Product information

PJ-57en

BMT Disk-Type Tool Turret

Series 434.0xx

revision 2024/05/31

Attention

High pressure turret exceeding 50bar: For safety purpose, it is required to use high pressure tool holders which match specifications of turret.

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BMT Disk-Type Tool Turret

Series 434.0xx

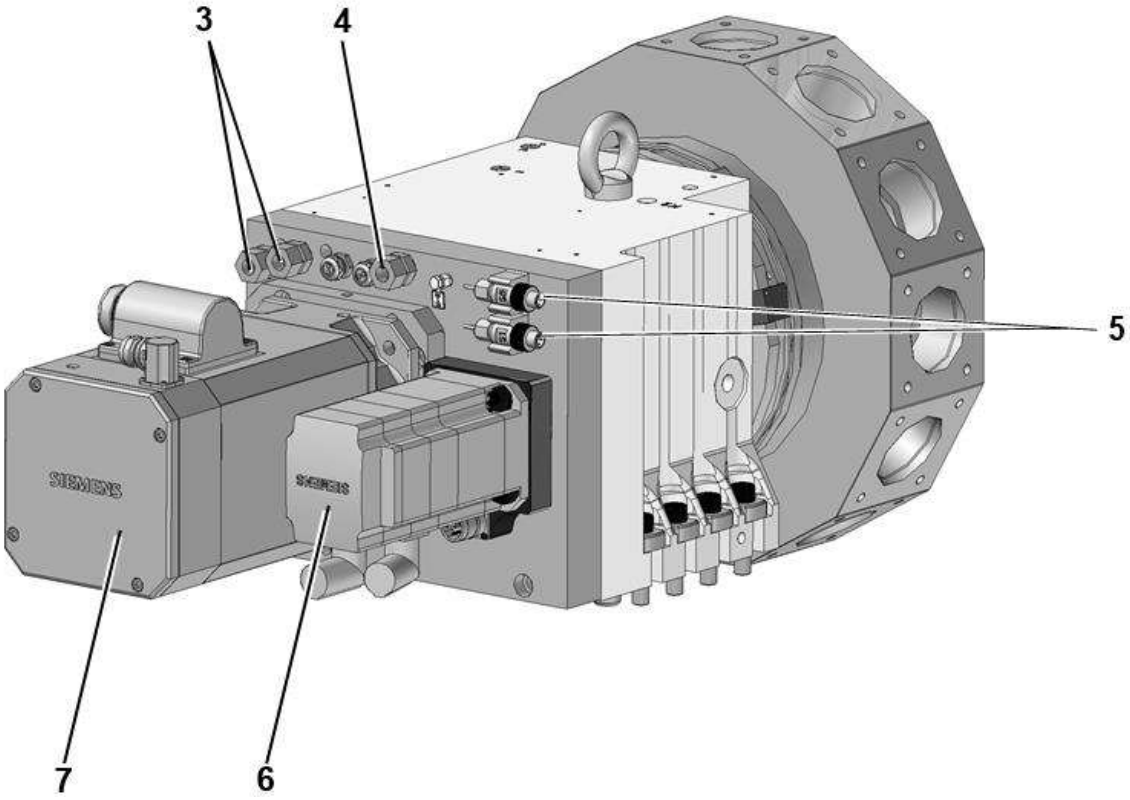
Description

These turrets are suitable for use on turning machines for forward and reverse machining. They are equipped with all of the features and functions of modern high performance tool turrets. They are suitable for series manufacture due to their robust design and short switching times.

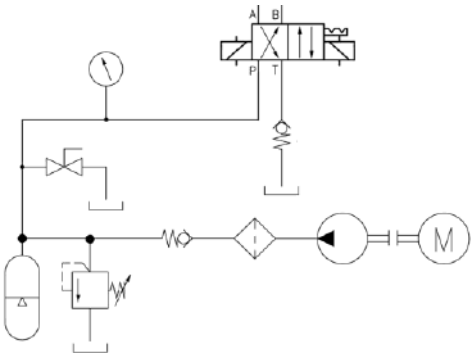
Features

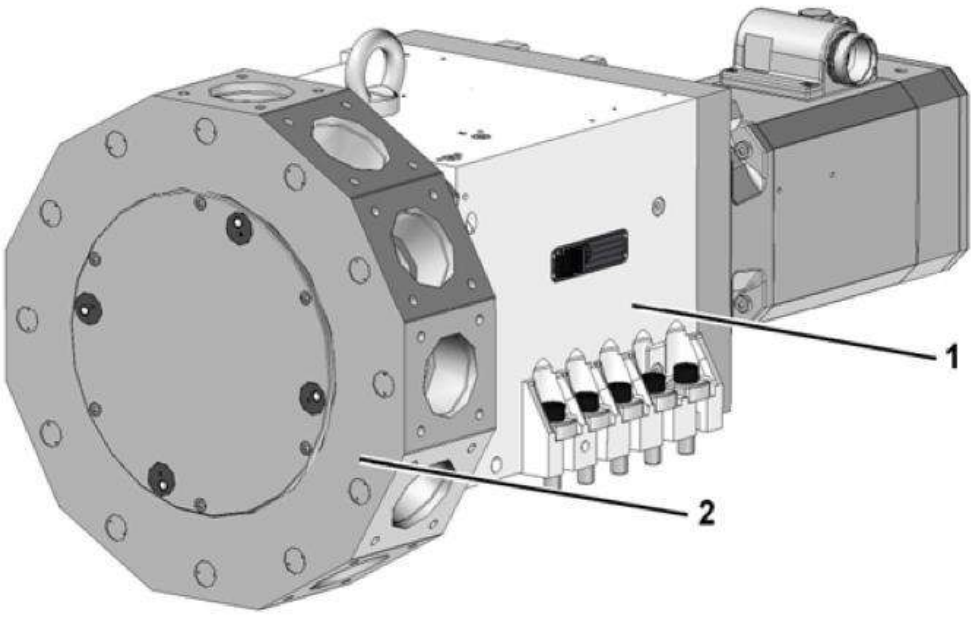
- ➢ Drive with controllable electric motor for very fast bidirectional swivel use of:
  - GPM drive unit EK 700 with motor and converter
  - GPM drive with rotary encoder activation and customary control
  - or customary servo motors
- ➢ Heavy loads of stability due to high locking forces
- ➢ Hydraulic locking with special triple generating crown gear (pat.)
- ➢ Not affected by collisions due to:
  - ➪ Low kinetic energy of the drive, and
  - ➪ Fastening snap-ring groove for the tool disk
- ➢ Directly controllable with machine controller (not apply to GPM drive unit EK 700)
- ➢ Can be installed in any position
- ➢ For all market BMT - interfaces (BMT45 / 55 / 65 / 75 / 85 a.o.)
- ➢ Options:
  - BMT turret Premier Series : Performance upgrade for long term operation
  - High pressure coolant solution
  - Others

Standard appearance :

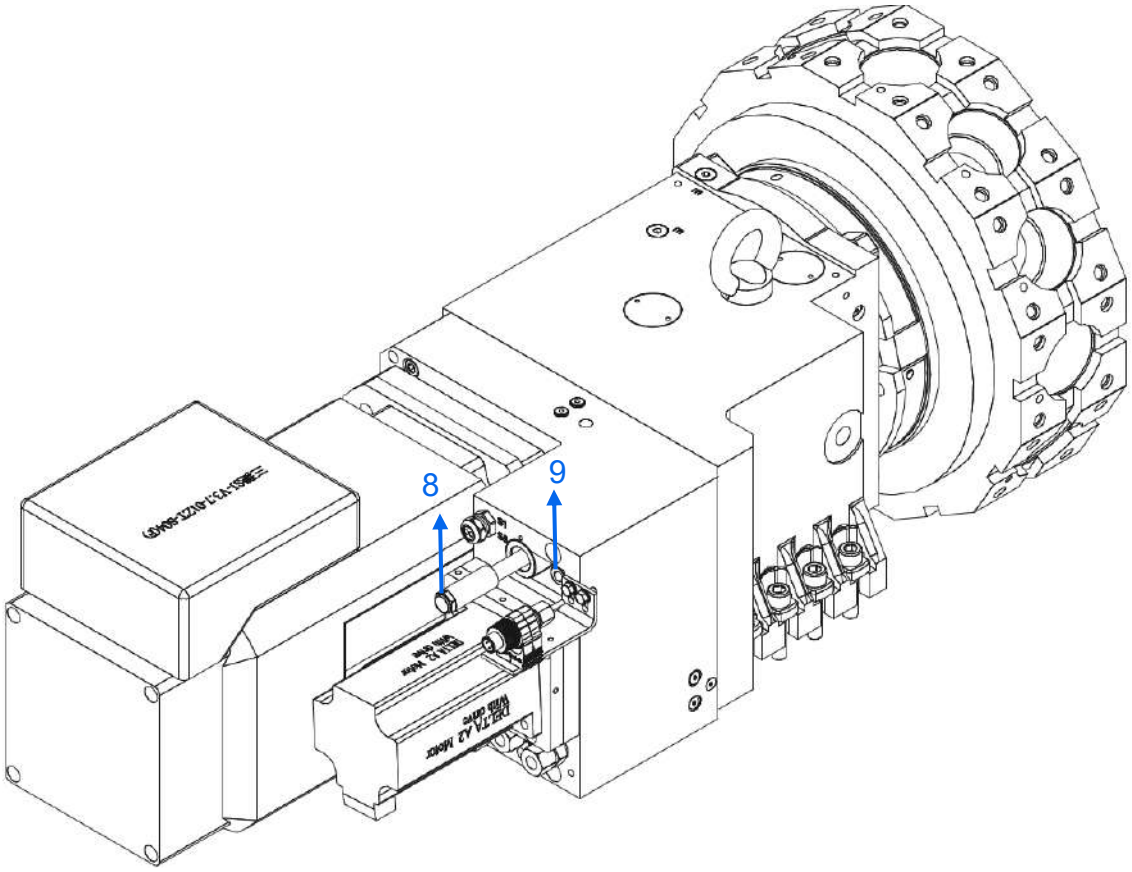


1 Turret housing
2 Tool disk
3 Connection – hydraulic locking control
4 Connection – cooling coolant
5 Connection - Electric
6 Indexing motor
7 Tool drive motor





Premier Series appearance (Option) :



