

Annex 1

Specification

Variants:	Reach	Payload	Armload
IRB 4600-60/2.05	2.05 m	60 kg	20 kg
IRB 4600-45/2.05	2.05 m	45 kg	20 kg
IRB 4600-40/2.55	2.55 m	40 kg	20 kg
IRB 4600-20/2.50	2.51 m	20 kg	11 kg
Number of axes	6+3 external (up to 36 with MultiMove)		
Protection	Standard IP67, as option Foundry Plus 2		
Mounting	Floor, shelf, inverted or tilted		
IRC5 Controller variants	Single cabinet, Dual cabinet		

Physical

Dimensions robot base	512 x 676 mm
Robot height IRB 4600-60/2.05 and IRB 4600-45/2.05	1727 mm
Robot height IRB 4600-40/2.55 and IRB 4600-20/2.50	1922 mm
Robot weight	412 to 435 kg

Performance

Position repeatability (RP)	0.05 - 0.06 mm
Path repeatability (RT)	0.13 - 0.46 mm (measured at speed 250 mm/s)

Movement

Axis movements	Working range	Maximum speed
Axis 1	+180° to -180°	175°/s
Axis 2	+150° to -90°	175°/s
Axis 3	+75° to -180°	175°/s
Axis 4	+400° to -400°	250° (20/2.50 has 360°)/s
Axis 5*	+120° to -125°	250° (20/2.50 has 360°)/s
Axis 6	+400° to -400°	360° (20/2.50 has 500°)/s

* Axis 5 for IRB 4600-20/2.50 +120°-120°

Electrical connections

Supply voltage	200-600 V, 50-60 Hz
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Environment

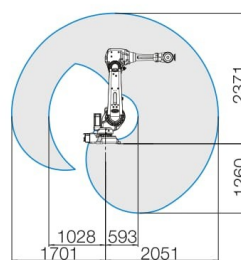
Ambient temperature for mechanical unit:

During operation	+5° C (41° F) to +45° C (113° F)
During transportation and storage	-25° C (-13° F) to +55° C (131° F)
For short periods (max 24 h)	up to +70° C (158° F)
Relative humidity	Max 95%
Safety	Double circuits with supervisions, emergency stops and safety functions. 3-position enable device
Emission	EMC/EMI shielded

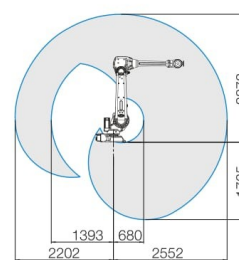
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Main applications

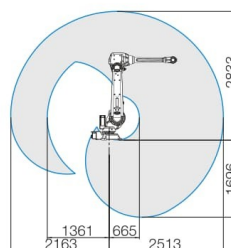
- Machine tending
- Material handling
- Arc welding
- Cutting
- Dispensing
- Assembly
- Palletizing and packing



IRB 4600-60/2.05
IRB 4600-45/2.05



IRB 4600-40/2.55



IRB 4600-20/2.50

For more information please contact:

ABB AB

Robotics

Hydrovägen 10
SE-721 36 Västerås, Sweden
Phone: +46 21 325000

www.abb.com/robotics

Note

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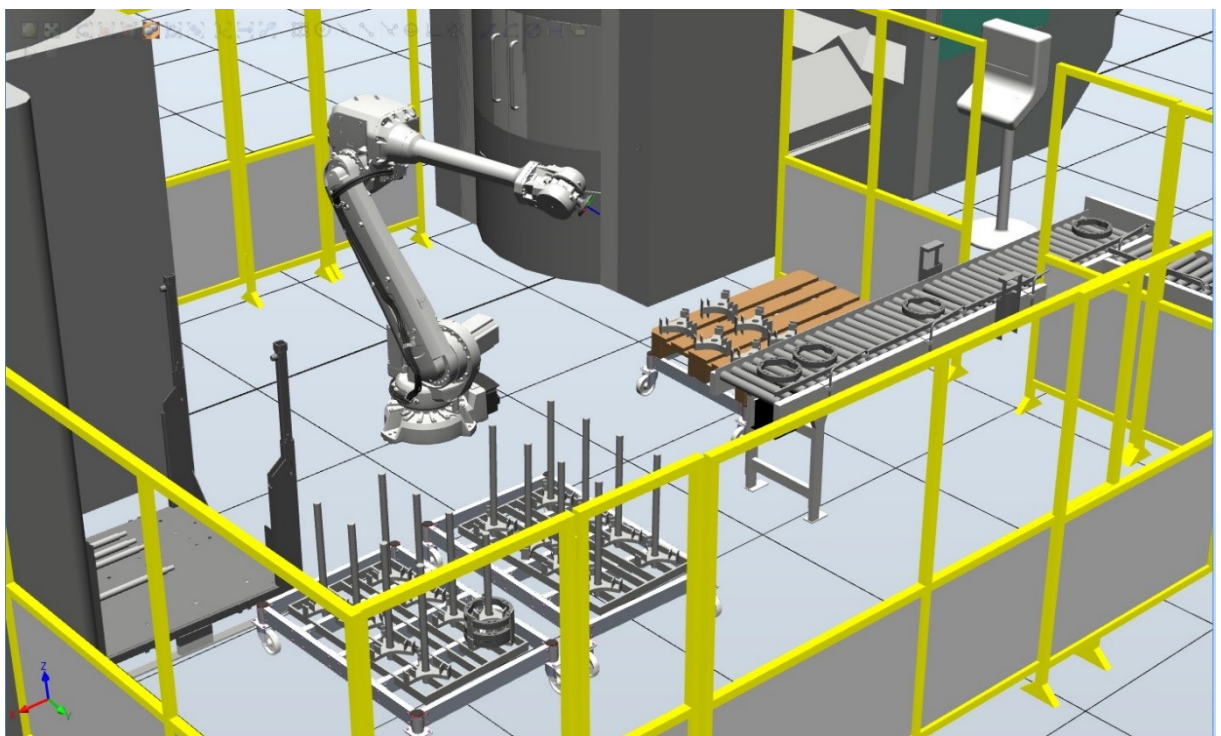
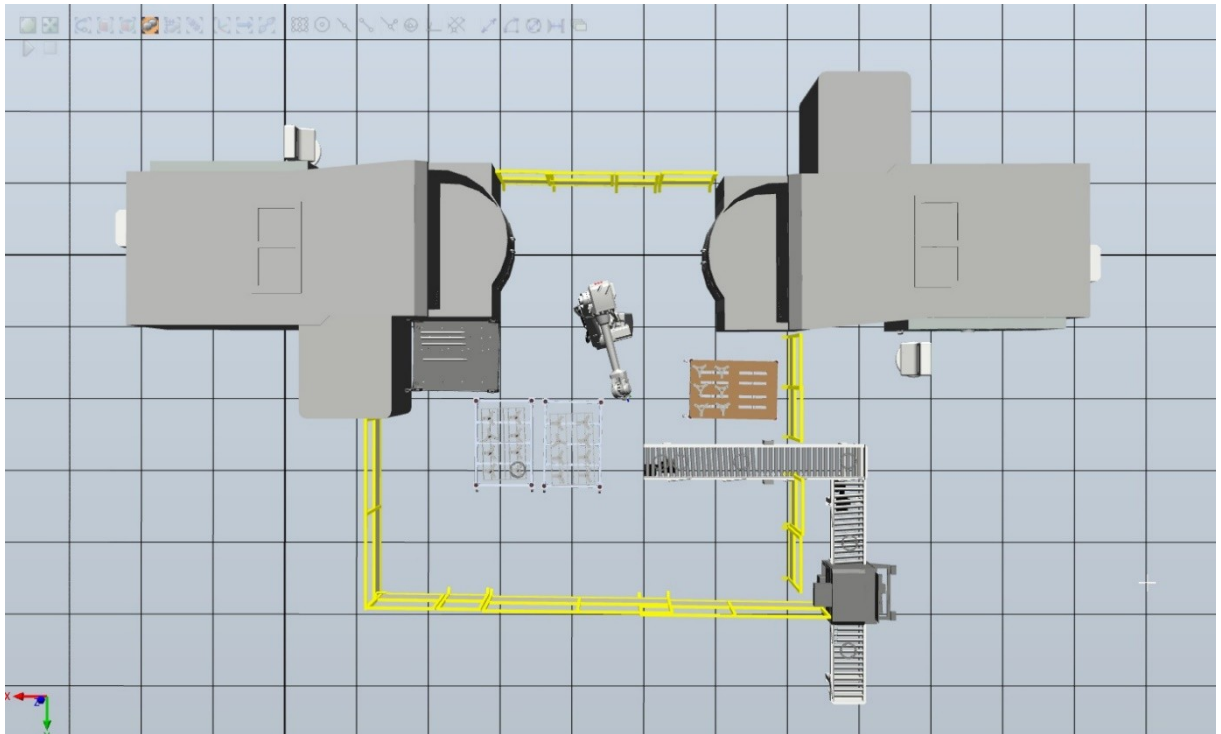
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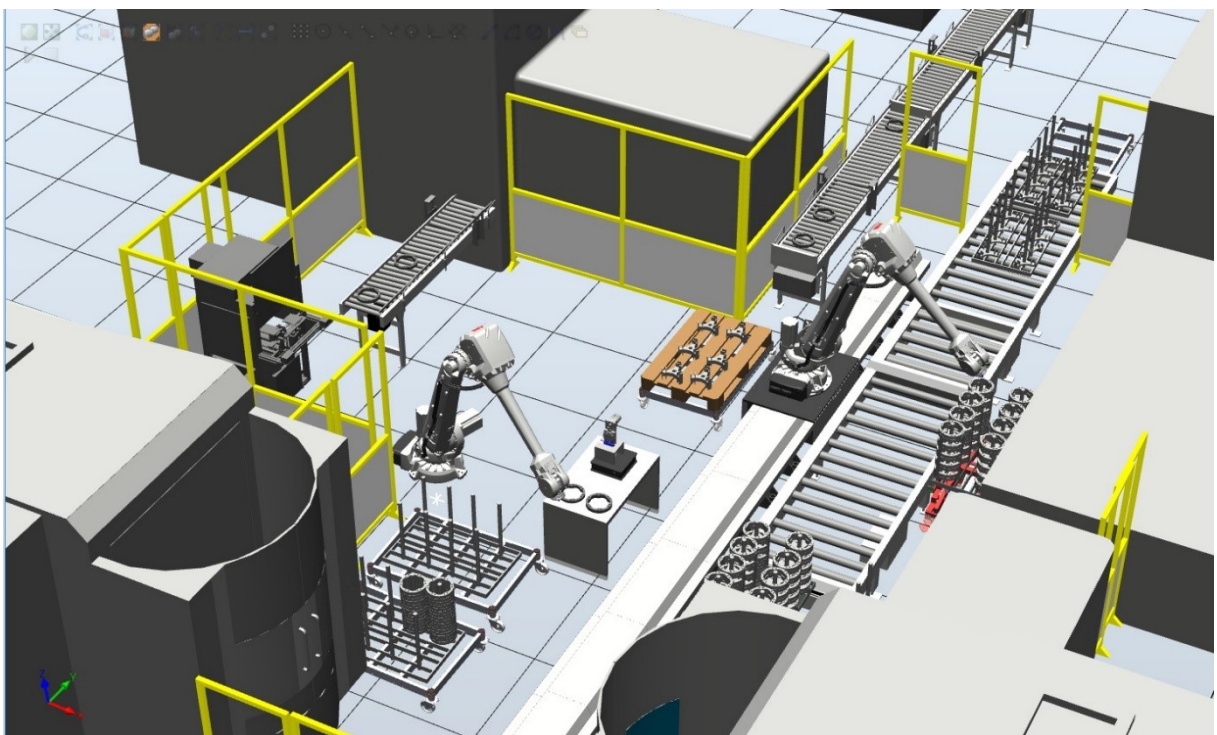
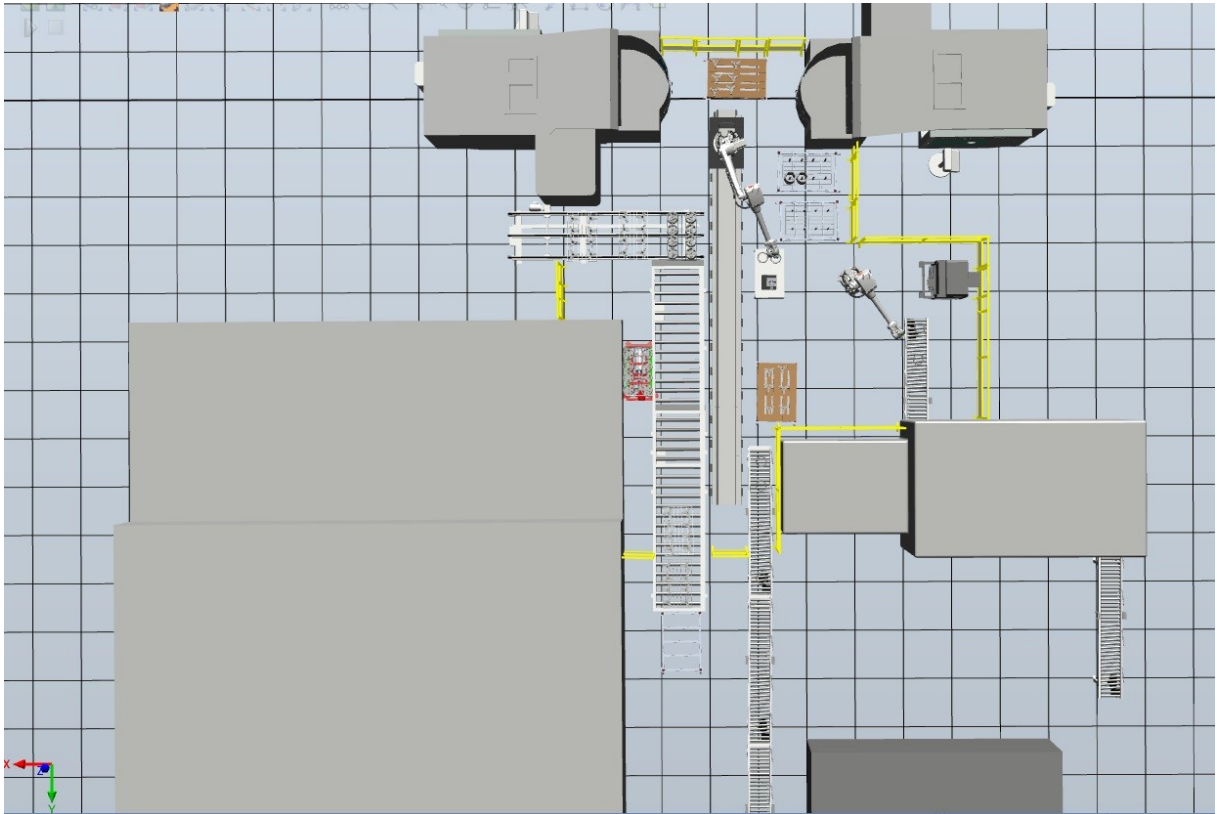
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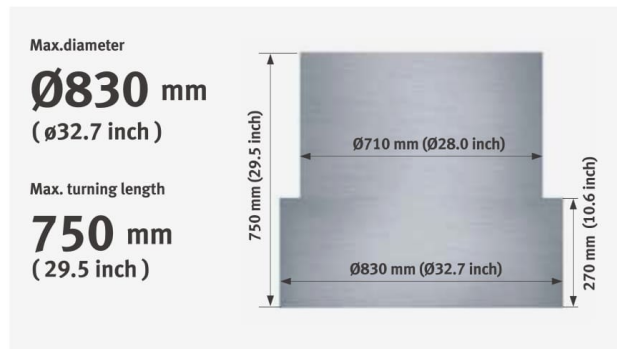
Annex 2



Annex 3



Various machining capacity



Main spindle



PUMA V8300 series

Outstanding machining performance with wide capacity

With max. turning diameter of Ø830 mm (Ø32.7 inch), respectively, PUMA V8300 maintains high accuracy over a long-term operation. Heavy duty cutting capability and high durability implemented with the meehanite cast bed and column-integrated box guide.

