



Precision Planetary Gearboxes

Performance & Effective line



PRODUCTS &
SOLUTIONS



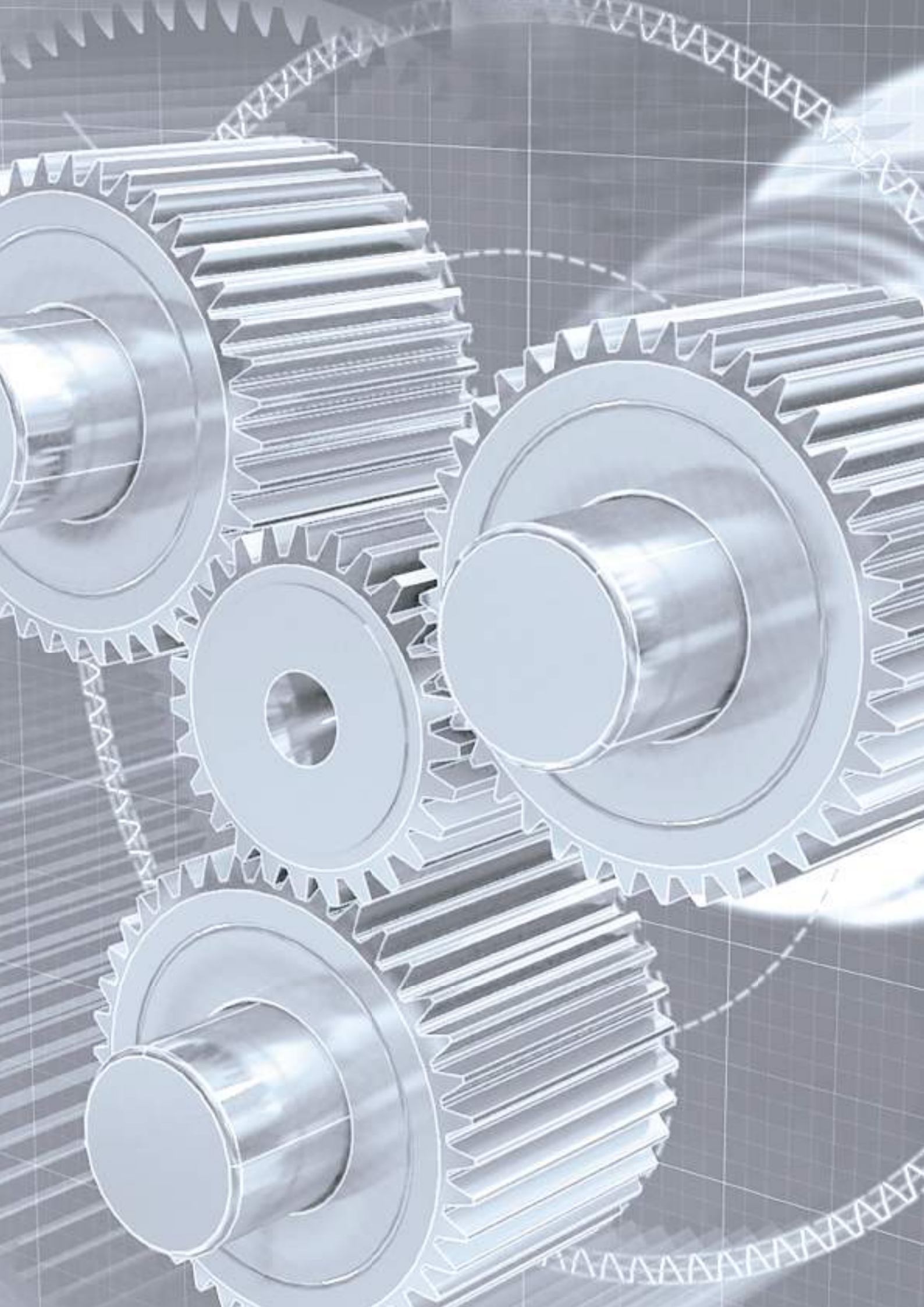
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Revisions

Refer to page 258 for the catalogue revision index.
Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.



The highest level of precision, efficiency and energy optimization

With almost 20 years of experience in creating tailored and forward-thinking motion control systems, Bonfiglioli has proven being a reliable partner as **one-stop shop for mechatronic applications** in industrial automation. Bonfiglioli engineering specialists work side by side with customers to develop dedicated integrated solutions, covering the entire motion drive train according to an **Industry 4.0 approach**.

Thanks to the extensive know-how and the long-term collaboration with key customers, our two centers of excellence, located in Italy and Germany, develop **breakthrough mechatronic innovations**, including low backlash planetary gearboxes, servomotors, open and closed loop inverters, servo drives and energy regenerative units.

This, combined with a comprehensive range of **Professional Services**, enables us to respond to customers' requests by:

- providing **user friendly, plug & play solutions**
- **increasing** applications' **efficiency** and **productivity**
- designing **flexible, modular solutions** targeted to a wide range of applications
- granting access to real time data for **diagnostic, maintenance** and **predictive analytics**



Fully committed to the efficiency of customers' system over its life cycle

Bonfiglioli technical sales experts support customers with a proactive, flexible and dedicated approach **throughout the system's entire life cycle**.

- **Assessment and recommendation:** our team provides support starting from the very early stage of the project by assessing the requirements and developing a targeted analysis of the application, guiding customers in the choice of the most suitable components for their drive solution.
- **Engineering and planning:** our experts work with customers to co-engineer their application, offering consultancy in sizing, fine tuning and selecting the optimized drive train, always considering life cycle cost optimization.
- **Installation and commissioning:** we partner with our customers to ensure a quick, cost-effective and successful installation, optimizing the benefits and functions of their drive technology.
- **Retrofit and upgrade:** we update customers' machines with state-of-the-art technology to ensure constant levels of productivity, reliability and performance.
- **Maintenance and repair:** we work side by side with customers to avoid failures, reduce down times and ensure the best system operation.

A complete integrated solution for all industrial applications

Our engineering specialists **work side by side with customers** to create the most effective solution, whether the request is to optimize an existing machine or to develop a new one. Our relationship with customers is based on an **active partnership** with fast decision-making processes to develop individually tailored offers.

Our full-range and modular offering provides the necessary products for the development of vertically integrated solutions in **a variety of sectors**, such as material handling, automated storage, textile and packaging. Our team of experts assists customers in designing cost effective and energy efficient machines, aligning performance to meet the specific requirements.



A complete integrated solution

- Precision Planetary Gearboxes
- Industrial Gearboxes
- Permanent Magnet Synchronous Motors
- Synchronous Reluctance Motors
- Asynchronous Motors
- Servo Inverters
- Frequency Inverters
- Energy Regenerative Inverters
- Motion Control
- Industry 4.0 solutions

Industry sector expertise



Bonfiglioli Digital Tools

Thanks to a powerful set of **software tools** and **online platforms**, developed through partnerships with the main market leaders, Bonfiglioli enables its customers to **engineer tailored applications** in a smooth and productive way: the components selection and sizing, as well as the design of the whole motion drive train, are made simpler and more reliable.

In addition, thanks to its in-depth knowledge of industrial solutions, **Bonfiglioli engineering team is ready to assist customers** in their selection and design process, providing high quality technical support for specific application developments.



SERVOSOFT | Develop optimized solutions

Bonfiglioli and SERVOsoft® work together to **support customers in sizing complete multi-axis servo systems**, including motors, gearboxes and servodrives with 15 mechanisms and up to 50 axes in a shared bus or standalone configuration.

With the Bonfiglioli products available on SERVOsoft, customers are able to select, size and design their customized and high performance applications.

In addition, the Bonfiglioli engineering team, thanks to its in-depth knowledge of the products, uses the high level servosizing tool SERVOsoft® to provide a **top level customer support service** by developing **optimized, energy-efficient** and **tailored engineering solutions** to meet individual needs.



MOSAICO 3.0 | Product configuration and order assistant

Bonfiglioli's **complete e-business system** guides customers, distributors and agents through the process of **selecting the right product** for their specific needs, and provides support for **design activities** and **order management**, greatly accelerating the selection and ordering process and improving accuracy.

Thanks to this web-based technology, customers can get in touch with Bonfiglioli technical service any time from anywhere around the world.



EPLAN | Enhance your electrical design

Bonfiglioli and EPLAN work together to **provide efficient engineering solutions**, aimed at reducing the gap between the initial concept and its development, programming and commissioning, thanks to:

- Always up-to-date device data and documentation
- Easy drag and drop function to develop optimized electrical drawings

Bonfiglioli Precision Planetary Gearboxes



We have decades of experience in supporting customers across a broad spectrum of industry sectors, providing a **wide range of innovative, efficient and highly reliable precision planetary gearboxes**.

Our team is fully dedicated to continuous improvements in terms of quality, safety and environmental sustainability across the entire value chain. We develop and manufacture our precision planetary gearboxes exclusively in Italy, according to the **highest quality standards** and procedures.

Robust, compact, highly performant and specially customized: we respond to our customers' needs in all industries, regardless the complexity of their projects. Our portfolio is constantly evolving with the aim of providing the right answer for each application, according to the different requirements in terms of performance, price and optimized machine integration.

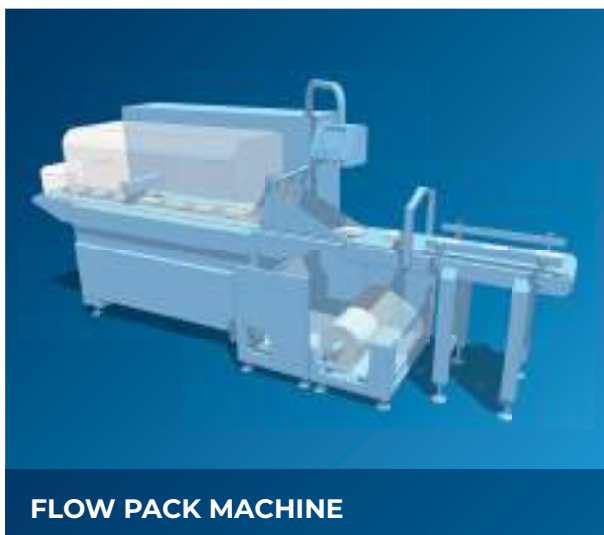
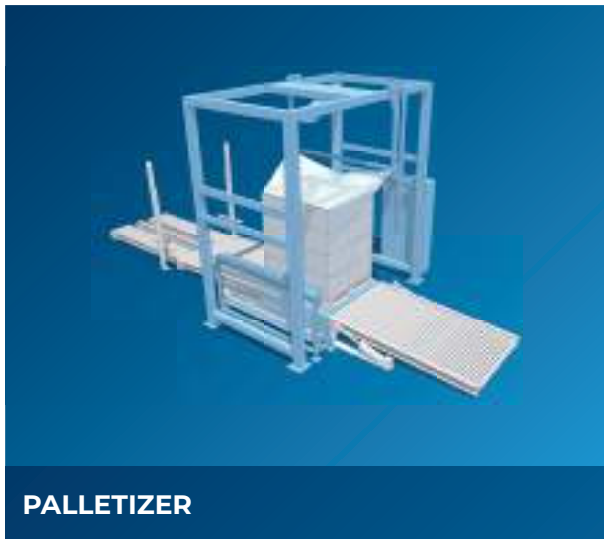
Our story

<p>1988</p>  <p>BGT SERIES</p>	<p>2002</p>  <p>MP/TR SERIES</p>	<p>2004</p>  <p>LC SERIES</p>	<p>2008</p>  <p>KR SERIES</p>	<p>2009</p>  <p>SL SERIES</p>	<p>2010</p>  <p>LCK SERIES</p>
<p>2013</p>  <p>TQ SERIES</p>	<p>2014</p>  <p>TQK SERIES</p>	<p>2015</p>  <p>TQF SERIES</p>	<p>2017</p>  <p>BMS SERIES</p>	<p>2019</p>  <p>TQFE, TQFEK, MPE, MPEK SERIES</p>	

The right solution for a wide spectrum of applications

Whether in material handling, automated storage, packaging or automation technology, our precision planetary gearboxes are **optimized for numerous applications**.

Our offer expands far beyond standard, providing the **right solutions tailored to customers' needs** in terms of performance and price.



Performance Line

(P)

Developed to meet the most demanding requirements and to ensure maximum performance.

Bonfiglioli precision planetary gearboxes Performance Line includes a wide selection of products developed to **meet the most demanding requirements of servo applications** characterized by **high dynamics** and **high levels of precision**.

Bonfiglioli acknowledges the increasing demand for highly complex applications connected to the maximization of machine productivity and the growth of product variety in assembly systems. Hence, in combination with the products, we focus on offering **comprehensive consultancy services** and on **developing tailored solutions** which fully respond to customers' requirements, ensuring the optimization of applications both under the performance and the energy efficiency point of view.

The Performance Line presents the perfect features to be matched with our servomotors and frequency inverters in **optimized mechatronic integrated systems**.

Main benefits

- Maximum power density
- Outstanding position accuracy
- Top class design
- Extreme reliability
- Easy installation
- Customized solutions and engineering service

Product	TQ	TQK	TQF	TR	MP
					
Nominal output torque	●●●●	●●●●	●●●●	●●●●●	●●●●●
Bearing load	●●●●	●●●●	●●●●●	●●●●	●●●●
Input speed	●●●●	●●●●	●●●●	●●●●	●●●●
Torsional stiffness	●●●●	●●●●	●●●●●	●●●	●●●
Backlash	●●●●●	●●●	●●●●	●●●●	●●
Range of ratios	●●●	●●●●	●●●	●●●●●	●●●●●

● Standard > ●●●●● Excellent



Effective Line

Bonfiglioli performance and reliability at a great value-price ratio.

The precision planetary gearboxes Effective Line is specially designed for **systems with medium requirements for precision, dynamics, and power density**, delivering **well-known Bonfiglioli quality and reliability** standards at a great value-price ratio.

Our Effective Line covers a wide range of products characterized by high **flexibility**. Thanks to the wide variety of output configurations and design versions, this line provides great freedom when designing different applications.

In addition, this group of products ensures easy installation and retrofit thanks to **extensive compatibility** with a wide range of market standards.

Our technical team supports our customers already from the design phase with **servo-sizing and engineering services** in order to quickly select the most suitable solutions.

Main benefits

- Wide flexibility
- High modularity
- Great value-price ratio
- Bonfiglioli quality and reliability

TQFE	TQFEK	SL	LC	LCK	MPE	MPEK	KR	Product
••	••	••	•••	•••	••	••	•	Nominal output torque
••••	••••	••••	•••	•••	•••	•••	•	Bearing load
•••	•••	•••	•••	•••	•••	•••	••	Input speed
••••	••••	••••	••	••	••	••	••	Torsional stiffness
•••	•••	•••	•••	•••	•••	•••	••	Backlash
•••	•••	•••	•••	•••	•••	•••	•	Range of ratios

• Standard > ••••• Excellent

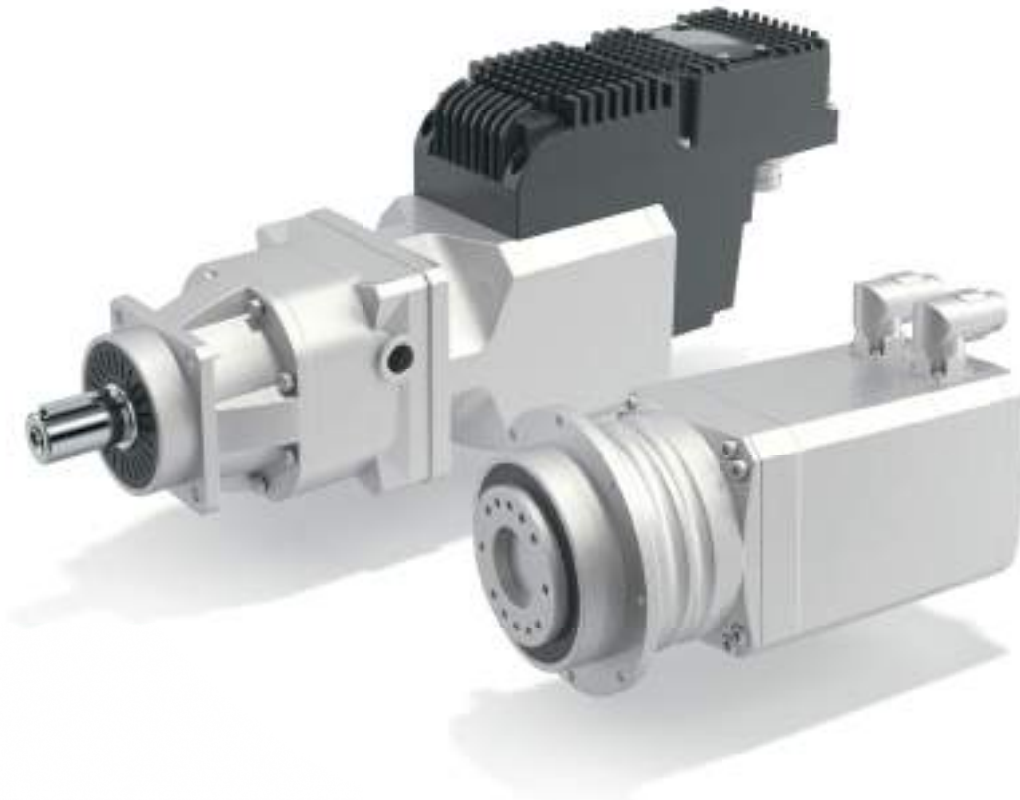
Top level Mechatronic Integration

Our **integrated servo actuators** represent the response to the increasing requirements of motion applications in terms of power, speed and precision. Our integrated products are designed to **maximize the synergies between our drives, motors and gearboxes** with the main goal of **performance optimization and complexity reduction**.

Bonfiglioli mechatronic integrated solutions focus on providing increased performances in every key aspect: precision, compactness, energy efficiency, dynamics and reliability.

Our **servo gearmotors BMS** represents the best integration between our precision planetary gearboxes and our servomotors. It benefits from the **high torsional rigidity** and **low backlash** of our precision planetary gearboxes in combination with the **excellent torque density** and **high dynamics** of our permanent magnet synchronous motors.

In addition, the combination of our permanent magnet synchronous motors with our powerful servo drives is designed for servo applications requiring highest standards in terms of control dynamics, precision, robustness and long-term operation. **Our servomotors with integrated drive, iBMD**, delivers **high torque capability** and **extremely low inertia** in a **compact and light package**, ideal for decentralized applications characterized by high dynamics.



**Technical
information**



1 GENERAL INFORMATION

1.1 SYMBOLS, UNITS AND DEFINITIONS

Values depending on the APPLICATION

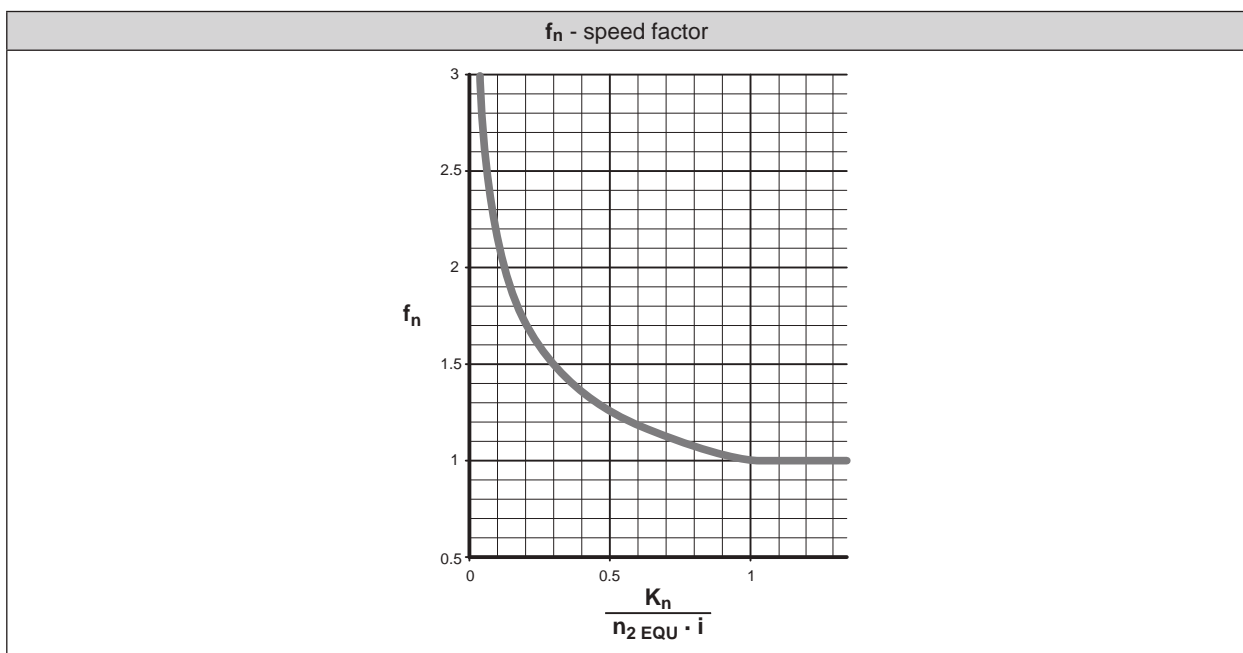
term	u.m.	definition
A_2	[N]	Axial force on output shaft
$A_2 \text{ EQU}$	[N]	Equivalent axial force applying on output shaft
$A_2 \text{ MAX}$	[N]	Maximum axial force applying on output shaft
R_2	[N]	Radial force on output shaft
$R_2 \text{ EQU}$	[N]	Equivalent radial force applying on output shaft
$R_2 \text{ MAX}$	[N]	Maximum radial force applying on output shaft
ED	[s]	Duration of the duty (without brake)
$ED\%$	[%]	Cyclic duration factor
$L_{10h \text{ TARGET}}$	[h]	Output shaft bearings' desired basic rating life
$M_1 \text{ PEAK}$	[Nm]	Maximum input torque (limited by motor control)
$M_{2(1)} \dots M_{2(n)}$	[Nm]	Output torque at the times $t_1 \dots t_n$
$M_2 \text{ EQU}$	[Nm]	Equivalent output torque
$M_2 \text{ MAX}$	[Nm]	Maximum output torque in case of emergency
$M_{T2 \text{ EQU}}$	[Nm]	Equivalent tilting moment applying on output shaft
$M_{T2 \text{ MAX}}$	[Nm]	Maximum permissible tilting moment applying on output shaft
n_1	[min ⁻¹]	Nominal input speed
n_2	[min ⁻¹]	Output speed
$n_{2(1)} \dots n_{2(n)}$	[min ⁻¹]	Output speed based on the times $t_1 \dots t_n$
$n_2 \text{ EQU}$	[min ⁻¹]	Equivalent output speed
$n_2 \text{ MAX}$	[min ⁻¹]	Maximum output speed
T	[C°]	Ambient temperature
$t_1 \dots t_n$	[s]	Operating time
t_Σ	[s]	Cycle duration including pause
Z	[1/h]	Number of cycles per hour

Values depending on the GEAR DRIVE SELECTION

term	u.m.	definition
$A_{2 \max} / A_{3 \max}$	[N]	Admissible axial force on output shaft
$A_{2 \max} / A_{3 \max}$	[N]	Axial force acting simultaneously with radial force
$R_{1 \max}$	[N]	Admissible radial force at midpoint of input shaft
$R_{2 \max} / R_{3 \max}$	[N]	Admissible radial force at midpoint of output shaft
C_B	[Nm]	Constant for bearing's lifetime calculation
C_t	$\left[\frac{\text{Nm}}{\text{arcmin}} \right]$	Torsional stiffness
f	—	Factor ratio between axial and radial force
f_n	—	Speed factor
f_z	—	Cycle factor
f_T	—	Temperature adjusting factor
i	—	Gearbox ratio
J_G	[kgcm ²]	Mass moment of inertia of the gearhead
K_n	—	Speed constant
L_{10h}	[h]	Bearings basic rating life
L_z	[mm]	Factor for bearing lifetime calculation
M_{a2}	[Nm]	Maximum acceleration output torque
M_{n2}	[Nm]	Rated output torque
M_{p2}	[Nm]	Emergency stop output torque. Permitted 1000 times during service life of the gearbox
$M_{T2 \max}$	[Nm]	Maximum tilting moment applying on output shaft
$n_{1 \max}$	[min ⁻¹]	Maximum momentary input speed. The speed the unit can be driven at occasionally and in non-repetitive conditions For duty type S5, it cannot be applied continuously for more than 30 seconds
p	—	Bearing lifetime exponent
η	[%]	Gear efficiency
φ_R	[arcmin]	Reduced backlash
φ_S	[arcmin]	Standard backlash

1.2 SELECTING THE GEAR UNIT

(a)	Ratio	i	—	$i = \frac{n_1}{n_2}$
(b)	Equivalent output torque	$M_{2\text{ EQU}}$	[Nm]	$M_{2\text{ EQU}} = \sqrt[3]{\frac{ n_{2(1)} \cdot t_1 \cdot M_{2(1)} ^3 + \dots + n_{2(n)} \cdot t_n \cdot M_{2(n)} ^3}{ n_{2(1)} \cdot t_1 + \dots + n_{2(n)} \cdot t_n}}$
(c)	Equivalent output speed	$n_{2\text{ EQU}}$	[min ⁻¹]	$n_{2\text{ EQU}} = \frac{ n_{2(1)} \cdot t_1 + n_{2(2)} \cdot t_2 + \dots + n_{2(n)} \cdot t_n}{t_\Sigma}$
(d)	Speed factor	f_n	—	<p>If $\frac{K_n}{n_{2\text{ EQU}} \cdot i} \geq 1 \Rightarrow f_n = 1$</p> <p>If $\frac{K_n}{n_{2\text{ EQU}} \cdot i} < 1 \Rightarrow f_n = \text{Obtain from diagram}$</p>
(e)	Temperature adjusting factor	f_T	—	
(f)	Cyclic duration factor	ED%	[%]	$ED\% = \frac{ED}{t_\Sigma} \cdot 100$
	Duration of the duty	ED	[s]	$ED = t_1 + t_2 + \dots + t_n$
(g)	Number of cycles per hour	Z	[1/h]	$Z = \frac{3600}{t_\Sigma}$
(h)	Cycle factor*	f_z	—	<p>*For Z>6000 please contact us!</p>
(i)	Maximum input torque	$M_{1\text{ PEAK}}$	[Nm]	maximum motor torque



K_n - speed constant

i	TQ 060	TQ 070	TQ 090	TQ 130	TQ 160
3	3500	3100	1050	1800	1100
4	3500	3300	1050	2000	1450
5	3500	3500	1700	2500	1650
7	4000	3500	3000	2800	2500
10	4000	3500	3000	2800	2500
16	4500	3500	3000	2800	2500
20	4500	3500	3000	2800	2500
25	4500	3500	3000	2800	2500
28	4500	3500	3000	2800	2500
35	4500	3500	3000	2800	2500
40	4500	3500	3000	2800	2500
50	4500	3500	3500	3200	2500
70	5000	4500	4000	3500	2500
100	5000	4500	4000	3500	2500

i	TQK 060	TQK 070	TQK 090	TQK 130	TQK 160
6	2400	2400	2000	1600	1600
8	2400	2400	2000	1600	1600
10	2400	2400	2000	1600	1600
14	2400	2400	2000	1600	1600
18	2400	2400	2400	2000	1600
20	2400	2400	2400	1600	1600
24	2400	2400	2400	2000	1600
30	2400	2400	2400	2000	1600
40	2400	2400	2400	2000	1600
50	2400	2400	2400	2000	1600
70	2400	2400	2400	2000	1600
80	2400	2400	2400	2000	1600
100	2400	2400	2400	2000	1600
140	2400	2400	2400	2000	1600
200	2400	2400	2400	2000	1600

i	TQF 060	TQF 070	TQF 090	TQF 130	TQF 160
4	3500	3300	1050	2000	1450
5	3500	3500	1700	2500	1650
7	4000	3500	3000	2800	2500
10	4000	3500	3000	2800	2500
16	4500	3500	3000	2800	2500
20	4500	3500	3000	2800	2500
25	4500	3500	3000	2800	2500
28	4500	3500	3000	2800	2500
35	4500	3500	3000	2800	2500
40	4500	3500	3000	2800	2500
50	4500	3500	3500	3200	2500
70	5000	4500	4000	3500	2500
100	5000	4500	4000	3500	2500

i	TR / MP 053	TR / MP 060	TR / MP 080	TR / MP 105	TR / MP 130	TR / MP 160	TR / MP 190
3	1400	1400	2700	2500	1700	550	1500
4	2000	1600	1500	1600	500	350	1150
5	2300	2050	1750	1850	600	350	1300
6	2300	2500	2500	1050	150	150	1150
7	3800	3000	2100	1350	400	300	1600
9	4000	3300	2900	2500	2100	1600	1500
10	-	4000	4000	3500	3200	1150	2900
12	3300	3300	1500	1500	500	300	1050
15	3300	3300	1700	1750	600	350	1200
16	3500	3500	1950	2050	700	450	1400
20	3500	3500	2450	2550	850	300	1750
25	3500	3500	2800	2900	1000	350	2000
28	4000	4000	3450	3500	1200	450	2450
30	-	4000	4000	3500	3200	3000	1950
35	4000	4000	3950	3500	1350	500	2800
36	4000	3500	3200	1950	550	500	2300
40	-	4000	4000	3500	1700	650	2900
45	4000	-	-	-	-	-	-
48	4000	3500	3100	2800	2300	850	2100
50	-	4000	4000	3500	1950	750	2900
60	3500	-	-	-	-	-	-
64	3500	3500	3100	2800	2400	1000	2100
70	-	4000	4000	3500	2400	900	2900
75	3500	3500	3200	3000	2900	1350	2300
80	3500	3500	3100	2800	2400	1300	2100
81	4000	-	-	-	-	-	-
84	4000	4000	4000	3500	2900	1050	2900
90	-	4000	4000	3500	2850	3000	2900
100	3500	4000	4000	3500	3200	3000	2900
112	3500	-	-	-	-	-	-
120	-	4000	4000	3500	3200	2150	2900
125	3500	3500	3200	3000	2900	1800	2300
140	4000	4000	4000	3500	3200	2050	2900
144	4000	-	-	-	-	-	-
150	-	4000	4000	3500	3200	2200	2900
160	-	4000	4000	3500	3200	2550	2900
175	4000	4000	4000	3500	3200	2550	2900
180	4000	-	-	-	-	-	-
200	-	4000	4000	3500	3200	2900	2900
210	-	4000	4000	3500	3200	2700	2900
216	3500	3500	3200	3000	1900	-	-
225	4000	-	-	-	-	-	-
245	4000	-	-	-	-	-	-
250	-	4000	4000	3500	3200	3000	2900
252	4000	-	-	-	-	-	-
280	-	4000	4000	3500	3200	3000	2900
324	4000	-	-	-	-	-	-
350	-	4000	4000	3500	3200	3000	2900
400	-	4000	4000	3500	3200	3000	2900
405	4000	-	-	-	-	-	-
500	-	4000	4000	3500	3200	3000	2900
567	4000	-	-	-	-	-	-
700	-	4000	4000	3500	3200	3000	2900
729	4000	-	-	-	-	-	-
1000	-	4000	4000	3500	3200	3000	2900

K_n - speed constant

i	MPE 040	MPE 060 TQFE 060	MPE 080 TQFE 070	MPE 120 TQFE 090
3	2000	1400	3500	3000
4	2000	1600	2000	1700
5	2000	2050	1500	1500
7	3000	3050	1900	1900
9	2000	3300	3500	3000
10	3000	4000	3500	3500
12	3000	3300	3500	3000
15	3000	3300	3500	3000
16	3000	3500	3100	2800
20	3000	3500	3200	3000
25	3000	3500	3200	3000
28	3000	3700	3500	3500
30	3000	4000	4000	3500
35	3000	4000	3500	3000
40	3000	4000	4000	3500
50	3000	4000	4000	3500
70	3000	4000	4000	3500
100	3000	4000	4000	3500

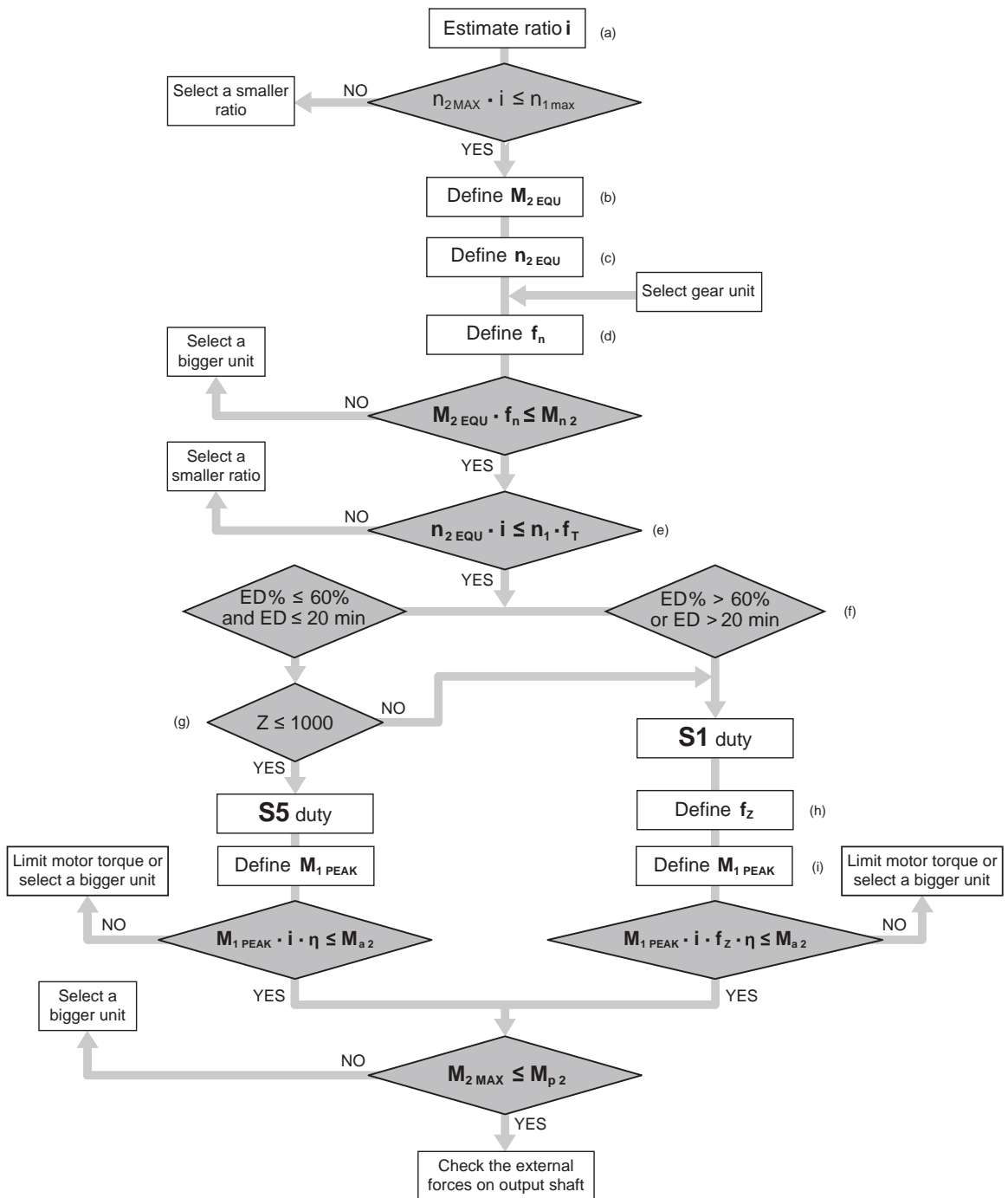
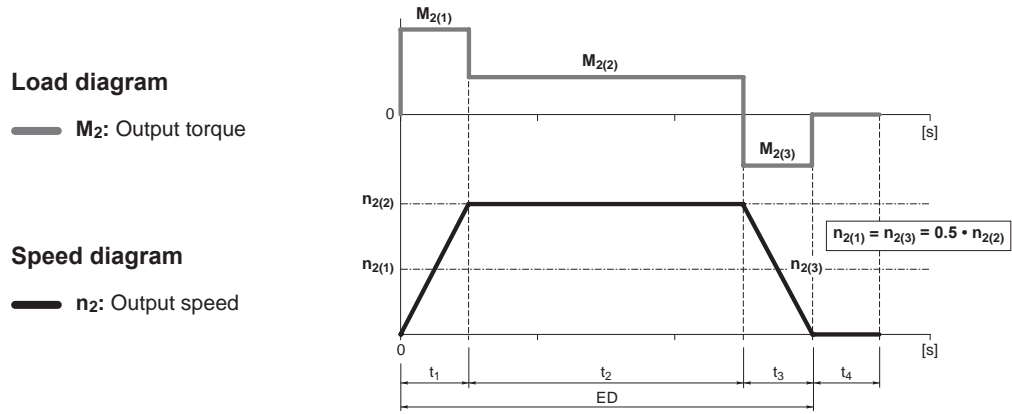
i	MPEK 060 TQFEK 060	MPEK 080 TQFEK 070	MPEK 120 TQFEK 090
3	1400	3500	3000
4	1600	2000	1700
5	2050	1500	1500
7	3050	1900	1900
9	3300	3500	3000
10	4000	3500	3500
12	3300	3500	3000
15	3300	3500	3000
16	3500	3100	2800
20	3500	3200	3000
25	3500	3200	3000
28	3700	3500	3500
30	4000	4000	3500
35	4000	3500	3000
40	4000	4000	3500
50	4000	4000	3500
70	4000	4000	3500
100	4000	4000	3500

i	LC 050	LC 070 LC 070P	LC 090 / LC 090P	LC 120 / LC 120P	LC 155 / LC 155P
3	1650	1400	2900 / 3500	2500 / 3000	1350 / 2100
4	2200	1600	2500 / 2000	2100 / 1700	900 / 2200
5	2900	2050	2700 / 1500	2300 / 1500	950 / 800
7	3700	3050	3500 / 1900	3000 / 1900	1250
9	4000	3300	2900 / 3500	2500 / 3000	2100
10	-	4000	4000 / 3500	3500	2500 / 3200
12	3300	3300	2900 / 3500	2500 / 3000	2100
15	3300	3300	2900 / 3500	2500 / 3000	2100
16	3500	3500	3100	2800	2400
20	3500	3500	3200	3000	2900
25	3500	3500	3200	3000	2900
28	3500	3700	3500	3500	3000
30	-	4000	4000	3500	3000
35	3700	4000	3500	3000	3000
36	4000	-	-	-	-
40	-	4000	4000	3500	3000
45	4000	-	-	-	-
50	-	4000	4000	3500	3000
70	-	4000	4000	3500	3000
81	4000	-	-	-	-
100	-	4000	4000	3500	3000

