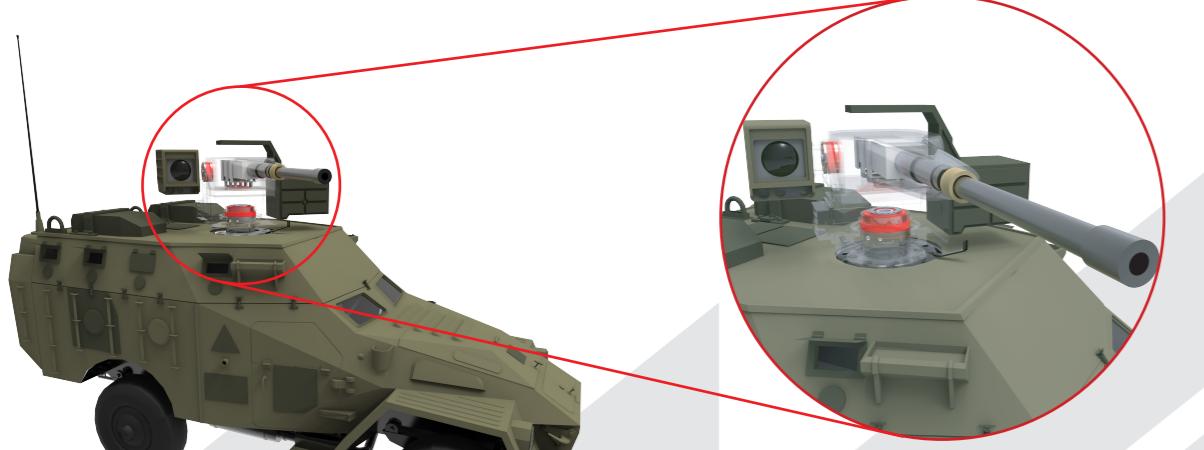
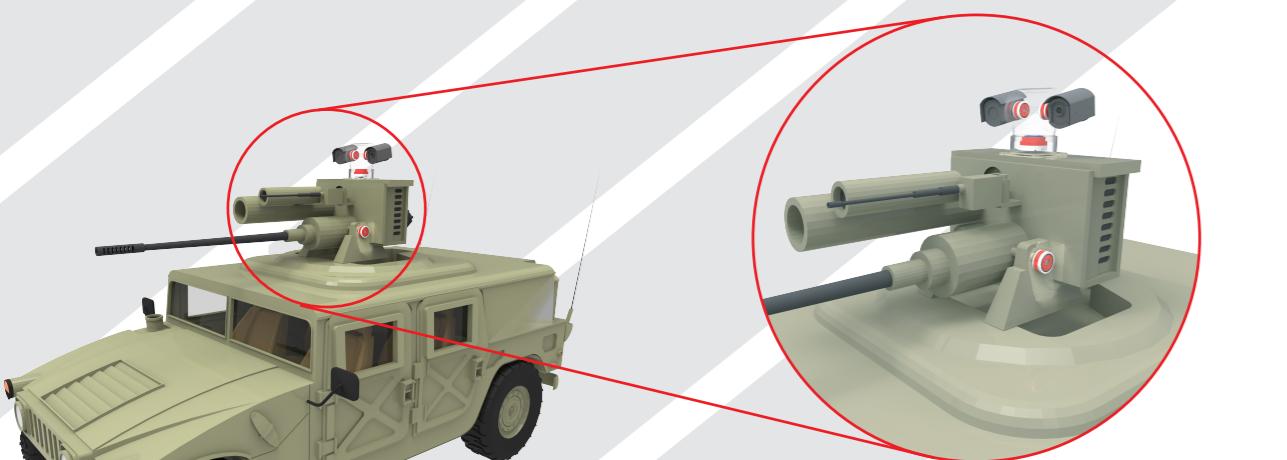


## Applications

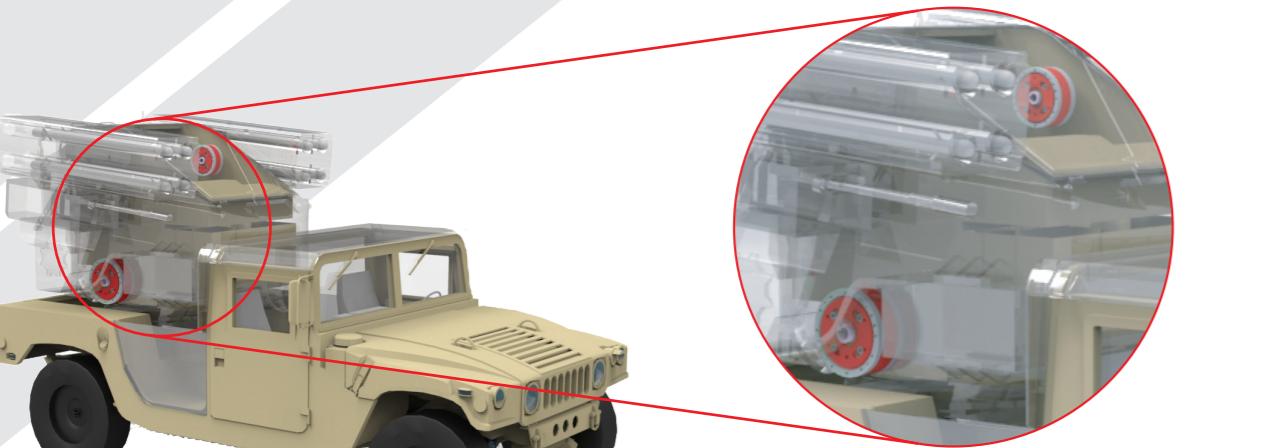
### Defence industry applications



Remote weapon station (azimuth and elevation)



Monitoring systems (pan/tilt - positioning)



Launcher systems - drive system / brake system

... a passion for innovation

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New 2016



## About Spinea For Defence and Security

SPINEA is modern Slovak engineering company that since its foundation 20 years ago , has dealt with research, development, manufacture and sales of high precision reduction gears TwinSpin and actuators DriveSpin.

Thanks to its unique technical solution and outstanding characteristics , products of Spinea are valued by customers from defence and security sectors and are used in applications where precision is required to the hundredths or tenths of a millimeter as well as reliable operation in harsh environment. Spinea meets the requirements of the defense sector at a high level of quality assurance, long-term support and confidentiality.

Products recorded solid performance in daily operations on land and sea.

Spinea is supplier of standard, customized and OEM products for higher integration in the defence equipment in the broad range of azimut and elevation positioning, including:

- Devices for observation
- Military vehicles
- Weapon stations
- Radars
- Simulators

Thanks to its construction the products of Spinea are used in hars envirnronement applications which includes extreme temperatures, shock and vibrations, EMC.

