





M series

EXCELLENCE IN MOTION

M series

2.6 M SERIES

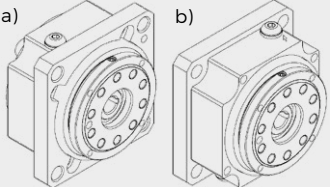


Advantages

- small dimensions and compact design
- series sealed by 2RS ball bearings
- simple installation
- zero- backlash reduction gear
- very low mass
- very high power density
- output deep groove ball bearings with very low friction
- high performance of the reduction gear
- high precision
- high torsional stiffness
- high linearity of torsional stiffness characteristics
- very low friction and high efficiency

The **M series** represents TwinSpin® high precision reduction gears of mini sizes. The M series is filled with grease for lifetime. The sealing of the M series reduction gears is secured by sealed (2RS) ball bearings, which are used as output bearings of the reduction gear, and also as the housing of the input shaft of the reduction gear (slight leakage of lubricant is allowed). Upon customer's request, SPINEA® is able to supply a completely sealed reduction gear. This design of the reduction gears allows the load to be mounted directly on the output flange or the case without the need for additional bearings.

Tab. 2.6a: TwinSpin® M series mini reduction gear versions

<p>Shape of the case</p>	<p>a) The mounting part of the case is located on the output side of the TwinSpin® high precision reduction gear.</p> <p>b) The mounting part of the case is located on the input side of the TwinSpin® high precision reduction gear.</p>	
<p>Input shaft connection</p>	<p>a) Direct connection of shafts without couplings. The motor shaft is aligned with the hole with a keyway.</p> <p>b) Indirect connection of shafts with rigid or flexible couplings</p> <p>c) Shafts are aligned according to the customer's requirements.</p>	

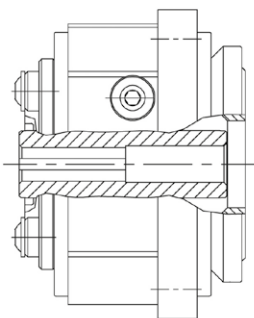
The M series high precision reduction gears are manufactured in several modifications according to specification of the shaft and the case; see Tab. 2.6a.

Tab. 2.6b: M series ordering specifications

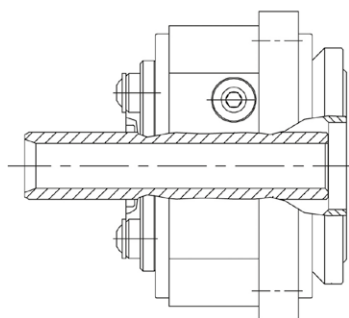
TS - 50 - 63 - M - P6						
Name	Size	Ratio	Series version	Shaft version		
				P	H	S
TS	50	47, 63	M	6	8	according to special request

Note: An example of ordering code of a modified TwinSpin® reduction gear with motor flange:
 TS 50 - 63 - M - P6- M235 - P231. The marks M235 and P231 for specific modification are defined by the manufacturer.

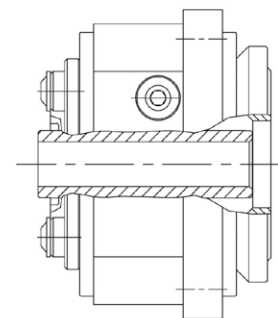
Shaft version



a) P- Shaft with keyway



b) H - Hollow shaft



c) S- Special shaft

Tab. 2.6c: M series rating table

Size	Reduction ratio	Rated output torque	Max. acceleration / deceleration torque	Permissible output torque at emergency stop	Rated input speed	Rated output speed	Max. continuous input speed	Max. allowable input speed 1) 6)	Tilting stiffness 1)	Torsional stiffness 1)
	i	T_R [Nm]	T_{acc} [Nm]	T_{em} [Nm]	n_R [rpm]	n_{Rout} [rpm]	n_{cmax} [rpm]	n_{max} [rpm]	M_t [Nm/arcmin]	k_t [Nm/arcmin]
TS 50	47	18	36	90	2 000	32	3 000	5 000	4	2.5
	63									

RIGHT TO CHANGE WITHOUT PRIOR NOTICE RESERVED

- 1) Mean statistical value
- 2) Load at output speed $n_{Rout} = n_R / i$. For TS 50 M at 32 [rpm]
- 3) Moment $M_{c,max}$ at $F_a=0$. If $F_a \neq 0$ see par. 3.5.1
- 4) Radial force $F_{r,max}$ for $F_a=0$. If $F_a \neq 0$ see par. 3.5.1
- 5) Axial force $F_{a,max}$ for $F_r=0$, $M_c=0$. If $M_c \neq 0$, see par. 3.5.1
- 6) At 50% n_{cmax} (max input speed in cycle)
- 7) Applies to standard version of the high precision reduction gear with shaft connected by keyway
- 8) a_2 - the distance of the radial force centre from the output flange front side [m]