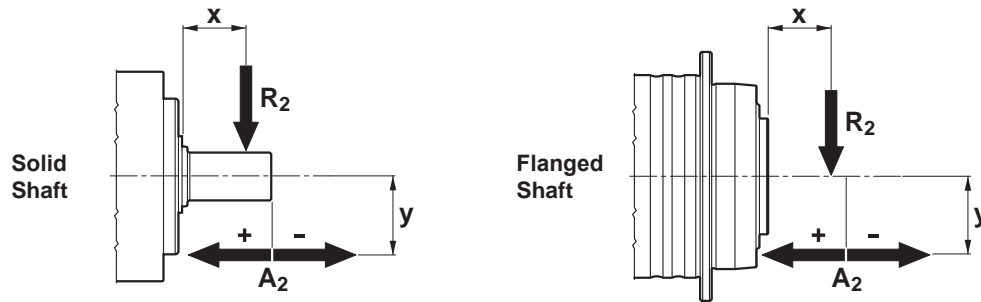
i	SL 070 / SL 070P	SL 090 / SL 090P	SL 120 / SL 120P
3	1400	2900 / 3500	2500 / 3000
4	1600	2500 / 2000	2100 / 1700
5	2050	2700 / 1500	2300 / 1500
7	3050	3500 / 1900	3000 / 1900
9	3300	2900 / 3500	2500 / 3000
10	4000	4000 / 3500	3500
12	3300	2900 / 3500	2500 / 3000
15	3300	2900 / 3500	2500 / 3000
16	3500	3100	2800
20	3500	3200	3000
25	3500	3200	3000
28	3700	3500	3000
30	4000	4000	3500
35	4000	3500	3000
40	4000	4000	3500
50	4000	4000	3500
70	4000	4000	3500
100	4000	4000	3500

i	LCK 050	LCK 070 LCK 070P	LCK 090 LCK 090P	LCK 120 LCK 120P	LCK 155 LCK 155P
6	2400	2400	2400	2000	1600
8	2400	2400	2400	2000	1600
10	2400	2400	2400	2000	1600
14	2400	2400	2400	2000	1600
20	-	2400	2400	2000	1600
24	2400	2400	2400	2000	1600
30	2400	2400	2400	2000	1600
50	2400	2400	2400	2000	1600
70	2400	2400	2400	2000	1600
80	-	2400	2400	2000	1600
90	2400	-	-	-	-
100	-	2400	2400	2000	1600

i	KR 010	KR 020	KR 030	KR 040
1	1200	1200	1000	800
2	2400	2400	2000	1600
3	3000	3000	2800	2500



1.3 SERVICE LIFE OF BEARINGS



(a)	Maximum radial force applying on output shaft	$R_{2\text{ MAX}}$	[N]	Please consider the specific conditions (e.g. belt drives under acceleration torque)
	Maximum axial force applying on output shaft	$A_{2\text{ MAX}}$	[N]	
(b)	Maximum tilting moment applying on output shaft	$M_{T2\text{ MAX}}$	[Nm]	$M_{T2\text{ MAX}} = \frac{R_{2\text{ MAX}} \cdot (x + L_z) \pm A_{2\text{ MAX}} \cdot y}{1000}$
(c)	Equivalent forces applying on output shaft	$R_{2\text{ EQU}}$	[N]	$R_{2\text{ EQU}} = \sqrt[3]{\frac{ n_{2(1)} \cdot t_1 \cdot R_{2(1)} ^3 + \dots + n_{2(n)} \cdot t_n \cdot R_{2(n)} ^3}{ n_{2(1)} \cdot t_1 + \dots + n_{2(n)} \cdot t_n}}$
		$A_{2\text{ EQU}}$	[N]	
(d)	Equivalent tilting moment applying on output shaft	$M_{T2\text{ EQU}}$	[Nm]	$M_{T2\text{ EQU}} = \frac{R_{2\text{ EQU}} \cdot (x + L_z) + A_{2\text{ EQU}} \cdot y}{1000}$
(e)	Equivalent output speed	$n_{2\text{ EQU}}$	[min ⁻¹]	$n_{2\text{ EQU}} = \frac{ n_{2(1)} \cdot t_1 + n_{2(2)} \cdot t_2 + \dots + n_{2(n)} \cdot t_n}{t_1 + t_2 + \dots + t_n}$
(f)	Bearings' basic rating life	L_{10h}	[h]	$L_{10h} = \frac{16666}{n_{2\text{ EQU}}} \cdot \left(\frac{C_B}{M_{T2\text{ EQU}}} \right)^p$

	TQ / TQK 060		TQ / TQK 070		TQ / TQK 090		TQ / TQK 130	TQ / TQK 160
	SB	SB	SB	HB	SB	HB	SB	SB
L_z [mm]	56	67	64		95	89	96	114
$M_{T2\text{ max}}$ [Nm]	129.5	221	343		592	772	1233	2331
C_B [Nm]	632	1065	1510		2898	3325	6395	9795
p	3	3	3.33		3	3.33	3.33	3.33

	TQF 060	TQF 070	TQF 090	TQF 130	TQF 160
L_z [mm]	48	72	78	100	128
$M_{T2\text{ max}}$ [Nm]	115	318	430	1200	3700
C_B [Nm]	490	1335	1815	5055	16200
p	3.33	3.33	3.33	3.33	3.33

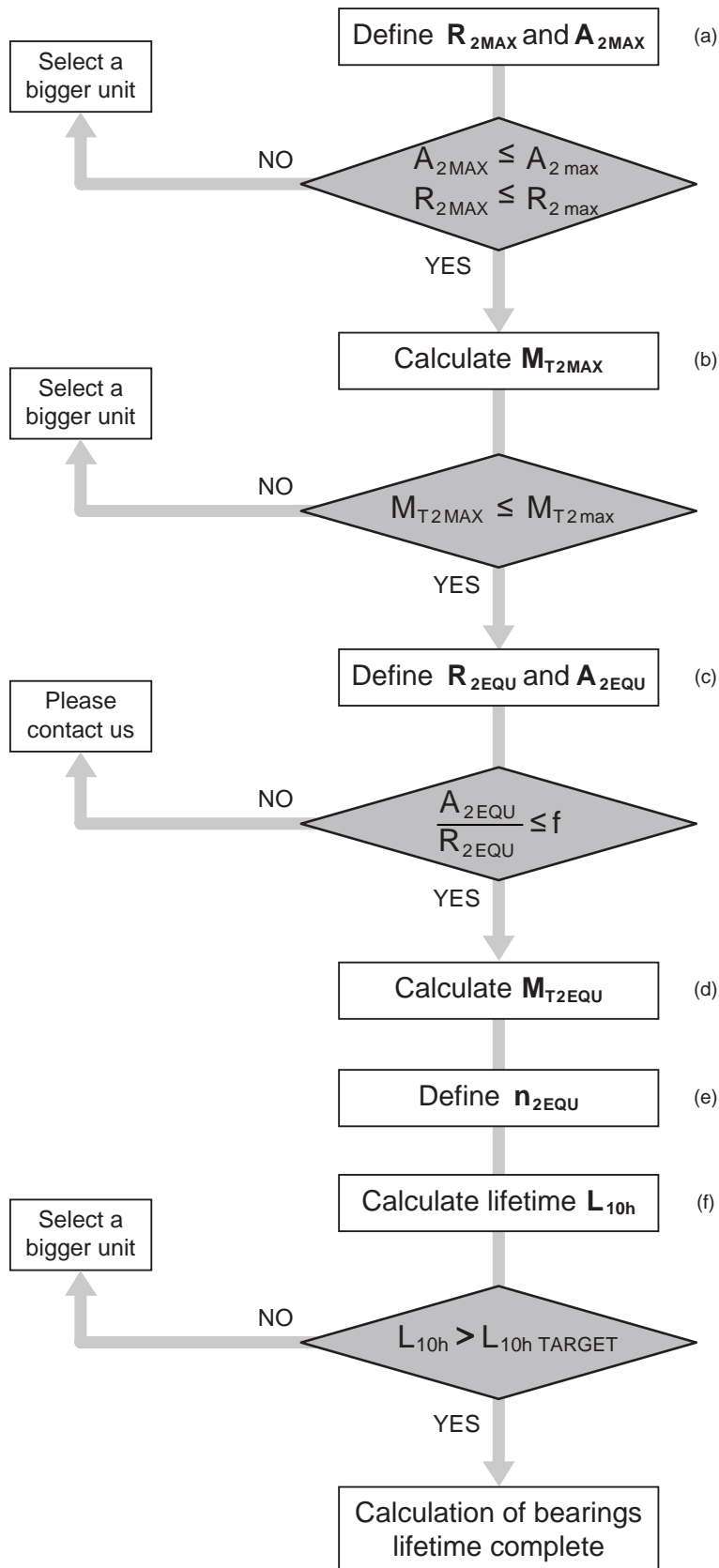
	TR 053	TR 060	TR 080	TR 105	TR 130	TR 160	TR 190
	SB	SB	SB	SB	SB	SB	SB
L_z [mm]	22	23	42	53	74	94	100
$M_{T2\text{ max}}$ [Nm]	16	23	155	278	515	739	1683
C_B [Nm]	91	143	994	2048	3893	5824	8680
p	3	3	3.33	3.33	3.33	3.33	3.33

	MP 053	MP 060	MP 080		MP 105		MP 130	MP 160	MP 190
	SB	SB	SB	HB	SB	HB	SB	SB	SB
L_z [mm]	22	23	44	42	46	53	74	94	100
$M_{T2\text{ max}}$ [Nm]	16	23	83	155	99	278	515	739	1683
C_B [Nm]	91	143	407	994	637	2048	3893	5824	8680
p	3	3	3	3.33	3	3.33	3.33	3.33	3.33

	TQFE 060	TQFE 070	TQFE 090
	TQFEK 060	TQFEK 070	TQFEK 090
L_z [mm]	21	34	44
$M_{T2\text{ max}}$ [Nm]	70	280	650
C_B [Nm]	14	57	125
p	3	3	3

	MPE 040	MPE 060	MPE 080	MPE 120
	MPEK 060	MPEK 080	MPEK 120	MPEK 120
L_z [mm]	16	23	31	37
$M_{T2\text{ max}}$ [Nm]	6	17	44	124
C_B [Nm]	29	80	213	615
p	3	3	3	3

	LC / LCK 050	LC / LCK / SL 070	LC / LCK / SL 090	LC / LCK / SL 120	LC / LCK 155
	L_z [mm]	22	28	30	39
$M_{T2\text{ max}}$ [Nm]	15	54	105	238	522
C_B [Nm]	106	280	298	813	1588
p	3	3	3	3	3



f	TQ TQK	TQF	TR	MP	TQFE TQFEK	SL	LC LCK	MPE	MPEK	KR
0.26	060 SB ... 090 SB		053 SB ... 060 SB	053 SB ... 105 SB	060 ... 090	070 ... 120	050 ... 155	040 ... 120	060 ... 120	010 SB ... 040 SB
0.37	130 SB ; 160 SB 070 HB ; 090 HB	060 ... 160	080 SB ... 190 SB	130 SB ... 190 SB 080 HB ; 105 HB						020 HB ... 040 HB

Performance Line

(P)

TQ



TQ Series

The TQ series scores in each performance category: high torque density, high overload capacity, exceptional precision and low vibration. TQ is particularly suited for the highly demanding requirements of servo systems, such as fast dynamics and frequent reverse motion, precise position, motion control and high numbers of starts and stops.

Main benefits

- Maximum power density
- High precision
- High overload capacity
- Optional reinforced bearings for high axial and radial forces
- Best choice for servo applications requiring high dynamics and high level of precision
- Great flexibility thanks to universal design
- Quiet operation

Main features

- Nominal output torque (Nm)

20 - 800

- Torsional backlash (arcmin)

2 - 6

- Torsional stiffness (Nm/arcmin)

4.7 - 170

- Max tilting moment (Nm)

129.5 - 2331

Protection class

- IP65

Frame sizes

- 060
- 070
- 090
- 130
- 160

Main options

- Input versions

MOTOR ADAPTER	WITHOUT MOTOR ADAPTER
---------------	-----------------------
- Output shafts versions

SMOOTH KEYLESS SHAFT	KEYED SHAFT
----------------------	-------------
- Service type

S1	S5
----	----
- Lubrication

STANDARD LUBRICATION	UH1 FOOD GRADE LUBRICATION
----------------------	----------------------------
- Bearings versions

STANDARD	REINFORCED
----------	------------

2 FEATURES OF TQ SERIES

Low backlash planetary drives of TQ series combine outstanding performances with a distinctive Italian style which makes them immediately recognizable amongst similar products within the reference industry.

Their design and construction has been developed with the goal of offering consumers a line of products which feature absolute and consistent Quality, which in turn provides a competitive advantage for machines and systems that adopt them as transmission devices.

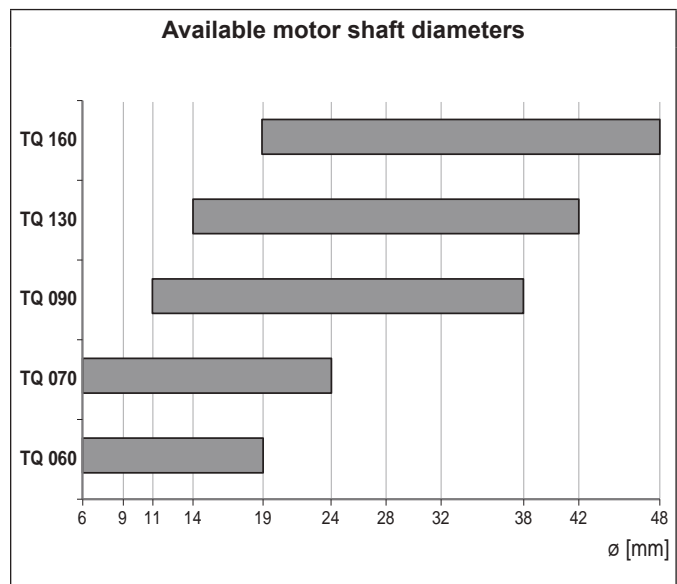
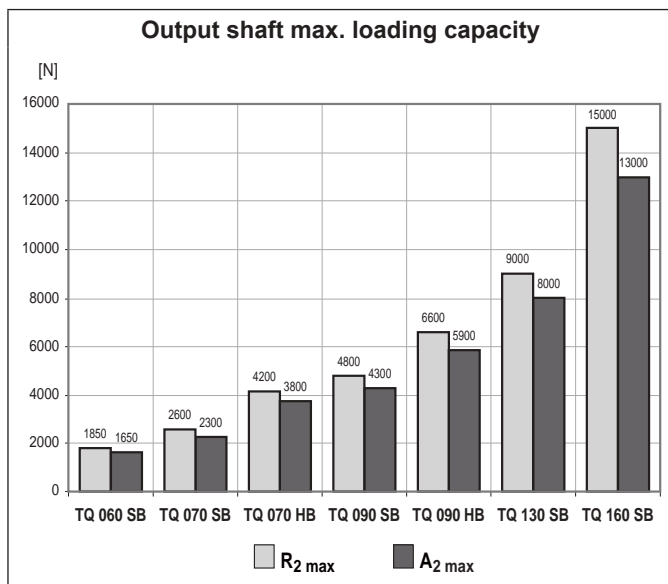
TQ

- TQ features two classes of precision, corresponding to the following values of torsional backlash
 1-stage units: standard $\varphi_S \leq 3'$ reduced $\varphi_R \leq 2'$ ($\varphi_S \leq 4'$; $\varphi_R \leq 2'$ for TQ 060 and TQ 070)
 2-stage units: standard $\varphi_S \leq 5'$ reduced $\varphi_R \leq 3'$ ($\varphi_S \leq 6'$; $\varphi_R \leq 4'$ for TQ 060 and TQ 070)
- A high IP rating (IP65) provides inner parts with protection against the ingress of dust and liquids.
- Input section oil seals made from a Fluoroelastomer compound are supplied as standard.
- Noise pressure level $60 \leq L_p \leq 70$ dB(A). Conditions: distance 1 m ; measured without load and an input speed of $n_1 = 3000 \text{ min}^{-1}$; $i = 10$.
- Numerous adapters allow matching the most popular brands of servomotors.
- Lubrication optimized for the type of duty specified when ordering.
 In the absence of contamination the lubricant requires no periodical changes.

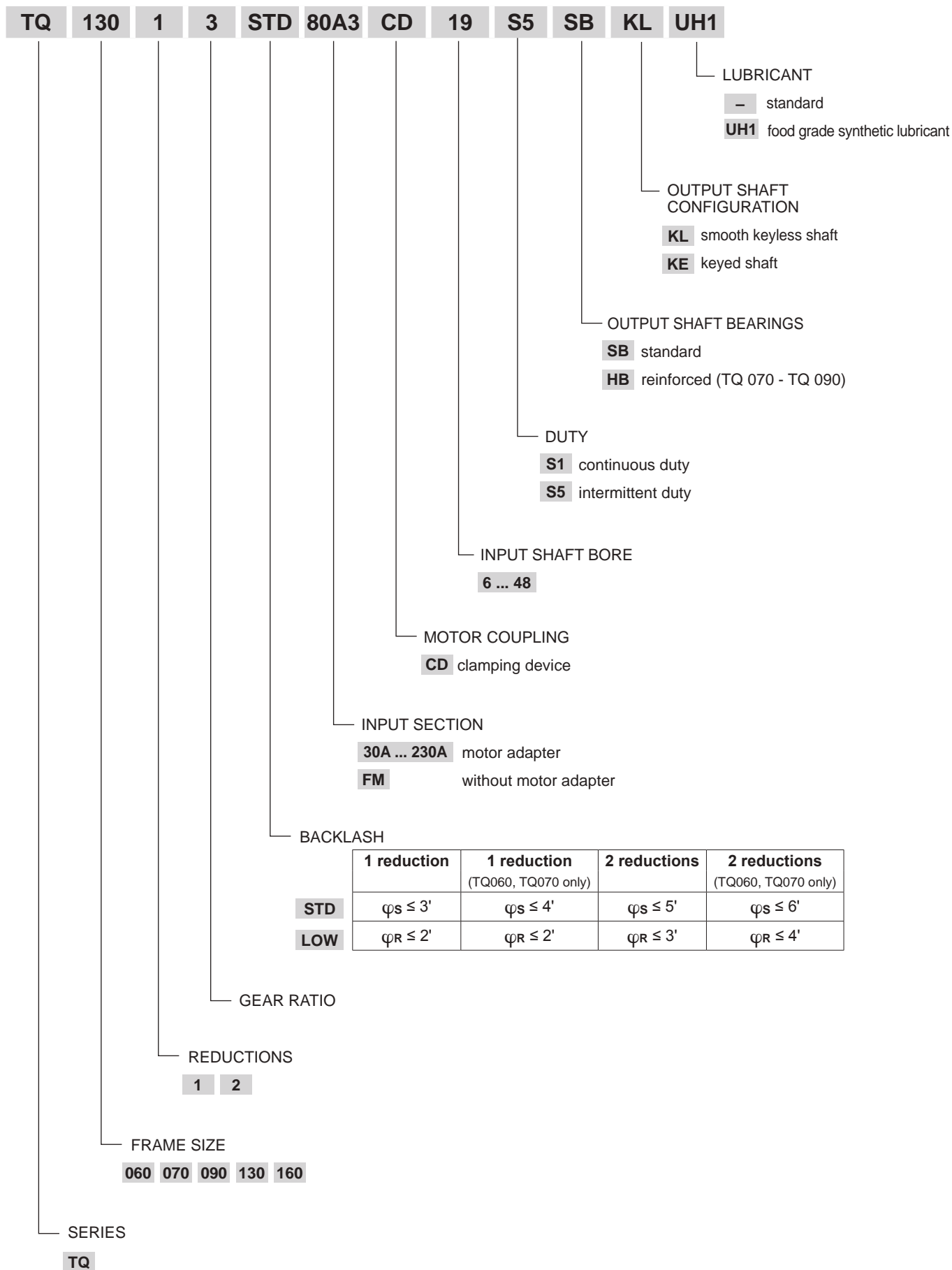
duty	TQ 060 ... TQ 160	output seals
S1 (continuous)	Synthetic oil viscosity ISO VG 220	Fluoroelastomer
S5 (intermittent)	NLGI grease consistency 00	NBR

- Ambient temperature min -20°C , max $+30^\circ\text{C}$. For temperature higher than 30°C please consider derating factor f_T .
- Housing temperature must not exceed $T_{\text{max}} = 90^\circ\text{C}$.

		Distribution of nominal torque M_{n2} [Nm]													
[i]	3	4	5	7	10	16	20	25	28	35	40	50	70	100	
TQ 060	21	30	30	25	20	30	30	30	30	30	30	30	25	20	
TQ 070	45	70	70	60	40	70	70	70	70	70	70	70	60	40	
TQ 090	130	200	180	160	110	200	180	180	200	180	200	180	160	110	
TQ 130	260	400	400	360	280	400	400	400	400	400	400	400	360	280	
TQ 160	530	800	800	750	550	800	800	800	800	800	800	800	750	550	



2.1 ORDERING CODE

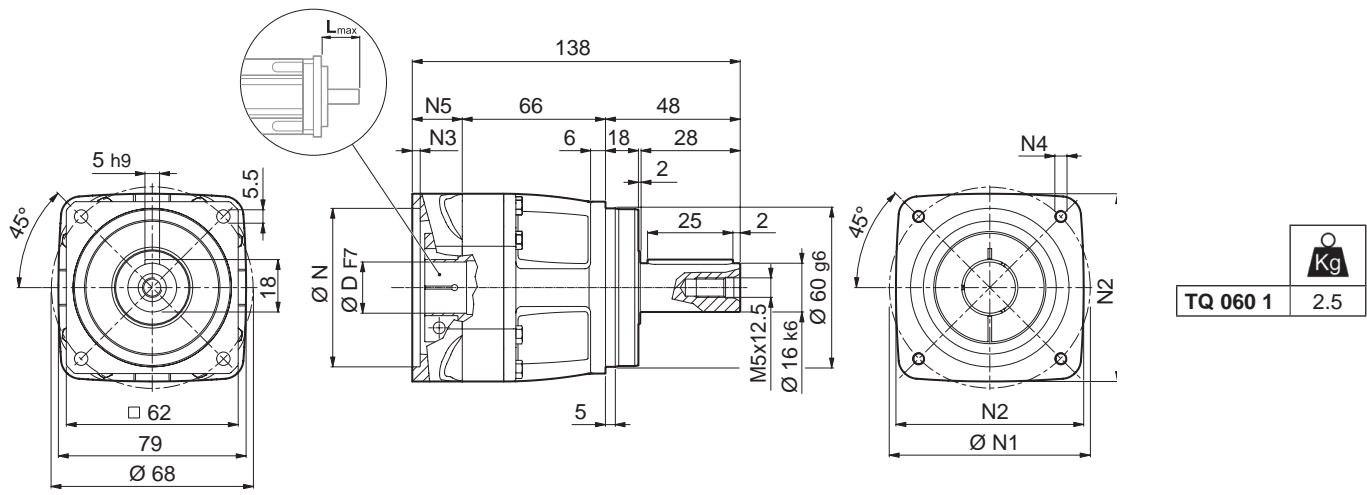


TQ

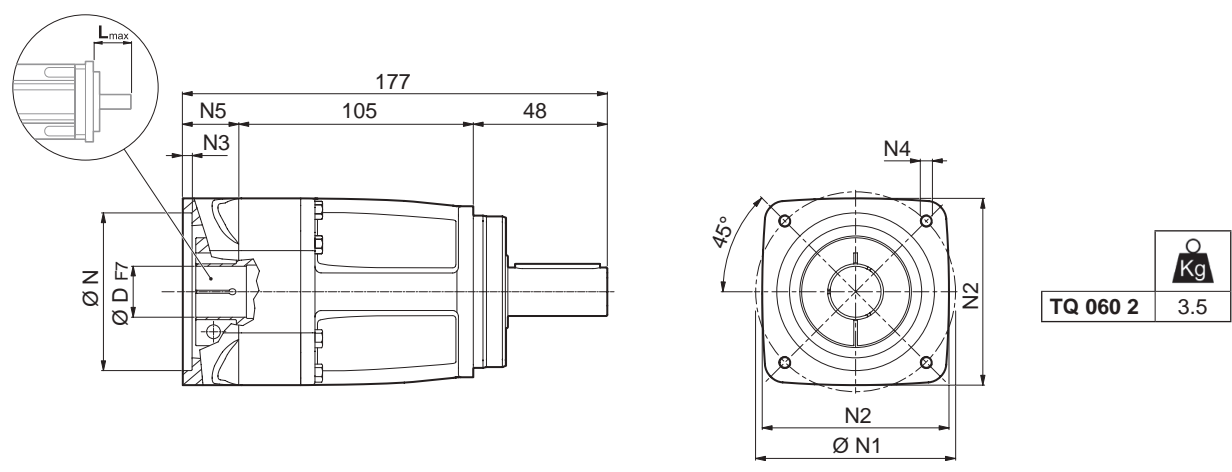
2.2 DIMENSIONS AND TECHNICAL SPECIFICATIONS



TQ 060

TQ



30A ... 110B0

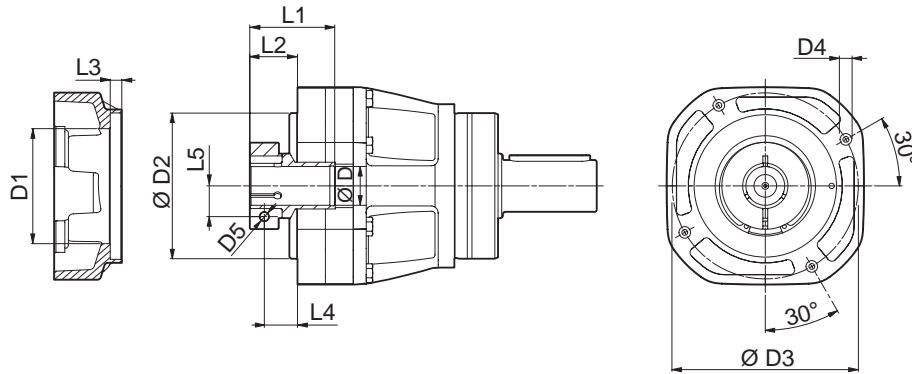


							N	N1	N2	N3	N4	N5	L _{max}
30A	6	-	-	-	-	30	46	80	3.5	M4x10	24	40	
40B1	6	9	11	14	-	40	63	80	3.5	M4x10	24	40	
50A1	6	9	11	14	-	50	60	80	4.0	M4x10	24	40	
50C1	6	9	11	14	-	50	70	80	4.0	M4x10	24	40	
60A2	6	9	11	14	19	60	75	80	4.0	M5x12	24	40	
70B1	6	9	11	14	19	70	90	80	4.0	M5x12	24	40	
80A1	6	9	11	14	19	80	100	100	4.0	M6x14	24	40	
95A	6	9	11	14	19	95	115	100	4.0	M8x24	24	40	
110B0	6	9	11	14	19	110	145	120	4.0	M8x24	24	40	


Please contact us for different motor adapters and input shaft bore.

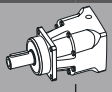

TQ 060

FM



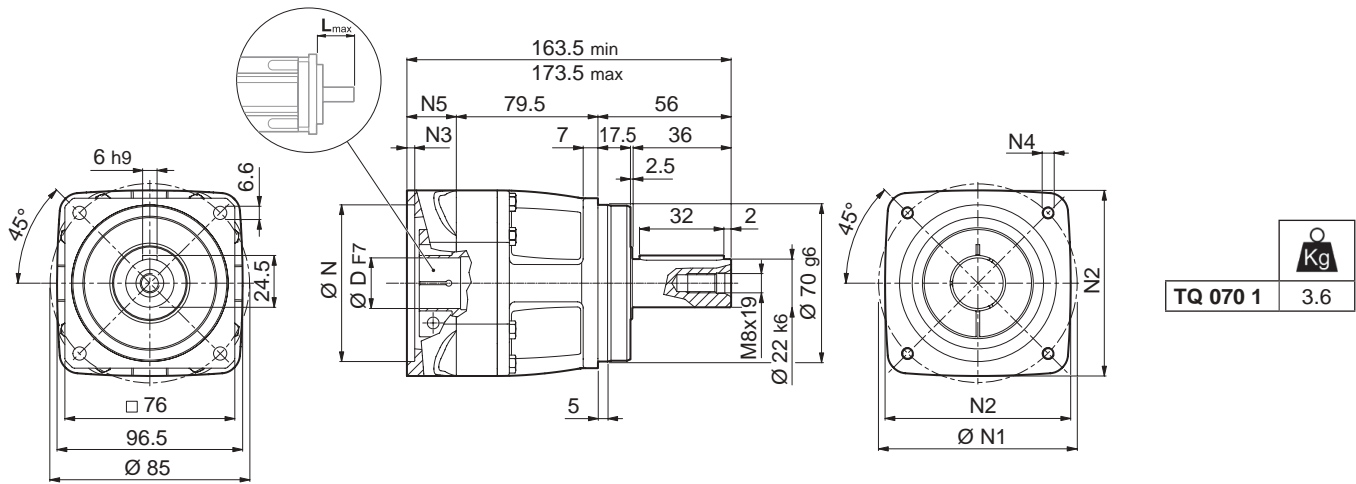
TQ

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	37	59	72	M5x11	M4	31.5	15.5	4.5	10.5	8
9	49	59	72	M5x11	M5	35	19	4.5	11.5	10.5
11	49	59	72	M5x11	M6	35	19	4.5	11.5	12.5
14	49	59	72	M5x11	M6	35	19	4.5	11.5	14.5
19	54	59	72	M5x11	M6	35	19	4.5	11.5	16.5

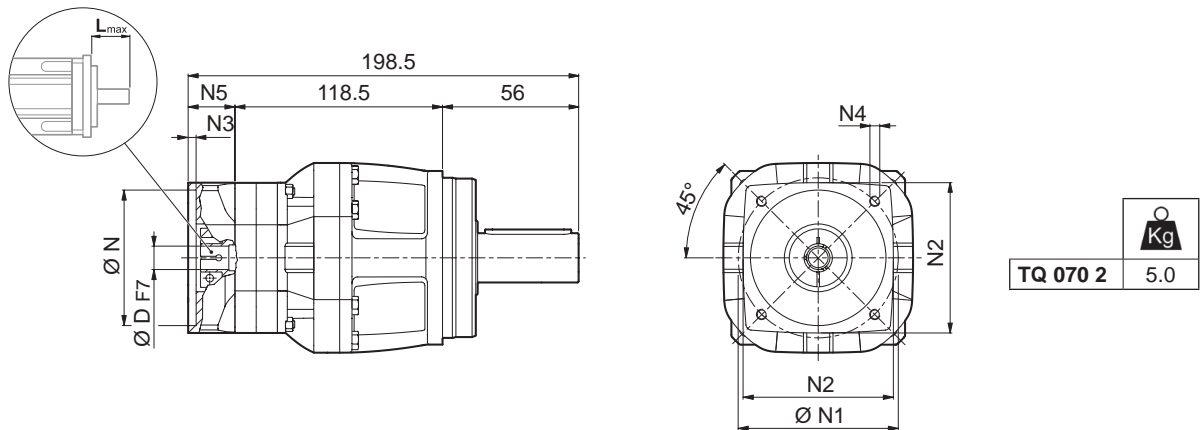
	M_{n2}	M_{a2}	M_{p2}	n_1	$n_{1\max}$	$\varphi_S \leq \varphi_R$		C_t	$R_{2\max}$	$A_{2\max}$	η	J_G [kgcm ²]		
						[arcmin]								
i	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]			$\left[\frac{Nm}{arcmin} \right]$	[N]	[N]	%	6 - 9	11 - 14	19
TQ 060 1_3	21	32	60	3500	6000	4'	2'	4.8	1850	1650	97	0.36	0.47	0.51
TQ 060 1_4	30	45	80	3500	6000	4'	2'	4.8	1850	1650	97	0.28	0.39	0.43
TQ 060 1_5	30	45	80	3500	6000	4'	2'	4.8	1850	1650	97	0.25	0.36	0.40
TQ 060 1_7	25	38	70	4000	6000	4'	2'	4.8	1850	1650	97	0.22	0.33	0.37
TQ 060 1_10	20	30	55	4000	6000	4'	2'	4.8	1850	1650	97	0.21	0.32	0.36
TQ 060 2_16	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.27	0.39	0.42
TQ 060 2_20	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.27	0.39	0.42
TQ 060 2_25	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.24	0.36	0.39
TQ 060 2_28	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.22	0.33	0.37
TQ 060 2_35	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.22	0.33	0.37
TQ 060 2_40	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.21	0.32	0.36
TQ 060 2_50	30	45	80	4500	6000	6'	4'	4.7	1850	1650	94	0.21	0.32	0.36
TQ 060 2_70	25	38	70	5000	6000	6'	4'	4.7	1850	1650	94	0.21	0.32	0.36
TQ 060 2_100	20	30	55	5000	6000	6'	4'	4.7	1850	1650	94	0.20	0.32	0.35

TQ 070

50C ... 130A



30A ... 110B0

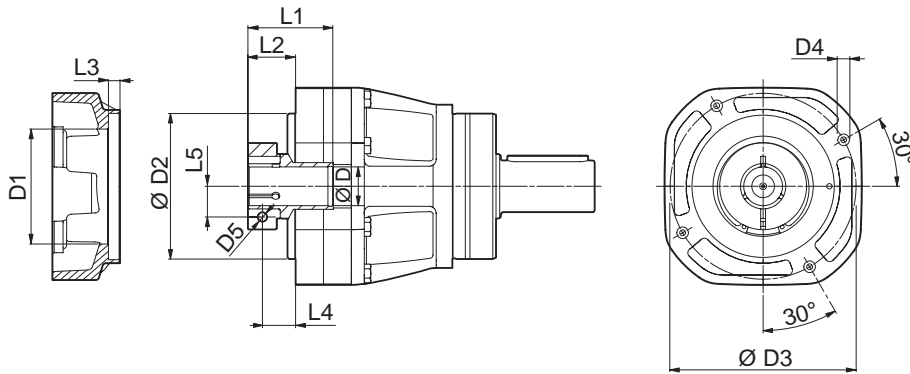


	D						N	N1	N2	N3	N4	N5	L _{max}
TQ 070 1													
50C2	6	9	11	14	–	–	50	70	100	6.5	M4x12	28	50
60A3	6	9	11	14	19	–	60	75	100	6.5	M5x14	28	50
70B2	6	9	11	14	19	–	70	90	100	6.5	M5x14	28	50
80A2	6	9	11	14	19	–	80	100	100	6.5	M6x14	28	50
95A1	6	9	11	14	19	24	95	115	100	6.5	M8x18	28	50
110A1	6	9	11	14	19	24	110	130	120	6.5	M8x18	28	50
110B1	6	9	11	14	19	24	110	145	120	6.5	M8x20	38	60
130A	6	9	11	14	19	24	130	165	140	6.5	M10x19	28	50
TQ 070 2													
30A	6	–	–	–	–	–	30	46	80	3.5	M4x10	24	40
40B1	6	9	11	14	–	–	40	63	80	3.5	M4x10	24	40
50A1	6	9	11	14	–	–	50	60	80	4.0	M4x10	24	40
50C1	6	9	11	14	–	–	50	70	80	4.0	M4x10	24	40
60A2	6	9	11	14	19	–	60	75	80	4.0	M5x12	24	40
70B1	6	9	11	14	19	–	70	90	80	4.0	M5x12	24	40
80A1	6	9	11	14	19	–	80	100	100	4.0	M6x14	24	40
95A	6	9	11	14	19	–	95	115	100	4.0	M8x24	24	40
110B0	6	9	11	14	19	–	110	145	120	4.0	M8x24	24	40

Please contact us for different motor adapters and input shaft bore.

