



LL SERIES



HORIZONTAL TURNING & TURNMILL CENTERS

CNC TURNING CENTERS

2 Axes Upto 700 mm turning length



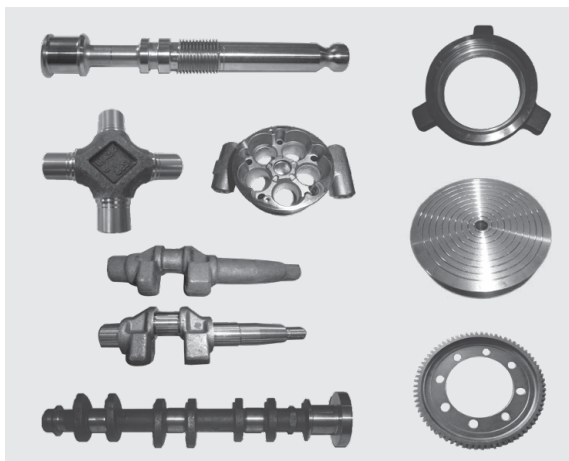
LL20T L3/L5/L7, LL25T L5/L7/ LL30T L7

2 Axes One metre CNC Turning Centers



LL20T L10/LL25T L10/LL30T L10

MACHINING SOLUTIONS



TURNMILL CENTERS

3 Axes Live tool



LL20TM L5/L7/L10, LL25TM L7, LL30TM L10

Upto 6 Axes Live tool, Y axis, Sub-spindle



LL20MY L5, LL20MYS L5

MACHINING SOLUTIONS



LL30T L10



HIGHLIGHTS

- Larger swing over bed.
- Bearing diameter of 120mm with A2-8 spindle nose.
- Bigger size rigid hydraulic turret with A/F 400mm.
- High Precision Roller LM Guide ways.
- Boring bar diameter of 50mm for bigger operations.
- Highly rigid bed structure for heavy cutting.
- User friendly design.

MACHINING SOLUTIONS



LL SERIES

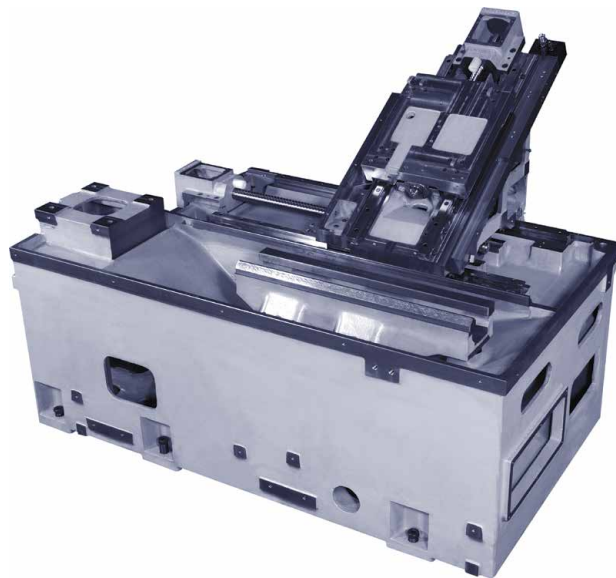
LL Series, CNC lathes to stay ahead of your competition with high efficiency turning.

The LL Series capture all your needs to sustain from here. These are with additional power, faster traverses and indeed very user friendly.

Simple to use, easy to maintain, the LL Series is a true value to improve overall manufacturing efficiency.

The LL Series lends itself minimum floor space and available time.

Computer optimised cast iron (FG 300) box structure bed for stable material removal, free of vibration.



LL20TL3 / L5 / L7 / L10

9 kW (continuous) power at the spindle provides enormous capacity for highly efficient metal cutting. A massive hydraulic turret providing over 23 kN of clamping force ensures very stable machining. Very responsive feed mechanism incorporating widely spaced, amply dimensioned Linear Motion guides and large diameter ball screws provide excellent part-to-part repeat accuracies.

Copious coolant and stability in machining ensure use of optimum cutting parameters, thereby reducing cost. Interference free turning diameter and ample working clearances are added for operator convenience.

LL25TL5 / L7 / L10

The LL25T takes a 254 mm diameter chuck and yet provide ample working clearances as well as interference free tool setting. The maximum turning length available is 480, 670 & 1020 mm.

Full 15 kW from 292 rpm onwards through inbuilt motor Low gear / High gear winding connections switch over through M codes.

LL30TL7 / L10

The LL30T takes a 304 mm diameter chuck that provides maximum turning diameter of 400 mm and maximum turning length of 611 & 960 mm which helps to cater the turning demand of today's and tomorrow's market.

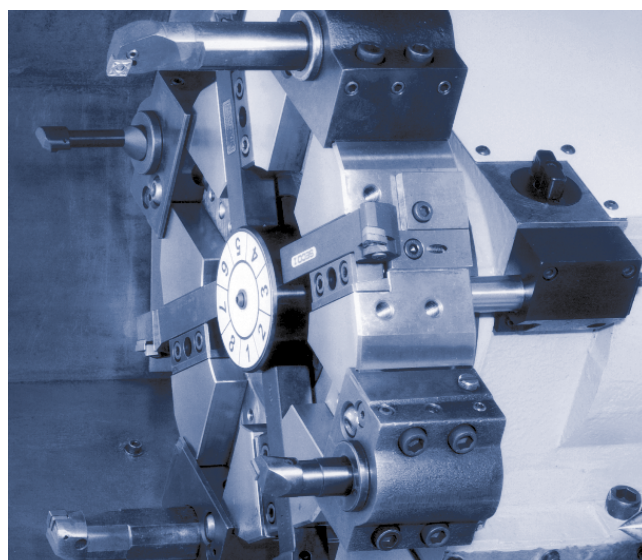
HYDRAULIC TURRET

The 8 station vertically indexing turret uses bi-directional shortest path indexing to reduce non-cut time. The forged steel turret employs a high torque hydraulic motor for indexing and clamping.

OPTIONAL

12 station turret

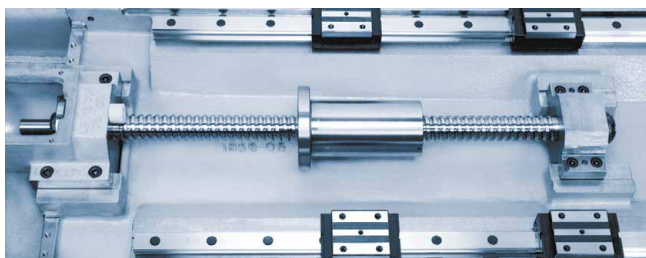
25x25 square shank with maximum boring bar diameter of 40 mm Use of a 180mm diameter coupling and 23 kN of clamping force ensures very stable machining close to clamping forces.



