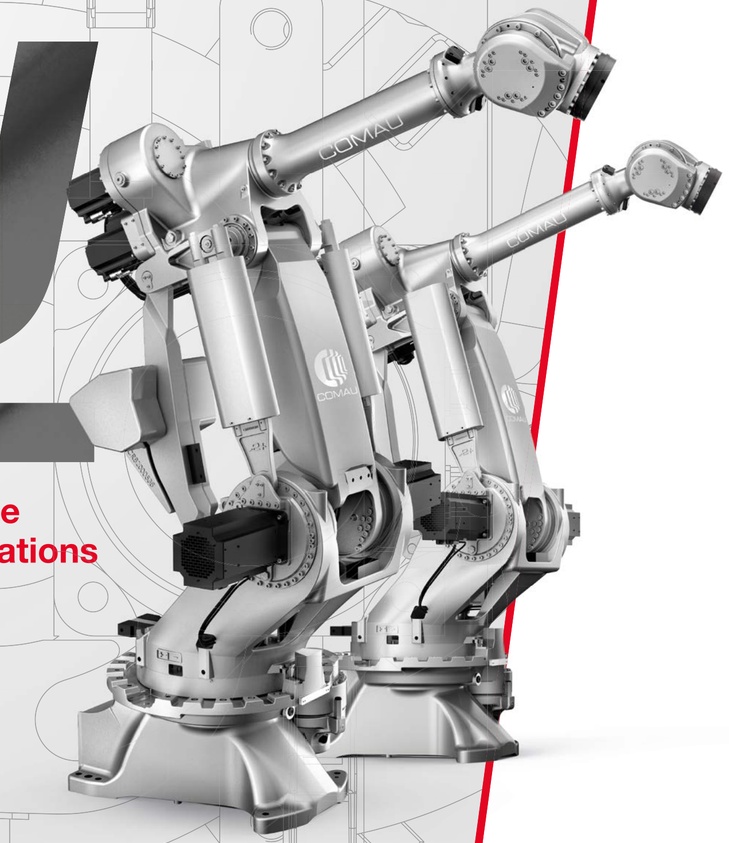
Model		NJ 420 - 3.0		NJ 450 - 2.7	
Number of axes		6		6	
Maximum wrist payload		420 kg		450 kg	
Additional load on forearm		50 kg		50 kg	
Maximum horizontal reach		2997 mm		2703 mm	
Torque on axis 4		2550 Nm		2550 Nm	
Torque on axis 5		2550 Nm		2550 Nm	
Torque on axis 6		1569 Nm		1569 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(85°/s)	+/- 180°	(85°/s)
	Axis 2	+75° / -60°	(85°/s)	+75° / -60°	(85°/s)
	Axis 3	-10° / -231°	(85°/s)	-10° / -231°	(85°/s)
	Axis 4	+/- 2700°	(90°/s)	+/- 2700°	(90°/s)
	Axis 5	+/- 125°	(90°/s)	+/- 125°	(90°/s)
	Axis 6	+/- 2700°	(120°/s)	+/- 2700°	(120°/s)
Repeatability		0.15 mm		0.15 mm	
Tool coupling flange		ISO 9409 - 1 - 200 - 6 - M12		ISO 9409 - 1 - 200 - 6 - M12	
Robot weight		2450 kg		2400 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Floor		Floor	
Operating Areas	A	3680 mm		3292 mm	
	B	2997 mm		2703 mm	
	C	3195 mm		2895 mm	
	D	433 mm		486 mm	
	E	-118 mm		181 mm	

Suggested applications

- Assembly
- Foundry
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Process Machining
- Spot Welding
- Wood / Glass Machining



NJ



Strongest models for the most demanding applications

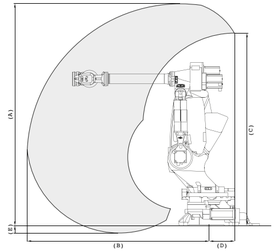
NJ 500 - 2.7
NJ 650 - 2.7

TECHNICAL SPECIFICATIONS

Model		NJ 500 - 2.7		NJ 650 - 2.7	
Number of axes		6		6	
Maximum wrist payload		500 kg		650 kg	
Additional load on forearm		50 kg		50 kg	
Maximum horizontal reach		2703 mm		2703 mm	
Torque on axis 4		2550 Nm		3060 Nm	
Torque on axis 5		2550 Nm		3060 Nm	
Torque on axis 6		1569 Nm		1766 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(85°/s)	+/- 180°	(75°/s)
	Axis 2	+75° / -60°	(85°/s)	-60° / +75°	(75 °/s)
	Axis 3	-10° / -231°	(85°/s)	-231° / -10°	(75 °/s)
	Axis 4	+/- 2700°	(90°/s)	+/- 2700°	(90 °/s)
	Axis 5	+/- 125°	(90°/s)	+/- 125°	(90°/s)
	Axis 6	+/- 2700°	(120°/s)	+/- 2700°	(120°/s)
Repeatability		0.15 mm		0.15 mm	
Tool coupling flange		ISO 9409 - 1 - 200 - 6 - M12		ISO 9409 - 1 - 200 - 6 - M12	
Robot weight		2400 kg		2450 kg	
Protection class		IP65 / IP67 Foundry Version		IP44 / IP65 Wrist	
Mounting position		Floor		Floor	
Operating Areas	A	3392 mm		3392 mm	
	B	2703 mm		2703 mm	
	C	2895 mm		2895 mm	
	D	486 mm		486 mm	
	E	181 mm		181 mm	

Suggested applications

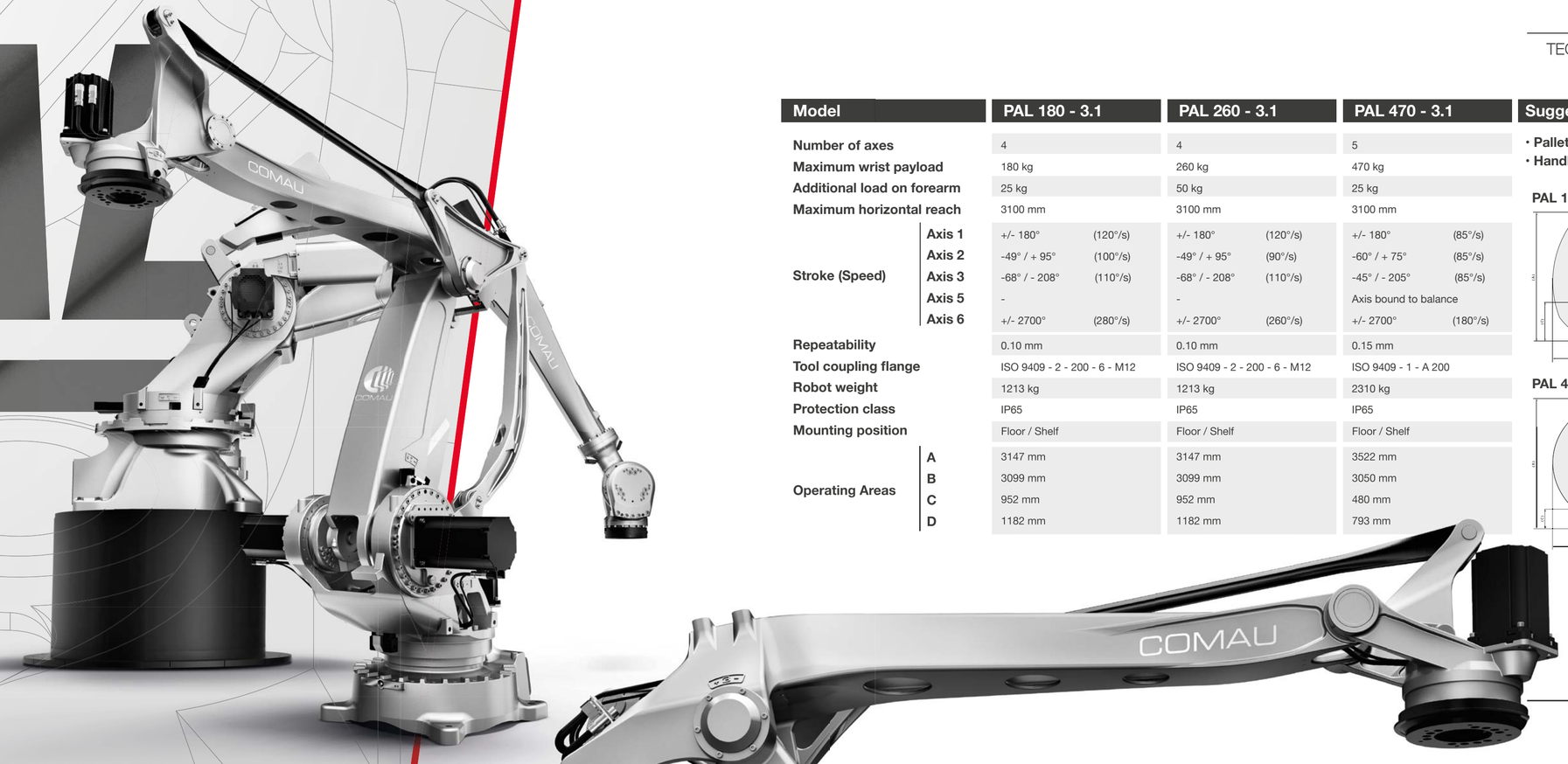
- Assembly
- Foundry
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Process Machining
- Spot Welding
- Wood / Glass Machining



PAL

Fast and robust palletizing robots

PAL 180 - 3.1
PAL 260 - 3.1
PAL 470 - 3.1

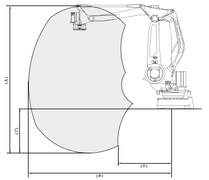


Model		PAL 180 - 3.1	PAL 260 - 3.1	PAL 470 - 3.1
Number of axes		4	4	5
Maximum wrist payload		180 kg	260 kg	470 kg
Additional load on forearm		25 kg	50 kg	25 kg
Maximum horizontal reach		3100 mm	3100 mm	3100 mm
Stroke (Speed)	Axis 1	+/- 180° (120°/s)	+/- 180° (120°/s)	+/- 180° (85°/s)
	Axis 2	-49° / + 95° (100°/s)	-49° / + 95° (90°/s)	-60° / + 75° (85°/s)
	Axis 3	-68° / - 208° (110°/s)	-68° / - 208° (110°/s)	-45° / - 205° (85°/s)
	Axis 5	-	-	Axis bound to balance
	Axis 6	+/- 2700° (280°/s)	+/- 2700° (260°/s)	+/- 2700° (180°/s)
Repeatability		0.10 mm	0.10 mm	0.15 mm
Tool coupling flange		ISO 9409 - 2 - 200 - 6 - M12	ISO 9409 - 2 - 200 - 6 - M12	ISO 9409 - 1 - A 200
Robot weight		1213 kg	1213 kg	2310 kg
Protection class		IP65	IP65	IP65
Mounting position		Floor / Shelf	Floor / Shelf	Floor / Shelf
Operating Areas	A	3147 mm	3147 mm	3522 mm
	B	3099 mm	3099 mm	3050 mm
	C	952 mm	952 mm	480 mm
	D	1182 mm	1182 mm	793 mm

