



OPERATION MANUAL





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1 General Information

1.1 Introduction

- This manual contains important information on how to safely use and operate TwinSpin® reducers and how to properly install, maintain and dispose of them.
- In the following, TwinSpin® reducers of all series are referred to as "reducers" or "product"
- The operator must ensure that the instructions in this manual have been read and understood by anyone who will install, operate or maintain the reducer.
- This manual must be kept close to the equipment in which the reducer is installed and used and must be easily accessible when needed.
- The original of this document has been prepared in Slovak; all the other language versions are translations of this document. The document is subject to change and may be changed without prior notice.

1.2 Use of the reducer

- The TwinSpin reducer was designed as a speed reduction and torque transfer device with integrated output bearing.
- Do not use reducer for any purpose other than that for which it was designed. Do not use the reducer outside the specified parameter range. Do not modify the reducer or any part of it.
- The manufacturer of the equipment in which the TwinSpin reducer is used is responsible for ensuring that the TwinSpin reducer is used in accordance with the purpose for which it was designed and must take into account all possible risks arising from its use and ensure that its unexpected movement does not cause injury to persons or damage to property.

1.3 Terminology and types of alerts

Type of alert



Definition of an alert

- This sign indicates imminent danger and risk of serious injury or death to the user.
- This mark indicates a potential risk of serious injury or even death to the user.
- This sign indicates a potential hazard that could cause minor or moderate injury.
- This mark indicates a potential hazard that could cause material damage.
- This mark indicates important information about the reducer or its use or function.

2 Safety instructions

2.1 General instructions

WARNING

- Installation, operation and maintenance of the reducers may only be carried out by persons who have read and understood these instructions. Furthermore, all persons working with reducers must have the qualifications required for working with this type of equipment.
- Responsible persons (managers, supervisors, foremen) must not allow any person to work with reducers who does not understand and know the reducer as a mechanical device.

NOTE

- If the end-user of the product works in the defence industry, or if the product is to be used for the production of weapons, the product may be subject to trade controls and export regulations. Therefore, before exporting the product, check the export and trade control conditions and take the required steps.
- If equipment failure or product malfunction can directly endanger human lives, or if the product is used in equipment that can harm human health (nuclear, space, medical equipment, safety systems, etc.), it is essential to check it regularly. In this case, contact your sales representative or the nearest dealer.
- If it is to be used in machinery which, in the event of a breakdown, may seriously endanger human life or damage equipment, appropriate safety precautions must be taken.
- Comply with all laws, regulations and ordinances for this type of product applicable in the country where the reducer will be used.

2.2 Installation of the reducer

ATTENTION

- Installation of reducers must only be carried out by trained persons with specialist knowledge of drive systems and mechanics.
- Be careful that the reducer does not fall to the ground or hit a metal or hard object during handling/transport. Damage to internal components and failure of the reducer may result.
- The reducer should not be subjected to high vibrations during assembly as they may cause damage to internal components.



NOTE

- Before installation, check that the reducer or any part of it is not damaged.
- Do not strike any part of the reducer with any tool, e.g., a hammer, this may cause damage to internal components and failure of the reducer.
- Do not use a hammer or any impact causing device to mount the reducer in its final position, this may damage internal surfaces/components and cause the reducer to fail.
- Never install the reducer if it is visibly damaged or has been damaged during shipping and handling.

2.3 Operation of the reducer

CAUTION

- Do not touch the reducer while it is running.
- The reducer heats up in operation. Be careful not to touch its surface shortly after stopping the reducer. Risk of burns.
- Before changing the lubricant, performing any inspection or making any repairs, make sure that the reducer with the drive connected is turned off and cooled down.
- Immediately discontinue operation of a reducer that has been unduly overloaded due to improper use or if the machine has had an accident. If the machine crashes, we recommend replacing the reducer even if there are no visible signs of damage.
- During maintenance, inspection or repair, make sure that the reducer or any connected components do not rotate or move and that the reducer drive is switched off.
- Do not expose the reducer to open flames or use it near substances that are flammable or explosive.
- Reducers in the standard version are not surface protected with paint or anti-corrosion coating.
- Do not operate the reducer in wet or corrosive environments, this may lead to damage.
- Do not operate the reducer outside the specified technical parameters listed in the product catalogue.
- Do not continue operation if the reducer is damaged or if the surface temperature has suddenly exceeded 60 °C. If your application requires higher operating temperatures and the surface heats up to more than 60 °C, contact the manufacturer.
- Check the reducer for leaks. In some cases, lubricant may cause a small leak from the space between the dust lip and the sealing lip on the output seal. Remove the excess lubricant and observe if the lubricant leakage continues.



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- Check the noise level during break-in and when the reducer is running. In case of increased noise level compared to the normal condition, do not continue to operate the reducer. Increased noise levels may indicate wear or damage to the reducer.

2.4 Disposal

- Before scrapping, remove all lubricant from the inside of the reducer.
- The reducer must be disposed of in accordance with the industrial waste disposal regulations applicable to the country where the reducer has been used.

2.5 EU Directive 2006/42/EC

- The reducer is a mechanical component. It is used in machines and equipment. It is therefore not machinery or partly completed machinery within the meaning of Directive 2006/42/EC of the European Parliament and of the Council. A CE declaration of conformity is therefore not necessary for TwinSpin reducers.
- The reducer must not be put into service or operated until it has been ensured that the equipment in which the reducer is installed complies with Directive 2006/42/EC.

