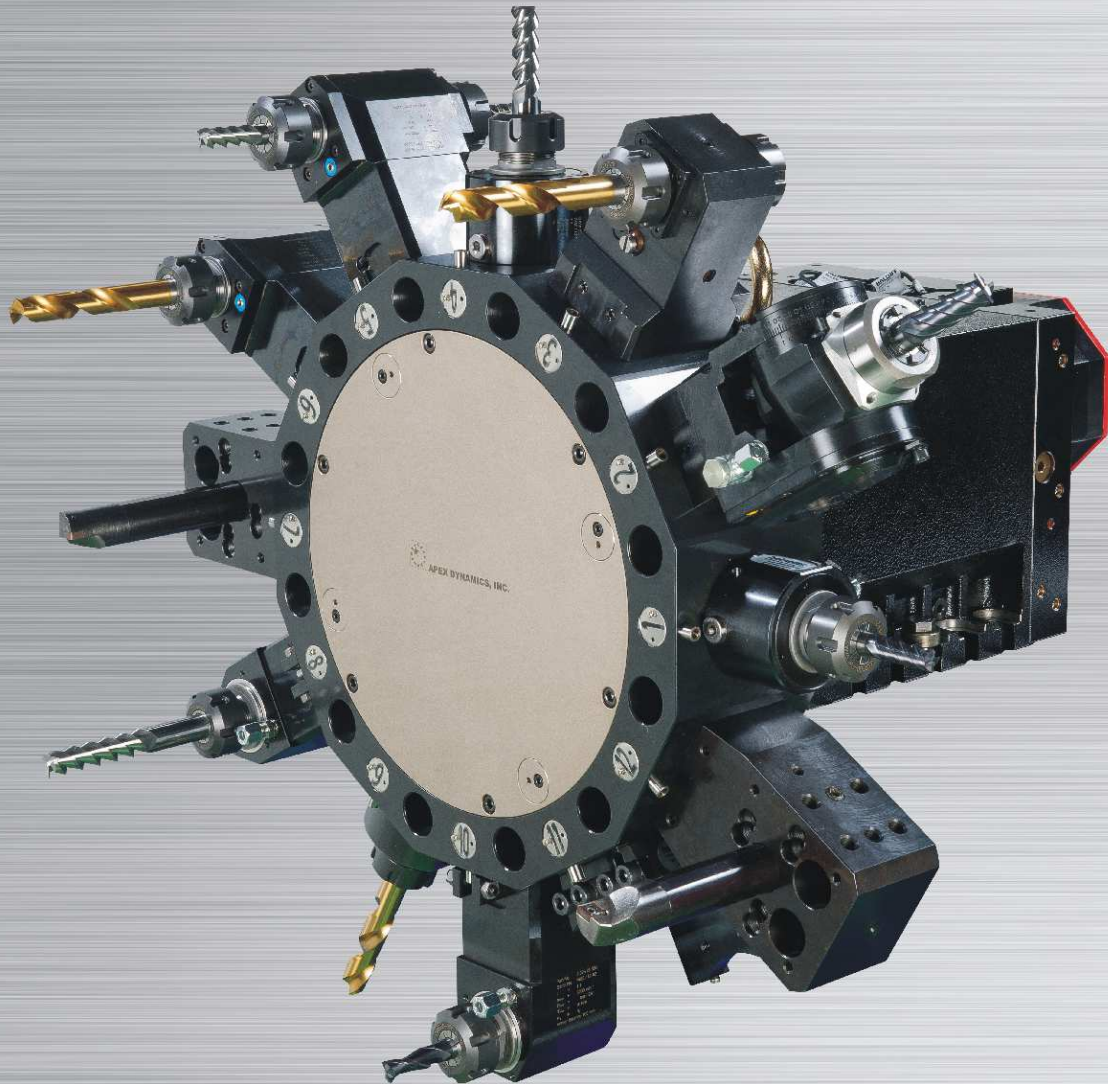
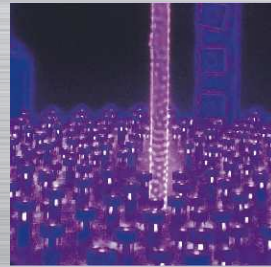


APEX DYNAMICS, INC.



**Single Motor
Power Tool Turret**

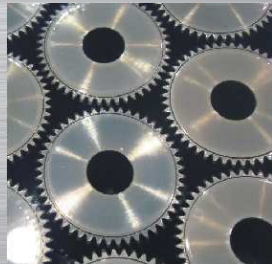


APEX DYNAMICS, INC.

APEX DYNAMICS INC., established in 1987 in Taiwan, has developed into a world-leading manufacturer of servomotor driven robot and high precision planetary gearbox.

APEX has been committed to producing every possible part and component in house, to control the quality all in one hand! Beginning with the heat treatment of the raw materials, the most high-end precision machine tools and most high precision QC instruments are applied to ensure our products can fulfill the highest quality.