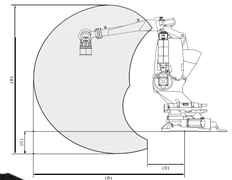
Suggested applications

- Pallettizing
- Handling

PAL 180 / 260

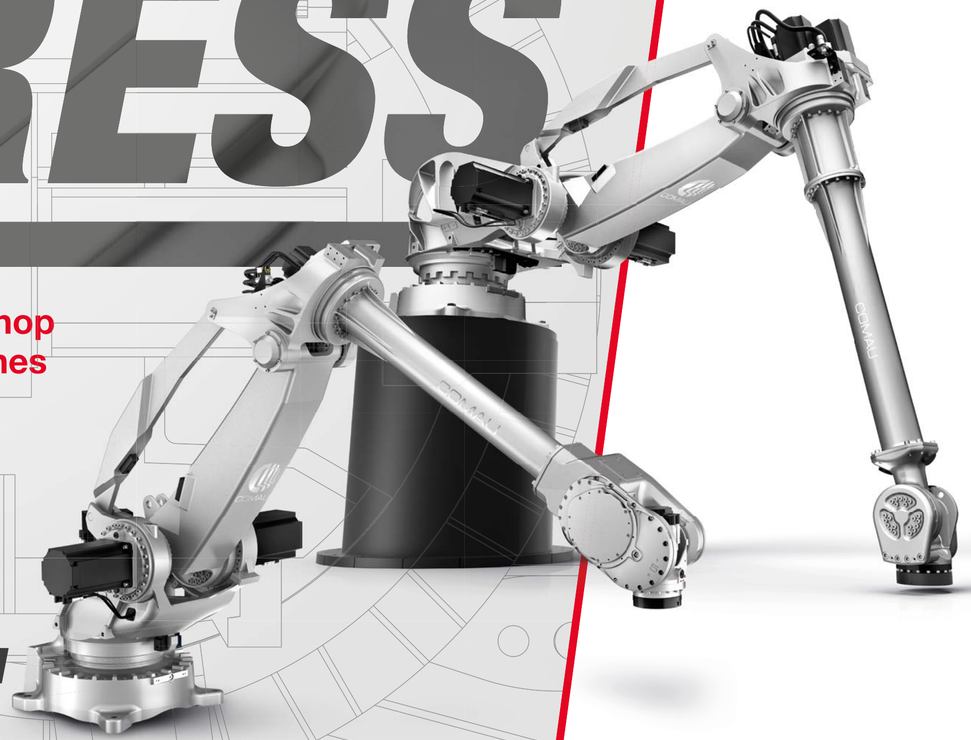


PAL 470



PRESS

Dedicated press-shop automation machines



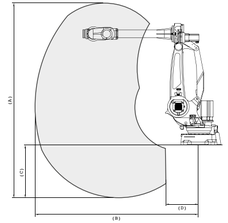
NJ 100 - 3.2
NJ 130 - 3.7 SH

Model		NJ 100 - 3.2 PRESS		NJ 130 - 3.7 SH PRESS	
Number of axes		6		6	
Maximum wrist payload		100 kg		130 kg	
Additional load on forearm		50 kg		15 kg	
Maximum horizontal reach		3209 mm		3741 mm	
Torque on axis 4		638 Nm		1225 Nm	
Torque on axis 5		638 Nm		1225 Nm	
Torque on axis 6		280 Nm		648 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(120°/s)	+/- 180°	(120°/s)
	Axis 2	-49° / +95°	(108°/s)	-60° / +170°	(95°/s)
	Axis 3	-222° / -68°	(120°/s)	-292° / -21°	(112°/s)
	Axis 4	+/- 200°	(190°/s)	+/- 2700°	(180°/s)
	Axis 5	+/- 120°	(190°/s)	+/- 125°	(175°/s)
	Axis 6	+/- 200°	(250°/275°/s)	+/- 2700°	(250°/s)
Repeatability		0.17 mm		0.20 mm	
Tool coupling flange		ISO 9409 - 1 - A 125		ISO 9409 - 1 - A 160	
Robot weight		1250 kg		1520 kg	
Protection class		IP44 / IP65 Wrist		IP44 / IP65 Wrist	
Mounting position		Shelf		Shelf	
Operating Areas	A	2780 mm		3391 mm	
	B	3209 mm		3741 mm	
	C	1035 mm		692 mm	
	D	642 mm		712 mm	
	E	-		2386 mm	
	F	-		850 mm	

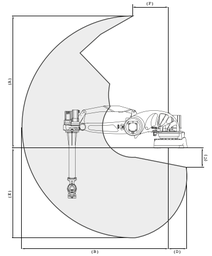
Suggested applications

- Handling / Packaging
- Press to Press

NJ 100 - 3.2



NJ 130 - 3.7 SH



NJ

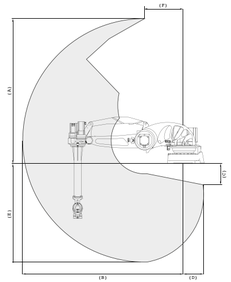
Shelf robots for wider operation areas

NJ 165 - 3.4 SH
NJ 210 - 3.1 SH

Model		NJ 165 - 3.4 SH		NJ 210 - 3.1 SH	
Number of axes		6		6	
Maximum wrist payload		165 kg		210 kg	
Additional load on forearm		25 kg		25 kg	
Maximum horizontal reach		3450 mm		3151 mm	
Torque on axis 4		1089 Nm		1177 Nm	
Torque on axis 5		804 Nm		1177 Nm	
Torque on axis 6		411 Nm		677 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(85°/s)	+/- 180°	(110°/s)
	Axis 2	-50° / +170°	(90°/s)	-50° / +170°	(90°/s)
	Axis 3	-18,8° / -288°	(110°/s)	-21,3°/ -288°	(110°/s)
	Axis 4	+/- 2700°	(130°/s)	+/- 2700°	(130°/s)
	Axis 5	+/- 125°	(130°/s)	+/- 125°	(130°/s)
	Axis 6	+/- 2700°	(195°/s)	+/- 2700°	(195°/s)
Repeatability		0.10 mm		0.10 mm	
Tool coupling flange		ISO 9409 - 1 - A 160 / 200		ISO 9409 - 1 - A 160	
Robot weight		1430 kg		1415 kg	
Protection class		IP65 / IP67 Foundry Version		IP65 / IP67 Foundry Version	
Mounting position		Shelf		Shelf	
Operating Areas	A	3100 mm		2801 mm	
	B	3450 mm		3151 mm	
	C	449 mm		547 mm	
	D	397 mm		93 mm	
	E	2100 mm		1800 mm	
	F	850 mm		850 mm	

Suggested applications

- Assembly
- Cosmetic Sealing
- Dispensing
- Handling / Packaging
- Laser Welding / Cutting
- Machine Tending
- Measuring / Testing
- Plasma Cutting / Water Jet
- Polishing / Deburring
- Press Brake Bending
- Press to Press
- Process Machining
- Spot Welding
- Wood / Glass Machining



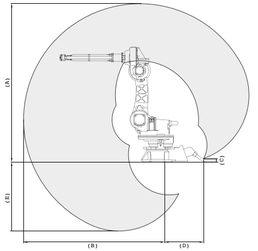
Arc4

Hollow Wrist arc welding robot

Model		Arc 4	
Number of axes		6	
Maximum wrist payload		5 kg	
Additional load on forearm		10 kg	
Maximum horizontal reach		1951 mm	
Torque on axis 4		14 Nm	
Torque on axis 5		14 Nm	
Torque on axis 6		4.9 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(170°/s)
	Axis 2	-60° / +155°	(175°/s)
	Axis 3	-170° / +110°	(185°/s)
	Axis 4	+/- 185°	(360°/s)
	Axis 5	+/- 123°	(375°/s)
	Axis 6	+/- 270°	(550°/s)
Repeatability		0.05 mm	
Tool coupling flange		ISO 9409 - 1 - 63 - 4 - M6	
Robot weight		375 kg	
Protection class		IP65	
Mounting position		Floor / Ceiling / Sloped (45° max)	
Operating Areas	A	2251 mm	
	B	1951 mm	
	C	49 mm	
	D	1257 mm	
	E	986 mm	

Suggested applications

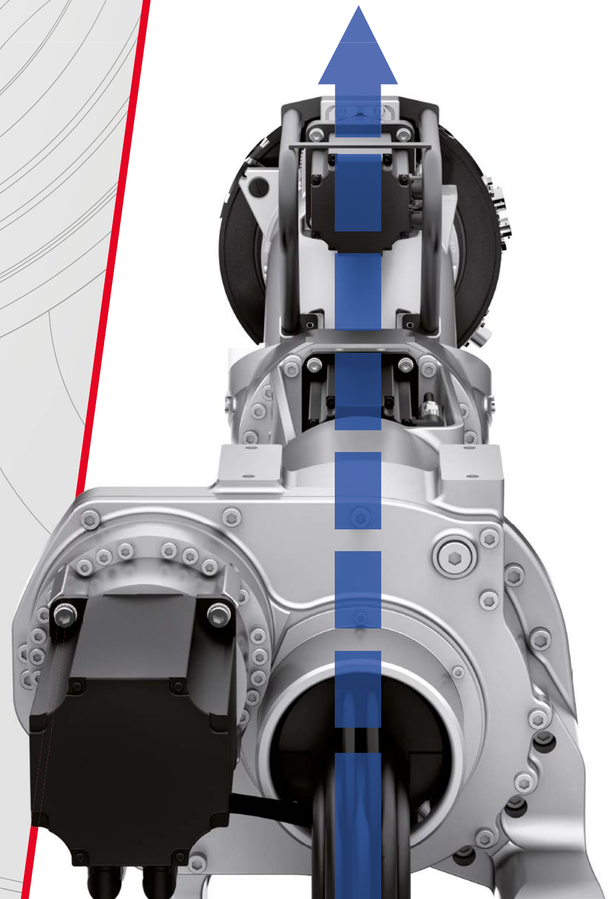
- **Arc Welding**

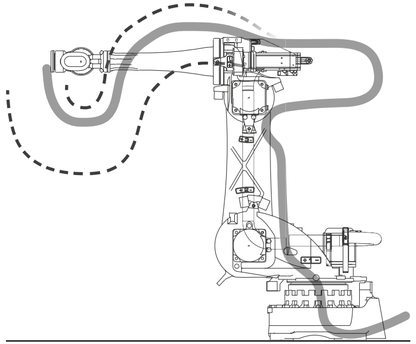


NJ4

Best Hollow Wrist in the market

- **100% INTEGRATED DRESSING**
- **COMPACT DIMENSIONS:** no need for external cables
- **LOW MAINTENANCE COSTS:** integrated dressing means the reduction of cable failures
- **HIGHER PERFORMANCE:** agile and light structure allows higher performance and efficiency





TRADITIONAL SOLUTION WITH EXTERNAL DRESSING

Unpredictable product life

- Unknown torsion, bending & stretching
- Friction, wear

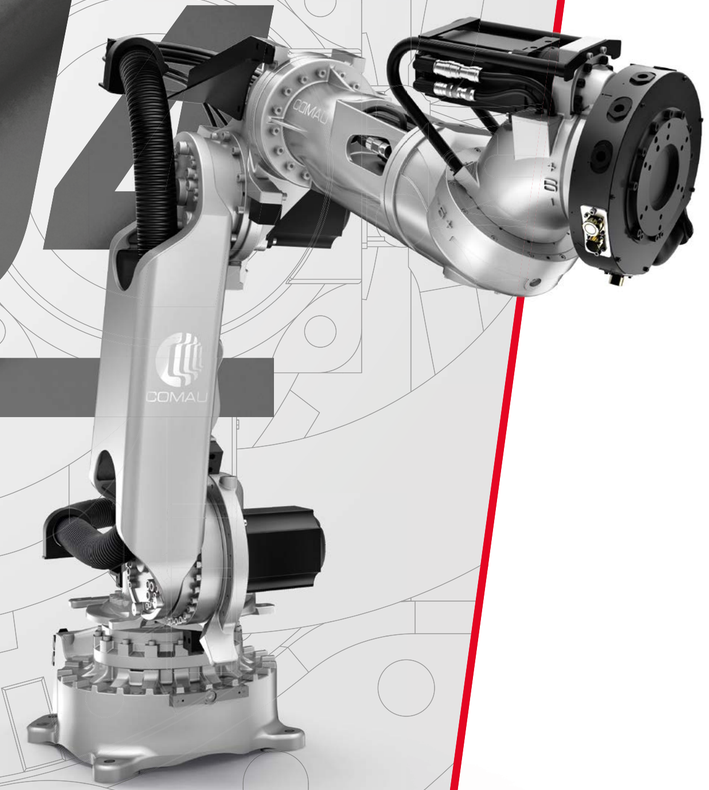
HIGH RISK OF PRODUCTION STOPS

FULLY INTEGRATED DRESSING

Comau Hollow Wrist advantages:

- Lean and compact solution
- No offset flange - gun
- Easier access through tooling and framing gates
- No risk of snagging
- Simplified tooling design
- Best results from off-line programming
- Outstanding dressing-MTBF

NJ4



The most compact Hollow Wrist robots

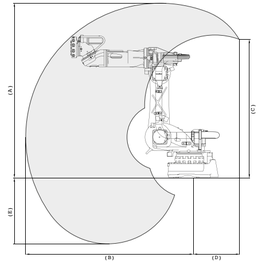
NJ4 90 - 2.2
NJ4 110 - 2.2

TECHNICAL SPECIFICATIONS

Model		NJ4 90 - 2.2	NJ4 110 - 2.2
Number of axes		6	6
Maximum wrist payload		90 kg	110 kg
Additional load on forearm		10 kg	10 kg
Maximum horizontal reach		2210 mm	2210 mm
Torque on axis 4		577 Nm	796 Nm
Torque on axis 5		432 Nm	609 Nm
Torque on axis 6		206 Nm	284 Nm
Stroke (Speed)	Axis 1	+/- 180° (170°/s)	+/- 180° (170°/s)
	Axis 2	-60° / +125° (125°/s)	-60°/+125° (125°/s)
	Axis 3	0° / -165° (165°/s)	0° / -165° (165°/s)
	Axis 4	+/- 200 (200°/s)	+/- 200° (200°/s)
	Axis 5	+/- 200° (200°/s)	+/- 200° (165°/s)
	Axis 6	+/- 200° (265°/s)	+/- 200° (265°/s)
Repeatability		0.07 mm	0.07 mm
Tool coupling flange		ISO 9409 - 1 - 125 - 6 - M10 ISO 9409 - 1 - 160 - 6 - M10	ISO 9409 - 1 - 125 - 6 - M10 ISO 9409 - 1 - 160 - 6 - M10
Robot weight		685 kg	685 kg
Protection class		IP65	IP65
Mounting position		Floor / Ceiling	Floor / Ceiling
Operating Areas	A	2360 mm	2360 mm
	B	2210 mm	2210 mm
	C	1856 mm	1856 mm
	D	712 mm	712 mm
	E	893 mm	893 mm

Suggested applications

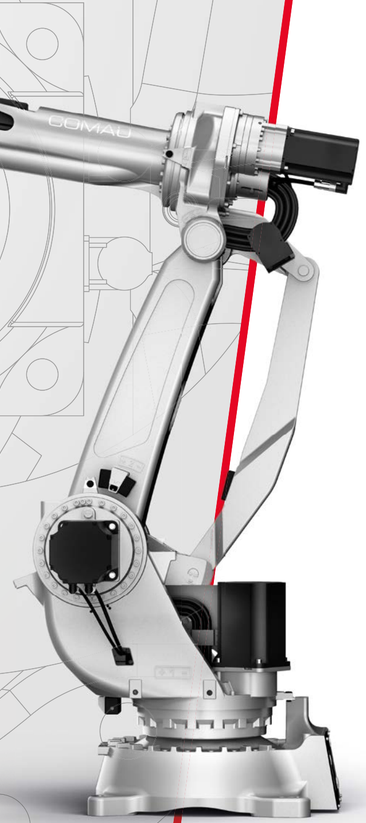
- Assembly
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Spot Welding



NJ4

Best-in-class Hollow Wrist for high payload applications

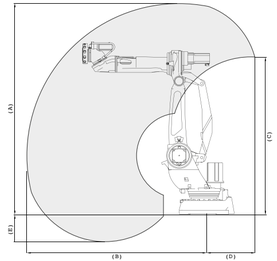
NJ4 170 - 2.5
NJ4 170 - 2.9
NJ4 175 - 2.2



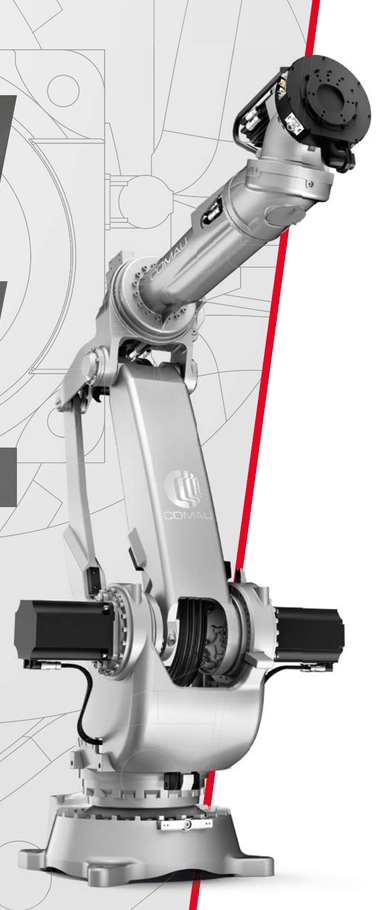
Model		NJ4 170 - 2.5		NJ4 170 - 2.9		NJ4 175 - 2.2	
Number of axes		6		6		6	
Maximum wrist payload		170 kg		170 kg		175 kg	
Additional load on forearm		50 kg		25 kg		50 kg	
Maximum horizontal reach		2500 mm		2918 mm		2204 mm	
Torque on axis 4		1010 Nm		1010 Nm		1010 Nm	
Torque on axis 5		804 Nm		804 Nm		804 Nm	
Torque on axis 6		412 Nm		412 Nm		412 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(110°/s)	+/- 180°	(100°/s)	+/- 180°	(110°/s)
	Axis 2	-75° / +95°	(110°/s)	-75° / +95°	(90°/s)	-75° / +95°	(110°/s)
	Axis 3	-10° / -230°	(110°/s)	-10° / -230°	(110°/s)	-10° / -230°	(110°/s)
	Axis 4	+/- 200°	(180°/s)	+/- 200°	(130°/s)	+/- 200°	(180°/s)
	Axis 5	+/- 200°	(140°/s)	+/- 200°	(125°/s)	+/- 200°	(140°/s)
	Axis 6	+/- 200°	(190°/s)	+/- 200°	(170°/s)	+/- 200°	(190°/s)
Repeatability		0.10 mm		0.10 mm		0.10 mm	
Tool coupling flange		ISO 9409 - 1 - A 125 ISO 9409 - 1 - A 160		ISO 9409 - 1 - A 125 ISO 9409 - 1 - A 160		ISO 9409 - 1 - A 125 ISO 9409 - 1 - A 160	
Robot weight		1100 kg		1240 kg		1080 kg	
Protection class		IP65		IP65		IP65	
Mounting position		Floor / Ceiling		Floor / Ceiling		Floor / Ceiling	
Operating Areas	A	2981 mm		3357 mm		2685 mm	
	B	2501 mm		2927 mm		2204 mm	
	C	2226 mm		2524 mm		2080 mm	
	D	720 mm		744 mm		959 mm	
	E	387 mm		436 mm		360 mm	

Suggested applications

- Assembly
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Spot Welding



NJ4



A proven innovative solution for spot welding applications

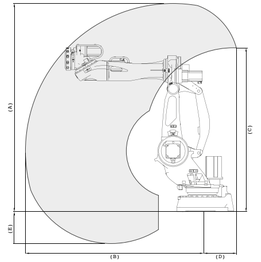
NJ4 220 - 2.4
NJ4 220 - 2.7

TECHNICAL SPECIFICATIONS

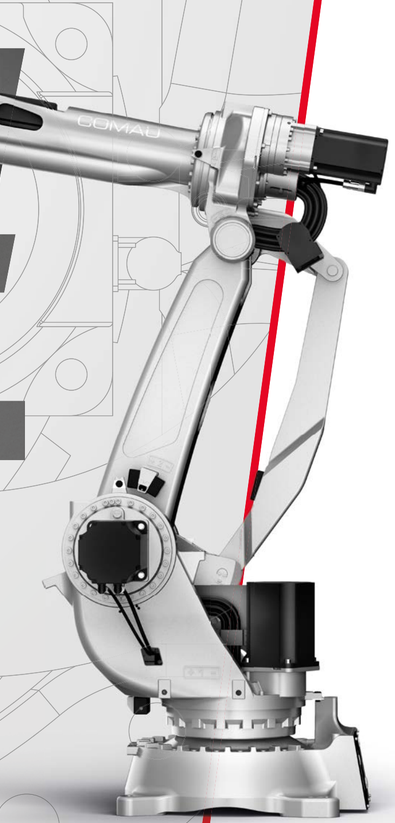
Model		NJ4 220 - 2.4		NJ4 220 - 2.7	
Number of axes		6		6	
Maximum wrist payload		220 kg		220 kg	
Additional load on forearm		25 kg		25 kg	
Maximum horizontal reach		2417 mm		2738 mm	
Torque on axis 4		1320 Nm		1320 Nm	
Torque on axis 5		950 Nm		950 Nm	
Torque on axis 6		690 Nm		690 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(100°/s)	+/- 180°	(100°/s)
	Axis 2	-75° / +95°	(90°/s)	-75° / +95°	(90°/s)
	Axis 3	-10° / -256°	(110°/s)	-10° / -256°	(110°/s)
	Axis 4	+/- 200°	(130°/s)	+/- 200°	(130°/s)
	Axis 5	+/- 200°	(125°/s)	+/- 200°	(125°/s)
	Axis 6	+/- 200°	(170°/s)	+/- 200°	(170°/s)
Repeatability		0.15 mm		0.15 mm	
Tool coupling flange		ISO 9409 - 1 - A 125 ISO 9409 - 1 - A 160		ISO 9409 - 1 - A 125 ISO 9409 - 1 - A 160	
Robot weight		1260 kg		1290 kg	
Protection class		IP65		IP65	
Mounting position		Floor / Ceiling		Floor / Ceiling	
Operating Areas	A	2847 mm		3168 mm	
	B	2417 mm		2738 mm	
	C	2241 mm		2324 mm	
	D	465 mm		779 mm	
	E	436 mm		464 mm	

Suggested applications

- Assembly
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Spot Welding



NJ4



Strong mechanical structure for Hollow Wrist high payload robots

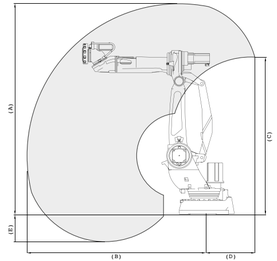
NJ4 220 - 3.0
NJ4 270 - 2.7

Model		NJ4 220 - 3.0		NJ4 270 - 2.7	
Number of axes		6		6	
Maximum wrist payload		220 kg		270 kg	
Additional load on forearm		25 kg		25 kg	
Maximum horizontal reach		3002 mm		2703 mm	
Torque on axis 4		1320 Nm		1960 Nm	
Torque on axis 5		950 Nm		1457 Nm	
Torque on axis 6		690 Nm		834 Nm	
Stroke (Speed)	Axis 1	+/- 180°	(90°/s)	+/- 180°	(90°/s)
	Axis 2	-75° / +75°	(90°/s)	-75° / +75°	(90°/s)
	Axis 3	-231° / 0°	(90°/s)	-231° / 0°	(90°/s)
	Axis 4	+/- 200°	(115°/s)	+/- 200°	(115°/s)
	Axis 5	+/- 200°	(125°/s)	+/- 200°	(125°/s)
	Axis 6	+/- 200°	(170°/s)	+/- 200°	(170°/s)
Repeatability		0.15 mm		0.15 mm	
Tool coupling flange		ISO 9409 - 1 - A 160 ISO 9409 - 1 - A 200		ISO 9409 - 1 - A 160 ISO 9409 - 1 - A 200	
Robot weight		2005 kg		1975 kg	
Protection class		IP65		IP65	
Mounting position		Floor		Floor	
Operating Areas	A	3685 mm		3392 mm	
	B	3002 mm		2703 mm	
	C	2927 mm		2617 mm	
	D	804 mm		804 mm	
	E	123 mm		-181 mm(*)	

(*) This dimension is negative because the wrist center can not reach positions below the floor level.