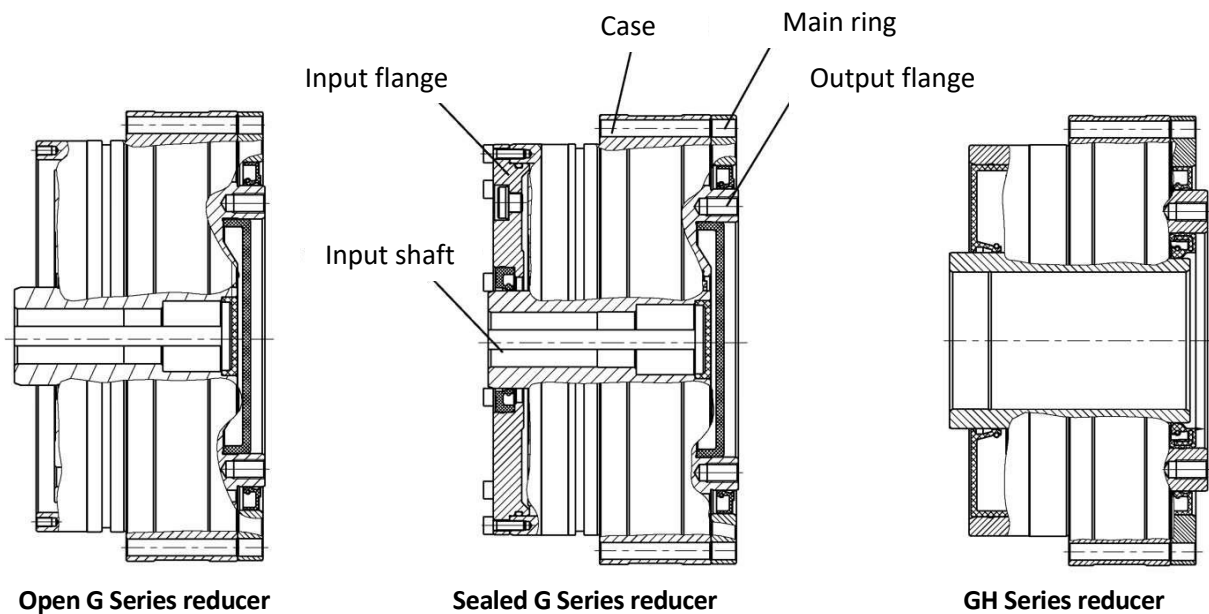
3 Product Description

3.1 Reducer versions

- The individual TwinSpin reducer series are supplied in the following versions as standard:

G and GH Series

1. open reducers - the reducer is supplied unsealed on the input side and sealed on the output side,
2. sealed reducers - the reducer is supplied as a fully sealed reducer,
3. GH series reducers are supplied sealed as standard.



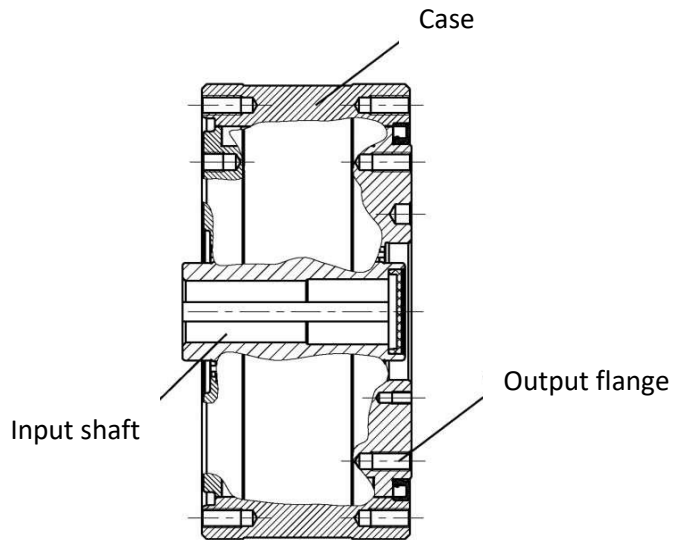
- For further information on possible modifications and designs of the G series reducers, please contact the sales department.



T Series

All sizes of T Series reducers are open on both the input and output side as a standard, except for the TS 70T size which is sealed on the output side.

For further information on possible modifications of the T Series reducers, please contact the sales department.

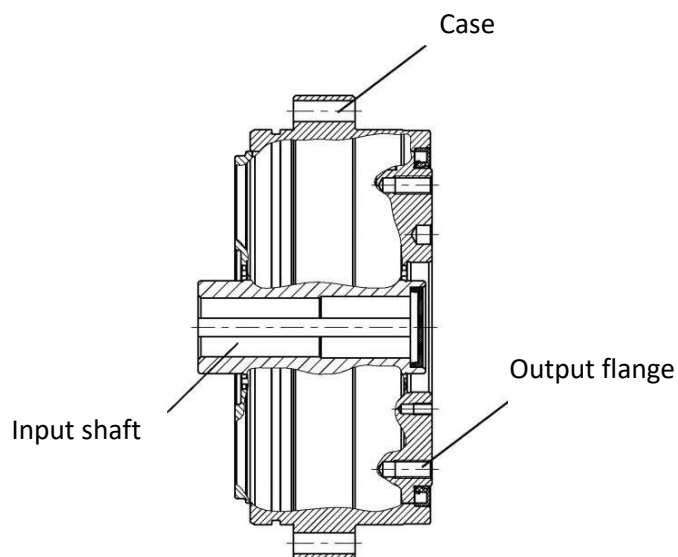


T Series Standard reducer

E Series

All sizes of the E series reducers are open on the input side and sealed on the output side as a standard, except for the TS 110E and TS140E sizes which are also open on the output side.