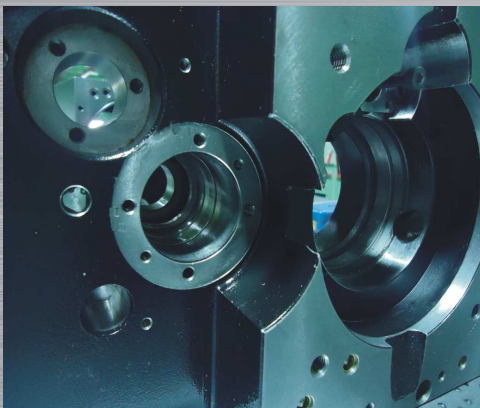
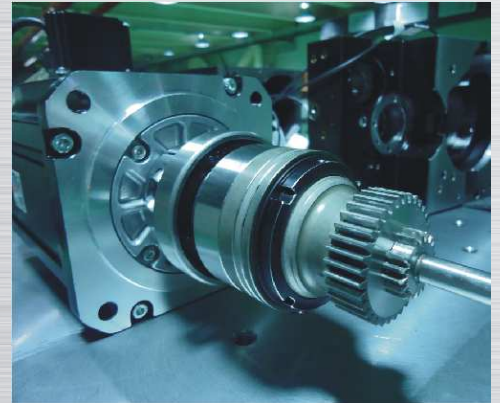


With the modern ERP, e-Commerce system and the full automatic warehouse, APEX assure high-efficient production and a minimal delivery time to meet promptly the different customer requirements.

APEX is certificated with ISO 9001 UKAS, OHSAS 18001 and ISO 14001 UKAS.

26 APEX Family Members all over the world - with professional, integrity and responsive to provide the best services close to customer.





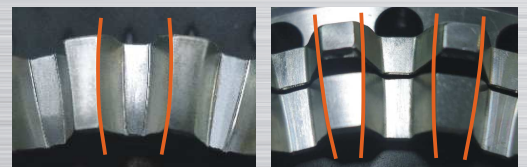
APEX Single Motor Power Tool Turret

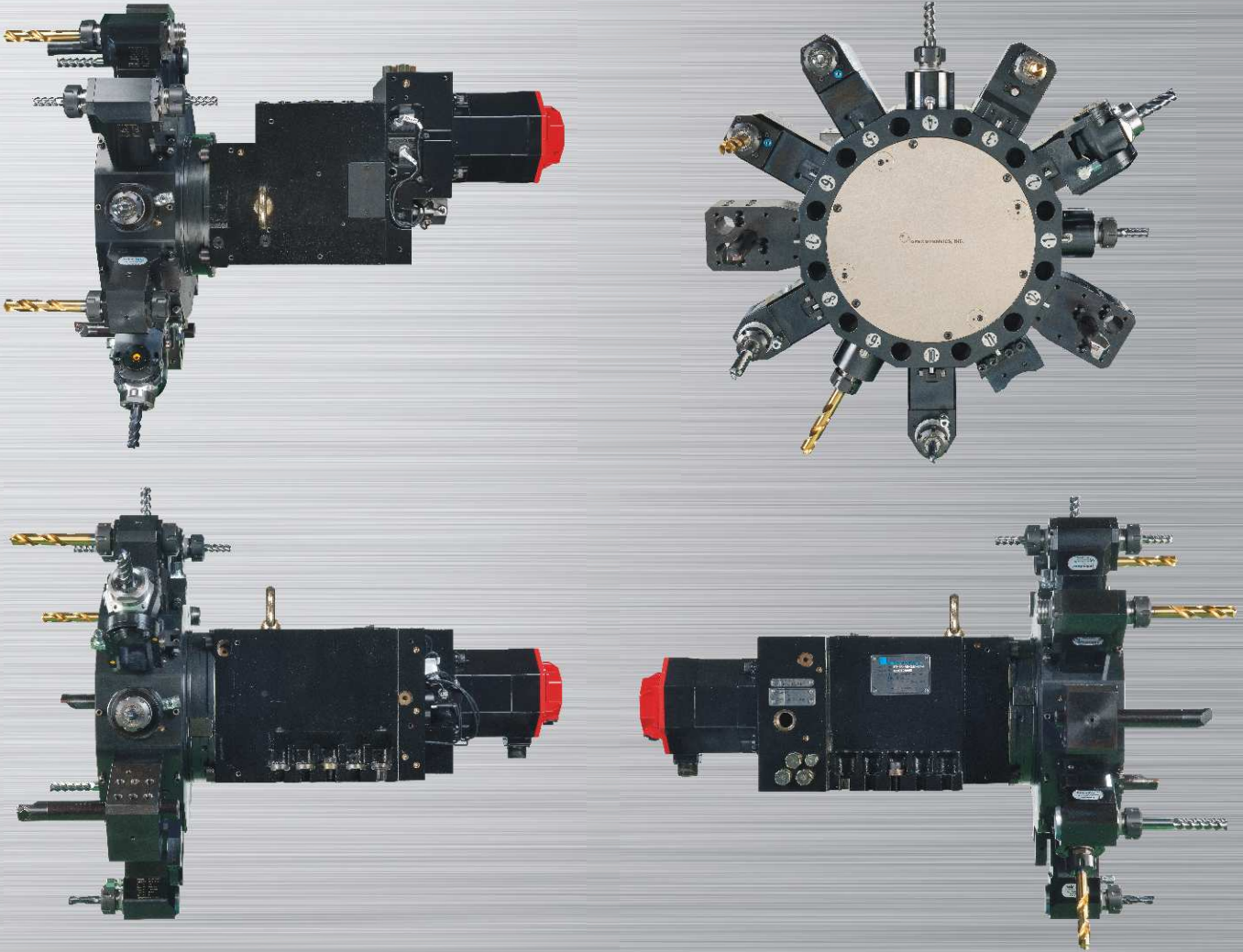
Over 20 years, wide range of APEX products have been applied around the world in diverse industries and received the best compliments and respects from our customers.