Suggested applications

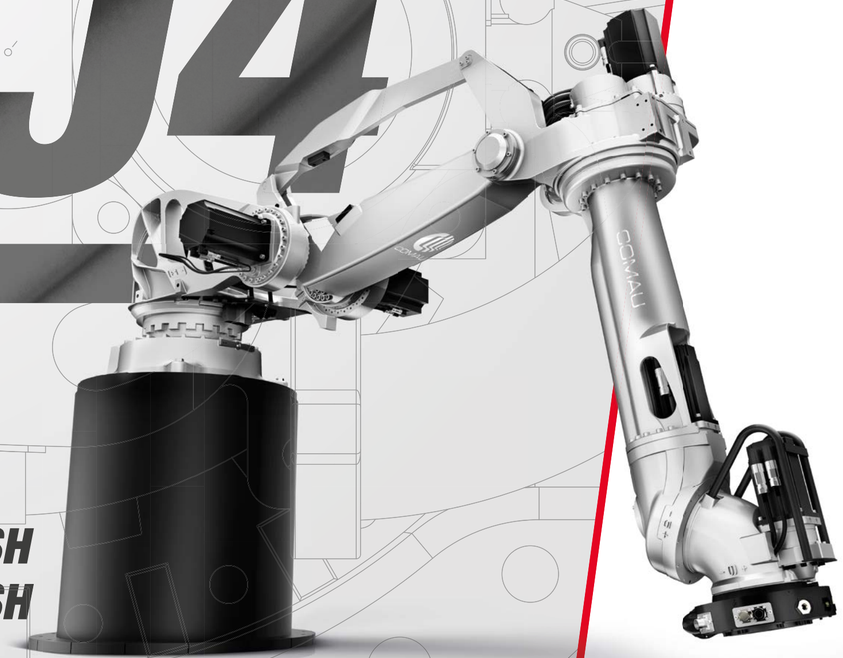
- Assembly
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Spot Welding



TECHNICAL SPECIFICATIONS

NJ4

The Hollow Wrist shelf version

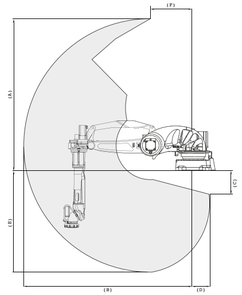


NJ4 165 - 3.4 SH
NJ4 210 - 3.1 SH

Model		NJ4 165 - 3.4 SH	NJ4 210 - 3.1 SH
Number of axes		6	6
Maximum wrist payload		165 kg	210 kg
Additional load on forearm		50 kg	25 kg
Maximum horizontal reach		3377 mm	3188 mm
Torque on axis 4		1089 Nm	1315 Nm
Torque on axis 5		804 Nm	952 Nm
Torque on axis 6		411 Nm	687 Nm
Stroke (Speed)	Axis 1	+/- 180° (85°/s)	+/- 180° (85°/s)
	Axis 2	-50° / +170° (90°/s)	+95° / -75° (110°/s)
	Axis 3	-19,4° / -288° (110°/s)	-21° / -288° (110°/s)
	Axis 4	+/- 200° (130°/s)	+/- 200° (130°/s)
	Axis 5	+/- 200° (140°/s)	+/- 200° (125°/s)
	Axis 6	+/- 200° (170°/s)	+/- 200° (190°/s)
Repeatability		0.10 mm	0.10 mm
Tool coupling flange		ISO 9409 - 1 - A 160 ISO 9409 - 1 - A 200	ISO 9409 - 1 - A 160 ISO 9409 - 1 - A 200
Robot weight		1430 kg	1460 kg
Protection class		IP65	IP65
Mounting position		Shelf	Shelf
Operating Areas	A	3027 mm	2837 mm
	B	3377 mm	3187 mm
	C	472 mm	535 mm
	D	323 mm	131 mm
	E	2027 mm	1837 mm
	F	850 mm	850 mm

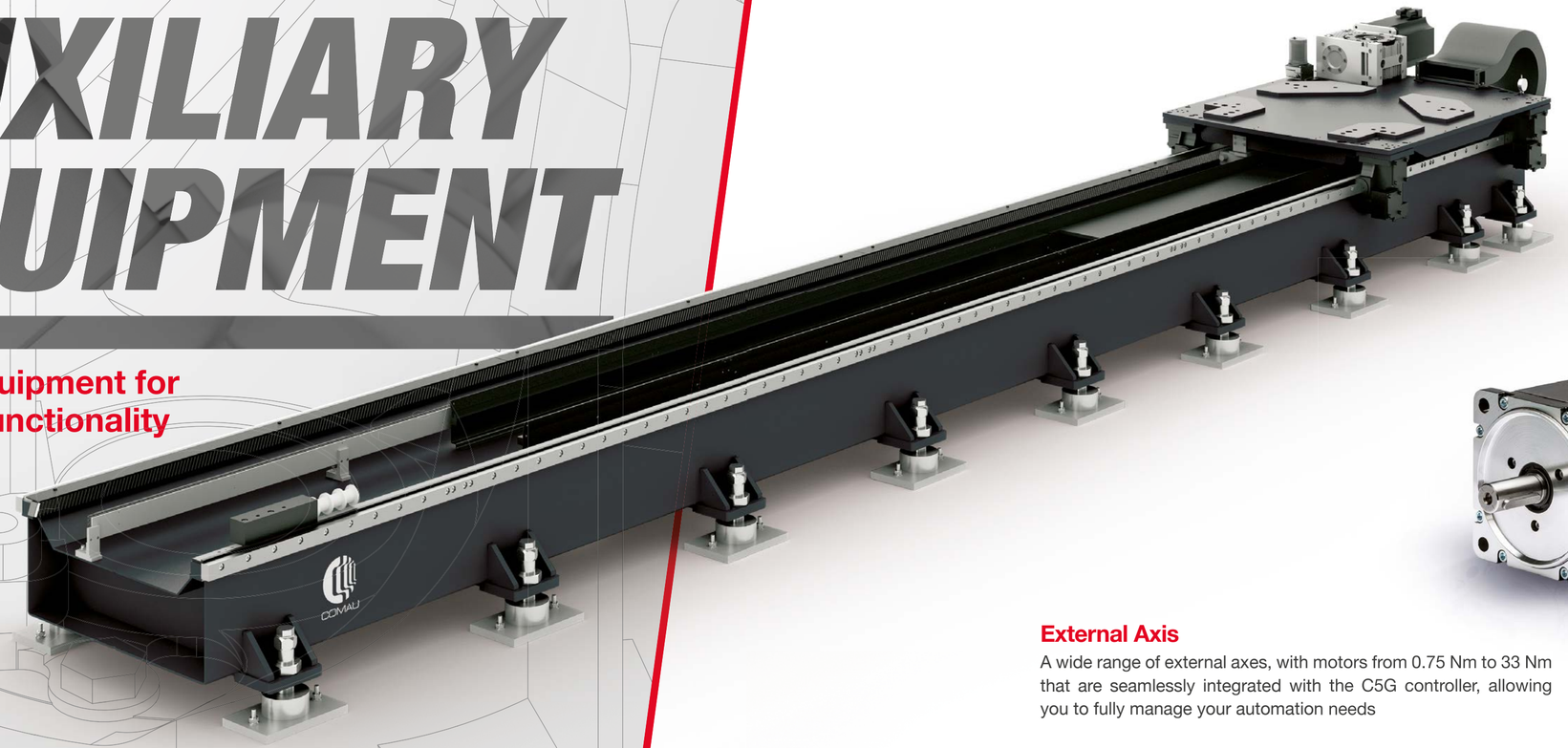
Suggested applications

- Assembly
- Handling / Packaging
- Machine Tending
- Measuring / Testing
- Spot Welding



AUXILIARY EQUIPMENT

Enabling equipment for increased functionality



Slides

Fast and precise slides, perfectly managed with the C5G controller, ensure maximum flexibility by widening the operating area of the robot

External Axis

A wide range of external axes, with motors from 0.75 Nm to 33 Nm that are seamlessly integrated with the C5G controller, allowing you to fully manage your automation needs

MP

Positioner modules

MP 500 - MP 1000
MP 1250 - MP 2500 - MP 5000

Model	MP 500	MP 1000	MP 1250	MP 2500	MP 5000
Payload	500 kg	1000 kg	1250 kg	2500 kg	5000 kg
Max inertia	250 kgm²	400 kgm²	400 kgm²	1100 kgm²	2500 kgm²
Static torque on main axis	600 Nm	1000 Nm	1500 Nm	5000 Nm	4000 Nm
Turnover moment (Max moment of flexure)	2000 Nm	3500 Nm	3500 Nm	7000 Nm	50000 Nm
Max axial thrust	1150 daN	1500 daN	1500 daN	2000 daN	3000 daN
Acceleration time	0.60 s	0.75 s	0.80 s	0.70 s	0.50 s
Output rotation speed	150 (°/s)	150 (°/s)	150 (°/s)	100 (°/s)	27 (°/s)
Repeatability at 500 mm	0.05 mm	0.06 mm	0.06 mm	0.09 mm	0.10 mm
Motors	AC brushless				
Protection class	IP67				
Weight	53 kg	90 kg	90 kg	290 kg	2000 kg
Flange diameter - D	190 mm	370 mm	370 mm	600 mm	900 mm

Diagram: Payload – P (kg) / Distance Y (mm) from center of gravity related to rotation axis.

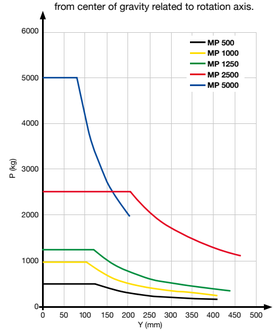
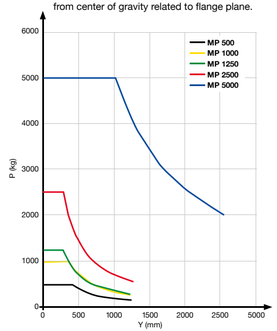


Diagram: Payload – P (kg) / Distance X (mm) from center of gravity related to flange plane.