HIGH RESPONSE FEED MECHANISM

The LL Series employs low-friction linear Motion guideways for both the axis traverses. The seating and locating surface are precision machined to a tolerance of 10 microns. The LM guides provide stick-slip free movement. These are extremely long lasting and free of any deformation, thereby retaining the accuracies over a longer period of continuous use.

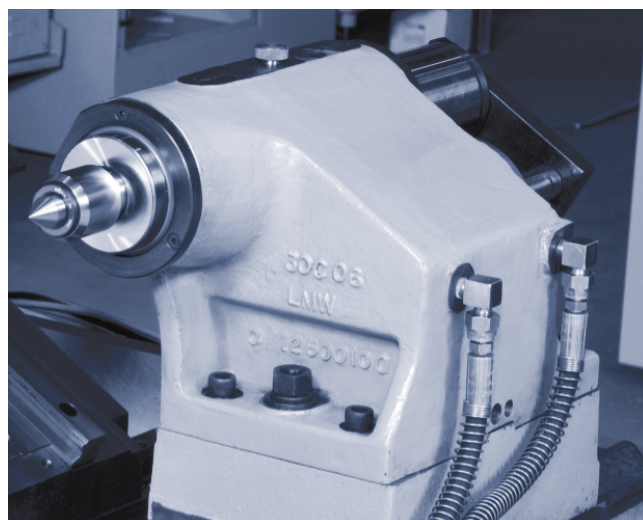
Large diameter ball screws, with double nut pretensioning helps in providing ample feed thrust and high rapid traverse rate. The ball screw remain supported at both ends by P4 class angular contact ball bearings. The stiffness built into the feed mechanism of the LL Series ensures a high degree of accuracy in positioning as well as interpolated cutting. Excellent part to part repeat accuracies allow you to achieve greater process capabilities.



UNIVERSAL APPLICATION

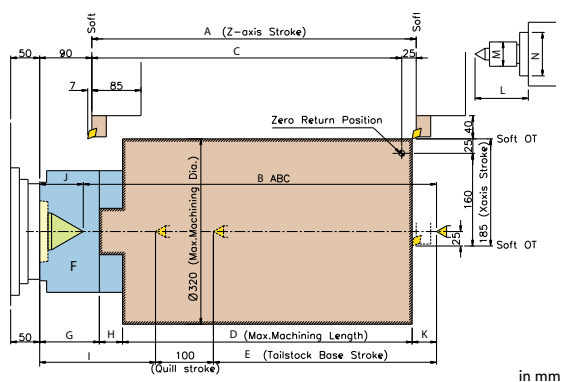
The LL series is equally suitable for both chucking & shaft turning applications.

The heavy duty tailstock interpolates an MT-5 ADD-ON center & provides a maximum thrust of 500 kg.

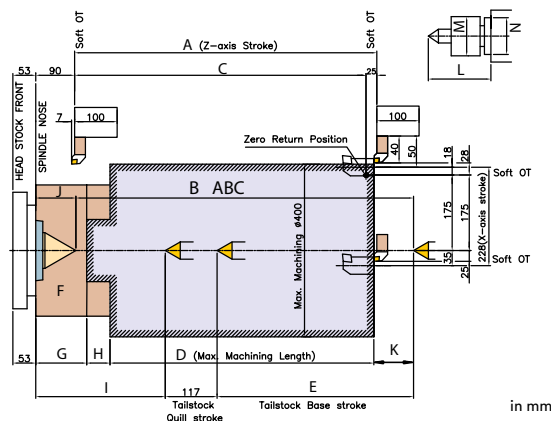


MOVING RANGE

LL20T L3 / L5 / L7 / L10
LL25T L5 / L7 / L10



LL30T L7 / L10



Description	LL20T L3	LL20T L5	LL20T L7	LL20T L10	LL25T L5	LL25T L7	LL25T L10	LL30T L7	LL30T L10
A	370	560	750	1100	560	750	1100	700	1050
B	440	625	830	1175	610	815	1160	782	1100
C	345	535	725	1075	535	725	1075	675	1025
D	310	500	690	1040	480	670	1020	611	960
E	235	420	575	920	420	575	920	458	876
*F	Ø210	Ø210	Ø210	Ø210	Ø254	Ø254	Ø254	Ø304	Ø304
*G	103	103	103	103	120	120	120	118	118
*H	40	40	40	40	43	43	43	54	54
I	180	180	230	230	180	230	230	300	200
J	75	75	75	75	90	90	90	93	93
K	62	57	72	67	57	72	67	92	61
L	120	120	120	120	142	142	142	147	147
M	Ø68	Ø68	Ø68	Ø68	Ø87	Ø87	Ø87	Ø87	Ø87
N	Ø75	Ø75	Ø75	Ø75	Ø85	Ø85	Ø85	Ø85	Ø85

* Value varies w.r.t chuck manufacturer.

LL SERIES

BASIC INFORMATION

DIAGRAMS

SPECIFICATIONS

APPLICATIONS & SOLUTIONS

SPECIFICATIONS

Title	Description	Unit	LL 20T L3	LL 20T L5	LL 20T L7	LL20T L10	LL 25T L5	LL 25T L7	LL25T L10	LL30T L7	LL30T L10	
Capacity	Swing over bed	mm	510							610		
	Chuck dia. Max	mm	210				254			304		
	Max. Turning dia	mm	320							400		
	Max. Turning Length*	mm	310	500	690	1040	480	670	1020	611	960	
	Admit between Centres	mm	440	625	830	1175	610	815	1160	782	1100	
Spindle	Spindle nose	type	A2-6							A2-8		
	Hole through spindle	mm	61				77					
	Spindle speed	rpm	3500							3000		
	Spindle motor power (Cont./15 Min)	kW	9/11				11 / 15			15/18.5		
Feed System	Cross travel X-axis	mm	185							228		
	Longitudinal travel Z-axis	mm	370	560	750	1100	560	750	1100	700	1050	
	Rapid traverse rate X/Z axes	m/min	30 / 36									
Turret	No. of stations	nos.	8									
	Tool shank size	mm	25 x 25									
	Max. Boring bar dia.	mm	40							50		
	Turret indexing	type	Bi-directional									
	Turret indexing time	sec	Less than 1							Less than 1.2		
Tailstock	Quill dia	mm	75				85					
	Quill stroke	mm	100							117		
	Quill taper	–	MT-4				MT-5					
CNC System	Controller	–	Fanuc / Siemens*									
Power Supply	Power Requirement	kVA	21				28.6			30		
Machine Size	Front x Side x height	mm	2065 × 1650 x 1920	2255 × 1650 x 1920	2705x1650 x 1920	3055 × 1695 x 1920	2505 × 1650 x 1920	2705 × 1650 x 1920	3055 × 1695 x 1920	2915 × 1810 x 2085	3230 × 1900x 2085	
	Weight	Kg	3500	3500	3800	4200	3800	4000	4200	5000	5500	

Note: *May vary depending upon make / model of chuck.