Basing on the great know-how in design and manufacturing of the high precision planetary gearbox, the innovation spirit of APEX Dynamics takes the next step to another high-end key-component for the industrial application -

The Single Motor driven Power Tool Turret.

Close-up of the three-pieces curvic coupling

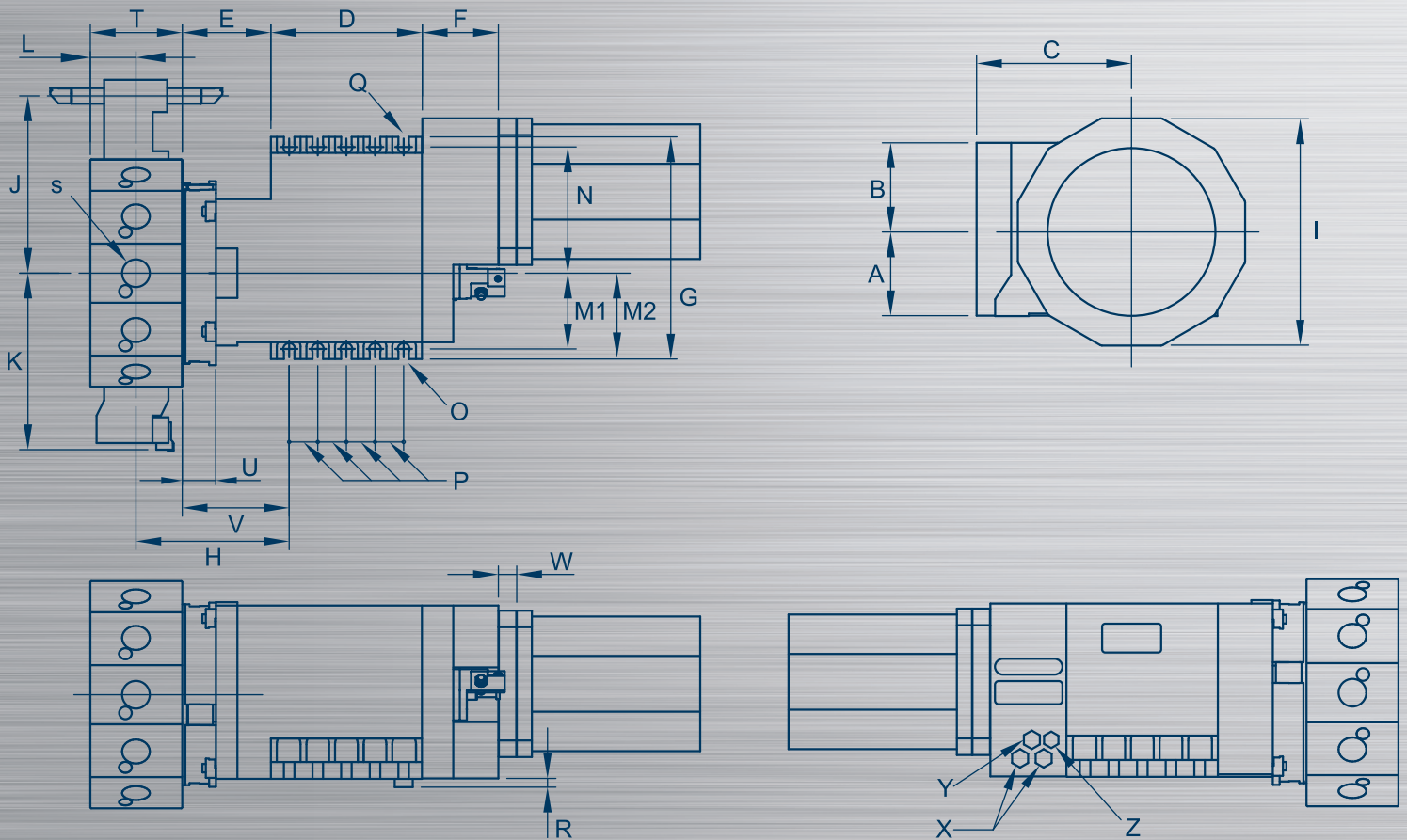




Main Features

- Single servomotor technology for driving the tool disk and cutting tools. Low investment, less maintenance, less interference. Nevertheless, high reliability.
- Super rigid, large-scale three-pieces curvic coupling ensure high indexing accuracy, high repeatability accuracy, and high-torque low-noise transmission.
- Non-lifting coupling system prevents possible pollution from cutting-chips and coolant.
- Powerful hydraulic controlled, high speed clamping system increases overall performance.
- High-speed bidirectional indexing system minimizes the non-cutting time and enhances the efficiency and productivity.
- High tool speed and high torque provide superlative cutting force.
- Every index position applicable for rotating tool, to ensure highest machining flexibility and efficiency and to reduce the interference.
- Torque Limiter Safety clutch reduce damage level due to collision.
- High loading capacity and stability design ensure the forward/backward heavy-machining.
- Compressed air and centralized lubrication system ensure a longer service life-time.
- Stabilized housing design guarantees a high stiffness of cutting.
- Suitable for various servomotors brands like Fanuc, Mitsubishi, Siemens, etc.

