Serie GX

单螺杆挤出机专用减速机及减速电机

Standard and long Helical gear reducers and gearmotors for extruders

Edition January 2011

目录

Contents

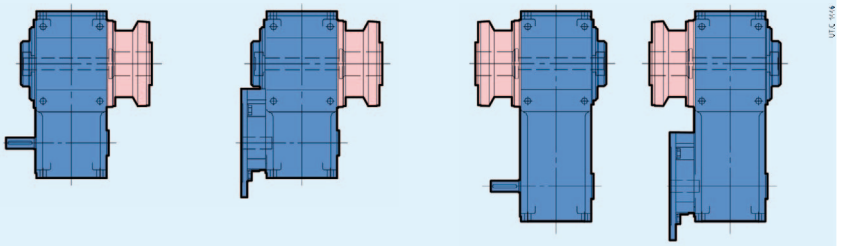
GX09样本 - Catalogue GX09

2I 100, 125
2级圆柱齿轮副
(E...4...带一个惰轮)
with 2 cylindrical gear pairs
(E...4... with idle gear)

H

推力头设计
Extruder support design

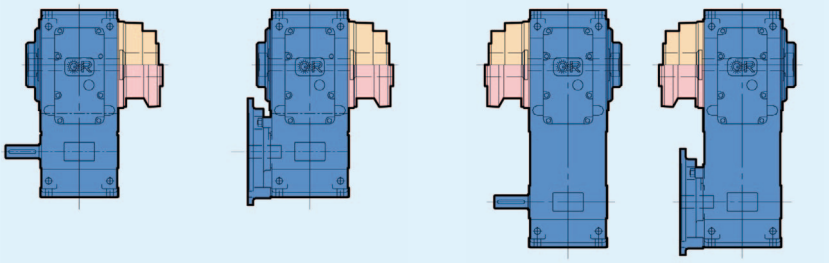
R 2I ... EH2Z | MR 2I ... EH2Z | R 2I ... EH4U | MR 2I ... EH4U



2I 140 ... 360
2级圆柱齿轮副
(E...4...带一个惰轮)
with 2 cylindrical gear pairs
(E...4... with idle gear)

N
H

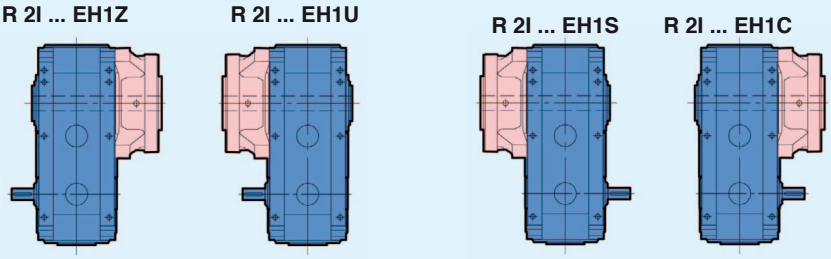
R 2I ... EN2Z
R 2I ... EH2Z
MR 2I ... EN2Z
MR 2I ... EH2Z
R 2I ... EN4U
R 2I ... EH4U
MR 2I ... EN4U
MR 2I ... EH4U



2I 400 ... 451
2级圆柱齿轮副
with 2 cylindrical gear pairs

H

R 2I ... EH1Z | R 2I ... EH1U | R 2I ... EH1S | R 2I ... EH1C

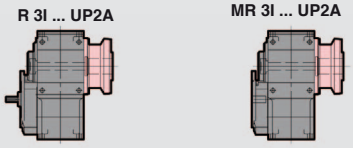


其他未包含在此样本中的可能型号，请咨询我们
Other possible configurations not covered by this catalogue GX09; consult us

3I 100, 125
3级圆柱齿轮副
(E...4...带一个惰轮)
with 3 cylindrical gear pairs
(E...4... with idle gear)

H

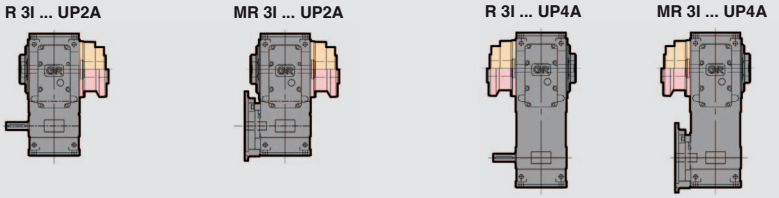
R 3I ... UP2A | MR 3I ... UP2A



3I 140 ... 360
3级圆柱齿轮副
(E...4...带一个惰轮)
with 3 cylindrical gear pairs
(E...4... with idle gear)

N
H

R 3I ... UP2A | MR 3I ... UP2A | R 3I ... UP4A | MR 3I ... UP4A



3I 400 ... 451
3级圆柱齿轮副
with 3 cylindrical gear pairs

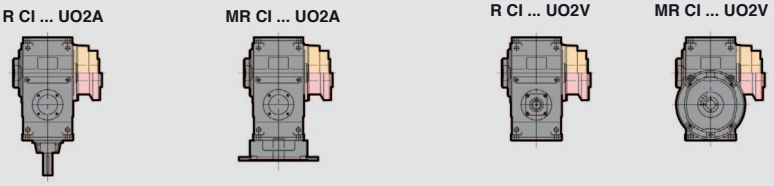
H

R 3I ... UP2A | MR 3I ... UP2A | R 3I ... UP4A | MR 3I ... UP4A

CI 125 ... 360
1级伞齿和
1级圆柱齿轮副
with 1 bevel and
1 cylindrical gear pairs

N
H

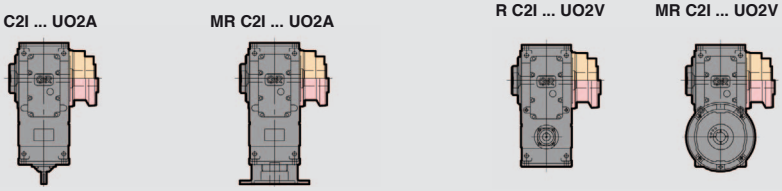
R CI ... UO2A | MR CI ... UO2A | R CI ... UO2V | MR CI ... UO2V



C2I 125 ... 360
1级伞齿和
2级圆柱齿轮副
with 1 bevel and
2 cylindrical gear pairs

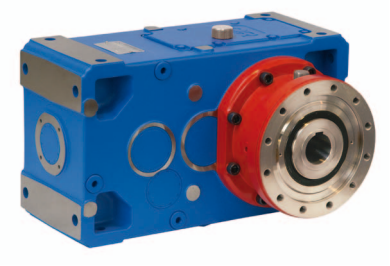
N
H

R C2I ... UO2A | MR C2I ... UO2A | R C2I ... UO2V | MR C2I ... UO2V



挤出机用减速机和减速电机，其输出端带有推力头法兰，从标准平行轴和直角轴系列产品发展而来，并经过重新设计，以实现更多的支撑面设计。

- 广泛的产品设计，型号（100...451）和齿轮副（2I,3I,CI,C2I）
- 可与之前的产品系列完全互换
- 可定制的产品尺寸
- 使用性能高，可靠，经测试，几乎可在工业领域内的各种应用中使用

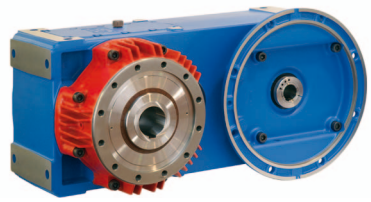


Gear reducers and gearmotors equipped with extruder support, derived from the parallel and right angle shaft standard series with extruder support flange redesigned to have wide support surfaces

- **Very wide range in terms of sizes (100 ... 451) and trains of gears (2I, 3I, CI, C2I)**
- **Full interchangeability with the previous series**
- **Customizable dimensions**
- **High, reliable performance, tested in almost every application of the industrial segments**

减速机和减速电机-标准和加长型设计，其输入轴和输出轴之间均留有充足的空间。整体式铸铁箱体，多样（对称）安装。

- 产品布局的最大适应性
- 根据电机和输出轴的位置不同，有两种产品布局形式：Z型和U型
- 载荷作用下具有高啮合刚度和啮合精度
- 满足不同安装方式的需求



Gear reducers and gearmotors - standard and «long» model featuring considerable distance between input and output shafts - with cast iron single-piece housing and universal «symmetrical» mounting

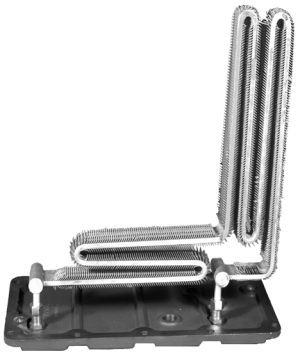
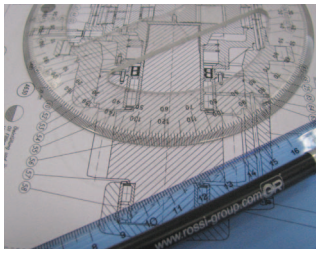
- **Maximum adaptability to the machine layout**
- **«Z» and «U» position of motor/ machine shaft**
- **High gear meshing stiffness and precision under load**
- **Suitable for different mounting position**

新型的电机连接装置是通过平键和胀紧装置连接，其可能的连接尺寸不以标准为限（IEC 60072-1）

- 电机-减速机的连接具有高的稳定性、刚度
- 电机轴键无侧隙
- 长时间运行后，仍能拆卸自如
- 产品结构设计紧凑，安全，节省成本，功能性减速电机解决方案，同时可用于非标设计产品和高功率密度的电机（矢量）

New motor fitting system through key and hub clamp and possible motor coupling dimensions not according to standard (IEC 60072-1)

- **High stability and stiffness of motor-gear reducer connection**
- **Backlash-free motor keying**
- **User-friendly motor removal even after long run periods**
- **Very compact, safe, cost-efficient, and functional gearmotor solution, also for non-standard and high power density motors («vector»)**

推力头：N型为正常载荷设计 H型为重型载荷设计 • **合适的产品应用，不浪费，因此节省成本**		Extruder support N for normal loads and H for high loads • **«Right» applications, without wastes, therefore cost-efficient**
新型水冷系统，采用铝翅片式、可移动的内部热交换器。 • **无需外置空间，热交换容量大，易于移除而无需拆卸减速机**		New water cooling system adopting finned and removable inner heat exchanger • **No external volumes, great heat exchange capacity, allowing an easy removal without any gear reducer disassembly**
设计过程中的专业辅助和技术支持 • **选型阶段-专业的售前、售中服务支持** • **最新的在线选型工具e-catalog，请访问 www.rossi-group.com** • **最优选型：性能、可靠性高，节省成本**		Competent assistance and technical support during design activities • **Skilled pre-sale service, supporting the customer in the selection phase** • **New on-line selection tool e-catalog; visit www.rossi-group.com** • **Selection optimization: performance, reliability, cost-efficiency**
全球化服务 • **全球化的销售和服务网络，请访问 www.rossi-group. com**		Global service • **Direct worldwide Sale and Service Network; visit www.rossi-group.com**
3年质保期 • **质量保证**		3 year warranty • **Quality warranty**

1 - 符号及测量单位

按照字母顺序排列，样本及公式中使用的符号和相关测量单位。

1 - Symbols and units of measure

Symbols used in the catalogue and formulae, in alphabetical order, with relevant units of measure.

符号 Symbol	定义 Definition		单位 Units of measure 样本中单位 In the catalogue	公式中单位 In the formulae 技术体系 Technical System	国际单位制 SI1) System	备注 Notes
	尺寸	dimensions	mm	–		
a	加速度	acceleration	–	m/s^2		
d	直径	diameter	–	m		
f	频率	frequency	Hz	Hz		
fs	服务系数	service factor				
ft	热功率系数	thermal factor				
F	力	force	–	kgf	N2)	1 kgf ≈ 9,81 N ≈ 0,981 daN
F_r	径向力	radial load	N	–		
F_a	轴向力	axial load	N	–		
g	重力加速度	acceleration of gravity	–	m/s^2		标准值 9,81 m/s^2 normal value 9,81 m/s^2
G	重力	weight (weight force)	–	kgf	N	
Gd^2	动态力矩	dynamic moment	–	kgf m^2	–	
i	减速比	transmission ratio				$i = \frac{n_1}{n_2}$
I	电流	electric current	–	A		
J	转动惯量	moment of inertia	kg m^2	–	kg m^2	
L_h	轴承寿命	bearing life	h	–		
m	重量	mass	kg	kgf s^2/m	kg3)	
M	扭矩	torque	N m	kgf m	N m	1 kgf m ≈ 9,81 N m ≈ 0,981 daN m
n	速度	speed	min^{-1}	rev/min	–	1 min^{-1} ≈ 0,105 rad/s
P	功率	power	kW	CV	W	1 CV ≈ 736 W ≈ 0,736 kW
Pt	热功率	thermal power	kW	–		
r	半径	radius	–	m		
R	异众比率	variation ratio				$R = \frac{n_{2\,max}}{n_{2\,min}}$
s	距离	distance	–	m		
t	摄氏温度	Celsius temperature	°C	–		
t	时间	time	s min h d	s		1 min = 60 s 1 h = 60 min = 3 600 s 1 d = 24 h = 86 400 s
U	电压	voltage	V	V		
v	圆周率	velocity	–	m/s		
W	工作，能量	work, energy	MJ	kgf m	J4)	
z	启动频率	frequency of starting	starts/h	–		
α	角加速度	angular acceleration	–	rad/s^2		
η	传动效率	efficiency				
η_s	静态传动效率	static efficiency				
μ	摩擦系数	friction coefficient				
φ	平面夹角	plane angle	°	rad		1 giro = 2 π rad 1 rev = 2 π rad $1° = \frac{\pi}{180}$ rad
ω	角速度	angular velocity	–	–	rad/s	1 rad/s ≈ 9,55 min^{-1}

附加索引及其他符号

Additional indexes and other signs

Ind.	定义	Definition
max	最大值	maximum
min	最小值	minimum
N	额定值	nominal
1	与高速轴（输入）相关	relating to high speed shaft (input)
2	与低速轴（输出）相关	relating to low speed shaft (output)
÷	从...到	from ... to
≈	约等于	approximately equal to
⩾	大于等于	greater than or equal to
⩽	小于等于	less than or equal to

1) SI是国际单位制的缩写，由国际计量大会制定和批准的，作为国际上通用的、唯一的测量单位。

参考:CNR UNI 10 003-84 (DIN 1 301-93 NF X 02.004, BS 5 555-93, ISO 1 000-92).
UNI: 意大利标准化协会
DIN: 德国标准化学会 (DNA).
NF: 法国标准化协会(AFNOR).
BS: 英国标准机构 (BSI).
ISO:国际标准化组织

2) 牛顿(N)：是以1m/s^2的加速度作用在重量为1kg的物体上，物体所承受的力的大小。

3) 千克（kg)是保持在固定介质中的模型重量，例如：1dm^3的物体在4°C的蒸馏水中的重量

4) 焦耳（J）是作用在物体作用点上1N的力，移动1m的距离时对物体所做的功。

1) SI are the initials of the International Unit System, defined and approved by the General Conference on Weights and Measures as the only system of units of measure.
Ref. CNR UNI 10 003-84 (DIN 1 301-93 NF X 02.004, BS 5 555-93, ISO 1 000-92).
UNI: Ente Nazionale Italiano di Unificazione.
DIN: Deutscher Normenausschuss (DNA).
NF: Association Française de Normalisation (AFNOR).
BS: British Standards Institution (BSI).
ISO: International Organization for Standardization.

2) Newton [N] is the force imparting an acceleration of 1 m/s^2 to a mass of 1 kg.

3) Kilogramme [kg] is the mass of the prototype kept at Sèvres (i.e. 1 dm^3 of distilled water at 4 °C).

4) Joule [J] is the work done when the point of application of a force of 1 N is displaced through a distance of 1 m.

2 - 产品说明

a - 减速机

主要结构特点

主要产品说明如下：

– **多样安装方式**，4个面上均带有整体式底脚；

– 合理的整体尺寸，以连接特殊的大功率电机，允许有**高额定**及**最大扭矩**的减速比存在，能承受**高载荷**的高、低速**轴端**

– 钢制**标准实心低速轴，**带**可定制**的螺杆孔

– **减速机：**机加工输入面带固定孔；高速带键轴端；

– **减速电机：**电机直接连接在带有4个胀紧用的开口槽和外置胀紧套（参考本书第10节）的空心高速轴内(Ø ⩾ 38)；

– **滚子轴承：**除一些轴（高速轴）上使用圆柱滚子轴承或球轴承之外，其他均使用圆柱滚子轴承（低速轴）和圆锥滚子轴承；

– **HT200整体式铸铁箱体**（型号100...360），标准：UNI ISO 185（型号140，180，225，280，360，400..451，采用球墨铸铁球墨铸铁，UNI ISO 1083），**带加强筋和高润滑油含量**；

– 油浴式润滑：合成或矿物油（第11节）带阀式注油塞、泄油塞及油位塞；

– 自然冷却或强制冷却（带内置热交换器，盘管水冷或带油/水热交换器的独立冷却单元，参考第11节）；

– 油漆：产品上涂有可耐正常工业环境的合成油漆，且适于多次喷涂合成油漆涂层，颜色为蓝色RAL 5010 DIN 1843;合成油漆的内部防护，可以阻挡矿物油或PAO合成油；

– **加长型箱体：**是在标准箱体的基础上发展来而的，在第一减速级小齿轮和齿轮之间增加一个惰轮，因此增大了输入轴和输出轴之间的距离。同时与标准产品具有相同的技术参数和使用性能，具体说明如下：

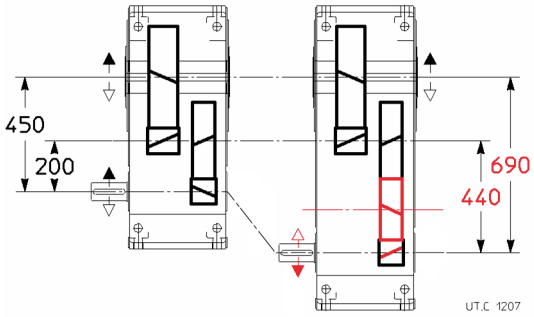
  – 相同的**输入和输出连接尺寸**（轴和B14输出法兰、电机型号）；

  – 同一减速比采用相同的**高速端装置**（轴和轴承）；

  – 相同的**底脚安装尺寸（**不包括尺寸A1）；
  – 相同的**减速比系列和性能；**
  – 相同的**电机和减速机组合；**
  – 相同的**热功率**（箱体加长）；
  – 相同的**附件和非标设计**；
  – 相同的**高品质等级**（设计方案，产品制造和测试，零件，整体式箱体，模块化和外观设计）

采用这种新的设计理念，加长型减速机得以成型，同时在高速轴滚子轴承和轴径方面，可以实现让富余的轴承的极低减速比成为可能。

除另外说明外，本样本中显示的**所有信息均可适用于标准型和加长型产品。**



R 2I 250 减速机，标准的UP2A与其相对应的加长型的UP4A（**专利申请中**）的比较：中心距，惰轮和旋转方向的不同是两者最主要的区别。

2 - Specifications

a - Gear reducer

Main structural features

Main specifications are:

– **universal** mounting having feet integral with housing on 4 faces;

– gear reducer overall sized so as to accept particularly powerful motors, to permit the transmission of **high** nominal and maximum **torques**, and to withstand **high loads** on the high and low speed **shaft ends**;

– **standard solid low speed shaft** made of steel with **customizable** screw shank hole;

– **gear reducers**: input face with machined with fixing holes; high speed shaft end with key;

– **gearmotors**: motor directly keyed into hollow high speed shaft provided (Ø ⩾ 38) with four cuts and **hub clamp** (see ch. 10);

– roller bearings: cylindrical roller bearings (low speed shaft) and tapered roller bearings, excluding some shafts (high speed shaft) on which bearings are cylindrical roller or ball type;

– **cast iron** single-piece (for size 100 ... 360) housing 200 UNI ISO 185 (**spheroidal** UNI ISO 1083 for sizes 140, 180, 225, 280, 360, 400 … 451) with **stiffening ribs and high oil capacity**;

– oil bath lubrication; synthetic or mineral oil (ch. 11) with filler plug with valve, drain and level plugs;

– natural or forced cooling (with inner heat exchanger, coil or independent cooling unit with oil/water heat exchanger, see ch. 11);

– paint: external coating in synthetic paint appropriate for resistance to normal industrial environments and suitable for the application of further coats of synthetic paint; colour blue RAL 5010 DIN 1843; internal protection with synthetic paint providing resistance to mineral oils or to polyalphaolefines synthetic oils;

– **«long» model**: it is derived from the standard one (completing it) through the addition of an **idle gear** between wheel and pinion of the first reduction stage hence allowing to **distance considerably** the input and output shafts, whilst maintaining the **same specifications and performances** as the standard model. In particular:
  – same **input and output coupling dimensions** (shafts and B14 output flange, motor sizes);
  – same **high speed shaft bearing** (shafts and bearings) with the same transmission ratio;
  – same **foot mounting dimensions** (A1 dimension excluded);
  – same **transmission ratios and performances**;
  – same **combinations of motors and gear reducers**;
  – same **thermal power** (thanks to the greater length of the housing);
  – same **accessories** and **non-standard designs**;
  – same **high quality level** (design solutions, production processes and tests, components, single-piece housing, modular and aesthetic design).