Suggested applications

- **Positioning**

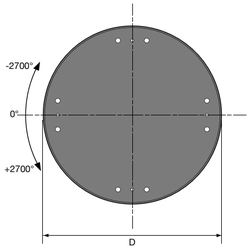
MP 5000

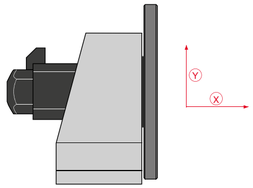
MP 1000

MP 1250

MP 2500

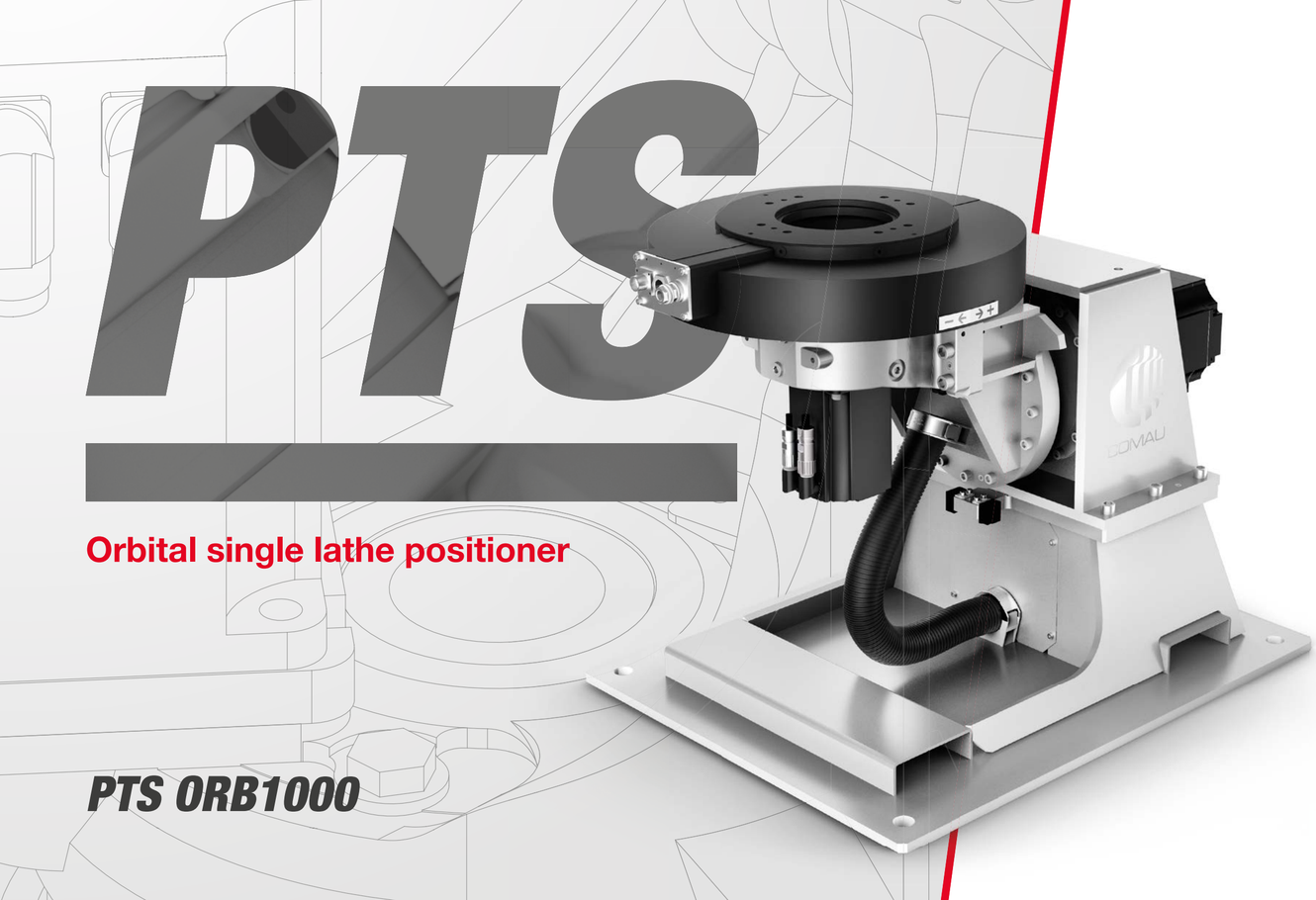
MP 5000





PTS

Orbital single lathe positioner



PTS ORB1000

Model	PTS ORB 1000
Payload	1000 kg
Max inertia	400 kgm²
Static torque on main axis	1000 Nm
Turnover moment (Max moment of flexure)	2060 Nm
Max axial thrust	1150 daN
Acceleration time	0.75 s
Output max rotation speed	150 (°/s)
Output max rotation speed 2	90 (°/s)
Repeatability at 500 mm	0.06 mm
Motors	AC brushless
Protection class	IP65
Weight	630 kg
Flange diameter - D	288 mm

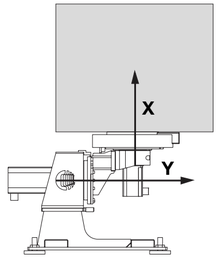


Diagram: Payload - P (kg) / Limit position of center of gravity related Axis X

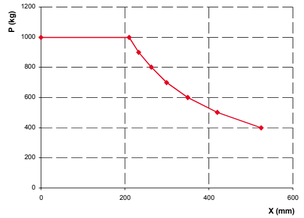
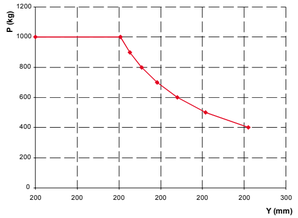


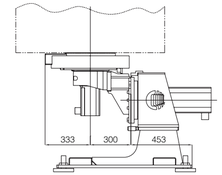
Diagram: Payload - P (kg) / Limit position of center of gravity related Axis Y

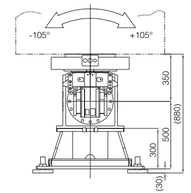


Suggested applications

- **Positioning**

PTS ORB1000





PTDO

Double action horizontal positioners

PTDO 750 - 1.2

Model	PTDO 750 - 1.2			
	2.0	3.1	4.0	4.5
Payload	2x750 kg	2x750 kg	2x750 kg	2x750 kg
Static torque on main axis	1000 Nm	1000 Nm	1000 Nm	1000 Nm
Approx. time for 180° changeover	3.7 s	3.7 s	3.7 s	3.7 s
Max load difference between stations	350 kg	350 kg	350 kg	350 kg
Max inertia	270 kgm²	270 kgm²	270 kgm²	270 kgm²
Main axis rotation angle	from -90° to+90°	from -90° to+90°	from -90° to+90°	from -90° to+90°
Secondary axis rotation angle	from -180° to +180°	from -180° to +180°	from -180° to +180°	from -180° to +180°
Repeatability at 500 mm	0.15 mm	0.15 mm	0.15 mm	0.15 mm
A	1200 mm	1200 mm	1200 mm	1200 mm
B	1430 mm	1430 mm	1430 mm	1430 mm
C	1405 mm	1405 mm	1405 mm	1405 mm
H	2720 mm	2720 mm	2720 mm	2720 mm
L	2000 mm	3100 mm	4000 mm	4500 mm
L1	4086 mm	5186 mm	6086 mm	6586 mm

Suggested applications

- **Positioning**

PTDO 750 - 1.2

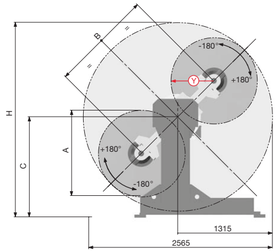
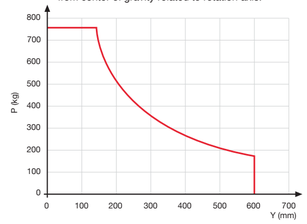
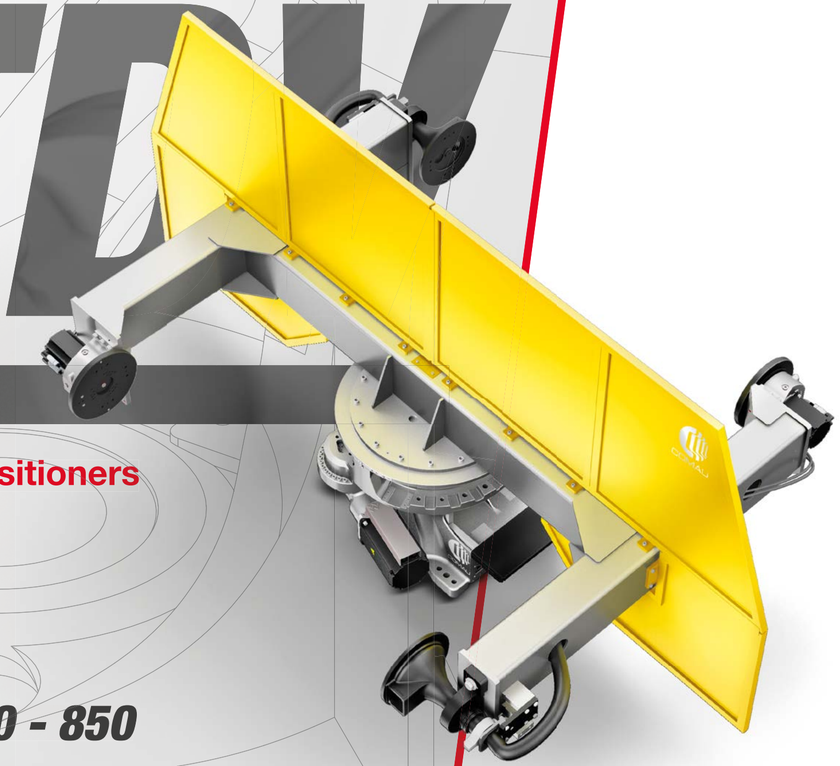


Diagram: Payload - P (kg) / Distance Y (mm) from center of gravity related to rotation axis.



PTDV



Double action vertical positioners

PTDV 250 - 500 - 750 - 850

Model	250	500		750	850
	1.1 - 1.6	1.2 - 2.0	1.2 - 2.5	1.2 - 2.0	1.2 - 2.5
Payload	2x250 kg	2x500 kg	2x500 kg	2x750 kg	2x850 kg
Static torque on main axis	600 Nm	1000 Nm	1000 Nm	1000 Nm	1000 Nm
Approx. time for 180° changeover	5.3 s	4.9 s	5.3 s	4.7 s	4.8 s
Max load difference between stations	250 kg	500 kg	500 kg	750 kg	850 kg
Max inertia	60 kgm^2	200 kgm^2	200 kgm^2	350 kgm^2	350 kgm^2
Main axis rotation angle	from -90° to+90°				
Secondary axis rotation angle	from -180° to +180°				
Repeatability at 500 mm	0.15 mm	0.16 mm	0.20 mm	0.16 mm	0.20 mm
A	1100 mm	1200 mm	1200 mm	1200 mm	1200 mm
B	1700 mm	2150 mm	2150 mm	2150 mm	2150 mm
C	1100 mm	795/677 mm	795/677 mm	795/677 mm	795/677 mm
H	1969 mm	2003 mm	2003 mm	2003 mm	2003 mm
L	1600 mm	2056 mm	2556 mm	2056 mm	2556 mm
L1	3300 mm	3956 mm	4400 mm	3956 mm	4400 mm