OVERALL DIMENSION / VDI



(mm)	PT-12	PT-16	PT-20	PT-25
A (Center Height)	90 ^{+0.05} / _{+0.02}	100 ^{+0.05} / _{+0.02}	125 ^{+0.05} / _{+0.02}	150 ^{+0.05} / _{+0.02}
B	80	106	125	150
C	157	184	222	242
D	175	179	210	242
E	77	105	132	179
F^(1*)	68 (88)	71 (91)	71 (91)	71 (95)
G^(2*)	200	244 (264)	300 (325)	373 (406)
H	142	182	224	280
I (standard)	240	270	320	380
I (option 1)	300	340	360	410
I (option 2)	--	--	380	--
I (option 3)	--	400 (16 Tools)	440 (16 Tools)	--
J	195	220	260	315
K	195	220	260	315
L	47	54	66	74
M1^(2*)	58	70 (90)	85 (110)	107 (140)
M2^(2*)	70	82 (102)	100 (125)	125 (158)

(mm)	PT-12	PT-16	PT-20	PT-25
N	120	150	185	230
O	M8	M10	M12	M16
P	28	34	40	44
Q	∅15 g6 x 14	∅17 g6 x 22.5	∅20 g6 x 24	∅26 g6 x 29
R	9	15	15	20
S	∅25 H6	∅30 H6	∅40 H6	∅50 H6
T	95	109	132	148
U	32	40	53	96
V	94	127	158	206
W^(3*)	21.8	21.8	24.5	25.5
X (inch)	G1/4	G1/4	G3/8	G1/2
Y (inch)	G1/4	G1/4	G3/8	G1/2
Z (inch)	G1/8	G1/8	G1/4	G1/4

(1*) In brackets are data for motor types SIEMENS-AC Servomotor and MITSUBISHI, HF

(2*) In brackets are for the External Housing Fixture.

(3*) For the FANUC Spindle Motor. Contact APEX for other motors.

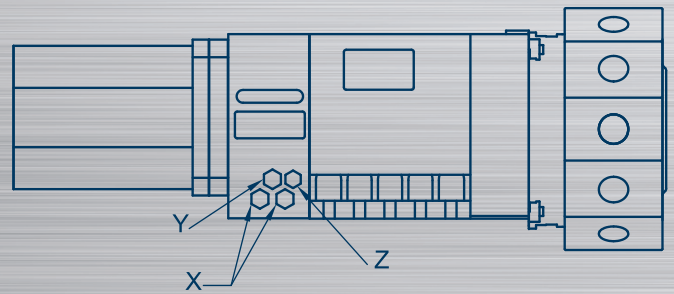
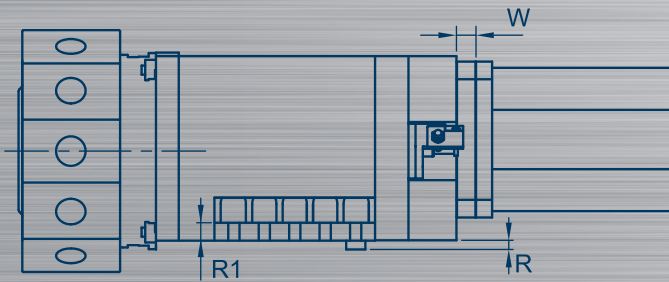
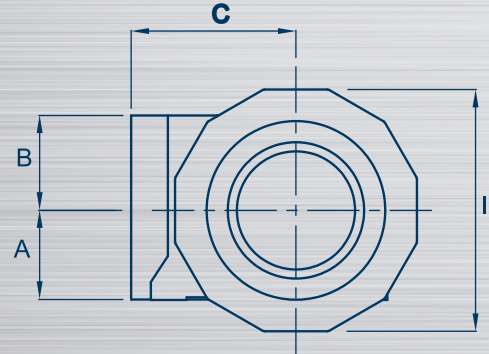
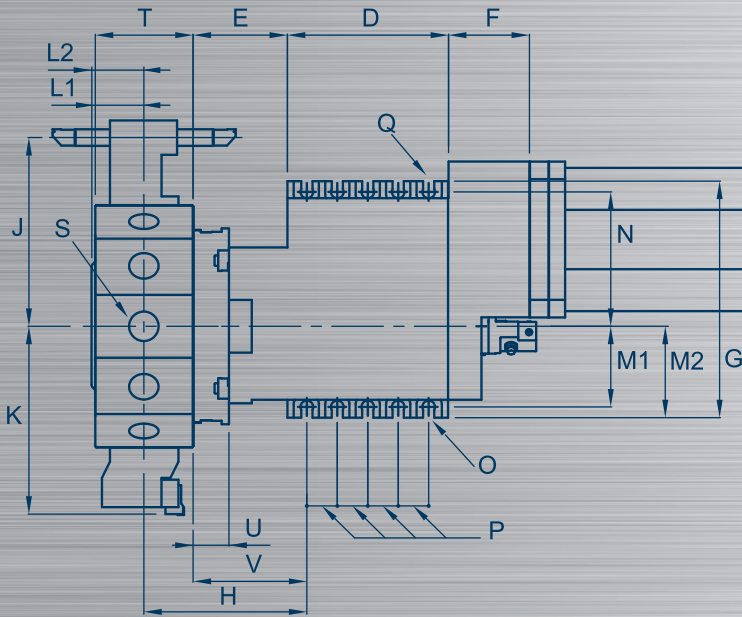
TECHNICAL DATA / VDI