For further information on possible modifications of the E Series reducers, please contact the sales department.

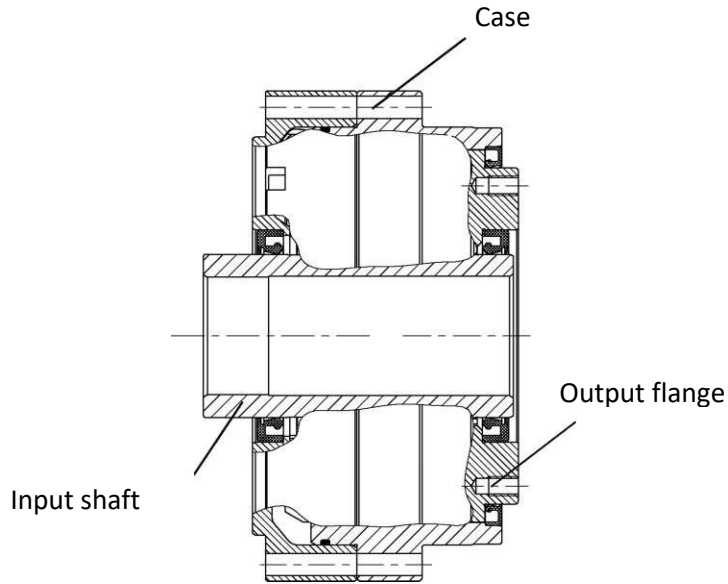


E Series Standard reducer

H Series

All sizes of H Series reducers are sealed as a standard.

For further information on possible modifications of the H series reducers, please contact the sales department.

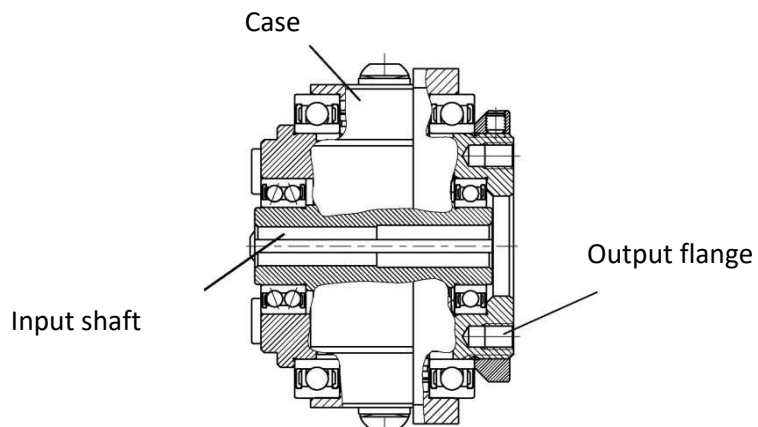


Standard H Series reducer

M Series

The only size in M Series - TS 50 is sealed.

For further information on possible modifications to the TS 50, please contact the sales department.



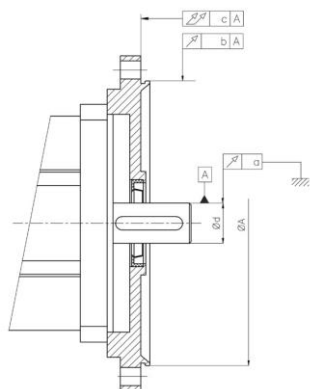
TS 50 M series reducer

4 Chapter Mounting Reducers in Applications

4.1 Motor flanges

- If you design and manufacture your own sealing motor flanges for direct connection of the TwinSpin reducer to the motor, ensure that the following manufacturing tolerances are observed.

G Series /valid only for open reducers/



flange Type A

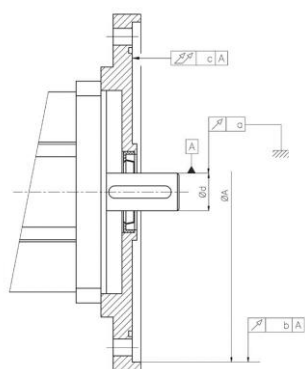
Flange Type A is used for all G Series sizes

Size	a	b	c	ϕd	ϕA
TS75G	0.015	0.040	0.038	9 k6	56.4 g6
TS85G	0.018	0.040	0.038	11 k6	63 g6
TS95G	0.018	0.050	0.038	14 k6	71 g6
TS 115G	0.018	0.050	0.044	14 k6	90.2 g6
TS 155G	0.021	0.050	0.050	19 k6	123 g6
TS 185G	0.021	0.050	0.058	24 k6	147.4 g6
TS 225G	0.021	0.060	0.058	24 k6	176 g6

T Series

Flange Type A is used for sizes TS70, TS110, TS140, TS170 and TS200.