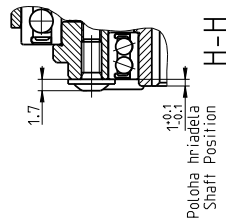
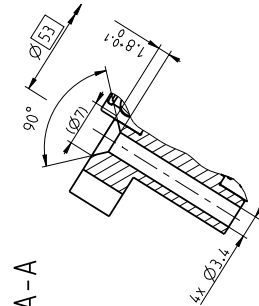
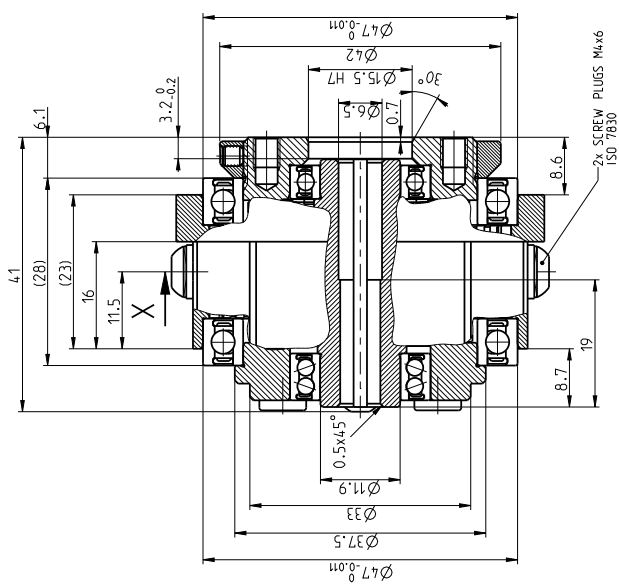
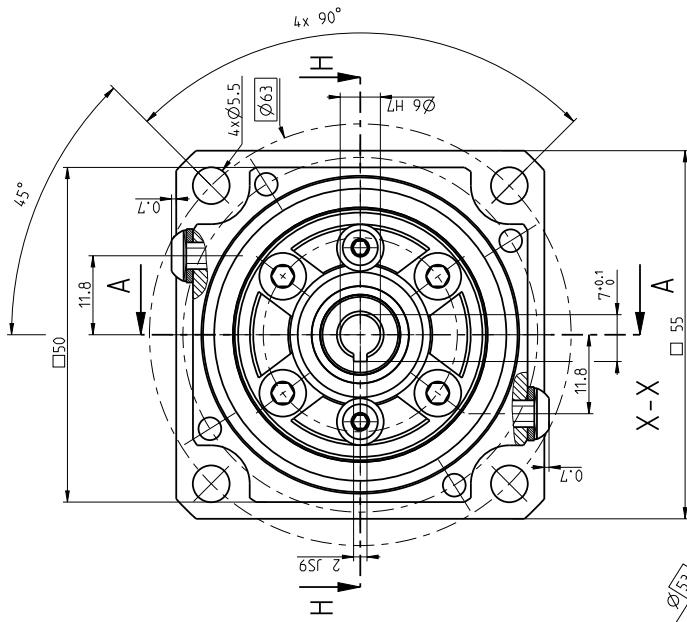
Tab. 2.6c: M series rating table - continued

Average no-load starting torque 1)	Average back driving torque 1)	Max. lost motion	Hysteresis	Max. peak moment 2) 3)	Max radial force 2) 4) 8)	Max axial force 2) 5)	Input inertia 7)	Weight 7)
[cNm]	[Nm]	LM [arcmin]	H [arcmin]	$M_{c\ max}$ [Nm]	F_{rR} [kN]	$F_{a\ max}$ [kN]	I [10^{-4} kgm ²]	m [kg]
4	3	<1.5	<1.5	44	$a_2=0$ 1.44 $a_2>0$ $0.044/(a_2+0.0305)$	1.9	0.007	0.47
3	2							

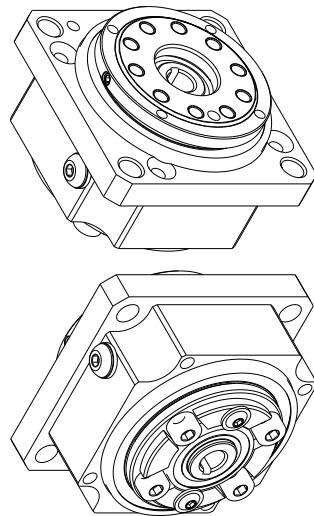
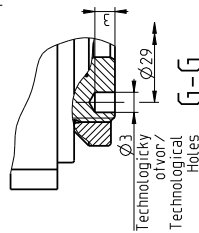
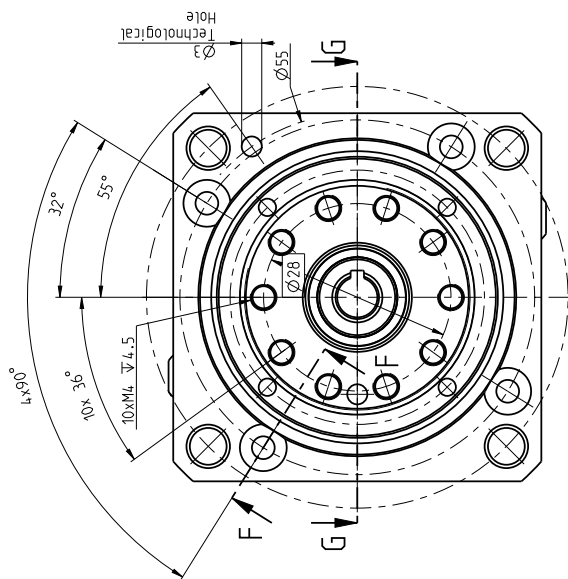
Note:
 Load values in Tab. 2.6c are valid for the nominal life of $L_{10} = 6\ 000$ [Hrs].