MATERIAL REMOVAL RATE (MRR)
STEEL EN8

OUTER DIA TURN TEST

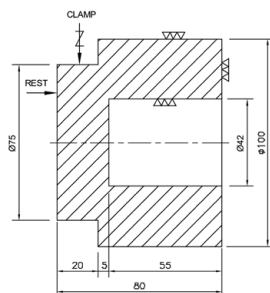
Description	Unit	LL20T Series	LL25T Series	LL30T Series	
				Min	Max
Diameter	mm	64	79	171	376
Cutting Speed	m/min	200	200	205	250
Spindle Speed	rpm	1000	806	380	212
DOC	mm	3	7.5	6.5	5
Feed	mm/rev	0.32	0.3	0.25	0.2
Capacity	cc/min	192	450	333	250
Spindle Load	%	100	100	82	108
Max.Spindle speed	rpm	3500	3500	3500	3500
Spindle Base speed	rpm	1000	438	500	500
Spindle Power	kW	9/11	11/15	15/18.5	15/18.5



DRILLING TEST

Description	Unit	LL20T Series	LL25T Series	LL30T Series
Diameter	mm	40	50	50
Cutting Speed	m/min	150	150	125
Spindle Speed	rpm	1190	850	800
Feed	mm/rev	0.1	0.12	0.18
Spindle Load	%	100	100	70
Max.Spindle speed	rpm	3500	3500	3500
Spindle Base speed	rpm	1000	438	500
Spindle Power	kW	9/11	11/15	15/18.5

ACCURACY



Surface Finish Ra			Roundness mm		Perpendicularity mm	
I.D.	O.D.	Face	I.D.	O.D.	I.D.	O.D.
0.3	0.3	0.24	0.002	0.002	0.002	0.002
Cylindricity mm		Concentricity mm		Flatness mm		
I.D.	O.D.					
0.003	0.003	0.004		0.002		

MATERIAL : STEEL EN8



Tapping

	LL20T Series	LL25T Series	LL30T Series
Max. Tap Size	M16 x 2	M24 x 3	M30 x 3

Threading

	Threading Dia	Cutting Speed	Spindle Speed	Pitch	Spindle Load
LL30T Series	170 mm	245 m/sec	400 rpm	4 tpi	24%



Profile Turning

Sphericity	0.007 mm
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Note : Values shown are in test conditions, may vary depending on tools, materials and cutting parameters / conditions

TURNMILL CENTRES

- LL20TM L5
- LL20TM L7
- LL20TM L10
- LL25TM L7
- LL30TM L10

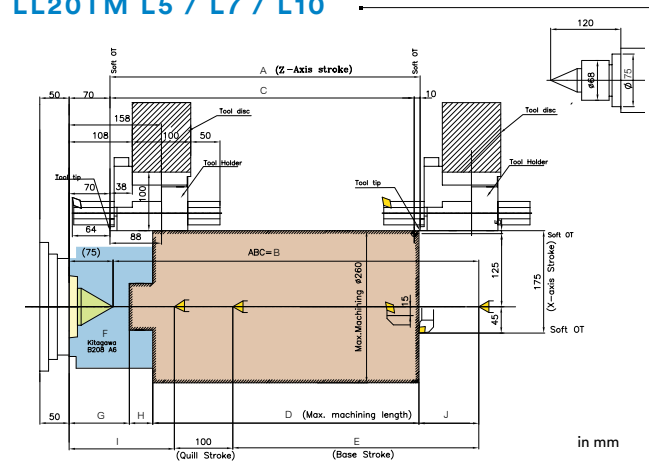
LIVE TOOL TURRET

- 12 station driven tools
- BMT 55/65 Turret
- Clamping / Declamping - Hydraulic
- Turret Indexing - Servo Turret



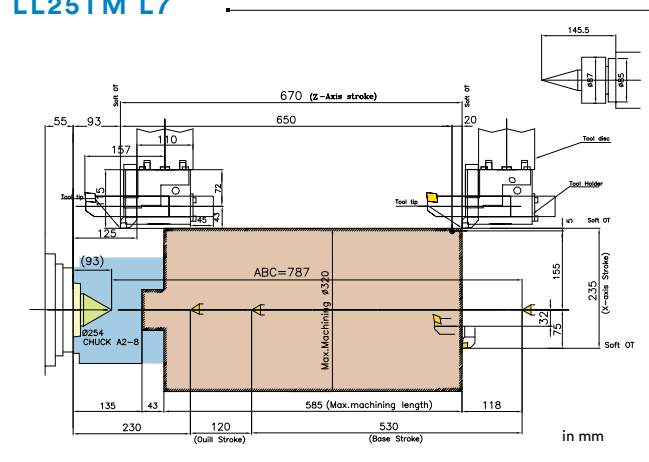
MOVING RANGE

LL20TM L5 / L7 / L10

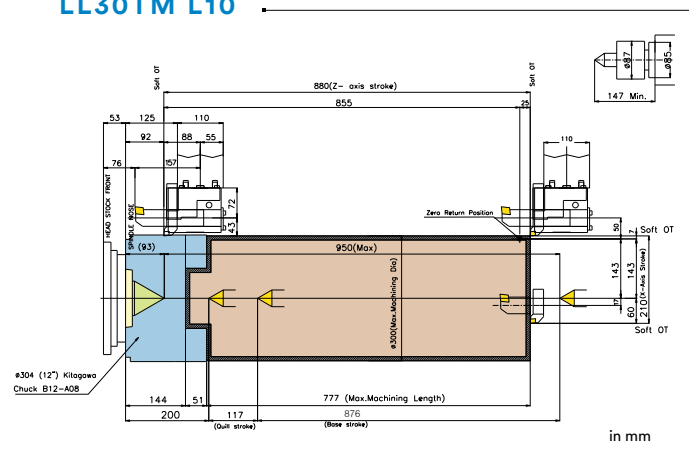


Description	A	B	C	D	E	F	G	H	I	J
LL20TM L5	530	625	520	455	420	Ø210	103	40	180	102
LL20TM L7	750	830	740	675	575	Ø210	103	40	230	87
LL20TM L10	1050	1175	1040	975	920	Ø210	103	40	230	132