TQ 070

FM



TQ

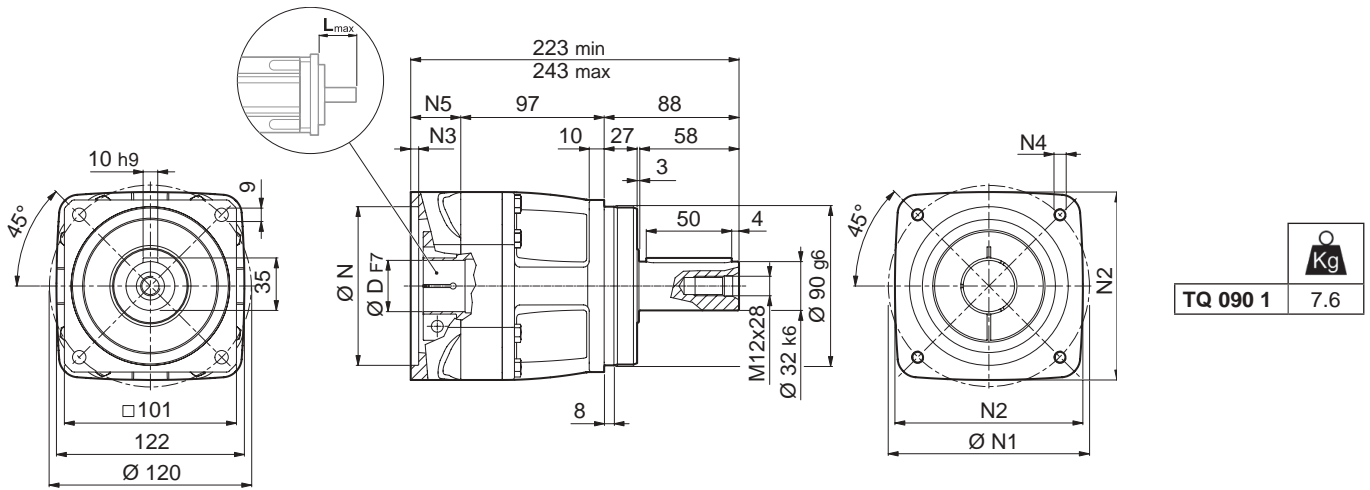
	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQ 070 1										
6	51	70	85	M6x11	M4	42	20	5	12.5	12.5
9	51	70	85	M6x11	M5	42	20	5	12.5	14.5
11	51	70	85	M6x11	M6	42	20	5	12.5	12.5
14	51	70	85	M6x11	M6	42	20	5	12.5	14.5
19	51	70	85	M6x11	M6	42	20	5	12.5	16.5
24	60	70	85	M6x11	M6	43.5	21.5	5	12.5	19
TQ 070 2										
6	37	59	72	M5x11	M4	31.5	15.5	4.5	10.5	8
9	49	59	72	M5x11	M5	35	19	4.5	11.5	10.5
11	49	59	72	M5x11	M6	35	19	4.5	11.5	12.5
14	49	59	72	M5x11	M6	35	19	4.5	11.5	14.5
19	54	59	72	M5x11	M6	35	19	4.5	11.5	16.5

	M_{N2}	M_{A2}	M_{P2}	n_1	$n_{1\max}$	φ_S	φ_R	C_t	SB		HB		η	J_G [kgcm ²]			
									$R_{2\max}$	$A_{2\max}$	$R_{2\max}$	$A_{2\max}$					
i	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	\leq	$\left[\frac{Nm}{arcmin} \right]$	[N]	[N]	[N]	[N]	%	6 - 9	11 - 14	19	24
TQ 070 1_3	45	65	120	3000	6000	4'	2'	11.3	2600	2300	4200	3800	97	-	0.99	1.02	1.15
TQ 070 1_4	70	100	180	3000	6000	4'	2'	11.3	2600	2300	4200	3800	97	-	0.76	0.79	0.92
TQ 070 1_5	70	100	180	3000	6000	4'	2'	11.3	2600	2300	4200	3800	97	-	0.67	0.70	0.83
TQ 070 1_7	60	90	160	3500	6000	4'	2'	11.3	2600	2300	4200	3800	97	-	0.59	0.62	0.75
TQ 070 1_10	40	60	110	3500	6000	4'	2'	11.3	2600	2300	4200	3800	97	-	0.55	0.58	0.71
TQ 070 2_16	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.28	0.40	0.43	-
TQ 070 2_20	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.28	0.39	0.43	-
TQ 070 2_25	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.25	0.36	0.40	-
TQ 070 2_28	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.22	0.34	0.37	-
TQ 070 2_35	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.22	0.34	0.37	-
TQ 070 2_40	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.21	0.32	0.36	-
TQ 070 2_50	70	100	180	3500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.21	0.32	0.36	-
TQ 070 2_70	60	90	160	4000	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.21	0.32	0.36	-
TQ 070 2_100	40	60	110	4500	6000	6'	4'	11.3	2600	2300	4200	3800	94	0.21	0.32	0.36	-

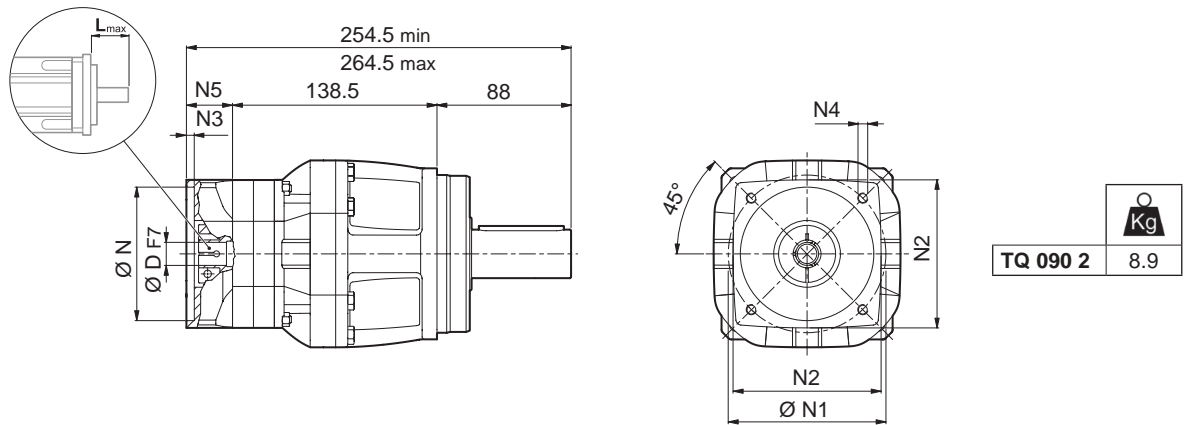
TQ 090

60A4 ... 180A1

TQ



50C2 ... 130A

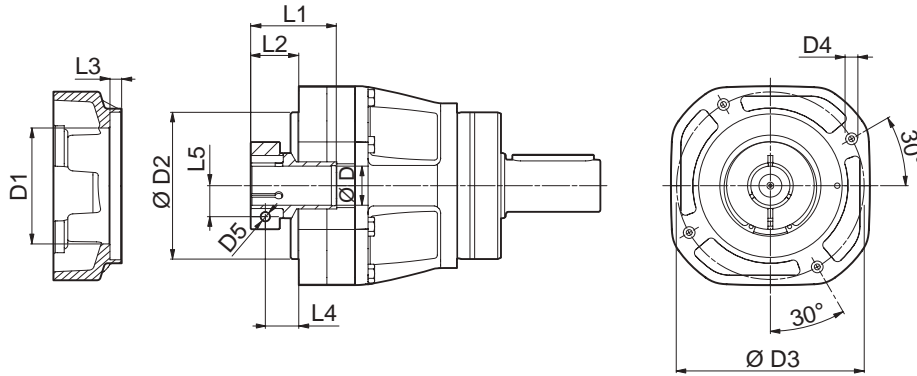


Motor Model	D							N	N1	N2	N3	N4	N5	L _{max}
	11	14	19	24	28	32	38							
TQ 090 1														
60A4	11	14	19	-	-	-	-	60	75	125	6.5	M5x14	38	60
80A3	11	14	19	-	-	-	-	80	100	125	6.5	M6x14	38	60
95A2	11	14	19	24	28	-	-	95	115	125	6.5	M8x18	38	60
110A2	11	14	19	24	-	-	-	110	130	125	6.5	M8x20	38	60
110B1	11	14	19	24	28	-	-	110	145	125	6.5	M8x20	38	60
130A1	11	14	19	24	28	32	-	130	165	140	6.5	M10x20	38	60
180A	11	14	19	24	28	32	-	180	215	190	6.5	M14x38	38	60
180A1	11	14	19	24	28	32	38	180	215	190	6.5	M14x28	58	80
TQ 090 2														
50C2	11	14	-	-	-	-	-	50	70	100	6.5	M4x12	28	50
60A3	11	14	19	-	-	-	-	60	75	100	6.5	M5x14	28	50
70B2	11	14	19	-	-	-	-	70	90	100	6.5	M5x14	28	50
80A2	11	14	19	-	-	-	-	80	100	100	6.5	M6x14	28	50
95A1	11	14	19	24	-	-	-	95	115	100	6.5	M8x18	28	50
110A1	11	14	19	24	-	-	-	110	130	120	6.5	M8x18	28	50
110B1	11	14	19	24	-	-	-	110	145	120	6.5	M8x20	38	60
130A	11	14	19	24	-	-	-	130	165	140	6.5	M10x19	28	50

Please contact us for different motor adapters and input shaft bore.

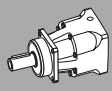
TQ 090

FM



TQ

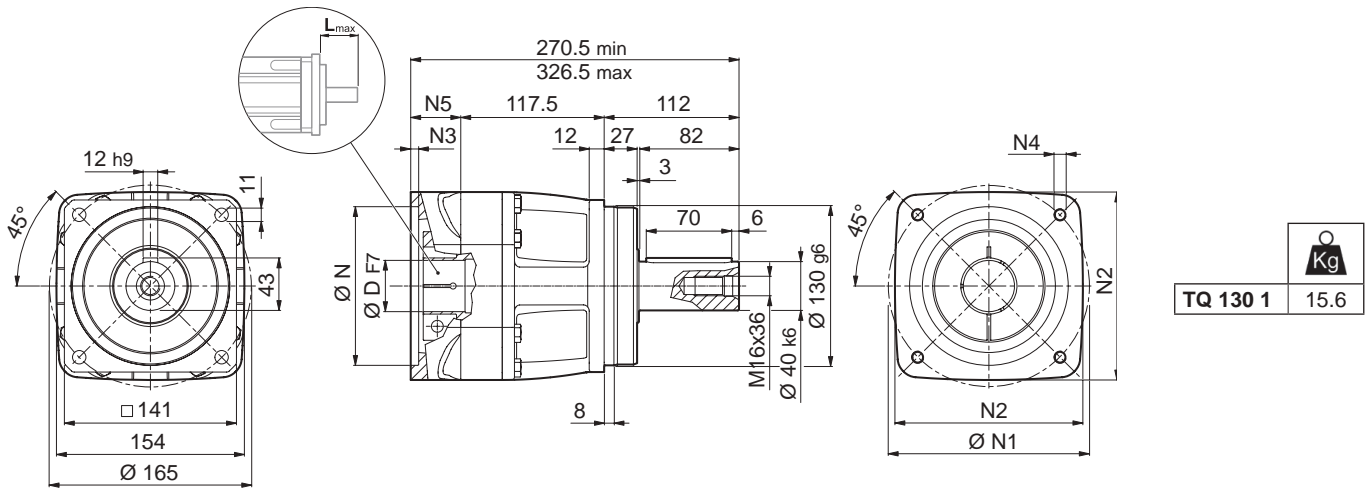
D	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQ 090 1										
11	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
14	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
19	51	90	115	M8x13	M6	50	28	6.5	20.5	16.5
24	60	90	115	M8x13	M6	51.5	29.5	6.5	20.5	19
28	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	22.5
32	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	24.5
38	80	90	115	M8x13	M8	51.5	32	6.5	20.5	28
TQ 090 2										
6	51	70	85	M6x11	M6	42	20	5	12.5	12.5
9	51	70	85	M6x11	M5	42	20	5	12.5	14.5
11	51	70	85	M6x11	M6	42	20	5	12.5	12.5
14	51	70	85	M6x11	M6	42	20	5	12.5	14.5
19	51	70	85	M6x11	M6	42	20	5	12.5	16.5
24	60	70	85	M6x11	M6	43.5	21.5	5	12.5	19

 i	M _{n 2}	M _{a 2}	M _{p 2}	n ₁	n _{1 max}	Ψ _S	Ψ _R	C _t	SB		HB		η	J _G [kgcm ²]				
	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	≤	[arcmin]	[$\frac{Nm}{arcmin}$]	R _{2 max}	A _{2 max}	R _{2 max}	A _{2 max}	%	11	14 - 19	24	28	32-38
TQ 090 1_3	130	200	400	2500	4500	3'	2'	28	4800	4300	6600	5900	97	-	2.18	2.30	2.69	4.48
TQ 090 1_4	200	300	500	2500	4500	3'	2'	28	4800	4300	6600	5900	97	-	1.63	1.75	2.14	3.93
TQ 090 1_5	180	280	500	2500	4500	3'	2'	28	4800	4300	6600	5900	97	-	1.39	1.52	1.90	3.70
TQ 090 1_7	160	250	500	3000	4500	3'	2'	28	4800	4300	6600	5900	97	-	1.19	1.32	1.70	3.50
TQ 090 1_10	110	170	350	3000	4500	3'	2'	28	4800	4300	6600	5900	97	-	1.08	1.21	1.59	3.39
TQ 090 2_16	200	300	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.70	0.80	0.94	-	-
TQ 090 2_20	180	280	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.69	0.79	0.92	-	-
TQ 090 2_25	180	280	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.60	0.70	0.83	-	-
TQ 090 2_28	200	300	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.53	0.63	0.76	-	-
TQ 090 2_35	180	280	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.52	0.62	0.75	-	-
TQ 090 2_40	200	300	500	3000	4500	5'	3'	28	4800	4300	6600	5900	94	0.48	0.58	0.71	-	-
TQ 090 2_50	180	280	500	3500	4500	5'	3'	28	4800	4300	6600	5900	94	0.48	0.58	0.71	-	-
TQ 090 2_70	160	250	500	4000	4500	5'	3'	28	4800	4300	6600	5900	94	0.48	0.58	0.71	-	-
TQ 090 2_100	110	170	350	4000	4500	5'	3'	28	4800	4300	6600	5900	94	0.48	0.58	0.71	-	-

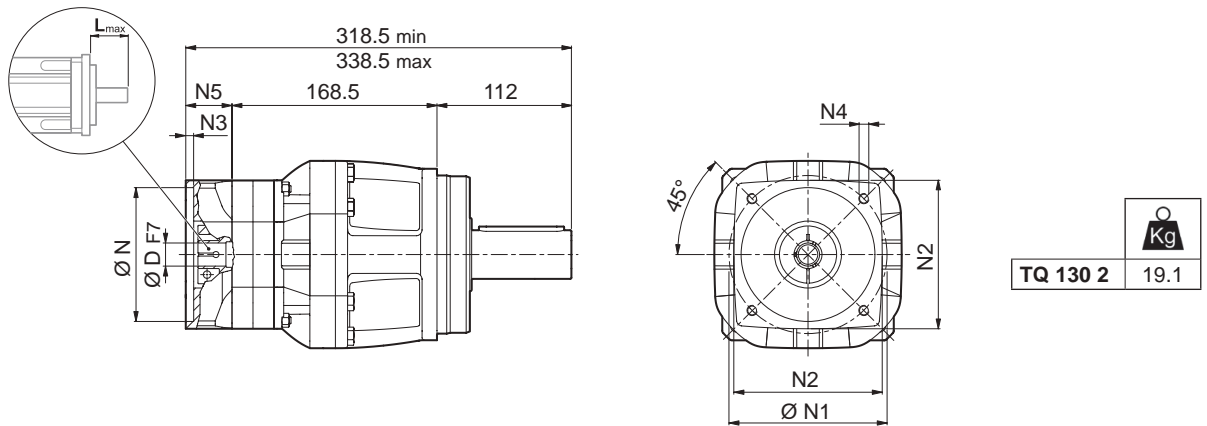
TQ 130

80A3 ... 200A

TQ



60A4 ... 180A1

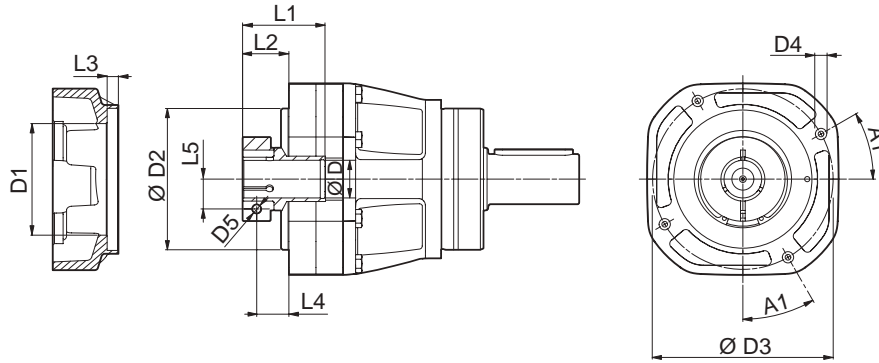


	D							N	N1	N2	N3	N4	N5	L _{max}
TQ 130 1														
80A3	14	19	-	-	-	-	80	100	155	6.5	M6x14	41	60	
95A2	14	19	24	28	-	-	95	115	155	6.5	M8x18	41	60	
110A2	14	19	24	-	-	-	110	130	155	6.5	M8x20	41	60	
110B1	14	19	24	28	-	-	110	145	155	6.5	M8x20	41	60	
130A1	14	19	24	28	32	-	130	165	155	6.5	M10x20	41	60	
180A	14	19	24	28	32	-	180	215	190	6.5	M14x28	41	60	
180A1	14	19	24	28	32	38	180	215	190	6.5	M14x28	61	80	
200A	14	19	24	28	32	38	200	235	220	6.5	M14x28	97	110	
TQ 130 2														
60A4	14	19	-	-	-	-	60	75	125	6.5	M5x14	38	60	
80A3	14	19	-	-	-	-	80	100	125	6.5	M6x14	38	60	
95A2	14	19	24	28	-	-	95	115	125	6.5	M8x18	38	60	
110A2	14	19	24	-	-	-	110	130	125	6.5	M8x20	38	60	
110B1	14	19	24	28	-	-	110	145	125	6.5	M8x20	38	60	
130A1	14	19	24	28	32	-	130	165	140	6.5	M10x20	38	60	
180A	14	19	24	28	32	-	180	215	190	6.5	M14x38	38	60	
180A1	14	19	24	28	32	38	180	215	190	6.5	M14x28	58	80	


Please contact us for different motor adapters and input shaft bore.

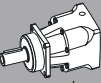
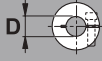
TQ 130

FM



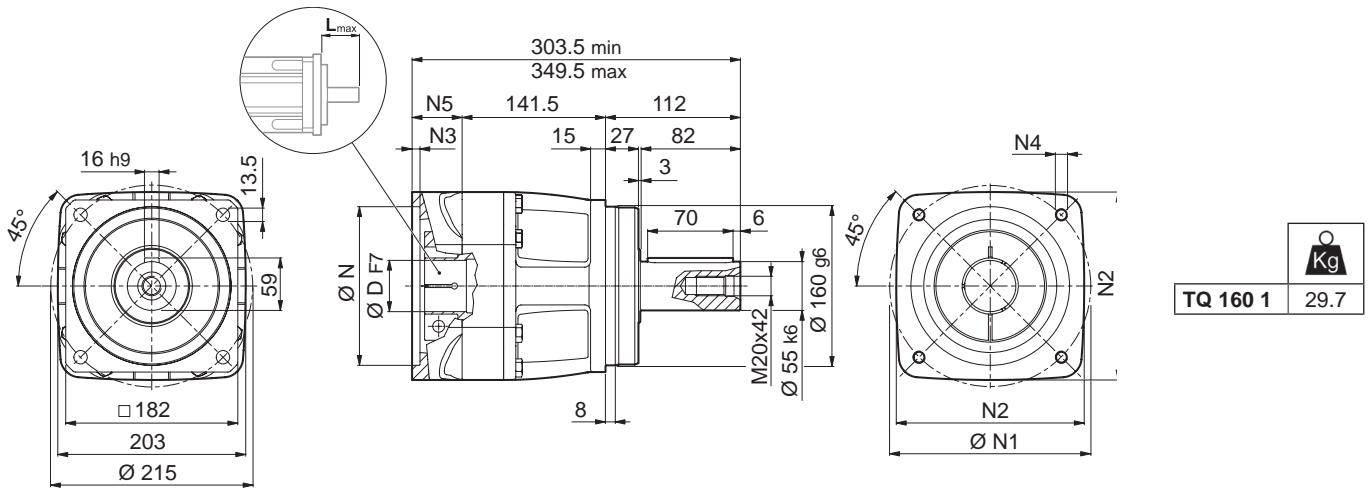
TQ

	A1	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQ 130 1											
14	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
19	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
24	22°	70	120	140	M10x16	M6	51.5	32.5	7.5	23.5	19
28	22°	70	120	140	M10x16	M8	51.5	32.5	7.5	23.5	22.5
32	22°	72	120	140	M10x16	M8	51.5	32.5	7.5	23.5	24.5
38	22°	100	120	140	M10x16	M8	54	35	7.5	23.5	28
42	22°	114	120	140	M10x16	M10	51.5	38.5	7.5	23.5	33
TQ 130 2											
11	30°	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
14	30°	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
19	30°	51	90	115	M8x13	M6	50	28	6.5	20.5	16.5
24	30°	60	90	115	M8x13	M6	51.5	29.5	6.5	20.5	19
28	30°	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	22.5
32	30°	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	24.5
38	30°	80	90	115	M8x13	M8	51.5	32	6.5	20.5	28

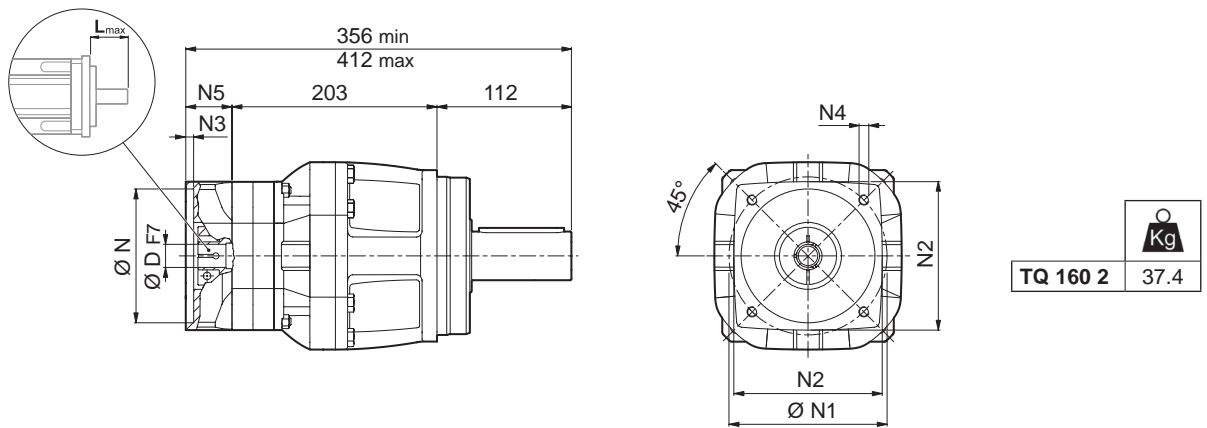
	M_{n2}	M_{a2}	M_{p2}	n_1	$n_{1\max}$	$\varphi_S \leq \varphi_R$		C_t	$R_{2\max}$	$A_{2\max}$	η	J_G [kgcm ²]				
						φ_S	φ_R									
i	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	[arcmin]	[Nm/arcmin]	[N]	[N]	%	14	19 - 24	28 - 32	38	42
TQ 130 1_3	260	400	900	2100	4000	3'	2'	59	9000	8000	97	-	10.02	10.48	11.12	17.12
TQ 130 1_4	400	600	1000	2100	4000	3'	2'	59	9000	8000	97	-	6.38	6.85	7.49	13.49
TQ 130 1_5	400	600	1000	2500	4000	3'	2'	59	9000	8000	97	-	5.01	5.47	6.11	12.11
TQ 130 1_7	360	550	950	2500	4000	3'	2'	59	9000	8000	97	-	3.82	4.28	4.93	10.93
TQ 130 1_10	280	420	900	2500	4000	3'	2'	59	9000	8000	97	-	3.15	3.61	4.25	10.25
TQ 130 2_16	400	600	1000	2800	4000	5'	3'	58	9000	8000	94	1.72	1.87	3.53	4.05	-
TQ 130 2_20	400	600	1000	2800	4000	5'	3'	58	9000	8000	94	1.64	1.80	3.46	3.98	-
TQ 130 2_25	400	600	1000	2800	4000	5'	3'	58	9000	8000	94	1.39	1.55	3.21	3.73	-
TQ 130 2_28	400	600	1000	2800	4000	5'	3'	58	9000	8000	94	1.20	1.36	3.02	3.54	-
TQ 130 2_35	400	600	1000	2800	4000	5'	3'	58	9000	8000	94	1.17	1.33	2.99	3.51	-
TQ 130 2_40	400	600	1000	3200	4000	5'	3'	58	9000	8000	94	1.07	1.23	2.89	3.41	-
TQ 130 2_50	400	600	1000	3200	4000	5'	3'	58	9000	8000	94	1.06	1.21	2.87	3.39	-
TQ 130 2_70	360	550	950	3500	4000	5'	3'	58	9000	8000	94	1.05	1.20	2.86	3.38	-
TQ 130 2_100	280	420	900	4000	4000	5'	3'	58	9000	8000	94	1.04	1.20	2.86	3.38	-

TQ 160

95A2 ... 230A



80A3 ... 200A

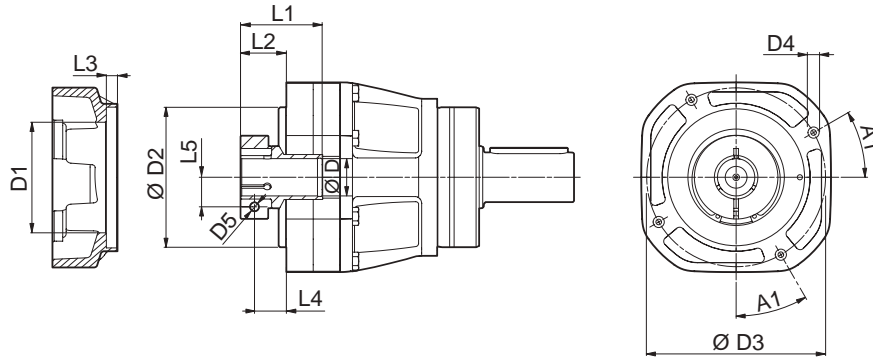


	D							N	N1	N2	N3	N4	N5	L _{max}
TQ 160 1														
95A2	19	24	28	-	-	-	-	95	115	205	6.5	M8x20	50	60
110A2	19	24	-	-	-	-	-	110	130	205	6.5	M8x20	50	60
130A1	19	24	28	32	-	-	-	130	165	205	6.5	M10x20	50	60
180A	19	24	28	32	-	-	-	180	215	205	6.5	M14x28	50	60
180A1	19	24	28	32	38	-	-	180	215	205	6.5	M14x28	60	80
200A	19	24	28	32	38	42	48	200	235	220	6.5	M14x28	96	110
230A	19	24	28	32	38	42	48	230	265	240	6.5	M14x28	96	110
TQ 160 2														
80A3	19	-	-	-	-	-	-	80	100	155	6.5	M6x14	41	60
95A2	19	24	28	-	-	-	-	95	115	155	6.5	M8x18	41	60
110A2	19	24	-	-	-	-	-	110	130	155	6.5	M8x20	41	60
110B1	19	24	28	-	-	-	-	110	145	155	6.5	M8x20	41	60
130A1	19	24	28	32	-	-	-	130	165	155	6.5	M10x20	41	60
180A	19	24	28	32	-	-	-	180	215	190	6.5	M14x28	41	60
180A1	19	24	28	32	38	-	-	180	215	190	6.5	M14x28	61	80
200A	19	24	28	32	38	42	-	200	235	220	6.5	M14x28	97	110


Please contact us for different motor adapters and input shaft bore.

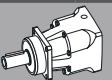
TQ 160

FM



TQ

	A1	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQ 160 1											
19	30°	58	150	175	M12x20	M6	47	37	9.5	28	19
24	30°	58	150	175	M12x20	M6	47	37	9.5	28	19
28	30°	70	150	175	M12x20	M8	47	37	9.5	28	22.5
32	30°	72	150	175	M12x20	M8	47	37	9.5	28	24.5
38	30°	100	150	175	M12x20	M8	59.5	39.5	9.5	28	28
42	30°	114	150	175	M12x20	M10	57	43	9.5	28	33
48	30°	125	150	175	M12x20	M12	57	43	9.5	28	36.5
TQ 160 2											
14	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
19	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
24	22°	70	120	140	M10x16	M6	51.5	32.5	7.5	23.5	19
28	22°	70	120	140	M10x16	M8	51.5	32.5	7.5	23.5	22.5
32	22°	72	120	140	M10x16	M8	51.5	32.5	7.5	23.5	24.5
38	22°	100	120	140	M10x16	M8	54	35	7.5	23.5	28
42	22°	114	120	140	M10x16	M10	51.5	38.5	7.5	23.5	33

	M_{n2}	M_{a2}	M_{p2}	n_1	$n_{1\max}$	φ_S	φ_R	C_t	$R_{2\max}$	$A_{2\max}$	η	J_G [kgcm ²]				
												i	[Nm]	[Nm]	[Nm]	[min ⁻¹]
TQ 160 1_3	530	800	1500	1500	3500	3'	2'	170	15000	13000	97	-	29.58	29.99	32.89	45.99
TQ 160 1_4	800	1200	2000	1500	3500	3'	2'	170	15000	13000	97	-	18.03	18.44	21.33	34.44
TQ 160 1_5	800	1200	2000	1800	3500	3'	2'	170	15000	13000	97	-	11.76	12.17	15.06	28.17
TQ 160 1_7	750	1150	2000	2500	3500	3'	2'	170	15000	13000	97	-	9.27	9.68	12.58	25.68
TQ 160 1_10	550	850	1600	2500	3500	3'	2'	170	15000	13000	97	-	7.05	7.46	10.35	23.46
TQ 160 2_16	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	6.52	7.05	7.77	13.77	-
TQ 160 2_20	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	6.16	6.69	7.41	13.41	-
TQ 160 2_25	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	4.81	5.34	6.06	12.06	-
TQ 160 2_28	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	3.77	4.30	5.02	11.02	-
TQ 160 2_35	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	3.65	4.18	4.90	10.90	-
TQ 160 2_40	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	3.05	3.57	4.30	10.30	-
TQ 160 2_50	800	1200	2000	2800	3500	5'	3'	170	15000	13000	94	2.99	3.52	4.24	10.24	-
TQ 160 2_70	750	1150	2000	3000	3500	5'	3'	170	15000	13000	94	2.97	3.50	4.22	10.22	-
TQ 160 2_100	550	850	1600	3000	3500	5'	3'	170	15000	13000	94	2.95	3.48	4.20	10.20	-

Performance Line

TQK



TQK Series

The TQK right-angle series represents the ideal solution for issues of space saving, while maintaining the same top performance levels of the TQ inline series.

This series is particularly suited for the highly demanding requirements of servo systems, such as fast dynamic response, frequent reverse motion, precise position, motion control and high number of starts and stops.

Main benefits

- Highest installation flexibility
- Optional reinforced bearings for high axial and radial overload forces
- Quiet operation
- Compact design for space-saving layouts
- Great flexibility thanks to universal design

Main features

- Nominal output torque (Nm)

20 - 800

- Torsional backlash (arcmin)

4 - 8

- Torsional stiffness (Nm/arcmin)

4.3 - 167

- Max tilting moment (Nm)

129.5 - 2331

Protection class



- IP65



Frame sizes



-  060
-  070
-  090
-  130
-  160



Main options



- Input versions

	
MOTOR ADAPTER	WITHOUT MOTOR ADAPTER
- Output shafts versions

	
SMOOTH KEYLESS SHAFT	KEYED SHAFT
- Service type

	
S1	S5
- Lubrication

	
STANDARD LUBRICATION	FOOD GRADE LUBRICATION
- Bearings versions

	
STANDARD	REINFORCED

3 FEATURES OF TQK SERIES

Low backlash bevel-planetary drives of the TQK series are the solution to space problems often posed by increasingly compact machines. TQK drives combine high levels of dynamic operation with top precision, which results in great accuracy and repeatability for any positioning mechanism in which they are installed.

On top of their robustness and dependability TQK drives also feature a distinctive Italian style that makes them clearly recognizable amongst like products within the reference industry.

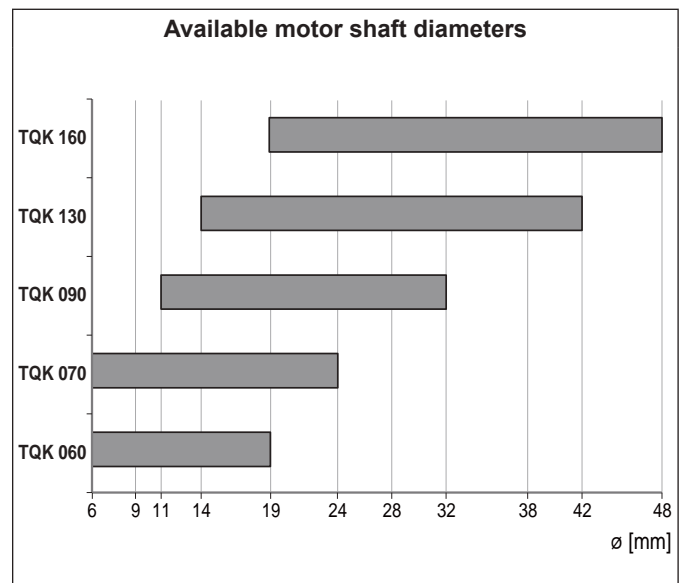
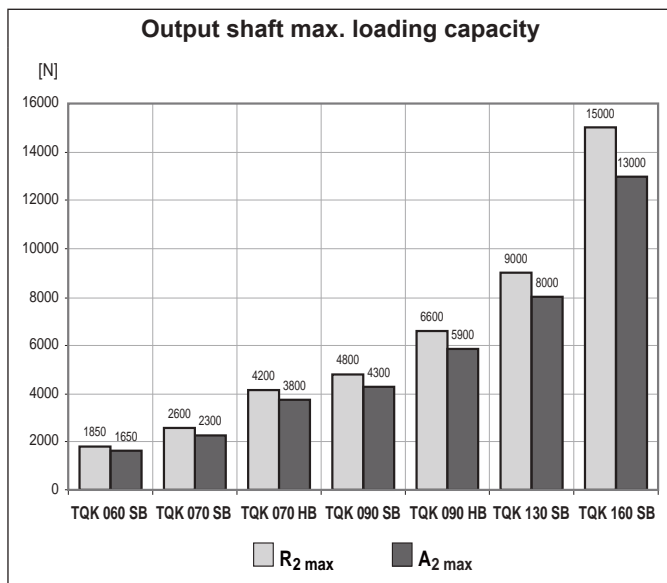
TQK

- TQK features two classes of precision, corresponding to the following values of torsional backlash
 2-stage units: standard $\varphi_S \leq 5'$; reduced $\varphi_R \leq 4'$ ($\varphi_S \leq 6'$; $\varphi_R \leq 5'$ for TQK 060 and TQK 070)
 3-stage units: standard $\varphi_S \leq 7'$; reduced $\varphi_R \leq 6'$ ($\varphi_S \leq 8'$; $\varphi_R \leq 7'$ for TQK 060 and TQK 070)
- A high IP rating (IP65) provides inner parts with protection against the ingress of dust and liquids.
- Input section oil seals made from a Fluoroelastomer compound are supplied as standard.
- Noise pressure level $60 \leq L_p \leq 70$ dB(A). Conditions: distance 1 m ; measured without load and an input speed of $n_1 = 3000 \text{ min}^{-1}$; $i = 20$.
- Numerous adapters allow matching the most popular brands of servomotors.
- Lubrication optimized for the type of duty specified when ordering, in the absence of contamination the lubricant requires no periodical changes.