8. Air cooling Out (option)
9. Air cooling In (option)

Technical Data

Series				
BMT Disk-type tool turret 434.0xx				
Number of switching positions				
Admissible tangential load (turret locked)[1)]				kNm
Admissible mass moment of inertia of tools[1)2)]			Standard load stage	kgm^2
with tool disk and holder			High load stage	kgm^2
Admissible out of balance (load moment) due to tooling				Nm
Gear ratio swivel drive[3)]				i
Switching times[3)]				s
Rotate tool disk:[5)]				
• incl. acceleration and braking	per partial step		Standard load stage	s
			High load stage	s
• without acceleration and braking	per additional partial step			s
Turret unlock/lock-hydraulic				s
Adm. switching frequency[3)] (median switching angle φm =90°)				
Operating pressure				
Hydraulic ± 10%				bar
Cooling lubricant				
• Standard				bar
• Medium pressure value				bar
• High-pressure cooling lubricant device				bar
Fluid absorption volume				
Turret unlock/lock				cm^3
Mass				
Turret (incl. drive motor)				kg
Tool disk and tooling (max) [4)]				kg
Adm. ambient temperature				°C

Size												
16			20			25			32			
8	12	16	8	12	16	8	12	16	8	12	16	
1.8			3.6			7.2			12.5			
1.8 2.5			3.2 5.0			8 12			25 40			
32			63			125			200			
54			72			90			216			
0.16			0.16			0.21			0.27			
0.15			0.19			0.25			0.31			
0.07			0.09			0.11			0.27			
0.12			0.13			02			0.5			
20			16			12			10			
50			50			50			50			
5-25(Filtering≦100μm)[5] 5-50Filtering≦500μm)[5] 150(Filtering≦25μm)[5]												
30			45			65			114			
100			155			270			570			
80			160			250			400			
10~40												

1) Higher values on request
2) Switching times
   Conditions:
   -Fluid supply sufficiently large
   -Turret up to operating temperature
   -Without controller-related non-productive time
   -Switching times valid for high dynamic motor (e.g. 1FK7043)

3) The swivel times are determined with an average load. Further details on request.
4) High load for special tools on request
5) Ensure compliance with the required fineness for the tools used. For example drive tool with internal cooling lubricant supply.

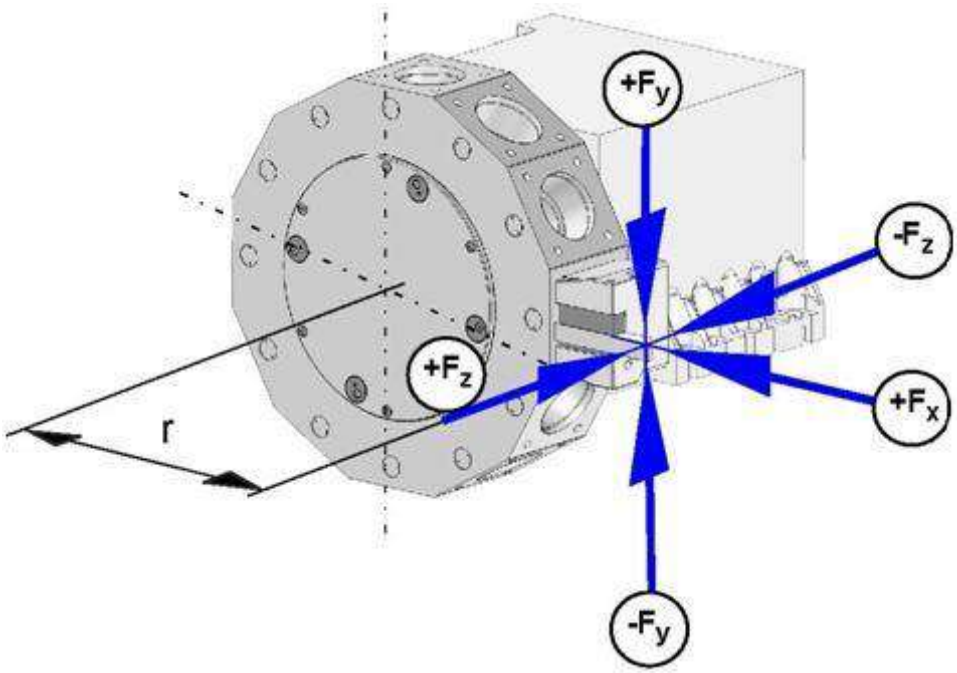
Recommended indexing motors degree of protection to IP 67	J kgm²	Adm. driving rpm	swiveling times for 30°-step without acceleration and braking s Size of turret			
			16	20	25	32
EK600 with encoder[1)]	0.0003	4500	0.06	0.08	0.10	0.24
Siemens 1FK7043 HD	0.0001	6000	0.05	0.06	0.08	0.18
Siemens 1FK7042	0.0003	4500	0.06	0.08	0.10	0.24
Fanuc α 2/5000 / β 2/5000	0.0003	4500	0.06	0.08	0.10	0.24
Delta A2 (EK700)	0.0003	4000	0.07	0.09	0.11	0.27

[1)] controlled via machine control system

Admissible Loads

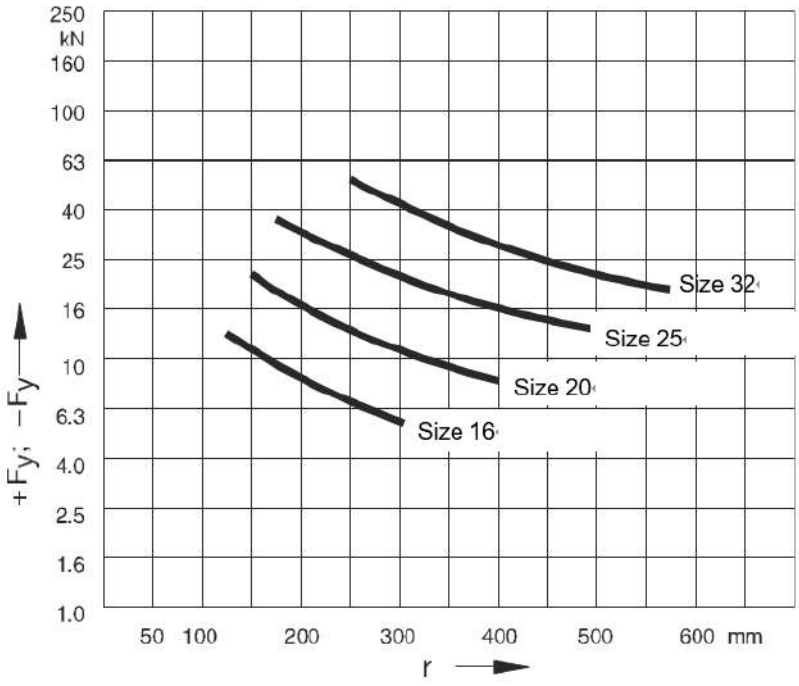
Note

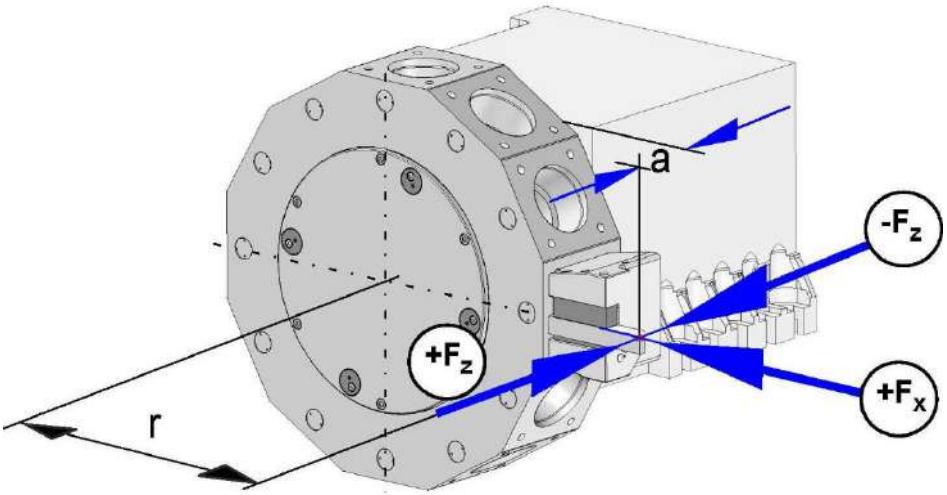
- ➢ The diagrams refer to static loads.
- ➢ In case of impact load (interrupted cutting), significantly lower values must be reckoned with.