Flange Type B is used for sizes TS60, TS80, TS240 and TS300

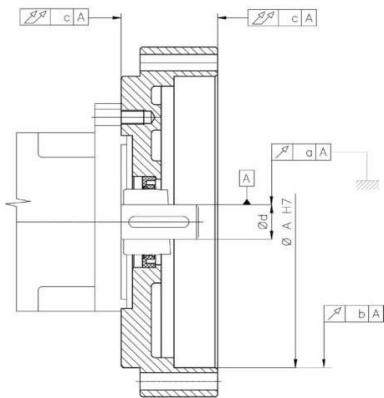


flange Type B

Size	a	b	c	ϕd	ϕA
TS 60	0.015	0.040	0.038	6 k6	63 H7
TS 70	0.018	0.040	0.038	11 k6	59.3 g6
TS 80	0.015	0.050	0.038	8 k6	80 H7
TS 110	0.018	0.050	0.044	14 k6	93 g6
TS 140	0.021	0.050	0.050	19 k6	119 g6
TS 170	0.021	0.050	0.050	24 k6	145 g6
TS 200	0.021	0.060	0.058	24 k6	170 g6
TS 240	0.021	0.063	0.058	28 k6	240 H7
TS 300	0.021	0.063	0.064	28 k6	300 H7

E Series

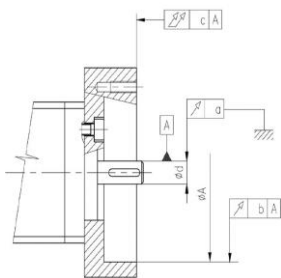
Flange Type E is used for all sizes of E series



flange Type E

Size	a	b	c	φd	φA
TS 70	0.015	0.040	0.038	11 k6	67 H7
TS 80	0.015	0.050	0.038	8 k6	75 H7
TS 110	0.018	0.050	0.044	14 k6	103 H7
TS 140	0.021	0.050	0.050	19 k6	128 H7
TS 170	0.021	0.050	0.050	24 k6	160 H7
TS 200	0.025	0.050	0.058	24 k6	186 H7
TS 220	0.025	0.063	0.058	28 k6	198 H7

M Series



Size	a	b	c	φd	φA
TS 50	0.020	0.040	0.038	6 j6	47 H7

4.2 Bolts and tightening torque for mounting reducers



- To safely transfer the external load acting on the reducer, use only metric grade 12.9 bolts, usually in an internal hexagon design.
- Thoroughly degrease the bolts and all surfaces of the bolted joint and remove any dirt before assembly. Never use screws with damaged threads for mounting the reducer.

Screw	M3	M4	M5	M6	M8	M10	M12
Tightening torque [Nm]	2.2	5.0	10.2	17.0	42.0	85.0	147.0
Clamping force [N]	3 700	6 400	10 600	14 900	27 300	43 500	63 500

Tightening torques of bolts of class 12.9





G Series Reducer	Case		Output flange	
	size	number	size	number
TS75G	M3	18	M5	12
TS85G	M4	18	M5	12
TS95G	M4	18	M4	18
TS 115G	M4	18	M5	18
TS 135G	M5	18	M6	18
TS 155G	M5	28	M8	28
TS 185G	M6	30	M8	24
TS 225G	M8	24	M8	32

GH Series Reducer	Case		Output flange	
	size	number	size	number
TS 85GH	M3	18	M5	12
TS 115GH	M4	18	M5	18
TS 125GH	M5	18	M6	18
TS 155GH	M5	18	M6	18
TS 245GH	M8	21	M8	24

T Series Reducer	Case		Output flange	
	size	number	size	number
TS60T	M3	12	M4	8
TS70T	M3	16	M4	14
TS80T	M4	12	M5	8
TS 110T	M5	12	M6	14
TS 140T	M6	12	M6	22
TS 170T	M8	12	M8	22
TS 200T	M10	12	M10	22
TS 240T	M12	12	M12	14
TS 300T	M16	12	M16	14

E Series Reducer	Case		Output flange	
	size	number	size	number
TS70E	M5	10	M6	5
TS80E	M5	10	M5	8
TS 110E	M5	14	M6	14
TS 140E	M6	12	M6	26
TS 170E	M8	14	M8	26
TS 200E	M10	14	M12	18
			M6	8



TS 220E	M10	14	M10	20
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H Series Reducer	Case		Output flange	
	size	number	size	number
TS70H	M5	8	M6	5
TS 140H	M6	12	M6	16
TS 170H	M8	12	M8	18
TS 200H	M10	12	M12	18
TS 220H	M10	12	M10	20

M Series Reducer	Case		Output flange	
	size	number	size	number
TS 50	M5	4	M4	10

⚠ CAUTION

- For safe torque transfer, use Loctite 603 adhesive on the friction joints of the bolt threads.
- Thoroughly clean and degrease the friction surfaces of the bolted joint before applying the adhesive.

4.3 Sealing components for sealed reducers

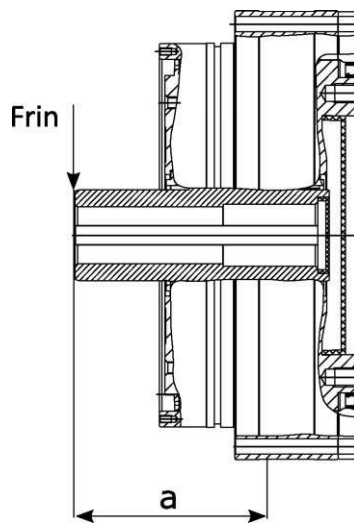
i NOTE

- SPINEA offers for all sizes of open TwinSpin reducers a set of sealing components necessary for complete sealing of the reducer from the input and output. Contact the sales department for more information.
- For sealing TwinSpin reducers, we recommend using seals made of fluoropolymers, available under the trade names VITON, FKM or FPM.