SPECIFICATION		PT-12	PT-16		PT-20		PT-25
Number of Indexing Position	N	12	12 / 16		12 / 16		12
Tool Shank Diameter	VDI	25	30		40		50
Max. Torque of Tool Driving	Nm	35	65		110		160
Indexing Time (*)	sec.	12 Port	12 Port	16 Port	12 Port	16 Port	12 Port
Tool No. 1 to Tool No.2		0.864	0.928	0.908	1.040	1.000	1.392
Tool No. 1 to Tool No.3		0.920	1.000	0.975	1.144	1.098	1.552
Tool No. 1 to Tool No.4		0.960	1.056	1.028	1.216	1.165	1.664
Tool No. 1 to Tool No.5		1.008	1.112	1.080	1.288	1.225	1.768
Tool No. 1 to Tool No.6		1.048	1.160	1.125	1.352	1.293	1.864
Tool No. 1 to Tool No.7		1.096	1.208	1.170	1.424	1.360	1.968
Tool No. 1 to Tool No.8		--	--	1.215	--	1.414	--
Tool No. 1 to Tool No.9		--	--	1.26	--	1.954	--
Indexing Accuracy	arcsec	±3"	±3"		±3"		±3"
Repeatability Accuracy	arcsec	±1"	±1"		±1"		±1"
Hydraulic Working Pressure	bar	50 ± 5	50 ± 5		50 ± 5		50 ± 5
Hydraulic Oil Volume for Turret Locking	cm ³	10	16		23		34
Mass (Tool Disk not inclusive) (Standard Tool Disk inclusive)	Kg	65 83	95 122		151 196		254 333
Admissible Ambient Temperature Range	°C	5~40	5~40		5~40		5~40
Coolant Supply medium Pressure	bar	5~25	5~25		5~25		5~25
Coolant Supply by Indexing by Tooling	bar	7 14	7 14		7 14		7 14
Motor Speed for Tool Disk Driving Motor Speed for Tool Driving	RPM	2500 6000	2100 6000		1600 6000		1050 4000
Tool Disk Driving Ratio (Motor to Tool Disk)		24:1	24:1		24:1		24:1
Tool Driving Ratio (Motor to Tool)		1:1	1:1		1:1		1:1

(*) The time given depends on the motor used. In this case the FANUC-Servomotor, Type α is applied.

The indexing time is the total time measured, beginning from the signal assigned by the controller, over the sequent actions of relay, valve, oil piston, sensors and tool disk rotation, until the signal transmitted back to the controller. The pre-defined delay-time between the end of the coupling action and the begin of tool disk rotation is also inclusive.

OVERALL DIMENSION / BMT



(mm)	PT-12	PT-16	PT-20	PT-25
A (Center Height)	90 ^{+0.05} / _{+0.02}	100 ^{+0.05} / _{+0.02}	125 ^{+0.05} / _{+0.02}	150 ^{+0.05} / _{+0.02}
B	80	106	125	150
C	157	184	222	242
D	175	179	210	242
E^(1*)	80(BMT45)	110(BMT55) 110(BMT45)	143(BMT65) 148(BMT55)	193(BMT75)
F^(2*)	68 (88)	71 (91)	71 (91)	71 (95)
G^(3*)	200	244 (264)	300 (325)	373 (406)
H	142	182	224	280
I (standard)	290 (BMT45)	330 (BMT55)	380 (BMT65)	440 (BMT75)
I (option 1)	--	440 (16 Tools BMT45)	440 (16 Tools BMT55)	--
J	220	250	260	345
K	220	250	260	345
L1	45	50 45	55 50	60
L2	47.5	52.5 50.5	--	--
M1^(2*)	58	70 (90)	85 (110)	107 (140)
M2^(3*)	70	82 (102)	100 (125)	125 (158)

(mm)	PT-12	PT-16	PT-20	PT-25
N	120	150	185	230
O	M8	M10	M12	M16
P	28	34	40	44
Q	Ø15 g6 x 14	Ø17 g6 x 22.5	Ø20 g6 x 24	Ø26 g6 x 29
R	9	15	15	20
S	Ø45	Ø55 / Ø45 H6	Ø65 / Ø55 H6	Ø75 H6
T	95	100 / 90	110 / 100	120
U	35	45 50	64 69	110
V	97	132 137	169 174	220
W^(4*)	21.8	21.8	24.5	25.5
X (inch)	G1/4	G1/4	G3/8	G1/2
Y (inch)	G1/4	G1/4	G3/8	G1/2
Z (inch)	G1/8	G1/8	G1/4	G1/4

(1*) The disk of PT16-BMT45 and PT20BMT55 is for 16 tools.

(2*) Pln brackets are data for motor types SIEMENS-AC Servomotor and MITSUBISHI, HF

(3*) In brackets are data for the External Housing Fixture.

(4*) For the FANUC Spindle Motor. Contact APEX for other motors.