Force ± F_y

Tangential loading

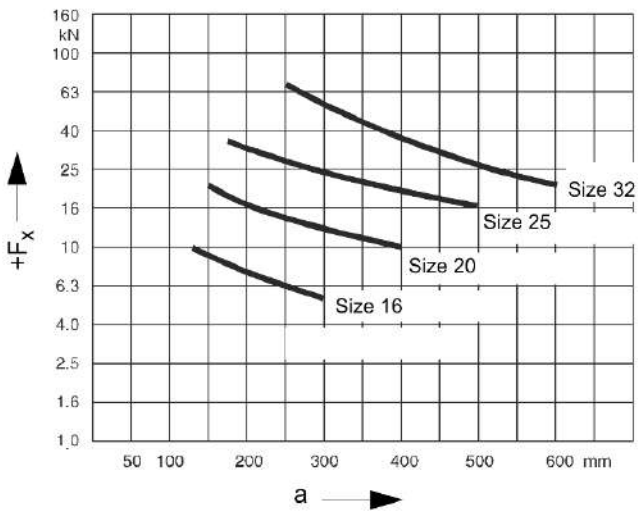




Force +Fx

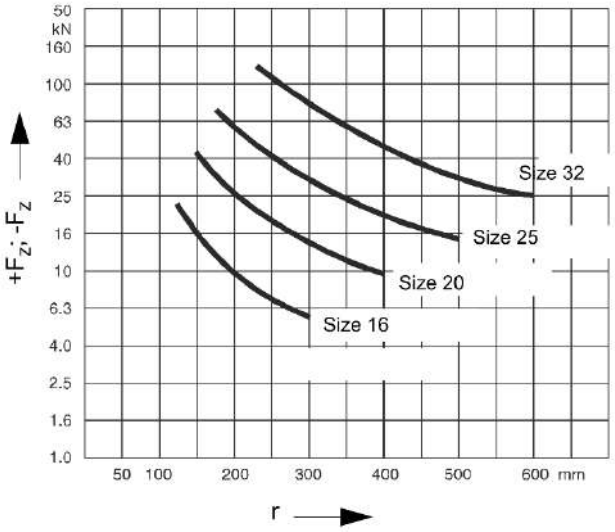
Shunt loading

leading edge is the basis for dimension a



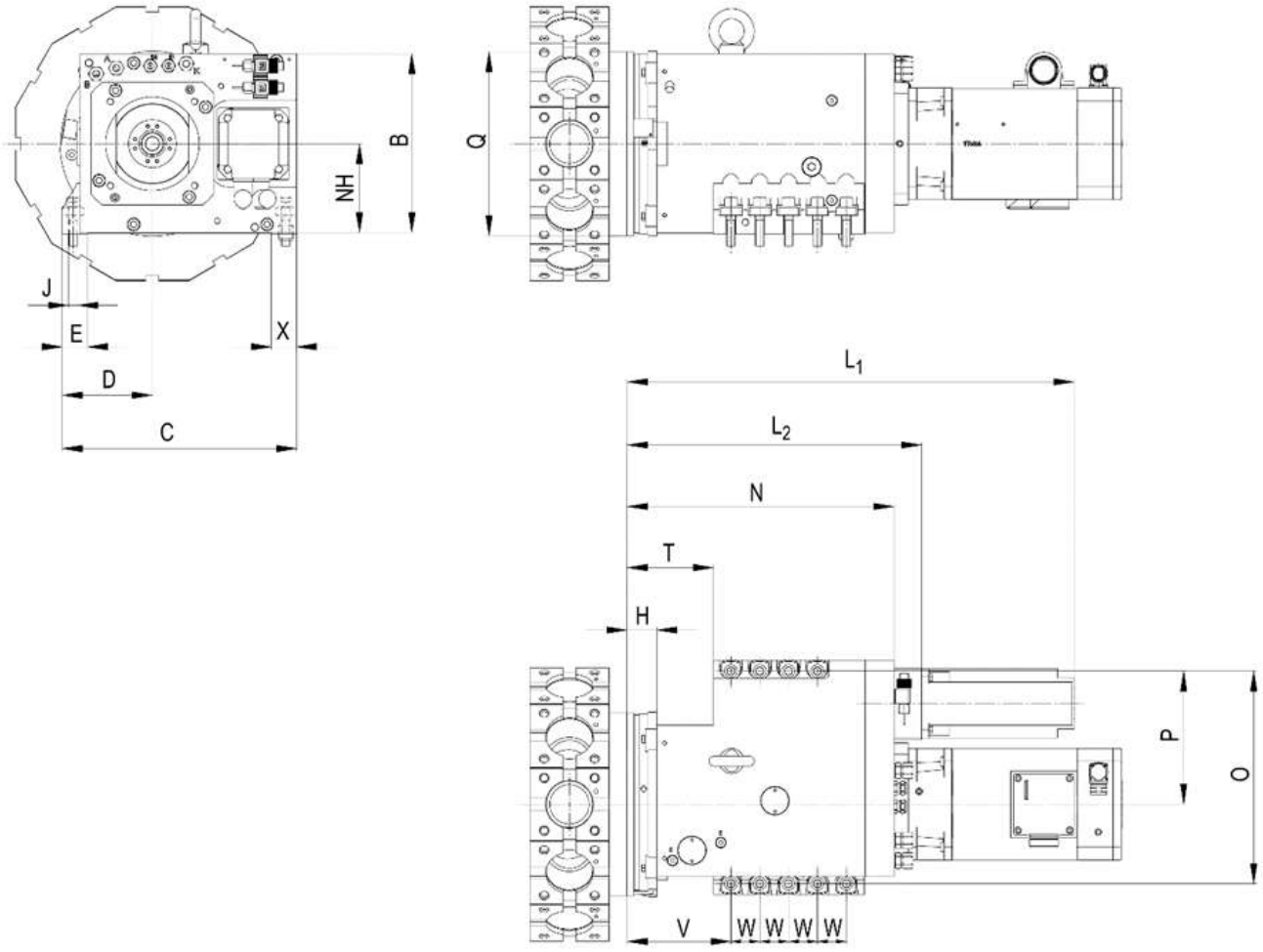
Force + Fz

longitudinal loading



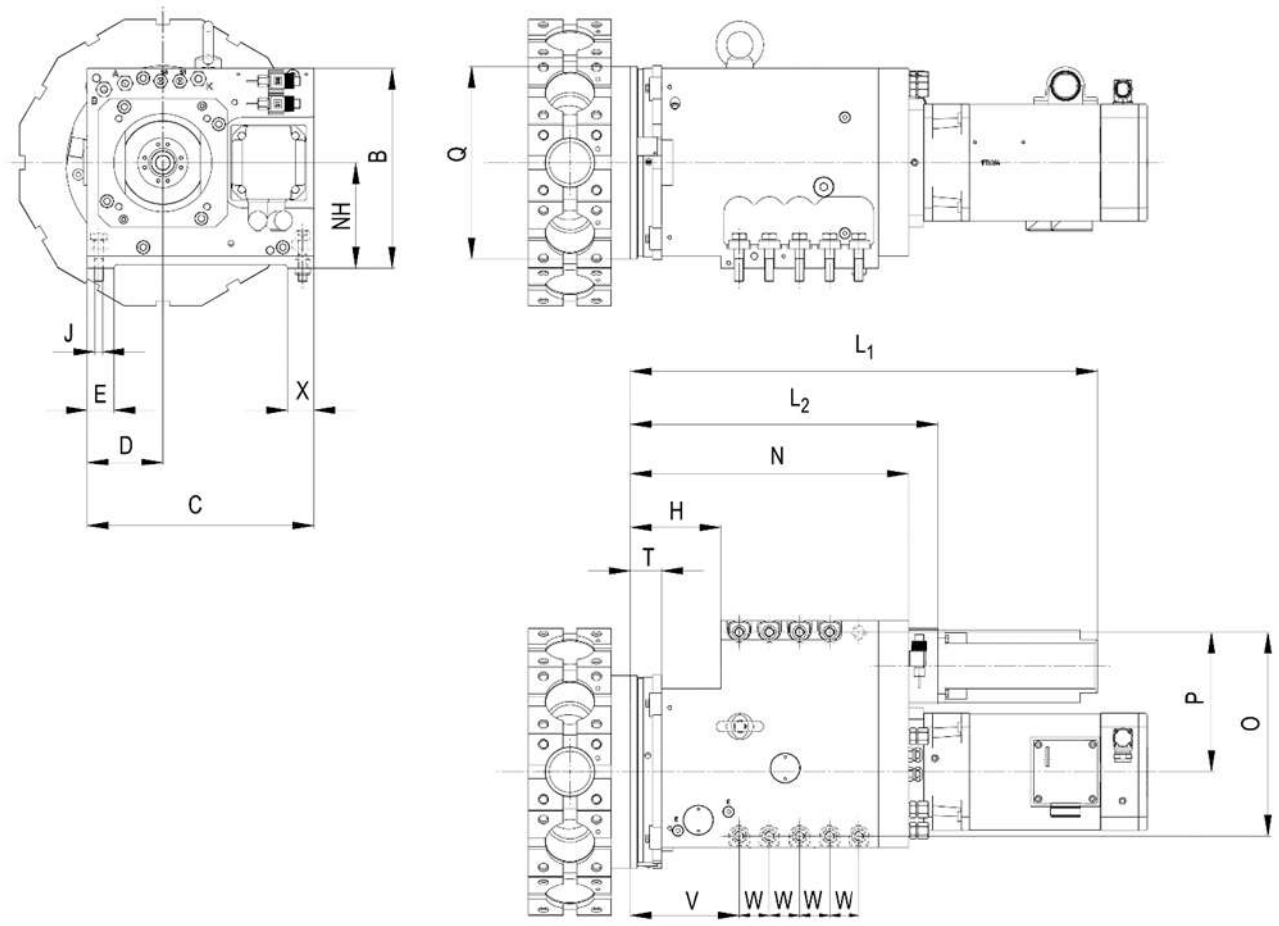
Dimension

L-shape (NH Standard 1)



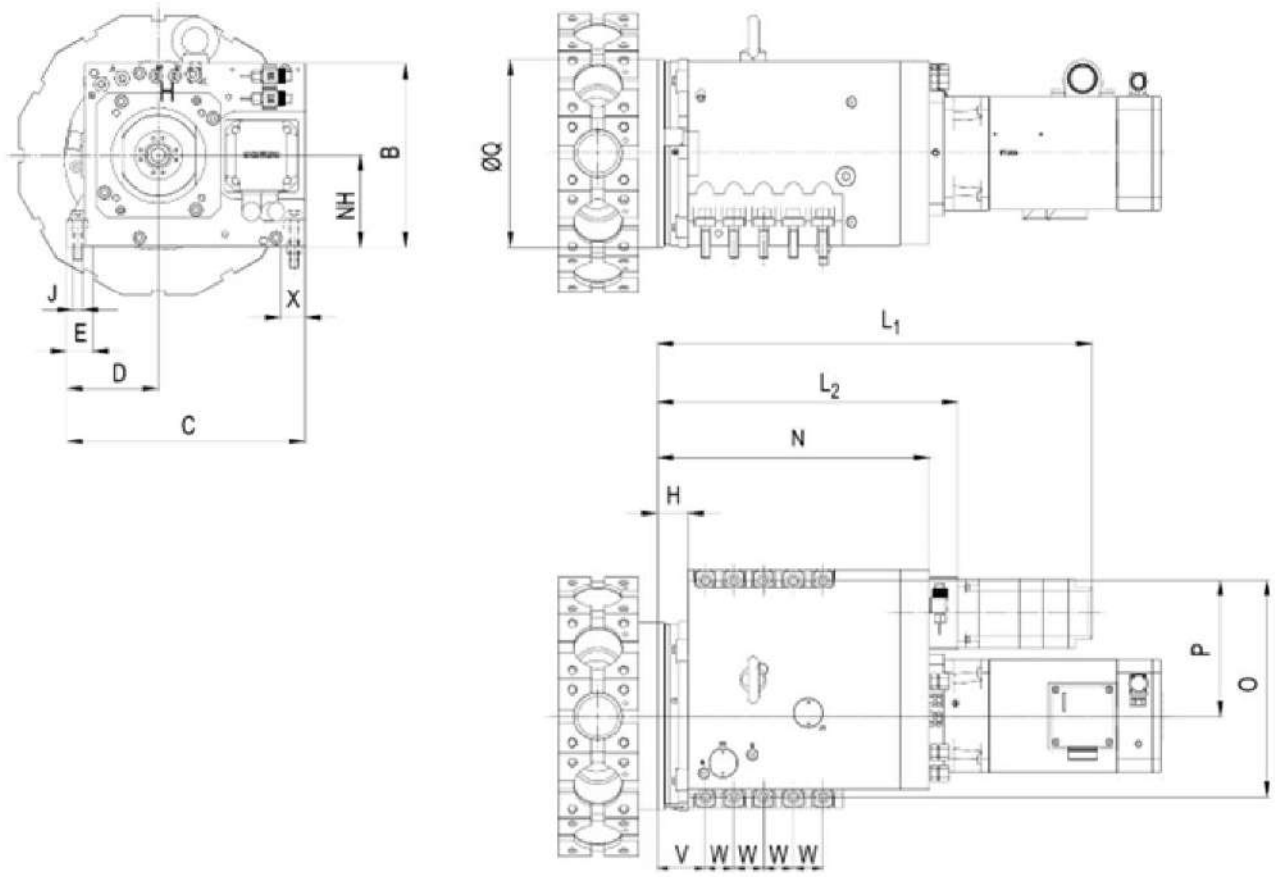
Series		Size			
434.0XX (L shape-NH Standard 1)		16	20	25	32
NH		100	125	150	
B		200	250	300	
C		284	325	406	
D		102	125	158	
E		26	35	45	
H		40	41	52	
J		M10	M12	M16	
L					
GPM drive 1.8.150.573	L_1	454	474	520	
Delta motor with drive	L_1	375	395	441	
Siemens 1FK70 43/42	L_2	374	394	440	
Fanuc $\alpha 2/\beta 2$	L_2	259	379	425	
N		234	370	412	
O		240	295	370	
P		150	185	230	
øQ		160	255	318	
T		105	120	150	
V		127	144	176	
W		34	40	42	
X		34	35	45	