4.4 Permissible input shaft load

- Since the input shaft of the TwinSpin reducers is supported in roller bearings at both ends, it can be loaded with radial loads as shown in the figure below. The tilting torque as a result of radial loading is calculated according to the following formula.

$$M_{cin} = F_{rin} \times a$$



T Series	TS 60	TS 70	TS80	TS 110	TS 140	TS 170	TS200	TS240	TS300
Allowable torque M_{cin} [Nm]	6	11	16	35	68	126	157	260	378

E Series	TS 70	TS 80	TS110	TS 140	TS 170	TS200	TS220		
Allowable torque M_{cin} [Nm]	11	16	35	68	126	157	210		

H Series	TS 70	TS 140	TS 170	TS 200	TS220				
Allowable torque M_{cin} [Nm]	29	39	45	50	55				

G Series	TS 75	TS 85	TS95	TS 115	TS 155	TS 185	TS225		
Allowable torque M_{cin} [Nm]	19	20	30	39	40	54	135		

GH Series	TS 85	TS 115	TS 125						
Allowable torque M_{cin} [Nm]	16	35	33						

4.5 Installation of TwinSpin reducers



- Use protective equipment when installing the reducer.
- Do not sit on the reducer box or place any objects or mounting hardware on the unpacked reducer during assembly.



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- Do not use a hammer or impact tools during installation. The reducer must not be subjected to shock or vibration during assembly as this may damage the internal components of the reducer.
 - Never install the reducer if it is visibly damaged or if it has fallen to the floor during handling. Although the damage may not be visible, the reducer may be damaged in operation.

ATTENTION

- The surface of the reducer is treated with a corrosion inhibitor. Remove all corrosion inhibitor from all surfaces to be connected to the input and output members. Inhibitor residues adversely affect the coefficient of friction of the clamping and bolted connections. We recommend the use of hydrocarbon-based solvents applied at room temperature.
- When installing an open reducer, ensure the cleanliness of the installation site and prevent contamination of the inside of the reducer with dirt. If the inside of the reducer becomes contaminated with dust, dirt or metal particles, they will significantly reduce the life of the reducer and may adversely affect the operation of the reducer.
- The assembly procedure of the reducer may differ from the procedures described in this manual if the customer uses components designed and manufactured by himself.

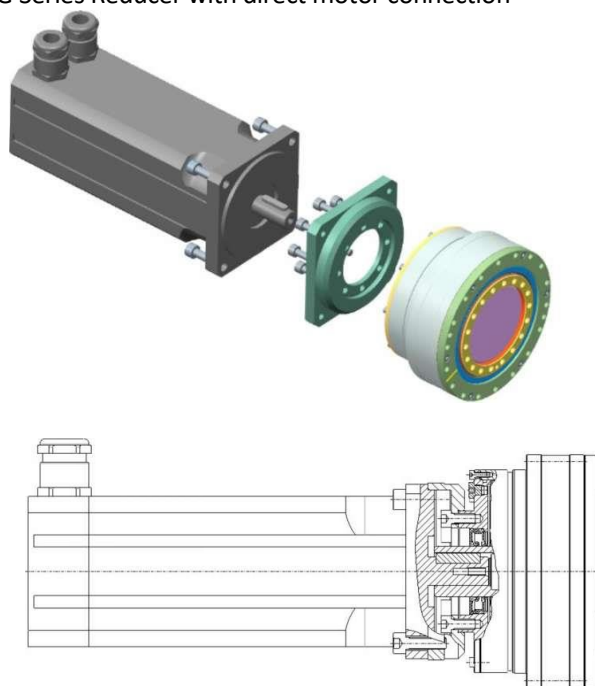
NOTE

- To achieve maximum reducer performance, it is important to pay attention to installation, mounting accuracy, sealing and lubrication. Most motor adapter flanges are available upon request. If you need further assistance, contact the sales department or your local sales representative.
- The TwinSpin reducer is a single-stage, high-precision, zero backlash gearbox that can only be used when properly mounted. The reducer can be mounted and operated in both horizontal and vertical positions.

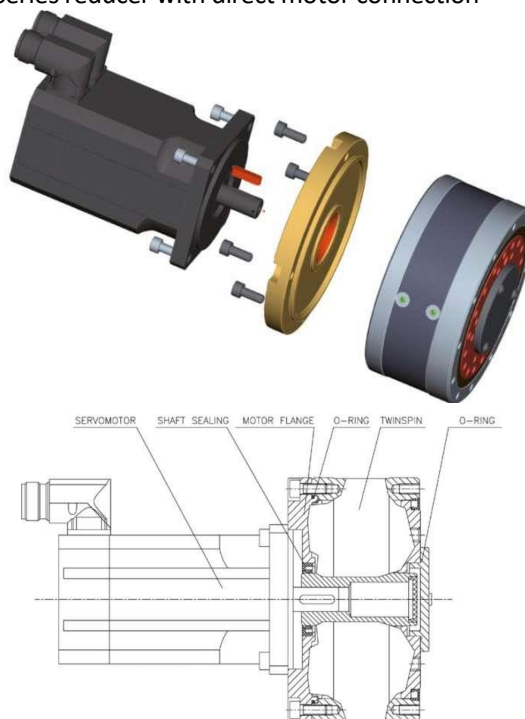
4.5.1 Assembly with direct connection to the motor with the keyway

- Ensure that all screw holes and contact surfaces are free of grease and dirt.
- Mount the motor flange on the input side of the reducer, use the prescribed tightening torques.
- If the motor flange is also a sealing flange, i.e., if it is mounted on an open reducer, fit a suitable O-ring in the flange groove. To facilitate installation, lubricate the O-ring with the same type of lubricant that will be used to lubricate the reducer in operation.
- Slowly slide the motor with the shaft oriented correctly into the reducer input shaft. Do not use excessive force or force to bring the motor to its final position.
- Center the motor and tighten the bolts on the motor, using the prescribed tightening torques.
- If the reducer is open on the output side, seal it with a suitable plug with an O-ring fitted or a rubberized shaft plug of suitable size.