The «long» gear reducer obtained through this new design concept, makes possible to have also very low transmission ratios with proportioned and generous bearings in terms of high speed shaft roller bearings and shaft diameters.

Everything stated in this catalogue is to be intended **valid both for standard and long model**, except otherwise stated.

Comparison between the standard UP2A gear reducer R 2I 250 and the corresponding long model **UP4A** (**patent pending**): centre distances, idle gear and reversal of rotation directions are here highlighted.

2 - 产品说明

齿轮副：

- 2级圆柱齿轮副；
- 2级圆柱齿轮副和1个惰轮（加长型）；
- 2种型号，其最后一级中心距服从R10优先数系（100，125）；11种型号其最后一级中心距服从R20优先数系（140...450，3对型号：标准和加强型），一共16种型号
- 额定减速比（i_N =6.3...25）服从R20优先数系（100，125型号服从R10优先数系）；
- 渗碳淬火轮副：16CrNi4或20MnCr5钢（根据型号）和8NiCrMo5钢，标准:UNI EN 10084;
- 斜齿圆柱齿轮副，齿形经研磨；
- 齿轮承载能力经轮齿破损和点蚀计算；

噪音等级：

标准产品声功率级L_{WA} [dB(A)]1)和平均声压级L_{pA} [dB(A)]2)的数值，是在额定载荷，输入转速n_1 = 1 400 min^{-1} 3)的情况下得到的数据。公差值在+3 dB(A) 左右。

1) 标准：ISO 8579-1.

2) 平均值是在空旷的场地内的反射表面上，距离减速机外表面1m处测量的数值。

3)对于n_1=710-1800min^{-1}，表格内数值需更改：因此n_1 = 710 min^{-1}, -3 dB(A); n_1 = 900 min^{-1}, -2 dB(A); n_1 = 1 120 min^{-1}, -1 dB(A); n_1 = 1 800 min^{-1}, +2dB(A).

型号 Size	$i_N \leq 14$		$i_N \geq 16$	
	L_{WA}	L_{pA}	L_{WA}	L_{pA}
100	**84**	75	**81**	75
125, 140	**87**	77	**84**	77
160, 180	**90**	79	**87**	79
200, 225	**93**	82	**90**	82
250, 280	**96**	85	**93**	85
320 ... 360	**100**	89	**97**	89
400 ... 451	**105**	93	**102**	93

如果为减速电机（电机由Rossi提供），4极50Hz电机，表中数值增加1dB(A),4极60Hz电机表中数值增加2dB(A)。

如有需要，可提供低噪音等级（比表中数值低3dB(A)）的减速机：请咨询我们。

详细参考标准

- 额定减速比和主要尺寸根据UNI2016标准编号制定。UNI 2016 (DIN 323-74, NF X 01.001, BS 2045-65, ISO 3-73);
- 齿轮齿形根据UNI6587-69 (DIN 867-86, NF E 23.011, BS 436.2-70, ISO 53-74);
- 轴径根据 UNI 2946-68 (DIN 747-76, NF E 01.051, BS 5186-75, ISO 496-73);
- B14和B5固定法兰（后者带定位螺栓«凹槽»）根据UNEL 13501-69 (DIN 42948-65, IEC 72.2);
- 中等系列固定孔根据 UNI 1728-83 (DIN 69-71, NF E 27.040, BS 4186-67, ISO/R 273);
- 圆柱轴端（长型或短型）根据UNI ISO 775-88 (DIN 748, NF E 22.051, BS 4506-70, ISO/R775) 带螺纹孔UNI 9321 (DIN 332 BI. 2-70, NF E 22.056) 不包括d-D直径比。
- 除一些特定情况下，电机与减速机连接的键高比标准值低之外，其他平键均依照UNI 6604-69 (DIN 6885 BI. 1-68, NF E 27.656 e 22.175, BS 4235.1-72, ISO/R/773-69)
- 安装方式依照CEI 2-14 (DIN EN 60034-7, IEC 34.7);
- 在运行时间≥ 25 000 h的情况下，承载能力校核根据UNI 8862, DIN 3990, AFNOR E 23-015, ISO 6336

2 - Specifications

Train of gears:

- 2 cylindrical gear pairs;
- 2 cylindrical gear pairs and 1 idle gear («long» model);
- 2 sizes, with final reduction centre distance to R 10 (100 and 125); 11 sizes with final reduction centre distance to R 20 series (140 ... 450, with 3 size pairs: standard and strengthened), for a total of 16 sizes;
- nominal transmission ratios (i_N = 6,3 ... 25) to R 20 series (R 10 series for sizes 100 and 125);
- casehardened and hardened gear pairs in 16CrNi4 or 20MnCr5 steel (depending on size) and 18NiCrMo5 steel, according to UNI EN 10084;
- helical toothed cylindrical gear pairs with ground profile;
- gears load capacity calculated for tooth breakage and pitting.

Sound levels

Standard production sound power level L_{WA} [dB(A)]1) and mean sound pressure level L_{pA} [dB(A)]2) assuming nominal load, and input speed n_1 = 1 4003) min^{-1}. Tolerance +3 dB(A).

1) To ISO 8579-1.

2) Mean value of measurement at 1 m from external profi-le of gear reducer standing in free field on a reflecting surface.

3) For n1 710 ÷ 1 800 min^{-1}, modify tabulated values: thus n_1 = 710 min^{-1}, -3 dB(A); n_1 = 900 min^{-1}, -2 dB(A); n_1 = 1 120 min^{-1}, -1 dB(A); n_1 = 1 800 min^{-1}, +2 dB(A).

In case of gearmotor (motor supplied by ROSSI MOTORIDUTTORI) add 1 dB(A) to the values in the table for 4 poles 50 Hz motors, and add 2 dB(A) for 4 poles 60 Hz motors.

If required, gear reducers can be supplied with reduced sound levels (normally 3 dB(A) less than tabulated values): consult us.

Specific standards

- nominal transmission ratios and main dimensions according to UNI 2016 standard numbers (DIN 323-74, NF X 01.001, BS 2045-65, ISO 3-73);
- tooth profiles to UNI 6587-69 (DIN 867-86, NF E 23.011, BS 436.2-70, ISO 53-74);
- shaft heights to UNI 2946-68 (DIN 747-76, NF E 01.051, BS 5186-75, ISO 496-73);
- fixing flanges B14 and B5 (the latter with spigot «recess») taken from UNEL 13501-69 (DIN 42948-65, IEC 72.2);
- medium series fixing holes to UNI 1728-83 (DIN 69-71, NF E 27.040, BS 4186-67, ISO/R 273);
- cylindrical shaft ends (long or short) to UNI ISO 775-88 (DIN 748, NF E 22.051, BS 4506-70, ISO/R775) with tapped butt-end hole to UNI 9321 (DIN 332 BI. 2-70, NF E 22.056) excluding d-D diameter ratio;
- parallel keys to UNI 6604-69 (DIN 6885 BI. 1-68, NF E 27.656 and 22.175, BS 4235.1-72, ISO/R/773-69) except for specific cases of motor-to-gear reducer coupling where key height is reduced;
- mounting positions derived from CEI 2-14 (DIN EN 60034-7, IEC 34.7);
- load capacity verified according to UNI 8862, DIN 3990, AFNOR E 23-015, and to ISO 6336 for running time ⩾ 25 000 h.

b - 推力头

主要结构特点

为适合单螺杆挤出机连接，在挤出侧设置**辅助的外置推力头**，2种支撑类型：标准**N**型（更经济，标准应用），高负载**H**型（重载）

在减速机和挤出机之间使用承载能力强的推力球面滚子轴承，这一设计可以承受挤出机运行中产生的巨大轴向负荷。挤出机侧设置的推力头可有效降低减速机箱体产生的应力变形，提高啮合精度和可靠性。

这一具体结构方案的使用，允许使用标准减速机配备特定的实心低速轴，以确保其：承载力、运行精度（承载力大的圆柱滚子轴承支撑高硬度的实心低速轴）、测试性能、可靠性和产品服务。

定制化服务

我们不仅可以提供标准设计产品（N，H型），还可提供定制产品（其他客户需要的附件），例如：

– 驱动设备推力头的连接尺寸可定制（关于孔的数量、位置和尺寸，请咨询我们）

– **适配法兰，**安装在挤出机和推力头之间，以实现更多的应用功能，请咨询我们。

– **独立冷却单元**，带油/水热交换器-持续冷却减速机和挤出支撑-可 根据需要定制保护装置，测量工具和报警信号；所需要的功率，尺寸，功能方案和附件，请参看具体文件：请咨询我们。

b - Extruder support

Main structural features

Auxiliary external support on extruder side in order to have **single screw extruder** coupling; 2 types of support: normal **N** (more economical, for standard applications) and high **H** loads (for heavy duties).

The generously dimensioned spherical roller thrust bearing, interposed between gear reducer and extruder, makes this design suitable to withstand **heavy axial loads** generated during the extruder running. The **position of extruder support on machine side** allows indeed to limit the stress and deformation of gear reducer housing for a greater meshing precision and reliability.

The particular construction solution adopted allows the use of the **standard gear reducer** equipped with specific solid low speed shaft, assuring: strength, precision (thanks to rigidity of low speed shaft supported by generously dimensioned cylindrical roller bearings), tested performance, reliability and service.

Customizations

The product was not only foreseen for **standard** designs (design N, H) but also for customizations (accessories on request, as well), such as:

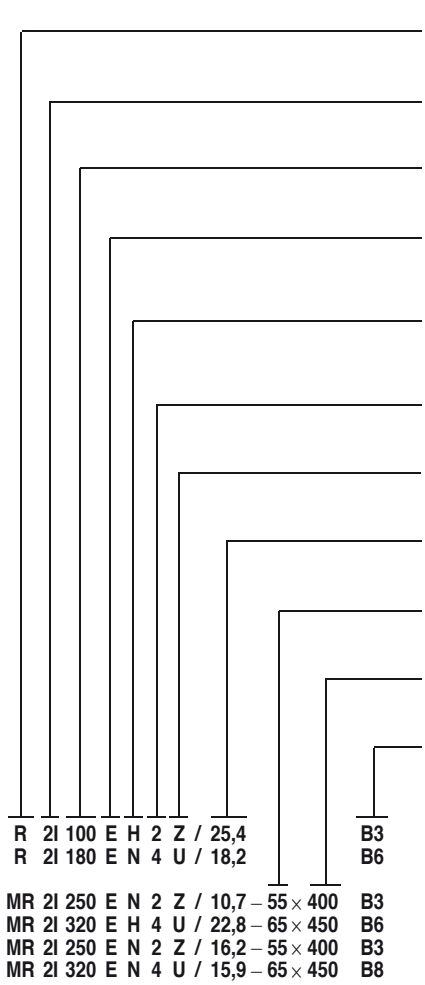
– extruder support **coupling dimensions** of driven machine are «**customized**» (consult us for number, position and dimension of the holes);

– **adaptation flange** interposed between extruder support and extruder, for the maximum application versatility: consult us;

– **independent cooling unit** with oil/water heat exchanger – for the simultaneous cooling of gear reducer and extruder support – which can be customized on request with protections, measuring instruments and alarm signals; for powers, dimensions, functional scheme and accessories on request, see specific documentation: consult us.

3 - 型号标记说明

3 - Designation



R **MR**	减速机 减速电机	gear reducer gearmotor
2I	2级圆柱齿轮副	2 cylindrical gear pair
100 ... 451		
E		
N **H**	标准负载 高负载	normal loads high loads
1, 2 **4**	标准型 (cap.8) 加长型 (cap.8)	standard (ch.8) long (ch.8)
Z, S **U, C**	输入端异侧(cap.8) 输入端同侧(cap.8)	opposite to input side (ch.8) input side (ch.8)
6,41 ... 28,8		
24 ... 80		
200 ... 660		
B3, ...	见第8节	see ch. 8

在技术条件允许的情况下，产品型号需完整描述出输入转速n_1 和挤出螺杆柄部连接尺寸(ØDc × Ec)；如果柄部轴肩必须与孔底在同一平面，请咨询我们。

例如: R 2I 100 EH2Z / 15,2 B3
n_1 = **1 800 min^{-1}**
螺杆柄部 45 × 90

MR 2I 180 EH4U / 14,4 – 42×350 B3
n_1 = **1 800 min^{-1}**
螺杆柄部 45 × 90,轴肩在底部

如电机由Rossi提供，其型号描述请参考TX11样本:

例如: MR 2I 180 EH4U / 14,4 – 42×350 B3
HB2 160L 4 400-50 B5

如果电机由客户[2]提供，完整的型号描述，应增加**“电机自备”**。

例如.: MR 2I 180 EH4U /14,4 – 42×350 B3
n_1 = 1 800 min^{-1}
螺杆柄部 45 × 90, 轴肩在底部
电机自备

如所需减速机，减速电机或推力头不同于上述所展示的，订货时需详细描述（参考第12节）。

1) 为简化说明，型号描述中的安装方式（参考第8节）仅指底脚安装，即使减速电机是多样安装方式。
2) 客户自备电机时，其配合面需依照标准等级（IEC 72-1）进行加工，且由客户自费将电机发至我们工厂，由我公司进行组装。
3) 可选的电机连接尺寸请参考第10节。

The designation is to be completed stating input speed n_1 and mating dimensions of the extruder screw shank (ØDc × Ec) specifying – upon technical approval; consult us – when the shoulder must be on the hole bottom.

Eg.: R 2I 100 EH2Z / 15,2 B3
n_1 = **1 800 min^{-1}**
screw shank 45 × 90

MR 2I 180 EH4U / 14,4 – 42×350 B3
n_1 = **1 800 min^{-1}**
screw shank 45 × 90, shoulder on the bottom

Where the motor is supplied by ROSSI MOTORIDUTTORI it has to be designated according to cat. TX:
Eg.: MR 2I 180 EH4U / 14,4 – 42×350 B3
HB2 160L 4 400-50 B5

Where the motor is supplied by the Buyer[2], complete designation by adding **motor supplied by us**.
Eg.: MR 2I 180 EH4U /14,4 – 42×350 B3
n_1 = 1 800 min^{-1}
screw shank 45 × 90, shoulder on the bottom
motor supplied by us

In the event of a gear reducer, gearmotor or extruder support being required in a design different from those stated above, specify it in detail (ch. 12).

1) To make things easier, the designation of mounting position (see ch. 8) is referred to foot mounting only, even if gearmotors are in universal mounting.
2) The motor supplied by the Buyer must be with mating surfaces machined under «standard» rating (IEC 72-1) at least and is to be sent carriage and expenses paid to our factory for fitting to the gear reducer.
3) See ch. 10, for possible motor coupling dimensions.

4 - 服务系数*fs*

服务系数是减速机性能计算和校核时必须要参考的数值，其数值是基于不同的工况（载荷类型，运行时间，启动频率，输出速度及其他因素）确定的。

样本中所列的功率和扭矩值均为额定值，即f_s=1时的值。

4 - Service factor *fs*

Service factor *fs* takes into account the different running conditions (nature of load, running time, frequency of starting, speed n_2, other considerations) which must be referred to when performing calculations of gear reducer selection and verification.

The powers and torques shown in the catalogue are nominal, i.e. valid for *fs* = 1.

服务系数：依据**载荷类型**和**运行时间**确定（此表中的数值与右表中的数值相乘）　…依据输出转速n_2确定

Service factor based: on the **nature of load** and **running time** (this value is to be multiplied by the values shown in the tables alongside).　… on **output** speed n_2.

从动机的载荷类型 Nature of loads of the driven machine	运行时间 Running time			
	12 500 h 4 h/d	**25 000 h** 8 h/d	**50 000 h** 16 h/d	**80 000 h** 24 h/d
均匀载荷 **Uniform**	–	1,00	1,18	1,32
中等冲击载荷 (均匀载荷的1.6倍) **Moderate overloads** (1,6 × normal load)	1,12	1,25	1,50	1,70
重载冲击载荷 (均匀载荷的2.5倍) **Heavy overloads** (2,5 × normal load)	1,50	1,70	2,00	2,24

n_2 min^{-1}	
560 ÷ 355	1,25
355 ÷ 224	1,18
224 ÷ 140	1,12
140 ÷ 90	1,06
⩽ 90	1,00

一般来说，选型时，建议选用服务系数***fs*** **⩾1,5**；如需高可靠性等级产品，根据具体情况服务系数需乘以**1,25 ÷ 1,4**范围内的一个数值。

In general, **it is recommended to use a service factor *fs* ⩾1,5**; when a **high** degree of reliability is required multiply fs by **1,25 ÷ 1,4**.

5 - 热功率　***Pt*** [kW]

对于一个正确的选型来说，必须依照表中所列数值评估推力头和减速机的热功率。

推力头

必须评估推力头的热功率值，以校核表中所列的热功率指数是否满足以下条件：

$$\text{热功率指数} \geqslant \frac{n_2^{1,12} \cdot F_{ad} \cdot (D + d)}{40\,000\,000}$$

式中：

n_2 [min^{-1} 低速轴转速
D, d [mm] 推力轴承的外径和内径值（见下表）
F_{ad} 轴向动载荷

5 - Thermal power ***Pt*** [kW]

For a proper selection it's necessary to evaluate both the extruder support and the gear reducer thermal power as stated below.

Extruder support

It is necessary to evaluate the thermal power of the extruder support verifying that the thermal index stated in the table satisfies the following condition:

$$\text{thermal index} \geqslant \frac{n_2^{1,12} \cdot F_{ad} \cdot (D + d)}{40\,000\,000}$$

where:

n_2 [min^{-1}] speed of low speed shaft;
D, d [mm] external and internal diameters of thrust bearing (see following table);
F_{ad} [N] axial dynamic force.

温度 T [°C]	热功率指数 - Thermal index																			
	N型推力头 design **N** 型号- size 轴承 - bearing **294...** $D + d$								H型推力头 design **H** 型号- size 轴承 - bearing **294...** $D + d$											
	140	**160**	**180**	**200**	**225**	**250**	**280**	**320, 321**	**100**	**125**	**140**	**160**	**180**	**200**	**225**	**250**	**280**	**320, 321**	**360**	**400, 401**	**450, 451**
	...17E	**...17E**	**...20E**	**...22E**	**...26E**	**...30E**	**...34E**	**...40E**	**...12E**	**...16E**	**...18E**	**...20E**	**...22E**	**...26E**	**...30E**	**...34E**	**...38E**	**...48E**	**...52E**	**...56E**	**...64E**
	265	*265*	*310*	*340*	*400*	*450*	*510*	*600*	*190*	*250*	*280*	*310*	*340*	*400*	*450*	*510*	*570*	*680*	*740*	*800*	*900*
10	300	300	400	500	630	950	950	1 500	150	236	355	355	450	560	710	950	1 060	1 500	1 500	2 120	2 120
20	**265**	**265**	**355**	**450**	**560**	**850**	**850**	**1 320**	**132**	**212**	**315**	**315**	**400**	**500**	**630**	**850**	**950**	**1 320**	**1 320**	**1 900**	**1 900**
30	236	236	315	400	500	750	750	1 180	118	190	280	280	355	450	560	750	850	1 180	1 180	1 700	1 700
40	200	200	265	335	425	630	630	1 000	100	160	236	236	300	375	475	630	710	1 000	1 000	1 400	1 400
50	160	160	212	265	335	500	500	800	80	125	190	190	236	300	375	500	560	800	800	1 120	1 120

如所校核热功率值无法满足要求，可使用**盘管水冷**（请咨询我们）或**独立冷却单元**带油/水热交换器（参考第12节）。

根据需要，依据客户的工况-载荷情况（轴向动载荷F,n_2）和ISO 281标准，可提供推力球轴承的寿命计算。

Whenever the verification is not satisfactory use **water cooling**, **with coil** (consult us) or **independent cooling unit** with oil/water heat exchanger (see ch. 12).

On request, the product is supplied with the **calculation** of **thrust bearing life**, according to ISO 281, considering the load conditions (*F* axial dynamic, n_2) of Customer application.