Major Specifications

PUMA V8300 series



Description		Unit	PUMA V8300R / L / 2SP	PUMA V8300MR / ML / 2SP
Capacity	Max. turning dia.	mm (inch)	Ø830 (Ø32.7)	
	Max. turning length	mm (inch)	750 (29.5)	
	Chuck size	inch	15 {18 / 21 / 24}	
Travel	X / Z axis travel distance	mm (inch)	495 (415+80) / 780 (19.5 (16.3+3.1) / 30.7)	
	X / Z axis rapid travel speed	m/min	20 / 20	
Spindle	Max. spindle speed	r/min	2000	
	Spindle motor power (30min/cont.)	kW (Hp)	37 / 30 (49.6 / 40.2)	
	Spindle bearing inner dia.	mm (inch)	Ø160 (Ø6.3)	
CNC system		-	DOOSAN FANUC i	



Doosan Machine Tools

<http://www.doosanmachinetools.com>

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Optimal Solutions for the Future

Head Office

Yeonkang Bldg., 6th FL., 270, Yeonji-dong,
Jongno-gu, Seoul, Korea
Tel +82-2-3670-5345 / 5362
Fax +82-2-3670-5382

Doosan Machine Tools America

19A Chapin Rd., Pine Brook, NJ 07058, U.S.A.
Tel +1-973-618-2500
Fax +1-973-618-2501

Doosan Machine Tools China

Room 101,201,301, Building 39 Xinzhuang Highway
No.258 Songjiang District, China Shanghai(201612)
Tel +86 21-5445-1155
Fax +86 21-6405-1472

Doosan Machine Tools Europe

Emdener Strasse 24, D-41540 Dormagen, Germany
Tel +49-2133-5067-100
Fax +49-2133-5067-111

Doosan Machine Tools Japan

#2412, Mita Kokusai Bldg. 1-4-28 Mita,
Minato-ku, Tokyo 108-0073, Japan
Tel +81 3 5730 9013
Fax +81 3 5730 9016

Doosan Machine Tools India

106 / 10-11-12, Amruthahalli, Byatarayanapura,
Bellary road, Bangalore-560 092, India
Tel +91-80-4266-0122 / 121 / 100



* For more details, please contact Doosan Machine Tools.

* The specifications and information above-mentioned may be changed without prior notice.

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TURNING CAPACITY

Standard chuck diameter [mm]	400
Max chuck diameter [mm]	400
Nominal turning diameter [mm]	300
Max turning diameter [mm]	400
Max swing diameter [mm]	480
Max turning length [mm]	300

AXES

Total stroke X axis [mm]	1250
Machining stroke X axis [mm]	475
Total stroke Y axis [mm]	--
Total stroke Z axis [mm]	330
Rapid speed X axis [m/min]	75
Rapid speed Y axis [m/min]	--
Rapid speed Z axis [m/min]	60
Ballscrew diameter X axis [mm]	50
Ballscrew diameter Y axis [mm]	--
Ballscrew diameter Z axis [mm]	40
Nominal Thrust X axis [kN]	4,7
Nominal Thrust Y axis [kN]	--
Nominal Thrust Z axis [kN]	7
S3-25% Thrust X axis [kN]	12,6
S3-25% Thrust Y axis [kN]	--
S3-25% Thrust Z axis [kN]	18,8

MAIN ELECTROSPINDLE

Spindle nose [ASA]	8 o 11
Front bearing ø [mm]	130
Nominal power [kW]	47.5
Nominal torque [Nm]	823
Max power [kW]	54
Max torque [Nm]	1302
Max speed [Rpm]	4000

TOOLS TURRET (Fixed/Live tools)

Toolholders type [VDI]	50
Toolholders [N°]	12
Max power [kW]	22,4
Max torque [Nm]	145
Max speed [Rpm]	8000/10000
Max tools length [mm]	220
Indexing time [sec]	0,25

GENERAL DATA

Loading/Unloading time [sec]	6 - 10
Machine Weight [kg]	10000 Approx
Main connection [V/Hz]	400/50 or 440/60
Compressed air [bar]	5
Conveyor height [mm]	1050
Length/Width/Height [mm] (Without chip conveyor)	3900/3500/3200

INFINITY OPTION**"L" OPTION****"Y" OPTION**

Main Machine Specifications

		NLX 3000 700			NLX 3000 1250		
Basic specification		IRIS			IRIS		
Optional specifications		—	☑	☑/Y	—	☑	☑/Y
Capacity							
Swing over bed	mm (in.)	978 (38.5) <interference with front cover 612 (24.1)>			978 (38.5) <interference with front cover 713 (28.1)>		
Swing over cross slide	mm (in.)	808 (31.8)					
Max. turning diameter	mm (in.)	430 (16.9)* ¹ / 420 (16.5)* ²					
Max. turning length	mm (in.)	713 (28.0)			1,260 (49.6)		
Bar work capacity	mm (in.)	90 (3.5)* ³ [102 (4.0)* ³⁺⁴]					
Travel							
X-axis travel	mm (in.)	280 (11.0)					
Z-axis travel	mm (in.)	820 (32.3)			1,370 (53.9)		
Y-axis travel	mm (in.)	—			—		
		120 <±60> (4.7 <±2.4>)			120 <±60> (4.7 <±2.4>)		
Spindle							
Max. spindle speed	min ⁻¹	3,000 [3,000* ⁵]					
Type of spindle nose		JIS A ₂ -8					
Turret							
Number of tool stations		10 [12]					
Shank height for square tool	mm (in.)	25 (1)					
Max. rotary tool spindle speed	min ⁻¹	—			—		
		10,000 [4,000* ⁶]			10,000 [4,000* ⁶]		
Feedrate							
Rapid traverse rate	mm/min (ipm)	X, Z: 30,000 (1,181.1) Tailstock <forward / retract> 7,000 / 20,000 (275.6 / 787.4)	X, Z: 30,000 (1,181.1) Tailstock <forward / retract> 7,000 / 20,000 (275.6 / 787.4) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock <forward / retract> 7,000 / 20,000 (275.6 / 787.4) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Tailstock <forward / retract> 7,000 / 20,000 (275.6 / 787.4) C: 400 min ⁻¹	X, Z: 30,000 (1,181.1) Y: 10,000 (393.7) Tailstock <forward / retract> 7,000 / 20,000 (275.6 / 787.4) C: 400 min ⁻¹	
Tailstock							
Tailstock travel	mm (in.)	734 (28.9)			1,284 (50.6)		
Taper hole of tailstock spindle		Live center <MT5> [Built-in center <MT4>]					
Motor							
Spindle drive motor <30 min / cont>	kW (HP)	22 / 18.5 (30 / 24.7) [30 / 25 (40 / 33.3)]					
Rotary tool spindle drive motor <3 min / 5 min / cont>	kW (HP)	—			—		
		5.5 / 5.5 / 3.7 (7.5 / 7.5 / 5) [5.5 / 3.7 / 2.2 (7.5 / 5 / 3) <10 min / 15 min / cont>* ⁶]			5.5 / 5.5 / 3.7 (7.5 / 7.5 / 5) [5.5 / 3.7 / 2.2 (7.5 / 5 / 3) <10 min / 15 min / cont>* ⁶]		
Machine size							
Machine height <from floor>	mm (in.)	2,273 (89.5)			2,362 (93.0)		
Floor space <width × depth>	mm (in.)	3,585 × 2,198 (141.1 × 86.5) [4,291 × 2,198 (168.9 × 86.5)* ⁷]			4,572 × 2,480 (180.0 × 97.6) [5,246 × 2,480 (206.5 × 97.6)* ⁷]		
Mass of machine	kg (lb.)	6,800 (14,960)	6,850 (15,070)	7,100 (15,620)	8,400 (18,480)	8,500 (18,700)	8,900 (19,580)
Control unit							
Mitsubishi Electric		M730UM					

Main Machine specifications (NZX 2000)