G Series Reducer with direct motor connection



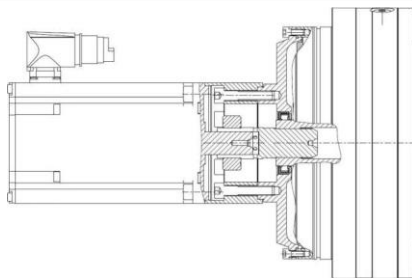
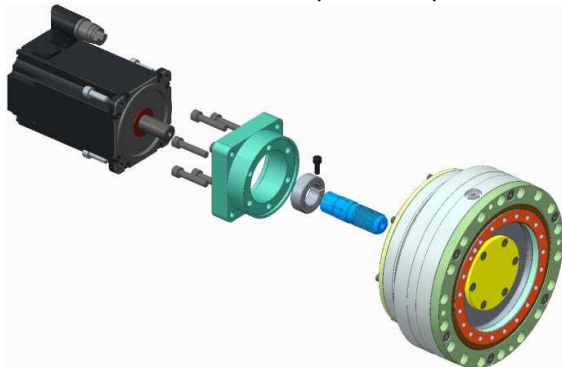
T Series reducer with direct motor connection



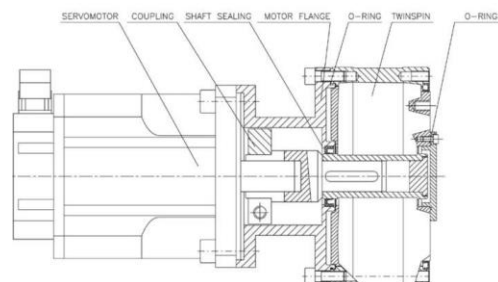
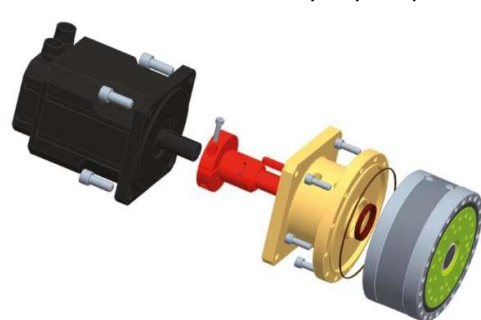
4.5.2 Mounting with adapter (splined or keyway) with smooth shaft motor

- Ensure that all screw holes and contact surfaces are free of grease and dirt.
- If the reducer is open on the output side, first seal it with a suitable O-ring or rubberized shaft plug of the appropriate size.
- Mount the motor flange on the input side of the reducer, use the prescribed tightening torques.
- If the motor flange is also a sealing flange, i.e., if it is mounted on an open reducer, fit a suitable O-ring in the flange groove. To facilitate installation, lubricate the O-ring with the same type of lubricant that will be used to lubricate the reducer in operation.
- If you use a splined shaft with involute splines, make sure it is lubricated with a special lubricant (see chapter Lubricating the reducer). Failure to do so may result in tribocorrosion, increased backlash and damage to the splined shaft.
- Slide the adapter onto the motor shaft, put on the clamping collar and tighten it with the correct tightening torque. Use the tightening torque recommended by the clamping collar manufacturer.
- Slowly insert the motor with the adapter oriented correctly into the input shaft of the reducer. Do not use excessive force or impact force to bring the motor to the end position. Use gentle motions when sliding the motor with the adapter to the counter surface.
- Center the motor and tighten the bolts on the motor, using the prescribed tightening torques.