Spinea is:

- Certified ISO-9001

Product is:

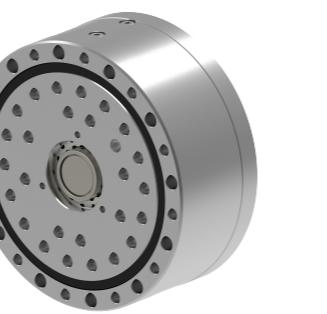
- Certified by third party test facility in compliance with MIL-STD-810G

Common Name	MIL-STD-810G/IP65 Method
High temperature	Method 501
Temperature Shock	Method 503
Low temperature	Method 502
Humidity	Method 507
Vibration	Method 514



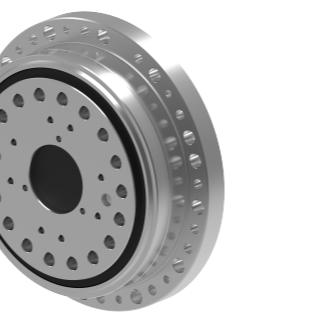
## TwinSpin Charakteristics

### TwinSpin



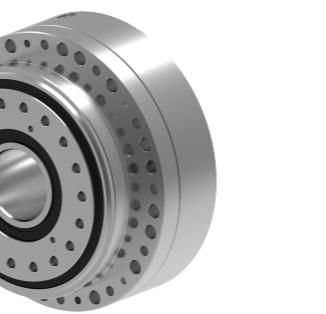
A standard version of the high precision reducer TwinSpin with through and threaded holes in the case.

### TwinSpin



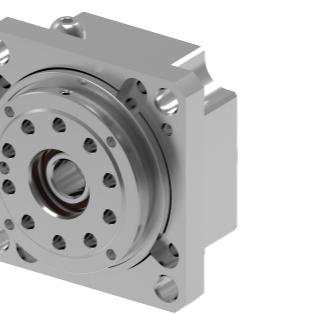
Compact unit with flange alike design. Suitable solution for robotics.

### TwinSpin



Hollow shaft-reducer with possibility of sealing, where a big through hole in the shaft enables passing of cables, tubing or additional shafts to other axes.

### TwinSpin



Miniversion of high precision reduction gears TwinSpin. In its category it represents the best solution in the market.

## DS Inline H Charakteristics

### DriveSpin



The DriveSpin electric rotary actuators, as the basic type of actuators, provide rotary motion and the transfer of output torque with a high radial-axial load capacity and are the most accurate and precise solution in their category.

### DriveSpin



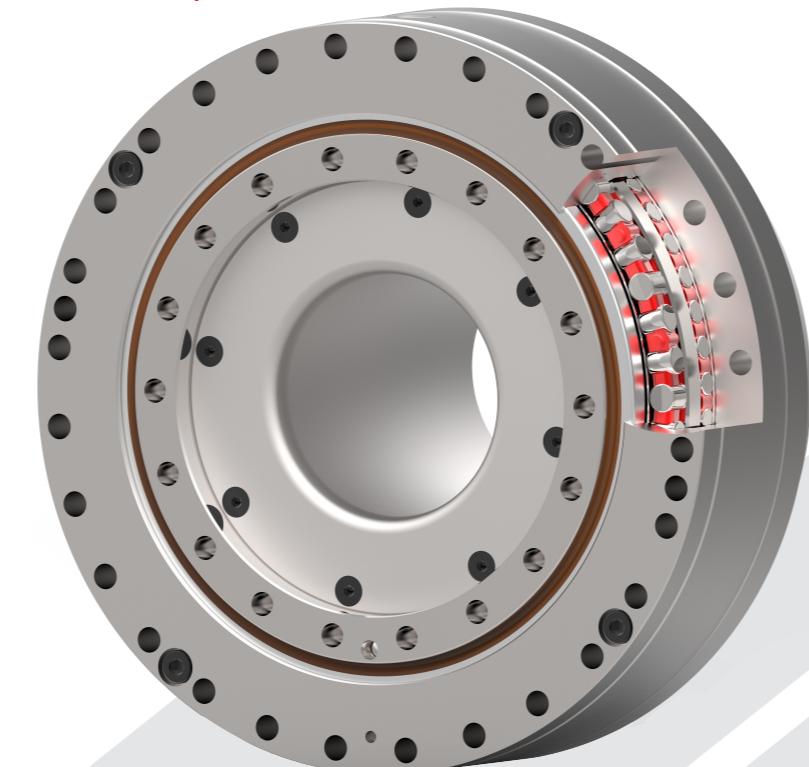
The DSH electric actuators are characterized by the possibility to use a through hole for routing cables, pipes, and drive shafts while maintaining the radial-axial and torque load capacity.

### DriveSpin



The DSM modular rotary positioning modules provide controlled rotary motion and transfer of torque with a high positioning accuracy and precision. The modules feature a special design of the case, which allows versatile connections, also without additional devices.

## Gseries New



A new series of the high precision reduction gears with an innovative design of the main bearing system and the TwinSpin reduction principle inside.

It comes in two variants, with sealed output only or as a fully sealed gear for direct connection with a motor.

## InlineSeries H

### DriveSpin



### DriveSpin



### DriveSpin



# DriveSpin DSH 155

## Technical Parameters DSH 155



DSH 155 is a representative of a new series of DRIVESPIN actuators in the hollowshaft version, which combines a high precision TwinSpin cycloid reduction gear and a wide range of sensors and servomotors. This technically advance drive offers a higher power density with the largest hole and the shortest axial length. The static tube with a diameter of 40 mm that runs through the whole actuator allows customers to route cables, a shaft or other feed systems without a risk of damage. The dimensions of the drive and the innovative design simplify the integration of the system in confined installation spaces for all applications. With this product, you can control movement accurately and meet your application requirements.

The concept of the Inline H - DSH 155 series is built on a modular platform with the objective to achieve maximum flexibility from the user's perspective. The performance characteristic of servomotors and reduction gears may be configured individually for a custom application.

### DSH 155G

**SERIAL PRODUCT**  
HOLLOW SHAFT  $\varnothing=40$  mm  
STATIC TUBE

**ON REQUEST**

HOLLOW SHAFT  $\varnothing=48$  mm  
STATIC TUBE

HOLLOW SHAFT  $\varnothing=55.6$  mm  
WITHOUT STATIC TUBE

MOTOR FEEDBACK TYPES : Hiperface, Endat, Resolver, Incremental

BRAKE OPTIONS: With or without hand release

ELECTRICAL CONNECTION TYPE: Terminal cables , Connectors (angled, rotatable angled, straight)