5 - 热功率 *Pt* [kW]

减速机

额定热功率Pt_N（如表1）是在连续运转，输入转速$n_1 \leq 1\,400$ min^{-1}，最高海拔1000m，风速≥ 1,25 m/s（宽阔，空气自由流动的环境）时，加载到减速机输入端的功率。风速< 0,63 m/s（环境狭小，空气流通受阻），大概油温不超过**95 °C** 时，请咨询我们。

热功率*Pt*的确定是基于额定热功率值Pt_N，并考虑实际输入转速n_1，安装方式和冷却方式共同确定的，公式如下：

$$Pt = Pt_N \cdot ft_1 \cdot ft_2 \cdot ft_3$$

Pt_N, ft_1, ft_2, ft_3的值见下表。

因此，必须校核使输入功率P_1小于热功率 ***Pt***，如大于，根据需要安装盘管水冷（表4）或独立冷却单元带油/水热交换器（参考第12节）。

5 - Thermal power *Pt* [kW]

Gear reducer

The nominal thermal power Pt_N (table 1) is that power which can be applied at the gear reducer input side when operating on continuous duty, with input speed n1 $\leq$ 1 400 min^{-1}, max altitude 1 000 m and air speed 1,25 m/s (wide environment with free air motion); for air speed < 0,63 m/s (narrow environment with restricted air motion), consult us, without exceeding **95 °C** approximately oil temperature.

The **thermal power *Pt*** should be determined starting from the nominal Pt_N considering the actual input speed n_1, the mounting position and the cooling system, as following:

$$Pt = Pt_N \cdot ft_1 \cdot ft_2 \cdot ft_3$$

Values of Pt_N, ft_1, ft_2, ft_3 are given in the following tables.

Therefore, **it is necessary to verify that the applied power *P*1 would not exceed the thermal power *Pt***, making provision – if required – for water cooling (table 4) or independent cooling unit with oil/water heat exchanger (see ch. 12).

表 1. 不同型号减速机和最高环境温度下的额定热功率值Pt_N（同样适用于加长型减速机）
Table 1. Gear reducer nominal thermal powers Pt_N (also valid for **long** model) as a function of **size** and **maximum ambient temperature**.

最高环境温度 Maximum ambient temperature °C	减速机型号 - Gear reducer size Pt_N [kW]												
	100	**125**	**140**	**160**	**180**	**200**	**225**	**250**	**280**	**320, 321**	**360**	**400, 401**	**450,451**
10	22,4	33,5	37,5	50	56	80	90	125	140	200	224	315	355
20	**20**	**30**	**33,5**	**45**	**50**	**71**	**80**	**112**	**125**	**180**	**200**	**280**	**315**
30	18	26,5	30	40	45	63	71	100	112	160	180	250	280
40	15	22,4	25	33,5	37,5	53	60	85	95	132	150	212	236
50	11,8	18	20	26,5	30	42,5	47,5	67	75	106	118	170	190

表 2. 基于输入转速n_1下的热功率因数ft_1
Table 2. Thermal factor ft_1 depending on input speed n_1.

Velocità entrata n_1 [min^{-1}] Input speed n_1 [min^{-1}]	ft_1
$n_1 \leq$ **1 400**	1
1 400 < $n_1 \leq$ **1 800**	0,9
1 800 < $n_1 \leq$ **2 000**	0,85
2 000 < $n_1 \leq$ **2 240**	0,8
2 240 < $n_1 \leq$ **2 500**	0,75

表 3.基于不同安装方式下的热功率因数 ft_2
Table 3. Thermal factor ft_2 depending on mounting position.

规格 size	ft_2				
	B3, B8	**B6**		**B7**	
		$i_N \leq 14$	$i_N \geq 16$	$i_N \leq 14$	$i_N \geq 16$
100 ... 140	1	1	1	1	1
160, 180	1	0,85	1	0,71	1
200, 225	1	0,85	1	0,71	1
250, 280	1	0,85	1	0,71	0,71
320 ... 360	1	0,85	0,85	0,71	0,71
400 ... 451	1	0,9	0,9	0,8	0,8

表 4. 基于不同冷却方式下的热功率因数ft_3
Table 4. Thermal factor ft_3 depending on cooling system.

冷却系统 Cooling system	ft_3
自然对流 Natural convection	1
水冷 Water cooling	(cap.12) (ch. 12)

当热功率校核不通过时，除了预先配置的冷却系统外，还可以安装带热交换器的独立冷却单元（参考第12节），此时请咨询我们。

如果最高环境温度超过 40 °C或低于0 °C或为间歇工作制，请咨询我们。

Whenever the thermal verification should not be satisfied, in spite the prearrangement of cooling systems, it is possible to install an independent cooling unit with a heat exchanger (see ch. 12); consult us.

In case of maximum ambient temperature above 40 °C or below 0 °C and/or intermittent duty cycle, consult us.

6 - 产品选型

确定减速机型号

– 提供所有必要的数据：请参考第4节，确定减速机所需的输出功率P_2，输出转速n_2和输入转速n_1，运行条件（载荷类型，运行时间，环境温度，安装方式，输入连接类型等等）。

–提供所有必要的挤出螺杆参数：直径，柄部直径和长度，工作压力。

–根据工况确定服务系数f_S。（参考第4节）

–根据n_2, n_1和$P_{N2} \geq P_2 \cdot f_S$（参考第7节），来确定减速机型号和减速比$i$。

–根据推推力球面滚子轴承额定负荷选择推力头类型（N，H）。

–运用公式P_2 / η，来计算减速机输入端所需要的功率P_1，η =0.96（型号400...451为0.97）是减速机的传递效率（参考第10节）。当由于电机标准化，加载在减速机输入端的装机功率P_1要比减速机所需要的功率要大（考虑到电机/减速机传递效率），此时必须确保超出的功率永远不会被用到（参考第4节）。

否则，选型时，P_{N2}需乘上一个系数，即P_1装机/ P_1需求。也可根据扭矩来计算选型，此时，对于比较低的n_2值用这种方法更合理。

– 如果电机和减速机之间为带驱动，此时必须要：

– 选择合适的皮带数量和类型，包括皮带制造商推荐的安全系数，以传递所有的电机功率；

– 确定皮带轮直径；

– 校核径向力（参考第9节）。

校核

–根据第9节中的说明和给定的数值，校核高速轴上可能存在的径向力。

—过载时，必须校核使最大扭矩（参考第10节)总是小于2 M_{N2}，如果大于或在上述情况下无法确定过载值时，需安装安全装置，使得最大扭矩无法超过2M_{N2}.

–校核可能需要的强制冷却方式（参看第5节）。

–根据第4节的说明校核推力头的热功率指数。

–根据ISO 281标准，考虑到减速机运行中，挤出螺杆产生的动态轴向力，校核推力轴承的额定寿命：

$$L_{10} = \frac{10^6}{n_2 \cdot 60} \cdot \left(\frac{C}{F_{ad}}\right)^{\frac{10}{3}} \quad [h]$$

式中 n_2 [min^{-1}] 是低速轴转速，C [kW] 推力轴承额定动载荷（参考第8节），F_{ad} [kN] 是加载在推力轴承上的轴向动载荷。

– 校核由于所选电机重量和力臂（参考第10节）而使电机安装法兰端产生的最大弯矩。

选型注意事项

电机功率

选型时，需将减速机或其他存在的驱动设备（若有）的传动效率计算在内，电机功率应与从动机所需的额定功率尽可能的接近，建议进行精确的计算。

同时也需考虑到超大型电机的情况：高启动电流，低功率因数和传递效率，驱动设备上的高应力。

输入转速

最大输入转速已在旁边的表中给定；也可接受间歇工作制或特定需求的高速；请咨询我们。

表中也给出了$n_1 > 1\,400$ min^{-1}时的额定功率和额定扭矩。对于不同的n_1值，按照$n_{1\,max}$ 进行选型，但需根据 $n_{1\,min}$ 进行校核。

型号 Size	$n_{1\,max}$ min^{-1}	P_{N2}	M_{N2}
100 ... 180	2 800	1,925	0,965
200, 225	2 500	1)	1)
250, 280	2 240	1,560	0,975
320 ... 360	2 000	1,400	0,980
400 ... 451	1 800	1,260	0,980

1) 见第7节。

当减速机和电机之间为带传动，选型时，为提供在机械性能和经济方面均具有优势的最佳驱动单元，需要检查输入转速n_1。除特殊工况外，输入转速不应高于1 400 min^{-1}，最好是利用减速比并使输入转速低于900 min^{-1}.

6 - Selection

Determining the gear reducer size

– Make available all necessary data: required output power P_2 of gear reducer, speeds n_2 and n_1, running conditions (nature of load, running time, ambient temperature, mounting position, input connection type, ecc.) with reference to ch. 4.
– Make available all extruder screw specifications: external diameter, shank diameter and length, extrusion pressure.
– Determine service factor f_S on the basis of running conditions (ch. 4).
– Select the gear reducer size and the transmission ratio i on the basis of n_2, n_1 and of a power P_{N2} greater than or equal to $P_2 \cdot f_S$ (ch. 7).
– Select extruder support design (N, H) according to thrust bearing load rating.
– Calculate power P_1 required at input side of gear reducer using the formula P_2 / η, where η = 0,96 (0,97 for sizes 400 … 451) is the efficiency of the gear reducer (ch. 10). When for reasons of motor standardization, power P_1 applied at input side of gear reducer turns out to be higher than the power required (considering motor/gear reducer efficiency), it must be certain that this excess power applied will never be required (ch. 4).
Otherwise, make the selection by multiplying P_{N2} by: P_1 applied / P_1 required. Calculations can also be made on the basis of torque instead of power; this method is even preferable for low n_2 values.
– When there is a belt drive between motor and gear reducer, it is necessary to:
– select the number and the type of belts suitable to transmit the whole motor power, included safety factor recommended by belt's manufacturer;
– determine the pulley diameters
– verify the radial load (see ch. 9).

Verifications

– Verify possible radial load on high speed shaft by referring to instructions and values given in ch. 9.
– When there are overloads verify that the maximum torque peak (ch. 10) is always less than 2 · M_{N2}; if it is higher or cannot be valuated in the above cases, install a safety device so that 2 · M_{N2} will never be exceeded.
– Verify, possible need for forced cooling (ch. 5).
– Verify extruder support thermal index according to the instructions given at ch. 4.
– Verify, according to ISO 281, the thrust bearing nominal life considering the dynamic axial force generated by extruder screw during running:

$$L_{10} = \frac{10^6}{n_2 \cdot 60} \cdot \left(\frac{C}{F_{ad}}\right)^{\frac{10}{3}} \quad [h]$$

where n_2 [min^{-1}] is the speed of the low speed shaft, C [kW] is the dynamic load rating of the thrust bearing (see. ch. 8) F_{ad} [kN] is the axial dynamic force acting on thrust bearing.
– Verify the maximum bending moment at the motor mounting flange due to the selected motor weight and its moment arm (see ch. 10).

Consideration on selection

Motor power

Taking into account the efficiency of the gear reducer, and other drives – if any – motor power is to be as near as possible to the power rating required by the driven machine: accurate calculation is therefore recommended.
An oversized motor would involve: greater starting current, lower power factor and efficiency, higher stress on the drive.

Input speed

Maximum input speed is given in the table; for intermittent duty or for particular needs higher speeds may be accepted; consult us.
The table gives also nominal power and torque variation for $n_1 > 1\,400$ min^{-1}. For variable n_1, the selection should be carried out on the basis of $n_{1\,max}$; but it should also be verified on the basis of $n_{1\,min}$.
When there is a belt drive between motor and gear reducer, different input speeds n_1 should be examined in order to select the most suitable unit from engineering and economy standpoints alike. Input speed should not be higher than 1 400 min^{-1}, unless conditions make it necessary; better to take advantage of the transmission, and use an input speed lower than 900 min^{-1}.

7 - 减速比 *i* ，额定输出扭矩 M_{N2} [N m] ，额定输出功率 P_{N2} [kW]
7 - Transmission ratios *i*, nominal torques M_{N2} [N m] and powers P_{N2} [kW]

		减速机型号 - Gear reducer size																		
		100			**125**			**140**			**160**			**180**			**200**		
i_N	n_1	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}
	min^{-1}		N m	kW		N m	kW		N m	kW		N m	kW		N m	kW		N m	kW
6,3	**2 500**	*6,42*	1 160	47,2	*6,53*	2 320	93	–	–	–	*6,41*	4 620	189	–	–	–	*6,42*	10 600	434
	1 500		1 190	29,1		2 380	57		–	–		4 760	117		–	–		10 900	268
	1 000		1 210	19,8		2 430	39		–	–		4 880	80		–	–		11 200	182
	700		1 240	14,1		2 480	27,8		–	–		4 980	57		–	–		11 400	130
8	**2 500**	*8,01*	1 290	42,2	*8,26*	2 590	82	–	–	–	*8,03*	5 790	189	–	–	–	*8,01*	11 900	388
	1 500		1 330	26,1		2 660	51		–	–		5 960	117		–	–		12 200	239
	1 000		1 360	17,8		2 720	34,5		–	–		6 110	80		–	–		12 400	163
	700		1 380	12,7		2 770	24,6		–	–		6 230	57		–	–		12 700	116
9	**2 500**	–	–	–	–	–	–	9,22	3 340	95	*9,24*	5 810	165	*9,31*	6 710	189	*8,85*	11 900	351
	1 500		–	–		–	–		3 440	59		5 980	102		6 910	117		12 200	216
	1 000		–	–		–	–		3 530	40		6 120	69		7 080	80		12 400	147
	700		–	–		–	–		3 600	28,6		6 240	49,5		7 220	57		12 700	105
10	**2 500**	*10,2*	1 290	33	*10,7*	2 590	63	10,2	3 700	95	*10,3*	5 810	148	*10,7*	7 690	189	*10,2*	11 900	303
	1 500		1 330	20,4		2 660	39		3 810	59		5 980	91		7 930	117		12 200	187
	1 000		1 360	13,9		2 720	26,6		3 900	40		6 120	62		8 120	80		12 400	127
	700		1 380	9,9		2 770	18,9		3 980	28,6		6 240	44,4		8 290	57		12 700	91
11,2	**2 500**	–	–	–	–	–	–	11,9	3 900	86	*11,9*	5 810	128	*11,8*	8 300	184	*11,2*	11 900	277
	1 500		–	–		–	–		4 020	53		5 980	79		8 550	113		12 200	171
	1 000		–	–		–	–		4 120	36,3		6 120	54		8 740	77		12 400	116
	700		–	–		–	–		4 210	25,9		6 240	38,5		8 920	55		12 700	83
12,5	**2 500**	*12,3*	1 290	27,5	*13,1*	2 590	52	13,3	3 790	74	*13,6*	5 660	109	*13,6*	8 050	154	*13*	11 600	234
	1 500		1 330	17		2 660	32		3 910	46,1		5 830	67		8 300	95		11 900	144
	1 000		1 360	11,6		2 720	21,8		4 000	31,4		5 970	46		8 490	65		12 100	98
	700		1 380	8,3		2 770	15,6		4 080	22,5		6 090	32,9		8 670	46,6		12 400	70
14	**2 500**	–	–	–	–	–	–	14,7	3 790	67	*14,1*	5 810	108	*14,4*	8 390	153	*13,9*	12 100	229
	1 500		–	–		–	–		3 910	41,7		5 990	67		8 640	94		12 500	141
	1 000		–	–		–	–		4 000	28,5		6 120	45,6		8 840	64		12 700	96
	700		–	–		–	–		4 080	20,3		6 240	32,5		9 000	45,8		12 800	67
16	**2 500**	*16,1*	1 320	21,6	*15,8*	2 650	43,7	15,1	3 990	69	*15,7*	5 950	99	*16,6*	8 140	128	*16,1*	12 100	198
	1 500		1 360	13,3		2 720	27		4 040	42,2		6 130	61	2)	8 390	79		12 500	122
	1 000		1 390	9,1		2 780	18,4		4 040	28,1		6 260	41,9		8 590	54		12 700	83
	700		1 400	6,4		2 800	13		4 040	19,7		6 300	29,5		8 750	38,6		12 800	58
18	**2 500**	–	–	–	–	–	–	17,6	3 990	60	*18,1*	5 950	86	*18*	7 440	108	*17,6*	12 100	181
	1 500		–	–		–	–		4 120	36,8		6 130	53		7 660	67		12 500	111
	1 000		–	–		–	–		4 220	25,1		6 260	36,3		7 840	45,6		12 700	76
	700		–	–		–	–		4 250	17,7		6 300	25,5		7 990	32,5		12 800	53
20	**2 500**	*19,3*	1 320	17,9	*19,3*	2 650	35,9	19,6	3 880	52	*20,7*	5 800	73	*20,8*	8 250	104	*20,3*	11 800	152
	1 500		1 360	11,1		2 720	22,2		3 990	31,9		5 980	45,4		8 500	64		12 200	94
	1 000		1 390	7,5		2 780	15,1		4 090	21,8		6 110	31		8 700	43,9		12 400	64
	700		1 400	5,3		2 800	10,6		4 120	15,4		6 150	21,8		8 750	30,9		12 500	45
22,4	**2 500**	–	–	–	–	–	–	21,7	3 650	44,1	*22,5*	5 480	64	*23,3*	7 780	87	*22,2*	11 200	132
	1 500		–	–		–	–		3 760	27,2		5 640	39,4		8 010	54		11 500	81
	1 000		–	–		–	–		3 840	18,5		5 770	26,8		8 200	36,8		11 700	55
	700		–	–		–	–		3 870	13,1		5 800	18,9		8 250	25,9		11 800	39
25	**2 500**	*23,7*	1 150	12,7	*24,1*	2 300	25	24,1	3 340	36,3	*24,6*	5 030	53	*25,4*	7 100	73	*24,2*	10 300	111
	1 500		1 190	7,9		2 360	15,4		3 440	22,4		5 160	32,9		7 300	45,2		10 600	69
	1 000		1 210	5,4		2 410	10,5		3 520	15,3		5 270	22,4		7 460	30,8		10 800	47
	700		1 220	3,77		2 430	7,4		3 550	10,8		5 300	15,8		7 500	21,7		10 900	33
28	**2 500**	*28,8*	1 030	9,4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		1 060	5,8		–	–		–	–		–	–		–	–		–	–
	1 000		1 080	3,93		–	–		–	–		–	–		–	–		–	–
	700		1 090	2,77		–	–		–	–		–	–		–	–		–	–
n_{1max} 2)		**2 800** min^{-1}															**2 500** min^{-1}		

1) 对于输入转速在1500 min^{-1}至$n_{1\,max}$之间，其对应的额定输出扭矩M_{N2}和额定输出功率P_{N2}见第6节。
2) 对于减速电机Ød ≤ 48, 其减速比等于16.3（其额定输出扭矩 M_{N2} 需乘以0.824，额定输出功率 P_{N2} 乘以0.843）。

1) For M_{N2} and P_{N2} value variations between 1 500 min^{-1} and $n_{1\,max}$ see ch. 6.
2) For gearmotors with Ød ≤ 48, the transmission ratio is equal to 16,3 (multiply M_{N2} by 0,824 and P_{N2} by 0,843).