LL25TM L7



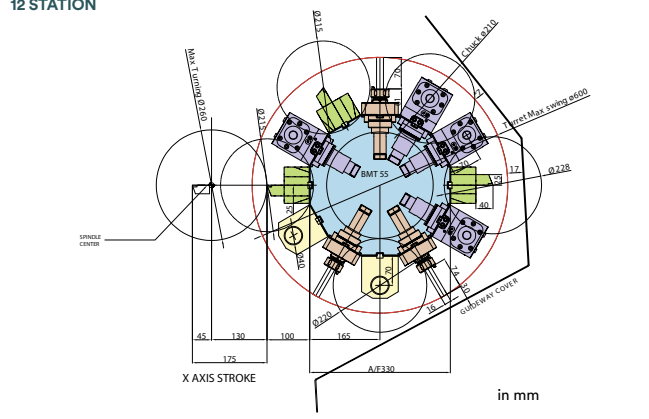
LL30TM L10



TURRET INTERFERENCE

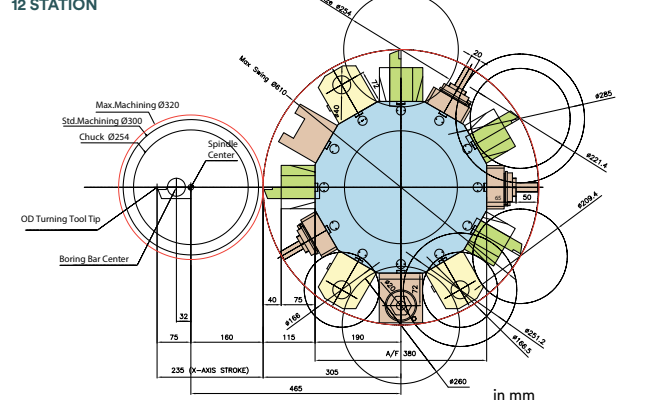
LL20TM L5 / L7 / L10

12 STATION



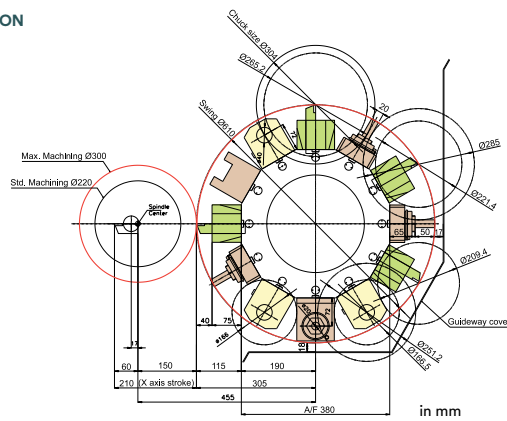
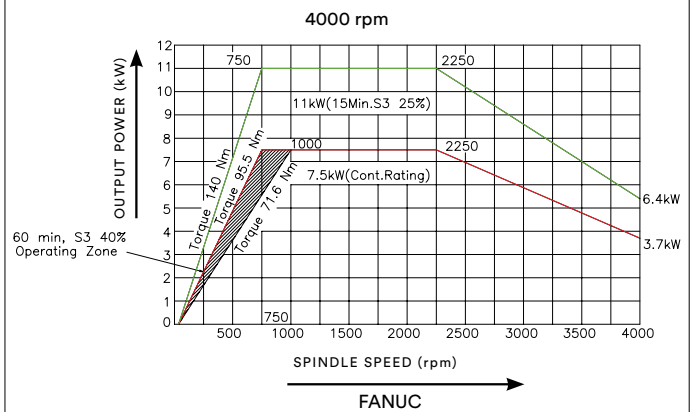
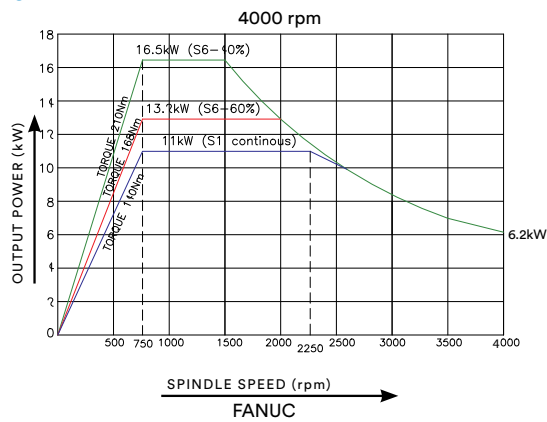
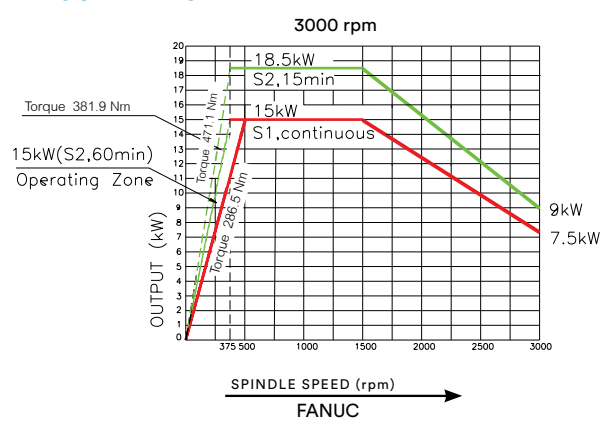
LL25TM L7

12 STATION



LL30TM L10

12 STATION

**SPEED POWER CURVE****LL20TM L5 / L7 / L10****LL25TM L7****LL30TM L10****SPECIFICATIONS**

Title	Description	Unit	LL20TM L5	LL20TM L7	LL20TM L10	LL25TM L7	LL30TM L10
Capacity	Swing over bed	mm	510				610
	Chuck dia, max	mm	210				304
	Max turning diameter	mm	260				300
	Max. turning length*	mm	455	675	975	585	777
	Admit between centres	mm	625	830	1175	787	1100
Spindle	Spindle nose	type	A2 – 6				A2 – 8
	Hole through spindle	mm	61				77
	Spindle speed	rpm	4000				3000
	Spindle motor power (Cont./15min)	kW	7.5 / 11				15/18.5
Feed System	Cross travel X-axis	mm	175				210
	Longitudinal travel Z-axis	mm	530	750	1050	670	880
	Rapid traverse rate X/Z-axes	m/min	30 / 36				
Turret	No. of stations	nos	12				
	Tool shank size	mm	25x25				
	Maximum boring bar dia	mm	40				
	Turret indexing	type	Servo				
Rotary	Spindle speed for rotary tool	rpm	5000				
	Motor power for rotary tool	kW	4.5				
Tailstock	Quill dia	mm	75				85
	Quill stroke	mm	100				117
	Quill taper	–	MT-4				MT-5
CNC System	Controller	–	Fanuc / Siemens*				Fanuc
Power Supply	Power Requirement	kVA	25				35
Machine Size	Front x Side x height	mm	2465 x 1770 x 1920	2920 x 1770 x 1920	3270 x 1945 x 1920	2920 x 1820 x 2020	3230 x 1900 x 2085
	Machine weight (Approx)	kg	4000	4200		4500	6000

Note: *May vary depending upon make / model of chuck.