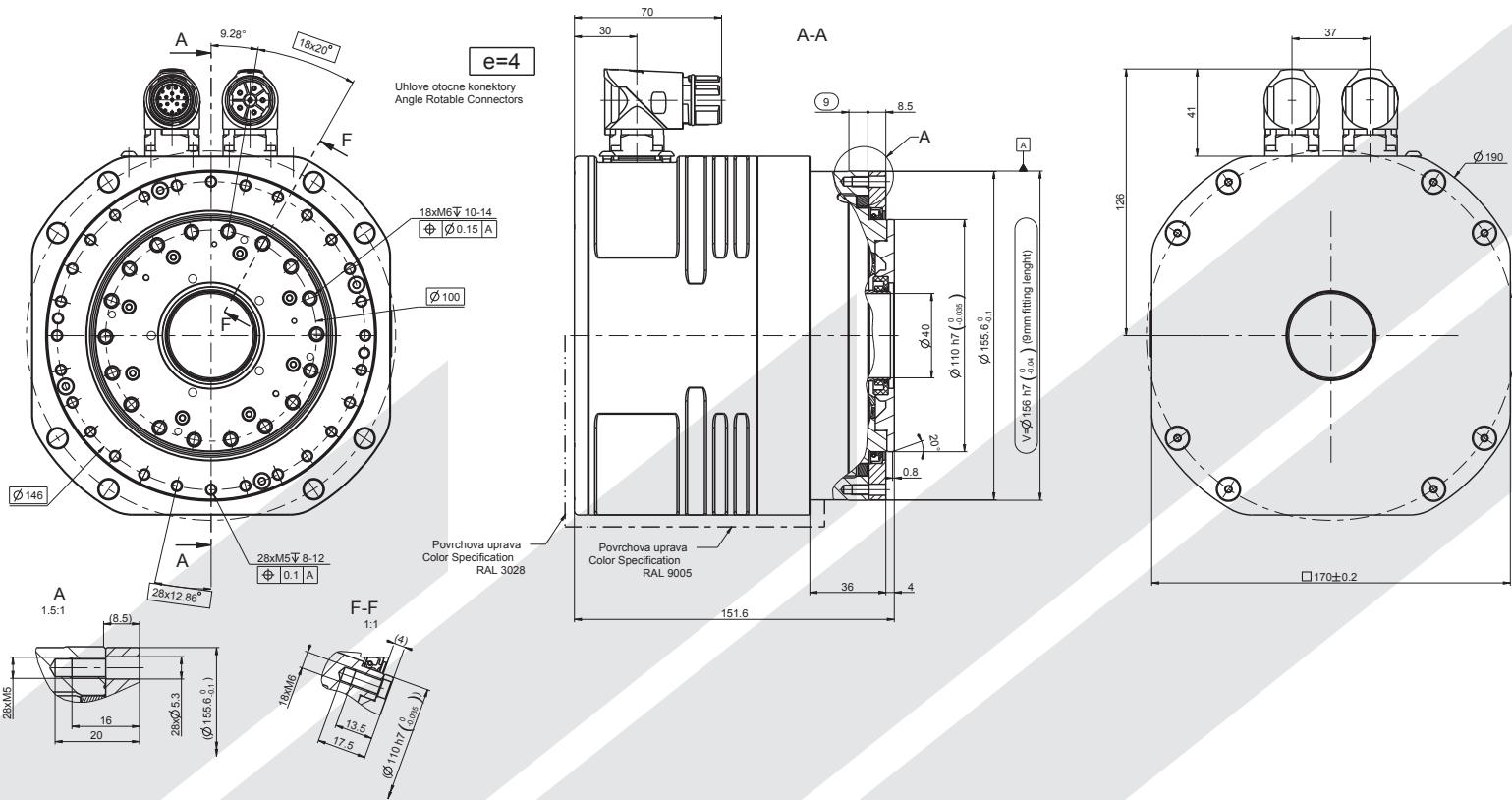
DS Actuator				DSH 155		
Reduction ratio	I				109	
Rated output torque	$T_R$	Nm			260	
Rated input speed of the reduction gear	$n_R$	rpm			2000	
Tilting stiffness	$M_t$	Nm/arcmin			810	
Torsional stiffness	$k_t$	Nm/arcmin			67	
Maximum lost motion	LM	arcmin			<1	
Hysteresis	H	arcmin			<1	
Allowed temperature range		°C		-10 °C to +40 °C		
Servo inverter DC bus voltage	$U_{dc}$	V	24	320	560	
Servomotor rated speed	$n_n$	min <sup>-1</sup>	4000	4000	4000	
Servomotor rated output torque	$M_n$	Nm	3.8	3.8	3.8	
Servomotor rated current	$I_n$	A	67.2	5	3	
Servomotor maximum torque	$M_{max}$	Nm	16	16	16	
Servomotor maximum current	$I_{max}$	A	283	21.2	14	
Number of poles	2p	pol	24	24	24	
Nominal brake voltage		V		24		
Electromagnetic brake braking torque		Nm		5		
Protection class				IP65 as standard		
Lubricant				Grease Castrol Optitemp TT1		
Paint				RAL 9005, RAL 3028		
Insulation class				F		

\*All technical parameters are found in the DriveSpin catalogue.

\*Technical modifications reserved.