L-shape (NH standard 2)



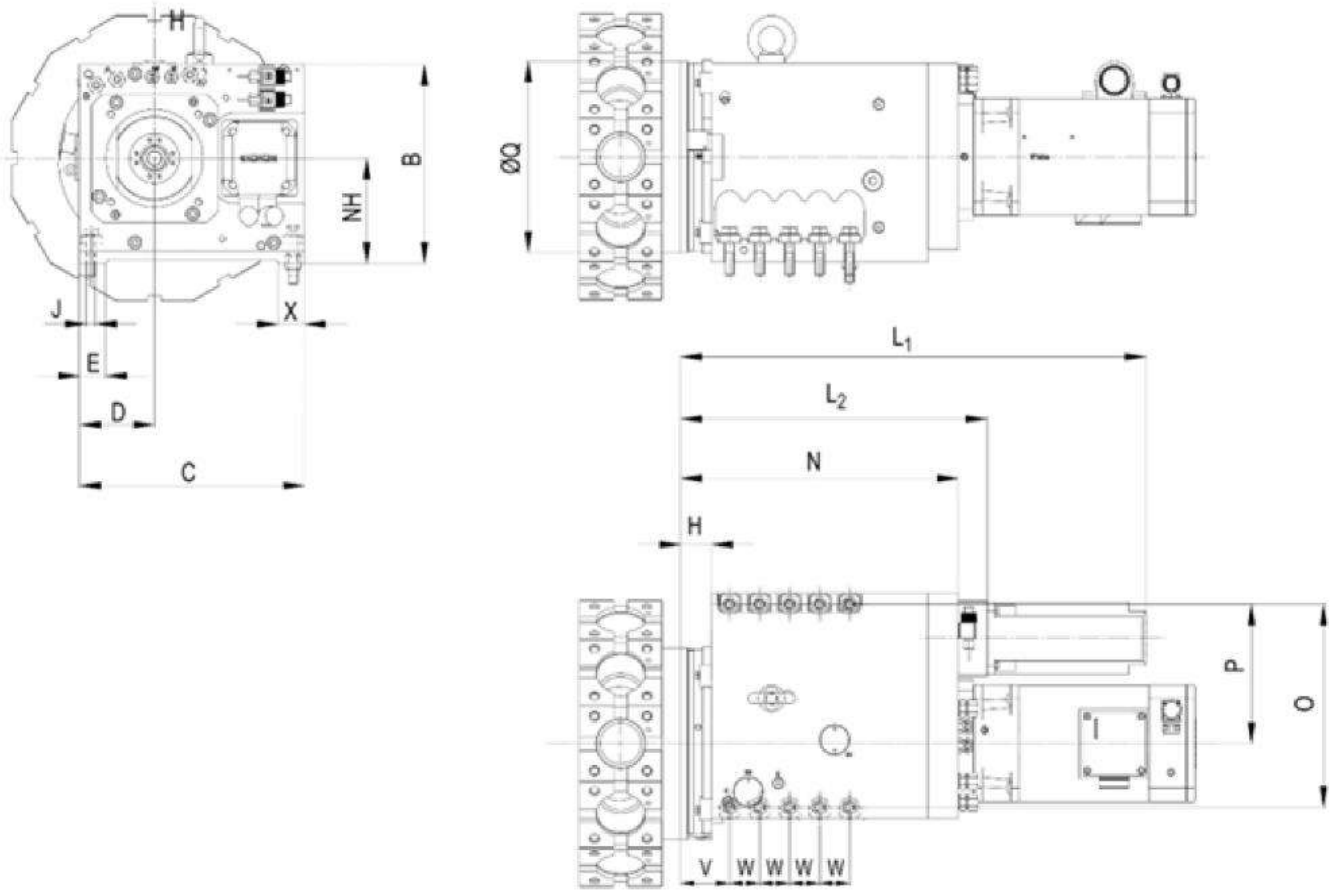
Series		Size			
434.0XX (L shape-NH standard 2)		16	20	25	32
NH			140	180	
B			265	330	
C			300	373	
D			100	125	
E			35	45	
H			41	52	
J			M12	M16	
L					
GPM drive 1.8.150.573	L_1		474	520	
Delta motor with drive	L_1		395	441	
Siemens 1FK70 43/42	L_2		394	425	
Fanuc α2/β2	L_2		379	425	
N			370	412	
O			270	337	
P			185	230	
øQ			255	318	
T			120	150	
V			144	176	
W			40	42	
X			35	45	

Block shape (reinforced version / NH standard 1)



Series		Size			
434.0XX (reinforced version/ NH standard 1))		16	20	25	32
NH		100	125	150	200
B		200	250	300	400
C		284	325	406	520
D		102	125	158	198
E		30	35	45	48
H		40	41	52	62
J		M10	M12	M16	M20
L					
GPM drive 1.8.150.573	L_1	454	474	520	666
Delta motor with drive	L_1	545	516	576	722
Siemens 1FK70 43/42	L_2	438	409	440	586
Fanuc α2/β2	L_2	123	395	425	571
N		340	370	412	528
O		240	295	370	476
P		150	185	230	300
øQ		160	255	318	396
V		62	65	78	96
W		34	40	42	52
X		50	35	45	48

Block shape (reinforced version / NH standard 2)

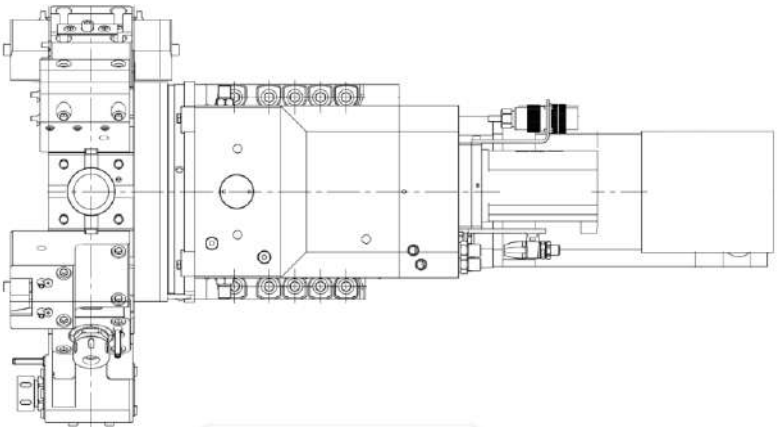


Series		Size			
434.0XX (Block shape reinforced version / NH standard 2)		16	20	25	32
NH			140	180	
B			265	330	
C			300	373	
D			100	125	
E			35	45	
H			41	52	
J			M12	M16	
L					
GPM drive 1.8.150.573	L_1		474	520	
Delta motor with drive	L_1		516	576	
Siemens 1FK70 43/42	L_2		409	440	
Fanuc α2/β2	L_2		394	425	
N			370	412	
O			295	370	
P			185	230	
øQ			255	318	
V			65	78	
W			40	42	
X			35	45	

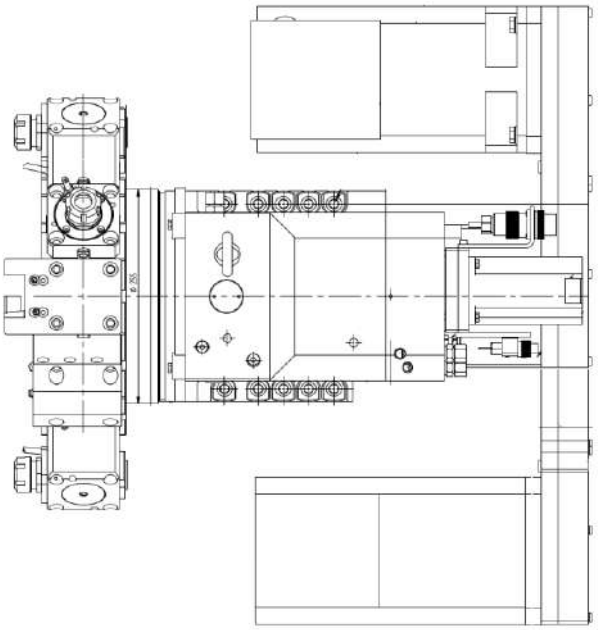
Motor Arrangement

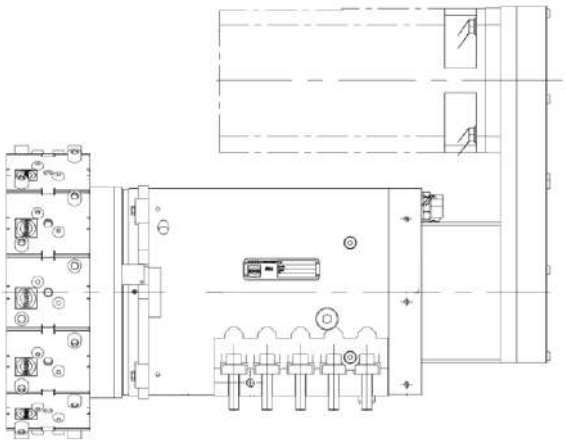
The tool drive motor can be installed directly on the turret or with a belt drive, depending on the application specifications.