		NZX 2000 800				
		S	SY	SY2	S DL	SY2 DL
Capacity						
Swing over bed	mm (in.)	800 (31.5)				
Max. turning diameter	mm (in.)	320 (12.5) <Interference with the cover>				
Max. workpiece delivery diameter	mm (in.)	300 (11.8)				
Bar work capacity	mm (in.)	65 (2.5) [80 (3.1)]**†				
Travel						
X-axis travel	mm (in.)	X1, X2: 210 (8.3)				
Y-axis travel	mm (in.)	—	Y1: 110 (4.3) <+65 (2.6), −45 (1.8)>	Y1: 110 (4.3) <+65 (2.6), −45 (1.8)> Y2: 110 (4.3) <+45 (1.8), −65 (2.6)>	—	Y1, Y2: 110 (4.3) <+65 (2.6), −45 (1.8)>
Z-axis travel	mm (in.)	Z1, Z2: 810 (31.9)			Z1, Z2: 280 (11.0)	
Spindle 1						
Max. spindle speed	min ^{−1}	5,000 [4,000]**†				
Spindle nose		JIS A ₂ -6				
Through-spindle hole diameter	mm (in.)	73 (2.8) [91 (3.5)]**†				
Spindle 2						
Max. spindle speed	min ^{−1}	5,000				
Spindle nose		JIS A ₂ -6				
Through-spindle hole diameter	mm (in.)	73 (2.8)				
Turret						
Turret type		16-station×2				
Shank height for square tool	mm (in.)	20 (0.8)				
Max. rotary tool spindle speed	min ^{−1}	6,000 [12,000]				
Feedrate						
Rapid traverse rate	mm/min (ipm)	X1, X2: 30,000 (1,181.1)	X1, X2: 30,000 (1,181.1)	X1, X2: 30,000 (1,181.1)	X1, X2: 30,000 (1,181.1)	X1, X2: 30,000 (1,181.1)
		Z1, Z2: 50,000 (1,968.5)	Y1: 20,000 (787.4)	Y1, Y2: 20,000 (787.4)	Z1, Z2: 50,000 (1,968.5)	Y1, Y2: 20,000 (787.4)
			Z1, Z2: 50,000 (1,968.5)	Z1, Z2: 50,000 (1,968.5)		Z1, Z2: 50,000 (1,968.5)
Motors						
Spindle 1 drive motor (30 min. / cont)	kW (HP)	25 / 22 (33.3 / 30) [26 / 22 (34.7 / 30)]**† [25 / 22 (33.3 / 30) <High-torque>]				
Spindle 2 drive motor (30 min. / cont)	kW (HP)	25 / 22 (33.3 / 30) [25 / 22 (33.3 / 30) <High-torque>]				
Rotary tool spindle drive motor (30 min. / cont)	kW (HP)	7.5 / 5.5 (10 / 7.5)				
Machine size						
Machine height <From floor>	mm (in.)	2,320 (91.3)			2,460 (96.9)	
Floor space <Width×Depth>	mm (in.)	4,396×2,835 (173.1×111.6) [4,897×2,835 (192.8×111.6)**†] [5,129×2,835 (201.9×111.6)**†]			4,396×2,957 (173.1×116.4) [4,897×2,957 (192.8×116.4)**†] [5,129×2,957 (201.9×116.4)**†]	
Mass of machine	kg (lb.)	8,200 (18,040)	8,300 (18,260)	8,500 (18,700)	8,200 (18,040)	8,500 (18,700)
Control unit						
FANUC		F31iB				

[] Option

*1 Bar work capacity ϕ 80 mm (ϕ 3.1 in) Specifications <Spindle 1 only>

*2 Including chip conveyor (right disposal)

*3 Including chip conveyor (right disposal) <EN type>

● Bar work capacity: Depending on the chuck cylinder used and its restrictions, it may not be possible to reach full bar work capacity.

● Max. spindle speed: Depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.

● Machine size: The actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.

● The information in this catalog is valid as of October 2016.

Main Machine Specifications

			NHX 4000	NHX 5000
Travel				
X-axis travel <longitudinal movement of saddle>	mm (in.)		560 (22.0)	730 (28.7)
Y-axis travel <vertical movement of spindle head>	mm (in.)		560 (22.0)	730 (28.7)
Z-axis travel <cross movement of pallet>	mm (in.)		660 (26.0)	880 (34.6)
Distance from pallet center to spindle gage plane	mm (in.)		70—730 (2.8—28.7)	70—950 (2.8—37.4)
Pallet				
Pallet working surface	mm (in.)		400 × 400 (15.7 × 15.7)	500 × 500 (19.7 × 19.7)
Pallet loading capacity	kg (lb.)		400 (880)	500 (1,100) [700 (1,540)]
Max. workpiece swing diameter	mm (in.)		630 (24.8)	800 (31.4)
Max. workpiece height	mm (in.)		Tap pallet: 900 (35.4) [T-slot pallet: 880 (34.6)]	1,000 (39.4)
Pallet indexing time (90°)	s		1.65*1 <1° indexing> [0.73*2 <full 4th axis rotary table>]	1.83*1 [1.97*1*3] <1° indexing>, [0.94*2] <full 4th axis rotary table>
Spindle				
Max. spindle speed	min ⁻¹		15,000 [15,000 <high torque>] [20,000 <high speed>]	
Feedrate				
Rapid traverse rate	mm/min (ipm)		X, Y, Z: 60,000 (2,362.2)	
Cutting feedrate	mm/min (ipm)		X, Y, Z: 0—60,000 (0—2,362.2) (when using high-precision control <look-ahead control>)	
ATC				
Type of tool shank			BT40** [CAT40] [DIN40] [HSK-A63]	
Tool storage capacity**5			Ring-type: 40 [60] Chain-type**6: [120] Rack-type**6: [180] [240]	
Max. tool diameter <with adjacent tools>	mm (in.)		70 (2.7)	
Max. tool diameter <without adjacent tools>	mm (in.)		170 (6.6): ring-type [140 (5.5): chain-type, rack-type]	
Max. tool length	mm (in.)		450 (17.7)	550 (21.6)*7
Max. tool mass	kg (lb.)		12 (26.4)	
Tool changing time	Cut-to-cut (chip-to-chip) <MAS>	s	2.2: 40 tools <ring-type>	2.5: 40 tools <ring-type>
APC				
Number of pallets			2	
Pallet changing time**8		s	8.0	9.0 [12.5*3]
Motor				
Spindle drive motor <MAPPS>	15,000 min ⁻¹	kW (HP)	30.7 / 26 / 18.5 (40.9 / 34.7 / 24.7) <15%ED / 30 min / cont>	
	15,000 min ⁻¹ <high torque>	kW (HP)	[37 / 26 / 22 (50 / 34.7 / 30) <15%ED / 30 min / cont>]	
	20,000 min ⁻¹ <high speed>	kW (HP)	[37 / 26 / 18.5 (50 / 34.7 / 24.7) <15%ED / 30 min / cont>]	

Annex 9

	NT4250 DCG			
	/1000, /1000Z	/1000S, /1000SZ	/1500, /1500Z	/1500S, /1500SZ
Max. turning diameter	Tool spindle: Capto C6 $\phi 660$ mm ($\phi 25.9$ in.) Turret 2 $\phi 350$ mm ($\phi 13.7$ in.)			
Max. turning length	1,047 mm (41.2 in.)	1,027 mm (40.4 in.)	1,562 mm (61.4 in.)	1,542 mm (60.7 in.)
Bar work capacity	80 mm (3.1 in.)	80 mm (3.1 in.)/80 mm (3.1 in.) ^{*2}	80 mm (3.1 in.)	80 mm (3.1 in.)/80 mm (3.1 in.) ^{*2}
	NT4200 DCG	NT4250 DCG	NT4300 DCG	NT5400 DCG
Chuck size	8-inch	10-inch	12-inch	15-inch
Max. spindle speed	5,000 min ⁻¹ 5,000 min ⁻¹ [OP]*	4,000 min ⁻¹ 4,000 min ⁻¹ [OP]*	3,000 min ⁻¹ 3,000 min ⁻¹ [OP]*	2,400 min ⁻¹ 2,400 min ⁻¹ [OP]*