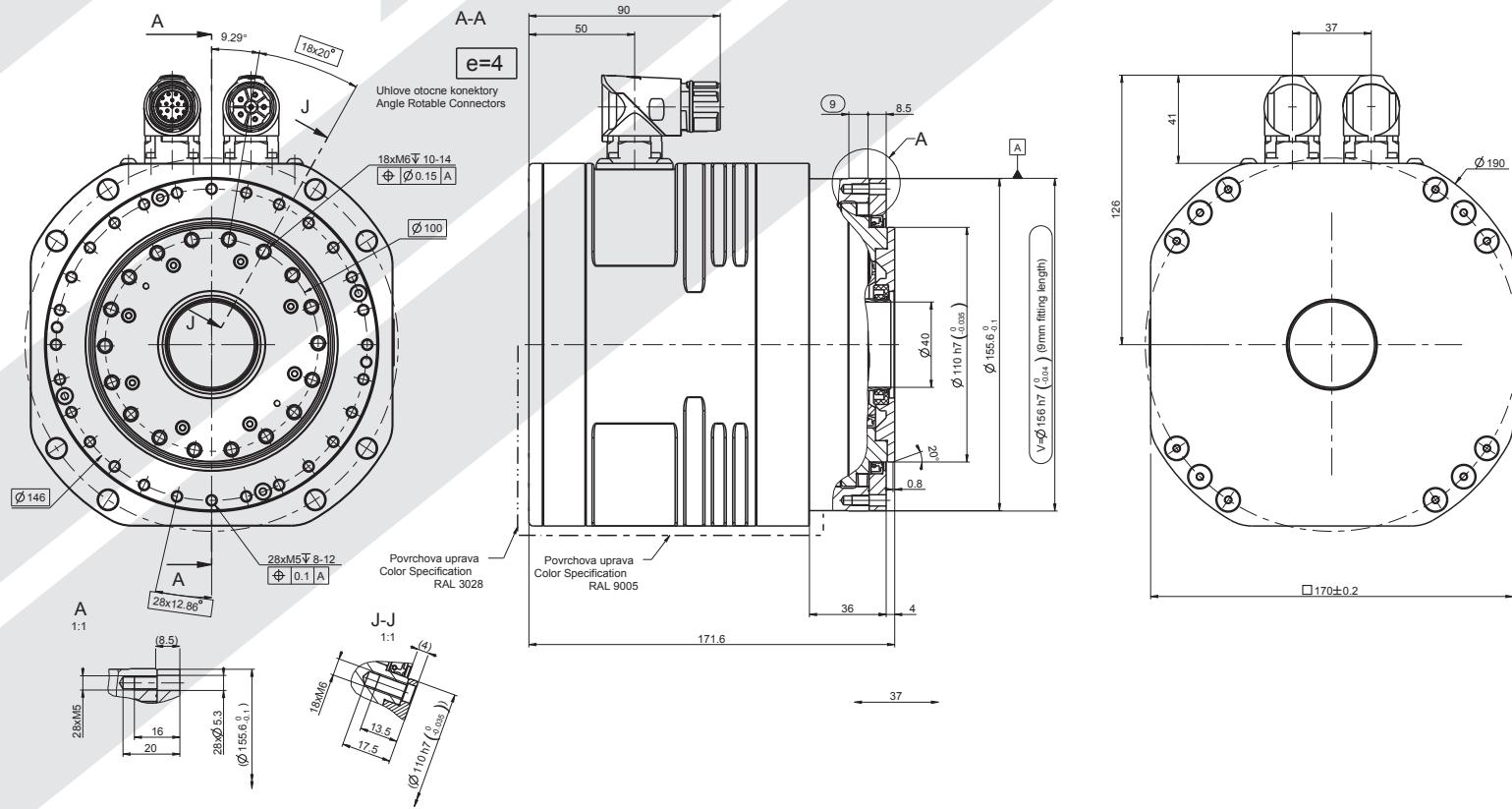
# DriveSpin DSH 155

Drawing DSH 155 without brake



# DriveSpin DSH 155

Drawing DSH 155 with brake



# DriveSpin DSH 115

## Technical Parameters DSH 115



DH 115 is a representative of a new series of DRIVESPIN actuators in the hollowshaft version, which combines a high precision TwinSpin cycloid reduction gear and a wide range of sensors and servomotors. This technically advanced drive offers a higher power density with the largest hole and the shortest axial length. The static tube with a diameter of 32 mm that runs through the whole actuator allows customers to route cables, a shaft or other feed systems without a risk of damage. The dimensions of the drive and the innovative design simplify the integration of the system in confined installation spaces for all applications. With this product, you can control movement accurately and meet your application requirements.

The concept of the Inline H - DSH 115 series is built on a modular platform with the objective to achieve maximum flexibility from the user's perspective. The performance characteristics of servomotors and reduction gears may be configured individually for a custom application.

Modular system for individual requirements:

**OPERATING VOLTAGE:** Depends on the customer's requirements; 24, 320 and 560V DC are available as a standard

**THERMAL SENSOR:** PTC, KTY

**MOTOR FEEDBACK TYPES:** Hiperface, Endat, Resolver

**BRAKE OPTIONS:** Parking brake with the possibility of manual release

**ELECTRICAL CONNECTION TYPE:** Terminal cables, Connectors (angled, rotatable angled, straight)

**PROTECTION CLASS:** IP65

## Preliminary

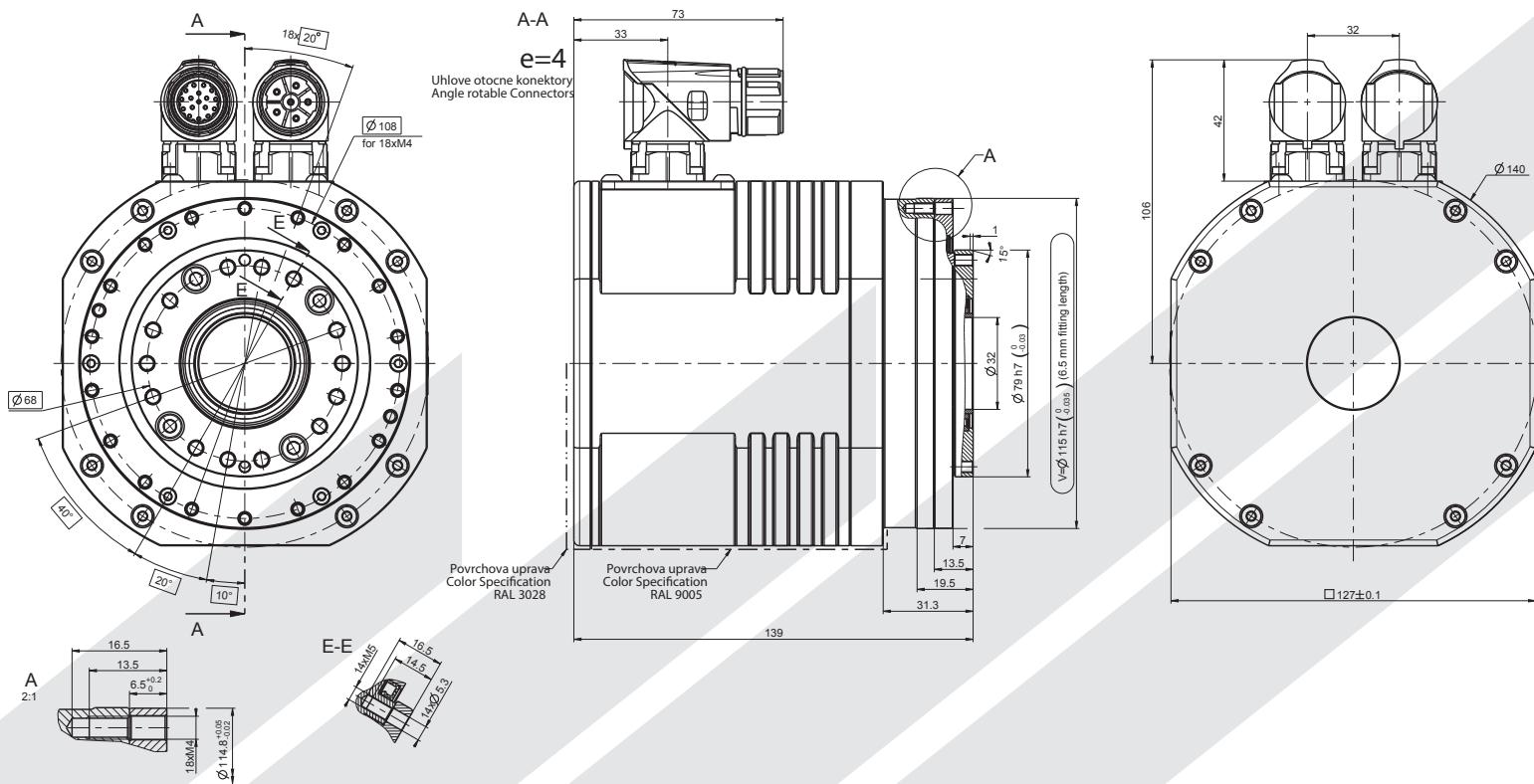
DS Actuator				DSH 115		
Reduction ratio	I			103		
Rated output torque	$T_R$	Nm		130		
Rated input speed of the reduction gear	$n_R$	rpm		450		
Tilting stiffness	$M_t$	Nm/arcmin		220		
Torsional stiffness	$k_t$	Nm/arcmin		36		
Maximum lost motion	LM	arcmin		<1		
Hysteresis	H	arcmin		<1		
Allowed temperature range		°C		-10 °C to +40 °C		
Servo inverter DC bus voltage	$U_{dc}$	V	24	320	560	
Servomotor rated speed	$n_n$	min <sup>-1</sup>	3500	3500	3500	
Servomotor rated output torque	$M_n$	Nm	2.9	2.9	2.9	
Servomotor rated current	$I_n$	A	9.2	0.7	0.4	
Servomotor maximum torque	$M_{max}$	Nm	8.5	8.5	8.5	
Servomotor maximum current	$I_{max}$	A	140	10.5	6	
Number of poles	2p	pol	20	20	20	
Nominal brake voltage		V		24		
Electromagnetic brake braking torque		Nm		2		
Protection class				IP65 as standard		
Lubricant				Grease Castrol Optitemp TT1		
Paint				RAL 9005, RAL 3028		
Insulation class				F		

\*All technical parameters are found in the DriveSpin catalogue.