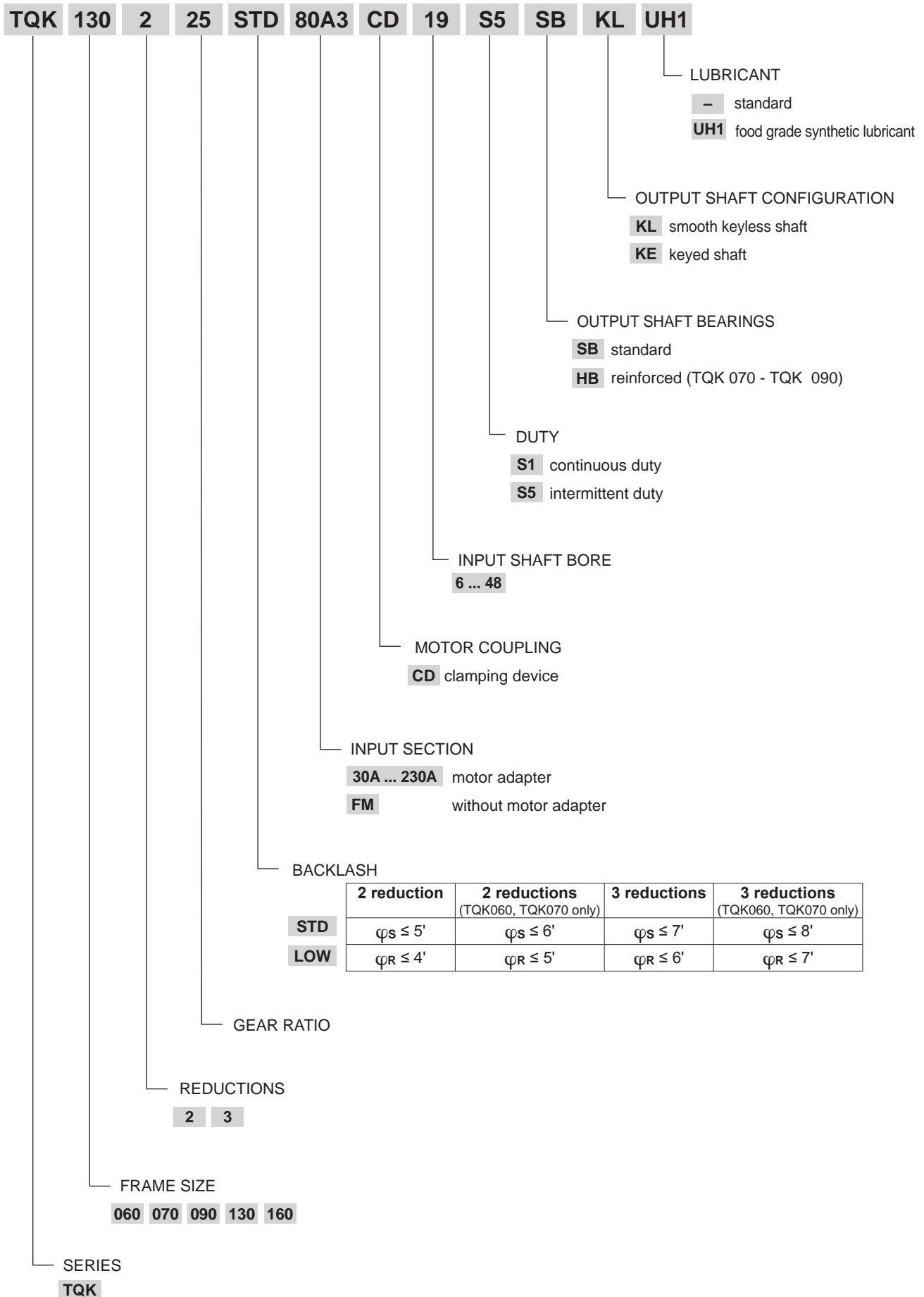
duty	TQK 060 ... TQK 160	output seals
S1 (continuous)	Synthetic oil viscosity ISO VG 220	Fluoroelastomer
S5 (intermittent)	NLGI grease consistency 00	NBR

- Ambient temperature min -20°C , max $+30^\circ\text{C}$. For temperature higher than 30°C please consider derating factor f_T .
- Housing temperature must not exceed $T_{\text{max}} = 90^\circ\text{C}$.

		Distribution of nominal torque M_{n2} [Nm]														
	[i]	6	8	10	14	18	20	24	30	40	50	70	80	100	140	200
TQK 060	21	28	30	25	21	20	30	30	30	30	30	30	30	30	25	20
TQK 070	45	60	70	60	45	40	70	70	70	70	70	70	70	70	60	40
TQK 090	110	150	180	160	130	110	200	180	180	180	180	180	200	180	160	110
TQK 130	255	340	400	360	260	280	400	400	400	400	400	400	400	400	360	280
TQK 160	420	560	700	750	530	550	800	800	800	800	800	800	800	800	750	550



3.1 ORDERING CODE

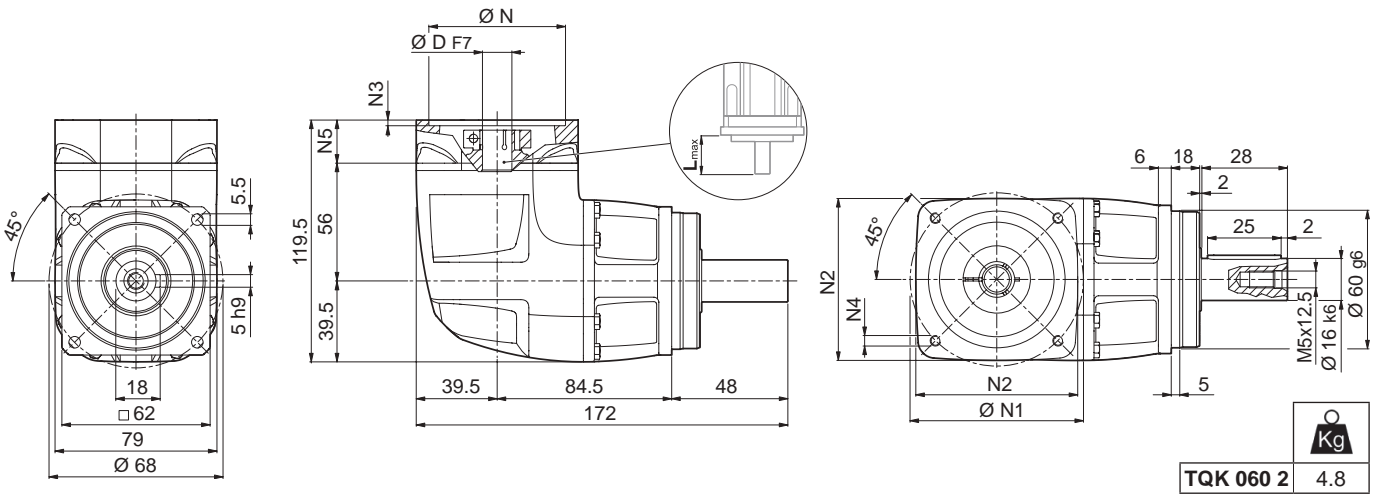


TQK

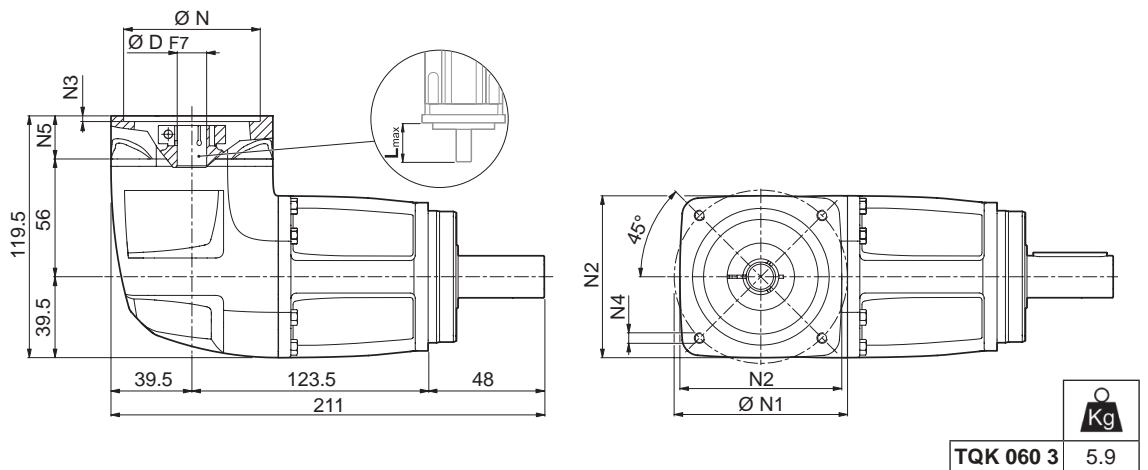
3.2 DIMENSIONS AND TECHNICAL SPECIFICATIONS

TQK 060

TQK



30A ... 110B0

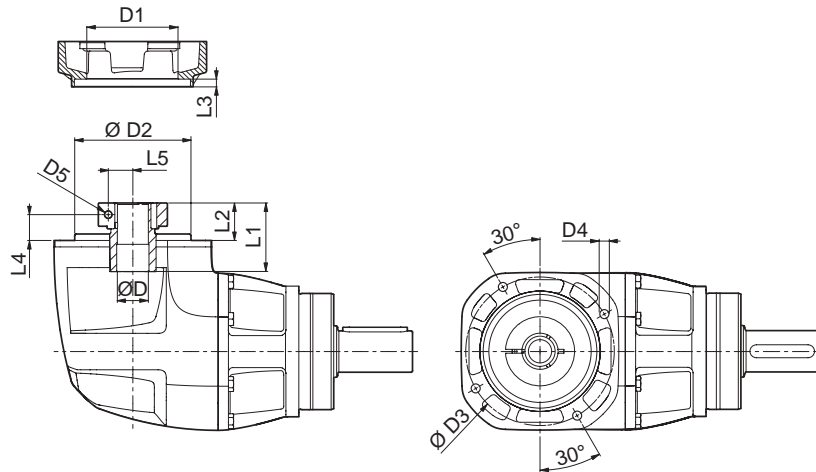


						N	N1	N2	N3	N4	N5	Lmax
30A	6	-	-	-	-	30	46	80	3.5	M4x10	24	40
40B1	6	9	11	14	-	40	63	80	3.5	M4x10	24	40
50A1	6	9	11	14	-	50	60	80	4.0	M4x10	24	40
50C1	6	9	11	14	-	50	70	80	4.0	M4x10	24	40
60A2	6	9	11	14	19	60	75	80	4.0	M5x12	24	40
70B1	6	9	11	14	19	70	90	80	4.0	M5x12	24	40
80A1	6	9	11	14	19	80	100	100	4.0	M6x14	24	40
95A	6	9	11	14	19	95	115	100	4.0	M8x24*	24	40
110B0	6	9	11	14	19	110	145	120	4.0	M8x24*	24	40

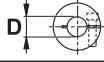
* through hole. Please contact us for different motor adapters and input shaft bore.

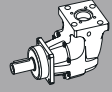
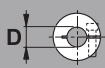
TQK 060

FM



TQK

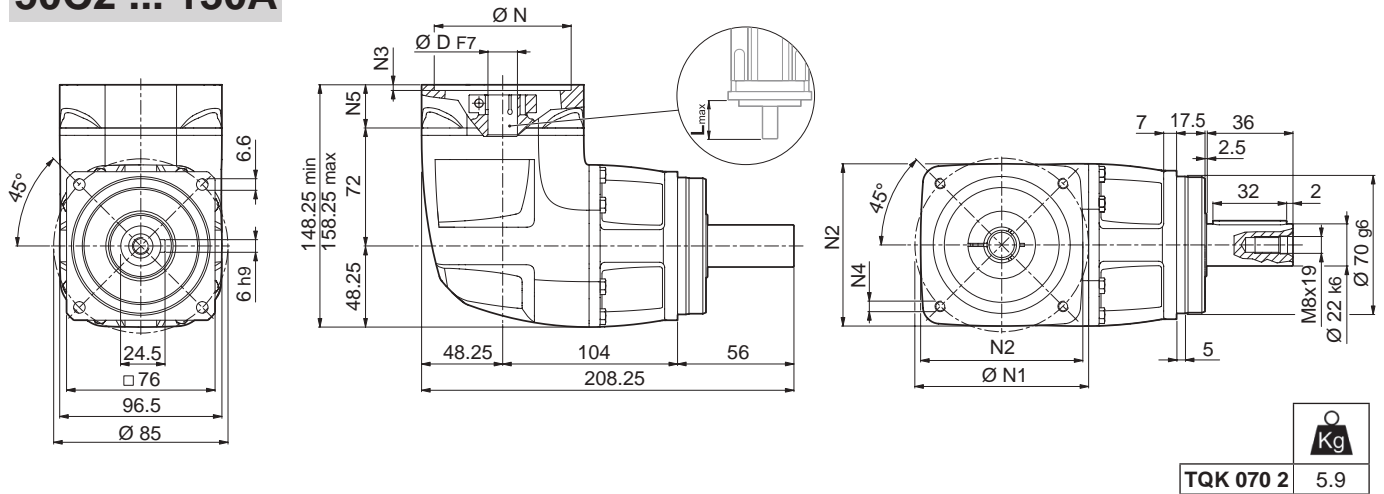
	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	37	59	72	M5x11	M4	31.5	15.5	4.5	10.5	8
9	49	59	72	M5x11	M5	35	19	4.5	11.5	10.5
11	49	59	72	M5x11	M6	35	19	4.5	11.5	12.5
14	49	59	72	M5x11	M6	35	19	4.5	11.5	14.5
19	54	59	72	M5x11	M6	35	19	4.5	11.5	16.5

	i	M _{n2} [Nm]	M _{a2} [Nm]	M _{p2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S ≤ [arcmin]	φ _R [arcmin]	C _t [$\frac{Nm}{arcmin}$]	R _{2 max} [N]	A _{2 max} [N]	η %	J _G [kgcm ²]		
														6 - 9	11 - 14
TQK 060 2_6		21	30	45	2500	5000	6'	5'	4.3	1850	1650	94	0.76	0.78	0.78
TQK 060 2_8		28	40	60	2500	5000	6'	5'	4.3	1850	1650	94	0.75	0.76	0.77
TQK 060 2_10		30	45	70	2500	5000	6'	5'	4.3	1850	1650	94	0.73	0.75	0.75
TQK 060 2_14		25	38	70	2500	5000	6'	5'	4.3	1850	1650	94	0.72	0.73	0.74
TQK 060 2_20		20	30	55	2500	5000	6'	5'	4.3	1850	1650	94	0.71	0.72	0.73
TQK 060 3_18		21	32	60	2500	5000	8'	7'	4.3	1850	1650	91	0.61	0.62	0.63
TQK 060 3_24		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.61	0.62	0.63
TQK 060 3_30		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.60	0.62	0.62
TQK 060 3_40		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.60	0.61	0.62
TQK 060 3_50		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.60	0.61	0.62
TQK 060 3_70		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.60	0.61	0.62
TQK 060 3_80		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.60	0.61	0.62
TQK 060 3_100		30	45	80	2500	5000	8'	7'	4.3	1850	1650	91	0.59	0.61	0.61
TQK 060 3_140		25	38	70	2500	5000	8'	7'	4.3	1850	1650	91	0.59	0.61	0.61
TQK 060 3_200		20	30	55	2500	5000	8'	7'	4.3	1850	1650	91	0.59	0.61	0.61

TQK 070

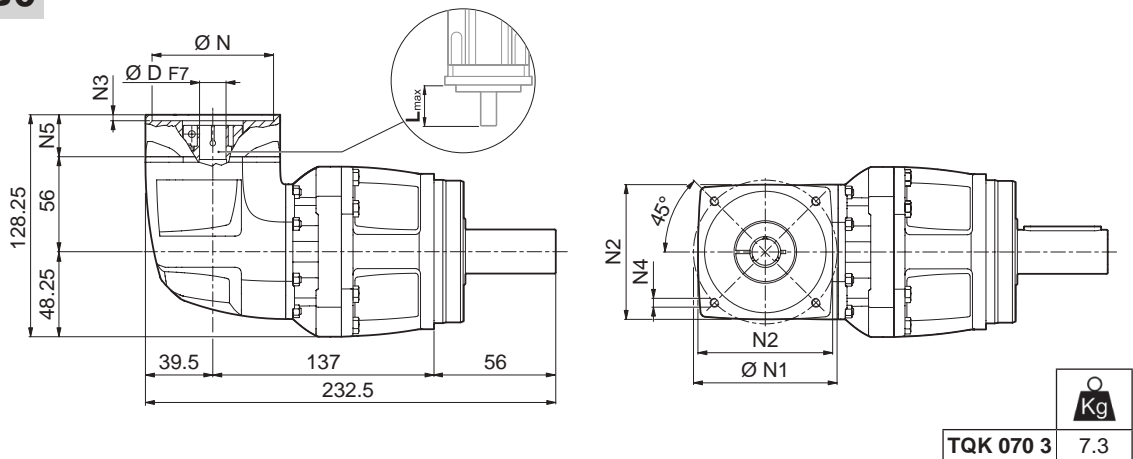
50C2 ... 130A

TQK



TQK 070 2 5.9

30A ... 110B0



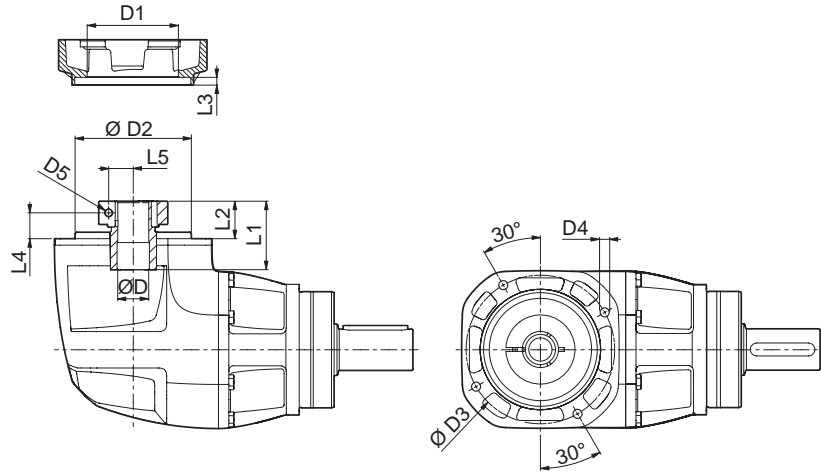
TQK 070 3 7.3

	D						N	N1	N2	N3	N4	N5	L _{max}
	6	9	11	14	19	24							
TQK 070 2													
50C2	6	9	11	14	-	-	50	70	100	6.5	M4x12	28	50
60A3	6	9	11	14	19	-	60	75	100	6.5	M5x14	28	50
70B2	6	9	11	14	19	-	70	90	100	6.5	M5x14	28	50
80A2	6	9	11	14	19	-	80	100	100	6.5	M6x14	28	50
95A1	6	9	11	14	19	24	95	115	100	6.5	M8x18	28	50
110A1	6	9	11	14	19	24	110	130	120	6.5	M8x18	28	50
110B1	6	9	11	14	19	24	110	145	120	6.5	M8x20	38	60
130A	6	9	11	14	19	24	130	165	140	6.5	M10x19	28	50
TQK 070 3													
30A	6	-	-	-	-	-	30	46	80	3.5	M4x10	24	40
40B1	6	9	11	14	-	-	40	63	80	3.5	M4x10	24	40
50A1	6	9	11	14	-	-	50	60	80	4.0	M4x10	24	40
50C1	6	9	11	14	-	-	50	70	80	4.0	M4x10	24	40
60A2	6	9	11	14	19	-	60	75	80	4.0	M5x12	24	40
70B1	6	9	11	14	19	-	70	90	80	4.0	M5x12	24	40
80A1	6	9	11	14	19	-	80	100	100	4.0	M6x14	24	40
95A	6	9	11	14	19	-	95	115	100	4.0	M8x24*	24	40
110B0	6	9	11	14	19	-	110	145	120	4.0	M8x24*	24	40

* through hole. Please contact us for different motor adapters and input shaft bore.

TQK 070

FM



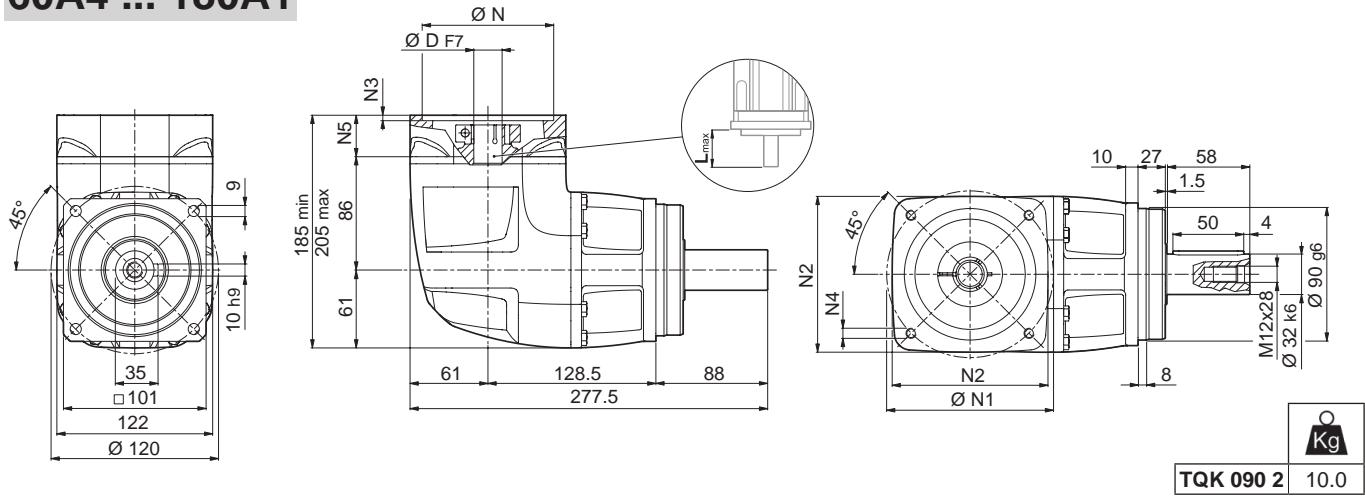
TQK

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQK 070 2										
6	51	70	85	M6x11	M6	42	20	5	12.5	12.5
9	51	70	85	M6x11	M6	42	20	5	12.5	12.5
11	51	70	85	M6x11	M6	42	20	5	12.5	12.5
14	51	70	85	M6x11	M6	42	20	5	12.5	14.5
19	51	70	85	M6x11	M6	42	20	5	12.5	16.5
24	60	70	85	M6x11	M6	43.5	21.5	5	12.5	19
TQK 070 3										
6	37	59	72	M5x11	M4	31.5	15.5	4.5	10.5	8
9	49	59	72	M5x11	M5	35	19	4.5	11.5	10.5
11	49	59	72	M5x11	M6	35	19	4.5	11.5	12.5
14	49	59	72	M5x11	M6	35	19	4.5	11.5	14.5
19	54	59	72	M5x11	M6	35	19	4.5	11.5	16.5

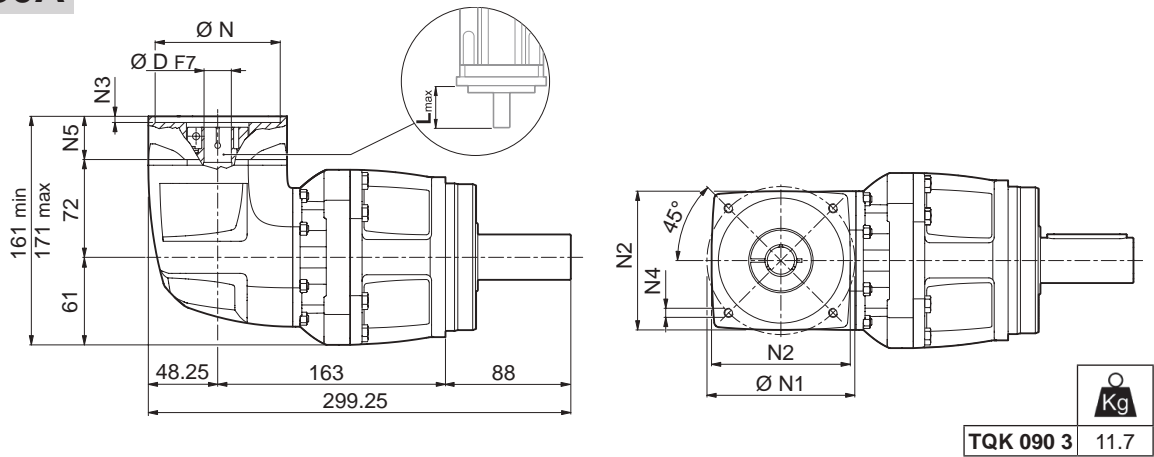
	i	M _{n 2} [Nm]	M _{a 2} [Nm]	M _{p 2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S [arcmin]	φ _R [arcmin]	C _t [Nm/arcmin]	SB		HB		η %	J _G [kgcm ²]			
										R _{2 max} [N]	A _{2 max} [N]	R _{2 max} [N]	A _{2 max} [N]					
															6-9	11-14	19	24
TQK 070 2_6		45	65	90	2500	5000	6'	5'	11	2600	2300	4200	3800	94	-	1.52	1.55	1.63
TQK 070 2_8		60	85	120	2500	5000	6'	5'	11	2600	2300	4200	3800	94	-	1.44	1.47	1.55
TQK 070 2_10		70	100	150	2500	5000	6'	5'	11	2600	2300	4200	3800	94	-	1.41	1.43	1.52
TQK 070 2_14		60	90	160	2500	5000	6'	5'	11	2600	2300	4200	3800	94	-	1.38	1.41	1.49
TQK 070 2_20		40	60	110	2500	5000	6'	5'	11	2600	2300	4200	3800	94	-	1.36	1.39	1.48
TQK 070 3_18		45	65	120	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.28	1.39	1.42	-
TQK 070 3_24		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.26	1.37	1.40	-
TQK 070 3_30		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.25	1.36	1.39	-
TQK 070 3_40		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.20	1.31	1.34	-
TQK 070 3_50		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.19	1.31	1.33	-
TQK 070 3_70		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.18	1.29	1.32	-
TQK 070 3_80		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.17	1.29	1.31	-
TQK 070 3_100		70	100	180	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.17	1.28	1.31	-
TQK 070 3_140		60	90	160	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.16	1.27	1.30	-
TQK 070 3_200		40	60	110	2500	5000	8'	7'	11	2600	2300	4200	3800	91	1.15	1.27	1.29	-

TQK 090

60A4 ... 180A1



50C2 ... 130A

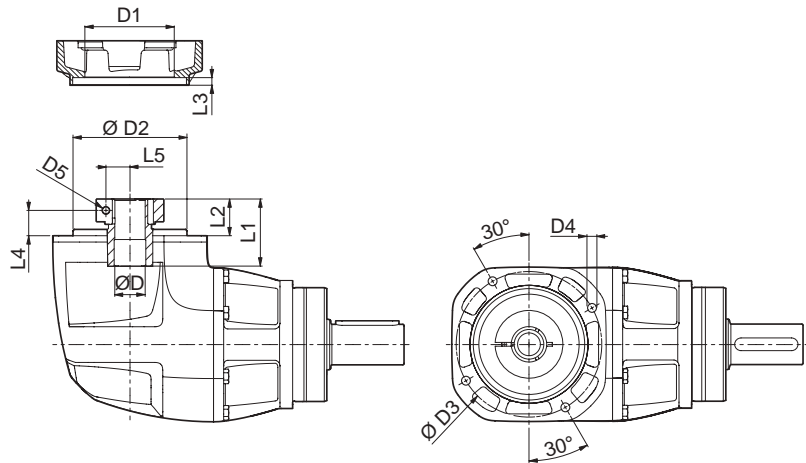


	D						N	N1	N2	N3	N4	N5	L _{max}
TQK 090 2													
60A4	11	14	19	-	-	-	60	75	125	6.5	M5x14	38	60
80A3	11	14	19	-	-	-	80	100	125	6.5	M6x14	38	60
95A2	11	14	19	24	28	-	95	115	125	6.5	M8x18	38	60
110A2	11	14	19	24	-	-	110	130	125	6.5	M8x20	38	60
110B1	11	14	19	24	28	-	110	145	125	6.5	M8x20	38	60
130A1	11	14	19	24	28	32	130	165	140	6.5	M10x20	38	60
180A	11	14	19	24	28	32	180	215	190	6.5	M14x38*	38	60
180A1	11	14	19	24	28	32	180	215	190	6.5	M14x28	58	80
TQK 090 3													
50C2	11	14	-	-	-	-	50	70	100	6.5	M4x12	28	50
60A3	11	14	19	-	-	-	60	75	100	6.5	M5x14	28	50
70B2	11	14	19	-	-	-	70	90	100	6.5	M5x14	28	50
80A2	11	14	19	-	-	-	80	100	100	6.5	M6x14	28	50
95A1	11	14	19	24	-	-	95	115	100	6.5	M8x18	28	50
110A1	11	14	19	24	-	-	110	130	120	6.5	M8x18	28	50
110B1	11	14	19	24	-	-	110	145	120	6.5	M8x20	38	60
130A	11	14	19	24	-	-	130	165	140	6.5	M10x19	28	50


* through hole. Please contact us for different motor adapters and input shaft bore.

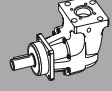
TQK 090

FM



TQK

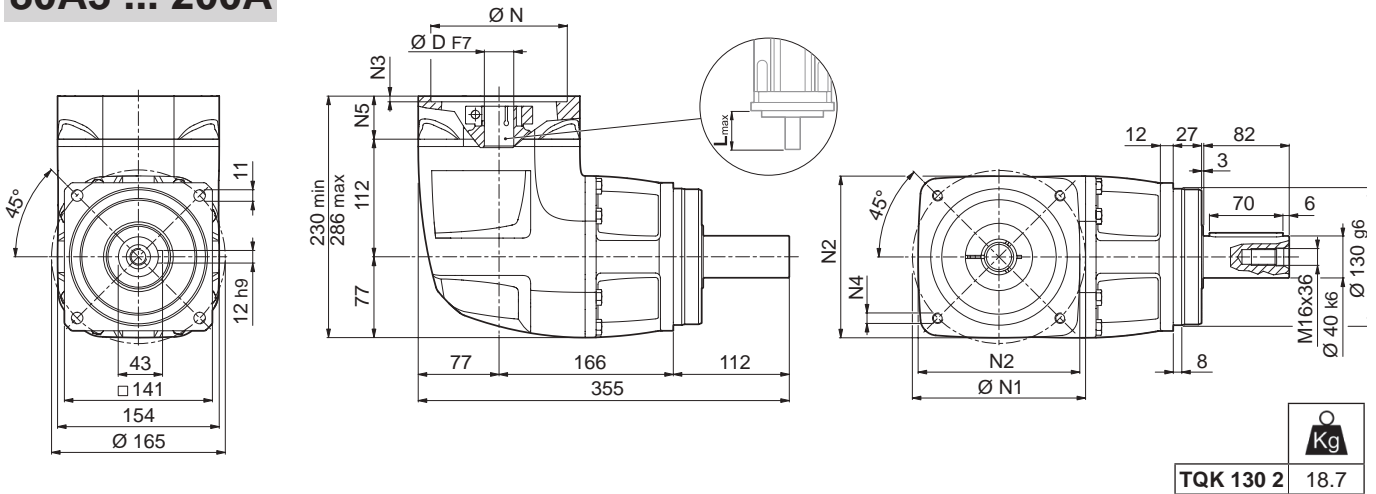
	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQK 090 2										
11	51	90	115	M9x13	M6	50	28	6.5	20.5	14.5
14	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
19	51	90	115	M8x13	M6	50	28	6.5	20.5	16.5
24	60	90	115	M8x13	M6	51.5	29.5	6.5	20.5	19
28	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	22.5
32	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	24.5
TQK 090 3										
11	51	70	85	M6x11	M6	42	20	5	12.5	12.5
14	51	70	85	M6x11	M6	42	20	5	12.5	14.5
19	51	70	85	M6x11	M6	42	20	5	12.5	16.5
24	60	70	85	M6x11	M6	43.5	21.5	5	12.5	19

	M_{n2}	M_{a2}	M_{p2}	n_1	n_{1max}	φ_S	φ_R	C_t	SB		HB		η	J_G [kgcm ²]			
									R_{2max}	A_{2max}	R_{2max}	A_{2max}		$\%$	11	14	19 - 24
i	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	\leq	[$\frac{Nm}{arcmin}$]	[N]	[N]	[N]	[N]	%				
TQK 090 2_6	110	150	225	2000	4500	5'	4'	28	4800	4300	6600	5900	94	-	4.82	4.89	5.42
TQK 090 2_8	150	208	300	2000	4500	5'	4'	28	4800	4300	6600	5900	94	-	4.56	4.63	5.16
TQK 090 2_10	180	260	360	2000	4500	5'	4'	28	4800	4300	6600	5900	94	-	4.45	4.51	5.04
TQK 090 2_14	160	250	500	2000	4500	5'	4'	28	4800	4300	6600	5900	94	-	4.34	4.41	4.94
TQK 090 2_20	110	170	350	2000	4500	5'	4'	28	4800	4300	6600	5900	94	-	4.29	4.36	4.88
TQK 090 3_18	130	200	400	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.56	3.63	3.70	-
TQK 090 3_24	200	300	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.53	3.60	3.67	-
TQK 090 3_30	180	280	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.52	3.59	3.66	-
TQK 090 3_40	180	280	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.45	3.52	3.58	-
TQK 090 3_50	180	280	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.42	3.49	3.56	-
TQK 090 3_70	180	280	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.40	3.46	3.53	-
TQK 090 3_80	200	300	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.38	3.45	3.52	-
TQK 090 3_100	180	280	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.38	3.45	3.52	-
TQK 090 3_140	160	250	500	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.38	3.45	3.52	-
TQK 090 3_200	110	170	350	2000	4500	7'	6'	28	4800	4300	6600	5900	91	3.38	3.45	3.52	-

TQK 130

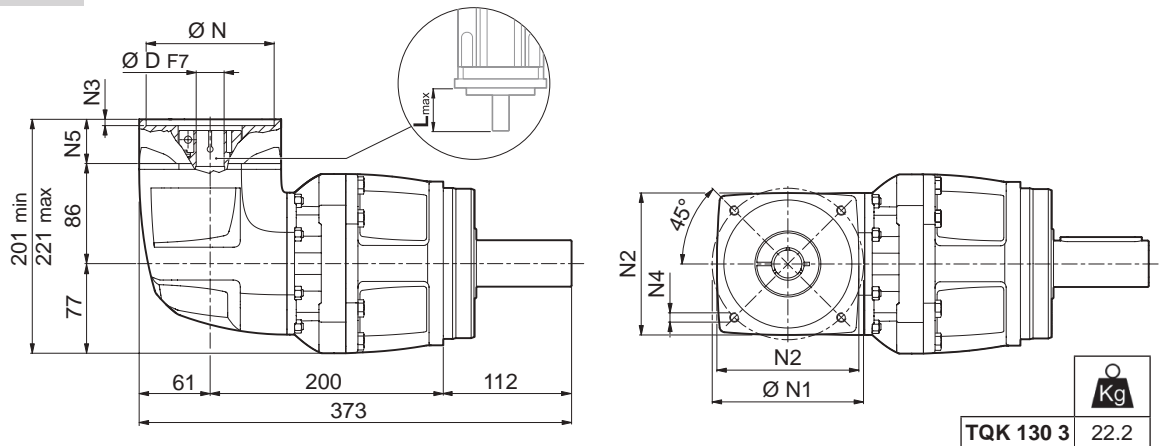
80A3 ... 200A

TQK



TQK 130 2 18.7

60A4 ... 180A1



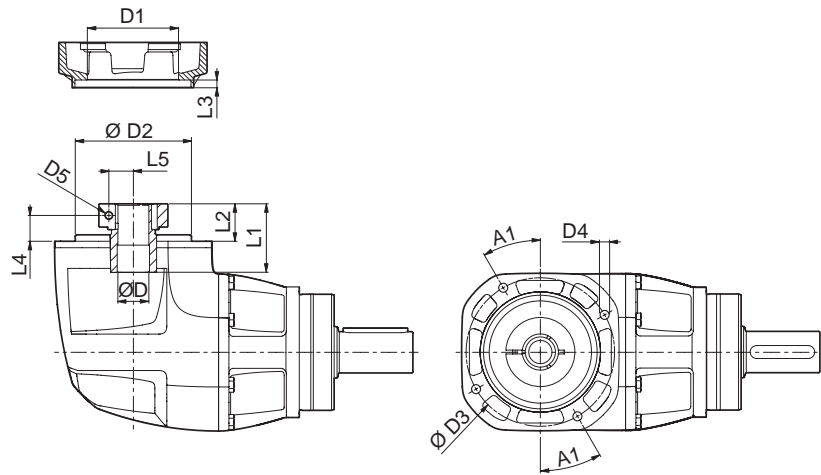
TQK 130 3 22.2

	D							N	N1	N2	N3	N4	N5	L _{max}
TQK 130 2														
80A3	14	19	-	-	-	-	80	100	155	6.5	M6x14	41	60	
95A2	14	19	24	28	-	-	95	115	155	6.5	M8x18	41	60	
110A2	14	19	24	-	-	-	110	130	155	6.5	M8x20	41	60	
110B1	14	19	24	28	-	-	110	145	155	6.5	M8x20	41	60	
130A1	14	19	24	28	32	-	130	165	155	6.5	M10x20	41	60	
180A	14	19	24	28	32	-	180	215	190	6.5	M14x28	41	60	
180A1	14	19	24	28	32	38	180	215	190	6.5	M14x28	61	80	
200A	14	19	24	28	32	38	200	235	220	6.5	M14x28	97	110	
TQK 130 3														
60A4	14	19	-	-	-	-	60	75	125	6.5	M5x14	38	60	
80A3	14	19	-	-	-	-	80	100	125	6.5	M6x14	38	60	
95A2	14	19	24	28	-	-	95	115	125	6.5	M8x18	38	60	
110A2	14	19	24	-	-	-	110	130	125	6.5	M8x20	38	60	
110B1	14	19	24	28	-	-	110	145	125	6.5	M8x20	38	60	
130A1	14	19	24	28	32	-	130	165	140	6.5	M10x20	38	60	
180A	14	19	24	28	32	-	180	215	190	6.5	M14x38	38	60	
180A1	14	19	24	28	32	-	180	215	190	6.5	M14x28	58	80	


* through hole. Please contact us for different motor adapters and input shaft bore.