7 - 减速比 i，额定输出扭矩 M_{N2} [N m]，额定输出功率 P_{N2} [kW]
7 - Transmission ratios i, nominal torques M_{N2} [N m] and powers P_{N2} [kW]

		减速机型号 - Gear reducer size																	
		225			**250**			**280**			**320**			**321**			**360**		
i_N	n_1	i	M_{N2}	P_{N2}	i	M_{N2}	P_{N2}	i	M_{N2}	P_{N2}	i	M_{N2}	P_{N2}	i	M_{N2}	P_{N2}	i	M_{N2}	P_{N2}
	min^{-1}		N m	kW		N m	kW		N m	kW		N m	kW		N m	kW		N m	kW
6,3	**2 500**	–	–	–	*6,53*	21 300	854	–	–	–	*6,41*	–	–	*6,41*	–	–	–	–	–
	1 500		–	–	3)	21 900	527		–	–	3)	37 100	907	3)	43 800	1 070		–	–
	1 000		–	–		22 400	359		–	–		38 300	626		44 900	732		–	–
	700		–	–		22 800	256		–	–		39 500	451		45 800	523		–	–
8	**2 500**	–	–	–	*8,26*	23 800	754	–	–	–	*8,03*	–	–	*8,03*	–	–	–	–	–
	1 500		–	–	3)	24 500	465		–	–	3)	42 700	836	3)	53 300	1 040		–	–
	1 000		–	–		25 000	317		–	–		43 700	570		54 500	710		–	–
	700		–	–		25 500	226		–	–		44 600	407		55 500	507		–	–
9	**2 500**	*8,88*	15 000	442	*9,19*	–	–	*9,22*	–	–	*9,24*	–	–	*9,24*	–	–	*9,31*	–	–
	1 500		15 500	274		24 500	418		31 700	540	3)	42 700	726	3)	53 300	906	3)	63 600	1 070
	1 000		15 900	187		25 000	285		32 400	368		43 700	495		54 500	617		65 100	732
	700		16 200	134		25 500	203		33 000	263		44 600	354		55 500	440		66 400	523
10	**2 500**	*9,95*	16 500	435	*10,7*	–	–	*10,4*	–	–	*10,3*	–	–	*10,3*	–	–	*10,7*	–	–
	1 500		17 000	269		24 500	358		33 700	508	3)	42 700	652	3)	53 300	813	3)	67 400	991
	1 000		17 400	183		25 000	244		34 500	347		43 700	445		54 500	554		69 000	676
	700		17 800	131		25 500	174		35 200	248		44 600	317		55 500	395		70 300	483
11,2	**2 500**	*11,5*	16 500	377	*11,8*	–	–	*11,9*	–	–	*11,5*	–	–	*11,5*	–	–	*11,8*	–	–
	1 500		17 000	233		24 500	325		33 700	444	3)	42 700	584	3)	53 300	728	3)	67 400	895
	1 000		17 400	159		25 000	222		34 500	303		43 700	398		54 500	496		69 000	610
	700		17 800	113		25 500	158		35 200	217		44 600	284		55 500	354		70 300	436
12,5	**2 500**	*12,8*	16 000	329	*13,1*	–	–	*13,3*	–	–	*13,4*	–	–	*13,4*	–	–	*13,1*	–	–
	1 500		16 500	204		23 800	286		32 800	386	3)	41 400	487	3)	50 500	594	3)	65 600	784
	1 000		16 900	139		24 300	195		33 500	264		42 400	332		51 600	404		67 100	534
	700		17 300	99		24 800	139		34 200	188		43 300	237		52 500	288		68 400	381
14	**2 500**	*14,6*	15 000	269	*14,6*	–	–	*14,7*	–	–	*14,3*	–	–	*14,3*	–	–	*14,4*	–	–
	1 500		15 500	167		22 500	242		30 900	330	3)	43 800	482	3)	53 500	589	3)	68 100	743
	1 000		15 900	114		23 000	165		31 600	225		44 800	328		54 800	402		69 700	507
	700		16 300	82		23 400	118		32 200	161		45 000	231		55 900	287		71 000	361
16	**2 500**	*15,6*	16 500	276	*16,2*	–	–	*15,7*	–	–	*15,9*	–	–	*15,9*	–	–	*16*	–	–
	1 500		16 500	166		25 000	243		32 100	321		43 800	432		54 600	539	3)	66 300	651
	1 000		16 500	110		25 500	165		32 500	217		44 800	295		55 700	367		67 800	444
	700		16 500	77		25 700	116		32 800	153		45 000	207		56 000	258		69 000	316
18	**2 500**	*18,1*	17 000	246	*17,8*	–	–	*17,9*	–	–	*17,8*	–	–	*17,8*	–	–	*18,3*	–	–
	1 500		17 500	152		25 000	221		34 500	302		43 800	387		54 600	482	3)	68 500	589
	1 000		17 900	104		25 500	150		35 300	206		44 800	264		55 700	328		70 100	402
	700		18 000	73		25 700	106		35 500	145		45 000	186		56 000	231		71 000	285
20	**2 500**	*20*	16 500	215	*19,7*	–	–	*20,1*	–	–	*20,6*	–	–	*20,6*	–	–	*20,3*	–	–
	1 500		17 000	133		24 300	194		33 500	262		42 500	323		51 700	393	3)	67 200	520
	1 000		17 400	91		24 800	132		34 300	179		43 500	221		52 800	268		68 700	354
	700		17 500	64		25 000	93		34 500	126		43 700	155		53 000	188		69 000	249
22,4	**2 500**	*23*	15 500	176	*22*	–	–	*22,2*	–	–	*22,8*	–	–	*22,8*	–	–	*23,4*	–	–
	1 500		16 000	109		23 000	164		31 600	224		40 100	275		47 500	327		63 300	426
	1 000		16 400	75		23 500	112		32 300	153		41 000	188		48 500	222		64 700	290
	700		16 500	53		23 600	79		32 500	108		41 200	132		48 700	156		65 000	204
25	**2 500**	*25*	14 100	148	*25*	–	–	*24,6*	–	–	*25*	–	–	*25*	–	–	*25,7*	–	–
	1 500		14 500	91		21 200	133		29 100	186		36 500	230		43 800	275		58 300	356
	1 000		14 900	62		21 700	91		29 800	127		37 300	156		44 800	188		59 700	243
	700		15 000	44		21 800	64		30 000	89		37 500	110		45 000	132		60 000	171
28	**2 500**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		–	–		–	–		–	–		–	–		–	–		–	–
	1 000		–	–		–	–		–	–		–	–		–	–		–	–
	700		–	–		–	–		–	–		–	–		–	–		–	–
n_{1max} 1)		**2 500** min^{-1}			**2 240** min^{-1}						**2 200** min^{-1}								

1)对于输入速度在1500 min^{-1}至n_{1max}之间，其对应的额定输出扭矩M_{N2}和额定输出功率P_{N2}见第6节。
3)仅适用于减速机，有关减速电机请咨询我们。

1) For M_{N2} and P_{N2} value variations between 1 400 min^{-1} and n_{1max} see ch. 6.
3) Gear reducer only; for gearmotor consult us.

7 - 减速比 *i* ，额定输出扭矩 M_{N2} [N m] ，额定输出功率 P_{N2} [kW]
7 - Transmission ratios *i*, nominal torques M_{N2} [N m] and powers P_{N2} [kW]

		减速机型号 - Gear reducer size											
		400			**401**			**450**			**451**		
i_N	n_1	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}	*i*	M_{N2}	P_{N2}
	min^{-1}		N m	kW		N m	kW		N m	kW		N m	kW
6,3	**2 500**	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		–	–		–	–		–	–		–	–
	1 000		–	–		–	–		–	–		–	–
	700		–	–		–	–		–	–		–	–
8	**2 500**	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		–	–		–	–		–	–		–	–
	1 000		–	–		–	–		–	–		–	–
	700		–	–		–	–		–	–		–	–
9	**2 500**	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		–	–		–	–		–	–		–	–
	1 000		–	–		–	–		–	–		–	–
	700		–	–		–	–		–	–		–	–
10	**2 500**	*9,86*	–	–	*9,86*	–	–	–	–	–	–	–	–
	1 500		78 500	1 250		90 600	1 440		–	–		–	–
	1 000		81 300	863		93 600	994		–	–		–	–
	700		83 800	623		96 300	716		–	–		–	–
11,2	**2 500**	*11,2*	–	–	*11,2*	–	–	*11,4*	–	–	*11,4*	–	–
	1 500		78 500	1 100		90 600	1 270		107 200	1 480		124 100	1 710
	1 000		81 300	760		93 600	875		110 800	1 020		126 400	1 160
	700		83 800	548		96 300	630		114 000	735		128 500	828
12,5	**2 500**	*12,4*	–	–	*12,4*	–	–	*12,9*	–	–	*12,9*	–	–
	1 500		80 100	1 010		92 300	1 170		107 200	1 310		123 100	1 500
	1 000		82 900	699		95 400	804		110 800	900		127 200	1 030
	700		85 400	504		98 000	579		114 000	648		130 900	744
14	**2 500**	*14,1*	–	–	*14,1*	–	–	*14,3*	–	–	*14,3*	–	–
	1 500		80 100	891		92 300	1 030		109 300	1 200		124 000	1 360
	1 000		82 900	615		95 400	707		112 900	826		127 100	930
	700		85 400	443		98 000	509		116 100	594		129 800	665
16	**2 500**	*16,3*	–	–	*16,3*	–	–	*16,2*	–	–	*16,2*	–	–
	1 500		77 900	752		89 600	865		109 300	1 060		125 400	1 210
	1 000		80 600	519		92 600	596		112 900	728		129 600	836
	700		83 000	374		95 200	429		116 100	524		133 200	601
18	**2 500**	*17,6*	–	–	*17,6*	–	–	*18,7*	–	–	*18,7*	–	–
	1 500		79 400	707		91 200	812		103 300	869		118 500	997
	1 000		82 100	487		94 200	559		106 600	598		122 300	686
	700		84 500	351		96 800	402		109 500	430		125 700	494
20	**2 500**	*20,3*	–	–	*20,3*	–	–	*20,3*	–	–	*20,3*	–	–
	1 500		79 400	613		91 200	705		111 300	861		127 700	988
	1 000		82 100	423		94 200	485		114 900	593		131 900	680
	700		84 500	305		96 800	349		118 100	426		134 600	486
22,4	**2 500**	*22,5*	–	–	*22,5*	–	–	*23,3*	–	–	*23,3*	–	–
	1 500		74 800	522		86 200	602		105 100	708		120 600	812
	1 000		77 400	360		89 200	415		108 500	487		124 400	558
	700		79 700	260		91 800	299		111 400	350		127 800	402
25	**2 500**	–	–	–	–	–	–	*25,7*	–	–	*25,7*	–	–
	1 500		–	–		–	–		96 800	591		111 300	680
	1 000		–	–		–	–		99 900	407		114 900	468
	700		–	–		–	–		102 600	293		118 100	337
28	**2 500**	–	–	–	–	–	–	–	–	–	–	–	–
	1 500		–	–		–	–		–	–		–	–
	1 000		–	–		–	–		–	–		–	–
	700		–	–		–	–		–	–		–	–
n_{1max} [1]		**1 800** min^{-1}											

1) 对于输入转速在1500 min^{-1}至$n_{1\,max}$之间，其对应的额定输出扭矩M_{N2}和额定输出功率P_{N2}见第6节。 1) For M_{N2} and P_{N2} value variations between 1 400 min^{-1} and $n_{1\,max}$ see ch. 6.

此页空白
This page is intentionally left blank

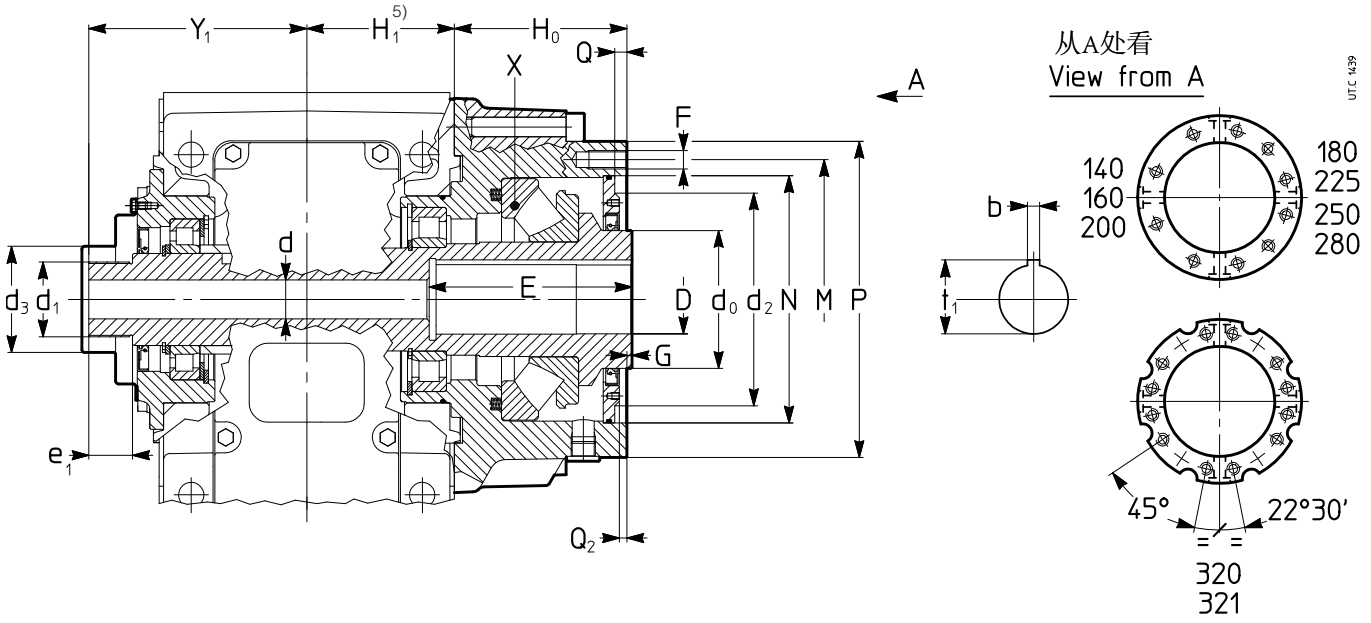
8 -产品设计，尺寸，安装方式和润滑油使用量

8 - Designs, dimensions, mounting positions and oil quantity

N型推力头

Extruder support N

140 ... 321



型号 Size	轴承 Bearing		N型设计 - Design **N**																		
	X	**C** kN	**D**[1] Ø H7	**E**[1) 4)]	**b**	**d** Ø	**d_0** Ø	**d_1** Ø	**d_2** Ø	**d_3** Ø ≈	**e_1**	**F**[2) 3)]	**G**	**H_0**	**M**[2)] Ø	**N**[2)] Ø H7	**P**[2)] Ø	**Q** 0 +0,5	**Q_2**	**t_1**	**Y_1** ≈
140	**294 17E**	633	40	103	12	34	110	M50 ×1,5	110	74	30	$M16^{8}$	1	131	208	180,5	240	8	8	43,3	165
160	**294 17E**	633	50	118	14	34	110	M65 ×2	110	84	40	$M16^{8}$	1	131	208	180,5	240	8	8	53,8	191
180	**294 20E**	863	60	133	18	34	120	M65 ×2	180	93	40	$M16^{12}$	1	150	243	215	275	10	6,5	64,4	190
200	**294 22E**	1 010	70	133	20	43	130	M85 ×2	200	113	45	$M20^{8}$	1	164	278	243	318	10	8,5	74,9	212
225	**294 26E**	1 380	80	158	22	43	160	M85 ×2	250	113	45	$M20^{12}$	1	182	318	283	358	10	5,5	85,4	224
250	**294 30E**	1 610	90	158	25	43	200	M85 ×2	319	143	45	$M24^{12}$	1,5	222	400	358	450	12	10,5	95,4	251
280	**294 34E**	2 020	100	188	28	43	200	M90 ×2	319	143	45	$M24^{12}$	1,5	222	400	358	450	12	10,5	106,4	267
320, 321	**294 40E**	2 760	110	188	28	72	240	M120×2	361	173	45	$M30^{12}$	1,5	277	535	483	595	12	8	116,4	306

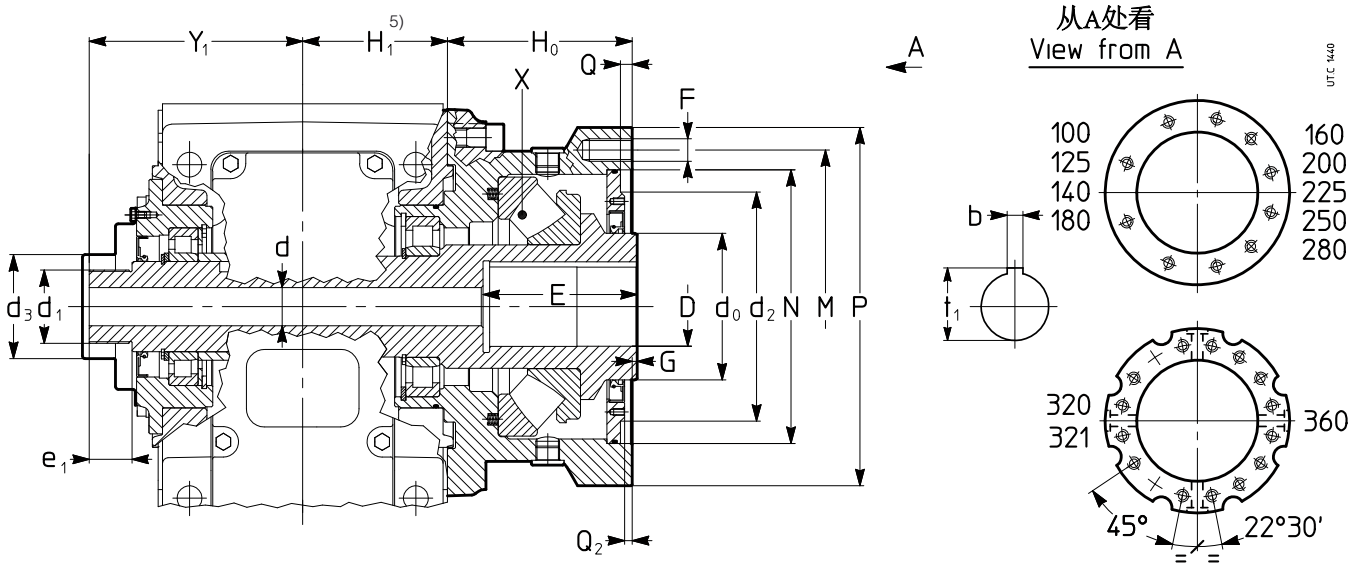
1) 根据需求可提供其他D × E 值，请咨询我们。
2) 根据需求可提供其他类型法兰，请咨询我们。
3) 螺纹工作长度2 · F.
4) 尺寸E包含退刀槽，通常大于螺杆柄部长度；技术条件允许的话，螺杆肩部必须与孔底在同一面上，并在产品描述中写明（参考第3节），请咨询我们。
5) 尺寸H_1，见第20...22页。

1) Other D×E values available on request: consult us.
2) Other flanges available on request: consult us.
3) Working length of thread 2 · F.
4) E dimension includes machining relief and is often higher than the shank length; when the screw shoulder must be on hole bottom – upon technical approval; consult us –, state it in full in the designation (see ch. 3).
5) For H_1 dimension, see pag. 20 ... 22.