Suggested applications

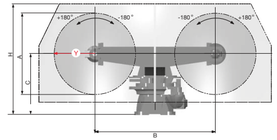
- **Positioning**

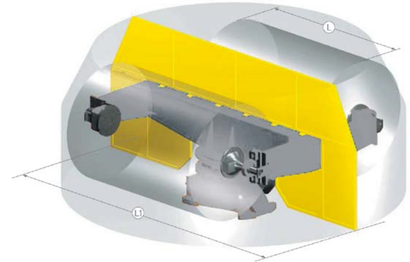
PTDV 250: 1.1 - 1.6

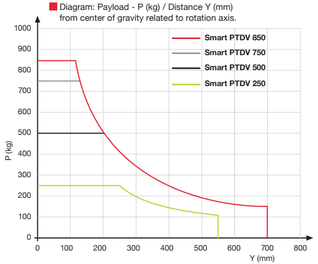
PTDV 500: 1.2 - 2.0 / 1.2 - 2.5

PTDV 750: 1.2 - 2.0

PTDV 850: 1.2 - 2.5

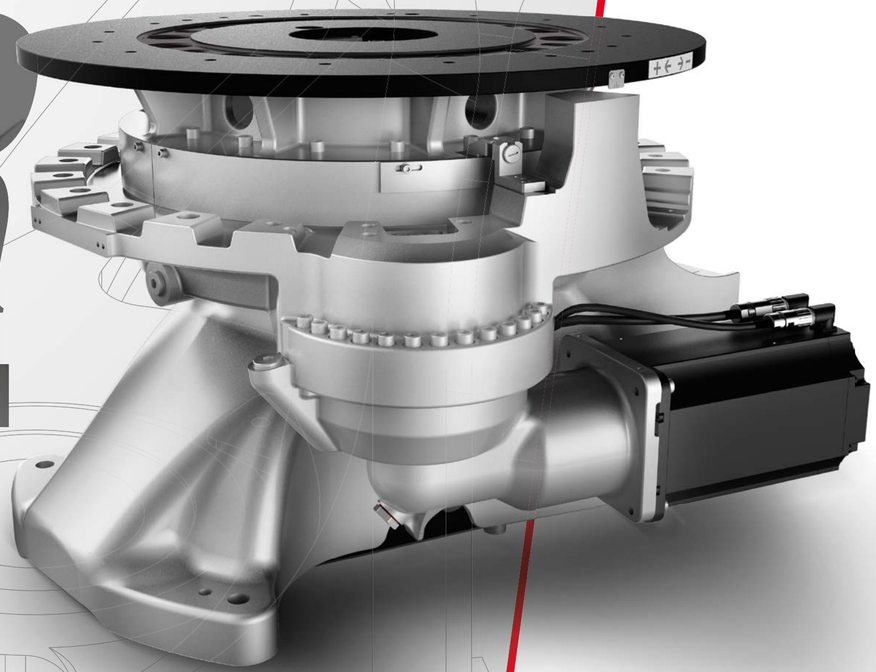






TR

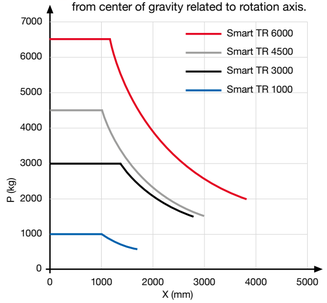
Rotary tables



TR 1000 - TR 3000 - TR 4500 - TR 6000

Model	TR 1000	TR 3000	TR 4500	TR 6000
Payload	1000 kg	3000 kg	4500 kg	6000 kg
Max inertia	1400 kgm²	3500 kgm²	7000 kgm²	15000 kgm²
Static torque on main axis	850 Nm	4200 Nm	4250 Nm	5800 Nm
Turnover moment (Max moment of flexure)	10000 Nm	41000 Nm	45000 Nm	75000 Nm
Approx. time for 180° changeover	3.5 s	3.8 s	4.3 s	5.9 s
Main axis rotation angle	69 (°/s)	50 (°/s)	55 (°/s)	33 (°/s)
Repeatability at 500 mm	0.10 mm	0.10 mm	0.15 mm	0.20 mm
Tilting angle up to 10°	yes	yes	yes	no
Availability in single-turn/multi-turn	ST	ST/MT	ST/MT	ST/MT
H	780 mm	660 mm	660 mm	800 mm
T	17 mm	23 mm	23 mm	23 mm
D	750 mm	900 mm	900 mm	1500 mm

Diagram: Payload – P (kg) / Distance X (mm) from center of gravity related to rotation axis.



Suggested applications

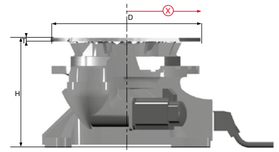
- **Positioning**

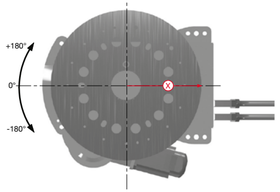
TR 1000

TR 3000

TR 4500

TR 6000





TP5

As simple as a touch

Enhanced ergonomics, wrist fatigue reduction, ease of use, reduced overall weight, increased manageability. The power is in your hands.

Style and design

- **Intensive design study and attention** to detail to guarantee **enhanced ergonomics**
- Enabling keys on the back **reduce wrist fatigue** and ensure easier use of the central keyboard area
- It can be handled in **multiple** ways to reduce operator fatigue at work
- **Lightweight** and high manoeuvrability
- The practical upper handle enables the TP to be hung and used even when far from the controller
- The **ease of use** allows quick learning by the operator via a “natural evolution”

Hardware and software architecture

- **Improved graphics** for more **intuitive use**
- **Faster USB** port

Display and keyboard

- **7” touch screen** provides simplified and **faster** interaction
- **Optimized operations**, even when using only the keyboard, for enhanced use in hard production environments
- **Simplified keyboard** designed to locate keys more easily during the programming phase thanks to special tactile marks on the membrane
- Improved **keyboard feedback** when buttons are pressed

CONTROL UNIT

All your needs are under control

Fast processing, modular system for drive units, I/O and fieldbus, free and ergonomic space to integrate application functions, compact dimensions. Everything you need is under control.

C5G - C5Compact - R1C - R1C-4

High processing power

The controller uses the latest generation of industrial PC board with a CPU that is capable of obtaining high performance with low energetic consumption

Energy saving

- Lowest consumption in stand-by, low consumption during operations
- Cooling system is proportional to control unit's operations
- Energy network recover system with a high dynamic content program

Flexibility and reliability

The new generation of field bus, based on Hilscher technology and integrated by B&R in their remote I/O X20 family, guarantees a flexible and reliable interface in every customer application. Modular interfaces are available, such as digital I/O, analog I/O as well as the position transducer encoder, resolver, etc.

RobotSAFE

Safe robot controller models allow a safety-rated management of the robot motion (joint or cartesian mode) and speed, offering advantages in terms of smaller layouts and the absence of physical fences. Using sensors, we ensure the safety of your automatic cell without affecting your productivity

Modular and expandible

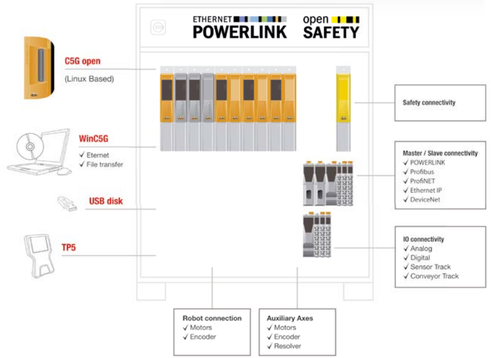
Modular system for drives with up to 13 axes in the C5G cabinet(*)

Simultaneous management of several robots and or additional axes

Hardware architecture designed to manage up to 16 axes(*) in "multi-arm" configuration with application box

*Depending on the robot model

Functional diagram (C5G case)



C5G

- **Fast processing with dual core architecture**
- **Modular system for drives unit, I/O and fieldbus**
- **Free and ergonomic space for application function integration**
- **Energy saving system**
- **Also available in safe version**
- **Also available in open controller version**
- **Runs up to 16 axes with application box**

Main technical data

- Dimensions: 800x500x1100 mm
- Weight: 125 kg
- Working temperature: 5 to 45°C (5 to 55°C with cooler)
- Humidity: from 5% to 95%, without condensation
- Extended line power range: 400 to 500V
- **Available for: Racer7, NS, NJ, NJ4 and PAL (all models)**

CONTROL UNIT

C5Compact

- **65% smaller than the standard version, lighter and easier to integrate**
- **Power saving, 50% less installed power than the standard version**
- **Runs up to 8 axes depending on the robot model**
- **Also available in safe version**
- **Also available in open controller version**

Main technical data

- Dimensions: 550x500x550 mm
- Weight: 100 kg
- Working temperature: 5 to 45°C
- Humidity: from 5% to 95%, without condensation
- Extended line power range: 400 to 500V
- **Available for: Racer7, NS**

R1C - R1C-4

- **6 axes (R1C) or 4 axes (R1C-4), equipped with brushless synchronous motors and high resolution encoder**
- **Interfaces with the most common field bus and communication protocols**
- **Can become an Ethernet network node to facilitate remote updates and diagnostics**
- **Programmable via software and by the Comau Teach Pendant**

Main technical data

- Dimensions: 266x427x498 mm
- Weight: 23 kg
- Working temperature: 5 to 45°C
- Humidity: from 5% to 95%, without condensation
- Extended line power range: 230V ±10%
- **R1C available for: Racer3, Racer5 / R1C-4 available for: Rebel-S**

SOFTWARE

Options to enhance system perfomances

In addition to the standard system software, it is possible to add a wide set of option functionalities and application packages in order to accomplish all application needs

Software functionalities

Cooperative Motion: geometrically coordinated motion management for two robots, or for a robot and a positioner, in which the trajectory and speed of the worker robot are defined referring to the moving positioner (for C5G only)

Collision Detection: emergency stop of the robot in case of a collision protects the mechanical equipment

Automatic Payload Identification: automatic identification of payload optimizes the robot movements

Joint Soft Servo: enables individual robot joints to yield to external forces as required by each specific application (for C5G only)

Synchronized Arms: synchronized movement management between two robots or between a robot and other axes groups like the positioner. This means that all the axes start and stop at the same time (for C5G only)

Sensor Tracking: applies a real time correction of the Cartesian trajectory based on information from an external sensor

Conveyor Tracking: tracks workpieces on linear and circular conveyors (reading the position from an external transducer)

Weaving Motion: weaving is an oscillating motion superimposed on a Cartesian trajectory used to distribute material in gaps with large cross sections relative to the material bead. It is used for arc-welding applications (for C5G only)

Robot Absolute Accuracy: an algorithm that enables the adaptation of the actual kinematics to a theoretical model that has been programmed off-line (for C5G only)

Speed Control for Arm: an alternative way to control the motion of an axis under speed control (for C5G only)

Multipass: a trajectory can be executed several times keeping a certain distance in relation to the programmed trajectory in arc-welding applications (for C5G only)

Palletizing Motion: this optional feature allows any anthropomorphic or parallelogram robot with a 6-axis, spherical wrist to be used as a palletizer.
The robot will always keep the flange parallel, in a downward position to the floor; axis 4 is not used

Interference Regions: limits the robot working space by dynamically defining regions of various shapes (for C5G only)

Advanced Interference Regions: automatic handling of inter-blocks

RoboSAFE Cartesian: the RoboSAFE Cartesian SW primarily controls that all the monitoring points of the Robot kinematics are confined or external to a 3D area defined by the user. This option is suitable only Safe version of Comau the control unit (for C5G only)

Quick Stop: the robot decreases the stopping distance 50% in case of emergency (for C5G only)

PDL2 Read/Write on TCP/IP: enables communication from external devices to the internal PDL2 program

VP2.Builder: VP2.Builder helps the programmer, who developing a user interface with the VP2 language, to easily create VP2 objects and edit their properties (for example, the position on a pane, the color, the text, etc..)

Axes Pursuit: makes it possible to move one or more axes belonging to one arm while allowing one or more axes of a different arm to pursue it, and works the same Automatic and Programming mode (for C5G only)

Low Resolution Euler's Angles: lower the precision in the orientation angles on axes X and Y. It is useful to manipulate points such as POSITION type

Wrist Singularity Management: an optional function for spherical wrist SMART family robots that helps programming in cases where there could be motion through the wrist singularity. It enables the trajectory planner to evaluate whether or not to automatically modify the "W" attitude flag and evaluation modality

Application software

SmartGlue: the SmartGlue application package provides full support for material delivering, gluing and sealing processes

SmartHand: this application package provides full management for tools such as grippers that are used for material handling and attach to the end of the robot arm

SmartArc: SmartArc incorporates a dedicated application software that allows the operator to set welding parameters and manage the complete system from the Teach Pendant, by means of a dedicated user interface

SmartTool Change: this software allows you to easily manage your Tool Change Systems. Simply select the devices to manage and the software application does the rest with no need for integration or additional programming code

SmartStud: the SmartStud software application features a set of ready-to-use technical instructions to manage your stud welding systems and the most common types of fieldbuses, with no need for process integration or additional programming code

SmartIP Interpress: SmartIP software handles the complete interpress process and in particular, features a smart and user-friendly interface for managing process cycles including:

- Interpress transfer cycles
- Line loading cycles from the centering table
- Line unloading cycles from table or mat
- Hand-over cycles with part overturning
- Cycles with part transfer onto intermediate table
- Double pick-up and double deposit cycles

SmartRivet: The SmartRivet software library supplies a set of ready-to-use technical instructions to manage your rivet system processes, with no need for process integration or code programming

SmartSense: VP2 interface for sensor tracking application

SmartSpot: The SmartSpot application package provides a full support and management of resistance welding technological process