TQK 130

FM



TQK

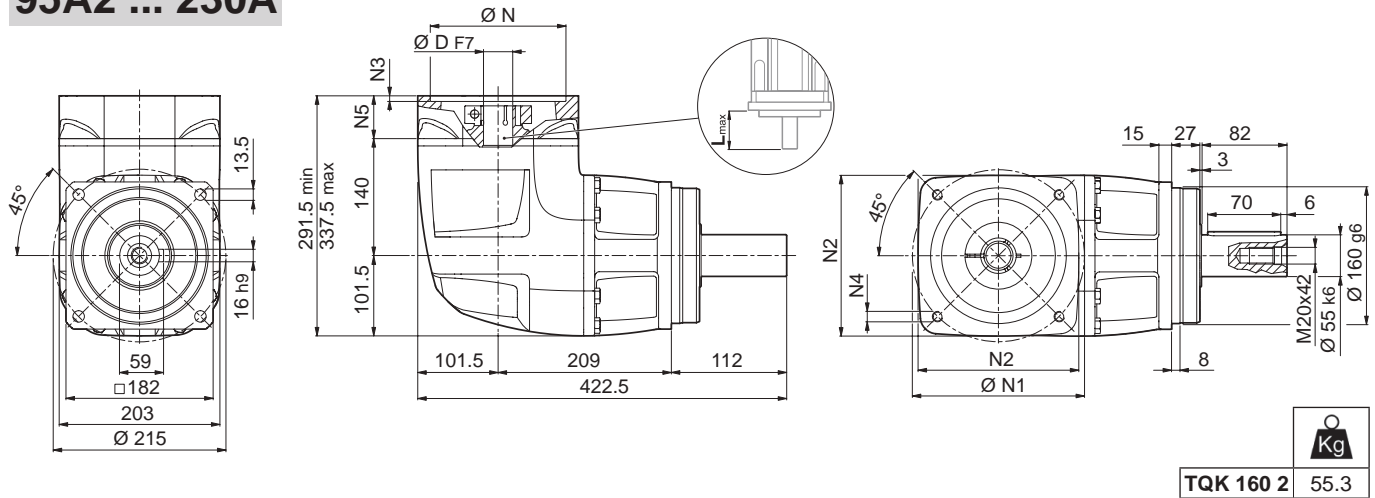
	A1	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQK 130 2											
14	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
19	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
24	22°	70	120	140	M10x16	M6	51.5	32.5	7.5	23.5	19
28	22°	70	120	140	M10x16	M8	51.5	32.5	7.5	23.5	22.5
32	22°	72	120	140	M10x16	M8	51.5	32.5	7.5	23.5	24.5
38	22°	100	120	140	M10x16	M8	54	35	7.5	23.5	28
42	22°	114	120	140	M10x16	M10	51.5	38.5	7.5	23.5	33
TQK 130 3											
14	30°	51	90	115	M8x13	M6	50	28	6.5	20.5	14.5
19	30°	51	90	115	M8x13	M6	50	28	6.5	20.5	16.5
24	30°	60	90	115	M8x13	M6	51.5	29.5	6.5	20.5	19
28	30°	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	22.5
32	30°	72	90	115	M8x13	M8	51.5	29.5	6.5	20.5	24.5

	M_{n2}	M_{a2}	M_{p2}	n_1	n_{1max}	φ_S	φ_R	C_t	R_{2max}	A_{2max}	η	J_G [kgcm ²]				
												i	[Nm]	[Nm]	[Nm]	[min ⁻¹]
TQK 130 2_6	255	360	510	2000	4500	5'	4'	56	9000	8000	94	-	17.44	18.02	18.55	24.47
TQK 130 2_8	340	480	680	2000	4500	5'	4'	56	9000	8000	94	-	16.31	16.89	17.41	23.33
TQK 130 2_10	400	600	850	2000	4500	5'	4'	56	9000	8000	94	-	15.77	16.35	16.88	22.80
TQK 130 2_14	360	550	950	2000	4500	5'	4'	56	9000	8000	94	-	15.35	15.93	16.46	22.38
TQK 130 2_20	280	420	900	2000	4500	5'	4'	56	9000	8000	94	-	15.13	15.71	16.23	22.15
TQK 130 3_18	260	400	900	2000	4500	7'	6'	56	9000	8000	91	15.18	15.34	15.92	-	-
TQK 130 3_24	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	15.05	15.21	15.79	-	-
TQK 130 3_30	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.99	15.15	15.73	-	-
TQK 130 3_40	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.72	14.88	15.46	-	-
TQK 130 3_50	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.61	14.77	15.35	-	-
TQK 130 3_70	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.52	14.68	15.25	-	-
TQK 130 3_80	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.47	14.63	15.21	-	-
TQK 130 3_100	400	600	1000	2000	4500	7'	6'	56	9000	8000	91	14.46	14.62	15.20	-	-
TQK 130 3_140	360	550	950	2000	4500	7'	6'	56	9000	8000	91	14.46	14.62	15.20	-	-
TQK 130 3_200	280	420	900	2000	4500	7'	6'	56	9000	8000	91	14.46	14.62	15.20	-	-

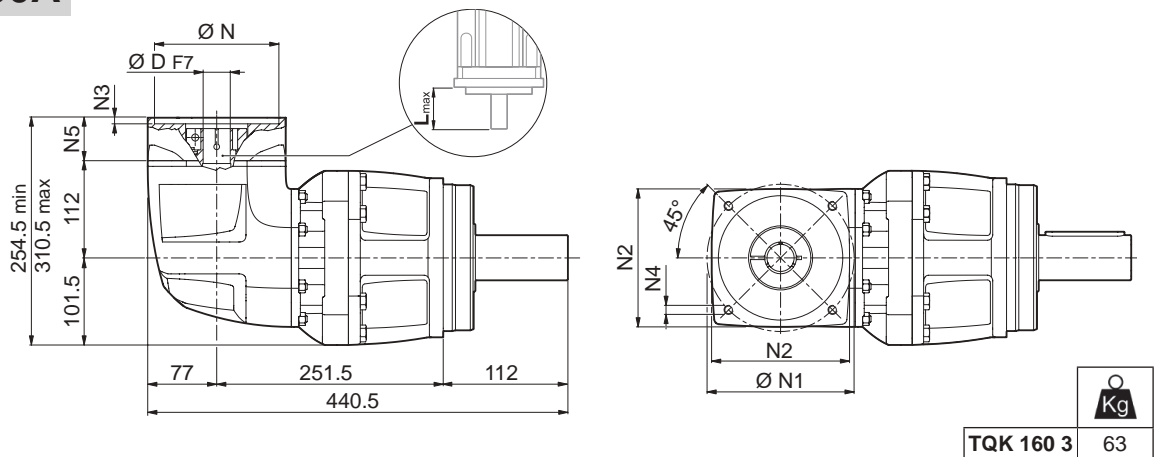
TQK 160


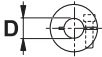
95A2 ... 230A

TQK



80A3 ... 200A

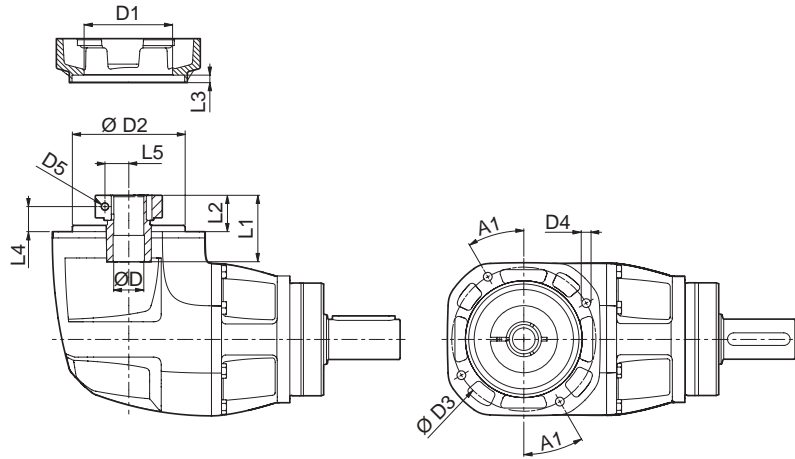


									N	N1	N2	N3	N4	N5	L _{max}
TQK 160 2															
95A2	19	24	28	-	-	-	-	95	115	205	6.5	M8x20	50	60	
110A2	19	24	-	-	-	-	-	110	130	205	6.5	M8x20	50	60	
130A1	19	24	28	32	-	-	-	130	165	205	6.5	M10x20	50	60	
180A	19	24	28	32	-	-	-	180	215	205	6.5	M14x28	50	60	
180A1	19	24	28	32	38	-	-	180	215	205	6.5	M14x28	60	80	
200A	19	24	28	32	38	42	48	200	235	220	6.5	M14x28	96	110	
230A	19	24	28	32	38	42	48	230	265	240	6.5	M14x28	96	110	
TQK 160 3															
80A3	19	-	-	-	-	-	-	80	100	155	6.5	M6x14	41	60	
95A2	19	24	28	-	-	-	-	95	115	155	6.5	M8x18	41	60	
110A2	19	24	-	-	-	-	-	110	130	155	6.5	M8x20	41	60	
110B1	19	24	28	-	-	-	-	110	145	155	6.5	M8x20	41	60	
130A1	19	24	28	32	-	-	-	130	165	155	6.5	M10x20	41	60	
180A	19	24	28	32	-	-	-	180	215	190	6.5	M14x28	41	60	
180A1	19	24	28	32	38	-	-	180	215	190	6.5	M14x28	61	80	
200A	19	24	28	32	38	42	-	200	235	220	6.5	M14x28	97	110	


Please contact us for different motor adapters and input shaft bore.

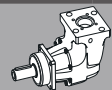

TQK 160

FM



TQK

	A1	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQK 160 2											
19	30°	58	150	175	M12x20	M6	47	37	9.5	28	19
24	30°	58	150	175	M12x20	M6	47	37	9.5	28	19
28	30°	70	150	175	M12x20	M8	47	37	9.5	28	22.5
32	30°	72	150	175	M12x20	M8	47	37	9.5	28	24.5
38	30°	100	150	175	M12x20	M8	59.5	39.5	9.5	28	28
42	30°	114	150	175	M12x20	M10	57	45	9.5	28	33
48	30°	125	150	175	M12x20	M12	57	45	9.5	28	36.5
TQK 160 3											
19	22°	54	120	140	M10x16	M6	50	31	7.5	23.5	16.5
24	22°	70	120	140	M10x16	M6	51.5	32.5	7.5	23.5	19
28	22°	70	120	140	M10x16	M8	51.5	32.5	7.5	23.5	22.5
32	22°	72	120	140	M10x16	M8	51.5	32.5	7.5	23.5	24.5
38	22°	100	120	140	M10x16	M8	54	35	7.5	23.5	28
42	22°	114	120	140	M10x16	M10	51.5	38.5	7.5	23.5	33

	i	M _{n2} [Nm]	M _{a2} [Nm]	M _{p2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S [arcmin]	φ _R [arcmin]	C _t [Nm/arcmin]	R _{2 max} [N]	A _{2 max} [N]	η %	J _G [kgcm ²]				
														19	24 - 28	32 - 38	42
TQK 160 2_6		420	630	840	1600	4000	5'	4'	167	15000	13000	94	-	73.33	73.51	75.57	79.19
TQK 160 2_8		560	840	1120	1600	4000	5'	4'	167	15000	13000	94	-	69.49	69.66	71.73	75.34
TQK 160 2_10		700	1050	1400	1600	4000	5'	4'	167	15000	13000	94	-	67.98	68.16	70.22	73.83
TQK 160 2_14		750	1150	2000	1600	4000	5'	4'	167	15000	13000	94	-	66.68	66.85	68.92	72.53
TQK 160 2_20		550	850	1600	1600	4000	5'	4'	167	15000	13000	94	-	65.94	66.12	68.18	71.80
TQK 160 3_18		530	800	1500	1600	4000	7'	6'	167	15000	13000	91	66.84	67.17	67.34	69.41	-
TQK 160 3_24		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	66.47	66.79	66.97	69.03	-
TQK 160 3_30		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	66.30	66.63	66.80	68.87	-
TQK 160 3_40		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	65.41	65.73	65.91	67.97	-
TQK 160 3_50		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	64.99	65.32	65.49	67.56	-
TQK 160 3_70		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	64.67	65.00	65.17	67.24	-
TQK 160 3_80		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	64.51	64.84	65.01	67.08	-
TQK 160 3_100		800	1200	2000	1600	4000	7'	6'	167	15000	13000	91	64.49	64.82	65.00	67.06	-
TQK 160 3_140		750	1150	2000	1600	4000	7'	6'	167	15000	13000	91	64.48	64.81	64.99	67.05	-
TQK 160 3_200		550	850	1600	1600	4000	7'	6'	167	15000	13000	91	64.47	64.80	64.98	67.04	-



Performance Line

TQF

TQF Series

The TQF series features a standardized and exceptionally compact flange interface for easy installations. High tilting moment, high stiffness and overload capacity characterize this robust gearbox within its product category.



Main benefits

- High positioning accuracy
- High compactness
- Easy installation thanks to standardized flange design
- Highest overload capacity
- Great flexibility thanks to universal design



Main features

- Nominal output torque (Nm)
 - 20 - 800
- Torsional backlash (arcmin)
 - 3 - 7
- Torsional stiffness (Nm/arcmin)
 - 12 - 500
- Max tilting moment (Nm)
 - 115 - 3700







Protection class

- IP65

Frame sizes

-  060
-  070
-  090
-  130
-  160

Main options

- Input versions
 -  MOTOR ADAPTER
 -  WITHOUT MOTOR ADAPTER
- Service type
 -  S1
 -  S5
- Lubrication
 -  STANDARD LUBRICATION
 -  UH1 FOOD GRADE LUBRICATION

4 FEATURES OF NEW TQF SERIES

Low backlash planetary drives of the TQF series feature a flange on the output shaft and are ideally suited for high positioning accuracy and highly dynamic cyclic operation.

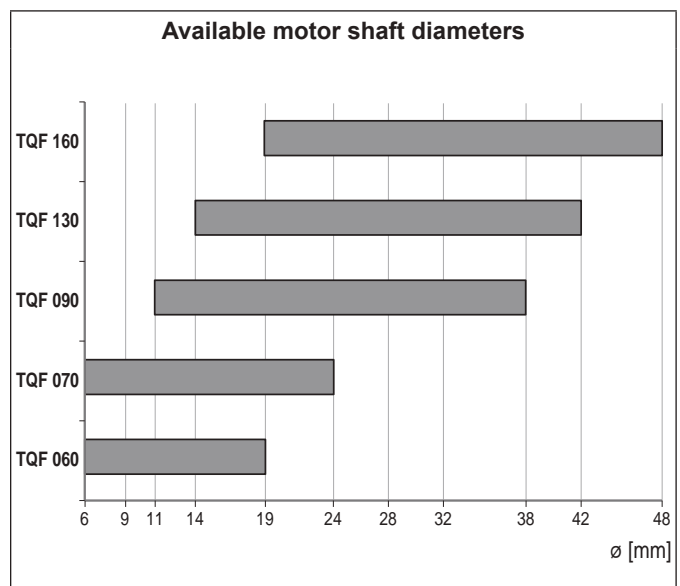
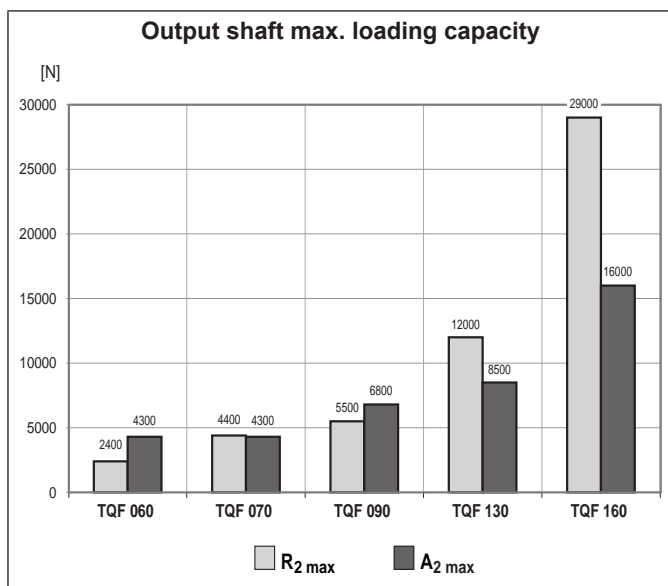
Their design and construction has been developed with the goal of offering a line of product, which features exceptional performance, highest level of stiffness, low backlash and compactness.

- TQF features two classes of precision, corresponding to the following values of torsional backlash
 1-stage units: standard $\varphi_S \leq 5'$ reduced $\varphi_R \leq 3'$
 2-stage units: standard $\varphi_S \leq 7'$ reduced $\varphi_R \leq 5'$
- A high IP rating (IP65) provides inner parts with protection against the ingress of dust and liquids.
- Input section oil seals made from a Fluoroelastomer compound are supplied as standard.
- Noise pressure level $60 \leq L_p \leq 70$ dB(A). Conditions: distance 1 m ; measured without load and an input speed of $n_1 = 3000 \text{ min}^{-1}$; $i = 10$.
- Numerous adapters allow matching the most popular brands of servomotors.
- Lubrication optimized for the type of duty specified when ordering.
 In the absence of contamination the lubricant requires no periodical changes.

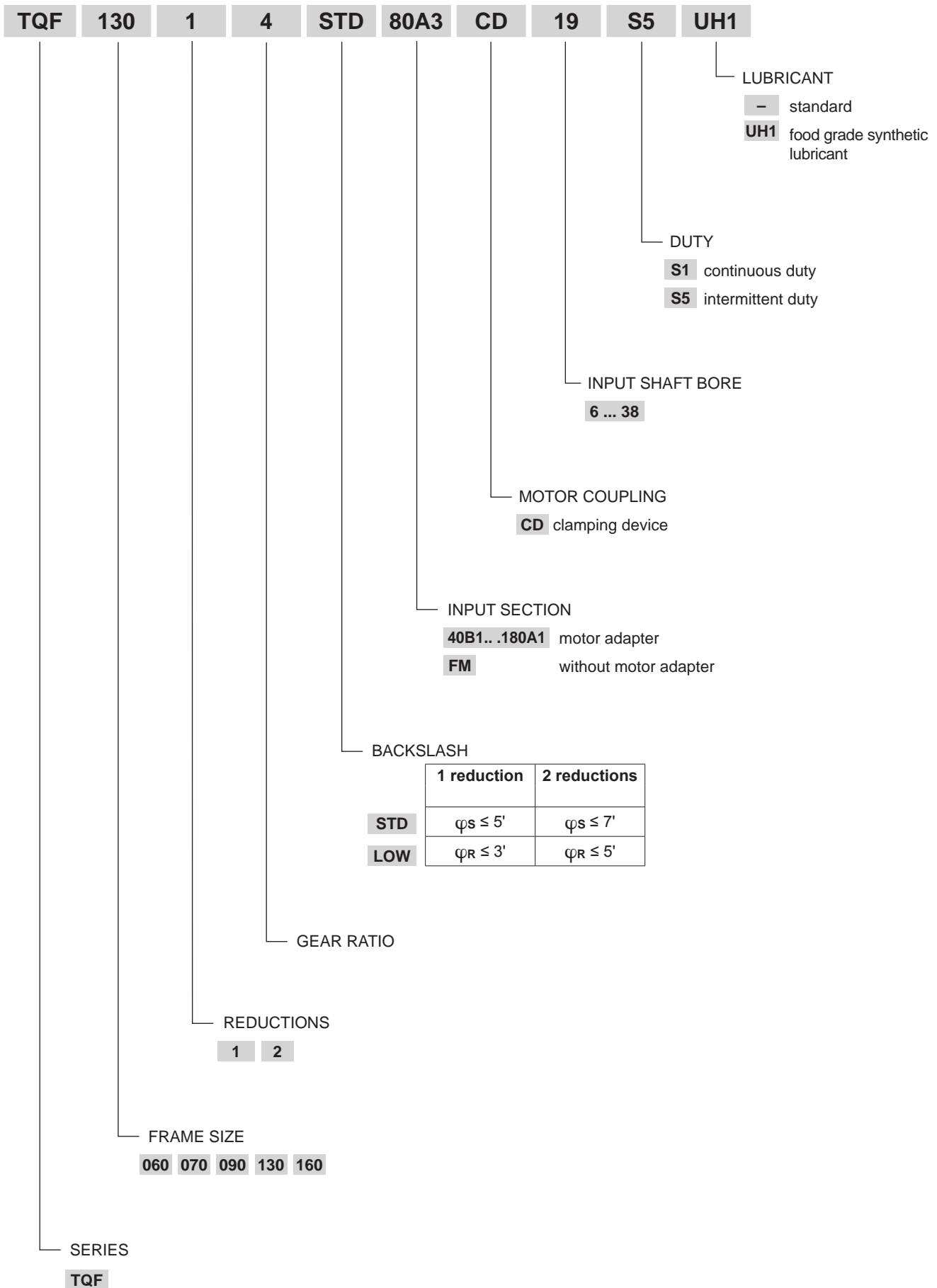
duty	TQF 060 ... TQF 160	output seals
S1 (continuous)	Synthetic oil viscosity ISO VG 220	Fluoroelastomer
S5 (intermittent)	NLGI grease consistency 00	NBR

- Ambient temperature min -20°C, max +30°C. For temperature higher than 30°C please consider derating factor f_T .
- Housing temperature must not exceed $T_{max} = 90^\circ\text{C}$.

		Distribution of nominal torque M_{n2} [Nm]												
	[i]	4	5	7	10	16	20	25	28	35	40	50	70	100
TQF 060		30	30	25	20	30	30	30	30	30	30	30	25	20
TQF 070		70	70	60	40	70	70	70	70	70	70	70	60	40
TQF 090		200	180	160	110	200	180	180	200	180	200	180	160	110
TQF 130		400	400	360	280	400	400	400	400	400	400	400	360	280
TQF 160		800	800	750	550	800	800	800	800	800	800	800	750	550



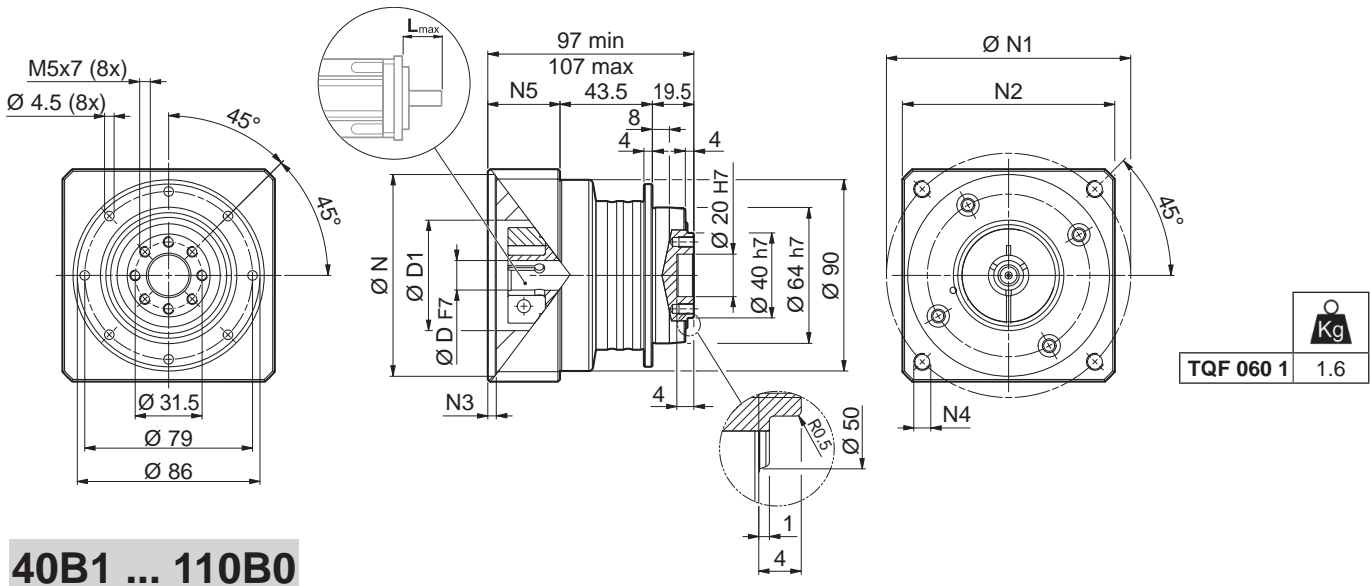
4.1 ORDERING CODE



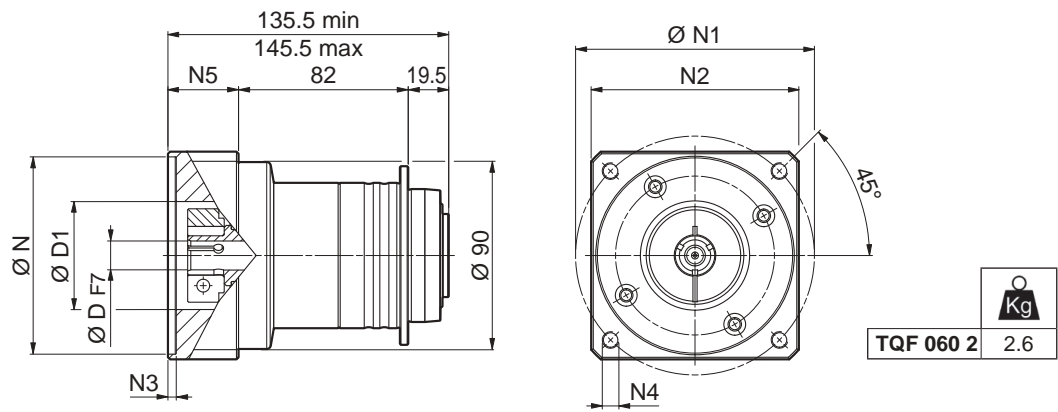
TQF


4.2 DIMENSIONS AND TECHNICAL SPECIFICATIONS

TQF 060



40B1 ... 110B0

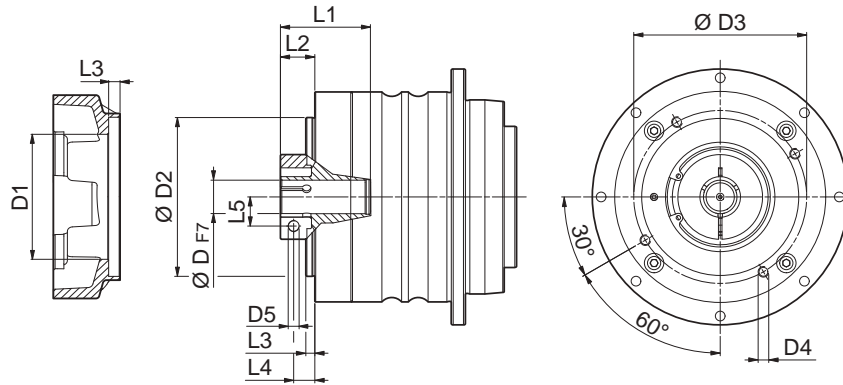


	D					N	N1	N2	N3	N4	N5	L _{max}
												
40B1	6	9	11	14	-	40	63	80	4	M4x12	34	40
50A1	6	9	11	14	-	50	60	80	4	M4x10	34	40
50C1	6	9	11	14	-	50	70	80	4	M4x10	34	40
60A2	6	9	11	14	19	60	75	80	4	M5x16	34	40
70B1	6	9	11	14	19	70	90	80	4	M5x16	34	40
80A1	6	9	11	14	19	80	100	90	4	M6x16	34	40
95A	6	9	11	14	19	95	115	100	6.5	M8x20	34	40
110B0	6	9	11	14	19	110	145	120	6.5	M8x20	44	40


Please contact us for different motor adapters and input shaft bore.



TQF 060

FM



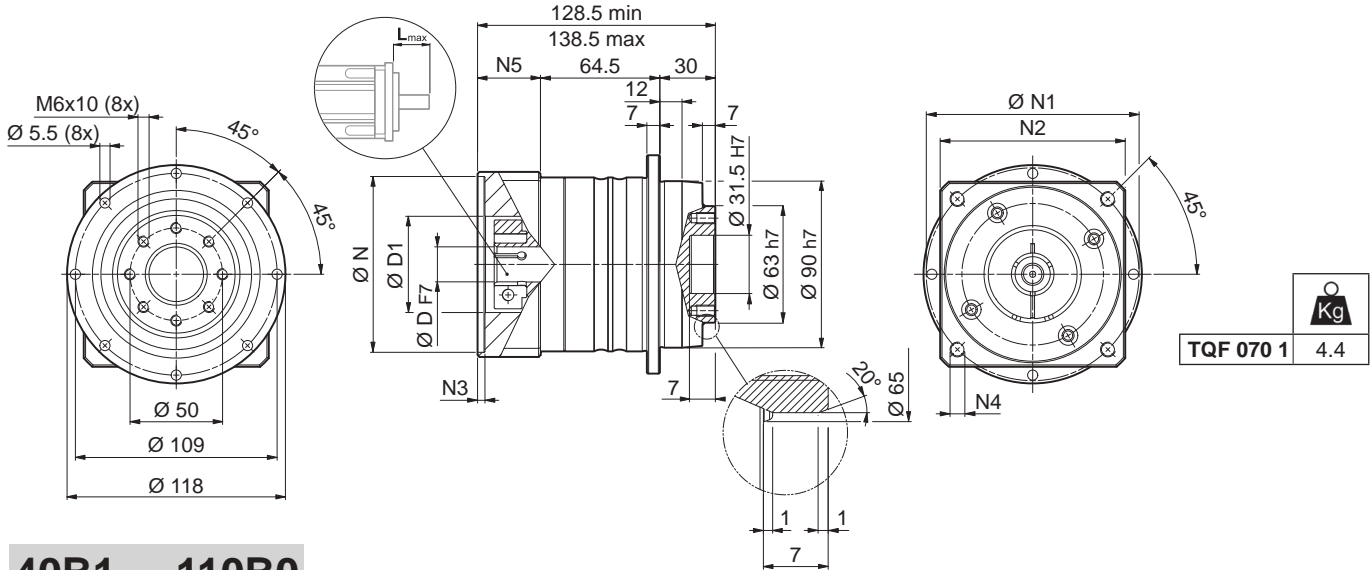
TQF

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	37	68	76.5	M6x12	M4	31.5	21	7.5	16	8
9	49	68	76.5	M6x12	M5	35	24.5	7.5	17	10.5
11	49	68	76.5	M6x12	M6	35	24.5	7.5	17	12.5
14	49	68	76.5	M6x12	M6	35	24.5	7.5	17	14.5
19	54	68	76.5	M6x12	M6	35	24.5	7.5	17	16.5

	i	M _{n2} [Nm]	M _{a2} [Nm]	M _{p2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S ≤ φ _R		C _t [$\frac{Nm}{arcmin}$]	R _{2 max} [N]	A _{2 max} [N]	η %	J _G [kgcm ²]		
														6 - 9	11 - 14
TQF 060 1_4		30	45	80	3500	6000	5'	3'	12	2400	4300	97	0.32	0.43	0.47
TQF 060 1_5		30	45	80	3500	6000	5'	3'	12	2400	4300	97	0.27	0.39	0.42
TQF 060 1_7		25	38	70	4000	6000	5'	3'	12	2400	4300	97	0.23	0.35	0.38
TQF 060 1_10		20	30	55	4000	6000	5'	3'	12	2400	4300	97	0.21	0.33	0.36
TQF 060 2_16		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.28	0.39	0.43
TQF 060 2_20		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.27	0.39	0.42
TQF 060 2_25		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.25	0.36	0.40
TQF 060 2_28		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.22	0.34	0.37
TQF 060 2_35		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.22	0.33	0.37
TQF 060 2_40		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.21	0.32	0.36
TQF 060 2_50		30	45	80	4500	6000	7'	5'	12	2400	4300	94	0.21	0.32	0.36
TQF 060 2_70		25	38	70	5000	6000	7'	5'	12	2400	4300	94	0.21	0.32	0.36
TQF 060 2_100		20	30	55	5000	6000	7'	5'	12	2400	4300	94	0.21	0.32	0.36

TQF 070

50C2 ... 130A



40B1 ... 110B0

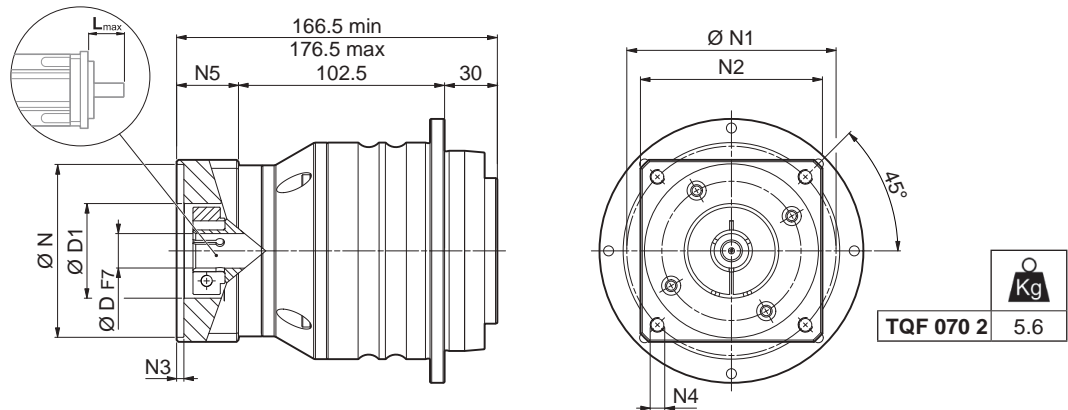
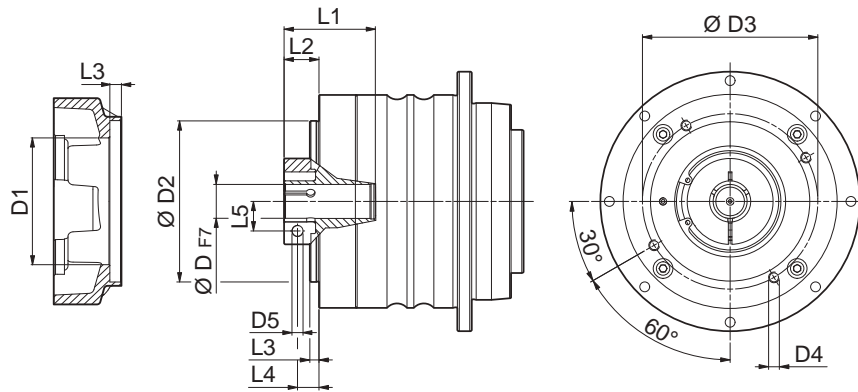


Image	D						N	N1	N2	N3	N4	N5	L _{max}
	6	9	11	14	19	24							
TQF 070 1													
50C2	6	9	11	14	-	-	50	70	80	4	M4x10	34	50
60A3	6	9	11	14	19	-	60	75	80	4	M5x16	34	50
70B2	6	9	11	14	19	-	70	90	80	4	M5x16	34	50
80A2	6	9	11	14	19	-	80	100	90	4	M6x16	34	50
95A1	6	9	11	14	19	24	95	115	100	6.5	M8x20	34	50
110A1	6	9	11	14	19	24	110	130	115	6.5	M8x20	34	50
110B1	6	9	11	14	19	24	110	145	120	6.5	M8x20	44	60
130A	6	9	11	14	19	24	130	165	140	6.5	M10x19	34	50
TQF 070 2													
40B1	6	9	11	14	-	-	40	63	80	4	M4x12	34	40
50A1	6	9	11	14	-	-	50	60	80	4	M4x10	34	40
50C1	6	9	11	14	-	-	50	70	80	4	M4x10	34	40
60A2	6	9	11	14	19	-	60	75	80	4	M5x16	34	40
70B1	6	9	11	14	19	-	70	90	80	4	M5x16	34	40
80A1	6	9	11	14	19	-	80	100	90	4	M6x16	34	40
95A	6	9	11	14	19	-	95	115	100	6.5	M8x20	34	40
110B0	6	9	11	14	19	-	110	145	120	6.5	M8x20	44	40


Please contact us for different motor adapters and input shaft bore.