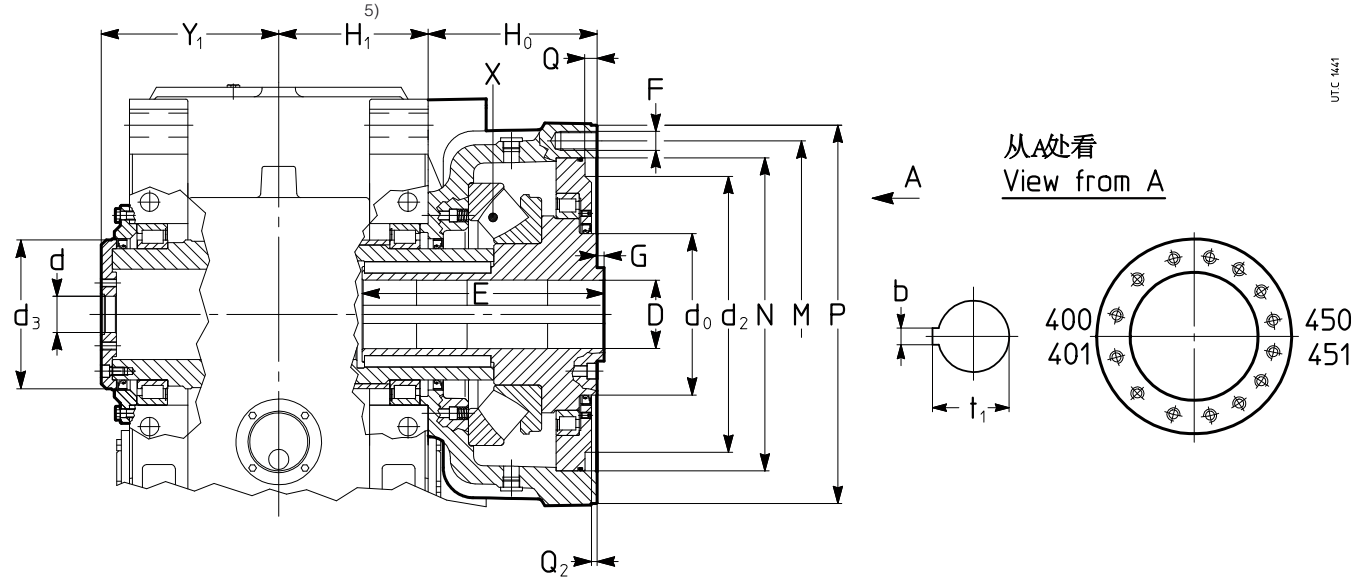
H型推力头

Extruder support H

100 ... 360



400 ... 451



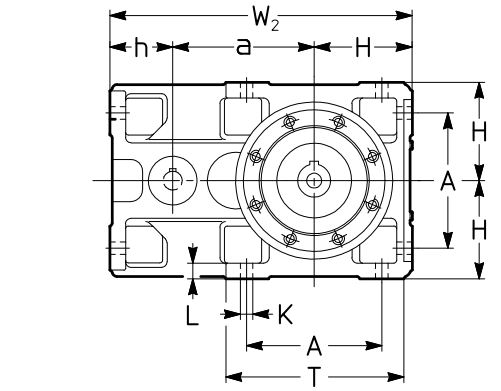
型号 Size	轴承 Bearing X	轴承 Bearing C	H型设计- Design H D[1]	E[1) 4)]	b	d	d_0	d_1	d_2	d_3	e_1	F[2) 3)]	G	H_0	M[2)]	N[2)]	P[2)]	Q	Q_2	t_1	Y_1
		kN	Ø H7			Ø	Ø	Ø	Ø	Ø ≈					Ø	Ø H7	Ø	0 +0,5			≈
100	**294 12E**	345	30	78	8	18	95	M35 ×1,5	95	59	25	$M12^{8}$	5	100	160	140	180	7	7	33,3	128
125	**294 16E**	575	40	103	12	27	110	M50 ×1,5	110	69	30	$M14^{8}$	1	120	208	180,5	240	8	8	43,3	148
140	**294 18E**	702	50	118	14	34	120	M50 ×1,5	180	74	30	$M16^{8}$	1	150	243	215	300	8	6,5	53,8	165
160	**294 20E**	863	60	133	18	34	120	M65 ×2	180	84	40	$M16^{12}$	1	150	243	215	300	8	6,5	64,4	191
180	**294 22E**	1 010	70	133	20	34	130	M65 ×2	200	93	40	$M20^{8}$	1	164	278	243	350	10	8,5	74,9	190
200	**294 26E**	1 380	80	158	22	43	160	M85 ×2	250	113	45	$M20^{12}$	1	182	318	283	380	10	5,5	85,4	212
225	**294 30E**	1 610	90	158	25	43	200	M85 ×2	272	113	45	$M24^{12}$	1	202	350	308	400	12	10,5	95,4	224
250	**294 34E**	2 020	100	188	28	43	200	M85 ×2	319	143	45	$M24^{12}$	1,5	222	400	358	450	12	10,5	106,4	251
280	**294 38E**	2 480	110	188	28	43	240	M90 ×2	344	143	45	$M30^{12}$	1,5	242	435	383	510	12	10,5	116,4	267
320, 321	**294 48E**	2 990	125	203	32	72	280	M120×2	361	173	45	$M30^{12}$	1,5	277	535	483	595	12	8	132,4	306
360	**294 52E**	3 510	140	203	36	72	280	M120×2	361	173	45	$M30^{16}$	1,5	277	535	483	595	12	8	148,4	325
400, 401	**294 56E**	4 310	135	393	36	72	320	–	563	295	–	$M36^{16}$	2	335	680	620	750	16	11,5	143,4	352
450, 451	**294 64E**	4 950	145	393	36	72	360	–	563	315	–	$M36^{16}$	2	335	680	620	750	16	11,5	153,4	352

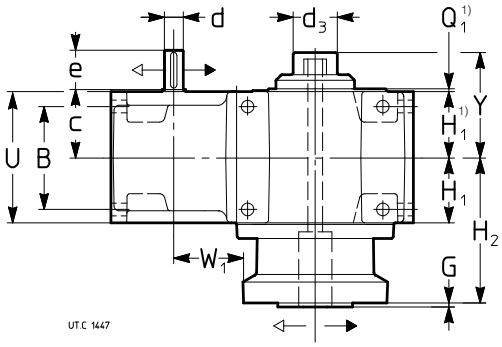
见上页说明。

See notes on previous page.

R 2I 100, 125

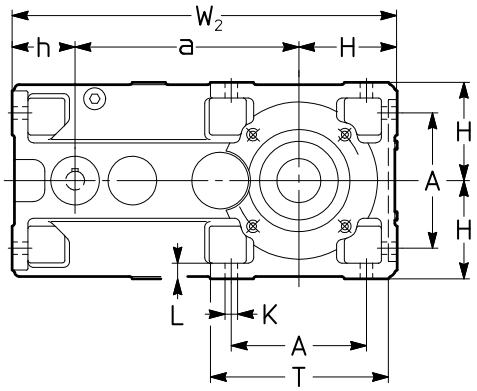
设计类型（旋转方向） **EH2Z**
Design (direction of rotation) **EH2Z**

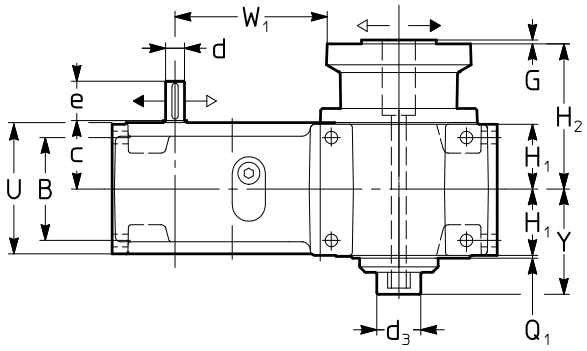




推力头 support **H**

设计类型（旋转方向） **EH4U**
Design (direction of rotation) **EH4U**





推力头 support **H**

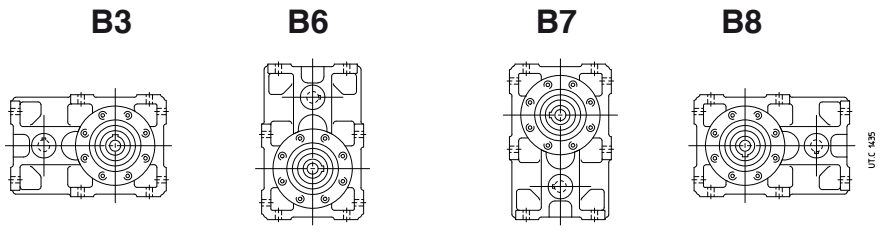
型号 Size	a ...2Z	a ...4U	A	B	c	d ∅ $i_N \leq 12,5$	e	d ∅ $i_N \geq 16$	e	d_3 ∅	G	H h11	H_1 1)	H_2	h h11	K ∅	L	Q_1 1)	T	U	W_1 ≈ ...2Z	W_1 ≈ ...4U	W_2 ≈ ...2Z	W_2 ≈ ...4U	Y	重量 [kg] Mass [kg] ...2Z	...4U
100	180	284,7	172	131	87	28	60	24	50	59	5	125	84,5	184,5	80	16	20	3,5	228	165	90	195	385	490	133	61	70
125	225	358	212	162	107	32	80	32	80	69	1	150	103,5	223,5	100	18	23	4	274	201	105	238	475	608	152	112	128

1) 可根据需要加工。

1) Machining on request.

安装方式和润滑油使用量[l]

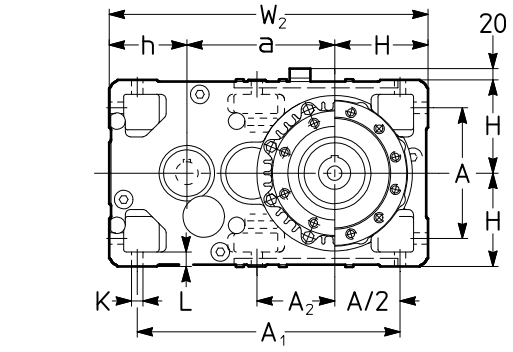
Mounting positions and oil quantities [l]

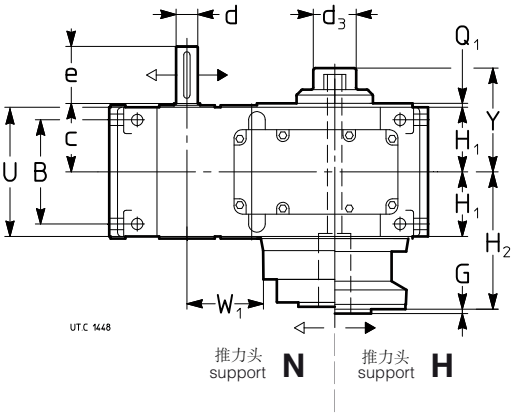


型号 Size	B3, B8 ...2Z	B3, B8 ...4U	B6 ...2Z	B6 ...4U	B7 ...2Z	B7 ...4U
100	3	5,1	8	9,9	6	8,3
125	6,1	9	10,4	17	8,5	14

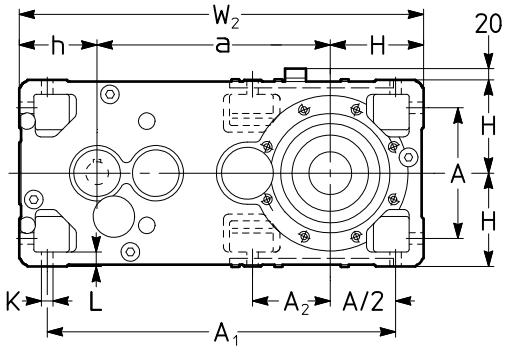
R 2I 140 ... 360

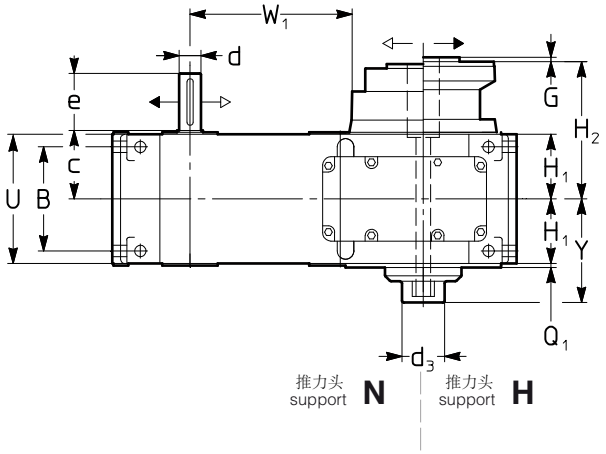
设计类型（旋转方向） **EN2Z, EH2Z**
Design (direction of rotation) **EN2Z, EH2Z**





设计类型（旋转方向） **EN4U, EH4U**
Design (direction of rotation) **EN4U, EH4U**



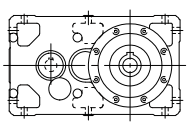


型号 Size	a ...2Z	a ...4U	A	A1 ...2Z	A1 ...4U	A2	B	c	d Ø	e	d3 Ø	G	H h11	H1	H2 EN...	H2 EH...	h h11	K Ø	L	Q1	U	W1 ≈ EN2Z	W1 ≈ EH2Z	W1 ≈ EN4U	W1 ≈ EH4U	W2 ...2Z	W2 ...4U	Y	重量 [kg] Mass [kg] EN2Z	EH2Z	EN4U	EH4U
140	240	373	212	427	560	127	162	107	32	80	74	1	150	103,5	234,5	253,5	125	18	23	4	201	104	102	237	235	515	648	170	147	154	163	170
160	285	450	252	507	672	–	201	132	42	110	84	1	180	128,5	259,5	278,5	150	22	28	4	249	149	147	314	312	615	780	196	219	229	247	257
180	305	470	252	527	692	170	201	132	42	110	93	1	180	128,5	278,5	292,5	150	22	28	5	249	137	130	302	295	635	800	196	258	272	286	300
200	360	556	320	635	831	–	250	162	55	110	113	1	225	158	322	340	180	27	34	5	307	184	180	380	376	765	961	218	406	420	454	468
225	385	581	320	660	856	223	250	162	55	110	113	1	225	158	340	360	180	27	34	5	307	180	185	376	381	790	986	231	471	487	520	536
250	450	690	396	791	1 031	–	310	200	70	140	143	1,5	280	195	417	417	225	33	42	5	380	196	196	436	436	955	1 195	258	777	798	859	880
280	480	720	396	821	1 061	277	310	200	70	140	143	1,5	280	195	417	437	225	33	42	5	380	235	232	475	472	985	1 225	274	849	875	934	960
320, 321	570	870	510	1 005	1 305	–	386	245	90	170	173	1,5	355	241	518	518	280	39	52	6	470	272	272	572	572	1 205	1 505	313	1 611	1 642	1 751	1 782
360	610	910	510	1 045	1 345	358	386	245	90	170	173	1,5	355	241	–	518	280	39	52	6	470	–	302	–	602	1 245	1 545	331	–	1 790	–	1 935

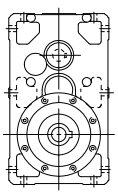
安装方式和润滑油使用量 [l]

Mounting positions and oil quantities [l]

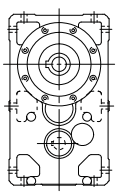
B3



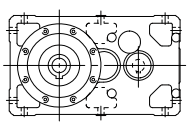
B6



B7



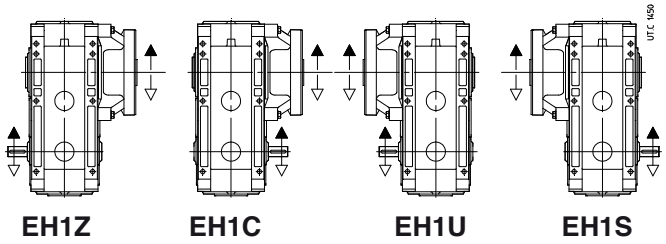
B8

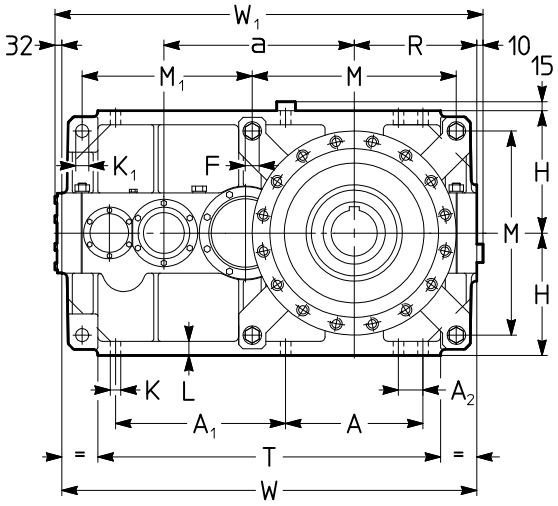


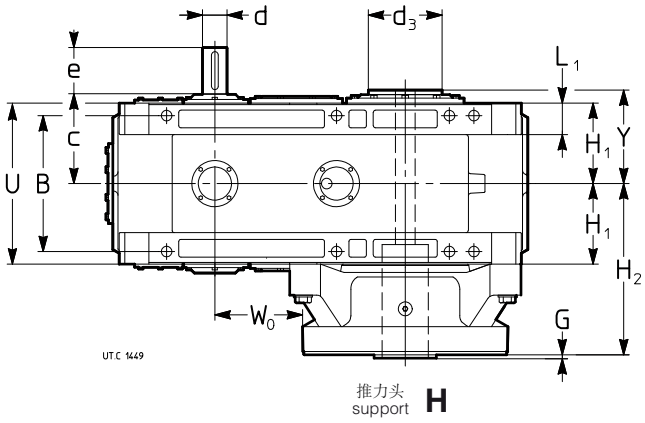
型号 Size	B3, B8 ...2Z	B3, B8 ...4U	B6 ...2Z	B6 ...4U	B7 ...2Z	B7 ...4U
140	6,8	9,4	12	18	10	16
160	11	16	20	31	17	28
180	12	17	21	32	18	29
200	21	29	37	56	32	51
225	22	30	40	58	34	53
250	40	53	70	102	60	94
280	43	55	76	106	65	98
320, 321	74	97	132	185	113	171
360	80	101	143	193	120	177

R 2I 400 ... 451

设计类型（旋转方向）
Design (direction of rotation)





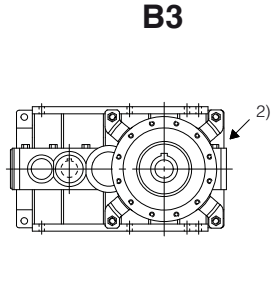


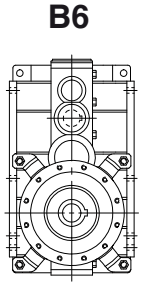
推力头
support **H**

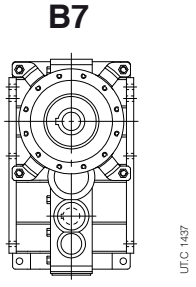
型号 Size	a	A	A_1 M_1	A_2	B	c	d ∅	e	d	e	d_3	G	H h11 R	H_1	H_2	K_1 ∅ H11	L	L_1	M	T	U	W_0 ≈	W	W_2	Y	重量 [kg] Mass [kg]
400, 401	700	505	625	90	500	330	$i_N \leq 11,5$ 110	210	$i_N \geq 12,5$ 90	170	295	2	450	296	631	48	52	116	750	1 260	580	273	1 525	1 567	352	3 120
450, 451	750	505	675	90	500	330	$i_N \leq 12,5$ 110	210	$i_N \geq 14$ 90	170	315	2	450	296	631	48	52	116	750	1 310	580	323	1 575	1 567	352	3 290

安装方式和润滑油使用量[1] [l]

Mounting positions and oil quantities[1] [l]







型号 Size	B3	B6,B7	推力头 Support
400, 401	125	224	20
450, 451	132	236	16

1) 表中显示的润滑油量是最大值，实际用量需根据具体的减速比和输入转速，由润滑油等级来确定。
2)根据箭头方向，从螺栓头位置看为B3安装方式。

1) Oil quantities indicated represent the maximum; the actual amount will be determined by the oil level depending on transmission ratio and input speed.
2) Mounting position B3 may be identified from the position of the screw-heads, as arrowed.

9 - 高速轴端径向力[1] F_{r1} [N]

由减速机和电机之间的驱动连接装置产生的，加载在减速机输入轴端的径向力必须小于等于相关表中给定的值。

由下列公式计算出的径向力F_{r1}，适用于最常见的驱动方式：

$$F_{r1} = \frac{28\,650 \cdot P_1}{d \cdot n_1}\ [N]$$ 同步带驱动

$$F_{r1} = \frac{47\,750 \cdot P_1}{d \cdot n_1}\ [N]$$ V型皮带轮驱动

式中：P_1 [kW] 是减速机输入端的需求功率，n_1 [min^{-1}]是输入转速，d [m]是带轮节圆直径。

表中给定的径向力值是在悬臂状态下载荷作用在高速轴端中心线上的，即作用在离轴肩0.5e处（e为轴长）。如力作用在0.315e处，径向力值需乘以1.25；如作用在0.8e处，径向力值乘以0.8.

通常建议皮带轮的位置与轴肩相抵，在任何情况下，都应避免皮带轮超出轴端。

9 - Radial loads[1] F_{r1} [N] on high speed shaft end

Radial loads generated on the shaft end by a drive connecting gear reducer and motor must be less than or equal to those given in the relevant table.
The radial load F_{r1} given by the following formula refers to most common drives:

$$F_{r1} = \frac{28\,650 \cdot P_1}{d \cdot n_1}\ [N]$$ for timing belt drive

$$F_{r1} = \frac{47\,750 \cdot P_1}{d \cdot n_1}\ [N]$$ for V-belt drive

where: P_1 [kW] is power required at the input side of the gear reducer, n_1 [min^{-1}] is the speed, d [m] is the pitch diameter.

Radial loads given in the table are valid for overhung loads on centre line of high speed shaft end, i.e. operating at a distance of 0,5 · e (e = shaft end length) from the shoulder. If they operate at 0,315 · e multiply by 1,25; if they operate at 0,8 · e multiply by 0,8.

It is always advisable **to mount the pulley against the shaft shoulder** and in any case to avoid that the pulley exceeds the shaft end.

n_1 min^{-1}	减速机型号- Gear reducer size						
	100	**125, 140**	**160, 180**	**200, 225**	**250, 280**	**320 ... 360**	**400 ... 451**
2 500	1 120	1 800	2 800	4 500	–	–	–
2 240	1 180	1 900	3 000	4 750	7 500	–	–
1 800	1 250	2 000	3 150	5 000	8 000	12 500	–
1 500	1 280	2 060	3 250	5 150	8 250	12 800	20 600
1 250	1 360	2 180	3 450	5 450	8 750	13 600	21 800
1 000	1 450	2 300	3 650	5 800	9 250	14 500	23 000
700	1 700	2 650	4 250	6 700	10 600	17 000	26 500
560	1 800	2 800	4 500	7 100	11 200	18 000	28 000
450	1 900	3 000	4 750	7 500	11 800	19 000	30 000
355	2 120	3 350	5 300	8 500	13 200	21 200	33 500

1) 当有轴向力和径向力同时作用时，轴向力不超过表中径向力值得0.2倍。如超过，请咨询我们。

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load. If exceeded consult us.