\*Technical modifications reserved.

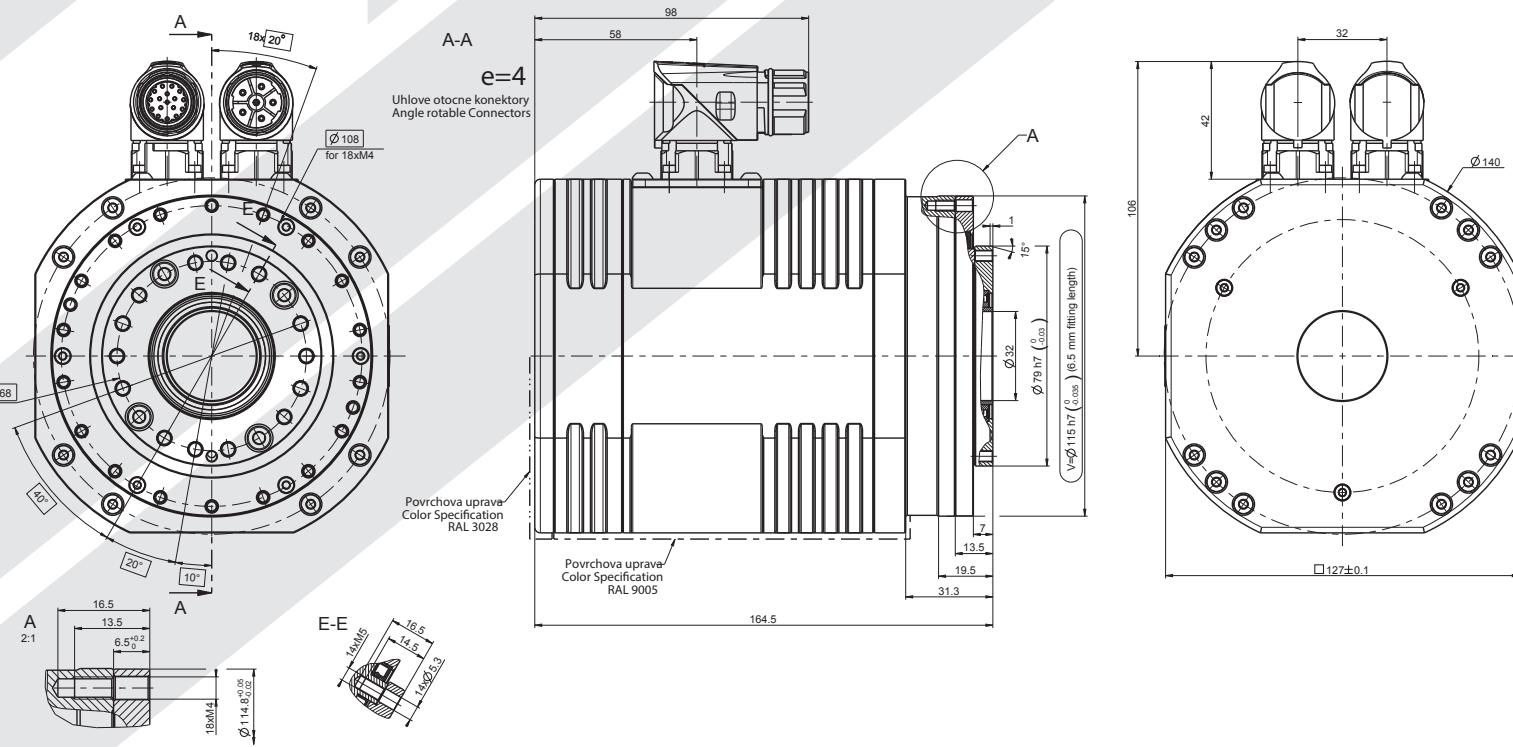
# DriveSpin DSH 115

Drawing DSH 115 without brake



# DriveSpin DSH 115

Drawing DSH 115 with brake



# TwinSpin parameters **T** series



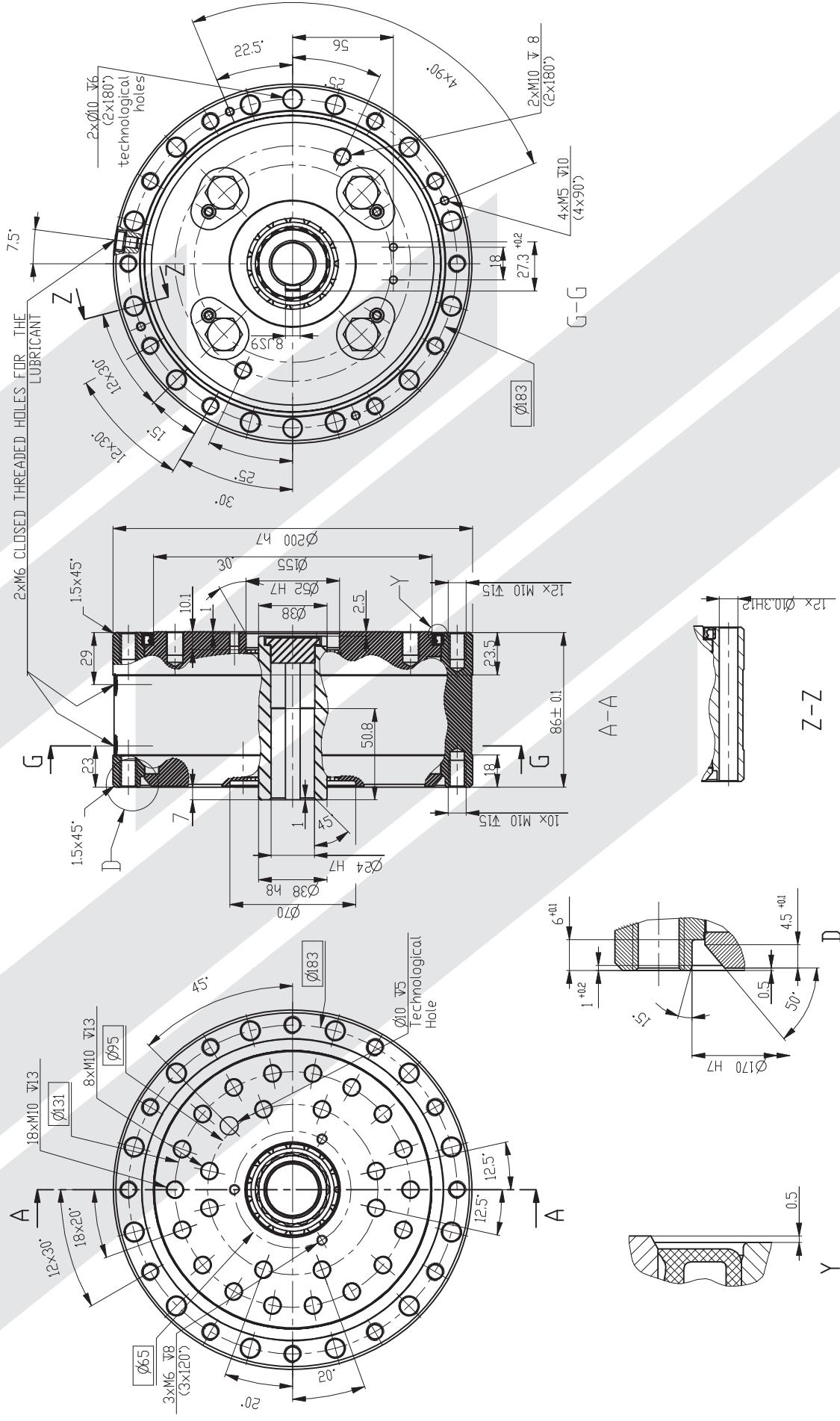
T series represents a wide range of TwinSpin high precision reduction gears with cylindrical shaped case. T Series high precision reduction gears consist of an accurate reduction mechanism and high-capacity radial and axial cylindrical roller bearings. This design of reduction gears allows the mounting of the load directly to the output flange or case without requiring additional bearings. T Series high precision reduction gears are characterized by a modular design, which allows mounting of the reduction gear with your desirable motor type by an inlet flange. T Series shows high precision reduction gears TwinSpin that are not completely sealed, the inlet flange and gasket kit has to be used for the sealing.