TQF 070

FM



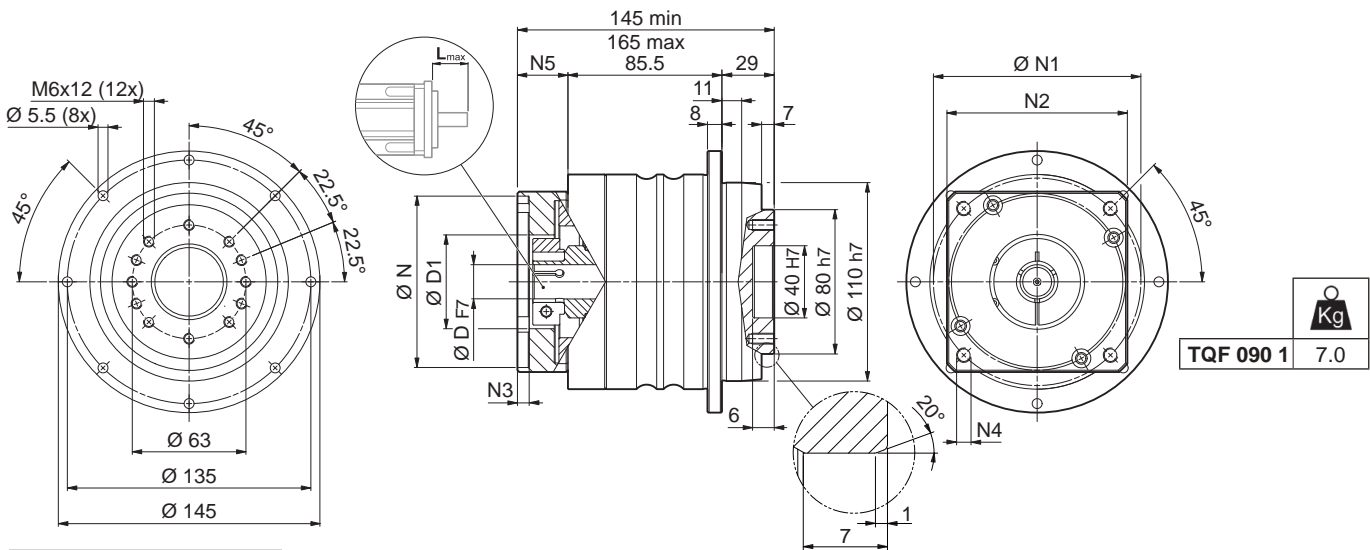
TQF

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQF 070 1										
6	37	68	76.5	M6x14	M4	45	25	9	19	8
9	49	68	76.5	M6x14	M5	42	25	9	18.5	10.5
11	51	68	76.5	M6x14	M6	42	25	9	17.5	12.5
14	51	68	76.5	M6x14	M6	42	25	9	17.5	14.5
19	51	68	76.5	M6x14	M6	42	25	9	17.5	16.5
24	60	68	76.5	M6x14	M6	43.5	26.5	9	17.5	19
TQF 070 2										
6	37	68	76.5	M6x12	M4	31.5	21	7.5	16	8
9	49	68	76.5	M6x12	M5	35	24.5	7.5	17	10.5
11	49	68	76.5	M6x12	M6	35	24.5	7.5	17	12.5
14	49	68	76.5	M6x12	M6	35	24.5	7.5	17	14.5
19	54	68	76.5	M6x12	M6	35	24.5	7.5	17	16.5

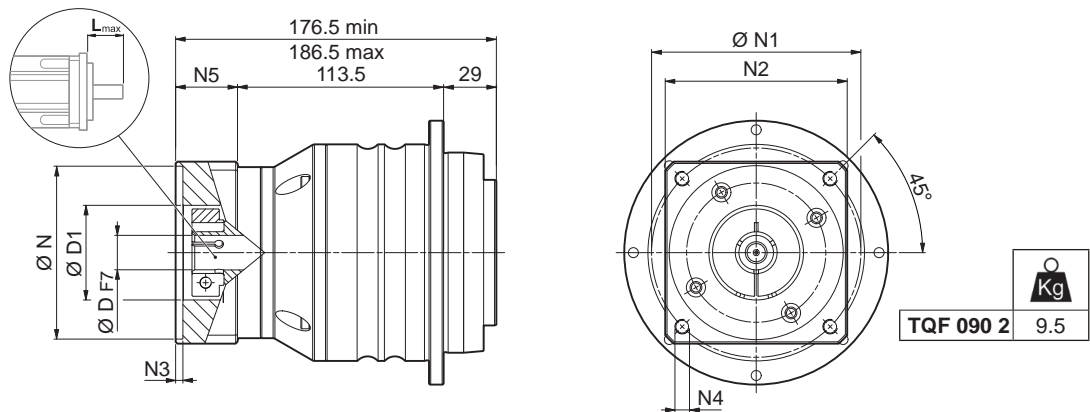
	M_{n2}	M_{a2}	M_{p2}	n_1	n_{1max}	φ_S	φ_R	C_t	R_{2max}	A_{2max}	η	J_G [kgcm ²]			
												D 	6 - 9	11 - 14	19
i	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	\leq	$\left[\frac{Nm}{arcmin} \right]$	[N]	[N]	%				
TQF 070 1_4	70	100	180	3000	6000	5'	3'	29	4400	4300	97	-	1.05	1.09	1.22
TQF 070 1_5	70	100	180	3000	6000	5'	3'	29	4400	4300	97	-	0.85	0.88	1.01
TQF 070 1_7	60	90	160	3500	6000	5'	3'	29	4400	4300	97	-	0.68	0.71	0.85
TQF 070 1_10	40	60	110	3500	6000	5'	3'	29	4400	4300	97	-	0.59	0.62	0.75
TQF 070 2_16	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.31	0.43	0.46	-
TQF 070 2_20	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.30	0.41	0.45	-
TQF 070 2_25	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.26	0.37	0.41	-
TQF 070 2_28	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.23	0.35	0.38	-
TQF 070 2_35	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.23	0.34	0.38	-
TQF 070 2_40	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.21	0.33	0.36	-
TQF 070 2_50	70	100	180	3500	6000	7'	5'	29	4400	4300	94	0.21	0.32	0.36	-
TQF 070 2_70	60	90	160	4000	6000	7'	5'	29	4400	4300	94	0.21	0.32	0.36	-
TQF 070 2_100	40	60	110	4500	6000	7'	5'	29	4400	4300	94	0.21	0.32	0.36	-

TQF 090

60A4 ... 180A



50C2 ... 130A

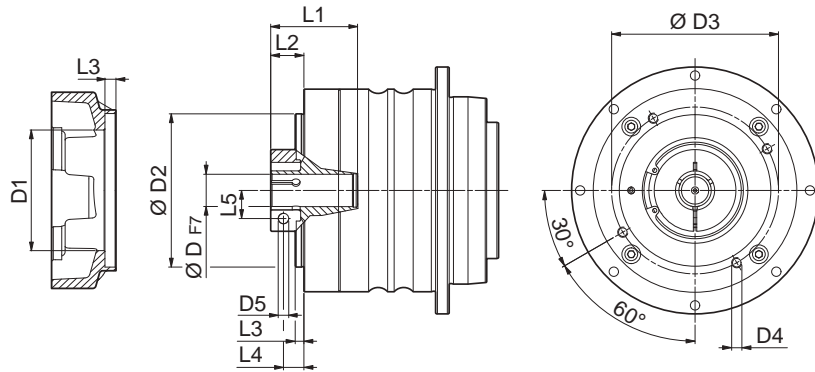


	D						N	N1	N2	N3	N4	N5	L _{max}
TQF 090 1													
60A4	11	14	19	-	-	-	60	75	100	6.5	M5x14	28	60
80A3	11	14	19	-	-	-	80	100	100	6.5	M6x16	28	60
95A2	11	14	19	24	28	-	95	115	100	6.5	M8x18	28	60
110A2	11	14	19	24	-	-	110	130	115	6.5	M8x18	28	60
110B1	11	14	19	24	-	-	110	145	120	6.5	M8x20	38	60
130A1	11	14	19	24	28	32	130	165	140	6.5	M10x25	38	60
180A	11	14	19	24	28	32	180	215	190	6.5	M14x28	48	80
TQF 090 2													
50C2	11	14	-	-	-	-	50	70	80	4	M4x10	34	50
60A3	11	14	19	-	-	-	60	75	80	4	M5x16	34	50
70B2	11	14	19	-	-	-	70	90	80	4	M5x16	34	50
80A2	11	14	19	-	-	-	80	100	90	4	M6x16	34	50
95A1	11	14	19	24	-	-	95	115	100	6.5	M8x20	34	50
110A1	11	14	19	24	-	-	110	130	115	6.5	M8x20	34	50
110B1	11	14	19	24	-	-	110	145	120	6.5	M8x20	44	60
130A	11	14	19	24	-	-	130	165	140	6.5	M10x19	34	50


Please contact us for different motor adapters and input shaft bore.


TQF 090

FM



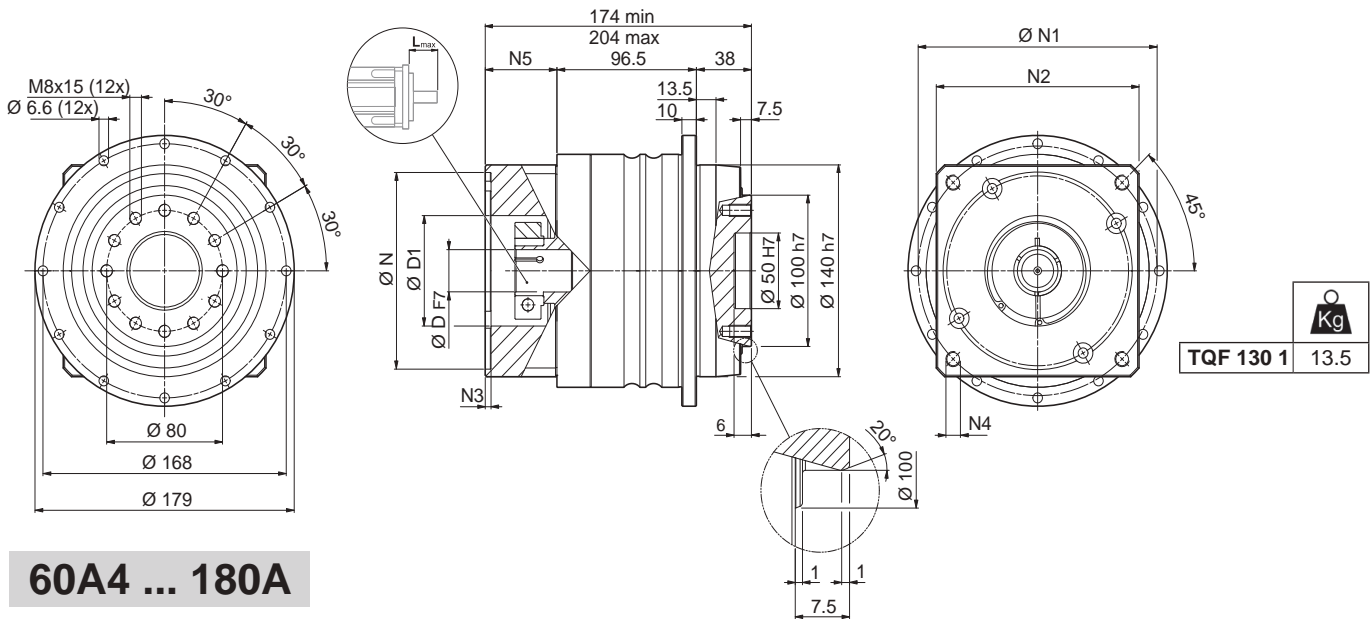
TQF

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQF 090 1										
11	49	90	98	M6x12	M6	50	17	4	9.5	12.5
14	51	90	98	M6x12	M6	50	17	4	9.5	14.5
19	51	90	98	M6x12	M6	50	17	4	9.5	16.5
24	60	90	98	M6x12	M6	51.5	18.5	4	9.5	19
28	72	90	98	M6x12	M8	51.5	18.5	4	9.5	22.5
32	72	90	98	M6x12	M8	51.5	21	5	12	24.5
TQF 090 2										
6	37	68	76.5	M6x14	M4	45	25	9	19	8
9	49	68	76.5	M6x14	M5	42	25	9	18.5	10.5
11	51	68	76.5	M6x14	M6	42	25	9	17.5	12.5
14	51	68	76.5	M6x14	M6	42	25	9	17.5	14.5
19	51	68	76.5	M6x14	M6	42	25	9	17.5	16.5
24	60	68	76.5	M6x14	M6	43.5	26.5	9	17.5	19

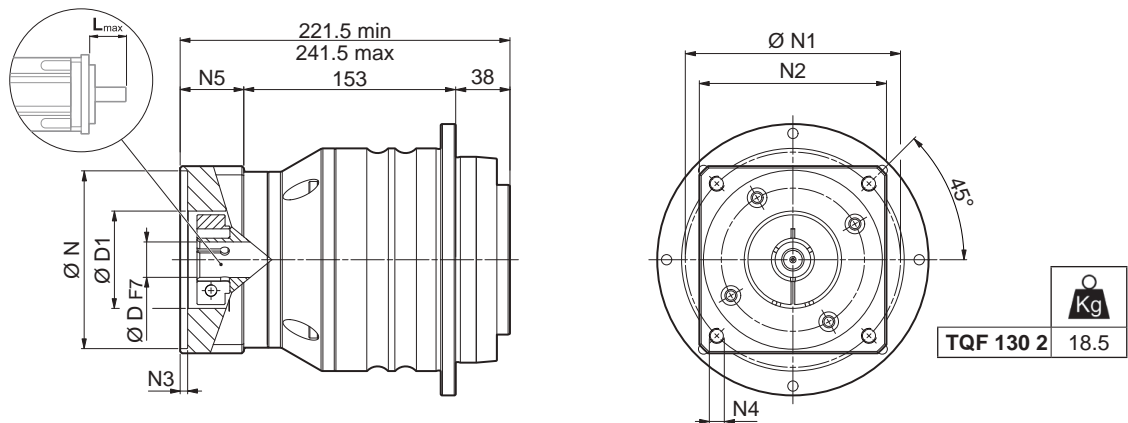
	M_{n2}	M_{a2}	M_{p2}	n_1	$n_{1\max}$	φ_S	φ_R	C_t	$R_{2\max}$	$A_{2\max}$	η	J_G [kgm ²]				
												i	[Nm]	[Nm]	[Nm]	[min ⁻¹]
TQF 090 1_4	200	300	500	2500	4500	5'	3'	70	5500	6800	97	-	2,00	2.12	2.51	4,30
TQF 090 1_5	180	280	500	2500	4500	5'	3'	70	5500	6800	97	-	1.63	1.76	2.14	3.94
TQF 090 1_7	160	250	500	3000	4500	5'	3'	70	5500	6800	97	-	1.31	1.44	1.82	3.62
TQF 090 1_10	110	170	350	3000	4500	5'	3'	70	5500	6800	97	-	1.14	1.27	1.65	3.45
TQF 090 2_16	200	300	500	3000	4500	7'	5'	70	5500	6800	94	0.75	0.85	0.98	-	-
TQF 090 2_20	180	280	500	3000	4500	7'	5'	70	5500	6800	94	0.72	0.82	0.96	-	-
TQF 090 2_25	180	280	500	3000	4500	7'	5'	70	5500	6800	94	0.62	0.72	0.85	-	-
TQF 090 2_28	200	300	500	3000	4500	7'	5'	70	5500	6800	94	0.54	0.64	0.77	-	-
TQF 090 2_35	180	280	500	3000	4500	7'	5'	70	5500	6800	94	0.53	0.63	0.76	-	-
TQF 090 2_40	200	300	500	3000	4500	7'	5'	70	5500	6800	94	0.49	0.59	0.72	-	-
TQF 090 2_50	180	280	500	3500	4500	7'	5'	70	5500	6800	94	0.48	0.58	0.72	-	-
TQF 090 2_70	160	250	500	4000	4500	7'	5'	70	5500	6800	94	0.48	0.58	0.71	-	-
TQF 090 2_100	110	170	350	4000	4500	7'	5'	70	5500	6800	94	0.48	0.58	0.71	-	-

TQF 130

80A3 ... 180A1



60A4 ... 180A

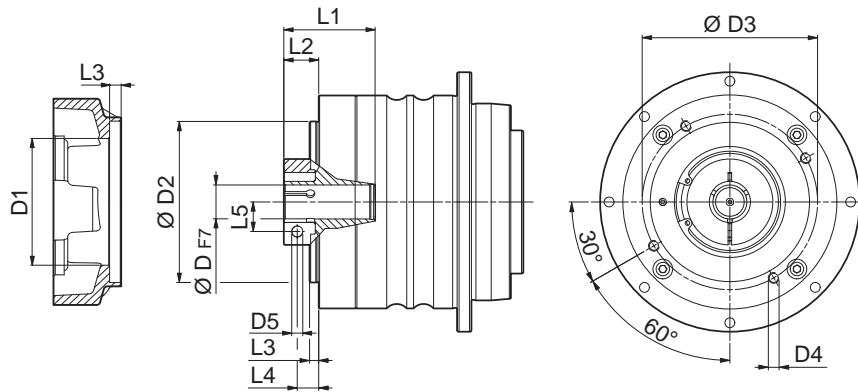


	D						N	N1	N2	N3	N4	N5	L _{max}
TQF 130 1													
80A3	14	19	-	-	-	-	80	100	130	4	M6x15	39.5	60
95A2	14	19	24	28	-	-	95	115	130	6.5	M8x20	39.5	60
110A2	14	19	24	-	-	-	110	130	130	4	M8x20	39.5	60
110B1	14	19	24	-	-	-	110	145	130	6.5	M8x20	49.5	60
130A1	14	19	24	28	32	-	130	165	140	4	M10x20	39	60
180A	14	19	24	28	32	-	180	215	190	5.5	M14x25	49.5	60
180A1	14	19	24	28	32	38	180	215	190	5.5	M14x25	69.5	80
TQF 130 2													
60A4	14	19	-	-	-	-	60	75	100	6.5	M5x14	28	60
80A3	14	19	-	-	-	-	80	100	100	6.5	M6x16	28	60
95A2	14	19	24	28	-	-	95	115	100	6.5	M8x18	28	60
110A2	14	19	24	-	-	-	110	130	115	6.5	M8x18	28	60
110B1	14	19	24	28	-	-	110	145	120	6.5	M8x20	38	60
130A1	14	19	24	28	32	-	130	165	140	6.5	M10x25	38	60
180A	14	19	24	28	32	-	180	215	190	6.5	M14x28	48	80

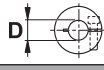
Please contact us for different motor adapters and input shaft bore.

TQF 130

FM



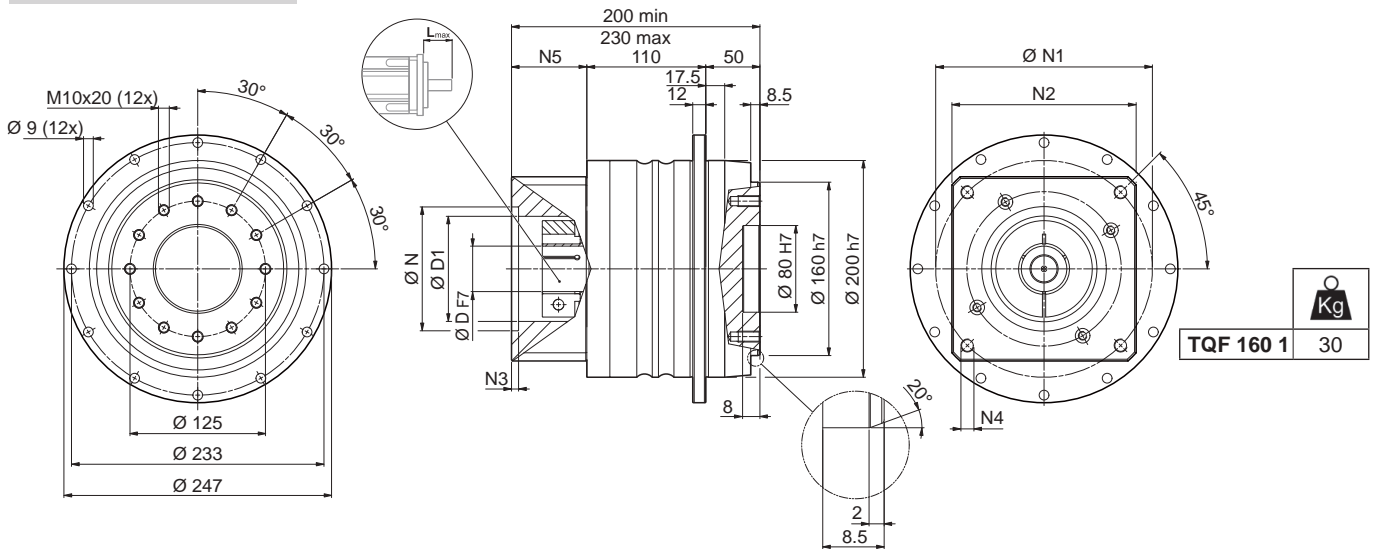
TQF

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQF 130 1										
14	51	113	125.5	M8x16	M6	50	27.5	5	23	14.5
19	54	113	125.5	M8x16	M6	50	27.5	5	20	16.5
24	70	113	125.5	M8x16	M6	51.5	29	5	20	19
28	70	113	125.5	M8x16	M8	51.5	29	5	20	22.5
32	72	113	125.5	M8x16	M8	51.5	29	5	20	24.5
38	100	113	125.5	M8x16	M8	54	31.5	5	20	28
TQF 130 2										
11	49	90	98	M6x12	M6	50	17	4	9.5	12.5
14	51	90	98	M6x12	M6	50	17	4	9.5	14.5
19	51	90	98	M6x12	M6	50	17	4	9.5	16.5
24	60	90	98	M6x12	M6	51.5	18.5	4	9.5	19
28	72	90	98	M6x12	M8	51.5	18.5	4	9.5	22.5
32	72	90	98	M6x12	M8	51.5	21	5	12	24.5

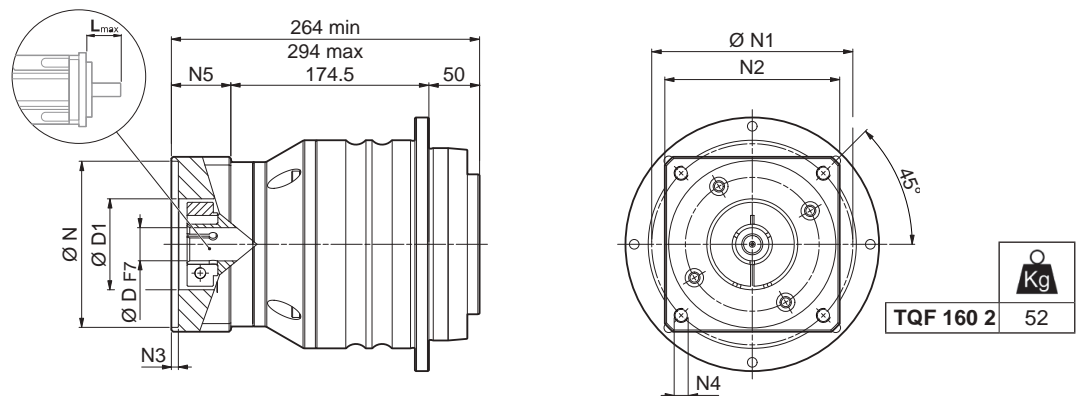
	M_{n2}	M_{a2}	M_{p2}	n_1	$n_{1\max}$	$\varphi_s \leq \varphi_R$		C_t	$R_{2\max}$	$A_{2\max}$	η	J_G [kgcm ²]			
						[Nm]	[Nm]					[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]
TQF 130 1_4	400	600	1000	2100	4000	5'	3'	180	12000	8500	97	-	8.14	8.61	9.25
TQF 130 1_5	400	600	1000	2500	4000	5'	3'	180	12000	8500	97	-	6.13	6.59	7.24
TQF 130 1_7	360	550	950	2500	4000	5'	3'	180	12000	8500	97	-	4.40	4.86	5.50
TQF 130 1_10	280	420	900	2500	4000	5'	3'	180	12000	8500	97	-	3.43	3.89	4.53
TQF 130 2_16	400	600	1000	2800	4000	7'	5'	180	12000	8500	94	1.89	2.05	3.71	-
TQF 130 2_20	400	600	1000	2800	4000	7'	5'	180	12000	8500	94	1.77	1.92	3.58	-
TQF 130 2_25	400	600	1000	2800	4000	7'	5'	180	12000	8500	94	1.47	1.63	3.29	-
TQF 130 2_28	400	600	1000	2800	4000	7'	5'	180	12000	8500	94	1.26	1.41	3.07	-
TQF 130 2_35	400	600	1000	2800	4000	7'	5'	180	12000	8500	94	1.22	1.37	3.03	-
TQF 130 2_40	400	600	1000	3200	4000	7'	5'	180	12000	8500	94	1.10	1.25	2.91	-
TQF 130 2_50	400	600	1000	3200	4000	7'	5'	180	12000	8500	94	1.08	1.23	2.89	-
TQF 130 2_70	360	550	950	3500	4000	7'	5'	180	12000	8500	94	1.06	1.22	2.88	-
TQF 130 2_100	280	420	900	4000	4000	7'	5'	180	12000	8500	94	1.05	1.21	2.87	-

TQF 160

95A2 ... 180A1



80A3 ... 180A1

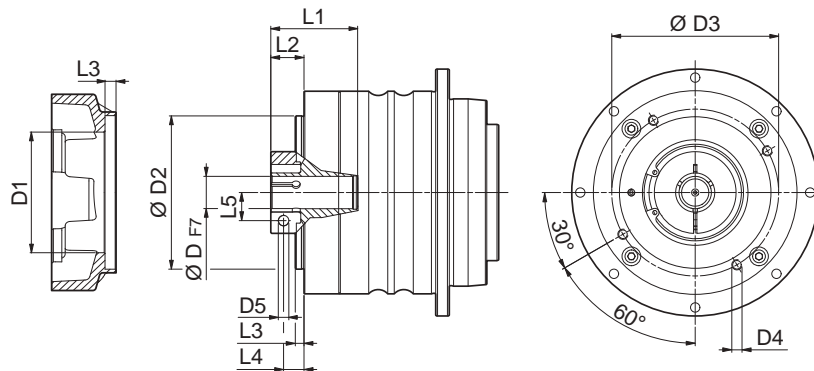


	D					N	N1	N2	N3	N4	N5	L _{max}
TQF 160 1												
95A2	19	24	28	-	-	95	115	140	6.5	M8x20	39.5	60
110A2	19	24	-	-	-	110	130	140	5	M8x20	39.5	60
130A1	19	24	28	32	-	130	165	140	5	M10x20	39.5	60
180A	-	24	28	32	-	180	215	190	6.5	M14x25	49.5	60
180A1	19	24	28	32	38	180	215	190	6.5	M14x25	69.5	80
TQF 160 2												
80A3	19	-	-	-	-	80	100	130	4	M6x15	39.5	60
95A2	19	24	28	-	-	95	115	130	6.5	M8x20	39.5	60
110A2	19	24	-	-	-	110	130	130	4	M8x20	39.5	60
110B1	19	24	28	-	-	110	145	130	6.5	M8x20	49.5	60
130A1	19	24	28	32	-	130	165	140	4	M10x20	39	60
180A	19	24	28	32	-	180	215	190	5.5	M14x25	49.5	60
180A1	19	24	28	32	38	180	215	190	5.5	M14x25	69.5	80


Please contact us for different motor adapters and input shaft bore.

TQF 160

FM



TQF

	D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
TQF 160 1										
19	54	130	142.5	M8x16	M6	47	35.1	8	26	16.5
24	58	130	142.5	M8x16	M6	47	35.1	8	26	19
28	70	130	142.5	M8x16	M8	47	35.1	8	26	22.5
32	72	130	142.5	M8x16	M8	47	35.1	8	26	24.5
38	100	130	142.5	M8x16	M8	59.5	37.6	8	26	28
TQF 160 2										
14	51	113	125.5	M8x16	M6	50	27.5	5	23	14.5
19	54	113	125.5	M8x16	M6	50	27.5	5	20	16.5
24	70	113	125.5	M8x16	M6	51.5	29	5	20	19
28	70	113	125.5	M8x16	M8	51.5	29	5	20	22.5
32	72	113	125.5	M8x16	M8	51.5	29	5	20	24.5
38	100	113	125.5	M8x16	M8	54	31.5	5	20	28

	M_{n2} [Nm]	M_{a2} [Nm]	M_{p2} [Nm]	n_1 [min ⁻¹]	$n_{1\ max}$ [min ⁻¹]	φ_S [arcmin]	φ_R [arcmin]	C_t [$\frac{Nm}{arcmin}$]	$R_{2\ max}$ [N]	$A_{2\ max}$ [N]	η %	J_G [kgcm ²]		
													19	24 - 28
TQF 160 1_4	800	1200	2000	1500	3500	5'	3'	500	29000	16000	97	-	27,10	27.51
TQF 160 1_5	800	1200	2000	1800	3500	5'	3'	500	29000	16000	97	-	18.22	18.63
TQF 160 1_7	750	1150	2000	2500	3500	5'	3'	500	29000	16000	97	-	13.46	13.87
TQF 160 1_10	550	850	1600	2500	3500	5'	3'	500	29000	16000	97	-	10.03	10.44
TQF 160 2_16	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	7.22	7.75	8.47
TQF 160 2_20	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	6.67	7,20	7.92
TQF 160 2_25	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	5.13	5.66	6.38
TQF 160 2_28	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	4,00	4.53	5.25
TQF 160 2_35	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	3.82	4.34	5.07
TQF 160 2_40	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	3.16	3.69	4.41
TQF 160 2_50	800	1200	2000	2800	3500	7'	5'	500	29000	16000	94	3.07	3,60	4.32
TQF 160 2_70	750	1150	2000	3000	3500	7'	5'	500	29000	16000	94	3.02	3.55	4.27
TQF 160 2_100	550	850	1600	3000	3500	7'	5'	500	29000	16000	94	2.99	3.52	4.24



Effective Line



TQFE Series

The TQFE series combines exceptional compactness with a standardized flange interface, ensuring a quick and easy mounting suitable for a wide variety of applications. With TQFE it is possible to have high levels of performance and precision at an optimum value-price ratio.

Main benefits

- High torsional stiffness
- High compactness
- Easy and quick installation
- Standardized flange for great compatibility

Main features

- Nominal output torque (Nm)
 - 18 - 155
- Torsional backlash (arcmin)
 - 5 - 12
- Torsional stiffness (Nm/arcmin)
 - 6 - 60
- Max tilting moment (Nm)
 - 12 - 110

Main options

- Input versions
 - MOTOR ADAPTER
 - SOLID INPUT SHAFT
 - WITHOUT MOTOR ADAPTER
- Lubrication
 - STANDARD LUBRICATION
 - UH1 FOOD GRADE LUBRICATION

Protection class

- IP54

Frame sizes

- 060
- 070
- 090

TQFE

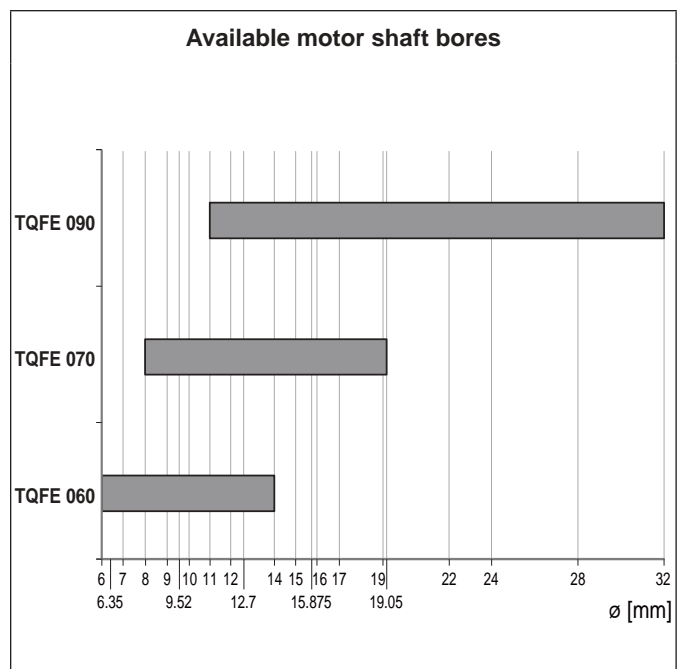
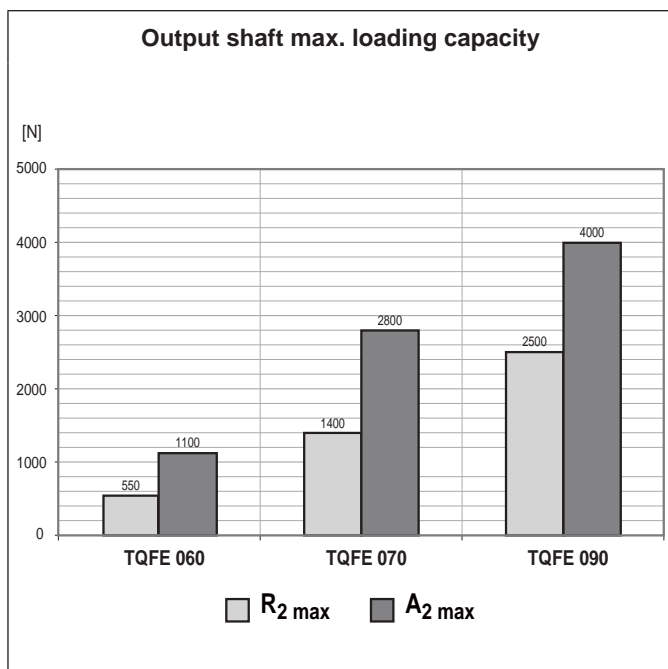
7 FEATURES OF TQFE SERIES

The TQFE Series represents the answer for applications requiring compact, space-saving solutions. Its standardized flange ensures great compatibility while its proportioned design allows quiet running and provides a long service life without maintenance requirements. Motor mounting is an operation that can be easily conducted without the need of any particular tooling, other than that usually available in a normally equipped workshop.

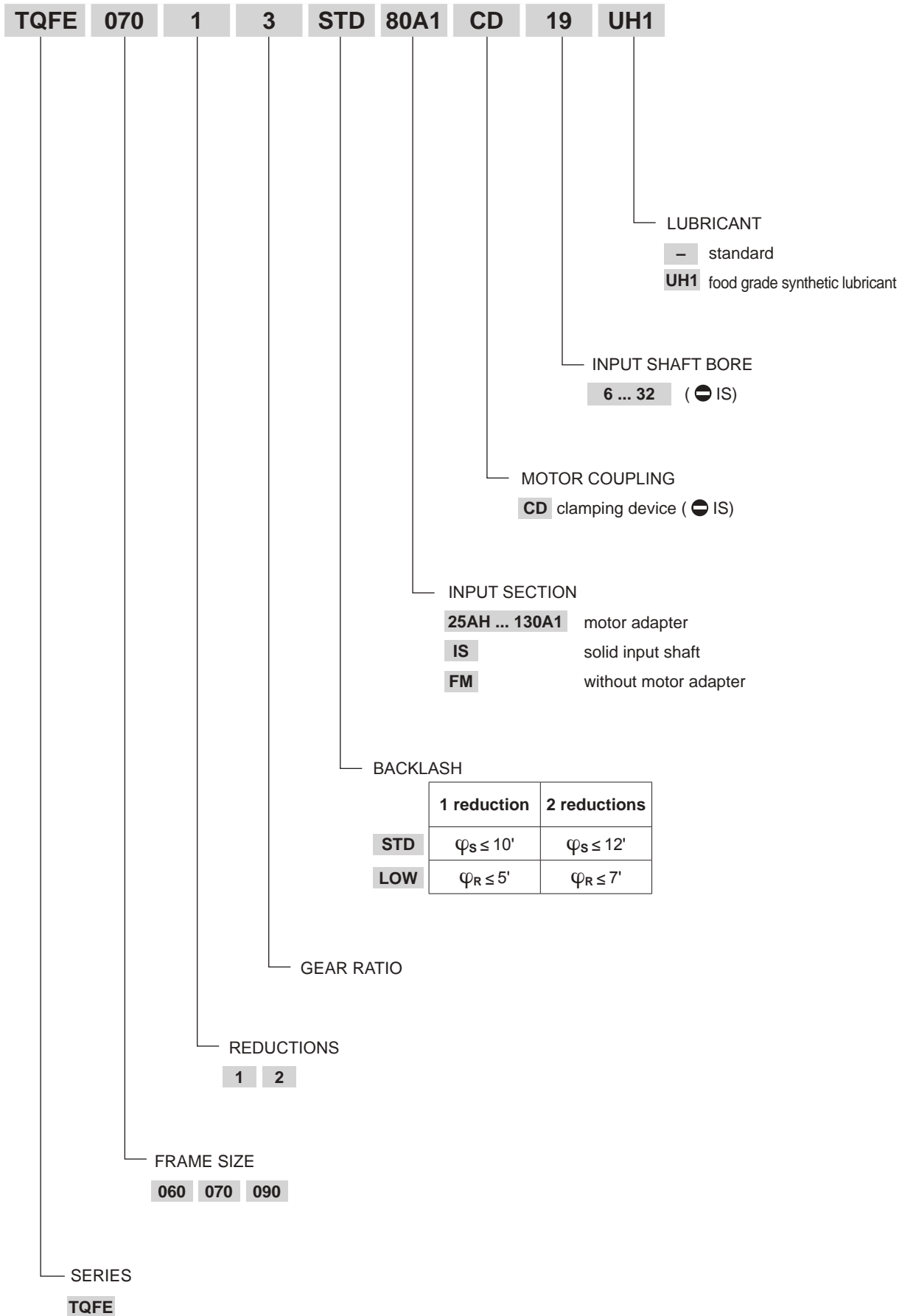
- Available with either standard (STD) or reduced (LOW) backlash:
 1-stage units: standard $\varphi_S \leq 10'$; reduced $\varphi_R \leq 5'$
 2-stage units: standard $\varphi_S \leq 12'$; reduced $\varphi_R \leq 7'$
- Its degree of protection IP54 provides protection against dust and liquid splashes.
- Input section oil seals made from a Fluoroelastomer compound are supplied as standard.
- Noise pressure level $LP \leq 70$ dB(A). Conditions: distance 1 m; measured without load an input speed of $n_1 = 3000$ min⁻¹; $i=10$.
- Units are factory packed with synthetic grease to NLGI consistency class 00, in the absence of contamination the lubricant requires no periodical changes.
- Ambient temperature min -20°C, max +30°C. For temperature higher than 30°C please consider derating factor f_T .
- Housing temperature must not exceed $T_{max} = 90^\circ\text{C}$.