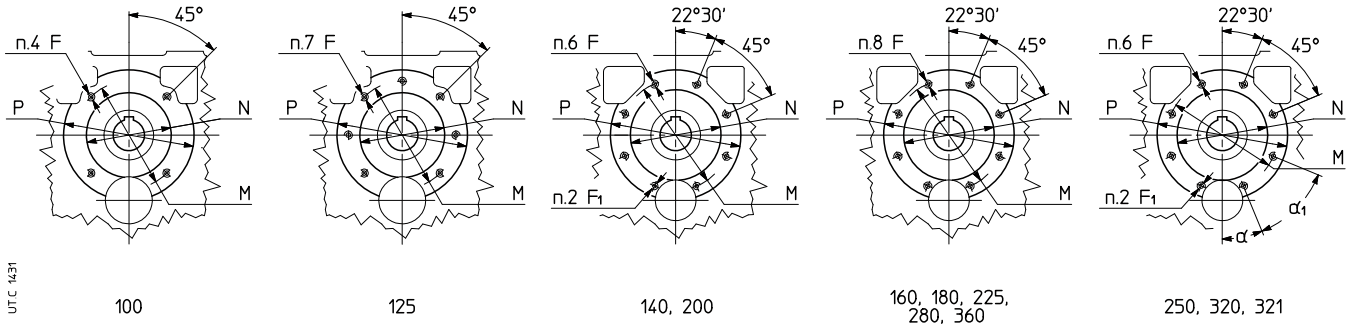
重要提示：在某些情况下（旋转方向，力的角位置等），表中给出的径向力值F_{r1}会增加。如有需要，**请咨询我们**。

IMPORTANT: tabulated values for radial load F_{r1} can increase considerably in certain instances (direction of rotation, angular position of load, etc.). **Consult us** if need be.

传动效率 η

2级圆柱齿轮副减速机E...2... η = 0,96，2级圆柱齿轮副E...1... η = 0,97，2级圆柱齿轮副带一个惰轮E...4... η = 0,95;对于$M_2 << M_{N2}$ η值将大大的减小：请咨询我们。

输出端-推力头对面



型号100...360 （对于型号100，125，仅适用于加长型）的减速机输出面具有带螺纹孔的机加工表面。

型号125上有8个通孔且所有孔径均相同，同样适用于140，200，250（孔径分别为Ø 15, 21, 25）。

1) 螺纹工作长度 2 · F.

型号 Size	F 1)	F_1 1)	M Ø	N Ø h6	P Ø	α	α_1
100	M12	–	165	130	200	–	–
125	M14	–	215	180	250	–	–
140	M14	M12	265	230	300	–	–
160	M16	–	265	230	300	–	–
180	M16	–	300	250	350	–	–
200	M20	M16	350	300	400	–	–
225	M20	–	400	350	450	–	–
250	M24	M20	500	450	550	23°30'	44°
280	M24	–	500	450	550	–	–
320 ... 321	M30	M30	600	550	660	30°	37°30'
360	M30	–	600	550	660	–	–

在标准减速机型号上安装滑轮，如果其安装面以轴肩定位（建议），有最大直径-在距离上 H1 + Q_1 + 3（参考第8节）-315（140型），400（180型），500（225型），630（280型），800（360型）。

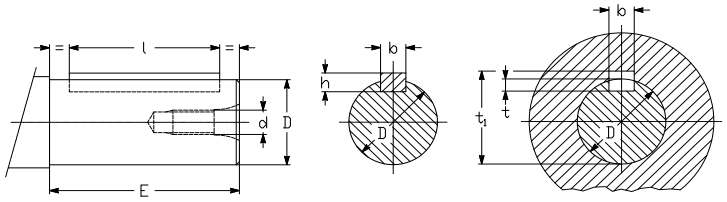
如所用皮带轮未从轴端伸出，且提供的最大径向力值可被测量到（参考第9节），此时可允许使用加大直径的皮带轮。如有需要请咨询我们。

挤出机螺杆套筒（机加工轴）

建议与减速机相接触的螺杆柄部轴肩直径值不低于1.25 D.

减速机输入面

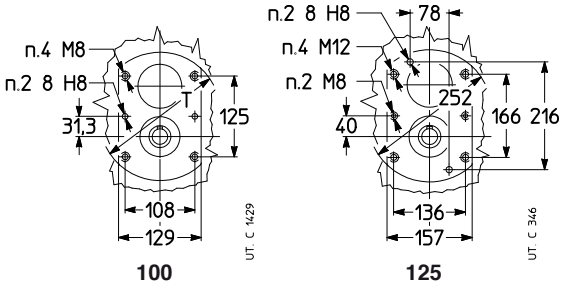
轴端 - Shaft end

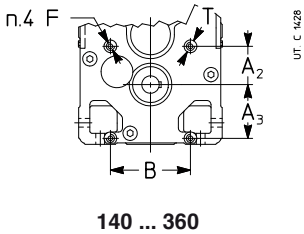


轴端 Shaft end D Ø	E	d Ø	平键 Parallel key b × h × l	键槽 Keyway b	t	t_1
24 j6	50	M8	8 × 7 × 45	8	4	21,7
28 j6	60	M8	8 × 7 × 45	8	4	31,2
32 k6	80	M10	10 × 8 × 70	10	5	35,3
42 k6	110	M12	12 × 8 × 90	12	5	45,3
55 m6	110	M12	16 × 10 × 90	16	6	59,3
70 m6	140	M16	20 × 12 × 125	20	7,5	74,9
90 m6	170	M20	25 × 14 × 140	25	9	95,4
110 m6	210	M24	28 × 16 × 180	28	10	116,4

UTC 723

为便于安装电机，100...360型减速机输入面有带螺纹孔的机加工表面。





型号 Size	A_1	A_2	A_3	B	F 1)	T Ø
140	138	81	113	162	M12	25
160, 180	165	96	135	201	M16	32
200, 225	207	115	162	250	M20	40
250, 280	258	143	203	310	M24	48
320 ... 360	327	180	252	386	M30	60

1) 螺纹工作长度2·F
如需螺栓，请咨询我们。

Efficiency η

For gear reducers with 2 gear pairs E...2... η = 0,96; with 2 gear pairs E...1... η = 0,97; with 2 gear pairs and 1 idle gear E...4... 0,95; for $M_2 << M_{N2}$ η could considerably decrease: consult us.

Output side opposite to extruder support

The gear reducer output face sizes **100 ... 360** (for sizes 100 and 125, long model only) has a machined surface with tapped holes.

The clearance holes must be 8 for size 125 as well and all of equal diameter for sizes 140, 200 and 250 (Ø 15, 21 and 25, respectively).

1) Working length of thread 2 · F.

In standard gear reducer models the perspective pulley, if mounted against shaft shoulder (always advisable), can have a maximum diameter - at the distance H1 + Q_1 + 3 (ch. 8) - of 315 (size 140), 400 (size 180), 500 (size 225), 630 (size 280), 800 (size 360).

The use of pulleys with larger diameter is allowed on condition that they don't overhang from the shaft end and provided that the maximum radial load values are observed (see ch. 9); consult us if need be.

Extruder screw spigot (machine shaft)

For the shoulder diameter of the screw shank abutting with the gear reducer it is advisable to adopt a value not lower than 1,25 · D.

Gear reducer input face

The gear reducer input face size 100 ... 360 has a machined surface with tapped holes for fitting motor mounting etc.

1) Working length of thread 2·F
If spigot is required, consult us..

减速机输入面

减速机输入面带有电机安装法兰（其最大允许弯矩 M_{bmax} 见下表），法兰上配有可与标准电机连接的螺栓和整体式空心高速轴，当d ≥38，空心轴上带有**轴向切口**和**胀紧套**。

带键和**胀紧套**的**键**连接系统能确保高的连接可靠性，易于安装和拆卸（无摩擦腐蚀），连接直线度好，结构紧凑。

空心高速轴带键，胀紧套（动态平衡）和轴向切口。

Hollow high speed shaft with keyway, hub clamp (dynamically balanced) and axial cuts.

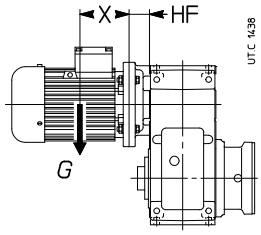
重要提示：选型时需校核：

$$M_b \leqslant M_{bmax}$$

式中：
$M_b = G \cdot (X + HF) / 100$ [N m]
G [daN] 电机重力
X [mm] 电机重力中心与法兰面之间的距离
HF [mm] 已在下表中列出

请注意最大弯矩值与电机安装法兰的强度有关。过长或过短的电机，即使其弯矩值远远小于最大允许值，运行过程中也可能造成电机异常振动。

在上述情况下，建议使用适当的辅助电机安装系统（参考电机详细资料）。



型号 Size	M_{bmax} [N m]
100	400
125	670
140	950
160, 180	1 320
200, 225	2 650
250, 280	5 300
320 ... 360	10 600

Gearmotor input face

The gearmotor input face has a motor mounting flange (see table for maximum allowable bending moment values M_{bmax}) including bolts for standardized motor and a hollow high speed shaft provided, for d ⩾ 38, with **axial cuts** and **hub clamp**.

The **keying system** with **key** and **hub clamp** ensures a high connection stability, easier installing and removal (absence of fretting corrosion), best alignment and compactness.

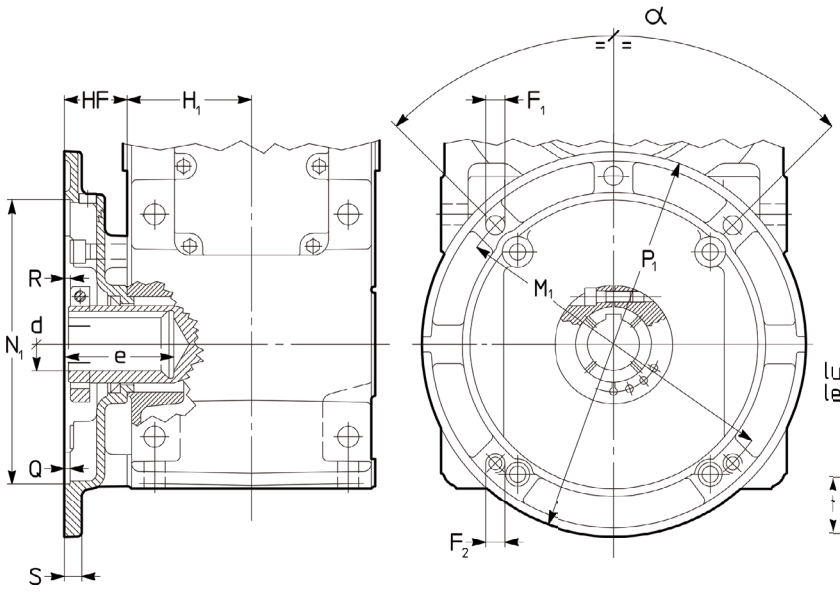
Important: always verify that

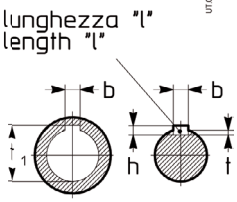
$$M_b \leqslant M_{bmax}$$

where:
$M_b = G \cdot (X + HF) / 100$ [N m]
G [daN] motor weight
X [mm] distance between motor centre of gravity and flange surface
HF [mm] given in the table

keeping in mind that the maximum bending moment value is relevant to the strength of the motor mounting flange. Excessive long and slim motors, even if the bending moment results lower than the maximum permissible value, may cause abnormal vibrations during running.

In these cases, it is advisable to adopt an adequate **auxiliary motor mounting system** (see motor specific literature).





孔 Hole		胀紧套 Hub clamb		平键 Parallel key		键槽 Keyway	
d[1] ∅	e	螺钉 Screw 2)	M_S[3] N m	b × h × l*	b	t	t_1 ±0,1
24	**53**	–	–	8 × 7 × 40	8	4	27,3
28	**63**	–	–	8 × 7 × 50	8	4	31,3
38	**83**	M8	25	10 × 8[4] × 70	10	5	40,2[6]
42	**113**	M12	143	12 × 8 × 90	12	5	45,3
48	**113**	M12	143	14 × 9 × 90	14	5,5	51,8
55	**113**	M12	143	16 × 10 × 90	16	6	59,3
60	**143**	M12	143	18 × 11 × 125	18	7	64,4
65	**143**	M12	143	18 × 11 × 125	18	7	69,4
75	**143**	M12	143	20 × 12[5] × 125	20	7,5	79,9[7]
80	**173**	M14	135	22 × 14 × 125	22	9	85,4

* 推荐长度值
1) 公差：d ⩽28为G6，d ⩾38为F6；
2) 性能等级：8.8（M12为12.9),标准：UNI 5931-84;
3) 拧紧力矩；
4) 100，125，140型中平键为10x7x70；
5) 200，225型中平键为 20x11x125;
6) 非标值；
7) 对于200，225型，t_1 = 78,8 (非标值）；

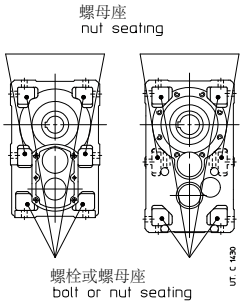
* Recommended length.
1) Tolerance: G6 for d ⩽ 28, F6 for d ⩾ 38.
2) UNI 5931-84 class 8.8 (12.9 for M12).
3) Tightening torque.
4) 10x7x70 for sizes. 100, 125 and 140.
5) 20x11x125 for sizes. 200 and 225.
6) Value **not** to standard.
7) For sizes 200 and 225 dimension t_1 = 78,8 (value **not** standard).

孔 Hole	法兰 Flange				减速机型号 - Gear reducer size																																			
					100					125					140					160, 180					200, 225					250, 280[2]					320 ... 360[2]				
d[1] ∅	P_1 ∅	M_1 ∅	N_1 ∅ H7	Q	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF	F_1 ∅	F_2 ∅	R	S	HF
24	**200**	165	130	4	11,5	M10	–	14	45																															
28	**250**	215	180	5	14	14	–	14	45	14	M12	–	16	55																										
38	**250**	215	180	5	14	14	15	16	65	14	M12	15	16	55	12	M12	14	16	55																					
	300	265	230	5	14	14	15	16	65	14	14	18,5	16	60,5	M12	M12	15	16	55																					
42	**350**	300	250	6						18	18	20	18	75	M16	18	20	18	75	M16	M16	20	18	75	M14	M14	10	18	67											
48	**350**	300	250	6						18	18	20	18	75	M16	18	20	18	75	M16	M16	20	18	75	M14	M14	10	18	67											
55	**400**	350	300	6																M16	18	8	18	65	M16	M16	8	18	67	M16	M16	6,5	18	65					
60	**400**	350	300	6																					M16	M16	34,5	20	97	M16	M16	32	20	95					
	450	400	350	6																18	18	35	20	95	18	18	35,5	20	97	18	18	34,5	20	95					
65	**400**	350	300	6																					M16	M16	22	20	97	M16	M16	22,5	20	95	M16	M16	17	20	85
	450	400	350	6																					18	18	26	20	97	18	18	23,5	20	95	M16	M16	17	20	85
	550	500	450	6																					18	18	22	22	97	18	18	23,5	22	95					
75	**450**	400	350	6																					18	18	26	20	97	18	18	23,5	20	95	M16	M16	17	20	85
	550	500	450	6																					18	18	22	22	97	18	18	23,5	22	95	18	18	23,5	22	95
80	**660**	600	550	7																										22	22	27	25	115	22	22	28	25	115

说明：$P_1 \leqslant 400$ 时 α = 90，$P_1 \geqslant 450$ 时 α = 45；
1)公差：d ⩽ 28为G6，d⩾ 38为F6；
2)对于EN4U和EH4U，请咨询我们。

Note: α = 90 for $P_1 \leqslant 400$; α = 45 for $P_1 \geqslant 450$.
1) Tolerance: G6 for d ⩽ 28, F6 for d ⩾ 38.
2) For EN4U and EH4U consult us.

减速机底脚紧固螺栓尺寸

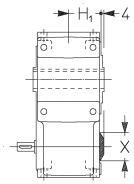


型号 Size	螺栓 Bolt UNI 5737-88 (l max)
100	M14 × 50
125, 140	M16 × 55
160, 180	M20 × 70
200, 225	M24 × 90
250, 280	M30 × 110
320 ... 360	M36 × 130
400 ... 451	M36 × 200

Fixing bolt dimensions for gear reducer feet

保护罩外形尺寸（型号125，140）

125，140型减速机和减速电机保护 罩(Ø72)安装在高速轴对侧，在尺寸H1的基础上向外延伸4mm,为逆止器的安装预留空间。



Cap overall dimension (sizes 125, 140)

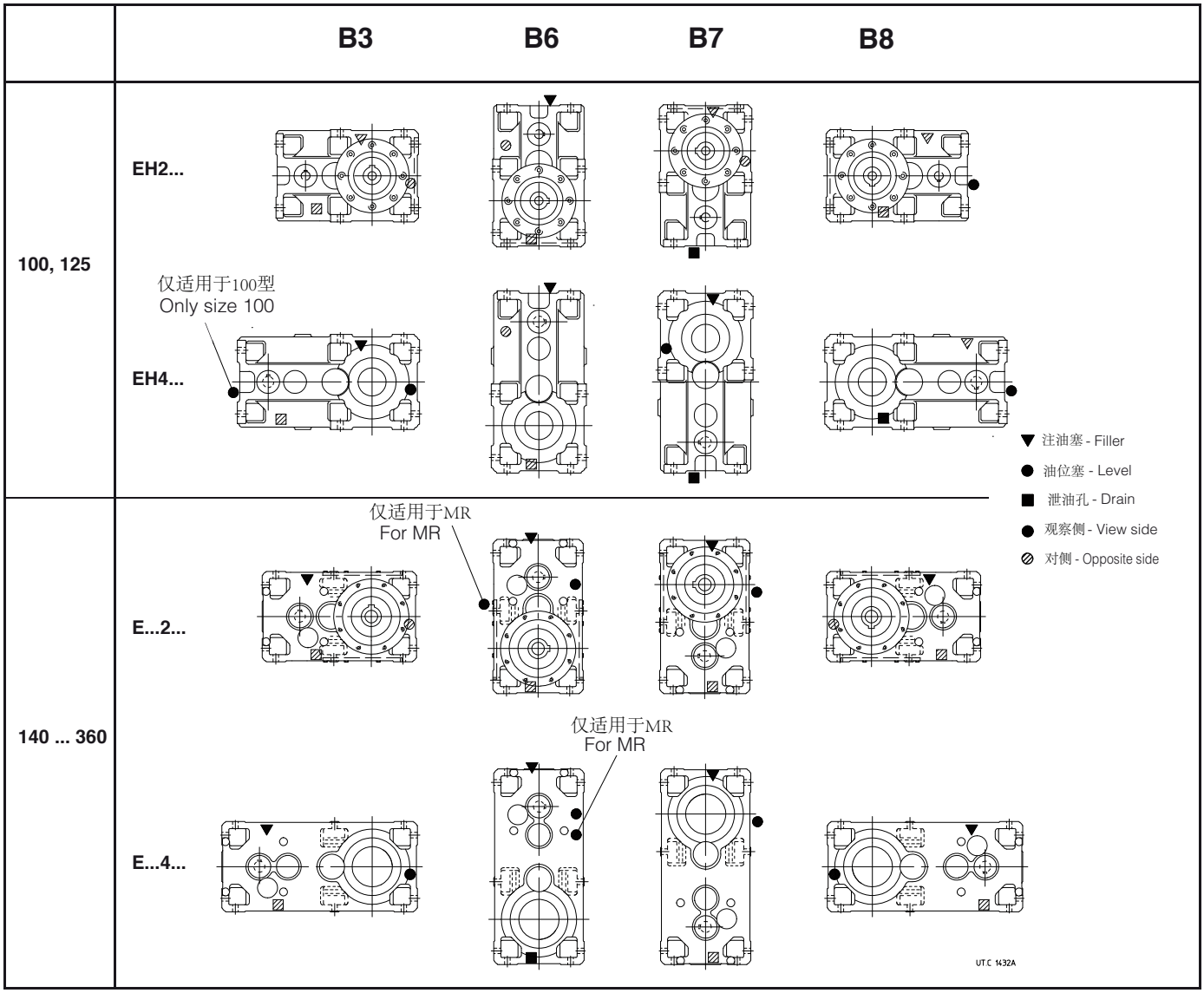
In the gear reducers and gearmotors sizes 125 and 140 the cap (Ø72), opposite side to the high speed shaft, projects 4 mm over the dimension H1, owing to the backstop device prearrangement.

螺塞孔位置和尺寸

下表展示了标准减速机螺塞孔类型和位置，非标设计请咨询我们。型号400...451，请咨询我们。

Plug position and dimension

The scheme show plug types and positions for standard gear rreducers. For non-standard design, consult us.
For sizes. 400 ... 451, consult us.