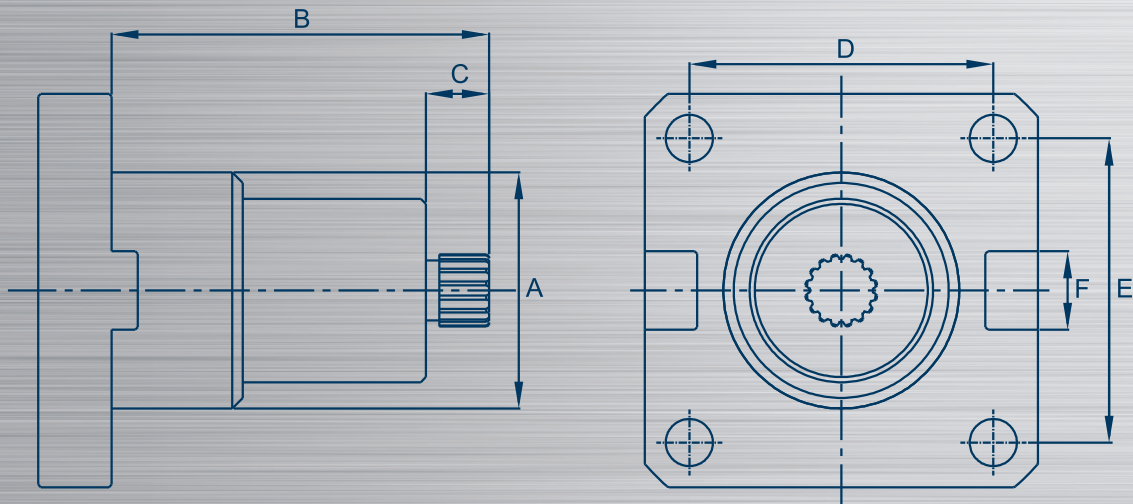
TECHNICAL DATA / BMT

SPECIFICATION		PT-12	PT-16		PT-20		PT-25
Number of Indexing Position	N	12	12 / 16		12 / 16		12
Tool Shank Diameter	BMT	45	55	45	65	55	75
Max. Torque of Tool Driving	Nm	35	65		110		160
Indexing Time (*)	sec.	12 Port	12 Port	16 Port	12 Port	16 Port	12 Port
Tool No. 1 to Tool No.2		0.864	0.928	0.908	1.040	1.000	1.392
Tool No. 1 to Tool No.3		0.920	1.000	0.975	1.144	1.098	1.552
Tool No. 1 to Tool No.4		0.960	1.056	1.028	1.216	1.165	1.664
Tool No. 1 to Tool No.5		1.008	1.112	1.080	1.288	1.225	1.768
Tool No. 1 to Tool No.6		1.048	1.160	1.125	1.352	1.293	1.864
Tool No. 1 to Tool No.7		1.096	1.208	1.170	1.424	1.360	1.968
Tool No. 1 to Tool No.8		--	--	1.215	--	1.414	--
Tool No. 1 to Tool No.9		--	--	1.26	--	1.954	--
Indexing Accuracy	arcsec	±3"	±3"		±3"		±3"
Repeatability Accuracy	arcsec	±1"	±1"		±1"		±1"
Hydraulic Working Pressure	bar	50 ± 5	50 ± 5		50 ± 5		50 ± 5
Hydraulic Oil Volume for Turret Locking	cm ³	10	16		23		34
Mass (Tool Disk not inclusive) (Standard Tool Disk inclusive)	Kg	65 83	95 122		151 196		254 333
Admissible Ambient Temperature Range	°C	5~40	5~40		5~40		5~40
Coolant Supply medium Pressure	bar	5~25	5~25		5~25		5~25
Coolant Supply by Indexing by Tooling	bar	7 14	7 14		7 14		7 14
Motor Speed for Tool Disk Driving Motor Speed for Tool Driving	RPM	2500 6000	2100 6000		1600 6000		1050 4000
Tool Disk Driving Ratio (Motor to Tool Disk)		24:1	24:1		24:1		24:1
Tool Driving Ratio (Motor to Tool)		1:1	1:1		1:1		1:1

(*) The time given depends on the motor used. In this case the FANUC-Servomotor, Type α is applied.

The indexing time is the total time measured, beginning from the signal assigned by the controller, over the sequent actions of relay, valve, oil piston, sensors and tool disk rotation, until the signal transmitted back to the controller. The pre-defined delay-time between the end of the coupling action and the begin of tool disk rotation is also inclusive.