		Distribution of nominal torque M_{n2} [Nm]																	
	[i]	3	4	5	7	9	10	12	15	16	20	25	28	30	35	40	50	70	100
TQFE 060		29	30	25	25	29	18	29	29	30	30	30	30	29	30	30	30	30	18
TQFE 070		65	60	50	50	65	40	65	65	60	60	50	50	65	50	60	50	50	40
TQFE 090		155	155	125	125	155	100	155	155	155	155	125	125	155	125	155	125	125	100

TQFE



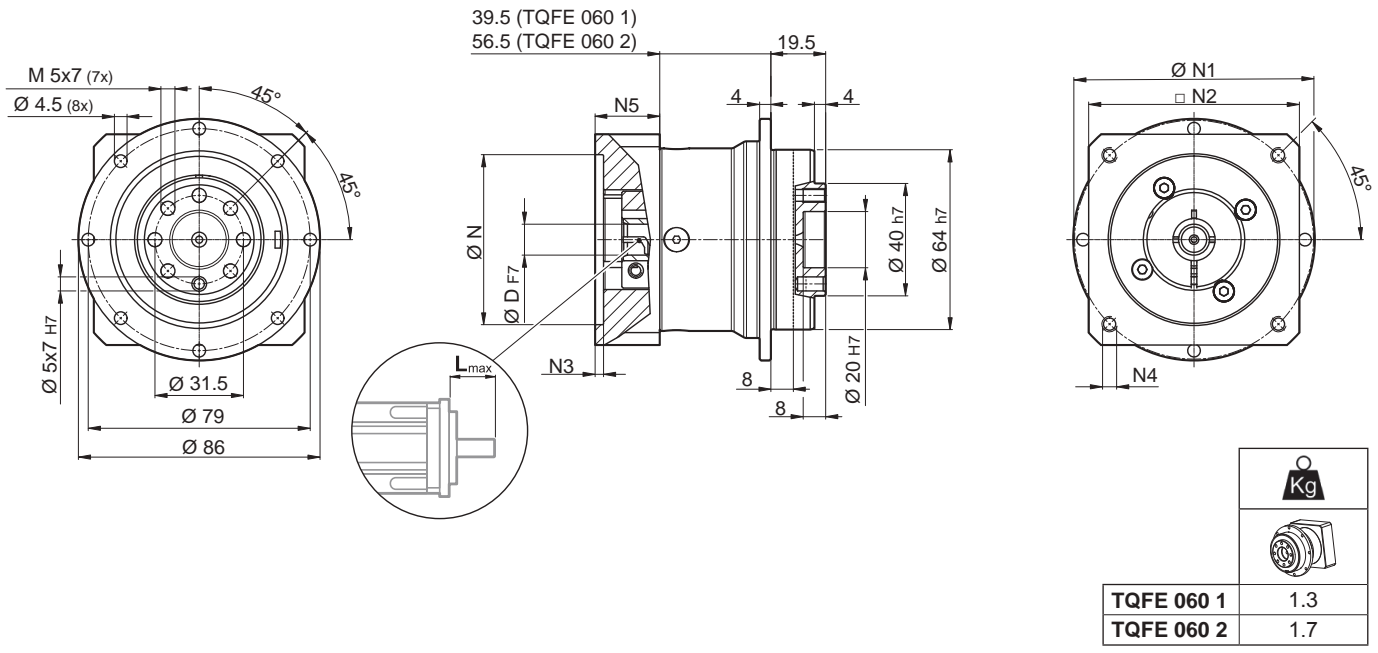
7.1 ORDERING CODE



TQFE

7.2 DIMENSIONS AND TECHNICAL SPECIFICATIONS

TQFE 060

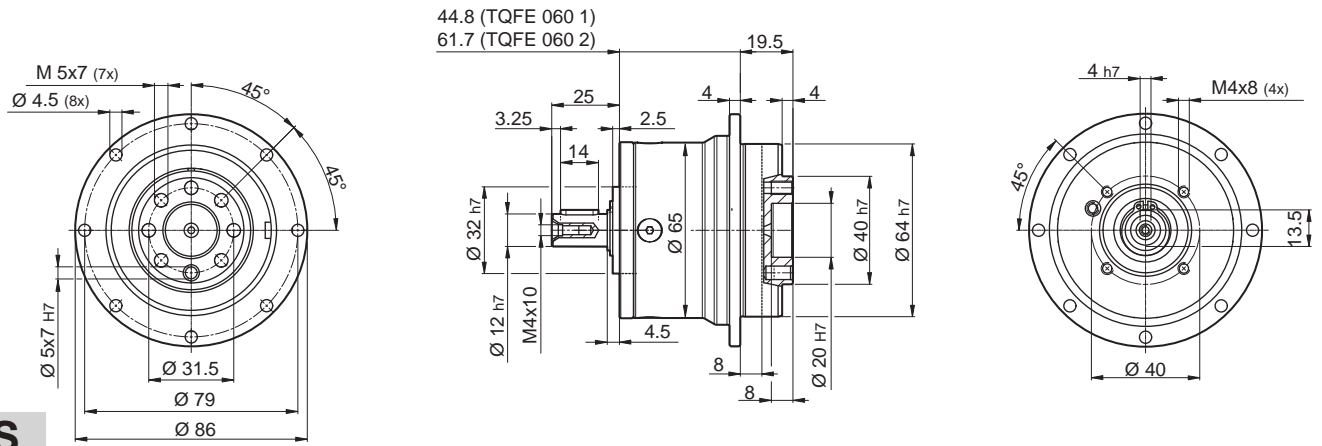


TQFE

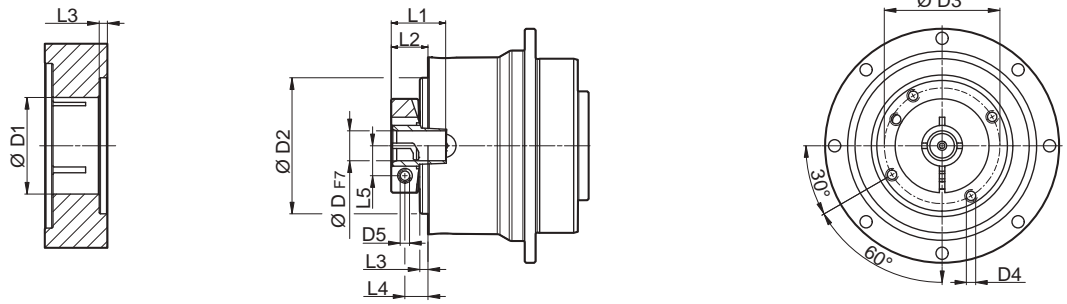
Motor Model	D											N	N1		N2	N3	N4	N5	L _{max}	
		6	6.35	7	8	9	9.52	-	-	-	-		-	min						max
25AH		6	6.35	7	8	9	9.52	-	-	-	-	-	25	39	56					
26AH		6	6.35	7	8	9	9.52	-	-	-	-	-	26	39	56					
28AH		6	6.35	7	8	9	9.52	-	-	-	-	-	28	39	56					
30AH		6	6.35	7	8	9	9.52	-	-	-	-	-	30	39	56					
32AH		6	6.35	7	8	9	9.52	-	-	-	-	-	32	39	56	65	3.5	4.5	25	25
34AH		6	6.35	7	8	9	9.52	-	-	-	-	-	34	40	56					
36AH		6	6.35	7	8	9	9.52	-	-	-	-	-	36	42	56					
39AH		6	6.35	7	8	9	9.52	-	-	-	-	-	39	45	56					
40AH		6	6.35	7	8	9	9.52	-	-	-	-	-	40	46	56					
38B		6	6.35	7	8	9	9.52	10	11	12	12.7	-	38.1	66.6	60	3	M4x10	18	25	
40B		6	6.35	7	8	9	9.52	10	11	12	12.7	-	40	63	60	3	M4x10	18	25	
50A		6	6.35	7	8	9	9.52	10	11	12	12.7	-	50	60	60	3	M4x10	18	25	
50B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65	60	3	M5x12	23	30	
50BH		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65	65	3	5.5	25	32	
50C		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	70	60	3	M4x10	23	30	
55MH		6	6.35	7	8	9	9.52	10	11	12	12.7	-	55	80	65	2	5.5	16	23	
60A		6	6.35	7	8	9	9.52	10	11	12	12.7	-	60	75	65	3	M5x12	18	25	
60AH		6	6.35	7	8	9	9.52	10	11	12	12.7	-	60	75	65	3	5.5	18	25	
60A1		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	75	65	3	M5x12	23	30	
60AH1		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	75	65	3	5.5	23	30	
60B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	85	75	3	M5x12	23	30	
60C		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	90	75	3	M5x12	23	30	
70A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	85	75	3	M6x15	23	30	
70B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	90	75	3	M5x12	23	30	
73A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	73	98.4	85	3	M5x12	25	32	
80A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	80	100	85	3	M6x15	23	30	

Please contact us for different motor adapters and input shaft bore.

TQFE 060



IS



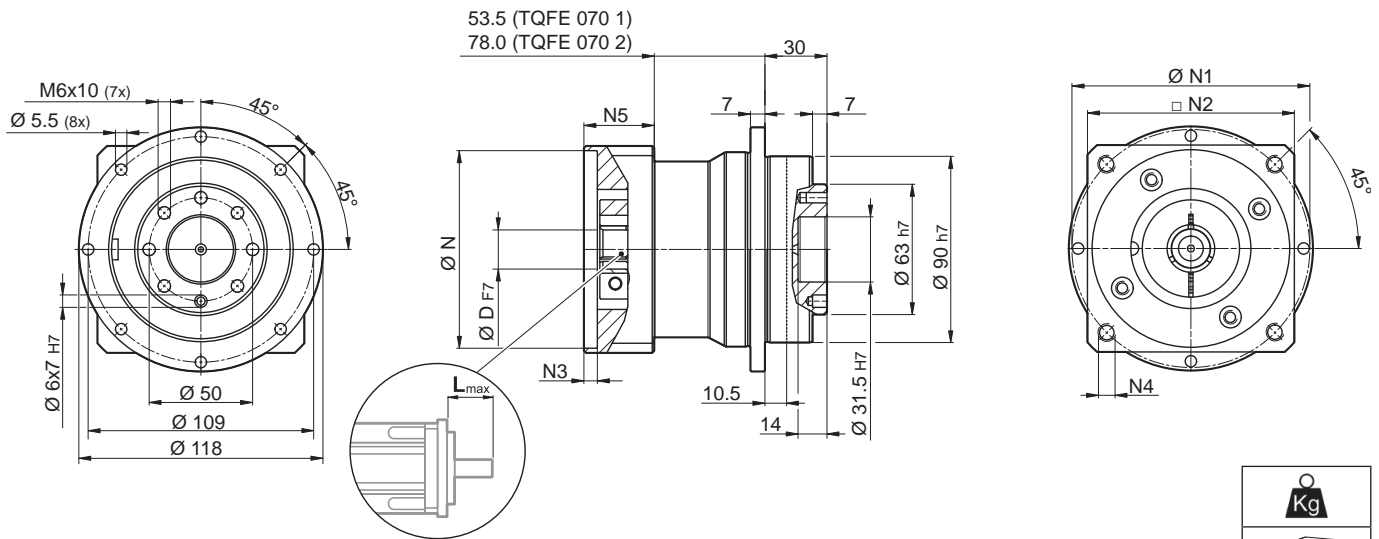
FM

TQFE

D	D			D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
	6	8	11										
6	6.35	7		32.5	50	42.5	M4x8	M4	21.7	13.2	3	8.2	8
8	9	9.52	10	32.5	50	42.5	M4x8	M4	21.7	13.2	3	8.2	9
11	12	12.7		35.5	50	42.5	M4x8	M4	22	13.5	3	8.5	11
14				35.5	50	42.5	M4x8	M4	25	17	3	10.2	11.5

i	M _{n2} [Nm]	M _{a2} [Nm]	M _{p2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S [arcmin]	φ _R [arcmin]	C _t [Nm/arcmin]	R _{1 max} [N]	R _{2 max} [N]	A _{2 max} [N]	η %	J _G [kgcm ²]	
													6 ... 10	11 ... 14
TQFE 060 1_3	29	55	60	3300	4000	10'	5'	6.5	200	550	1100	97	0.21	0.25
TQFE 060 1_4	30	45	70	3500	5000	10'	5'	6.5	200	550	1100	97	0.18	0.20
TQFE 060 1_5	25	40	70	3500	5000	10'	5'	6.5	200	550	1100	97	0.16	0.18
TQFE 060 1_7	25	40	70	4000	5000	10'	5'	6.5	200	550	1100	97	0.13	0.14
TQFE 060 1_10	18	30	60	4000	6000	10'	5'	6.5	200	550	1100	97	0.12	0.12
TQFE 060 2_9	29	55	60	3300	4000	12'	7'	6	200	550	1100	94	0.18	0.21
TQFE 060 2_12	29	55	70	3300	4000	12'	7'	6	200	550	1100	94	0.17	0.21
TQFE 060 2_15	29	55	70	3300	4000	12'	7'	6	200	550	1100	94	0.17	0.20
TQFE 060 2_16	30	45	70	3500	5000	12'	7'	6	200	550	1100	94	0.13	0.15
TQFE 060 2_20	30	45	70	3500	5000	12'	7'	6	200	550	1100	94	0.13	0.14
TQFE 060 2_25	30	45	70	3500	5000	12'	7'	6	200	550	1100	94	0.12	0.14
TQFE 060 2_28	30	45	70	4000	6000	12'	7'	6	200	550	1100	94	0.11	0.13
TQFE 060 2_30	29	55	60	4000	6000	12'	7'	6	200	550	1100	94	0.10	0.12
TQFE 060 2_35	30	45	70	4000	6000	12'	7'	6	200	550	1100	94	0.08	0.11
TQFE 060 2_40	30	45	70	4000	6000	12'	7'	6	200	550	1100	94	0.08	0.09
TQFE 060 2_50	30	45	70	4000	6000	12'	7'	6	200	550	1100	94	0.07	0.09
TQFE 060 2_70	30	45	70	4000	6000	12'	7'	6	200	550	1100	94	0.06	0.09
TQFE 060 2_100	18	30	60	4000	6000	12'	7'	6	200	550	1100	94	0.06	0.09

TQFE 070



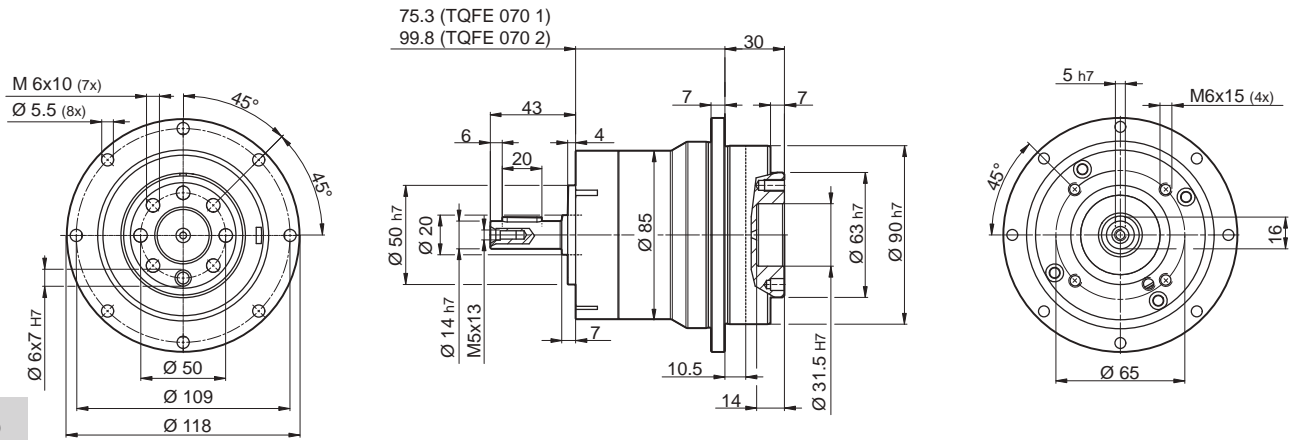
TQFE 070 1	3.7
TQFE 070 2	4.6

TQFE

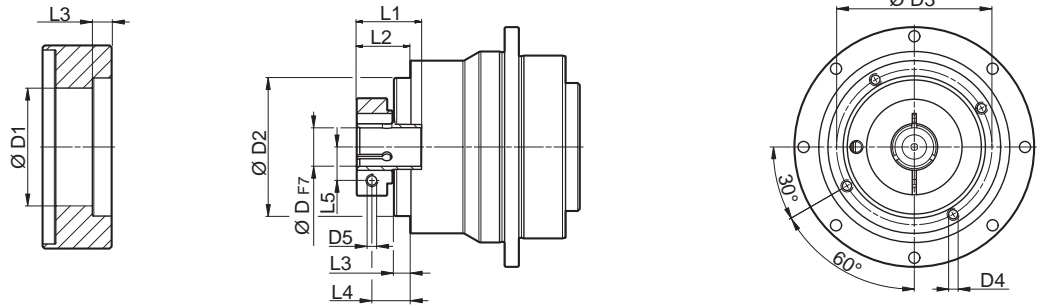
												N	N1	N2	N3	N4	N5	L _{max}	
40B1	8	9	9.52	11	12	12.7	14	-	-	-	-	-	40	63	80	4	M4x12	34	40
45A	8	9	9.52	11	12	12.7	-	-	-	-	-	-	45	63	80	4	M4x12	34	40
50B1	8	9	9.52	11	12	12.7	14	-	-	-	-	-	50	65	80	4	M5x16	34	40
50BH1	8	9	9.52	11	12	12.7	14	-	-	-	-	-	50	65	80	4	5.5	34	40
50C1	8	9	9.52	11	12	12.7	14	-	-	-	-	-	50	70	80	4	M4x10	34	40
50D	8	9	9.52	11	12	12.7	14	-	-	-	-	-	50	95	80	4	M6x20	34	40
55A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	55.5	125.7	105	4	M6x20	34	40
60A2	8	9	9.52	11	12	12.7	14	-	-	-	-	-	60	75	80	4	M5x16	34	40
60AH2	8	9	9.52	11	12	12.7	14	-	-	-	-	-	60	75	90	4	6.5	34	40
60B1	8	9	9.52	11	12	12.7	14	15.875	16	-	-	-	60	85	80	4	M5x16	34	40
60C1	8	9	9.52	11	12	12.7	14	15.875	16	-	-	-	60	90	80	4	M5x16	34	40
70A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	80	4	M6x20	34	40
70AH1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	90	4	6.5	34	40
70B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	90	80	4	M5x16	34	40
73A1	8	9	9.52	11	12	12.7	14	-	-	-	-	-	73	98.4	85	4	M5x16	34	40
80A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	80	100	90	4	M6x16	34	40
95A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	115	100	4	M8x20	34	40
95B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	130	115	4	M8x20	34	40
110A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	130	115	4	M8x20	34	40
110B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	44	50
110B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	54	60

Please contact us for different motor adapters and input shaft bore.

TQFE 070




IS



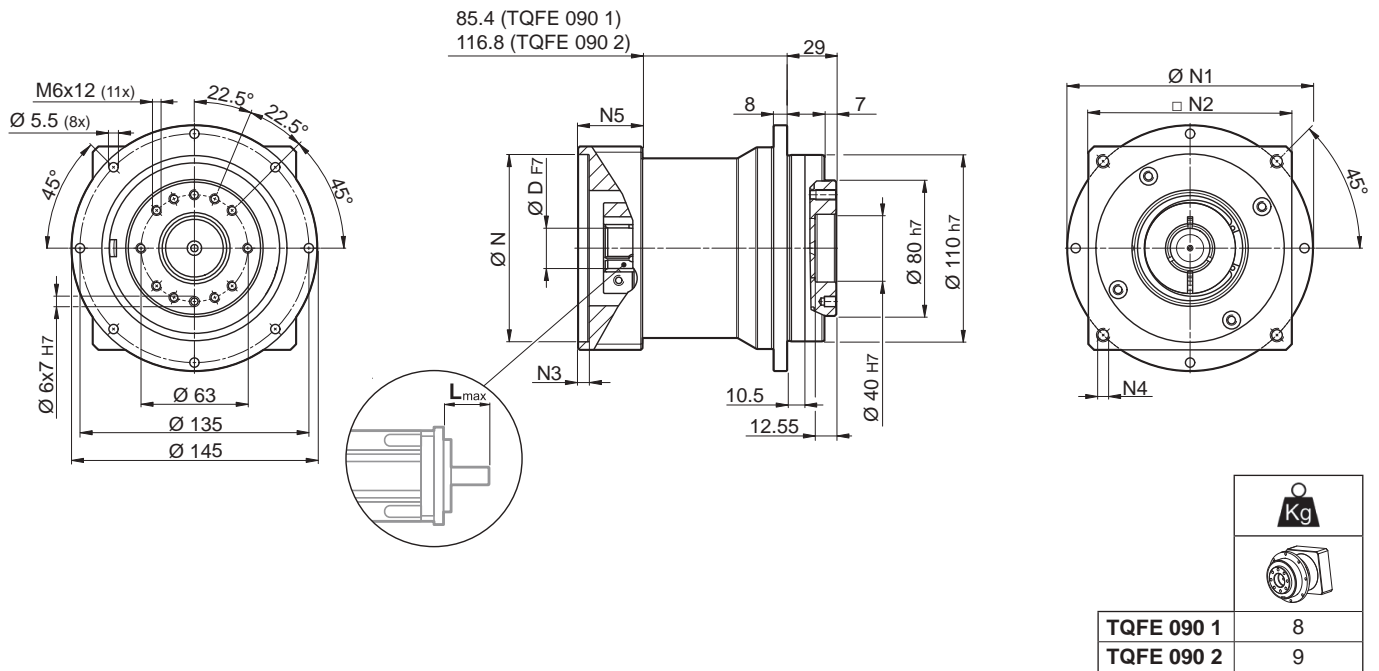
FM

TQFE


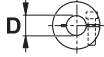
D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
8	9	9.52		38	68	76.5	M6x10	M6	34	26.8	9.5	18.8	10.5
11	12	12.7		52	68	76.5	M6x10	M6	34	26.8	9.5	18.8	12.5
14	15.875	16	17	48	68	76.5	M6x10	M6	34	26.8	9.5	18.8	14.5
19	19.05			51	68	76.5	M6x10	M6	34	26.8	9.5	18.8	16.5

 i	M _{n2}	M _{a2}	M _{p2}	n ₁	n _{1 max}	φ _S	φ _R	C _t	R _{1 max}	R _{2 max}	A _{2 max}	η	J _G [kgcm ²]	
	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	[arcmin]	$\frac{Nm}{arcmin}$	[N]	[N]	[N]	%	8 ... 12.7	14 ... 19.05
TQFE 070 1_3	65	120	150	3500	4000	10'	5'	26	400	1400	2800	97	0.94	1.15
TQFE 070 1_4	60	110	160	3500	4000	10'	5'	26	400	1400	2800	97	0.57	0.78
TQFE 070 1_5	50	100	160	3200	4500	10'	5'	26	400	1400	2800	97	0.41	0.61
TQFE 070 1_7	50	100	160	4000	6000	10'	5'	26	400	1400	2800	97	0.27	0.48
TQFE 070 1_10	40	70	150	4000	6000	10'	5'	26	400	1400	2800	97	0.21	0.40
TQFE 070 2_9	65	120	150	3500	4000	12'	7'	23	400	1400	2800	94	0.67	0.81
TQFE 070 2_12	65	120	160	3500	4000	12'	7'	23	400	1400	2800	94	0.65	0.75
TQFE 070 2_15	65	120	160	3500	4000	12'	7'	23	400	1400	2800	94	0.65	0.75
TQFE 070 2_16	60	110	160	3500	4500	12'	7'	23	400	1400	2800	94	0.58	0.67
TQFE 070 2_20	60	110	160	3500	4500	12'	7'	23	400	1400	2800	94	0.47	0.60
TQFE 070 2_25	50	100	160	3200	4500	12'	7'	23	400	1400	2800	94	0.47	0.60
TQFE 070 2_28	50	100	160	4000	6000	12'	7'	23	400	1400	2800	94	0.41	0.55
TQFE 070 2_30	65	120	150	4000	6000	12'	7'	23	400	1400	2800	94	0.37	0.51
TQFE 070 2_35	50	100	160	4000	6000	12'	7'	23	400	1400	2800	94	0.41	0.55
TQFE 070 2_40	60	110	160	4000	6000	12'	7'	23	400	1400	2800	94	0.37	0.52
TQFE 070 2_50	50	100	160	4000	6000	12'	7'	23	400	1400	2800	94	0.36	0.49
TQFE 070 2_70	50	100	160	4000	6000	12'	7'	23	400	1400	2800	94	0.36	0.49
TQFE 070 2_100	40	70	150	4000	6000	12'	7'	23	400	1400	2800	94	0.36	0.48

TQFE 090

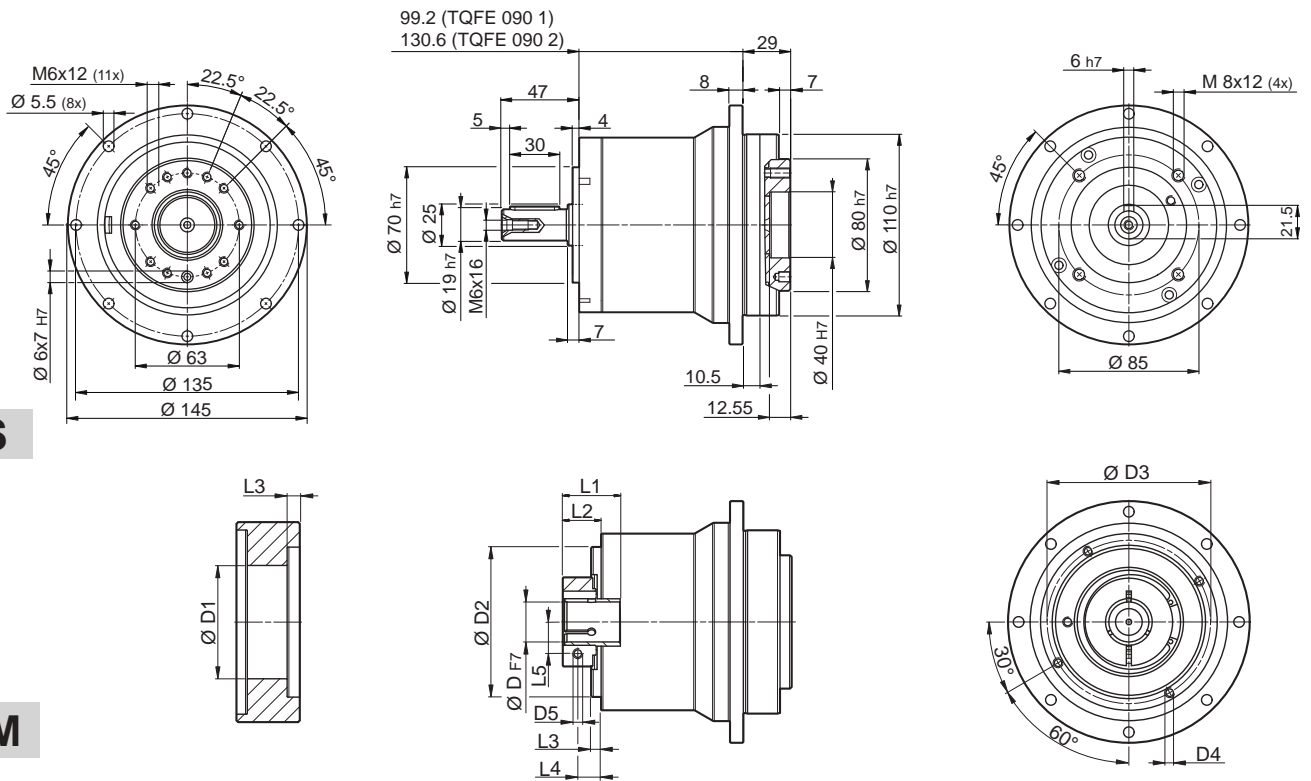


TQFE

												N	N1	N2	N3	N4	N5	L _{max}
50D	11	12	12.7	14	15	15.875	16	19	-	-	-	50	95	100	5	M6x14	28	40
55A	11	12	12.7	14	15	15.875	16	19	-	-	-	55	125.7	105	5	M6x16	28	40
60A2	11	12	12.7	14	15	15.875	16	19	-	-	-	60	75	100	6.5	M5x14	28	40
60AH2	11	12	12.7	14	15	15.875	16	19	-	-	-	60	75	100	4	6.5	33	40
60B1	11	12	12.7	14	15	15.875	16	19	-	-	-	60	85	100	6.5	M5x14	28	40
70A1	11	12	12.7	14	15	15.875	16	19	-	-	-	70	85	100	6.5	M6x14	28	40
70AH1	11	12	12.7	14	15	15.875	16	19	-	-	-	70	85	100	4	6.5	33	40
70B1	11	12	12.7	14	15	15.875	16	19	-	-	-	70	90	100	6.5	M5x12	28	40
80A1	11	12	12.7	14	15	15.875	16	19	-	-	-	80	100	100	6.5	M6x16	28	40
80AH1	11	12	12.7	14	15	15.875	16	19	-	-	-	80	100	100	4	6.5	33	40
95A	11	12	12.7	14	15	15.875	16	19	-	-	-	95	115	100	6.5	M8x18	28	40
95A1	11	12	12.7	14	15	15.875	16	19	22	24	-	95	115	100	6.5	M8x18	38	50
95B	11	12	12.7	14	15	15.875	16	19	-	-	-	95	130	115	6.5	M8x18	28	40
110A	11	12	12.7	14	15	15.875	16	19	-	-	-	110	130	115	6.5	M8x18	28	40
110A1	11	12	12.7	14	15	15.875	16	19	22	24	-	110	130	115	6.5	M8x20	38	50
110B	11	12	12.7	14	15	15.875	16	19	22	24	-	110	145	120	6.5	M8x20	38	50
110B1	11	12	12.7	14	15	15.875	16	19	22	24	28	110	145	120	6.5	M8x20	48	60
130A	11	12	12.7	14	15	15.875	16	19	22	24	-	130	165	140	6.5	M10x20	38	50
130A1	11	12	12.7	14	15	15.875	16	19	22	24	28	130	165	140	6.5	M10x25	48	60

Please contact us for different motor adapters and input shaft bore.

TQFE 090




IS

FM

TQFE

D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
11	12	12.7		43	90	98	M6x15	M6	33.5	20	7.6	12	12.5
14	15	15.875	16	48	90	98	M6x15	M6	33.5	20	7.6	12.5	14.5
19				51	90	98	M6x15	M6	33.5	20	7.6	12.5	16.5
22	24			56.5	90	98	M6x15	M6	36.5	23	7.6	14	19
28				70	90	98	M6x15	M8	36.5	23	7.6	14	22.5
32				71	90	98	M6x15	M8	38	24.5	7.6	15.5	24.5

	i	M _{N2} [Nm]	M _{a2} [Nm]	M _{p2} [Nm]	n ₁ [min ⁻¹]	n _{1 max} [min ⁻¹]	φ _S [arcmin]	φ _R [arcmin]	C _t [Nm/arcmin]	R _{1 max} [N]	R _{2 max} [N]	A _{2 max} [N]	η %	J _G [kgcm ²]			
																	
														11 ... 12.7	14 ... 19	22 ; 24	28 ; 32
TQFE 090 1_3		155	280	300	3000	4000	10'	5'	60	600	2500	4000	97	2.79	2.87	3.48	4.1
TQFE 090 1_4		155	300	360	3000	4500	10'	5'	60	600	2500	4000	97	1.53	1.60	2.21	2.84
TQFE 090 1_5		125	240	360	3000	4500	10'	5'	60	600	2500	4000	97	0.96	1.03	1.64	2.27
TQFE 090 1_7		125	240	360	3500	4500	10'	5'	60	600	2500	4000	97	0.55	0.62	1.22	1.86
TQFE 090 1_10		100	160	300	3500	5000	10'	5'	60	600	2500	4000	97	0.51	0.59	1.00	1.63
TQFE 090 2_9		155	280	300	3000	4000	12'	7'	50	600	2500	4000	94	1.77	1.82	2.86	3.05
TQFE 090 2_12		155	300	360	3000	4000	12'	7'	50	600	2500	4000	94	1.64	1.71	2.35	2.87
TQFE 090 2_15		155	300	360	3000	4000	12'	7'	50	600	2500	4000	94	1.58	1.66	2.01	2.83
TQFE 090 2_16		155	300	360	3000	4500	12'	7'	50	600	2500	4000	94	0.94	1.01	1.78	2.32
TQFE 090 2_20		155	300	360	3000	4500	12'	7'	50	600	2500	4000	94	0.92	1.00	1.78	2.29
TQFE 090 2_25		125	240	360	3000	4500	12'	7'	50	600	2500	4000	94	0.81	0.89	1.47	2.00
TQFE 090 2_28		125	240	360	3500	5000	12'	7'	50	600	2500	4000	94	0.59	0.67	1.31	1.94
TQFE 090 2_30		155	300	300	3500	5000	12'	7'	50	600	2500	4000	94	0.47	0.55	1.27	1.82
TQFE 090 2_35		125	240	360	3500	5000	12'	7'	50	600	2500	4000	94	0.50	0.58	1.32	1.91
TQFE 090 2_40		155	300	360	3500	5000	12'	7'	50	600	2500	4000	94	0.47	0.55	1.27	1.82
TQFE 090 2_50		125	240	360	3500	5000	12'	7'	50	600	2500	4000	94	0.47	0.55	1.25	1.80
TQFE 090 2_70		125	240	360	3500	5000	12'	7'	50	600	2500	4000	94	0.47	0.53	1.25	1.79
TQFE 090 2_100		100	160	300	3500	5000	12'	7'	50	600	2500	4000	94	0.47	0.53	1.25	1.79



Effective Line



TQFEK Series

The TQFEK series offers optimized performance and features at an optimum value-price ratio.

An exceptionally compact and standardized flange interface combined with optimal positioning accuracy make it suitable for a wide range of industrial applications.

Its right-angle design allows more compactness for space-saving layouts.

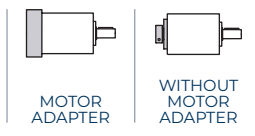
Main benefits


- High torsional stiffness
- High compactness
- Easy and quick installation
- Standardized flange for great compatibility
- Compact design for space-saving layouts

Main features

- Nominal output torque (Nm)
18 - 155
- Torsional backlash (arcmin)
7 - 14
- Torsional stiffness (Nm/arcmin)
6 - 60
- Max tilting moment (Nm)
12 - 110

Main options

- Input versions





MOTOR ADAPTER WITHOUT MOTOR ADAPTER
- Lubrication


STANDARD LUBRICATION FOOD GRADE LUBRICATION

Protection class

- IP54

Frame sizes

-  060
-  070
-  090

8 FEATURES OF TQFEK SERIES

The TQFEK Series right-angle design represents the answer for applications requiring compact, space-saving solutions.