## Advantages

- zero-backlash reduction gears
- high-moment capacity
- excellent positioning accuracy and positioning repeatability
- high torsional and tilting stiffness
- small dimensions and weight
- high reduction ratios
- high efficiency
- long lifetime
- easy assembly

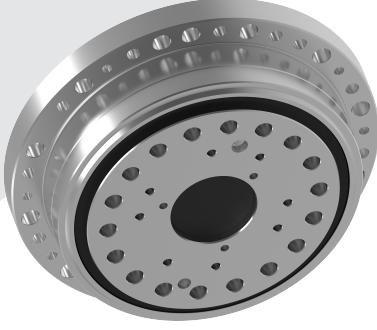
TS Size	Recommended reduction ratio*	Rated output torque	Accelerations and braking	Input speed	Max. allowable speed	Tilting stiffness	Torsional stiffness	Max. no-load starting torque	Max. back driving torque	Hysteresis lost motion	Max. tilting moment	Rated radial force	Max. axial force	Input inertia	Weight			
TS 60	47	37	T <sub>r</sub>	T <sub>max</sub>	T <sub>em</sub>	n <sub>R</sub>	n <sub>max</sub>	M <sub>t</sub>	k <sub>t</sub>		LM	H	M <sub>c,max</sub>	F <sub>IR</sub>	I	m		
TS 70	75	50	74	185	2000	4000	27	3.5	0.12	9	<1.5	107	2.6	3.7	0.006	0.86		
TS 80	63	78	100	250	2000	5000	35	7	0.14	13	<1.5	142	2.8	4.1	0.061	1.05		
TS 110	89	122	156	390	2000	5000	62	9	0.20	15	<1.5	280	4.8	6.9	0.03	1.64		
TS 140	33	268	670	1340	2000	4500	150	22	0.30	30	<1.0	740	9.3	13.1	0.16	3.76		
TS 170	59	495	115	1237	2475	2000	4000	3500	705	102	2.00	85	<1.0	2430	19.2	27.9	1.15	11.07
TS 200	63	890	125	2225	4450	2000	4000	3500	1070	178	1.90	90	<1.0	3300	21.1	31.7	2.6	17.23
TS 240	153	1620	4050	8100	1500	3700	1800	340	1.20	180	<1.0	5720	30.8	47.3	3.9	31.15		
TS 300	63	2940	7350	14700	1500	2500	3500	680	3.00	200	<1.0	12000	45.3	68.1	11.2	55.73		

\*All Reduction ratio are found in the TwinSpin catalogue.



\*Drawings all sizes are found in the TwinSpin catalogue.

# Technical Parameters E series



E series represents a wide range of TwinSpin high precision reduction gears with flange shaped case. E series high precision reduction gears consist of an accurate reduction mechanism and high-capacity radial and axial cylindrical bearings. This design of gears allows the mounting of the load directly to the output flange or case without requiring additional bearings. E series high precision reduction gears are characterized by a modular design, which allows mounting of the reduction gear with your desirable motor type by an inlet flange. E series show high precision reduction gears TwinSpin that are not completely sealed, the inlet flange and gasket kit has to be used for the sealing.

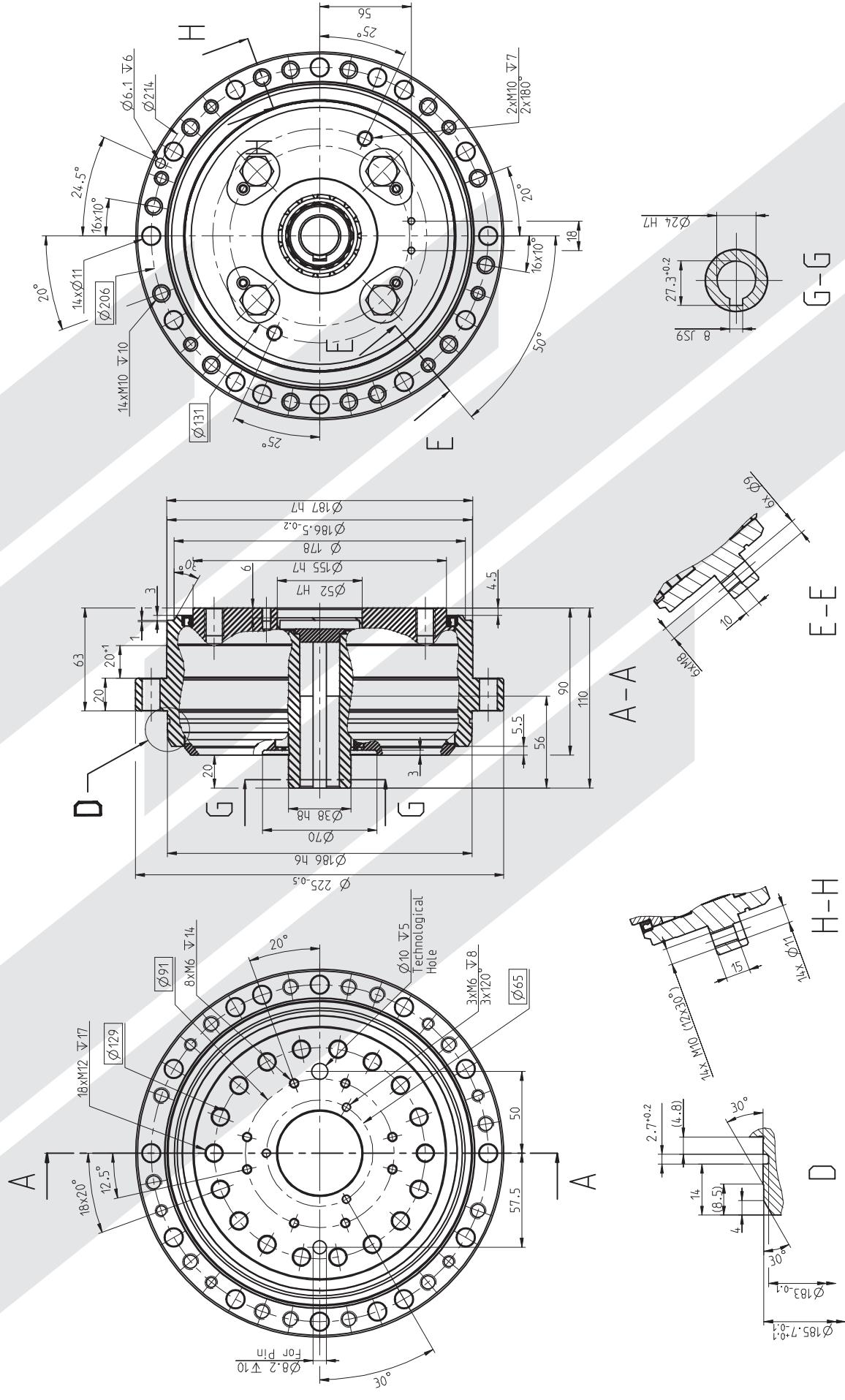
## Advantages

- zero-backlash reduction gears
- high-moment capacity
- excellent positioning accuracy and positioning repeatability
- high torsional and tilting stiffness
- small dimensions and weight
- high reduction ratios
- high efficiency
- long lifetime
- easy assembly