* High output

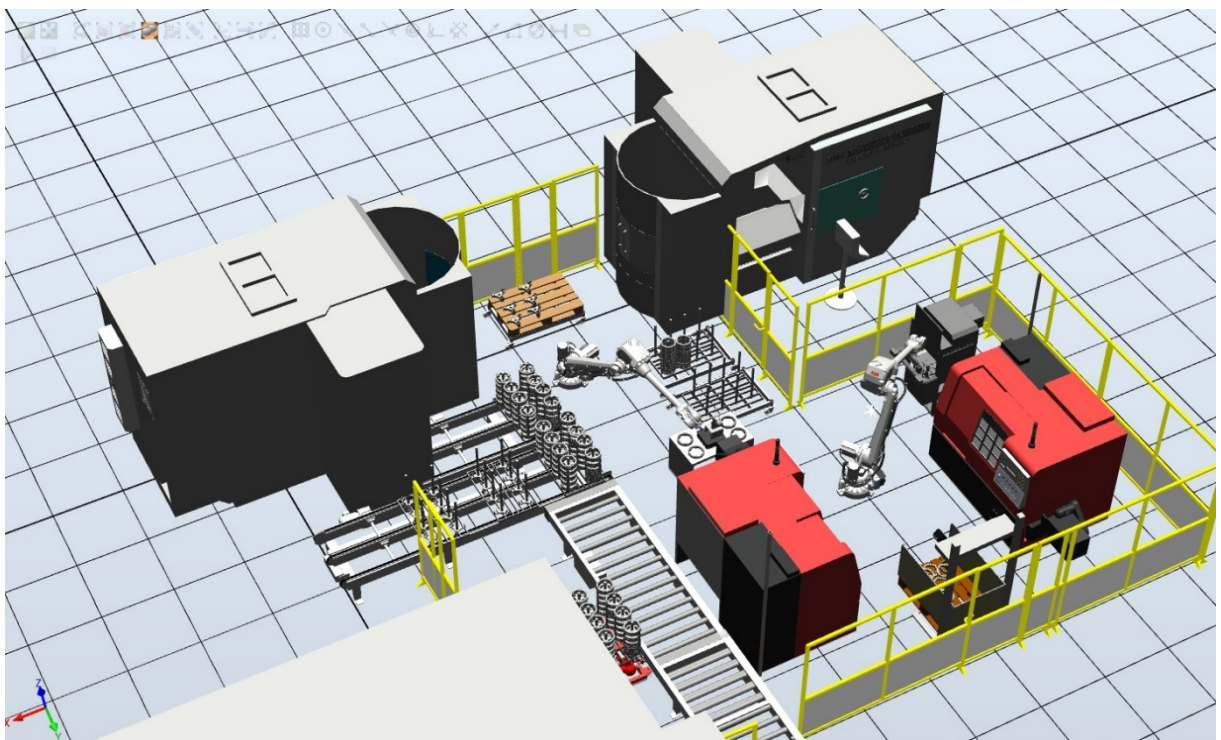
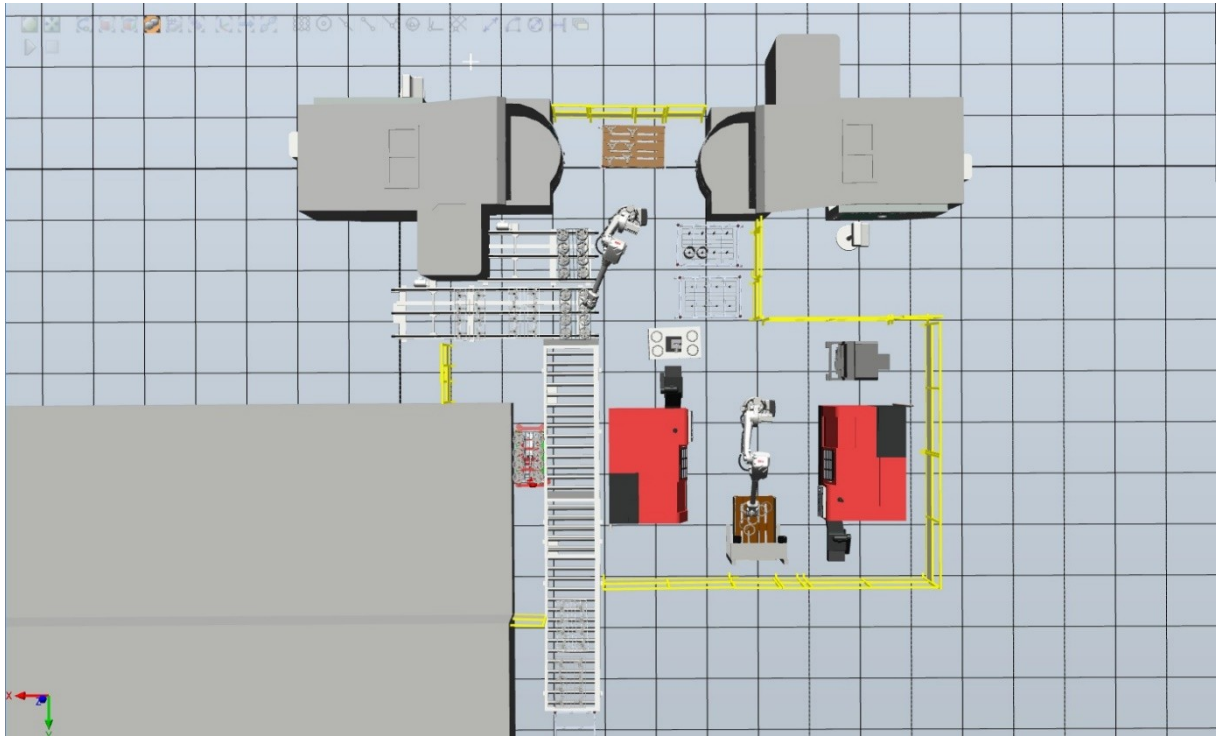
Tool-to-tool

NT4200 DCG, NT4250 DCG, NT4300 DCG	NT5400 DCG
1.25 sec.	2.4 sec. <Less than 15 kg (33 lb.)>