LL SERIES

BASIC INFORMATION

DIAGRAMS

SPECIFICATIONS

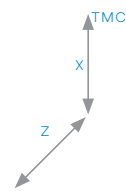
APPLICATIONS & SOLUTIONS

TURNMILL CENTRE WITH Y AXIS

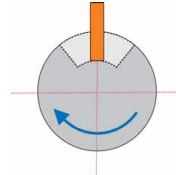
LL20MY L5



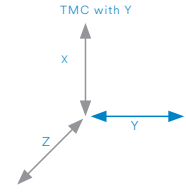
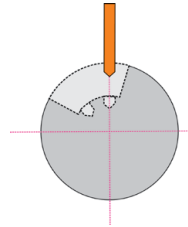
TMC Vs. TMC with Y Axis



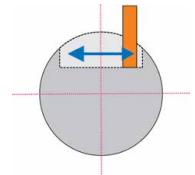
Radial Cutting: slots, pockets, flats



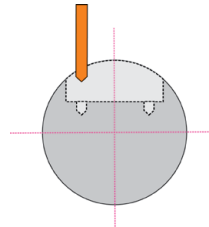
Radial Cutting: drilling



Radial Cutting: slots, pockets, flats



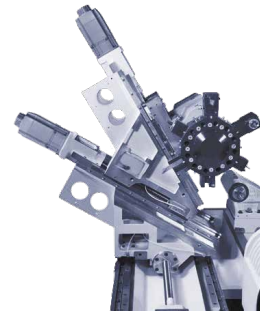
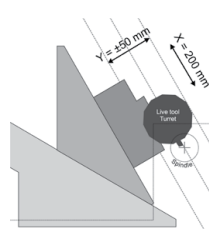
Radial Cutting: drilling



- 60° inclined, simplified design / structure
- LM Guides
- BMT 55 Turret
- 12 Station Drive Tools

SPECIFICATIONS

Title	Description	Unit	LL20MY L5
Capacity	Swing over bed	mm	510
	Chuck dia. Max	mm	210
	Max. Turning dia	mm	300
	Max. Turning Length*	mm	414
	Admit between Centres	mm	625
Spindle	Spindle nose	type	A2-6
	Hole through spindle	mm	61
	Spindle speed	rpm	4000
	Spindle motor power(Cont./S6 40%)	kW	9 / 13.5
Feed System	Inclination Cross slide	deg	60° to horizontal plan
	Travel X-axis	mm	230
	Travel Y-axis	mm	±50
	Travel Z-axis	mm	520
	Rapid traverse rate X / Y / Z axes	m/min	30 / 15 / 30
Live tool Turret	Turret Type	-	BMT 55
	No. of stations	nos.	12
	Tool shank size	mm	25 x 25
	Max. Boring bar dia.	mm	40
	Turret indexing	type	Servo
	Turret indexing time	sec	2.3 to 2.5
	Driven motor power	kW	4.82
	Rotary tool speed	rpm	4500
Tailstock	Quill dia	mm	75
	Quill stroke	mm	100
	Quill taper	-	MT-4
CNC System	Controller	-	Siemens
Power Supply	Power Requirement	kVA	35
Machine Size	Front x Side x height	mm	2940 x 1788 x 2005
	Weight	kgs	4500



MATERIAL REMOVAL RATE

MATERIAL : STEEL EN8

	Description	Unit	LL20MY L5
TURNING	Work Piece Ø	mm	66
	Cutting Speed	m/min	200
	Spindle	rpm	965
	Feed	mm/min	0.25
	Depth of Cut	mm	4

	Description	Unit	Radial		Axial		
			Y		Z	X	C
MILLING	Milling Cutter Ø	mm	15	16	15	16	16
	Cutting Speed	m/min	30	30	30	30	30
	Spindle	rpm	640	600	640	600	600
	Feed	mm/min	130	120	130	120	120
	Depth of Cut	mm	8	6	7	6	3

	Description	Unit	LL20MY L5
TAPPING	Tap Ø	mm	M10X1.5
	Cutting Speed	m/min	8
	Spindle	rpm	250
	Feed	mm/min	375
	Depth of Cut	mm	12

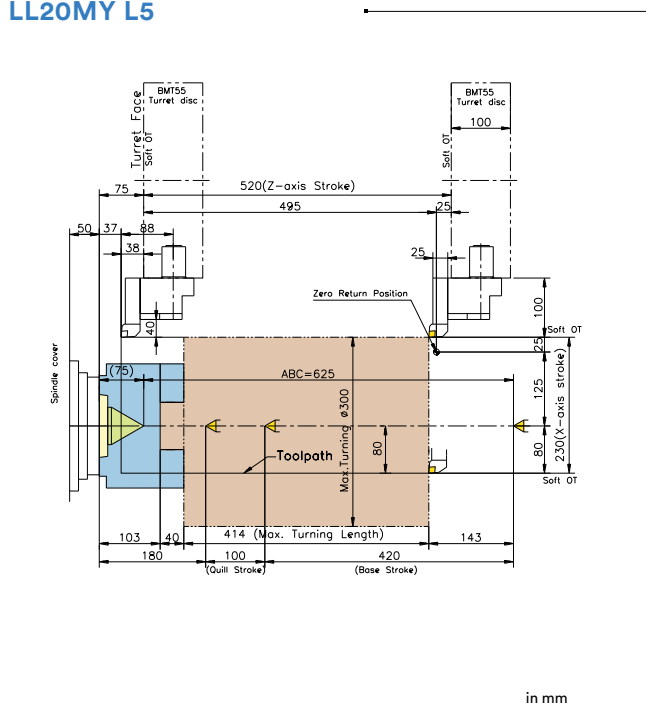
	Description	Unit	Solid Carbide	HSS Drill
DRILLING	Drill Ø	mm	10	14.5
	Cutting Speed	m/min	60	30
	Spindle	rpm	2000	660
	Feed	mm/min	200	100
	Pecking Depth	mm	10	5

* Note : Values shown are in test conditions, may vary depending on tools, materials and cutting parameters / conditions

Note: *May vary depending upon make / model of chuck.