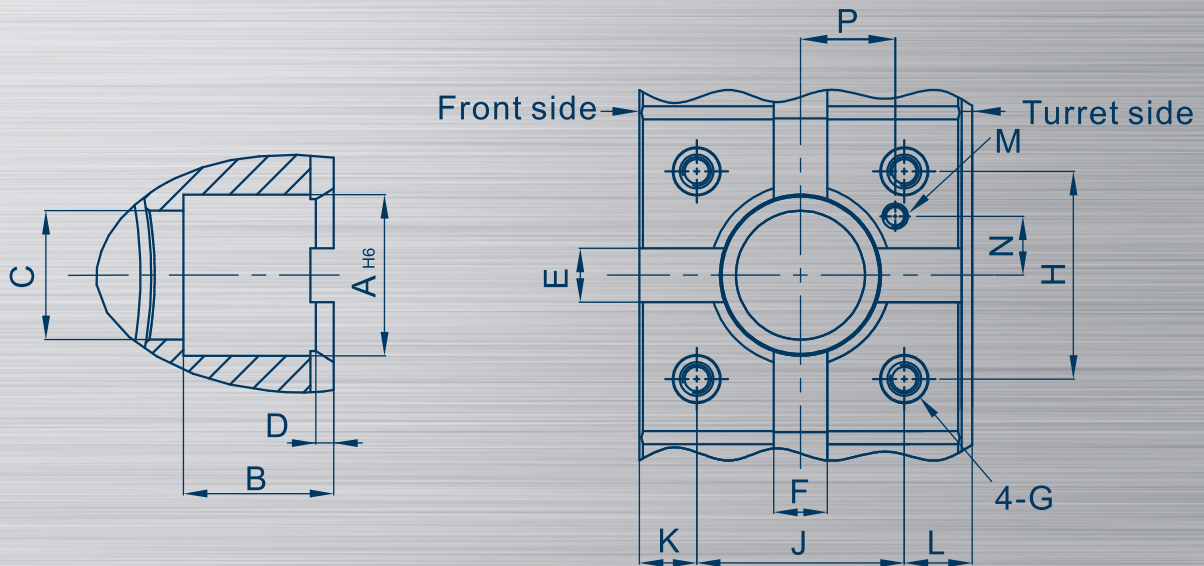
BMT TOOL HOLDER



(mm)	PT-12	PT-16		PT-20		PT-25
Ø A	45	45	55	55	65	75
B	69	69	84	84	95	95
C	9	9	12	12	12	15
D	58	58	64	64	73	90
E	58	58	64	64	70	90
F	15	15	15	15	18	25
DIN5480 (*)	W14x0.8x30x 16	W14x0.8x 30x16	W16x0.8x 30x18	W16x0.8x 30x18	W20x0.8x 30x24	W24x1.25x 30x18

(*) : Pitch Circle Diameter x Module-No. x Pressure Angel x Teeth -No. .

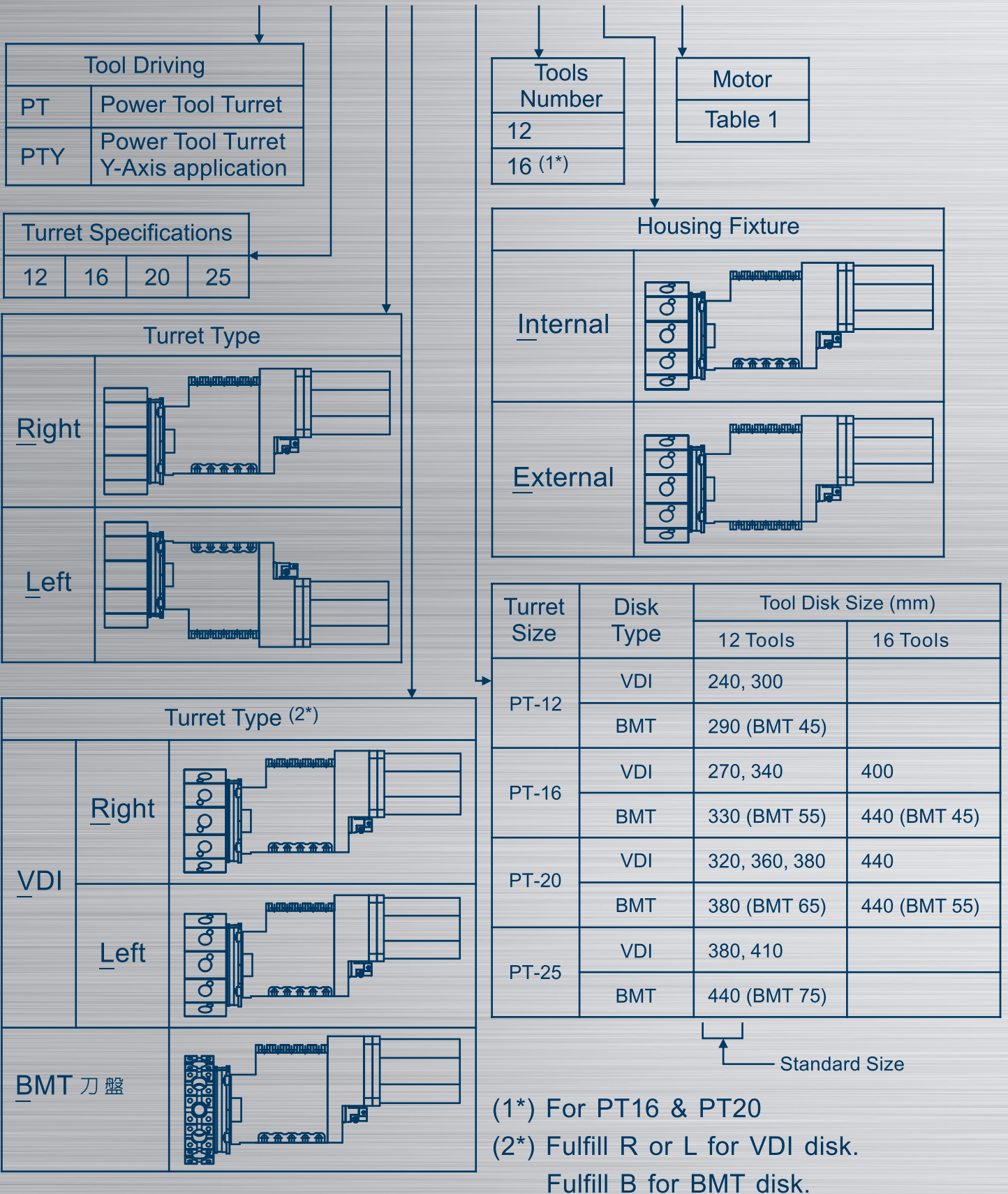
BMT TOOL HOLDER & DISK INTERFACE



(mm)	PT-12	PT-16		PT-20		PT-25
Ø A	45 H6	45 H6	55 H6	55 H6	65 H6	75 H6
B	42	42	42	42	43	47
C	36	36	41	41	46	56
D	6.5	6.5	7.5	7.5	7.5	7.5
E	15	15	15	15	18	25
F	15	15	15	15	18	25
G	M8x1.25Px16	M8x1.25P x16	M10x1.5P x20	M10x1.5P x20	M12x1.75P x24	M12x1.75Px24
H	58	58	64	64	73	90
J	58	58	64	64	70	90
K	16	16	18	18	20	15
L	16	16	18	18	20	15
Ø M	5	5	5	5	5	7
N	16.5	16.5	14	14	17	33
P	29	29	32	32	37	33