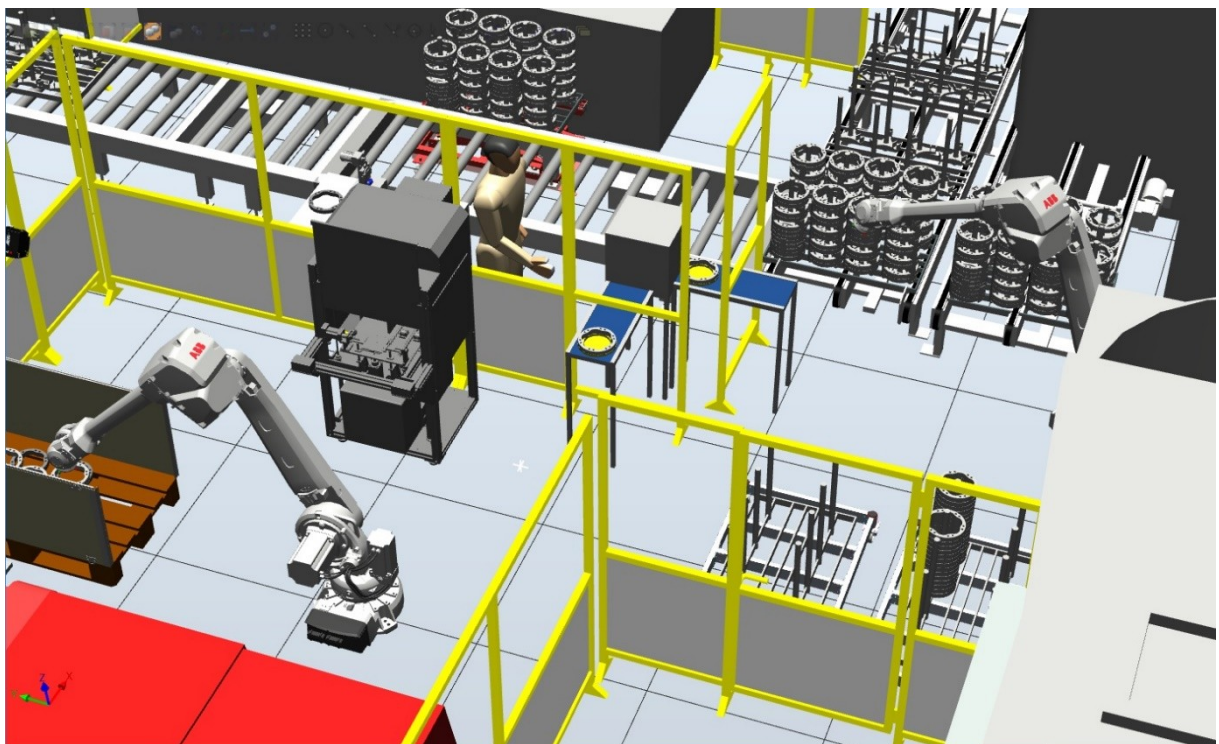
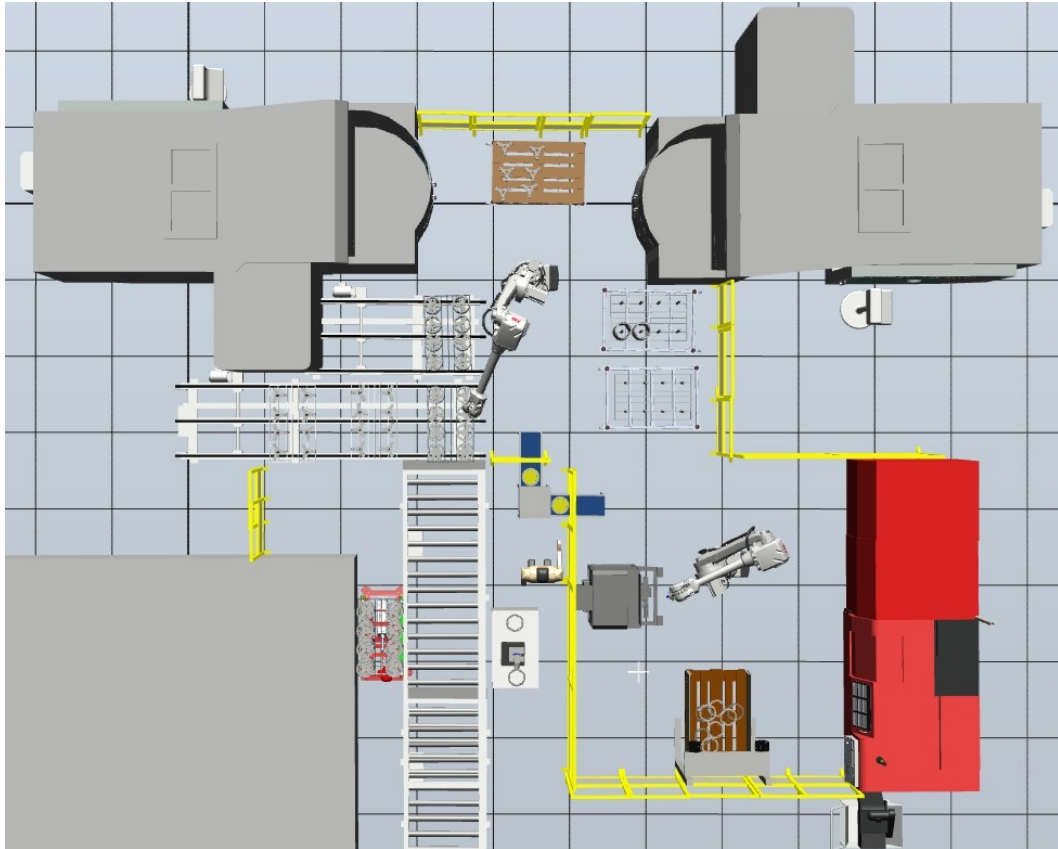
Tool storage capacity

NT4200 DCG, NT4250 DCG, NT4300 DCG	NT5400 DCG
20 tools 40, 100, 179, 239 tools [OP]	20 tools 40, 80, 139, 179 tools [OP]

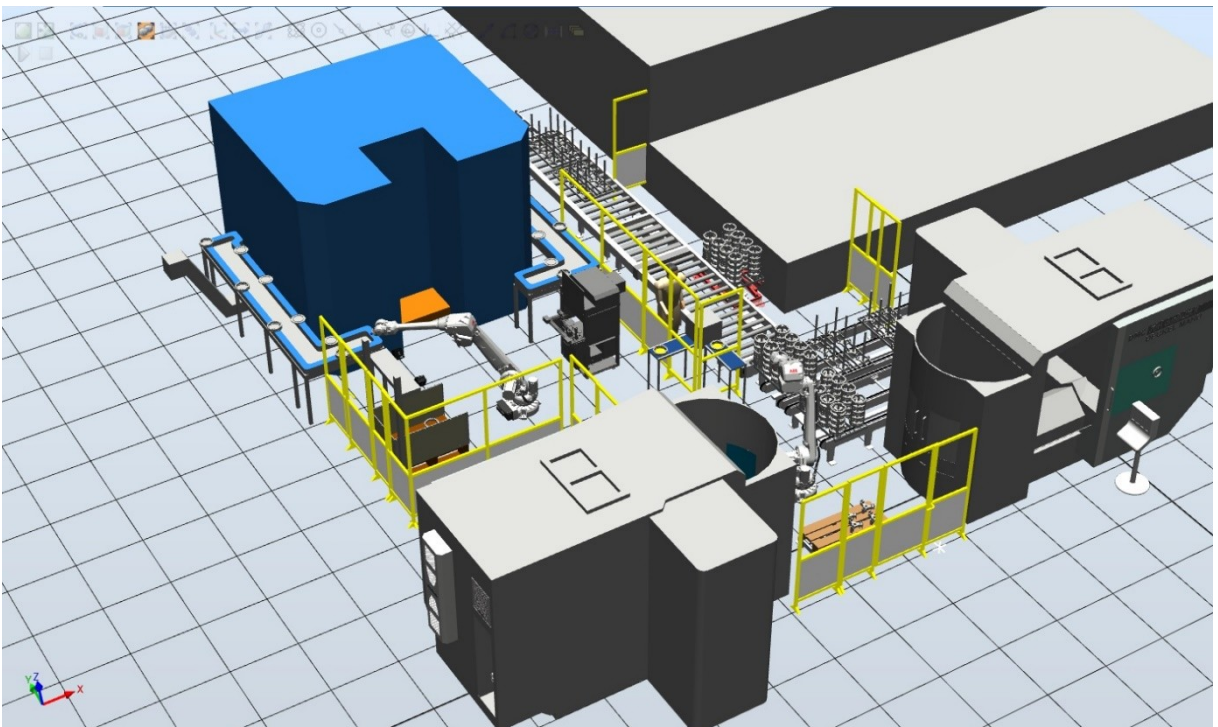
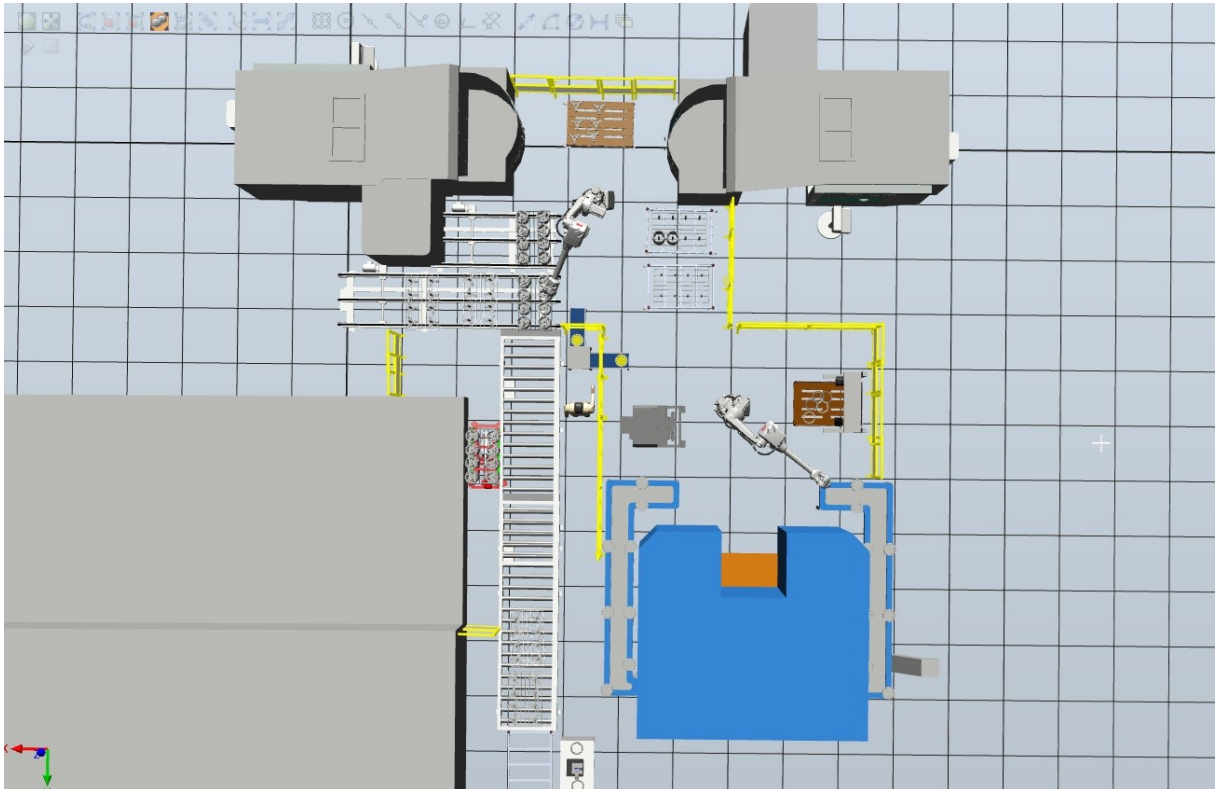
Annex 10