Motor – arrangement – direct-

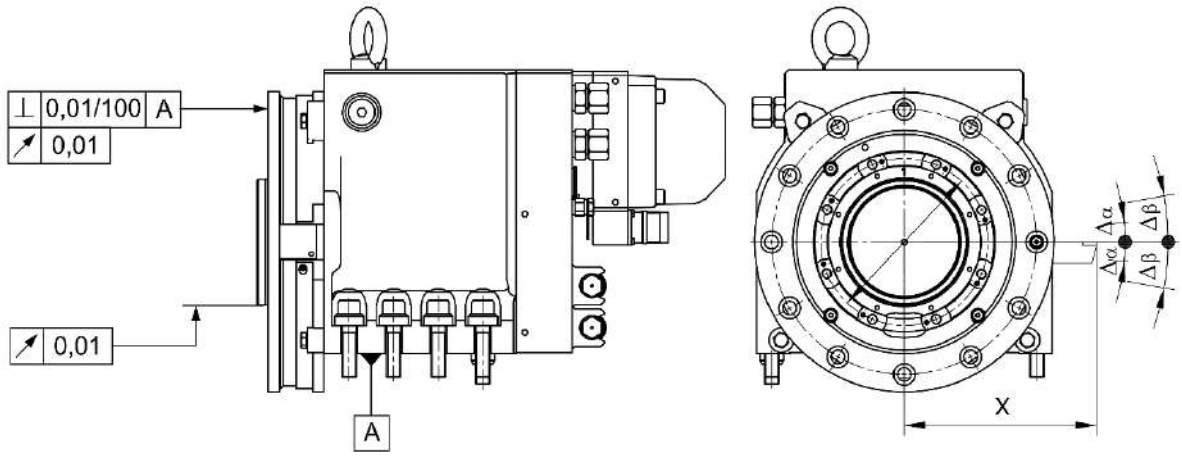


Motor – arrangement with deflection





Precision



Repeating accuracy

(Multiple move to a switching position from the same direction)

$$\Lambda\alpha = \pm 1.6\text{“} \equiv \pm 0.8 \text{ x } \frac{X[mm]}{100[mm]}[\mu m]$$

Indexing precision

(Multiple move to a switching position from the same direction)

$$\Lambda\beta = \pm 4\text{“} \equiv \pm 2 \text{ x } \frac{X[mm]}{100[mm]}[\mu m]$$

Performance Data for the Tool Coupling - Standard

The gearbox is designed for the performance data indicated below for the tool coupling.

The actually available performance data depend on the drive motor for tool drive (see below).

Series	Size			
434.0xx	**16**	**20**	**25**	**32**
Performance data				
Adm. drive rating[1] P_{adm} kW	8	10	12.5	16
Adm. torque[2] M_{adm} Nm	32	63	100	180
Adm. rpm[1) 3)] n_{adm} min^{-1}	6000	6000	4000	4000
ratio $i=n_1/n_2$	1.0	1.0	1.0	1.0
Recommended motors for tool drive				
Siemens Servo motor Type 1FT6..	..84-1AK	..086-1AH	..105-8AF	..108-8AF
Fanuc servo motor α	12/6000 is	22/4000 is	40/4000 is	50/3000
Fanuc spindle motor α	2	3	6	15 HVi

1) The values are reference values for short-term operation. Higher rpm generate more heat and noise.

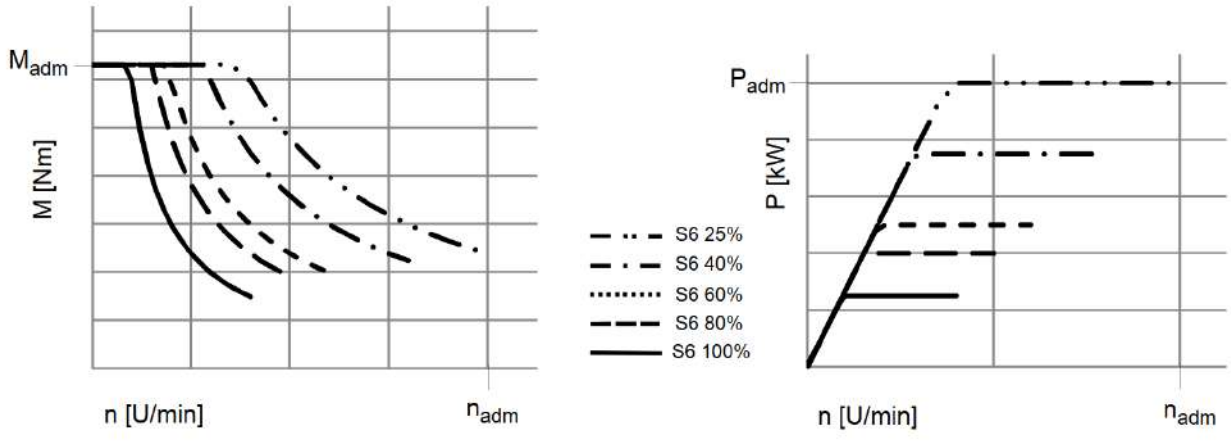
2) Torque limitation at motor converter required! The torque values apply to smooth-machining (such as thread drilling).
In the case of machining with severe shock loads
(e.g. face milling and similar operations) it is necessary to reduce the motor drive torque by 50% or more.

3) Higher rpm or long time operation, please go to next page : 434.0xx Premier Series

Admissible duty cycle (DC)

Tool Drive

Performance Diagram



See Appendix Performance data for tool drive

Performance Data for the Tool Coupling – Premier Series (Option)

The gearbox is designed for the performance data indicated below for the tool coupling.

The actually available performance data depend on the drive motor for tool drive (see below).

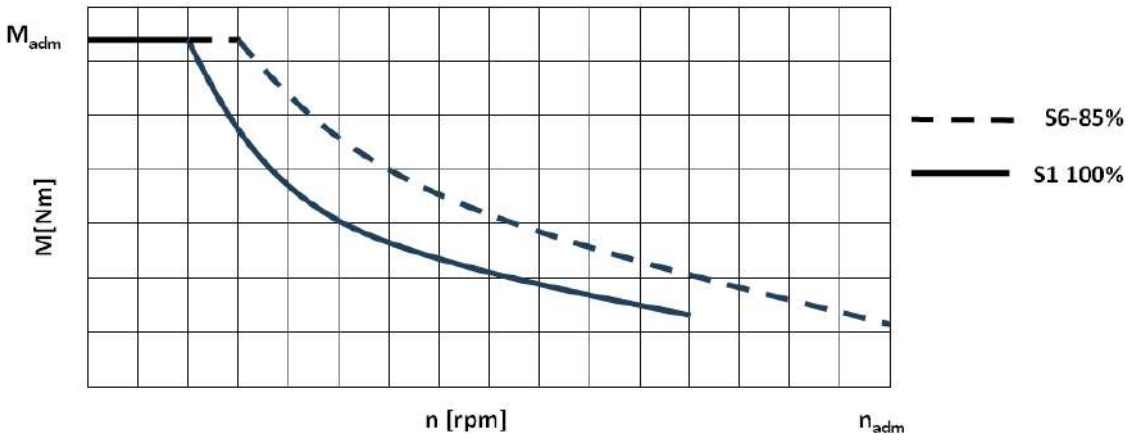
Series			Size		
434.0xx Premier Series			**16**	**20**	**25**
Performance data					
Adm. drive rating[1)]	P_{adm}	kW	8	10	12.5
Adm. torque	M_{adm}	Nm	32	63	100
Adm. rpm[1)]	n_{adm}	min^{-1}	*8000*	*8000*	*6000*
ratio $i=n_1/n_2$			1.0	1.0	1.0
Recommended motors for tool drive					
Siemens Servo motor 1FT6..			..84-1AK	..086 – 1AH	..105-8AF
Fanuc servo motor α			12/6000 is	22/4000 is	40/4000 is
Fanuc spindle motor α			2	3	6

1) Torque limitation at motor converter required! The torque values apply to smooth-machining (such as thread drilling). In the case of machining with severe shock loads (e.g. face milling and similar operations) it is necessary to reduce the motor drive torque by 50% or more.

Admissible duty cycle (DC) – Premier Series(Option)