螺纹孔 Threaded holes	型号 - Size 100	125	140	160 ... 225	250 ... 280	320 ... 360
减速机 Gear reducer	1/2" G	1/2" G	1/2" G	3/4" G	3/4" G	1" G
推力头 Extruder support	M16×1,5	M16×1,5	1/2" G	1/2" G	3/4" G	3/4" G

11 - 安装和维护

综述

为了确保配合的稳定和无振动性，必须保证减速机或减速电机的配合面结构平整，水平，尺寸完整，并注意所有由于重量，扭矩，径向和轴向力所引起的传递力。减速机和减速电机的安装时应留有间隙以允许空气自由流通，冷却减速机和电机（尤其是在电机风扇侧）。

避免加热源靠近减速机，影响冷却空气的温度和减速机热量消散，造成减速机内部空气流通受阻或其他因素阻碍热量的稳定耗散。

安装在恶劣环境中的减速机或减速电机喷涂防腐油漆。可提供附加的防水油脂保护（尤其在油封旋转底座和轴端接触区）。

环境温度高于40 °C或低于 0 °C，请咨询我们。

接通减速电机之前，确保电机电压与输入电压相同。

如果减速机的旋转方向与产品描述不同，请将电机接线盒中的两个相位进行调换。

如有需要，可将热探针与辅助安全回路相连。

使用变阻器以限制峰值电压。

警告：轴承寿命，轴和联接装置的良好运行取决于轴间的对准精度。

安装时必须注意将减速机与电机和挤出机对齐，如有需要可使用弹性联轴器进行连接。

在任何情况下，润滑油泄露都会造成减速机的重大损害，所以应该增加检查频率或是预先安装合适的控制装置（如远程油位计量器，使用食品级润滑油等）。

在污染环境中，使用油封或其他适当的预防性措施防止润滑油污染。

减速机或减速电机未与符合2006/42/EC指令的设备组合使用之前，不能单独投入使用。

11 - Installation and maintenance

General

Be sure that the structure on which gear reducer or gearmotor is fitted is plane, levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence, keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads. Position the gear reducer or gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at motor fan side).

Avoid heat sources near the gear reducer that might affect the temperature of cooling-air and of gear reducer for radiation, insufficient air recycle or any other factor hindering the steady dissipation of heat.

For installation in a hostile environment protect the gear reducer or gearmotor with anticorrosion paint. Added protection may be afforded by water-repellent grease (especially around the rotary seating of seal rings and the accessible zones of shaft end).

For ambient temperatures higher than 40 °C or lower than 0 °C, consult us.

Before wiring-up the gearmotor, make sure that motor voltage corresponds to input voltage.

If the direction of rotation is not as desired, invert two phases at the terminals.

Connect thermal probes, if any, to auxiliary safety circuits.

Use varistors to limit voltage peaks due to contactors.

Warning! Bearing life, good shaft and coupling running depend on alignment precision between the shafts. Carefully align the gear reducer with the motor and the extruder, interposing flexible couplings whenever possible.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices (e.g.: remote oil level gauge, lubricant for food industry, etc.).

In polluting surroundings, take suitable precautions against lubricant contamination through seal rings or other.

Gear reducer or gearmotor should not be put into service before it has been incorporated on a machine which is conform to 2006/42/EC directive.

轴端装配组件

与轴端配合的孔件的公差推荐使用**H7**；D≥ 55 mm承载较轻、均匀的高速轴端，其公差可以是G7.其他细节已在“减速电机输入面表"中给出（参考第10节）安装前，请彻底清洁配合面，并进行油脂处理以避免粘连和摩擦腐蚀。

利用轴端螺纹孔，钳子和顶起螺丝进行安装和拆卸工序。预加热到80 - 100°C的零件配合推荐使用H7/m6.

电机安装和替换

电机安装按如下进行：

- 确保电机配合面按照IEC 60072-1 (UNEL 1350-69; DIN 42955)精度等级加工,驱动端所用电机轴承至少应与表中所列等级相同。
- 彻底清洗配合面
- 校核键，如必要（参考第10节中的表），可降低平键高度，使平键顶端和键槽底部孔间留有0.1 -0.2mm的间隙；如果轴上为通孔键槽，使用销钉固定平键。
- 校核孔轴端配合公差（压接式）： D ≤ 28mm 时,为G7/j6; D ≥ 38 mm时,为F7/k6
- 配合面还需进行油脂处理，以防止摩擦腐蚀。而且，如果提供胀紧套 (D ≥ 38 mm)，必须按照如下要求进行处理：
- 首先移除相关油塞，旋转胀紧套，以使夹紧螺钉头与减速机法兰面上两个孔中的其中一个对齐（有些法兰面上只有一个孔）；这种方法是达到最大紧固效果的最好方案，因此进行上述动作时，不能改变胀紧套的轴向位置；如有需要，请参考第10节中列出的胀紧套的轴向位置。

空心输入轴直径 Input hollow shaft diameter ∅D	主驱动端轴承 Min drive end bearing
24	6205
28	6206
38	6308
42	6310
48	6310
55	6312
60	6313
65	6314
75	NU2217
80	NU2217

Fitting of components to shaft ends

It is recommended that the bore of parts keyed to shaft ends is machined to **H7** tolerance; G7 is permissible for high speed shaft ends D ≥ 55 mm, provided that load is uniform and light. Other details are given in the «Gear motor input face» table (ch. 10). Before mounting, clean mating surfaces thoroughly and lubricate against seizure and fretting corrosion.

Installing and removal operations should be carried out with **pullers** and **jacking screws** using the tapped hole at the shaft butt-end; for H7/m6 fits it is advisable that the part to be keyed is preheated to a temperature of 80 ÷ 100 °C.

Motor mounting or replacement

For motor mounting proceed as follows:

- ensure that motor mating surfaces are machined under accuracy rating IEC 60072-1 (UNEL 13501-69; DIN 42955) and motor bearing on drive end is at least equivalent to the one stated in the table;
- clean surfaces to be fitted, thoroughly;
- check, and if necessary (see table at ch. 10), lower the parallel key so as to leave a clearance of 0,1 ÷ 0,2 mm between its tip and the bottom of the keyway of the hole; when shaft keyway is without end, lock the key with a pin;
- check that the fit-tolerance of (push-fit) holeshaft end is G7/j6 for D ≤ 28 mm, F7/k6 for D ≥ 38 mm;
- lubricate surfaces to be fitted against fretting corrosion. Moreover, if hub clamp is provided (D ≥ 38) it is necessary to:
- rotate the hub clamp so that the tightening screw head is aligned with one of the two input holes present on gear reducer flange (some flange have one hole only), removing first the relevant plugs; when carrying out this operation do not modify the axial position of hub clamp (for this purpose it is advised to keep the tightening key inserted into the hub clamp screw), as this is the best solution in order to reach the maximum tightening effect; please refer to the axial position of hub clamp stated on ch. 10 (R dimension), if need be.

11 - 安装和维护

– 安装电机，法兰肩面定位；
– 在胀紧套螺钉上施加轻微的拧紧力矩；
– 运用测力计将电机配合螺钉或螺栓与减速机法兰拧紧；
– 使用测力计拧紧胀紧套螺钉，直到拧紧扭矩达到第10节所列的值为止（在这一过程中，仍不能改变胀紧套的轴向位置）。
– 拧上减速机法兰上的孔塞；
如果有胀紧套的话，在拆卸电机前，务必确保胀紧螺钉已松开。

11 - Installation and maintenance

– mount the motor against the shoulder;
– apply a slight tightening torque to the hub clamp screw;
– lock the motor fitting screws or bolts to the gear reducer flange using a dynamometer key;
– lock the hub clamp screw by means of dynamometer key until the tightening torque stated at ch. 10 is reached (also during this operation it is advisable not to modify the hub clamp axial position);
– screw the hole plugs of gear reducer flange ;
Before any motor dismounting be sure that the hub clamp tightening screw has been unloosed, if present.

润滑

齿轮副和推力头轴承采用油浴式润滑；其他轴承采用油浴式或飞溅式润滑。

减速机和推力头供货时不带润滑油，因此在试车前，加入规定等级[1]的PAO合成润滑油，(AGIP Blasia SX, CASTROL Tribol 1510, ELF Reductelf SYNTHESE, ESSO Spartan SEP, KLÜBER Klübersynth EG4, MOBIL Mobil-gear SHC XMP).

共同润滑（100...360型）
减速机和挤出头支撑（两者内部型腔相通）内加入如表中所列的具有相同ISO粘度等级的润滑油。

分开润滑（400...451型） [2]
减速机（其内部型腔被推力头端的一个油封阻隔）必须加入表中列出的具有ISO粘度等级的润滑油。而推力头，配有带过滤器和阀注油塞，油位塞，泄油塞，必须加入具有**ISO 320 cSt**粘度等级的润滑油（大概需要的润滑油量见第8节）。

1)第8节给出的润滑油量是粗略值，仅作参考使用。减速机需求的实际润滑油量根据油位来确定。

2)型号400...451带独立冷却单元的减速机，其冷却系统同时作用于减速机和推力头上（无油封阻隔），请按共同润滑中描述的进行处理。

Lubrication

Gear pairs and extruder support thrust bearing are oil-bath lubricated; other bearings are either oil-bathed or splashed lubricated.
Gear reducers and extruder supports are supplied **without oil** therefore, before commissioning, fill up to the specified level[1] with polyalphaolefines basis synthetic oil (AGIP Blasia SX, CASTROL Tribol 1510, ELF Reductelf SYNTHESE, ESSO Spartan SEP, KLÜBER Klübersynth EG4, Mobilgear SHC XMP).

Shared lubrication (sizes **100 … 360**).
The **gear reducer** and the **extruder support** have to be filled with the same lubricant (their inner chambers are connected with each other) having ISO viscosity grade as indicated in the table.

Separated lubrication (sizes **400 … 451**)[2].
The **gear reducer** (whose inner chamber is separated by means of a seal ring from the one of extruder support) has to be filled with lubricant having ISO viscosity grade as indicated in the table whereas the **extruder support** – equipped with a metal filler plug with filter and valve, level and draining plug – has to be filled with lubricant having viscosity grade **ISO 320 cSt** (the approximate lubricant quantities are given at ch. 8).

1) The lubricant quantities stated in ch. 8 are approximate and indicative only for provisioning. The exact oil quantity the gear reducer is to be filled with is definitely given by the level.
2) For sizes 400 … 451 with independent cooling unit serving both the gear reducer and the extruder support (seal ring not present), proceed as stated in «Shared lubrication».

ISO粘度等级
40 °C时的平均运动粘度

输出转速n_2 [min^{-1}]	环境温度[1] [°C]		
	矿物油		合成油
	0 ÷ 20	10 ÷ 40	0 ÷ 40
> **224**	150	150	150
224 ÷ **22,4**	150	220	220
22,4 ÷ **5,6**	220	320	320
< **5,6**	320	460	460

1)峰值温度高于环境温度10 °C和低于10 °C(合成油20 °C）是可以接受的。

ISO viscosity grade
Mean kinematic viscosity [cSt] at 40 °C.

Speed n_2 [min^{-1}]	Ambient temperature [1] [°C]		
	mineral oil		synthetic oil
	0 ÷ 20	10 ÷ 40	0 ÷ 40
> **224**	150	150	150
224 ÷ **22,4**	150	220	220
22,4 ÷ **5,6**	220	320	320
< **5,6**	320	460	460

1) Peak of 10 °C above and 10 °C (20 °C for synthetic oil) below the ambient temperature range are acceptable.

假定无污染环境下，**换油间隔时间**概况如下表所示。如果是重载情况，换油间隔时间减半。

油温 [°C]	换油间隔时间 [h]	
	矿物油	合成油
⩽ **65**	8 000	25 000
65 ÷ **80**	4 000	18 000
80 ÷ **95**	2 000	12 500
95 ÷ **110**[1]	–	9 000

1) 此值仅适用于非连续工作制。

An overall guide to **oil-change interval** is given in the table, and assumes pollution-free surroundings. Where heavy overloads are present, halve the values.

Oil temperature [°C]	Oil-change interval [h]	
	mineral oil	sintetic oil
⩽ **65**	8 000	25 000
65 ÷ **80**	4 000	18 000
80 ÷ **95**	2 000	12 500
95 ÷ **110**[1]	–	9 000

1) Values admissible for not continuous duty, only.-

请勿将不同品牌的合成润滑油混合使用；如需更换润滑油类型，更换前需彻底清洗减速机。

油封： 其耐用度有多方面因素影响，如牵引力，温度，环境状况等；粗略估计，其使用时间在3150h至25000h之间不等。

警告警告： 务必在设备冷却后，才能小心地将带阀注油塞（标记）拔下。

Never mix different makes of synthetic oil; if oil-change involves switching to a type different from that used hitherto, then give the gear reducer a through clean-out.
Seal rings: duration depends on several factors such as dragging speed, temperature, ambient conditions, etc.; as a rough guide; it can vary from 3 150 to 25 000 h.
Warning: before unscrewing the filler plug with valve (symbol) wait until the unit has cooled and then open with caution.

水冷

减速机和减速电机可提供水去冷却润滑油。

140...360型 ：带有内置的、可移动的铝翅片热交换器（易于维护操作），安装在减速机盖板上。

400...451型 ：**固定式**盘管水冷，安装在减速机箱体上。

根据减速机型号和安装方式确定的热功率因数f_{t_3}值，见下表。

Water cooling

Gear reducers and gearmotors can be supplied with lubrication oil cooling by water.

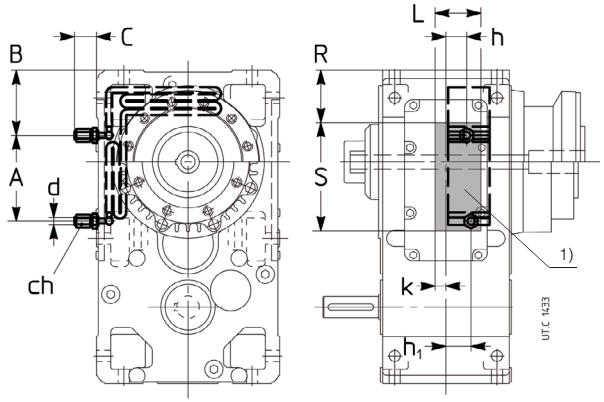
Sizes **140 ... 360**: inner and **removable** aluminium finned heat exchanger (for easier maintenace operations) mounted onto the gear reducer inspection cover.

Sizes **400 ... 451**: **fixed** copper coil mounted onto the gear reducer housing.

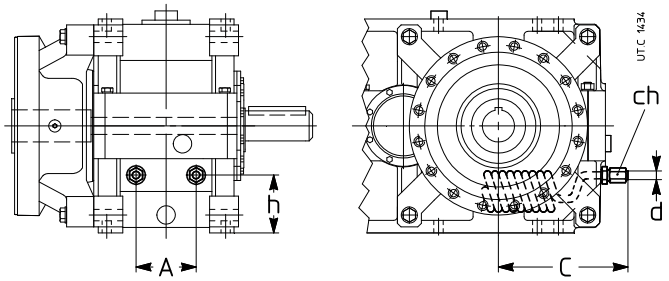
In the following table the thermal factor f_{t_3} is given according to the gear reducer size and the mounting position.

安装在减速机盖板上的内置热交换器。
Inner heat exchanger mounted onto gear reducer inspection cover.

型号 Size	f_{t_3} B3	f_{t_3} B6, B7	f_{t_3} B8	A ≈	B ≈	C	ch	d ∅	h	h_1	K	L	R	S
140	1,7	1,9	1,8	30	81,5	54	22	12L	32	19	16	68	60	130
160	2,12	2,36	2,24	0	102	54	22	12L	20	46	16	86	77	177
180	2	2,24	2,12	0	102	54	22	12L	21	47	15	86	77	177
200	2,12	2,36	2,36	190	152	25	22	12L	41	41	14	75	105	263
225	2	2,24	2,12	190	152	25	22	12L	41	41	14	75	105	263
250	2,36	2,65	2,5	180,5	170,5	25	22	12L	50,5	50,5	18	100	125	311
280	2,24	2,5	2,36	180,5	170,5	25	22	12L	54	54	15	100	125	311
320, 321	2,12	2,36	2,24	60	255	34	30	16S	66	66	2	129	177	302
360	2	2,24	2,12	60	255	34	30	16S	66	66	2	129	177	302
400 ... 451	2	2	–	180	–	472	30	16S	250	–	–	–	–	–



140 ... 360



400 ... 451

1) 用于管道固定和整体固定装置的自由表面。

1) Free surface for pipe fastening and for overall fastening devices.

冷却水具体要求：
– 水质不要太硬；
– 最高水温不超过20 °C；
– 流水量 10 ÷ 20 dm^3/min；
– 水压0,2 ÷ 0,4 MPa (2 ÷ 4 bar).

用扳手固定住连接部位，使用如表中所列外径值**d**的光滑金属管进行连接。

应要求，在技术允许条件下（请咨询我们），可安装一个自动的、无需提供辅助设施的**恒温阀**，阀传感器带有油浸式灯泡；当减速机内油温达到设定温度时，可启动水循环。客户负责安装和设置设定温度，设定温度范围为50-90 °C

环境温度低于0 °C时，请咨询我们。

订货描述时需补充说明：减速机带**内置交换器盘管水冷**（140...360）或减速机带**盘管水冷**（400...450）

Cooling water specifications:
– be not too hard;
– max temperature 20 °C;
– capacity 10 ÷ 20 dm^3/min;
– pressure 0,2 ÷ 0,4 MPa (2 ÷ 4 bar).

For the connection it is sufficient to use a smooth metallic pipe having a **d** external diameter as per table, holding fixed the connector using a second wrench, while fitting the pipe itself.

On request, upon technical approval (consult us), **thermostatic valve** which, automatically and without auxiliary supply need, permits water circulation when gear reducer oil reaches the set temperature; the valve sensor is equipped with immersion bulb. Mounting and setting, adjustable within 50 ÷ 90 °C, are Buyer's responsibility.

For ambient temperature lower than 0 °C consult us.

Supplementary description when ordering by **designation**: **gear reducer** with **water cooling by inner heat exchanger** (140 ... 360) or **water cooling by coil** (400 ... 450)

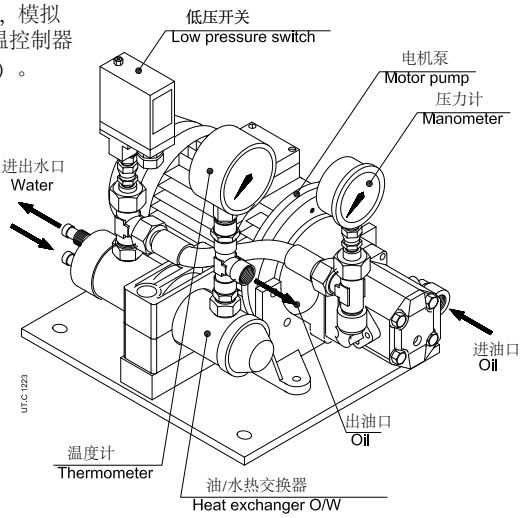
独立冷却单元

当盘管水冷不足以降低油温时使用的一种油冷系统（有关热功率校核请参考第4节）。

独立冷却单元包括：油/水热交换器，电机泵，模拟压力计，低压开关，可启动电机泵的远程油温控制器（包含一个Pt100探针和两个设定点信号装置）。

减速机与独立冷却单元的连接是通过软管（SAE 100 R1型，最大长度4m)实现的，客户负责安装两个设定点信号装置（分开供货）.

为满足所有功能性和安全性需求，根据需要，可提供多种附件（如温度计，流量开关，过滤器等等，单独供货，由客户负责安装。）



独立冷却单元需求的热交换功率计算如下：

$$P_S \geq (P_{2max}/\eta - Pt_N \cdot ft_1 \cdot ft_2) \cdot (1 - \eta) \cdot K_1 \cdot K_2$$

式中：

P_S 独立冷却单元额定功率（见下表）；

P_{2max} 挤出机所需的最大输出功率（如果无法准确得出，可用输入功率P_1替代）

Pt_N 额定热功率（参考第5节）

ft_1 根据输入速度确定的热功率因数（参考第5节）

ft_2 根据安装方式确定的热功率因数（参考第5节）；

η 减速机传动效率（参考第10节）；

K_1 = 1,18（由于冷却单元外表面灰尘而使热交换效率降低所采用的系数）

K_2= 1,12（当推力头热功率校核无法满足而部分热量被冷却单元带走时，采用的系数；否则 K_2 = 1).

有关尺寸、附件、设计及深入的细节问题，请参考具体资料（U.T.D 148）。

Independent cooling unit

An oil cooling system when coil cooling is not sufficient anymore (for thermal power verification see ch. 4).

Consisting of oil/water heat exchanger, motor pump, analogic manometer, low pressure switch and remote controller of oil temperature (composed by a Pt100 probe and by a 2 set point signalling device) allowing the pump to start.