TS 50 - i - M - P6

INPUT SIDE VIEW

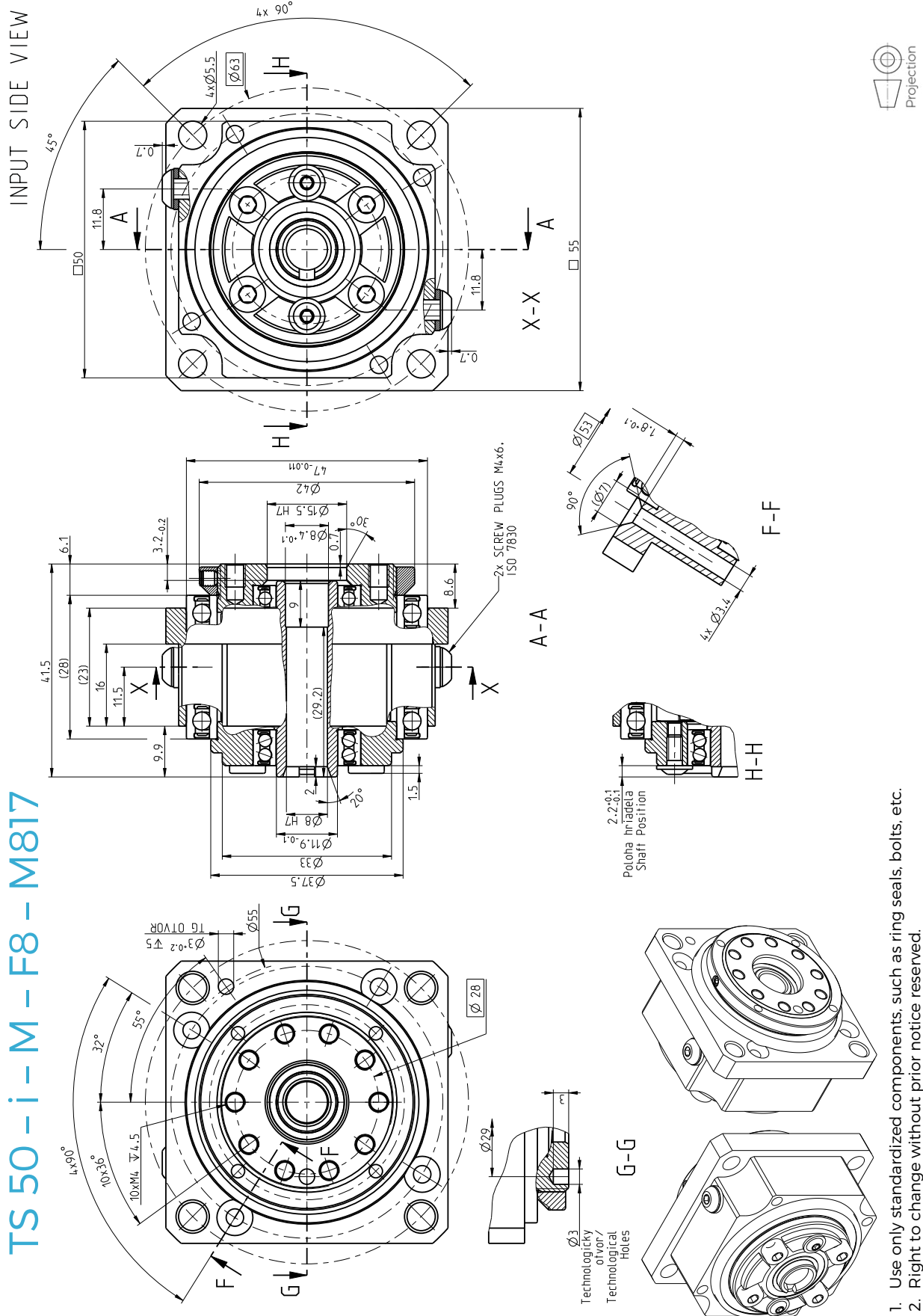


TS 50 - i - M - P6



1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.

TS 50 - i - F8 - M817



1. Use only standardized components, such as ring seals, bolts, etc.
2. Right to change without prior notice reserved.
3. Unsealed space, see the installation instructions in the TS Catalogue.