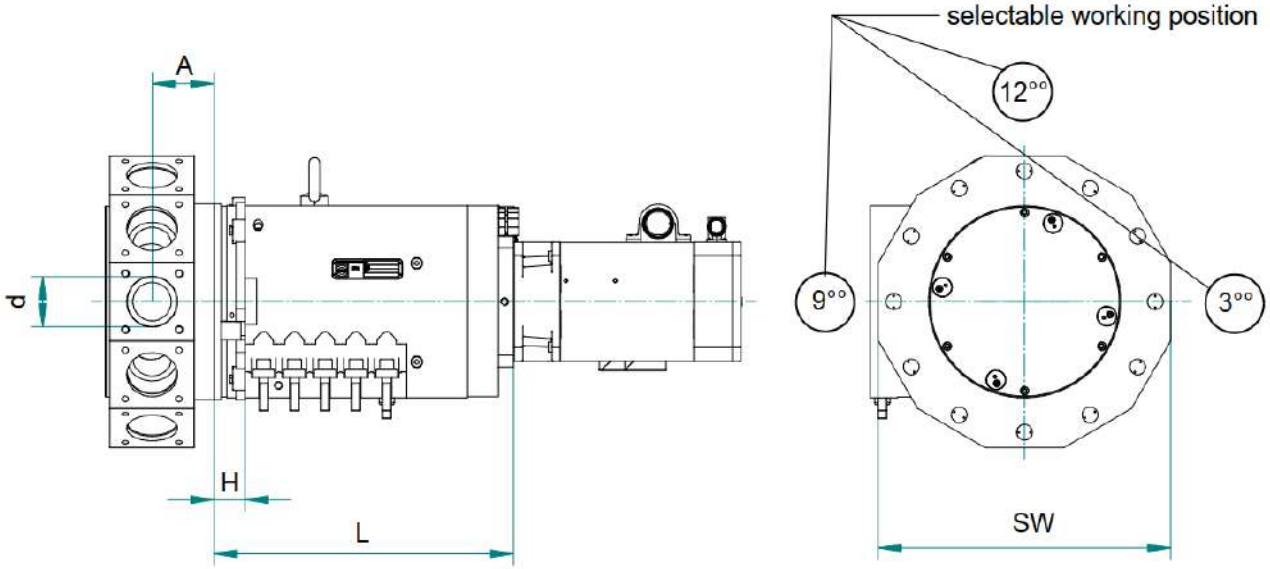
Tool Drive

Performance Diagram



See Appendix Performance data for more detail – page 30

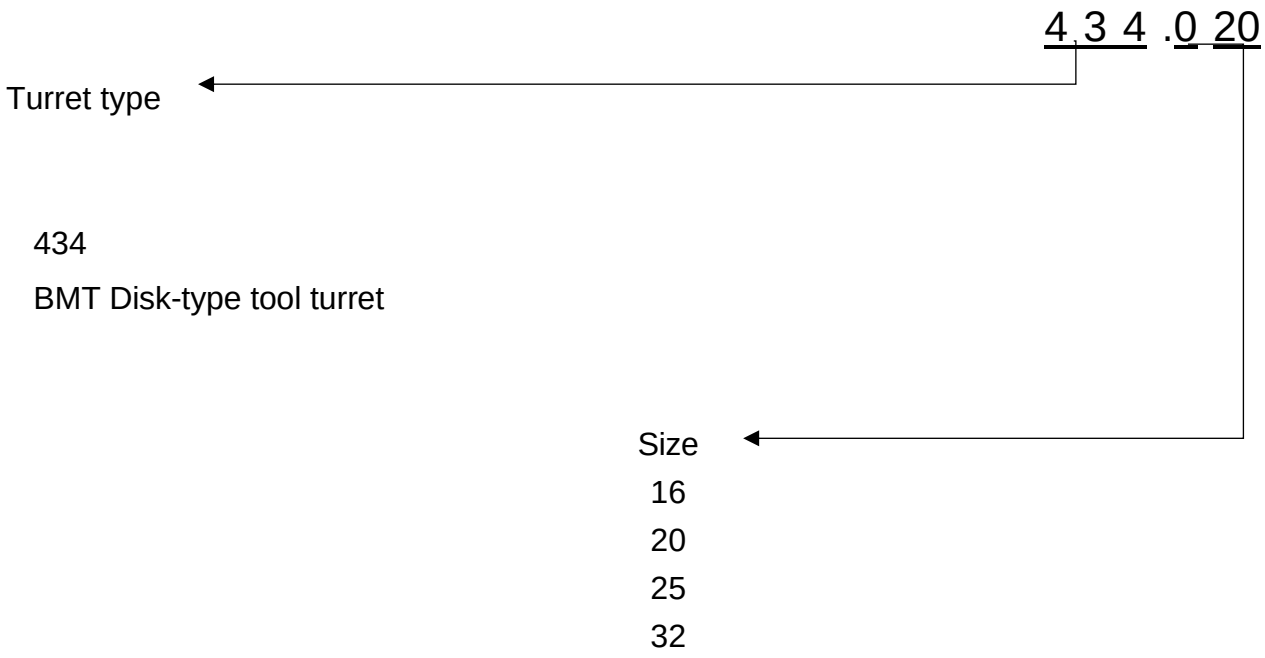
Dimensions



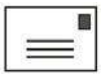
Series	Size			
434.0xx	**16**	**20**	**25**	**32**
Tool Coupling DIN 1809[1)]	BMT 55	BMT 65	BMT 75	BMT 85
Distance A	70	80	100	120
Distance H	40	41	52	62
d	55	65	75	85
SW – standard	330	380	430	530/720
Motors for tool drive				
Siemens Servo motor	1FT084	..086 - 1AH	..105 - 8AF	..108 - 8AF
L	-	390	452	-
Fanuc servo motor α	12/6000 is	22/4000 is	40/4000 is	50/3000 is
L	-	-	-	-
Fanuc spindle motor α	α2	α3	α6	15 HVi
L	-	-	-	-

1) Other interfaces on request

Type Key


4 3 4 .0 20
Turret type
434
BMT Disk-type tool turret
Size
16
20
25
32

Order Details

	Service GPM CO., LTD No. 368, Sec. 4, Huan Zhong Rd., Nan tun District, Taichung City, Taiwan
	+886-4-23805836
	+886-4-23805832
	www.GPMcnc.com
	info@gpmcnc.com

Company:_____

Street:_____

Postal Code:_____
City

Name:_____

Phone:_____

Fax:_____

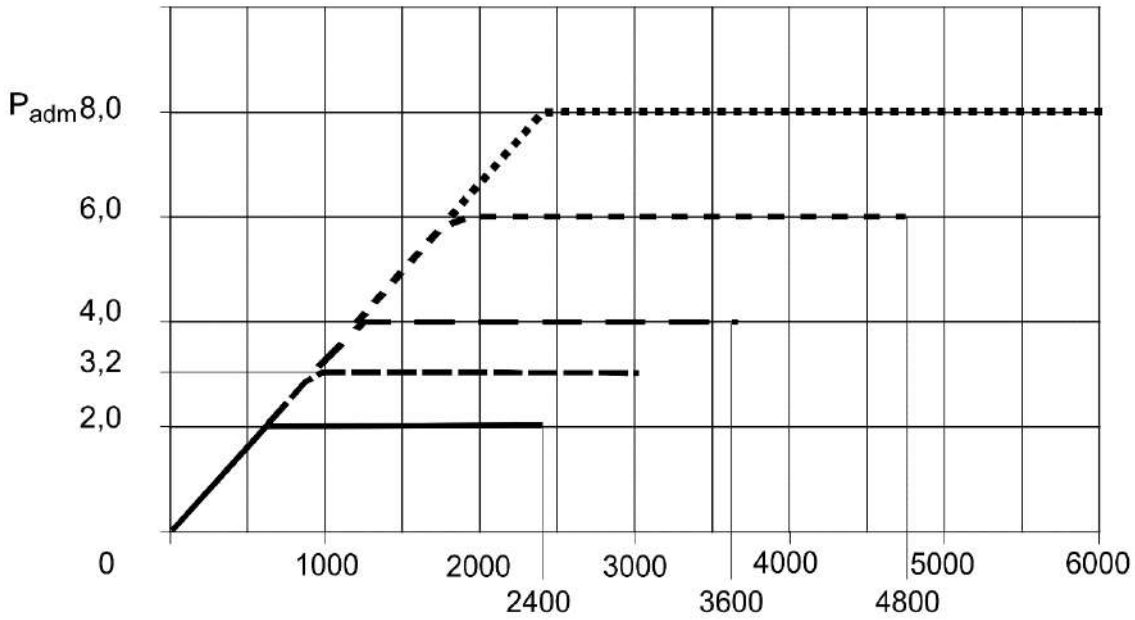
E-Mail:_____

Disk-type tool turret 434.0xx		
Ordering informations	**Possible configurations**	**Your selection**
Basis turret		
Housing shape	L / Block (NH 1/2)	
Size	20 / 25	
Number of switching positions	8 / 12 / 16	
Motor for indexing drive	Delta/ Siemens / Fanuc / ...	
Installation position		
Radial tool drive		
Working position	3°° / 9°° / 12°°	
Tool disc	SW	
Tool system	BMT 45 / 55 / 65 / 75 / 85	
Motor for tool drive	s. page 20	
Option		
Coolant pressure	25bar/70bar/others	
Premier series function	Long time operation	
Special requirements: ✍		

Appendix

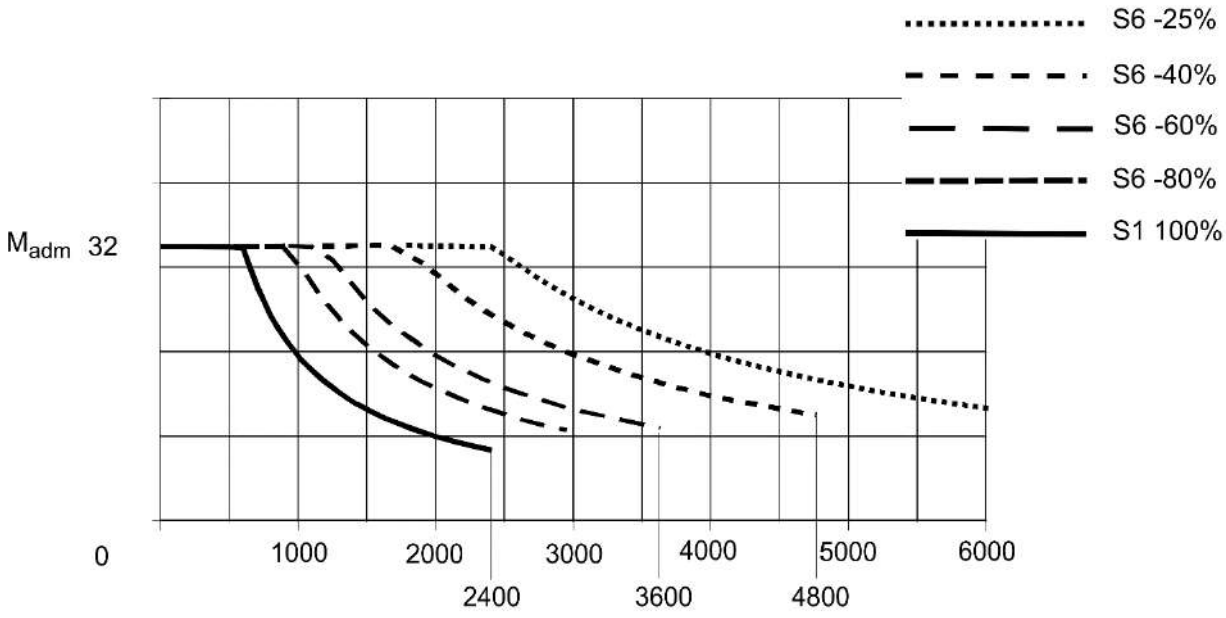
Technical Data	Performance Data Tool Drive (Grease lubricated)	4xx.x16-TI02-zh

Power [kW]



n_{adm} rotational speed rpm

Torque[Nm]

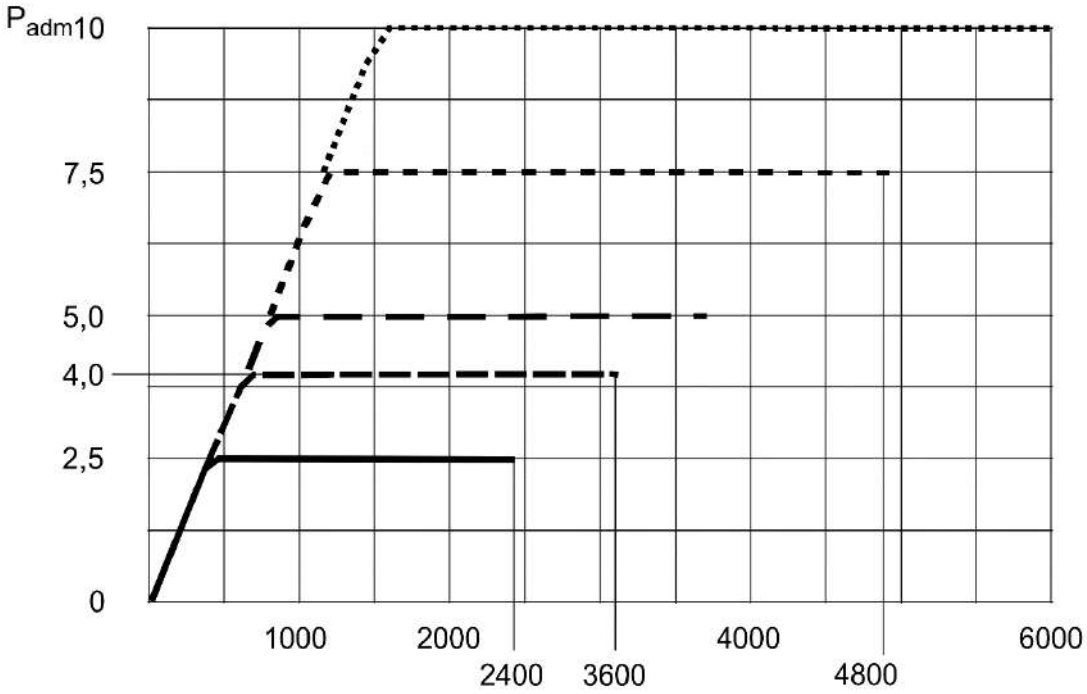


n_{adm} rotational speed rpm

The data for duty cycle are valid for 10 min. technical changes reserved.