TS Size	Recommended reduction ratio*	Rated output torque and braking acceleration	Permissible torque at emergency stop	Max. allowable input speed	Tilting stiffness	Torsional stiffness	Max. no-load starting torque	Max. back driving torque	Max. lost motion	Hysteresis	Max. tilting moment	Rated radial force	Max. axial force	Input inertia	Weight
TS 70	41	50	100	250	2000	4000	40	8	0.30	11	<1.5	142	2.8	4.1	0.061
TS 80	37	78	156	390	2000	4000	70	10	0.35	14	<1.5	10	280	4.8	6.9
TS 110	67	122	244	610	2000	3900	155	24	0.35	28	<1.0	740	9.3	13.1	0.16
TS 140	69	268	670	1340	2000	4500	380	62	0.40	50	<1.0	1160	11.5	17	0.67
TS 170	125	495	1237	2475	2000	3900	1100	110	1.20	125	<1.0	2430	19.2	27.9	1.15
TS 200	125	890	2225	4450	2000	4000	1300	200	1.70	200	<1.0	3300	21.1	31.7	2.6
TS 220	125	1250	3125	6250	2000	3500	1900	310	1.40	220	<1.0	4400	22.5	35.5	4.8
															22.4

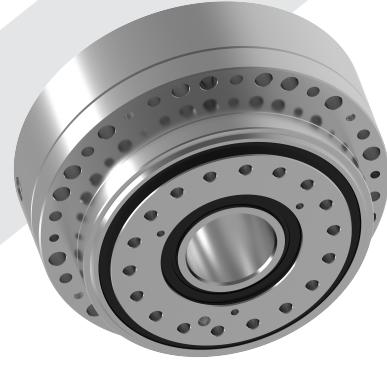
\*All Reduction ratio are found in the TwinSpin catalogue.

# Drawing TS-200T-S-E20P24



\*Drawings all sizes are found in the TwinSpin catalogue.

# Technical Parameters H series



H series represents high precision reduction gears TwinSpin with through holes in the shafts, also known as hollow-shaft version. Cables, tubes with compressed air, drive shafts etc. can be led via the through holes in the shaft of the gear. H series is completely sealed and are filled with grease for its lifetime. H series high precision reduction gears consist of an accurate reduction mechanism and high-capacity radial and axial cylindrical bearings. This design of reduction gears allows the mounting of the load directly to the output flange or case without requiring additional bearings.

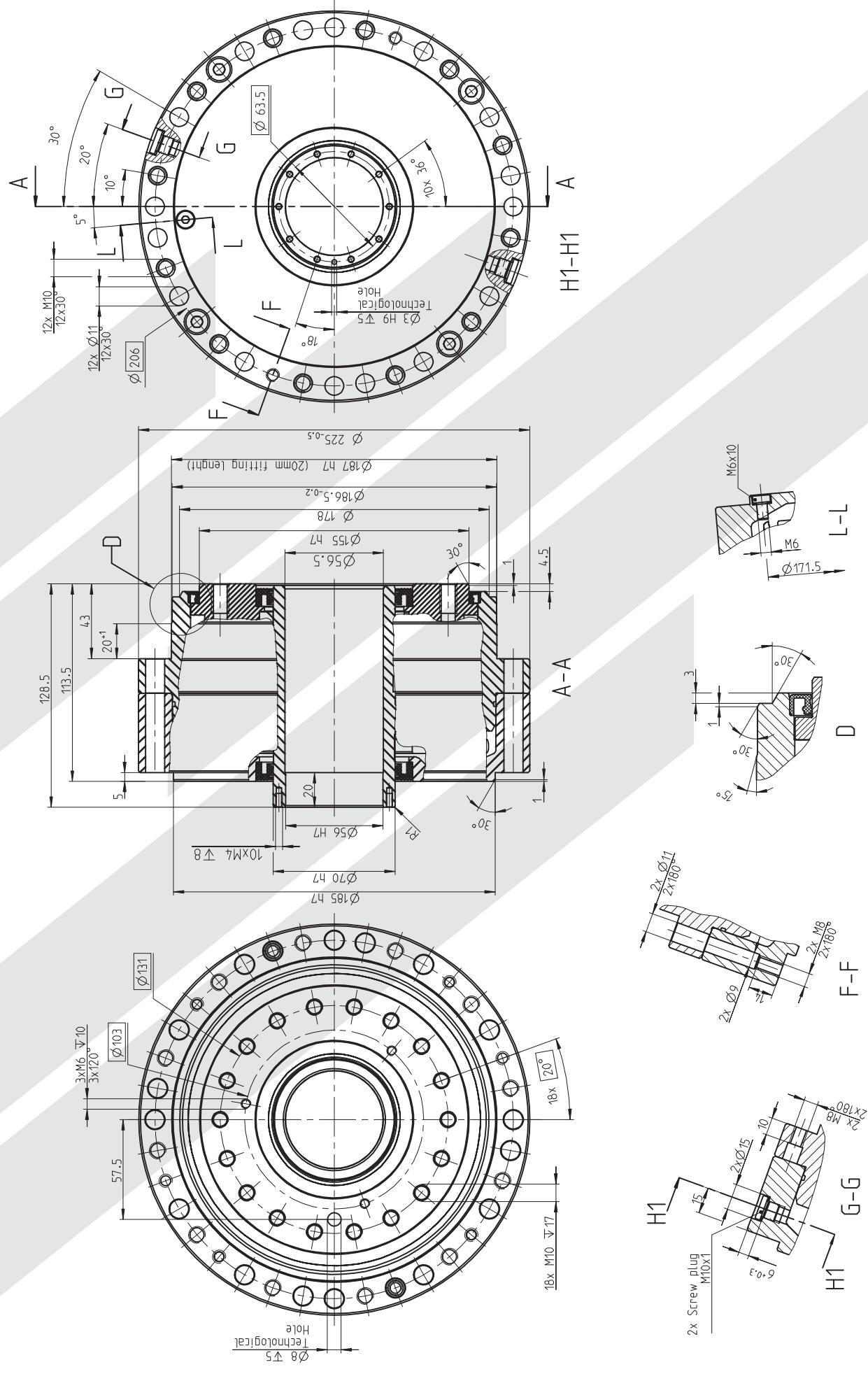
## Advantages

- zero-backlash reduction gears
- high-moment capacity
- excellent positioning accuracy and positioning repeatability
- high torsional and tilting stiffness
- small dimensions and weight
- high reduction ratios
- high efficiency
- long lifetime
- easy assembly
- large input shaft hole diameter