Ordering Code of Power Tool Turret

PT - X - XX - X - X - X / Motor



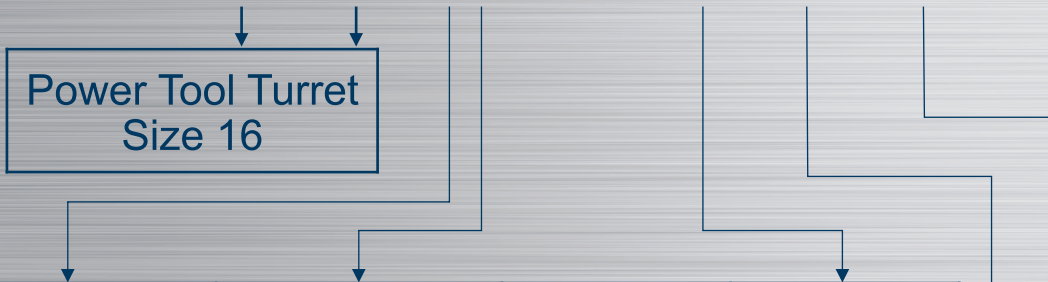
The recommend Motor of APEX Power Tool Turret (*)

Motor Type / Specification		PT-12	PT-16	PT-20	PT-25
SIEMENS-AC Servomotor Type 1FT6	Type	064-AK	084-AK	086-AH	105-AF
	RPM	6000	5000	4000	4000
	Torque (Nm)	14	28	40	68
BOSCH-REXROTH Indramat-MKD	Type	071B	090B	112B	112C
	RPM	6000	5000	4000	4000
	Torque (Nm)	14	22	48	68
FANUC-Spindle Motor Type α il	Type	1.5	2	3	6
	RPM	6000	5000	4000	4000
	Torque (Nm)	11	25	40	56
FANUC-Servomotor Type α iS	Type	8/4000	12/4000	22/4000	40/4000
	RPM	4000	4000	4000	4000
	Torque (Nm)	12	18	33	60
MITSUBISHI HF	Type	JP353	JP503	JP703	SP702-K
	RPM	6000	6000	5000	3000
	Torque (Nm)	10.5	15.9	22.3	33.4

(*) Motor is not included in the Turret package. Please contact APEX for more motor information.

Example of Ordering Code - VDI

PT – 16 – RL – 270 – 12 – E / Motor

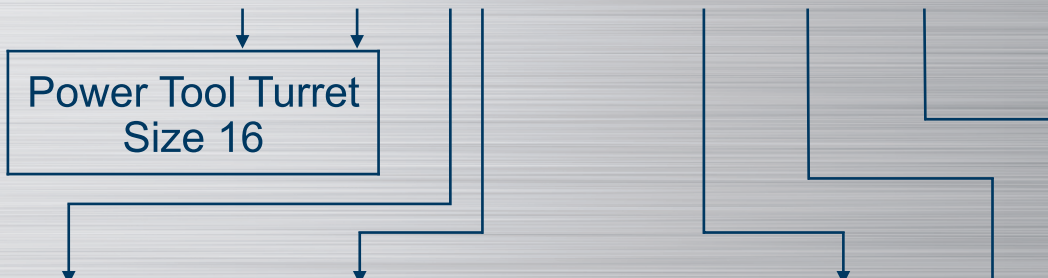


Turret Type	Tool Disk Type	Tool Disk Size (mm)	Tool Number
<u>R</u> ight	<u>L</u> eft		

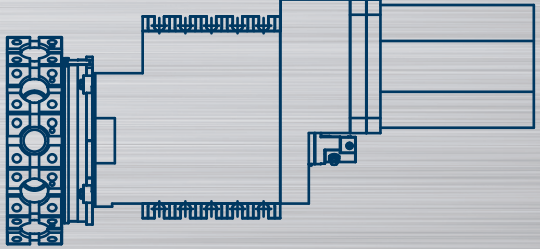
Housing Fixture		Motor Type
<u>E</u> xternal		FANUC-Servomotor Type Alpha 12/4000

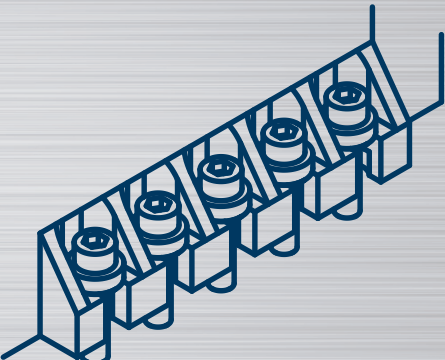
Example of Ordering Code - BMT

PT – 16 – RB – 330 – 12 – E / Motor



Turret Type	Tool Disk Type	Tool Disk Size (mm)	Tool Number
<u>R</u> ight	<u>B</u> MT	330	12



Housing Fixture		Motor Type
<u>E</u> xternal		FANUC-Servomotor Type Alpha 12/4000



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