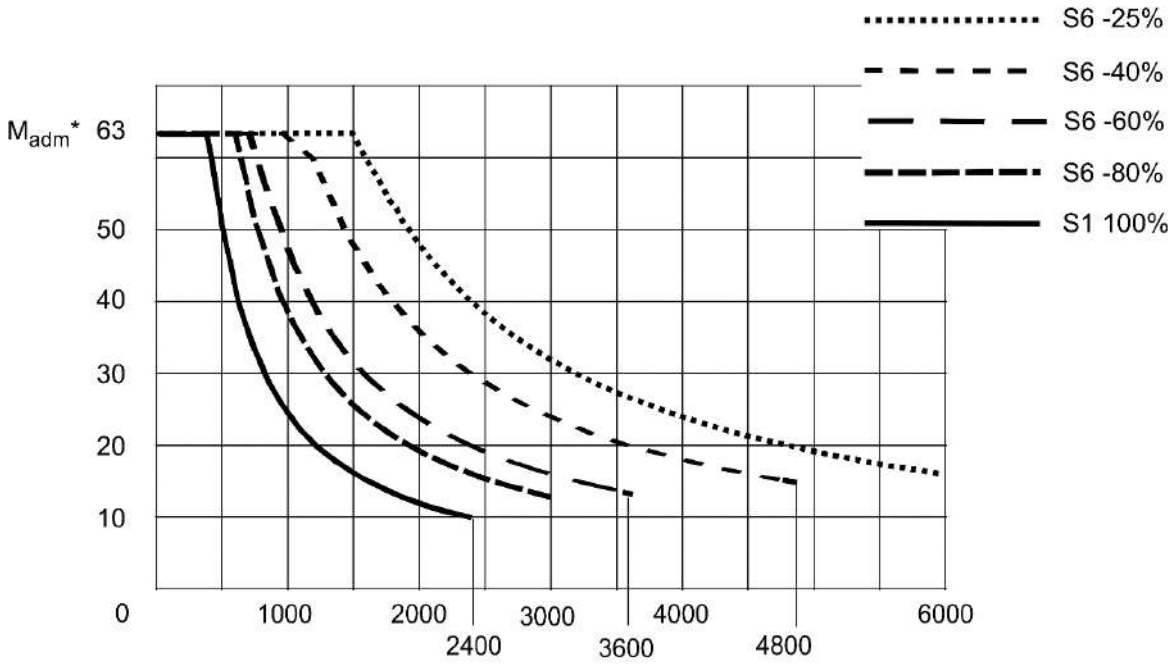
Technical Data	Performance Data Tool Drive (Grease lubricated)	4xx.x20-TI02-zh

Power [kW]



n_{adm} rotational speed rpm

Torque[Nm]



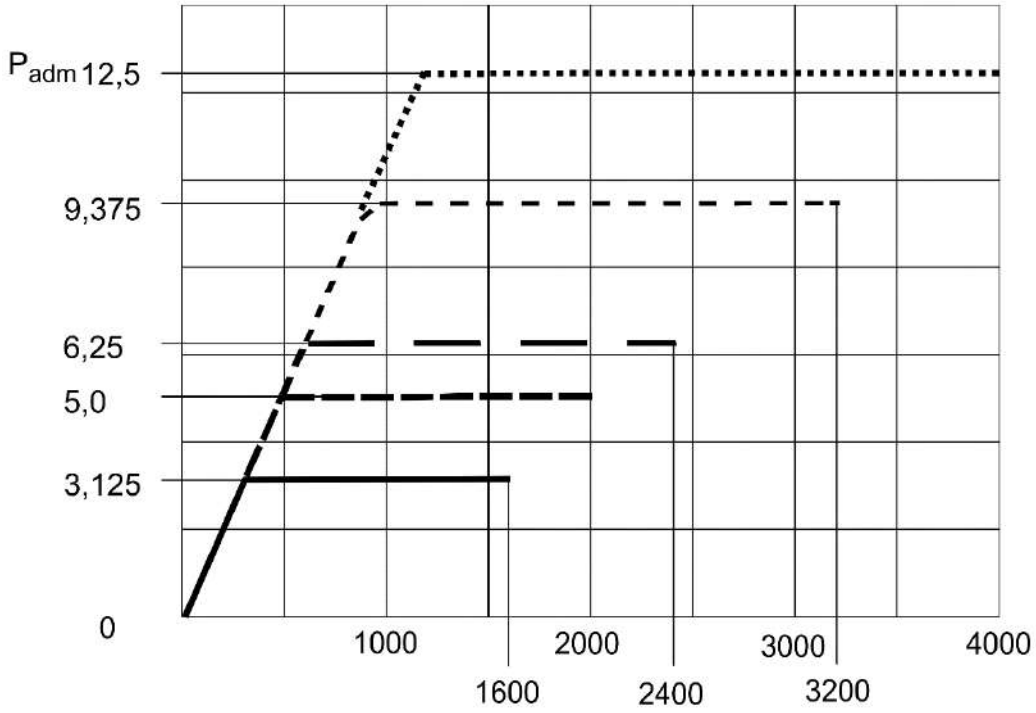
n_{adm} rotational speed rpm

The data for duty cycle are valid for 10 min. technical changes reserved

Tool Holder	M_{adm} [Nm]
BMT45	20
BMT55	32

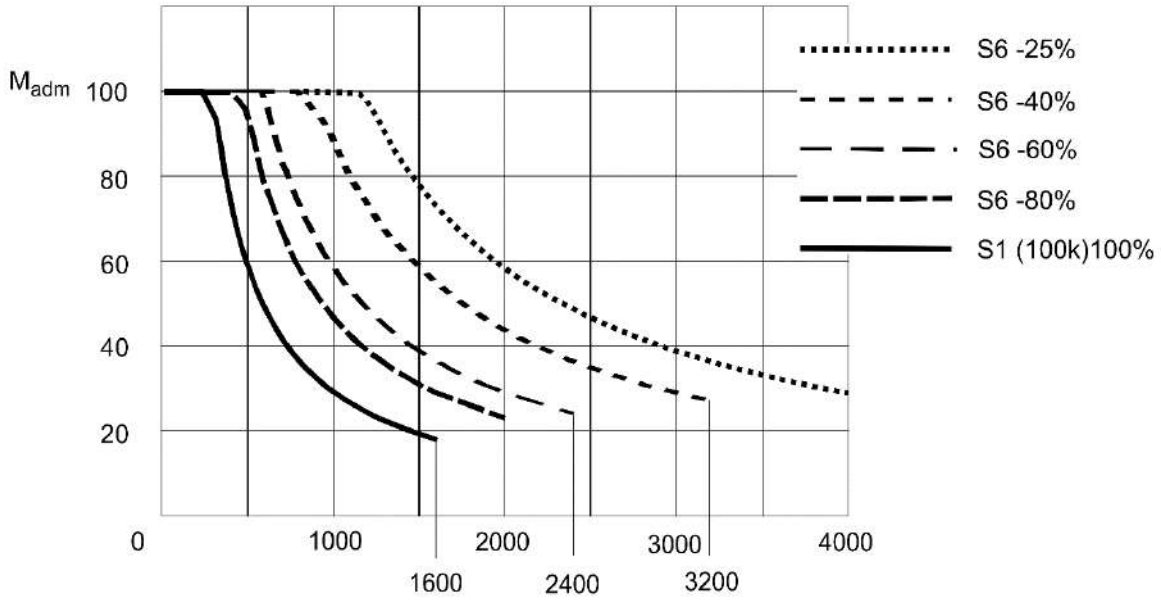
Technical Data	Performance Data Tool Drive (Grease lubricated)	4xx.x25-TI02-zh

Power [kW]



n_{adm} rotational speed rpm

Torque[Nm]