Connections realised by a flexible pipes (type SAE 100 R1, maximum length 4 m) between gear reducer and cooling unit and the mounting of a 2 set point signalling device (separately supplied for the mounting on rail DIN EN 50022) are Buyer's responsibility.

On request, several accessories are at disposal (thermometers, flowswitches, filters, etc., separately supplied; assembly is at Buyer's responsibility) in order to satisfy all functionality and safety needs.

Heat exchange power required by the independent cooling unit:

$$P_S \geq (P_{2max}/\eta - Pt_N \cdot ft_1 \cdot ft_2) \cdot (1 - \eta) \cdot K_1 \cdot K_2$$

where:

P_S nominal power of the independent cooling unit (see table below);

P_{2max} maximum output power required by extruder (if it is not known precisely, consider the input power P_1);

Pt_N nominal thermal power (see ch. 5);

ft_1 thermal factor depending on input speed (see ch. 5);

ft_2 thermal factor depending on mounting position (see ch. 5);

η gear reducer efficiency (see ch. 10);

K_1 = 1,18 (takes into account the decrease of the exchanger efficiency due to dirt on the external surface);

K_2 = 1,12 (takes into account the heat to be taken away when the extruder support thermal verification is not satisfied; otherwise K_2 = 1).

For dimensions, accessories, designation and further details see specific literature (UT.D 148).

单元代号 Unit designation	P_S	交换器 Exchanger	油泵电机 Oil motor-pump		油管接头 Oil connections	水 Water		交换容量	重量 Mass
			电机功率 motor	流量 capacity	吸油/排油 suction/delivery «F»	流量 capacity	接头 connection	Exch. volume	≈
	kW		kW	dm³/min		dm³/min		dm³	kg
UR O/W 4	**4**	T60CB1	0,37	16	G 1/2"	⩾ 8 (⩽ 30)	Ø 12	0,4	13
UR O/W 6	**6**	T60CB2	0,37	16		⩾ 10 (⩽30)	Ø 12	0,6	15
UR O/W 9	**9**	T80CB2	0,55	16		⩾ 16 (⩽30)	Ø 12	1	18
UR O/W 13	**13**	MS84P2	1,1	30	G 3/4"	⩾ 25 (⩽45)	G 1/2"	1	31
UR O/W 21	**21**	MS134P1	1,5	30		⩾ 40 (⩽110)	G 1"	3,4	44
UR O/W 31	**31**	MS134P1	2,2	56	G 1" 1/4	⩾ 50 (⩽110)	G 1"	3,4	55
UR O/W 50	**50**	MS134P2	3,5	80		⩾ 80 (⩽110)	G 1"	4,5	70

铋金属恒温器

可提供带铋金属恒温器的减速机和减速电机，以控制最高油温。

恒温器参数如下：

– 常闭接触开关，有最大的交流电10A-240V（直流5A-24V）

– G 1/2" 管螺纹连接；

– Pg 09 电缆密封套；

– 防护等级：IP65;

– 设定温度:90 °C ± 5 °C，（根据需求，其他设定温度也可满足）；

– 温度差异15 °C;

买方负责将其安装在一个螺纹塞（螺纹塞的位置由安装方式和安装位置确定，请咨询我们）内并进行后续的油浴润滑。

订货时需描述的**非标设计代号：铋金属型恒温器。**

Bi-metal thermostat

Gear reducers and gearmotors can be supplied with bimetal type thermostat for the control of the maximum oil temperature.

Thermostat specifications:

– NC contact with maximum alternate current 10 A - 240V a.c. (5 A - 24V d.c.);

– G 1/2" thread connection;

– Pg 09 cable gland;

– IP65 protection;

– setting temperature 90 °C ± 5 °C (other setting temperatures are possible, on request);

– differential temperature 15 °C;

Mounting into a threaded plug (position to be defined according to mounting position and mounting arrangement: consult us) and oil bath lubrication is Buyer's responsibility.

Non-standard design code for the **designation**: **bi-metal type thermostat**.

其他

– 根据G系列样本，平行轴（3I）、直角轴（CI，C2I）减速机和减速电机也可与挤出机组合使用。

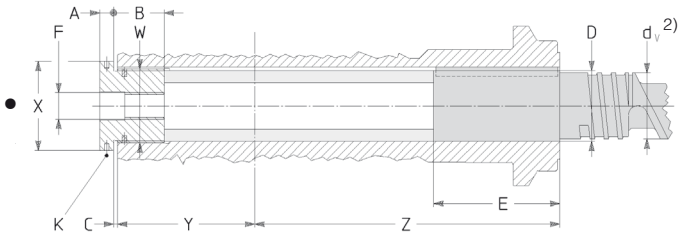
– 减速机设计代号为2和4时，推力头位置分别为U和Z。

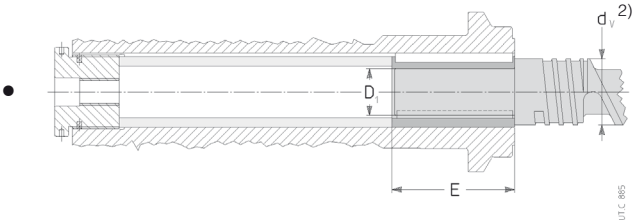
– 油位塞带油温度计（160型及以上）。
– 远程油位临界值信号（160型及以上）。
– 油温探针：Pt100探针（160...280型使用 G 3/4”，320...451使用 G 1”

– 轴承温度探针（250型及以上）：Pt100探针。
– 带设定温度值的远程油（轴承）温度显示仪器（160型及以上）。

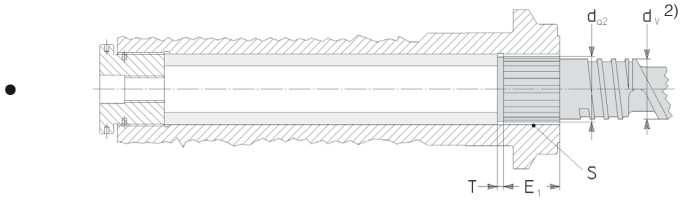
– 可选的特殊油漆：
  – **外部，单质油漆：镀锌防锈底漆加RAL 5010 DIN 1843蓝色合成油漆；**
  – **外部双复合油漆：复合型环氧聚酰胺防锈底漆加双复合RAL 5010 DIN 1843蓝色油漆聚氨酯瓷釉；**
  – 内部，双复合油漆：不受聚乙二醇合成润滑油影响（125...360型）；
– 在**挤出机对**面侧为HA、HB型设计挤出螺杆（在挤出机侧可以提供适合的挤出螺杆尺寸）：HA型是键，HB型是花键，在挤出机侧

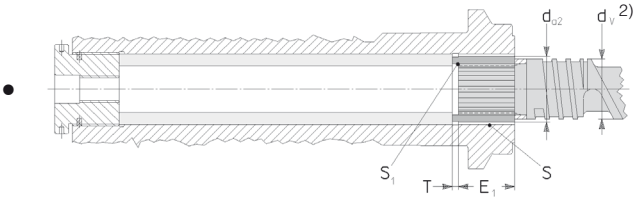
HA型设计：通过键与挤出螺杆配合





HB型设计：通过花键与挤出螺杆配合





• 参考槽侧（参考G系列样本）

Miscellaneous

– Parallel shaft (3I train of gears) and right angle shaft (CI, C2I train of gears) gear reducers and gearmotors for extruders, according to G catalogue.
– Extruder support position U for gear reducer model 2 or position Z for gear reducer model 4.
– Level plug with oil thermometer (sizes ⩾ 160).
– Remote threshold signalling of oil level (sizes ⩾ 160).
– Oil temperature probe: Pt100 probe (G 3/4” for sizes 160 ... 280, G 1” for sizes 320 ... 451).
– Bearing temperature probe (size ⩾ 250): Pt100 probe.
– Remote oil (or bearing) temperature indicator instrument with set point (size ⩾ 160).
– Special paint options:
  – External, single-compound: antirust zinc primer plus blue RAL 5010 DIN 1843 synthetic paint;
  – External, dual-compound: dual-compound epoxy-polyamidic antirust primer plus dual-compound blue RAL 5010 DIN 1843 polyurethane enamel;
  – Internal, dual-compound: unaffected by polyglycol synthetic oils (sizes 125 ... 360).
– Extruder **support** design for **screw extraction** on the **opposite side to extruder HA**, **HB** (the extraction on extruder side with proper extruder screw dimensions is possible): **HA** with key, **HB** with spline profile on extruder side.

Design HA: fitting extruder screw using key

Design HB: fitting extruder screw using spline profile

• Reference groove side (see cat. G).

减速机型号 Gear reducer size	螺纹衬套 - Threaded bush							空心轴/挤出螺杆套管 - Hollow shaft/extruder screw spigot										
	A	B	C	F	K[1] Ø	X	W Ø	D[2] Ø max H7	E max	D_1 Ø max H7	E_1	Y	L	L_1 max	S max DIN 5480	d_{a2}[2] Ø	S_1[3] max DIN 5480	T	V_1 H7	Z
125	15	38	3	M 24 × 2	6 × 8	68	M 55 × 1,5	52	105	35	40	110	253,5	13	50 × 2	46	35 × 2	6	52	224,5
140	15	42	3	M 24 × 2	6 × 8	78	M 62 × 1,5	60	105	40	48	125	285,5	15	60 × 2	52	40 × 2	6	60	254,5
160	18	48	3	M 24 × 2	6 × 8	88	M 70 × 1,5	67	130	45	52	136	312,5	17	65 × 3	59	45 × 2	6	67	279,5
180	18	53	3	M 24 × 2	6 × 8	100	M 80 × 1,5	75	130	52	60	150	327,5	19	75 × 3	69	55 × 2	6	75	293,5
200	24	64	4	M 36 × 3	8 × 11	118	M 95 × 2	90	150	63	72	167	368	22	90 × 3	84	65 × 3	8	90	341
225	24	74	4	M 36 × 3	8 × 11	140	M 110 × 2	105	180	75	85	180	378	26	105 × 4	97	75 × 3	8	105	361
250	24	86	6	M 36 × 3	8 × 11	155	M 125 × 3	120	210	85	95	206	438,5	30	120 × 4	112	90 × 3	11	120	418,5
280	30	96	6	M 36 × 3	10 × 14	175	M 140 × 3	135	230	95	108	222	451,5	34	135 × 4	127	100 × 3	11	135	438,5
320, 321	30	108	8	M 56 × 4	10 × 14	190	M 155 × 4	150	260	110	120	254	540	38	150 × 5	140	110 × 4	13,5	150	519,5
360	30	126	8	M 56 × 4	10 × 14	225	M 185 × 4	170	300	125	150	273	511	45	180 × 5	170	135 × 5	13,5	180	519,5

1)125...250型有4个孔，280...360型有6个孔。
2)尺寸d_v不得大于 (0,94 ÷ 0,97) · D 或(0,94 ÷ 0,97) · d_{2a}.
* 买方需注意图中灰色部分。

1) N. 4 holes for sizes. 125 ... 250, n. 6 holes for sizes. 280 ... 360.
2) d_v dimensions must not be higher than (0,94 ÷ 0,97) · D or (0,94 ÷ 0,97) · d_{2a}.
* Grey objects are on Buyer's care.

13 - 技术计算公式

根据技术系统和国际单位制（SI）列出与机械传动有关的主要公式。

13 - Technical formulae

Main formulae concerning mechanical drives, according to the Technical System and International Unit System (SI).

型号	Size	技术系统单位制 With Technical System units	SI单位制 With SI units
基于加速度或减速度，启动或制动扭矩的启动或停机时间	starting or stopping **time** as a function of an acceleration or deceleration, of a starting or braking torque	$t = \frac{Gd^2 \cdot n}{375 \cdot M}$ [s]	$t = \frac{J \cdot \omega}{M}$ [s]
旋转运动的**速度**	**velocity** in rotary motion	$v = \frac{\pi \cdot d \cdot n}{60} = \frac{d \cdot n}{19,1}$ [m/s]	$v = \omega \cdot r$ [m/s]
转速n和角速度ω	**speed n** and **angular velocity ω**	$n = \frac{60 \cdot v}{\pi \cdot d} = \frac{19,1 \cdot v}{d}$ [min^{-1}]	$\omega = \frac{v}{r}$ [rad/s]
启动时的**加速度**，停机时的减速度	**acceleration** or deceleration as a function of starting or stopping time	$a = \frac{v}{t}$ [m/s^2]	
启动或启动扭矩下的**角加速度**，停机或制动扭矩下的减速度	**angular acceleration** or deceleration as a function of a starting or stopping time, of a starting or braking torque	$\alpha = \frac{n}{9,55 \cdot t}$ [rad/s^2] $\alpha = \frac{39,2 \cdot M}{Gd^2}$ [rad/s^2]	$\alpha = \frac{\omega}{t}$ [rad/s^2] $\alpha = \frac{M}{J}$ [rad/s^2]
基于启动速度、加速度或停机速度、减速度的**运行距离**	starting or stopping **distance** as a function of an acceleration or deceleration, of a final or initial velocity	$s = \frac{a \cdot t^2}{2}$ [m] $s = \frac{v \cdot t}{2}$ [m]	
基于角加速度或减速度，最终或初级角速度的启动或停机角度	starting or stopping **angle** as a function of an angular acceleration or deceleration, of a final or initial angular velocity	$\varphi = \frac{\alpha \cdot t^2}{2}$ [rad] $\varphi = \frac{n \cdot t}{19,1}$ [rad]	$\varphi = \frac{\omega \cdot t}{2}$ [rad]
质量	**mass**	$m = \frac{G}{g}$ $[\frac{kgf\ s^2}{m}]$	m是质量的单位[kg] m is the unit of mass [kg]
重量(重力)	**weight** (weight force)	G是重量（重力）的单位[kgf] G is the unit of weight (weight force) [kgf]	$G = m \cdot g$ [N]
垂直（提升）力、水平力、倾斜运动的平移（μ = 摩擦系数；φ = 倾斜角度）	**force** in vertical (lifting), horizontal, inclined motion of translation (μ = coefficient of friction; φ = angle of inclination)	$F = G$ [kgf] $F = \mu \cdot G$ [kgf] $F = G\ (\mu \cdot \cos \varphi + \text{sen}\ \varphi)$ [kgf]	$F = m \cdot g$ [N] $F = \mu \cdot m \cdot g$ [N] $F = m \cdot g\ (\mu \cdot \cos \varphi + \text{sen}\ \varphi)$ [N]
由于运动的平移产生的动态力矩**Gd²**转动惯量**J**（数字意义上 $J = \frac{Gd^2}{4}$）	**dynamic moment Gd², moment of inertia J** due to a motion of translation (numerically $J = \frac{Gd^2}{4}$)	$Gd^2 = \frac{365 \cdot G \cdot v^2}{n^2}$ [kgf m^2]	$J = \frac{m \cdot v^2}{\omega^2}$ [kg m^2]
扭矩可用力，动态力矩，转动惯量，功率的函数式表示。	**torque** as a function of a force, of a dynamic moment or of a moment of inertia, of a power	$M = \frac{F \cdot d}{2}$ [kgf m] $M = \frac{Gd^2 \cdot n}{375 \cdot t}$ [kgf m] $M = \frac{716 \cdot P}{n}$ [kgf m]	$M = F \cdot r$ [N m] $M = \frac{J \cdot \omega}{t}$ [N m] $M = \frac{P}{\omega}$ [N m]
旋转运动下的**机械和能量**转换	**work, energy** in motion of translation, in rotary motion	$W = \frac{G \cdot v^2}{19,6}$ [kgf m] $W = \frac{Gd^2 \cdot n^2}{7160}$ [kgf m]	$W = \frac{m \cdot v^2}{2}$ [J] $W = \frac{J \cdot \omega^2}{2}$ [J]
旋转运动下的转化**功率**	**power** in motion of translation, in rotary motion	$P = \frac{F \cdot v}{75}$ [CV] $P = \frac{M \cdot n}{716}$ [CV]	$P = F \cdot v$ [W] $P = M \cdot \omega$ [W]
单相电机轴端有效**功率**（cos φ =功率因数）	**power** available at the shaft of a single-phase motor (cos φ = power factor)	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{736}$ [CV]	$P = U \cdot I \cdot \eta \cdot \cos \varphi$ [W]
三相电机轴端有效**功率**	**power** available at the shaft of a three-phase motor	$P = \frac{U \cdot I \cdot \eta \cdot \cos \varphi}{425}$ [CV]	$P = 1,73 \cdot U \cdot I \cdot \eta \cdot \cos \varphi$ [W]

备注：上述所说的加速度和减速度均是恒定值，平移运动和旋转运动分别按直线和环形运动来计算。

Note. Acceleration or deceleration are understood constant; motion of translation and rotary motion are understood rectilinear and circular respectively.

版本修订索引

样本更新目录(2011年1月版GX09样本，也可登录 *www.rossigearmotors.cn* 下载)

Pag. 11推力轴承型号更新
基于轴承寿命80000h和均匀载荷下, ***fs***的变化。

Pag. 14 第2点说明的变化。

Pag. 18 型号225，尺寸 $\mathbf{Q}_2$的变化。

Pag. 19 型号100尺寸**d**的变化。

Pag. 20 附加说明：可根据需求加工。
加长型减速机润滑油含量附加说明。

Pag. 21 加长型减速机尺寸$\mathbf{A}_1$附加说明。
加长型减速机润滑油含量附加说明。

Pag. 22 型号为400，401时，尺寸**e**的变化。
型号为500，501时，尺寸**d**的变化。

Pag. 24 传动效率值的变化。

Pag. 25 输入孔径**d**的公差为H7。
螺钉为M12时,M_S值的变化。
$\mathbf{t}_1$尺寸的改变
e尺寸的改变（参考图示）
第2、6、7节的附加说明。

Pag. 26 注油塞位置变化

Pag. 29 160，180型热功率因数值 *ft* 的变化。
A, **B**, **h**, $\mathbf{h}_1$, **K**, **L** 尺寸的变化。

Pag. 31 附加说明« • 参考槽侧 ».

Index of revisions

List of updates (Cat. GX09 - Edition January 2011 available on *www.rossigearmotors.cn*)

Pag. 11 Updating of thrust bearing designation.
Modification ***fs*** referred to 80 000 h and uniform load.

Pag. 14 Modification of note 2.

Pag. 18 Modification of $\mathbf{Q}_2$ dimension for 225.

Pag. 19 Modification of **d** dimension for size100.

Pag. 20 Addition of note * for «Machining on request».
Addition of «long» gear reducer oil quantity.

Pag. 21 Addition of «long» gear reducer $\mathbf{A}_1$ dimensions.
Addition of «long» gear reducer oil quantity.

Pag. 22 Modification of **e** for sizes 400, 401.
Modification of **d** for sizes 500, 501.

Pag. 24 Modification of efficiency values.

Pag. 25 Removal of H7 tolerance for **d** hole.
Modification of M_S for screws M12.
Modification of $\mathbf{t}_1$ dimensions.
Modification of **e** dimension (see drawing).
Addition of note 2, 6 and 7.

Pag. 26 Modification of filler plug positions.

Pag. 29 Modification of *ft* values for sizes 160, 180.
Modification of **A**, **B**, **h**, $\mathbf{h}_1$, **K**, **L** dimensions.

Pag. 31 Addition of note « • Reference groove side».

减速机

A系列：蜗轮蜗杆减速机和减速电机

E系列：同轴减速机和减速电机

EP系列：行星齿轮减速机和减速电机

EPS系列：回转驱动

G系列：平行轴和直角轴减速机和减速电机

GX系列：挤出机用平行轴减速机和减速电机

H系列：平行轴和直角轴减速机

L系列：直角轴减速机

P系列：轴安装减速机

RE系列：整体式驱动单元

减速电机

A系列：蜗轮蜗杆减速机和减速电机

AS系列：蜗轮蜗杆减速电机

E系列：同轴减速机和减速电机

EP系列：行星齿轮减速机和减速电机

EPS系列：回转驱动

ES系列：同轴减速电机

G系列：平行轴和直角轴减速机和减速电机

GX系列：挤出机用平行轴减速机和减速电机

电机

TX 系列：普通三相异步电机，刹车电机和辊道电机

S 系列：重载辊道电机

TI 系列：变频一体机

自动控制机

I 系列：变频机

TI 系列：变频一体机

SR 系列：同步和异步伺服电机

SM 系列：低侧隙行星齿轮减速电机不带电机

北美和中国区域样本，请登录网站*www.rossi-group.com*下载。

Catalogs for North America and China please visit our website *www.rossi-group.com*

Rossi

Solutions for
an evolving
industry

Rossi S.p.A.
Via Emilia Ovest 915/A
41123 Modena - Italy

Phone +39 059 33 02 88

info@rossi.com
www.rossi.com