G Series reducer with splined adapter



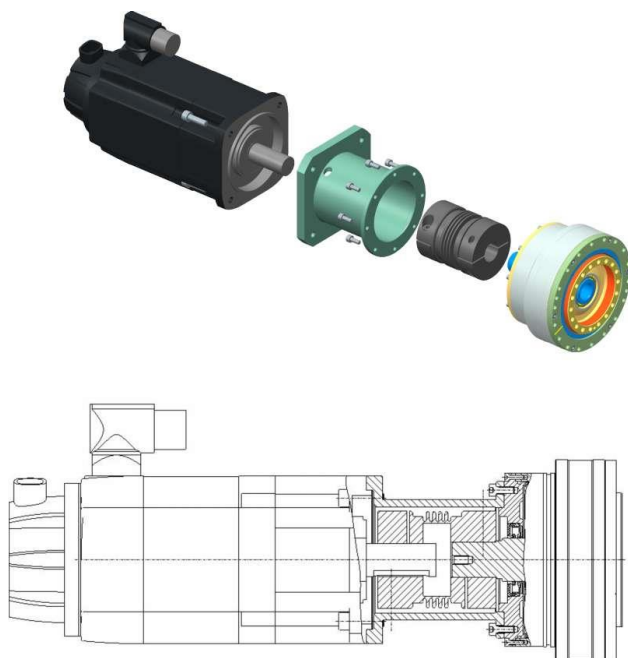
T Series reducer with keyway adapter



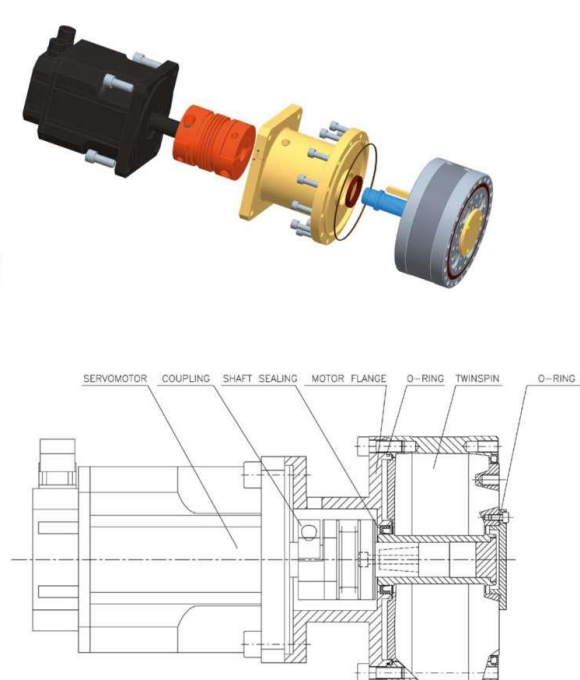
4.5.3 Assembly with coupling

- Ensure that all screw holes and contact surfaces are free of grease and dirt.
- If the reducer is open on the output side, first seal it with a suitable O-ring or rubberized shaft plug of the appropriate size.
- Fit the sealing flange to the input side of the reducer, using the prescribed tightening torques.
- If the motor flange is also a sealing flange, i.e., if it is mounted on an open reducer, fit a suitable O-ring into the flange groove. To facilitate installation, lubricate the O-ring with the same type of lubricant that will be used to lubricate the reducer in operation.
- Fit the coupling to the reducer input shaft. Tighten the bolts. When mounting the clutch, observe the clutch manufacturer's mounting instructions and tightening torques.
- Mount the motor flange on the inlet side of the reducer, use the prescribed tightening torques.
- Slide the motor to the other side of the coupling. Do not use excessive or impact force to bring motor to the final position.
- Center the motor and tighten the screws. Tighten the bolts on the coupling clamp. Observe the tightening torques prescribed by the coupling manufacturer.

G Series reducer with coupling

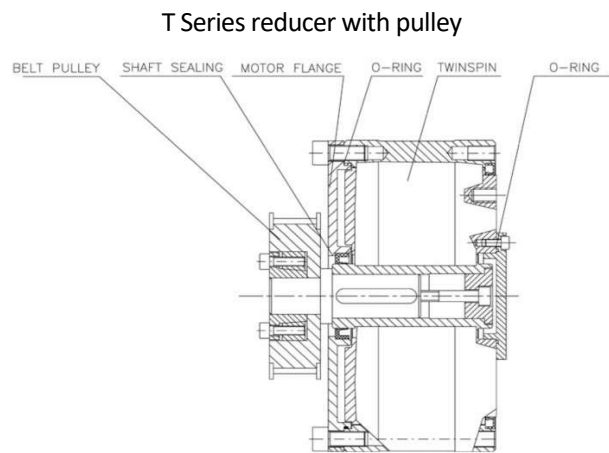
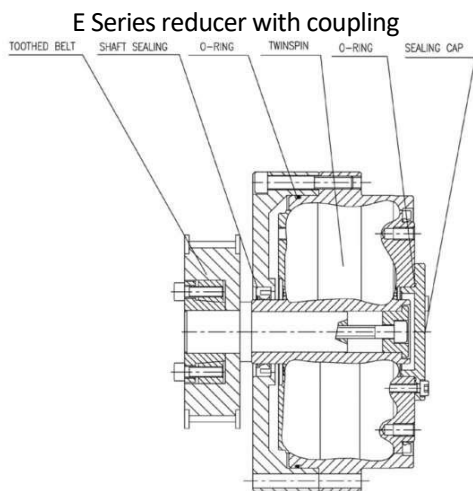


T Series reducer with coupling



4.5.4 Mounting with pulley

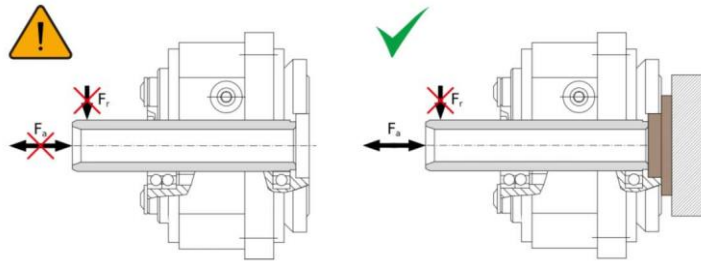
- Ensure that all screw holes and contact surfaces are free of grease and dirt.
- If the reducer is open on the output side, first seal it with a suitable O-ring or rubberized shaft plug of the appropriate size.
- Fit the sealing flange to the input side of the reducer, using the prescribed tightening torques.
- Fit the pulley to the reducer shaft. Tighten the bolts to the prescribed torque. Follow the pulley manufacturer's instructions when installing the pulley. Slide the pulley on carefully and without applying shock.