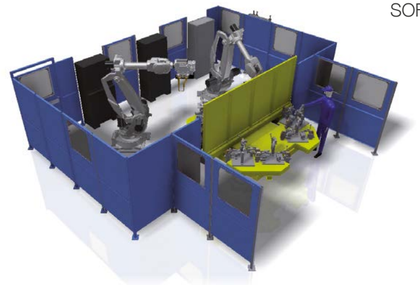
PC software

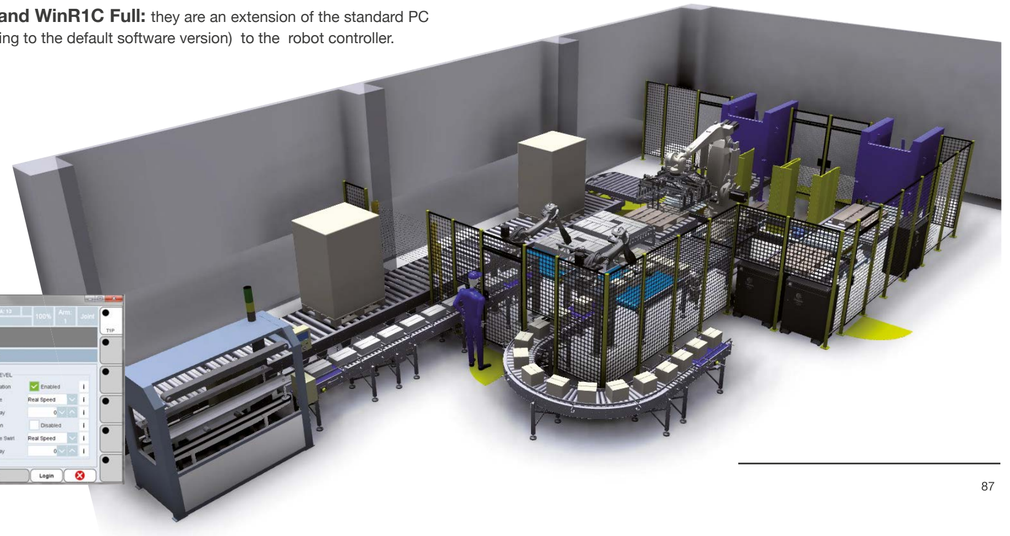
Comau Robosim PRO: 3D simulation software for offline programming. It gives you the possibility to simulate the behavior of our robots with other equipment and also to extract the pdl2 programs

Smart Payload: this tool can be used for checking that the self-determined values fits in the (static and dynamic) loading bend of the robot.

VP2.Frames: VP2.Frames is an application program to be executed on a PC allowing, when connected to a Controller, to display VP2 pages on the screen of the PC as they would be shown on the Teach Pendant device. VP2.Frames is particularly useful during the development of a program written in VP2 (see also VP2.Builder)

WinC5G Full and WinR1C Full: they are an extension of the standard PC interface (belonging to the default software version) to the robot controller.





PRESS automation

Complete turn-key solutions for press lines

The PRESS Excellence Center

The know-how of Comau Robotics results from a long and well-established experience gained in the automation of the press lines in traditional cold stamping and modern hot forming methods.

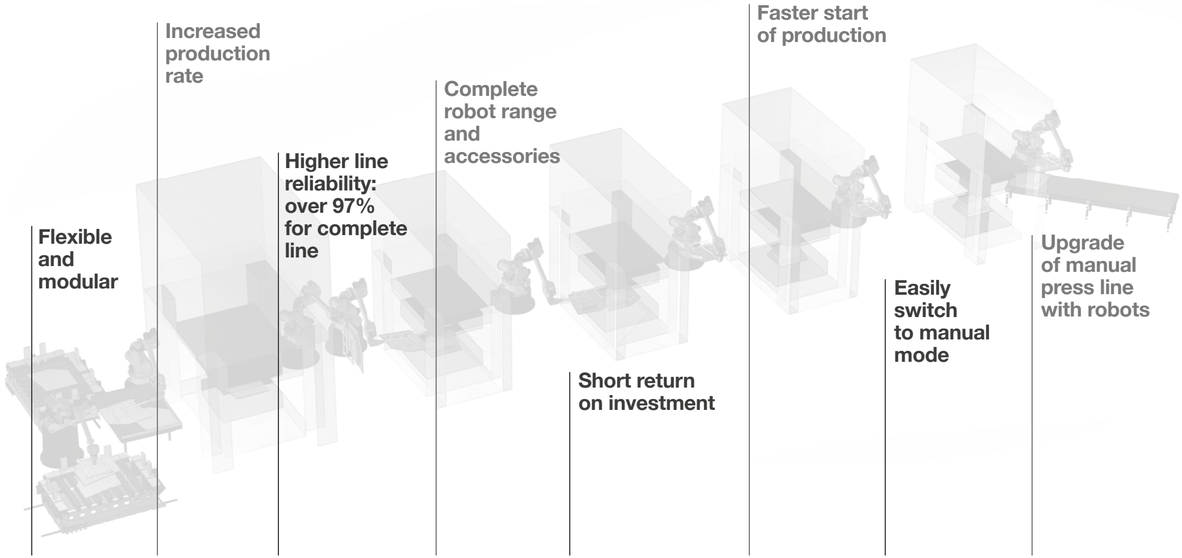
Since 1984, Comau has been developing highly efficient solutions with its dedicated PRESSbooster robot family and **Smart IP Interpress software**. During these years, Comau has improved its skills and gained experience in automatic press lines, making Comau a global leader in its sector.

With different levels of automation and customized products, Comau's turnkey solutions grant high production flexibility and a quick return on investment.

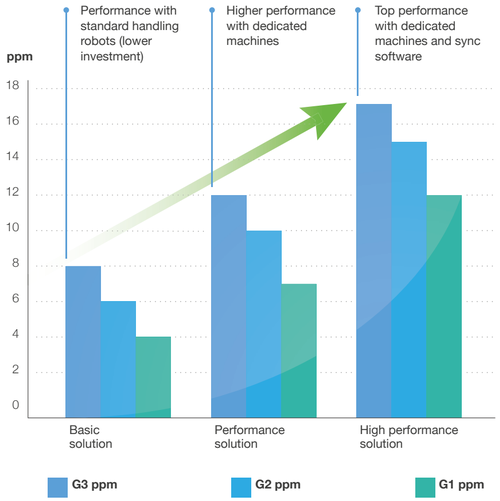
Experience
Knowledge Solutions
Automation
Project
Future
Management
Performance
Competence
Innovation

PRESS automation benefits

OVER 200
INSTALLED LINES
WORLDWIDE



Comau Robotics provides different levels of automation, performance and investment, from a portion of the line to the automation of the entire press line, according to instantaneous press speed, automation production rate increases, depending on the robot type and management software.



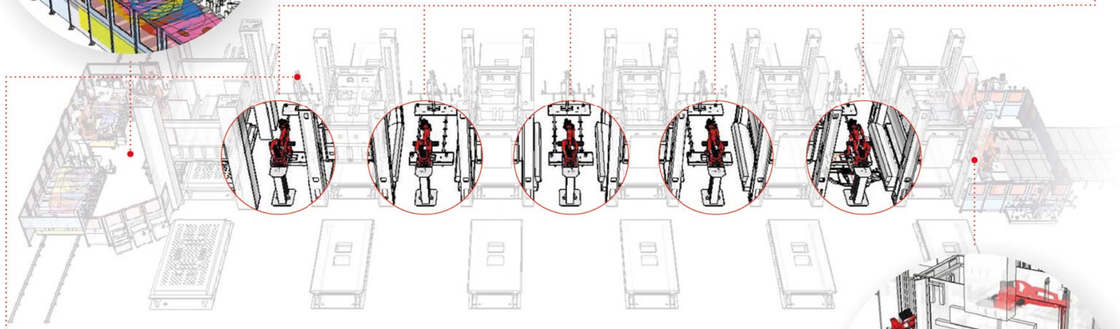
Tandem press lines classification

1° PRESS SIZE (Ton)	PRESS DISTANCE (m)	COMAU ROBOT TYPE
G1: 2000 T XL and XXL size blanks	7.0 to 9.0	NJ130-3.7 P NJ140-3.7 F
G2+: 1600 T L size blanks	6.0 to 8.0	NJ130-3.7 P NJ140-3.7 F NJ100-3.2 P
G2: 1000 T M and L size blanks	5.0 to 7.0	NJ100-3.2 P
G3: 600 T S and M size blanks	4.0 to 6.0	NJ100-3.2 P

Destacking station – Front of Line (FOL)
Robots handle blanks from pallet to leading press.
Station can be equipped with optional cleaning system.
Comau can provide a destacking station that is fully integrated in existing lines.

Press-to-press handling stations with:
- Part TURNOVER option with 2 robots
- INTERPRESS with 1 robot

Fitting to single or double action press.

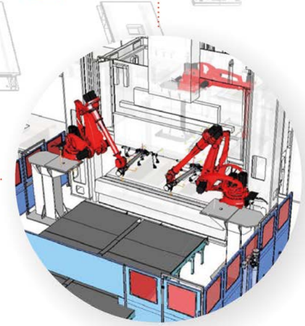


Automatic Tool Changer (ATC)
Sliding carts, rotating tables, stationary tables.

For high speed die change and ergonomics.

EOL station with manual or automatic racking station
Station behind last press with 1 or 2 robots handling parts from die to conveyor. Parts can be handled into containers:
- Manually by operators
- Automatically by additional racking robots

Comau also offers automatic racking stations as a modular upgrade to existing lines.



Our Customer Services

Our business is taking care of your business

Customer satisfaction is always a top priority of the Comau Robotics strategy.

We provide prompt and flexible service close to customers throughout the life cycle of their equipment. We offer a complete range of services to maximize the performance of Comau's solutions.

Training at either Comau Training Center or customer's sites with multi-language sessions.

On-line support with remote diagnostics and aids through Comau new robot control connection capacity.

Activities developed by experienced technicians at customer's site, delivery of spare parts, repairs and re-conditioning services and worldwide maintenance plans.

Offered Services

Spare parts and logistics

Professional consultancy and flexible solutions for your spare parts logistics and stock.

Support and management of parts, exchange units and repairs with a reliable response time in order to assure continuous production.

Training

Education and training with learning paths ranging from «*basic*» to «*advanced*» levels supplied at our Training Center, at the customer premises and with our new web-base interactive platform.

A complete training catalogue including basic use and programming, advanced programming, diagnostics and maintenance, application packages and more.

Technical assistance and agreements

Local teams to support customers, provide process reliability, improve product performances and maintain investment value.

Help Desk support, remote diagnostics and fault analysis by highly skilled engineers to support troubleshooting and address critical emergency situations.

A range of service agreement solutions to cover any specific need.

Advanced services, refurbishment and upgrades

Analysis of customer needs and process improvement packages that combine experience and knowledge with new technologies to enhance system performance or reconfigure existing applications.

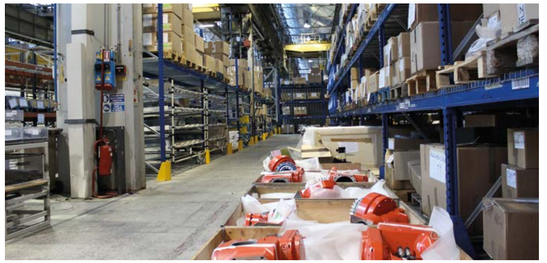
Industrial engineering support, upgrades, new software versions and hardware renewal and reconditioning.

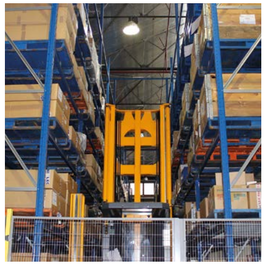
Spare Parts and Logistics

Spare parts and logistics

Introduction

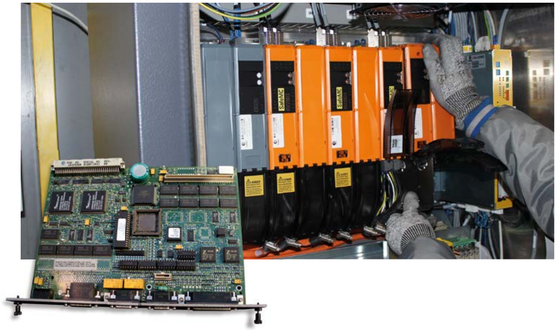
- Spare parts and Repair services available for at least 10 years following the discontinuation of production
- HQ warehouse with 20.000 available items
- Special packages of recommended spare parts and/or consignment stock based on installed robot c/o the customers
- Full one year warranty on all spare parts
- Fast repairs via an exchange service





Robot arm spare parts

- Immediate availability of wrist, reduction gears and balancing groups
- Wrist repair and revision
- Reduction gear repair and revision
- Motor repair and revision
- Test benches for measurements and lost motion/backlash check



Electronic spare parts

- Electronic boards repair and complete revision
- Servo drive modules repair and complete revision
- Teach pendant repair and complete revision
- Software upgrades

Logistics

- Urgent delivery (within 24 hours in most Countries)
- Spare parts available directly in 12 Countries through local COMAU sites
- HUB Logistic Centers in Italy, Brazil, US and China

Training

Personalized solutions for efficient results

Our courses mix in a coherent way:

- Challenging practical activities
- Tools
- Theoretical content

We adopt an innovative learning methodology, combining classroom training, business experience and multimedia tools.