MOVING RANGE

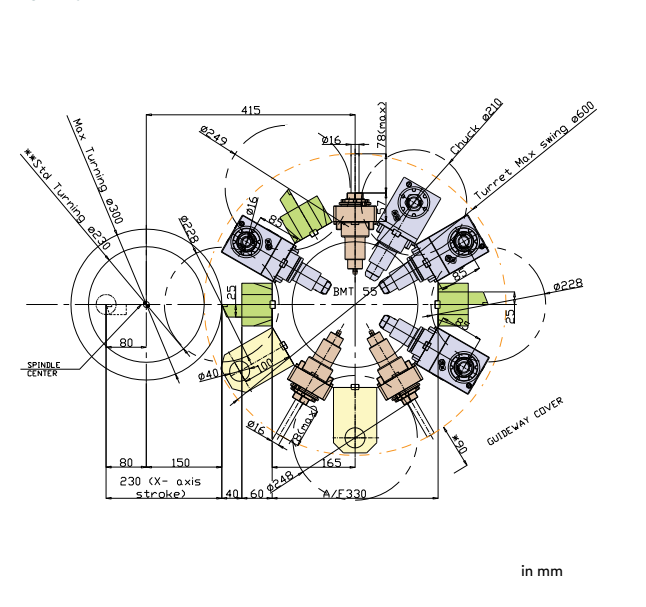
LL20MY L5



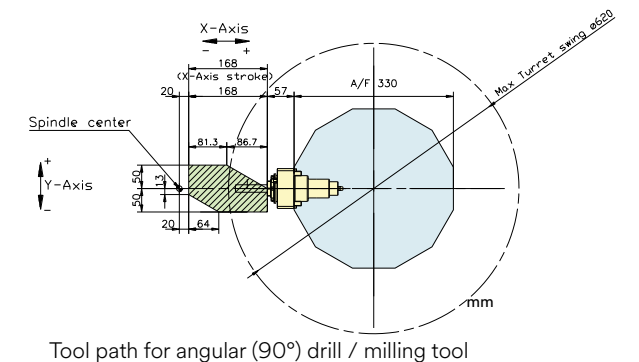
TURRET INTERFERENCE

LL20MY L5

12 STATION

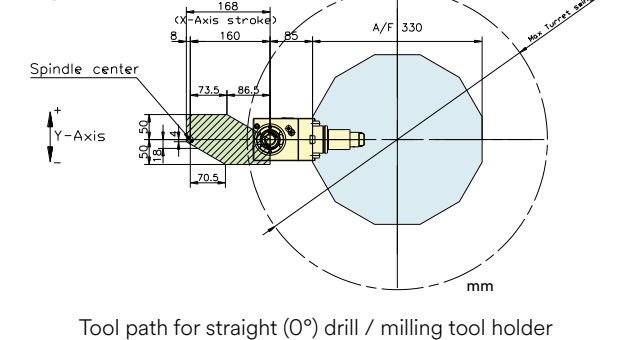


Y AXIS



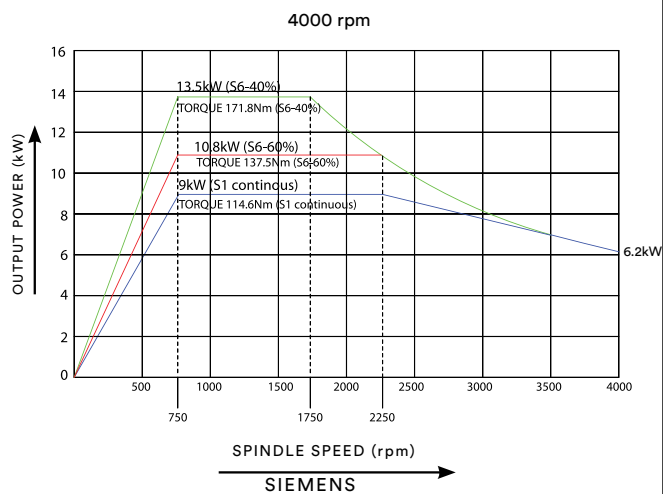
Note:
Angular Tool Holder (90°) Center height CH = 85mm
At Spindle Center + Y axis stroke = +50, - Y axis stroke = -37.3

Y AXIS

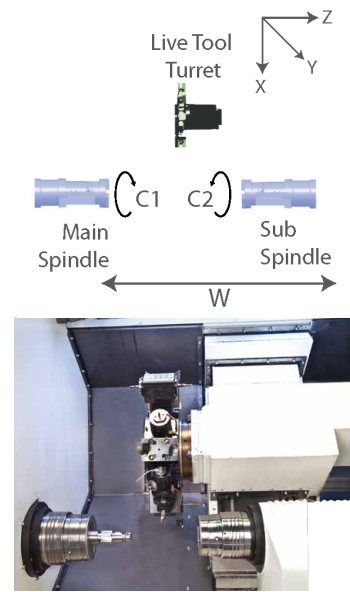


SPEED POWER CURVE

LL20MY L5



TURNMILL CENTRE WITH Y AXIS & SUB-SPINDLE LL20MYS L5



- 60° inclined, simplified design / structure
- LM Guides
- BMT 55 Turret
- 12 Station Drive Tools
- Sub Spindle