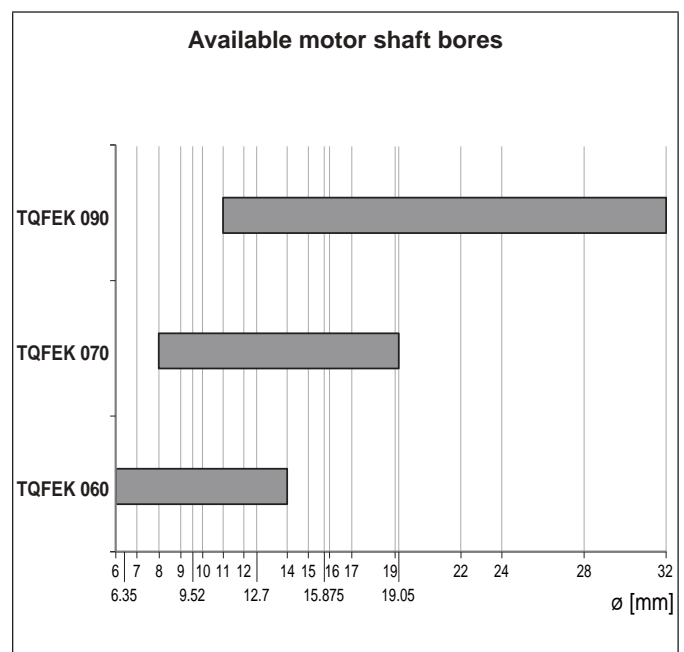
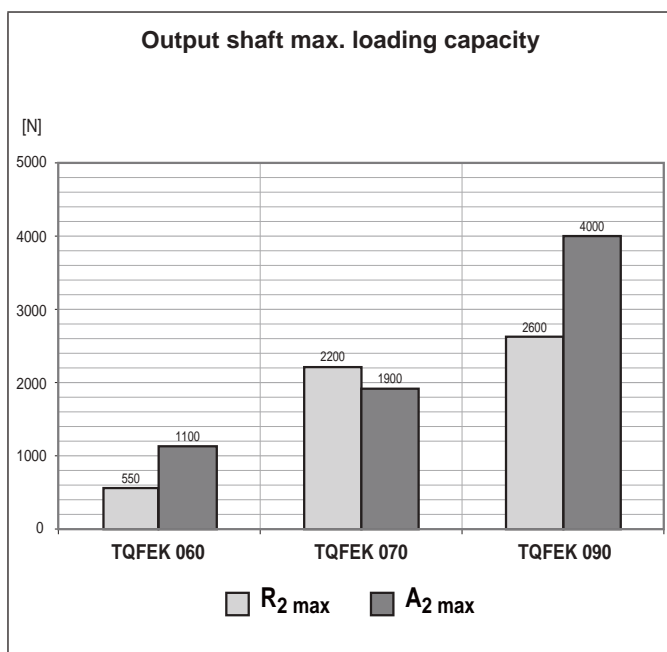
Its standardized flange ensures great compatibility while its proportioned design allows quiet running and provides a long service life without maintenance requirements.

Motor mounting is an operation that can be easily conducted without the need of any particular tooling, other than that usually available in a normally equipped workshop.

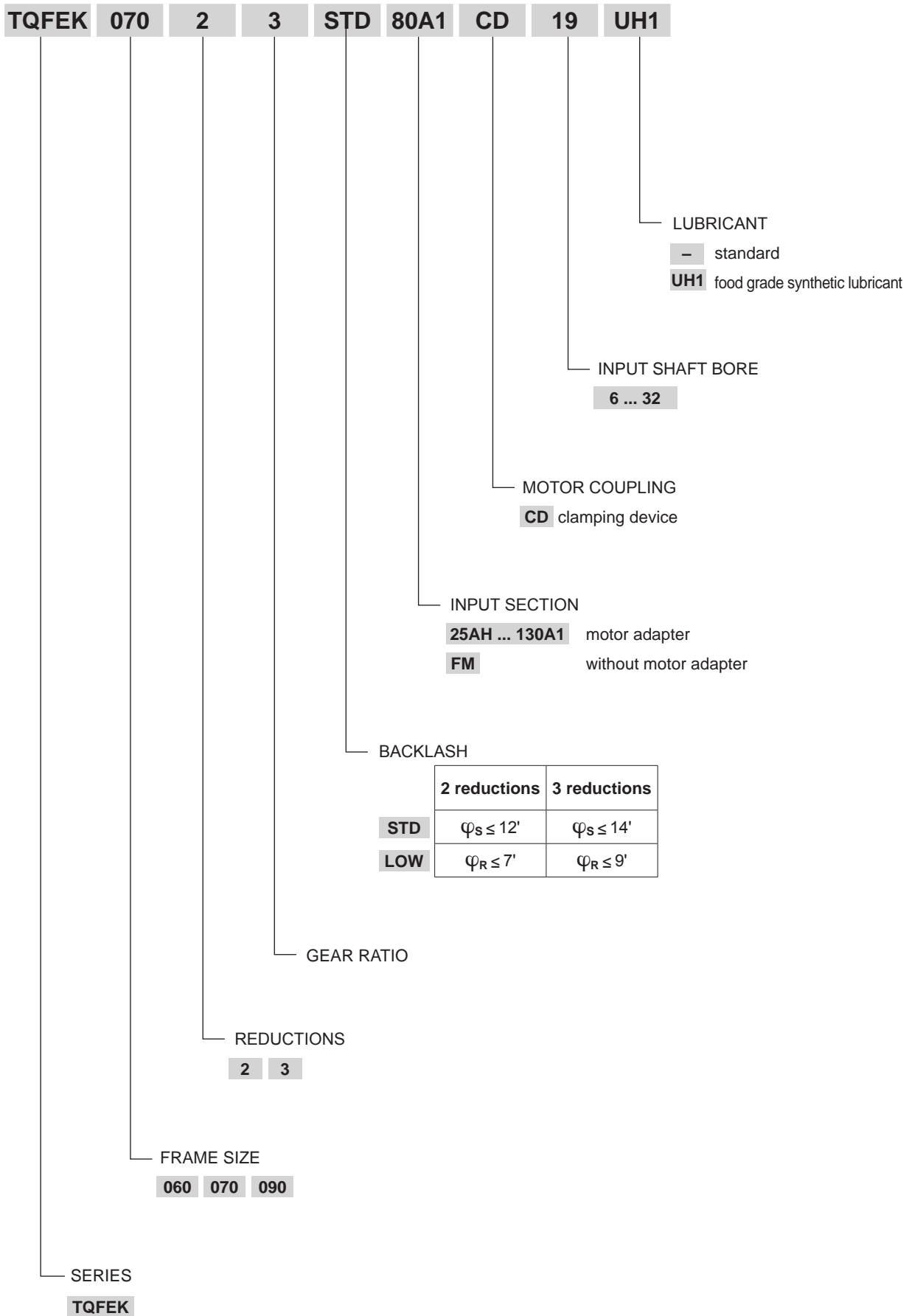
- Available with either standard (STD) or reduced (LOW) backlash:
 2-stage units: standard $\varphi_S \leq 12'$; reduced $\varphi_R \leq 7'$
 3-stage units: standard $\varphi_S \leq 14'$; reduced $\varphi_R \leq 9'$
- Its degree of protection IP54 provides protection against dust and liquid splashes.
- Input section oil seals made from a Fluoroelastomer compound are supplied as standard.
- Noise pressure level $LP \leq 70$ dB(A). Conditions: distance 1 m; measured without load an input speed of $n_1 = 3000 \text{ min}^{-1}$; $i=10$.
- Units are factory packed with synthetic grease to NLGI consistency class 00, in the absence of contamination the lubricant requires no periodical changes.
- Ambient temperature min -20°C , max $+30^\circ\text{C}$. For temperature higher than 30°C please consider derating factor f_T .
- Housing temperature must not exceed $T_{\text{max}} = 90^\circ\text{C}$.

		Distribution of nominal torque M_{n2} [Nm]																	
	[i]	3	4	5	7	9	10	12	15	16	20	25	8	30	35	40	50	70	100
TQFEK 060		29	30	25	25	29	18	29	29	30	30	30	30	29	30	30	30	30	18
TQFEK 070		40	50	50	50	65	40	65	65	60	60	50	50	65	50	60	50	50	40
TQFEK 090		80	105	130	125	155	100	155	155	155	155	125	125	155	125	155	125	125	100

TQFEK

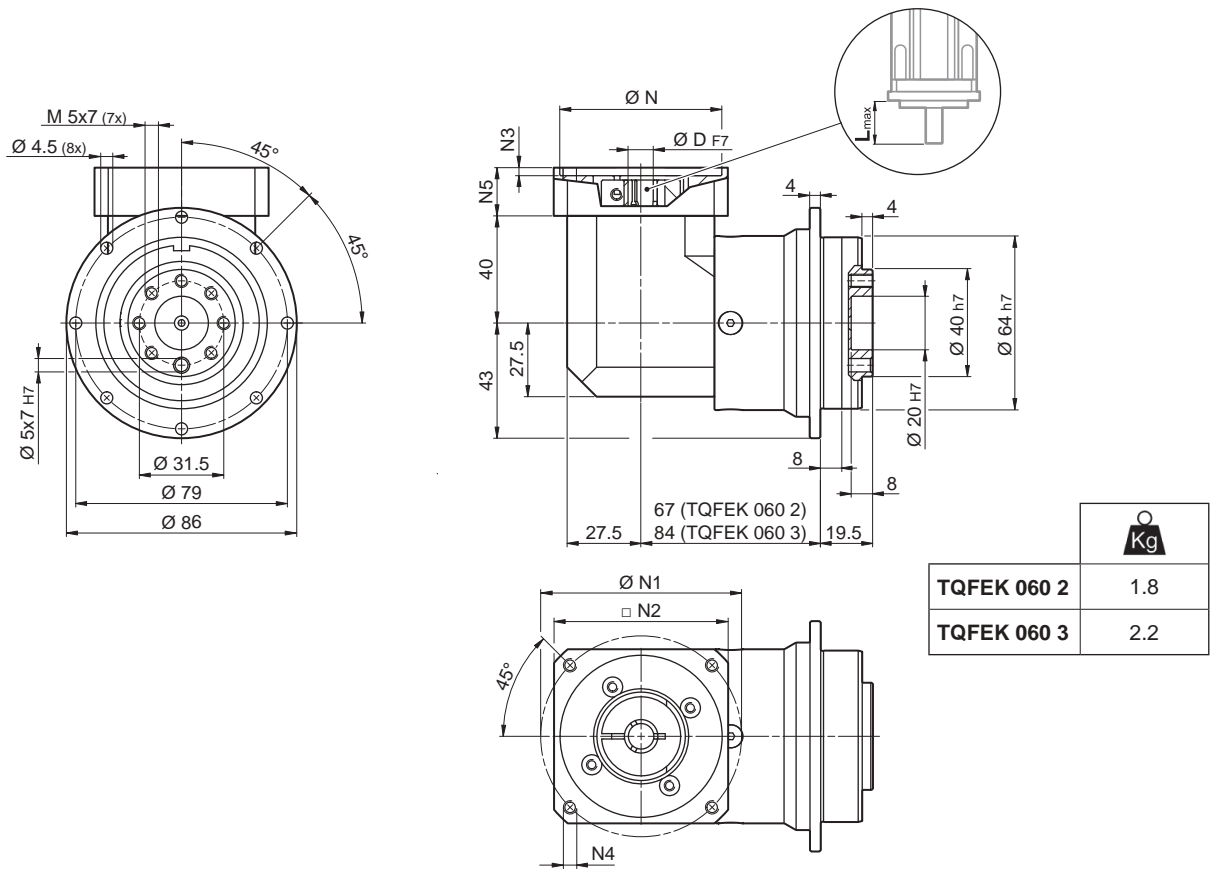


8.1 ORDERING CODE



8.2 DIMENSIONS AND TECHNICAL SPECIFICATIONS

TQFEK 060



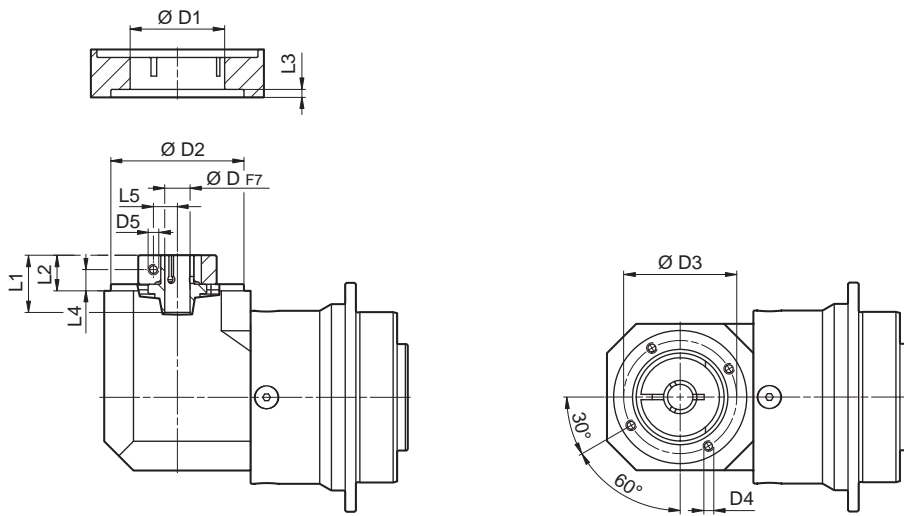
TQFEK

	D											N	N1		N2	N3	N4	N5	L _{max}
		6	6.35	7	8	9	9.52	-	-	-	-		-	min					
25AH		6	6.35	7	8	9	9.52	-	-	-	-	25	39	56					
26AH		6	6.35	7	8	9	9.52	-	-	-	-	26	39	56					
28AH		6	6.35	7	8	9	9.52	-	-	-	-	28	39	56					
30AH		6	6.35	7	8	9	9.52	-	-	-	-	30	39	56					
32AH		6	6.35	7	8	9	9.52	-	-	-	-	32	39	56	65	3.5	4.5	25	25
34AH		6	6.35	7	8	9	9.52	-	-	-	-	34	40	56					
36AH		6	6.35	7	8	9	9.52	-	-	-	-	36	42	56					
39AH		6	6.35	7	8	9	9.52	-	-	-	-	39	45	56					
40AH		6	6.35	7	8	9	9.52	-	-	-	-	40	46	56					
38B		6	6.35	7	8	9	9.52	10	11	12	12.7	-	38.1	66.6	60	3	M4x10	18	25
40B		6	6.35	7	8	9	9.52	10	11	12	12.7	-	40	63	60	3	M4x10	18	25
50A		6	6.35	7	8	9	9.52	10	11	12	12.7	-	50	60	60	3	M4x10	18	25
50B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65	60	3	M5x12	23	30
50BH		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	65	65	3	5.5	25	32
50C		6	6.35	7	8	9	9.52	10	11	12	12.7	14	50	70	60	3	M4x10	23	30
55MH		6	6.35	7	8	9	9.52	10	11	12	12.7	-	55	80	65	2	5.5	16	23
60A		6	6.35	7	8	9	9.52	10	11	12	12.7	-	60	75	65	3	M5x12	18	25
60A1		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	75	65	3	M5x12	23	30
60B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	85	75	3	M5x12	23	30
60C		6	6.35	7	8	9	9.52	10	11	12	12.7	14	60	90	75	3	M5x12	23	30
70A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	85	75	3	M6x15	23	30
70B		6	6.35	7	8	9	9.52	10	11	12	12.7	14	70	90	75	3	M5x12	23	30
73A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	73	98.4	85	3	M5x12	25	32
80A		6	6.35	7	8	9	9.52	10	11	12	12.7	14	80	100	85	3	M6x15	23	30

Please contact us for different motor adapters and input shaft bore.

TQFEK 060

FM

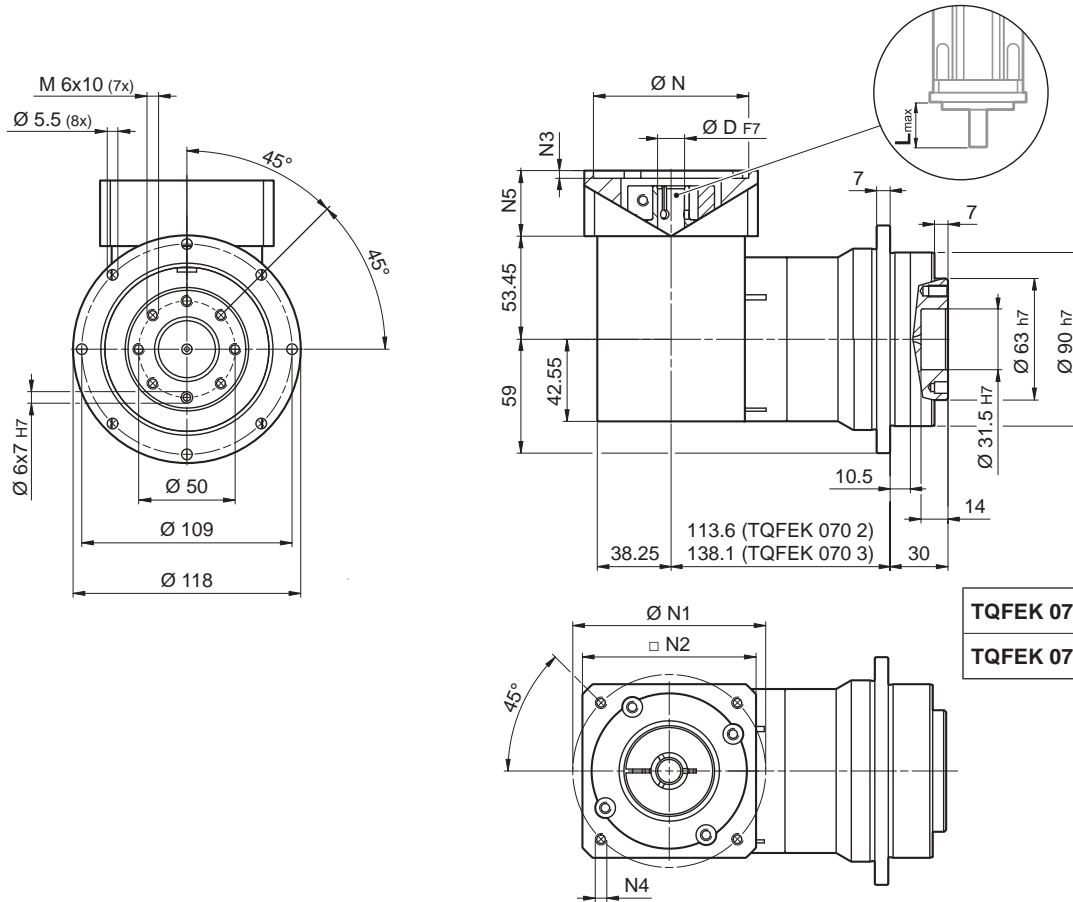


				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
6	6.35	7		32.5	50	42.5	M4x8	M4	21.7	13.2	3	8.2	8
8	9	9.52	10	32.5	50	42.5	M4x8	M4	21.7	13.2	3	8.2	9
11	12	12.7		35.5	50	42.5	M4x8	M4	22	13.5	3	8.5	11
14				35.5	50	42.5	M4x8	M4	25	17	3	10.2	11.5


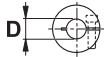
	i	M _{n2}	M _{a2}	M _{p2}	n ₁	n _{1 max}	φ _S	φ _R	C _t	R _{1 max}	R _{2 max}	A _{2 max}	η	J _G [kgcm ²]	
		[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]	[arcmin]	[Nm/arcmin]	[N]	[N]	[N]	%	6 ... 10	11 ... 14
TQFEK 060 2_3		29	45	60	3300	4000	12'	7'	6	200	550	1100	94	0.31	0.35
TQFEK 060 2_4		30	45	70	3500	5000	12'	7'	6	200	550	1100	94	0.30	0.32
TQFEK 060 2_5		25	40	70	3500	5000	12'	7'	6	200	550	1100	94	0.28	0.30
TQFEK 060 2_7		25	40	70	4000	5000	12'	7'	6	200	550	1100	94	0.26	0.27
TQFEK 060 2_10		18	30	60	4000	6000	12'	7'	6	200	550	1100	94	0.26	0.25
TQFEK 060 3_9		29	55	60	3300	4000	14'	9'	6	200	550	1100	91	0.28	0.31
TQFEK 060 3_12		29	55	70	3300	4000	14'	9'	6	200	550	1100	91	0.28	0.31
TQFEK 060 3_15		29	55	70	3300	4000	14'	9'	6	200	550	1100	91	0.27	0.30
TQFEK 060 3_16		30	45	70	3500	5000	14'	9'	6	200	550	1100	91	0.25	0.27
TQFEK 060 3_20		30	45	70	3500	5000	14'	9'	6	200	550	1100	91	0.25	0.27
TQFEK 060 3_25		30	45	70	3500	5000	14'	9'	6	200	550	1100	91	0.25	0.27
TQFEK 060 3_28		30	45	70	4000	6000	14'	9'	6	200	550	1100	91	0.24	0.26
TQFEK 060 3_30		29	55	60	4000	6000	14'	9'	6	200	550	1100	91	0.23	0.25
TQFEK 060 3_35		30	45	70	4000	6000	14'	9'	6	200	550	1100	91	0.23	0.25
TQFEK 060 3_40		30	45	70	4000	6000	14'	9'	6	200	550	1100	91	0.23	0.25
TQFEK 060 3_50		30	45	70	4000	6000	14'	9'	6	200	550	1100	91	0.20	0.22
TQFEK 060 3_70		30	45	70	4000	6000	14'	9'	6	200	550	1100	91	0.20	0.22
TQFEK 060 3_100		18	30	60	4000	6000	14'	9'	6	200	550	1100	91	0.20	0.22

TQFEK

TQFEK 070



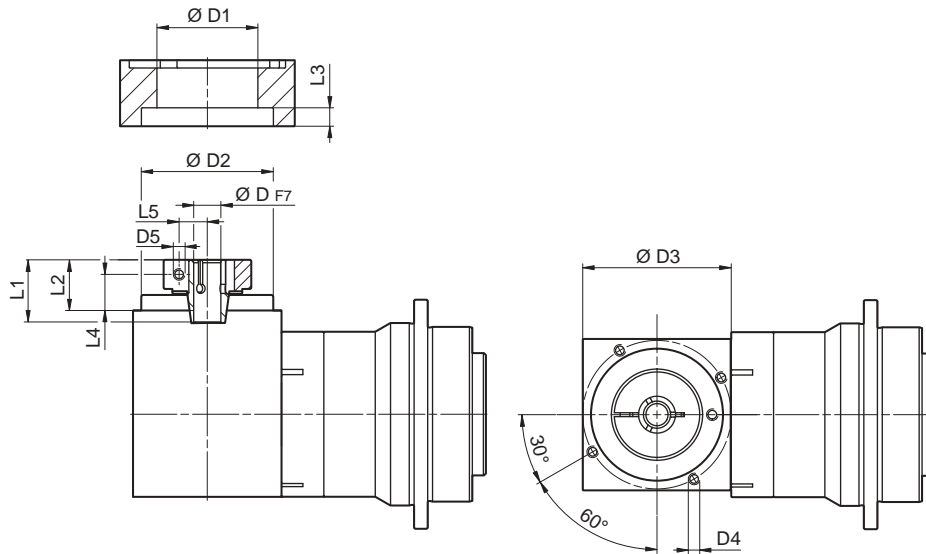
TQFEK

												N	N1	N2	N3	N4	N5	L _{max}	
40B1	8	9	9.52	11	12	12.7	14	-	-	-	-	40	63	80	4	M4x12	34	40	
45A	8	9	9.52	11	12	12.7	-	-	-	-	-	45	63	80	4	M4x12	34	40	
50B1	8	9	9.52	11	12	12.7	14	-	-	-	-	50	65	80	4	M5x16	34	40	
50BH1	8	9	9.52	11	12	12.7	14	-	-	-	-	50	65	80	4	5.5	34	40	
50C1	8	9	9.52	11	12	12.7	14	-	-	-	-	50	70	80	4	M4x10	34	40	
50D	8	9	9.52	11	12	12.7	14	-	-	-	-	50	95	80	4	M6x20	34	40	
55A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	55.5	125.7	105	4	M6x20	34	40
60A2	8	9	9.52	11	12	12.7	14	-	-	-	-	60	75	80	4	M5x16	34	40	
60AH2	8	9	9.52	11	12	12.7	14	-	-	-	-	60	75	90	4	6.5	34	40	
60B1	8	9	9.52	11	12	12.7	14	15.875	16	-	-	60	85	80	4	M5x16	34	40	
60C1	8	9	9.52	11	12	12.7	14	15.875	16	-	-	60	90	80	4	M5x16	34	40	
70A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	80	4	M6x20	34	40
70AH1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	85	90	4	6.5	34	40
70B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	70	90	80	4	M5x16	34	40
73A1	8	9	9.52	11	12	12.7	14	-	-	-	-	73	98.4	85	4	M5x16	34	40	
80A1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	80	100	90	4	M6x16	34	40
95A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	115	100	4	M8x20	34	40
95B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	95	130	115	4	M8x20	34	40
110A	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	130	115	4	M8x20	34	40
110B	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	44	50
110B1	8	9	9.52	11	12	12.7	14	15.875	16	17	19	19.05	110	145	120	6.5	M8x20	54	60

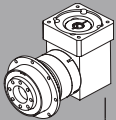
Please contact us for different motor adapters and input shaft bore.

TQFEK 070

FM

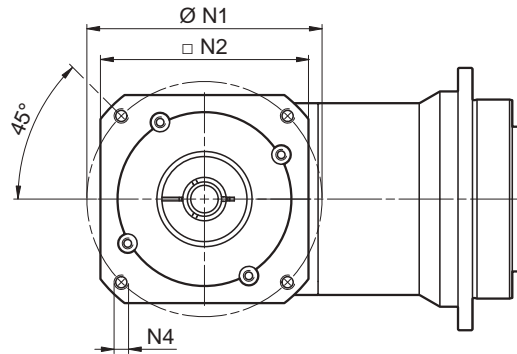
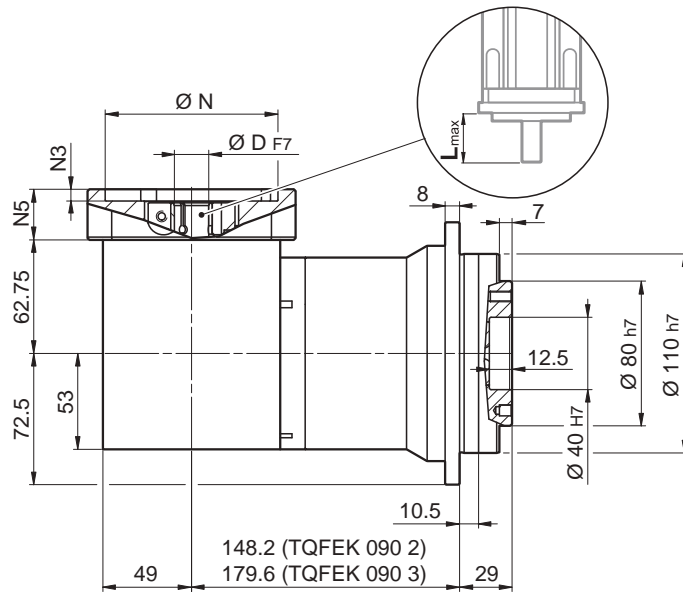
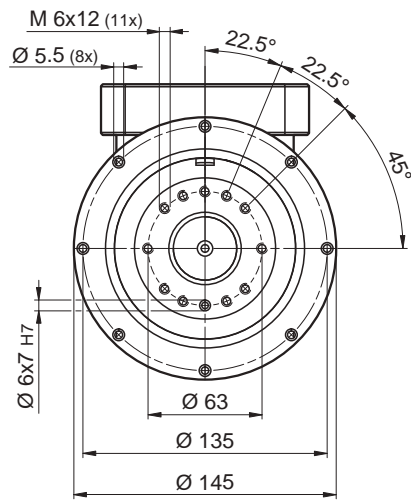



D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
8	9	9.52		38	68	76.5	M6x10	M6	34	26.8	9.5	18.8	10.5
11	12	12.7		52	68	76.5	M6x10	M6	34	26.8	9.5	18.8	12.5
14	15.875	16	17	48	68	76.5	M6x10	M6	34	26.8	9.5	18.8	14.5
19	19.05			51	68	76.5	M6x10	M6	34	26.8	9.5	18.8	16.5

 i	M _{n2}	M _{a2}	M _{p2}	n ₁	n _{1 max}	φ _S	φ _R	C _t	R _{1 max}	R _{2 max}	A _{2 max}	η	J _G [kgcm ²]	
	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]		$\frac{Nm}{arcmin}$	[N]	[N]	[N]	%	8 ... 12.7	14 ... 19.05
TQFEK 070 2_3	40	60	150	2900	3500	12'	7'	26	400	2200	1900	94	1.11	1.35
TQFEK 070 2_4	50	80	160	3100	4500	12'	7'	26	400	2200	1900	94	0.85	1.10
TQFEK 070 2_5	50	80	160	3200	4500	12'	7'	26	400	2200	1900	94	0.74	0.95
TQFEK 070 2_7	50	80	160	4000	6000	12'	7'	26	400	2200	1900	94	0.64	0.89
TQFEK 070 2_10	40	70	150	4000	6000	12'	7'	26	400	2200	1900	94	0.61	0.83
TQFEK 070 3_9	65	120	150	2900	3500	14'	9'	23	400	2200	1900	91	0.94	1.01
TQFEK 070 3_12	65	120	160	3100	3500	14'	9'	23	400	2200	1900	91	0.93	1.06
TQFEK 070 3_15	65	120	160	3200	3500	14'	9'	23	400	2200	1900	91	0.93	1.06
TQFEK 070 3_16	60	110	160	3100	4500	14'	9'	23	400	2200	1900	91	0.86	0.98
TQFEK 070 3_20	60	110	160	3200	4500	14'	9'	23	400	2200	1900	91	0.80	0.97
TQFEK 070 3_25	50	100	160	3200	4500	14'	9'	23	400	2200	1900	91	0.80	0.97
TQFEK 070 3_28	50	100	160	4000	6000	14'	9'	23	400	2200	1900	91	0.77	0.95
TQFEK 070 3_30	65	120	150	4000	6000	14'	9'	23	400	2200	1900	91	0.74	0.91
TQFEK 070 3_35	50	100	160	4000	6000	14'	9'	23	400	2200	1900	91	0.76	0.95
TQFEK 070 3_40	60	110	160	4000	6000	14'	9'	23	400	2200	1900	91	0.68	0.95
TQFEK 070 3_50	50	100	160	4000	6000	14'	9'	23	400	2200	1900	91	0.66	0.92
TQFEK 070 3_70	50	100	160	4000	6000	14'	9'	23	400	2200	1900	91	0.66	0.92
TQFEK 070 3_100	40	70	150	4000	6000	14'	9'	23	400	2200	1900	91	0.66	0.92


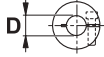
TQFEK

TQFEK 090



	
TQFEK 090 2	8.5
TQFEK 090 3	9.5

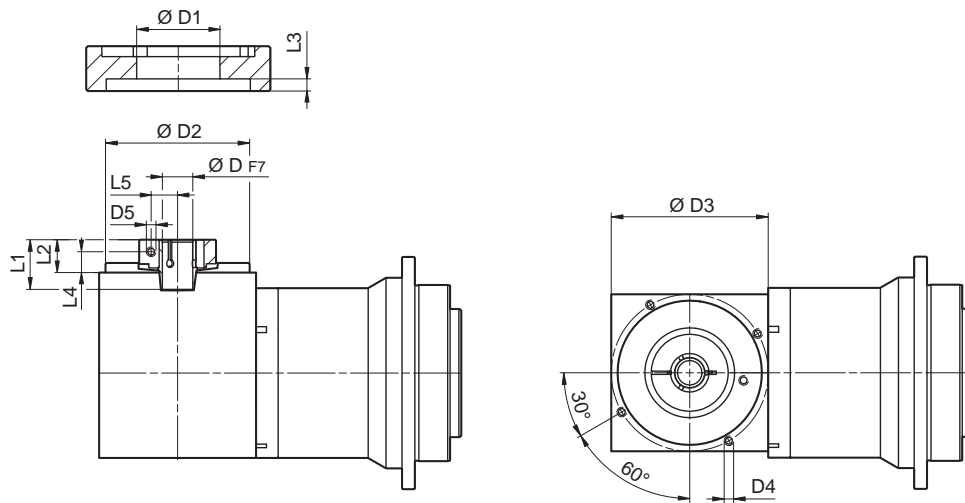
TQFEK

													N	N1	N2	N3	N4	N5	L _{max}
50D	11	12	12.7	14	15	15.875	16	19	-	-	-	-	50	95	100	5	M6x14	28	40
55A	11	12	12.7	14	15	15.875	16	19	-	-	-	-	55	125.7	105	5	M6x16	28	40
60A2	11	12	12.7	14	15	15.875	16	19	-	-	-	-	60	75	100	6.5	M5x14	28	40
60AH2	11	12	12.7	14	15	15.875	16	19	-	-	-	-	60	75	100	4	6.5	33	40
60B1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	60	85	100	6.5	M5x14	28	40
70A1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	70	85	100	6.5	M6x14	28	40
70AH1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	70	85	100	4	6.5	33	40
70B1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	70	90	100	6.5	M5x12	28	40
80A1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	80	100	100	6.5	M6x16	28	40
80AH1	11	12	12.7	14	15	15.875	16	19	-	-	-	-	80	100	100	4	6.5	33	40
95A	11	12	12.7	14	15	15.875	16	19	-	-	-	-	95	115	100	6.5	M8x18	28	40
95A1	11	12	12.7	14	15	15.875	16	19	22	24	-	-	95	115	100	6.5	M8x18	38	50
95B	11	12	12.7	14	15	15.875	16	19	-	-	-	-	95	130	115	6.5	M8x18	28	40
110A	11	12	12.7	14	15	15.875	16	19	-	-	-	-	110	130	115	6.5	M8x18	28	40
110A1	11	12	12.7	14	15	15.875	16	19	22	24	-	-	110	130	115	6.5	M8x20	38	50
110B	11	12	12.7	14	15	15.875	16	19	22	24	-	-	110	145	120	6.5	M8x20	38	50
110B1	11	12	12.7	14	15	15.875	16	19	22	24	28	-	110	145	120	6.5	M8x20	48	60
130A	11	12	12.7	14	15	15.875	16	19	22	24	-	-	130	165	140	6.5	M10x20	38	50
130A1	11	12	12.7	14	15	15.875	16	19	22	24	28	32	130	165	140	6.5	M10x25	48	60

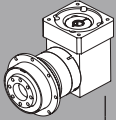
Please contact us for different motor adapters and input shaft bore.

TQFEK 090

FM




D				D1	D2	D3	D4	D5	L1	L2	L3	L4	L5
11	12	12.7		43	90	98	M6x15	M6	33.5	20	7.6	12	12.5
14	15	15.875	16	48	90	98	M6x15	M6	33.5	20	7.6	12.5	14.5
19				51	90	98	M6x15	M6	33.5	20	7.6	12.5	16.5
22	24			56.5	90	98	M6x15	M6	36.5	23	7.6	14	19
28				70	90	98	M6x15	M8	36.5	23	7.6	14	22.5
32				71	90	98	M6x15	M8	38	24.5	7.6	15.5	24.5

 i	M _{n2}	M _{a2}	M _{p2}	n ₁	n _{1 max}	ψ _S	ψ _R	C _t	R _{1 max}	R _{2 max}	A _{2 max}	η	J _G [kgcm ²]			
	[Nm]	[Nm]	[Nm]	[min ⁻¹]	[min ⁻¹]	[arcmin]		$\frac{Nm}{arcmin}$	[N]	[N]	[N]	%	11 ... 12.7	14 ... 19	22 ; 24	28 ; 32
TQFEK 090 2_3	80	120	300	3000	4000	12'	7'	60	600	2600	4000	94	2.94	3.00	3.59	4.58
TQFEK 090 2_4	105	160	360	3000	4500	12'	7'	60	600	2600	4000	94	1.76	1.83	2.32	3.32
TQFEK 090 2_5	130	195	360	3000	4500	12'	7'	60	600	2600	4000	94	1.38	1.45	1.75	2.75
TQFEK 090 2_7	125	240	360	3500	4500	12'	7'	60	600	2600	4000	94	1.06	1.21	1.60	2.51
TQFEK 090 2_10	100	160	300	3500	5000	12'	7'	60	600	2600	4000	94	1.11	1.27	1.38	2.37
TQFEK 090 3_9	155	180	300	3000	4000	14'	9'	50	600	2600	4000	91	1.95	2.05	2.97	3.53
TQFEK 090 3_12	155	300	360	3000	4000	14'	9'	50	600	2600	4000	91	1.72	1.87	2.46	3.35
TQFEK 090 3_15	155	300	360	3000	4000	14'	9'	50	600	2600	4000	91	1.68	1.84	2.12	2.83
TQFEK 090 3_16	155	300	360	3000	4500	14'	9'	50	600	2600	4000	91	1.09	1.24	1.89	2.80
TQFEK 090 3_20	155	300	360	3000	4500	14'	9'	50	600	2600	4000	91	1.26	1.42	1.99	2.77
TQFEK 090 3_25	125	240	360	3000	4500	14'	9'	50	600	2600	4000	91	1.31	1.47	1.74	2.64
TQFEK 090 3_28	125	240	360	3500	5000	14'	9'	50	600	2600	4000	91	1.09	1.26	1.58	1.94
TQFEK 090 3_30	155	300	300	3500	5000	14'	9'	50	600	2600	4000	91	1.08	1.23	1.65	2.56
TQFEK 090 3_35	125	240	360	3500	5000	14'	9'	50	600	2600	4000	91	1.09	1.25	1.68	2.64
TQFEK 090 3_40	155	300	360	3500	5000	14'	9'	50	600	2600	4000	91	1.12	1.27	1.69	2.60
TQFEK 090 3_50	125	240	360	3500	5000	14'	9'	50	600	2600	4000	91	1.12	1.27	1.69	2.60
TQFEK 090 3_70	125	240	360	3500	5000	14'	9'	50	600	2600	4000	91	1.08	1.21	1.63	2.53
TQFEK 090 3_100	100	160	300	3500	5000	14'	9'	50	600	2600	4000	91	1.08	1.21	1.63	2.53

TQFEK

INDEX OF REVISIONS

	TI_CAT_TIR_STD_ENG_R06_0
	Description
...	Amended some data.



We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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