Solution 1: e-learning + in-person training

E-learning - *to explore processes and behaviours, practice, reflect and receive feedback*

- Theoretical content (videos, animations, texts)
- Practical content (exercises and simulations)
- In-depth analysis
- Test + feedback

In-person training - *to share knowledge and practice on robotic systems*

- Hands-on activities and real exercises in Comau offices
- Reflection and sharing with Comau experts

Solution 2: in-person training with multimedia

During the classroom training, teacher and participants can share content, exercises and tests through multimedia tools (smart whiteboard, tablet and PC). This solution increases the involvement of participants, who are active subjects and share knowledge and experience.

Multimedia classroom - *content shared with multimedia tools*

- Theoretical content (videos, animations, texts)
- Practical content (exercises and simulations)
- In-depth analysis
- Test + feedback

In-person training - *to share knowledge and practice on robotic systems*

- Hands-on activities and real exercises in Comau offices
- Reflection and sharing with Comau experts

Comau Web Academy

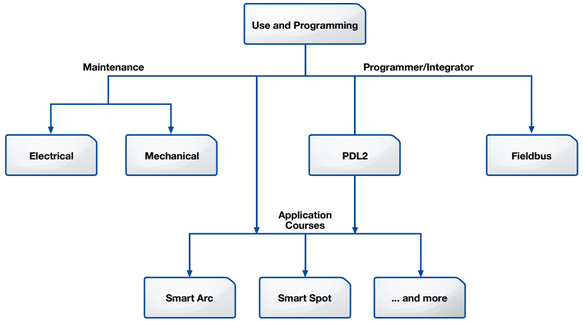
The *Comau Web Academy* manages the Comau on-line training offer. The courses are accessible from PC and tablet.

The participants can access their registered courses whenever they wish and can pause and resume their use of content according to their needs.

Each course consists of a training part and an evaluation part (test) to verify the progressive learning of the content.

At the end of an on-line course a final test is scheduled and a certificate of attendance will be issued.

After completion, the content of each on-line course remains available on the Comau Web Academy platform. Materials for in-depth analysis are also available.



Mobile Training Cell

You can't come to us?
The Mobile Training Cell will come to you!

The perfect solution for teaching the basics of robotics and industrial automation, wherever you want.

Comau has developed a **mobile cell for training which is easily transportable and compactible with retractable robot.**

This helps minimize its size from 1140x940x1700 to 1140x940x970, which is optimal for transport.

The Mobile Training Cell performs **basic and advanced programming exercises and processes management applications.**

Racer3, a six axis robot and the smallest of the Comau family, is optimal and comprehensive for **learning the robotics basics** from both a theoretical and practical point of view.

It is equipped with a camera mounted on the structure to permit the screening of the work area on the external monitor.

This enables the teacher to **manage the training of large groups** and ensure an **equal learning experience for all**.

The perforated work surface makes it possible to assemble various options developed by Comau, thanks to an anchoring system with quick release pins which are available on the market.

Therefore users will also be able to develop specific equipment (tools) based on their own needs, which can be easily installed on the Comau Mobile Training Cell.

An excellent tool for schools, universities and training and research centers.

Features

- Transportable on euro pallet ISO2 size 1200x1000 mm
- Height of the Cell transport box 1110 mm
- Total weight 250 kg
- Compactible with retractable robot
- Equipped with small size Racer3 robot
- Height of the open Cell in working position 1700 mm
- Height of the collapsed Cell 970 mm
- Forkliftable
- Easy movement due to the wheels
- The work surface can be fitted with accessories to do programming exercises
- Transportable on commercial vehicles such as small vans
- Cell and robot power supply 230 Vac ± 10% 50-60 Hz (±2 Hz) 3 kW main switch rated current 16 A @ 250 Vac

Technical Assistance and Agreements

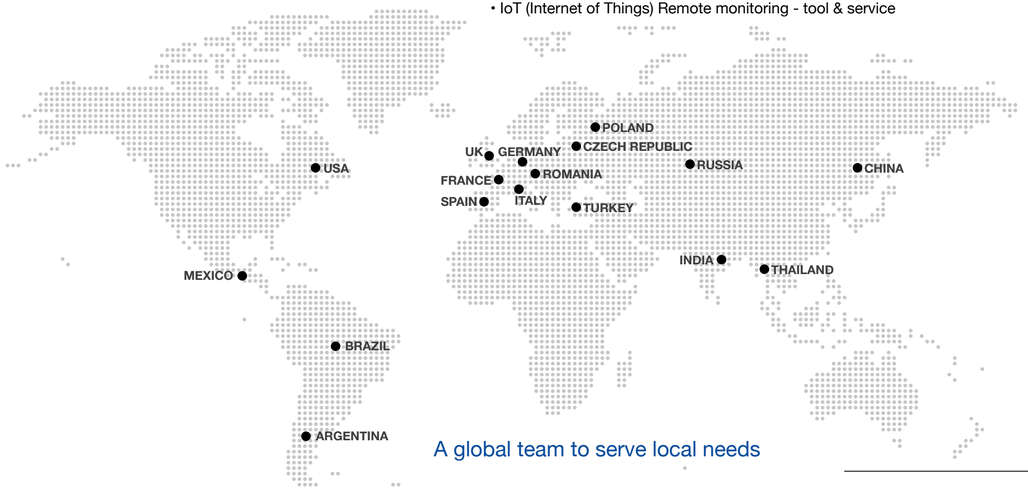
Technical assistance is committed to support customers throughout the entire product life cycle of a robot by providing:

- Installation, commissioning and programming support
- Preventive maintenance, auditing and consultancy services to extend the Mean Time Between Failure (MTBF)
- Help Desk support, Remote Monitoring and Response Time services to reduce downtime (MTTR)

A complete Agreement Portfolio to meet the specific requirements of each single customer

Available agreement options

- Help desk from 8:00 to 17:00
- Intervention within 24 hours (6-12 optional), Italy restricted availability, one solar year
- Prepaid technical assistance hours packages (16 or 48) hours within one solar year
- Special discount 20% for maintenance during February-May and October-November
- Special discount: 10% off spare partes and 5% off repairs
- Optional refurbished spare parts (around 50% less expensive) depending on availability
- Shipping spare parts within the same day if order is made before 13:00
- Battery/Fan/Oil replacement packages: replacement advised every 2-3 years
- Warranty extension on Robot 1-3 years
- Warranty extension on Spare Part 12-18 months on service intervention (standard 6 months)
- “Slim” Warranty option (50% discount on spare parts during service intervention) - 1 year coverage
- IoT (Internet of Things) Remote monitoring - tool & service



A global team to serve local needs

Preventive Maintenance

Preventive maintenance

The purpose of **preventive maintenance** is to maintain the efficiency of the robot over time by retaining its original integrity.

This helps to eliminate production stops caused by the failure to execute controls and calibrations that together form the basis for efficient operation.

To achieve this objective, Comau offers a set of maintenance agreements, tailored for the entire robot family, including the careful control of mechanics and electronics.

A planned and scheduled preventive maintenance enables the identification of malfunctions and critical parts in need of replacement, which could compromise the reliability of the entire production line.

Typical maintenance

ROBOT ARM

Annual controls and activities

- Check calibration position
- Check backlash and lost motion
- Visual check of lubricant leaks
- Check wiring harness
- Clean calibration references
- Clean robot
- Reset recovery position
- Specific intervention (depending on the Robot model)
- Fill out the maintenance card with relevant observations

Controls and activities (every 3 years)

- Replace gearbox lubricants
- Replace thrust bearing lubricant
- Grease bearings
- Specific intervention (depending on the Robot model)

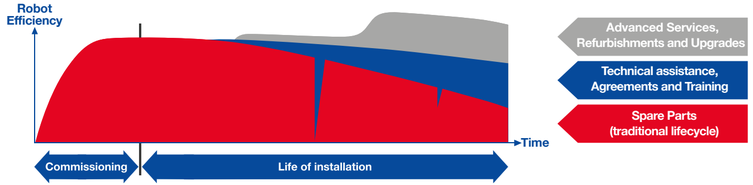
ROBOT CONTROLLER C5G/C4G

Annual controls and activities

- Save user programs on USB
- Check fans and clean cooling system
- Control emergency button on the TP / on the Control (C4G)
- UPS & APC battery check (C5G) / CU battery (C4G)
- Check grounding strips
- Control connections, clamping connectors and screws
- Control main voltage (380/500 V +/- 15%)
- Control SDM voltage (C5G) / APS and FIA board voltage (C4G)
- Control NET filters voltages
- Check dial functionality of the TP
- Check selector functionality on TP
- Check general integrity of the system (C5G or C4G)
- Fill out the maintenance card with relevant observations

Advanced Services, Refurbishments and Upgrades

Comau Services is always by the Customer's side to identify and implement innovative upgrades and refurbishment solutions to improve efficiency throughout the product lifecycle.



A refurbished robot is a used robot that has undergone an overhaul to return it to its original condition.
This procedure prolongs its operational lifetime.
After careful inspection, each robot is load tested for twenty-four hours.
Refurbished robots are guaranteed 12 months after shipping date.

- Process improvement projects (in terms of Performance Efficiency and Cycle time)
- HW and SW upgrade
- Robot configuration upgrade
- Consultancy services
- Relocations and end-of-life services (Refurbishment)
- Total cost of ownership reduction
- Used Robot sale

Refurbishment Services

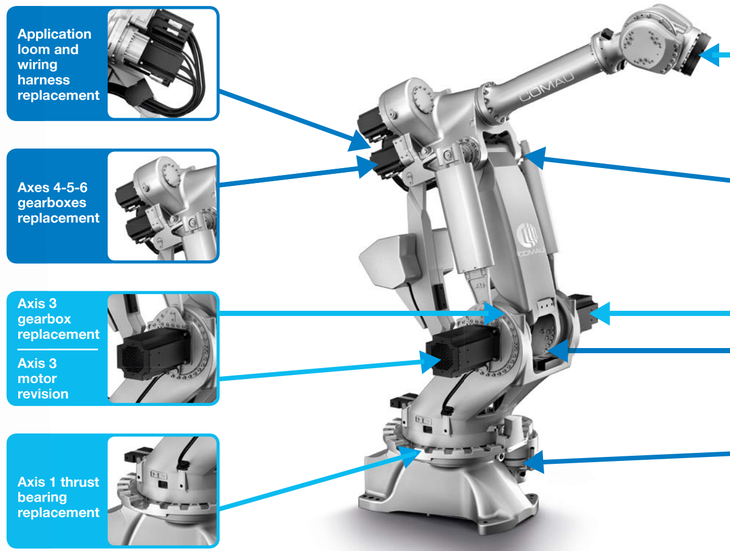
Components to be refurbished

Always

As necessary

Lubrication & backlash check

Visual inspection of all parts



- Application loom and wiring harness replacement
- Axes 4-5-6 gearboxes replacement
- Axis 3 gearbox replacement
- Axis 3 motor revision
- Axis 1 thrust bearing replacement
- Wrist revision
- Spring bearings replacement
- Axis 2 motor revision
- Axis 2 gearbox replacement
- Axis 1 gearbox revision

Long term experience is engraved into Comau's history: experience is continuously driving Comau to widen its offer, to meet Customers' improvement targets by anticipating Smart Factory requirements and accomplishing World Class Manufacturing standards.

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