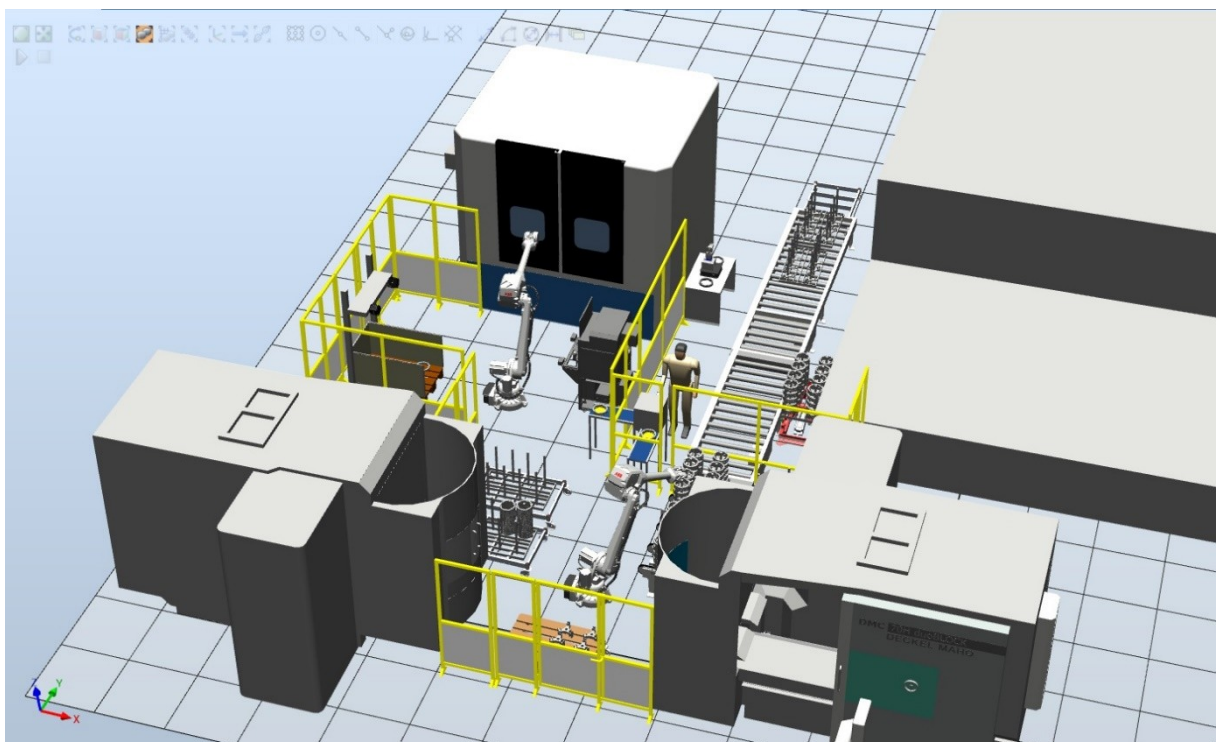
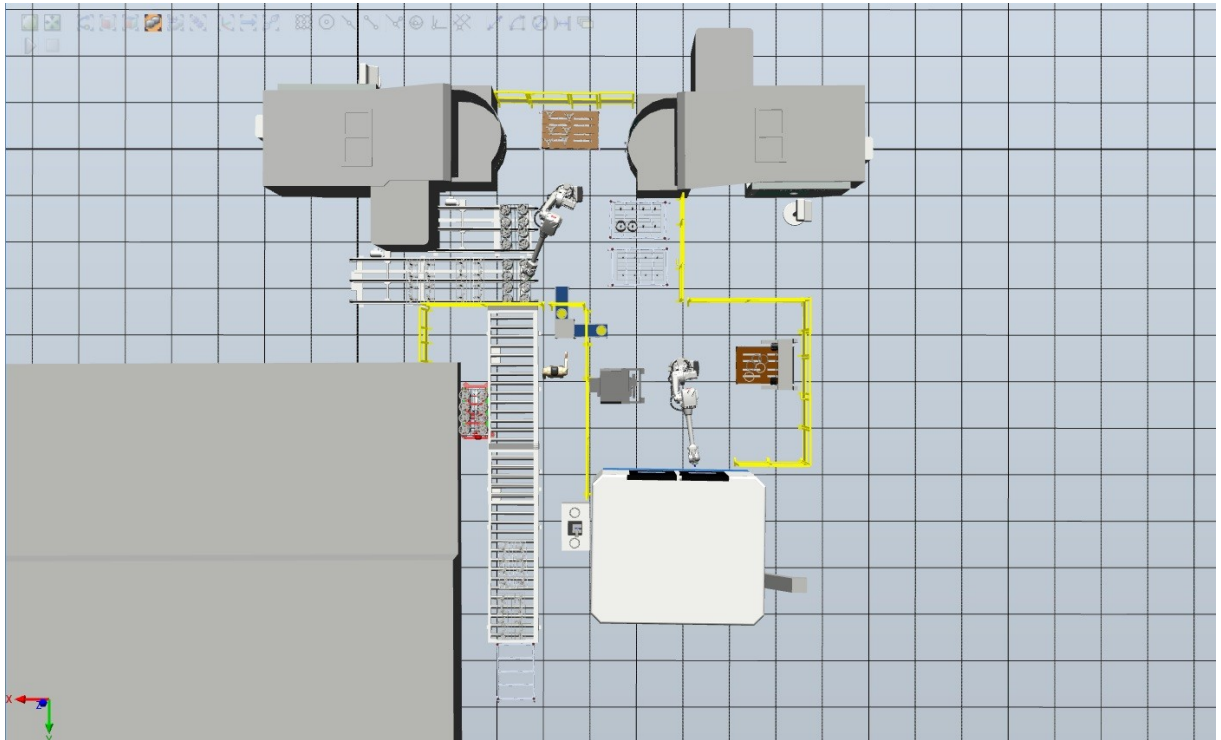
Annex 11