TS Size	Recommended reduction ratio*	Shaft inside diameter	Rated output torque	Rated speed	Input speed	Max. allowable speed	Tilting stiffness	Torsional stiffness	Max. no-load starting torque	Max. back driving torque	Max. lost motion	Hysteresis	Max. tilting moment	Rated radial force	Max. axial force	Input inertia	Weight	
TS 70	75	50	100	250	2000	5500	35	7.5	0.14	13	<1.5	<1.5	142	2.8	4.1	0.061	1	
TS 140	69	36	200	500	1000	2000	3500	340	55	1.6	110	<1.0	<1.0	1160	11.5	17	3.6	7.5
TS 170	69	46	420	825	1650	2000	3200	1100	110	2.5	180	<1.0	<1.0	2000	19.2	27.9	4.8	11.6
TS 200	63	56	712	1100	2200	2000	2700	2000	200	4	250	<1.0	<1.0	3300	21.1	31.7	18.2	20
TS 220	55	65	1100	2000	4000	2000	2400	2400	290	5	170	<1.0	<1.0	4400	22.5	35.5	31	26

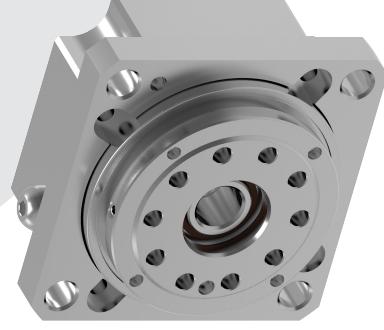
\*All Reduction ratio are found in the TwinSpin catalogue.

# Drawing TS 200 TS-H 56



\*Drawings all sizes are found in the TwinSpin catalogue.

# TwinSpin Parameters M series



M series represents high precision reduction gears TwinSpin of mini sizes. The first representative of the series is the size TS 50, and in the near future we plan to introduce even smaller TwinSpin gears that extend the M series. M series has retained all the qualities of the larger Spinea gears. M series includes a completely sealed gears and are filled with grease for long lifetime. This design of reduction gears allows the mounting of the load directly to the output flange or case without requiring additional bearings

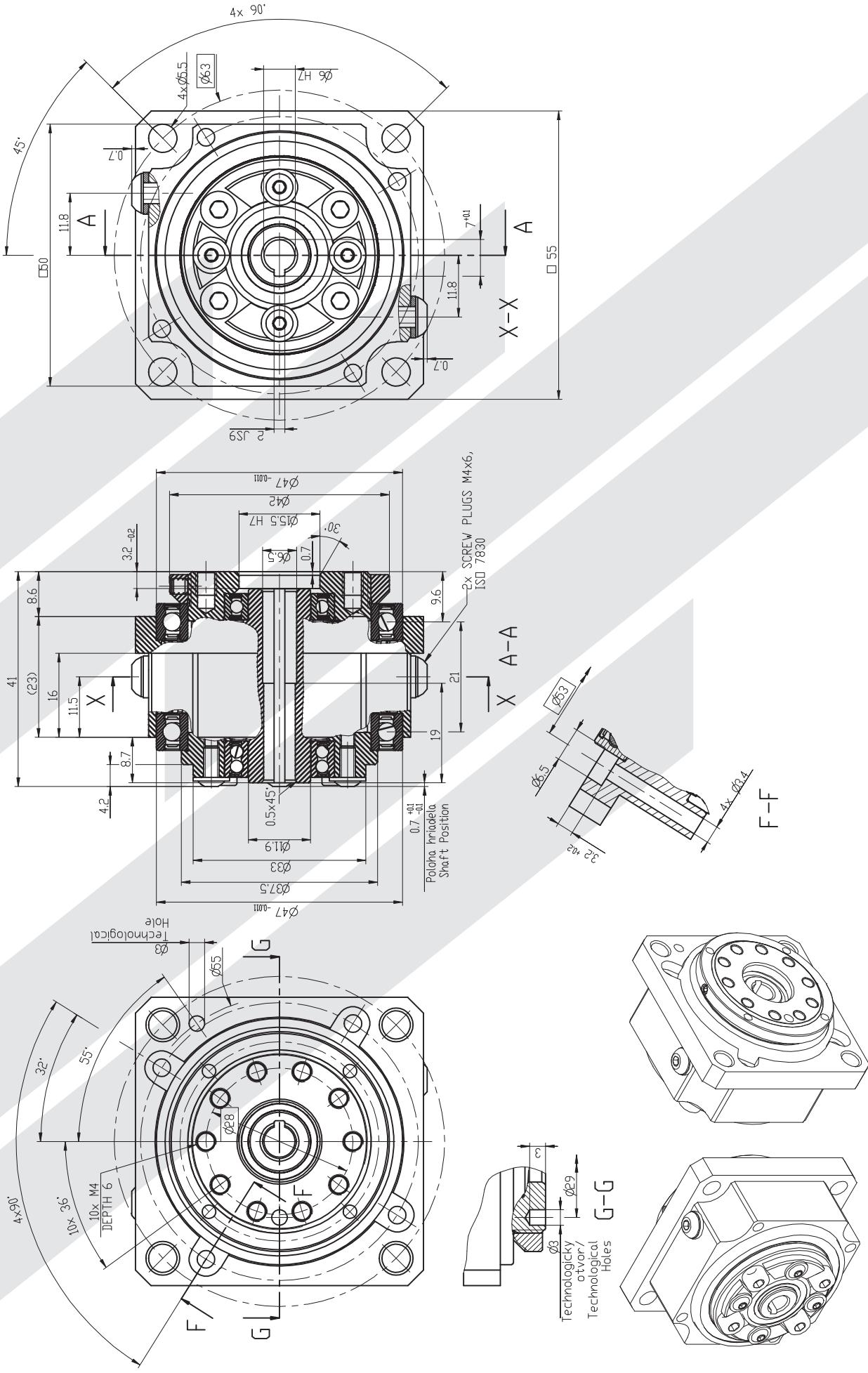
## Advantages

- small dimensions and compact design
- fully sealed series
- simple installation possibilities
- zero-backlash reduction gear
- very low mass
- very high power density
- deep groove ball output bearing with very low friction
- high performance of the reduction gear
  - high precision
  - high torsion rigidity
  - high linearity of torsion characteristics
- very low input inertia
- very good vibrations
- very low friction and high efficiency

TS Size	Recommended reduction ratio*	Rated output torque	Acceleration and braking	Permissible torque at emergency stop	Max. allowable input speed	Max. input speed	Tilting stiffness	Torsional stiffness	Max. lost motion	Hysteresis	Max. tilting moment	Max. axial force	Rated radial force	Input inertia	Weight
TS 50	47 63	18	36	90	2000	5000	4	2.5	<1.5	<1.5	44	*	1.9	0.007	0.47

\*All Technical Parameters are found in the TwinSpin catalogue.

# Drawing TS50-TSM50-P6



\*Drawings all sizes are found in the TwinSpin catalogue.