4.5.5 Specific installation warnings

ATTENTION

- When installing the G series reducers, all bolts in the carrier body and main ring must be installed and tightened to the specified torque. Failure to do so may damage the functionality of the reducer.
- When handling and mounting the TS50M, the input shaft of the gearbox must not be subjected to axial or radial loads to prevent damage to the ball bearings in which the shaft is housed. Such damage to the gearbox is not covered by the warranty. During installation, it is necessary to eliminate the compressive/tensile axial load on the shaft by supporting the shaft on the opposite side against the direction of axial force to prevent damage to the bearings.





5 Lubrication of reducers

- Reducers are supplied as standard with Castrol TRIBOL GR 100-0 PD or TRIBOL GR TT 1 PD lubricant. Alternatively, Castrol OPTIGEAR 150 oil can be used.
- If you have purchased a reducer without lubricant, please contact the sales department for information on the amount of lubricant required for each size and design of reducer.
- The lubricant change interval depends on the operating conditions. High temperatures, speeds and loads will reduce lubricant life. In many cases there is no need for relubrication as the reducer is filled with a lubricant to ensure its long life. If the reducer is oil lubricated, the recommended lubricant change interval is 20,000 operating hours.
- When changing the lubricant, fill the same volume of new lubricant as you drained from the reducer. For more detailed information on changing the lubricant, please contact the SPINEA sales department.

ATTENTION

- Do not use several types of lubricants in one reducer. Otherwise, the reducer may be damaged.
- If a splined shaft adapter is used to connect the motor to the reducer, always apply lubricant by applying it to the splined shaft. The lubricant type to be used is KLUEBER Microlube GL 261.
- If the lubricant in the reducer becomes contaminated for any reason, it must be replaced immediately. Otherwise, there is a risk of damage to the reducer during further operation.
- For more detailed information on lubrication of reducers, please refer to the SPINEA catalogue.



6 Storage and transport

- Reducers should be transported in closed vehicles, in containers or pallets secured against movement or overturning. The method of transport should be governed by mutual agreement between the customer and the supplier. In addition, the product must be protected from the elements, aggressive vapours, dust and mechanical damage. The manufacturer recommends that reducers be stored in their original shipping container.
- Standard packaging in the original packaging guarantees protection against corrosion for 6 months during storage in closed rooms with an ambient temperature of 5 °C to 25 °C and a relative humidity of up to 60%. After 6 months, a new layer of corrosion protection must be applied to the reducer.



- Never stand or move under a suspended reducer due to risk of injury.

7 Warranty

- Warranty conditions are specified in the General Terms and Conditions of Delivery of SPINEA, s.r.o. For more information, please see our website www.spinea.com

8 Operation of reducers

WARNING

- Do not approach or touch the reducer while it is in operation. The rotating part may catch part of your clothing and cause serious injury.
- In case of abnormally high noise or vibration of the reducer, immediately switch off the equipment. Carry out any repairs or removal of the reducer from the machine only after the machine and reducer have been completely stopped and cooled.

CAUTION

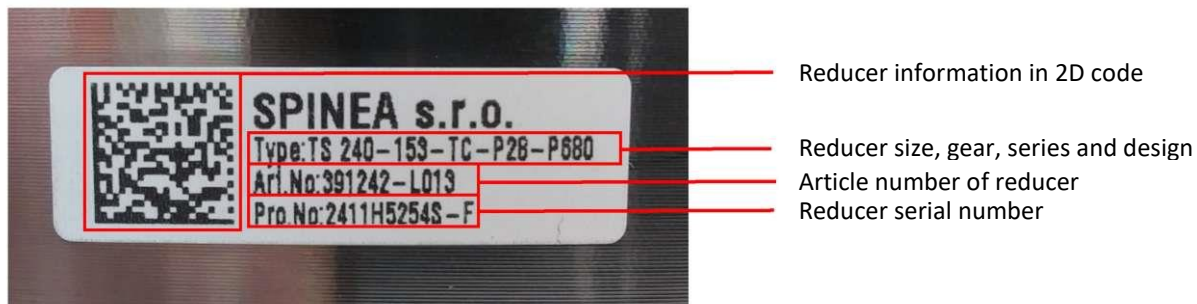
- The reducer heats up in operation. Do not touch the reducer immediately after it has stopped, as contact with the surface may cause burns.
- Operate the reducer only within the range specified in the technical specifications. Failure to do so may result in injury to the operator of the equipment or damage to the reducer.

ATTENTION

- Operate the reducer only in a dry and clean environment.
- Operate the reducer within the defined ambient temperature range of -10 °C to +40 °C. If operating conditions are outside these limits, contact the manufacturer.
- Ensure that the temperature of the reducer surface does not exceed 60 °C. Contact the manufacturer if your application requires operating parameters that will cause a surface temperature in excess of 60 °C.
- Check the reducer for leaks. In some cases, lubricant may cause a small leak from the space between the dust lip and the sealing lip. Remove the excess lubricant and observe if the lubricant leakage continues.
- Check the noise level during break-in and periodically when the reducer is running.
- The reducers are supplied without running-in. The reducer running-in is carried out by each user himself after installation in the respective device, during operation, usually lasting 48 hours. During break-in, the temperature on the surface of the reducer should not exceed 50 °C. If the customer requires the reducer to be delivered in run-in state, this must be agreed in the sales contract.

9 Labelling of reducers

- Each TwinSpin reducer is marked with 2 labels attached to its surface. The structure of the information on the labels is shown in the pictures below.



10 Service

- For further information about the reducer or in case of problems or complaints, please use the contact details below.

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