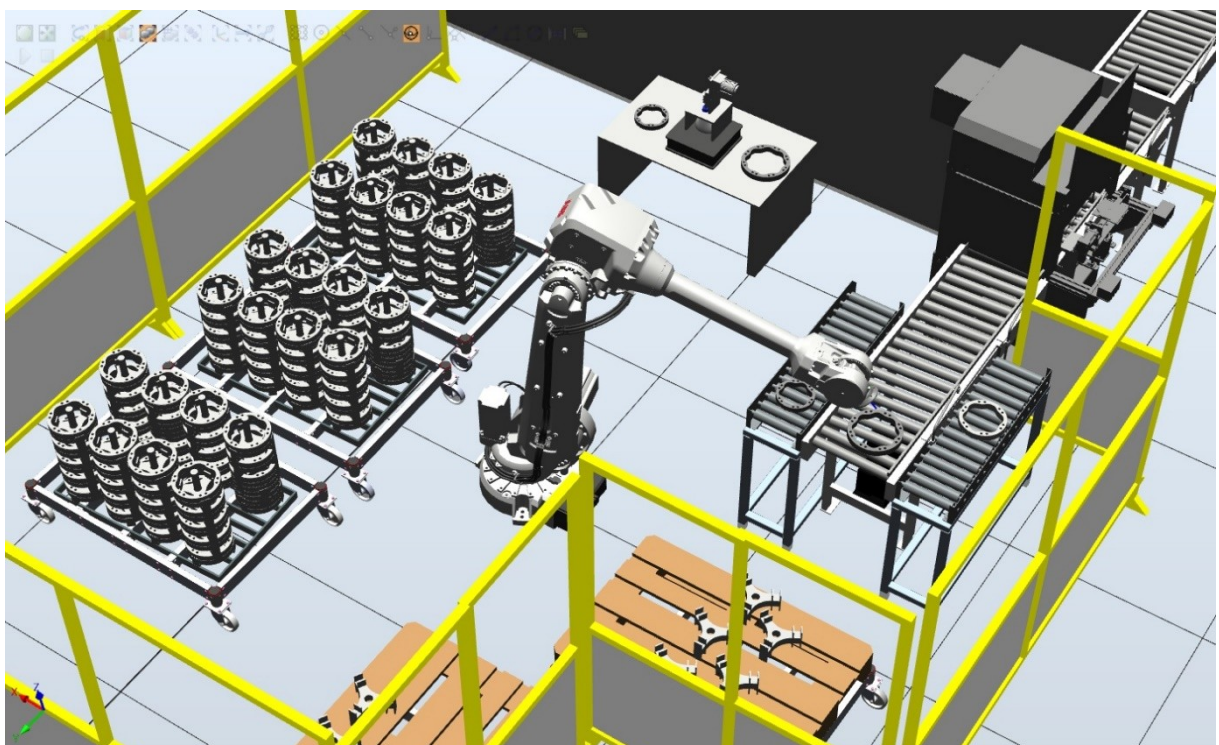
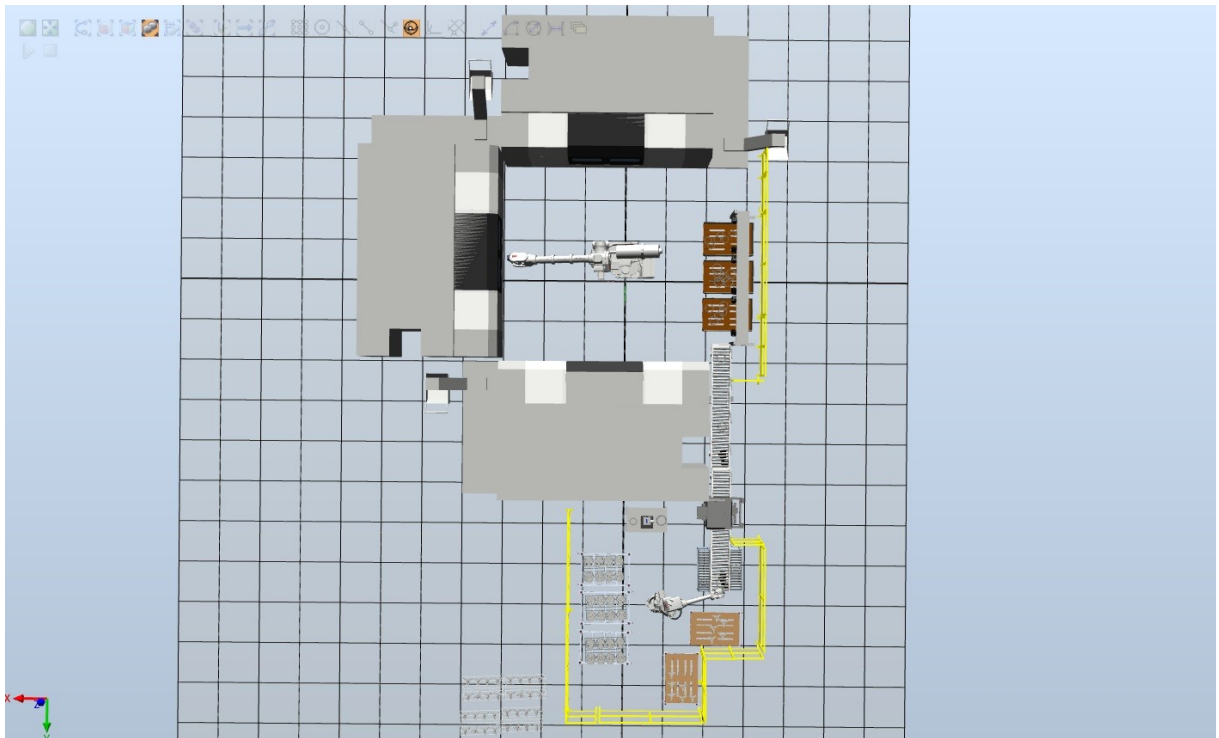
Annex 12



Annex 13



Annex 14



Annex 15

Specification

Robot versions	Reach (m)	Handling capacity (kg)	Center of gravity (mm)	Wrist torque (Nm)
6640-180*	2.55	280	300	961
6640-235*	2.55	235	300	1324
6640-205*	2.75	205	300	1264
6640-485*	2.80	185	300	1206
6640-130	3.20	130	300	1037
6640ID-200	2.55	200	300	1262
6640ID-170	2.75	170	300	1190

* Available as Lean ID option.
Extra loads can be mounted on all variants
50 kg on upper arm (except ID) and 250 kg on frame of axis 1.

Number of axes	6
Protection	Complete robot IP 67
Mounting	Floor mounted
IRC5 Controller variants	Single cabinet, Dual cabinet

Performance

Positions repeatability (mm)	0.07
Path repeatability (mm)	0.7

Axis movements	Working range	Working range	Axis max speed
	6640	6640ID	6640
Axis 1 Rotation	+170° to -170°	+170° to -170°	100 to -110°/s
Axis 2 Arm	+85° to -65°	+85° to -65°	90°/s
Axis 3 Arm	+70° to -180°	+70° to -180°	90°/s
Axis 4 Wrist	+300° to -300°	+300° to -300°	170 to -190°/s
Axis 5 Bend	+120° to -120°	+100° to -100°	120 to -140°/s
Axis 6 Turn	+360° to -360°	+300° to -300°	190 to -235°/s

For IRB 6640ID axis 4 and 6 together max +300° to -300°.
A supervision function prevents overheating in applications with intensive and frequent movements.

Environment

Ambient temperature for mechanical unit	
During operation	+5°C (41°F) - +50°C (122°F)*
During transportation and storage for short periods (max 24h)	-25°C (13°F) - +55°C (131°F)*
Relative humidity	Max 95 %
Noise level	Max 71 dB (A)
Safety	Double circuits with supervision, emergency stops and safety functions, 3-position enable device
Emission	EMC/EMI-shielded
Options	Foundry Plus 2 Foundry Prime 2

*In a high-speed press tending application, max ambient temperature is 40°C

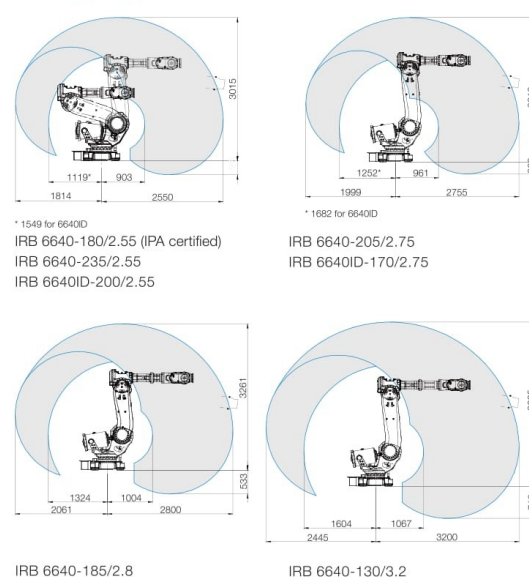
Electrical Connections

Supply voltage (Hz)	2000-600 V, 50/60 Hz
Power consumption (kW)	ISO-Cube 2.7 kW

Physical

Dimensions robot base (mm)	1107 x 720
Weight (kg)	1310 - 1405

Working range



For more information please contact:

ABB AB Robotics
Hydrovägen 10
SE-721 36 Västerås, Sweden
Phone: +46 21 325000

www.abb.com/robotics

Note

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