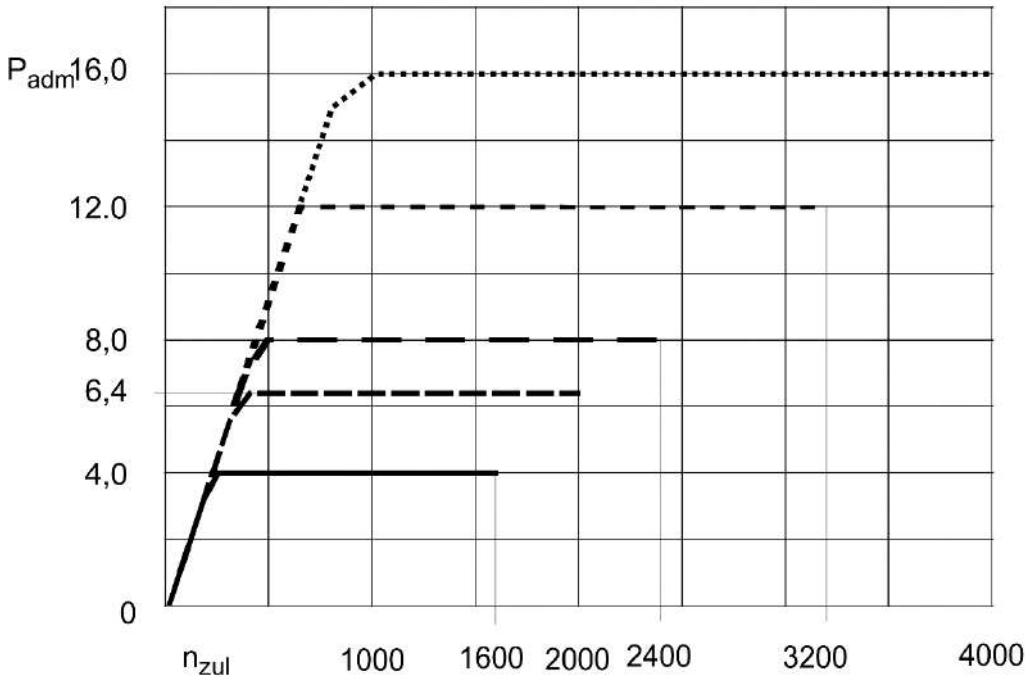


n_{adm} rotational speed rpm

The data for duty cycle are valid for 10 min. technical changes reserved

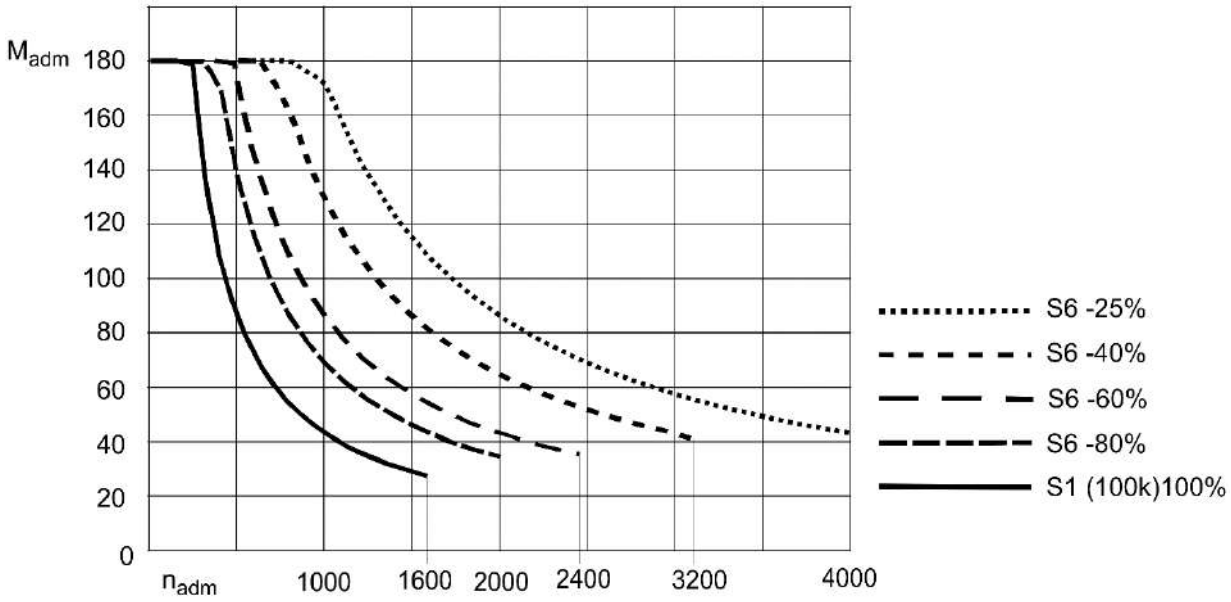
Technical Data	Performance Data Tool Drive (Grease lubricated)	4xx.x32-TI02-zh

Power [kW]



n_{adm} rotational speed rpm

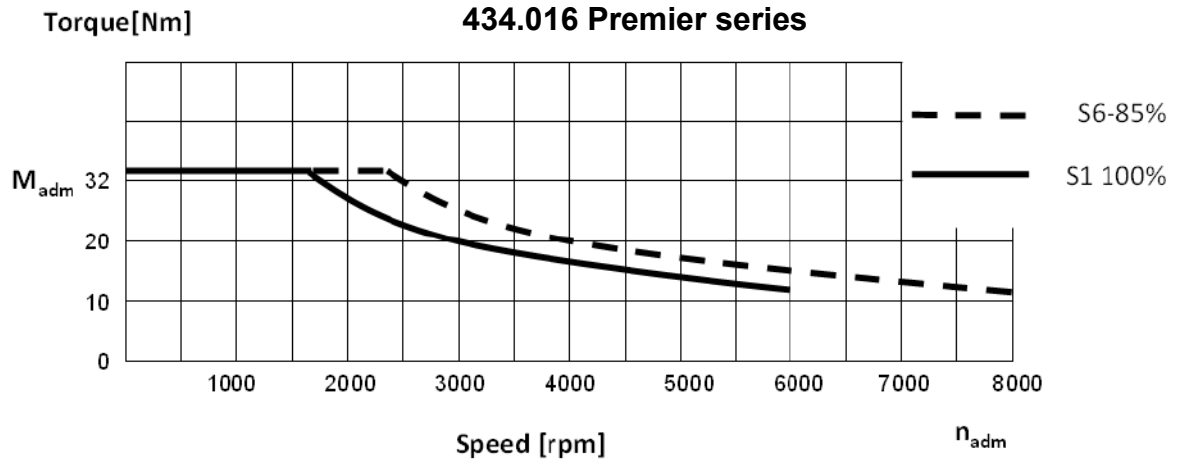
Torque[Nm]

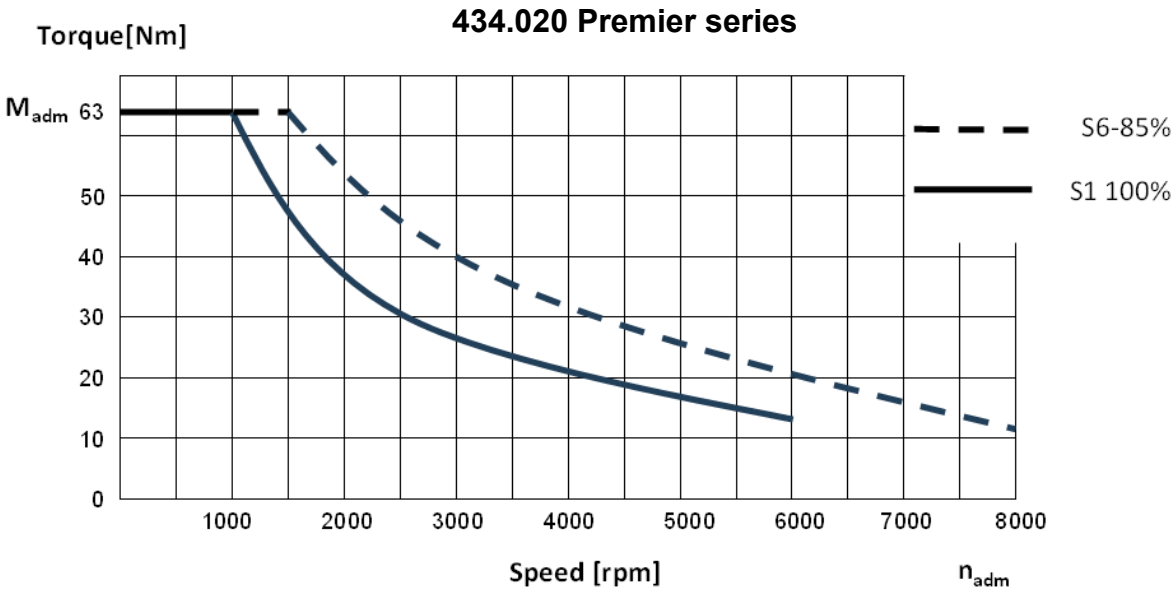


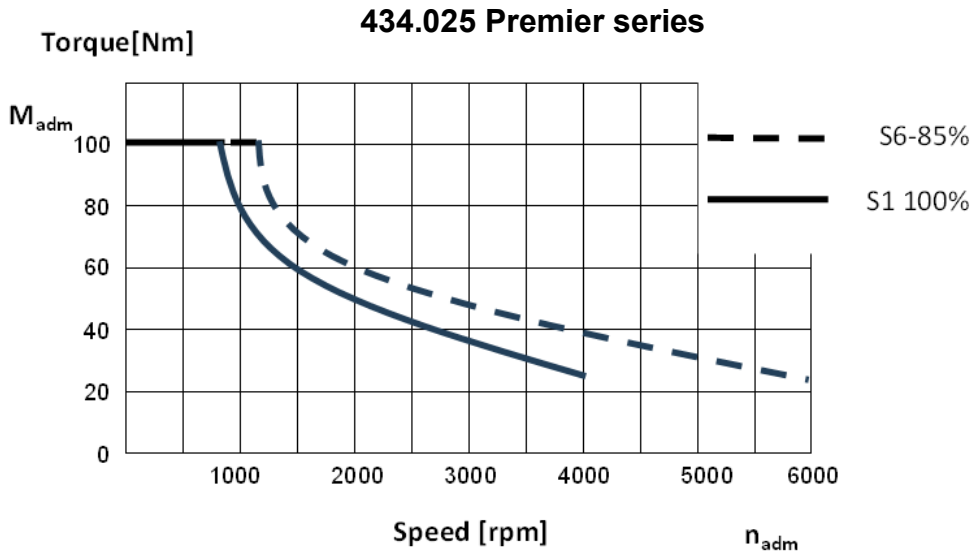
n_{adm} rotational speed rpm

The data for duty cycle are valid for 10 min. technical changes reserved

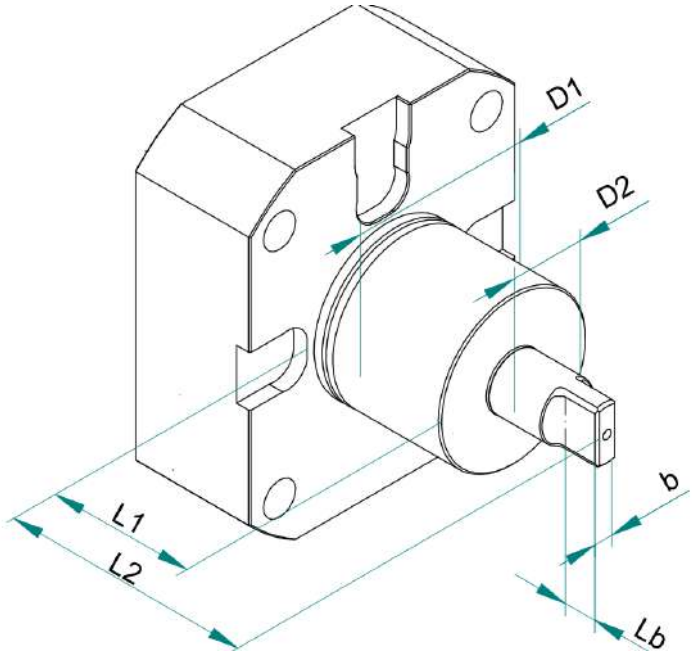
Performance data of tool drive for 434.0xx Premier Series







Dimensions for BMT tooling interface :



Tooling for interface	control measures [mm]							
	D1	D2	D3	b	L1	L2	L3	Lb
BMT 45	$44{,}9_{-0{,}05}$	35	23	$6_{-0{,}02}$	40	60	$84_{-0{,}3}$	8
BMT 55	$54{,}9_{-0{,}05}$	40	29	$8_{-0{,}02}$	30	75	$104_{-0{,}3}$	10
BMT 55 short	$54{,}9_{-0{,}05}$	40	29	$8_{-0{,}02}$	30	54	$83_{-0{,}3}$	10
BMT 65	$64{,}9_{-0{,}05}$	45	29	$10_{-0{,}02}$	32	81	$112_{-0{,}3}$	14
BMT 65 short	$64{,}9_{-0{,}05}$	45	29	$10_{-0{,}02}$	44	72	$91_{-0{,}3}$	14
BMT 75	$74{,}9_{-0{,}05}$	55	38	$14_{-0{,}02}$	43	80	$110_{-0{,}3}$	15
BMT 85	$84{,}9_{-0{,}05}$	65	30	$16_{-0{,}02}$	48	100	$140_{-0{,}3}$	20