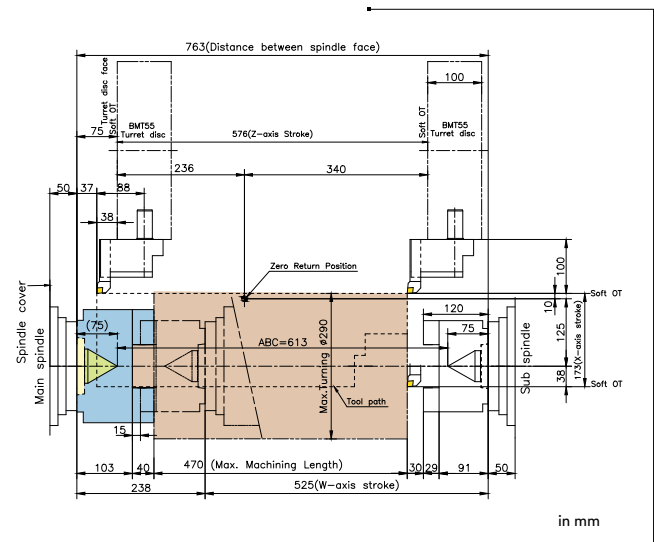
SPECIFICATIONS

Title	Description	Unit	LL20MYS L5
Capacity	Swing over bed	mm	560
	Max. Turning dia	mm	290
	Max. Turning Length*	mm	470
	Admit between Centres	mm	613
Main Spindle	Spindle nose	type	A2-6
	Chuck dia.	mm	210
	Hole through spindle	mm	61
	Max. Spindle speed	rpm	4000
	Spindle motor power	kW	7.5 / 11
	Spindle nose	type	A2-5
Sub Spindle	Chuck dia.	mm	165
	Hole through spindle	mm	53
	Max. Spindle speed	rpm	5000
	Spindle motor power	kW	5.5/ 7.5
Feed System	Inclination Cross slide	mm	60° to Horizontal Plane
	Travel X-axis	mm	173
	Travel Y-axis	mm	± 50
	Travel Z-axis	mm	576
	Travel W-axis	mm	525
	Rapid Traverse (X / Y / Z / W)		30 / 15 / 30 / 15
Live tool Turret	Turret Type	-	BMT 55
	No. of stations	nos.	12
	Tool shank size	mm	25 × 25
	Max. Boring bar dia.	mm	40
	Turret indexing	type	Servo
	Turret indexing time	sec	1
	Driven motor power	kW	4.5
CNC System	Controller	-	Fanuc
Power Supply	Power Requirement	kVA	45
Machine Size	Front x Side x height	mm	3242 × 2085 × 2010
	Weight	kg	4800

HIGHLIGHTS

- Turning Center with Y axis and Sub-Spindle.
- 60° inclined, simplified design/structure.
- Ball Screw Driven W axis on LM guides.
- High Accuracy Encoder for C - Axis (±10 arc Sec.)
- 12 Station Drive Tools, BMT 55 Turret.

MOVING RANGE LL20MYS L5

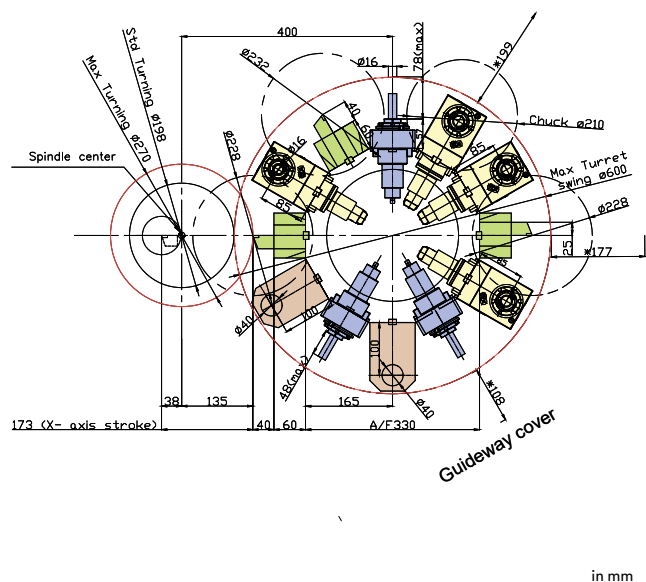


- Note : 1. Refer Turret interference diagram for max. weight of tool holders on the turret disc
 2. Mentioned indexing time in specification can be achieved based on the weight mentioned in Turret interference diagram
 3. Turret indexing time will increase if Tool & tool holders weight are increased.
 4. *May vary depending upon make / model of chuck.

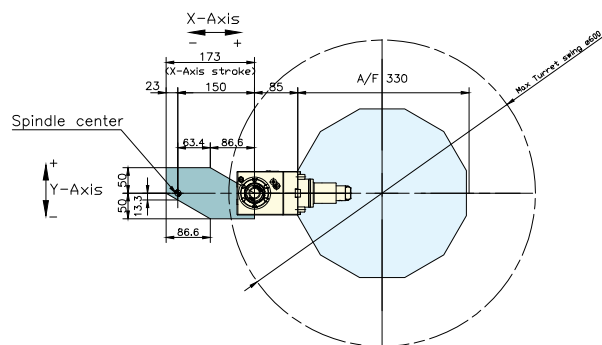
TURRET INTERFERENCE

LL20MYS L5

12 STATION



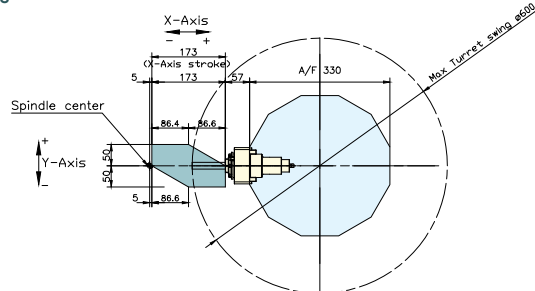
Y AXIS



Tool path 85mm Angular (90°) drill / milling Tool holder

Note:
Angular Tool Holder (90°) Center height CH = 85mm
At Spindle Center + Y axis stroke = +50, - Y axis stroke = -13.3

Y AXIS

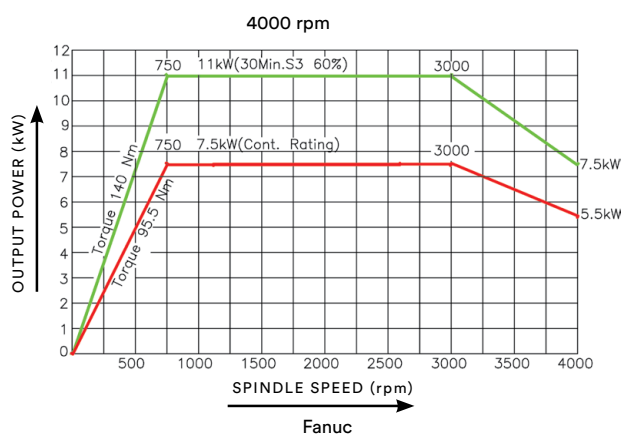


Tool path straight (0°) drill / milling Tool holder

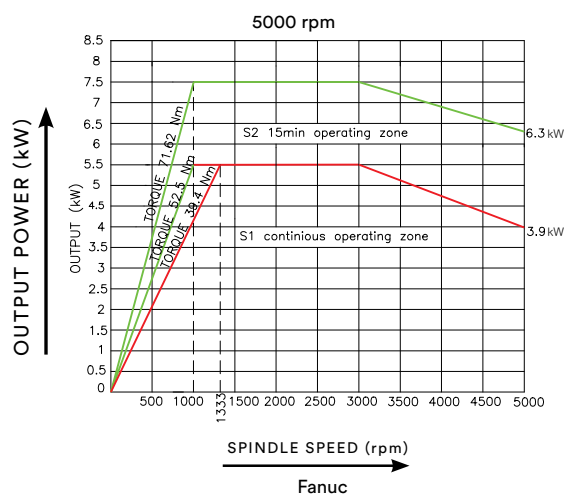
SPEED POWER CURVE

LL20MYS L5

MAIN SPINDLE



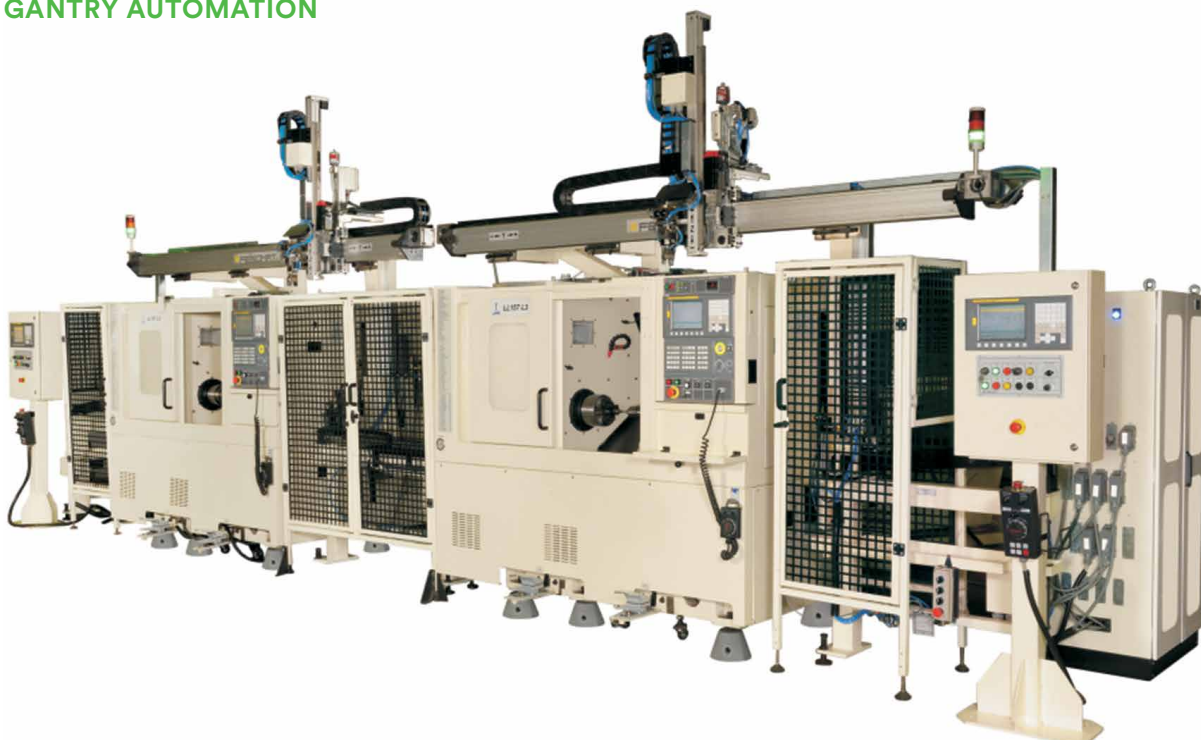
SUB SPINDLE



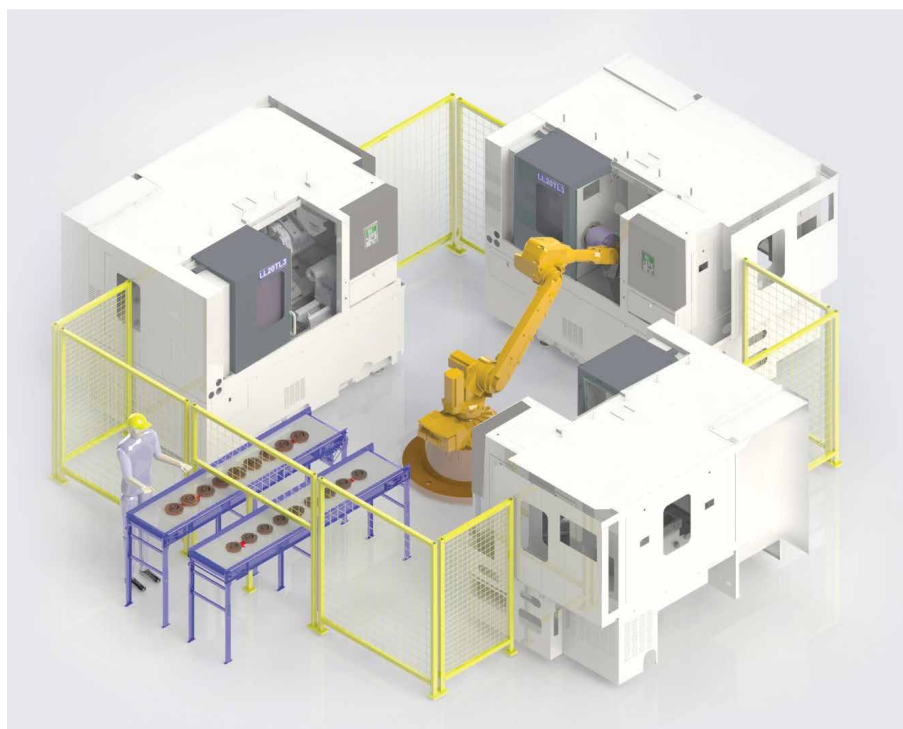
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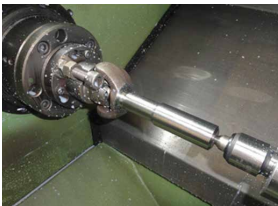
Connecting Rod



Universal Joint



Valve Housing



Yoke Shaft



Impeller



Bearing Collar



Pump Body



Ball Valve



Gate Valve



Pump Housing



Sprocket

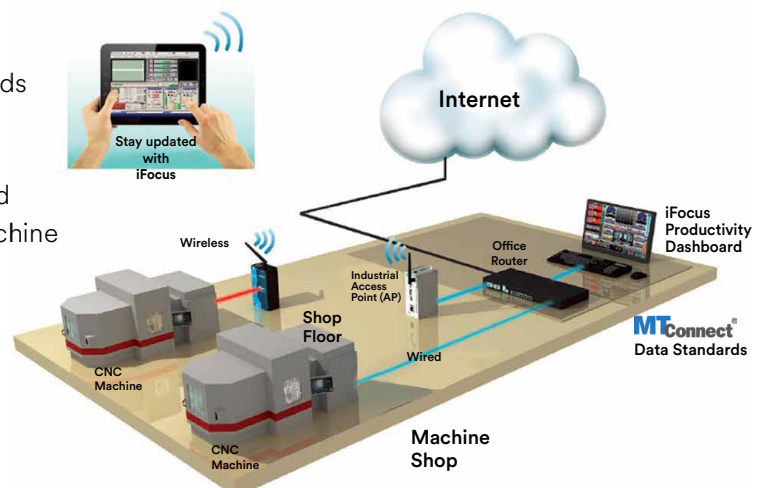
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