SPAGGIARI TRASMISSIONI

A Division of Motovario S.p.A.

**MAINTENANCE AND USE INSTRUCTIONS FOR WORM GEAR REDUCERS AND GEARMOTORS SERIES:**

# SW - ISW - SW+SW ISW+SW

## Warehouse storage

When moving the unit, care should be taken to protect external parts from breakage or damage due to accidental knocks or falls.
If the unit is to be stored in a hostile atmosphere or for a long period of time (2/4 months), it is important to apply protective and waterproofing products to avoid deterioration of shafts and rubber parts.
Before starting up the unit, carry out the following checks:
Check the data shown on the name plate of the reduction unit and/or the electric motor;
Check for any leaks of lubricant
If possible, remove any traces of dirt from the shaft and from the areas around the oil seal.
If the oil seal is not immersed in the lubricant inside the assembly during particularly long storage periods (4/6 months) it is recommended that it should be replaced as the rubber might stick to the shaft or even have lost the elasticity it needs to work.

## Installation

Particular care must be taken when installing drives, as this is often the source of damage and down time. Careful choice of the type of drive and mounting position can often avoid the need for protection of sensitive areas, particularly underneath the unit from oil leaks, however limited they may be.

- The machine must be firmly fastened in place in order to prevent any vibrations.
- Whenever possible, protect the reduction unit from direct sunlight and bad weather, especially when it is mounted on its vertical axis.
- Make sure the air intake on the fan side is unobstructed in order to ensure that the motor is correctly cooled.
- In the case of temperatures of < -5 °C or > +40 °C, contact Technical Assistance.
- If the motor is to be started very often under load, the use of a heat probe inserted into the motor is recommended.
- The various machine members (pulleys, gear wheels, couplings, etc.) must be mounted on the shafts using special threaded holes or other systems that ensure correct operation without risk of causing damage to the bearings or the external parts of the assemblies (fig.1).
- Lubricate the surfaces that come into contact in order to prevent oxidation or seizure.

## Installation

**Example of a pulley mounted correctly on the slow shaft of a reduction unit**

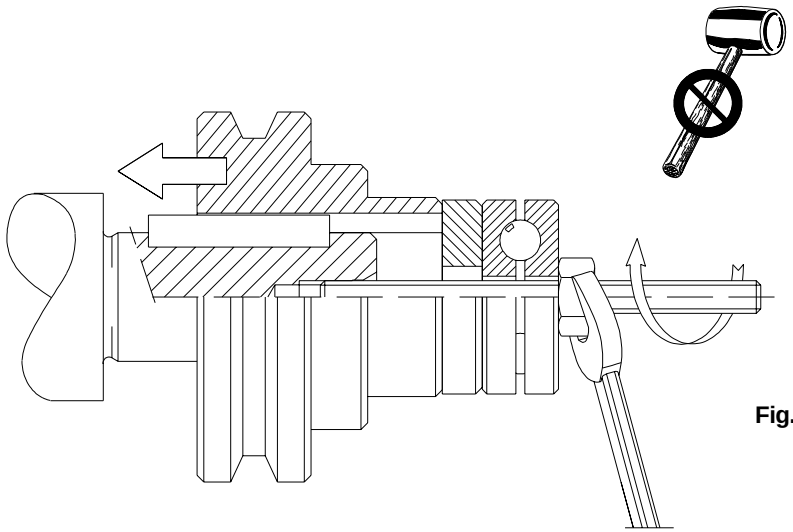


**Fig. 1**

**Correct and incorrect examples of pulleys mounted on the main shaft of a reduction unit.**

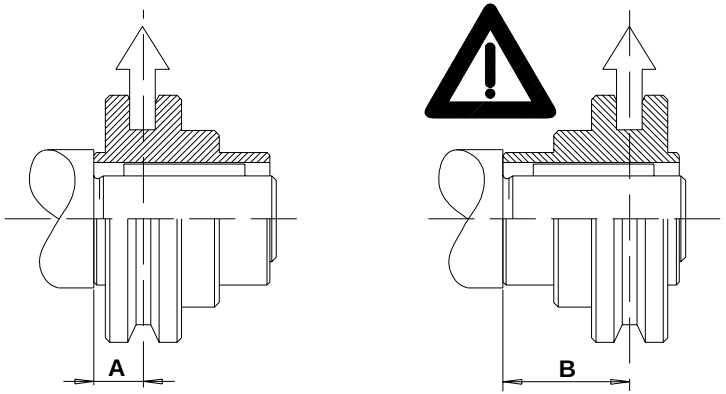
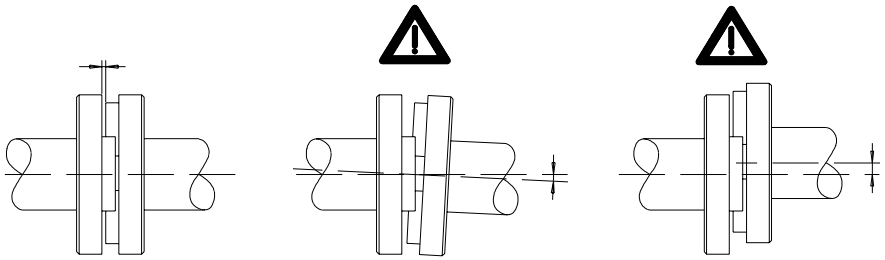



**Fig. 2**

## Installation

**Correct and incorrect examples of coupling connections**

**Fig. 3**




The pulley must be mounted on the main shaft as close as possible to the shoulder so that is does not cause excessive radial load on the bearings (fig. 2).Great care must be taken when connecting the couplings to ensure that they are well aligned, so as not to cause excessive radial load on the bearings (fig.3).When it is applied, paint must never be used on rubber parts: oil seal, etc. It must never be applied to any breather holes in plugs if they are mounted on the unit.In the case of assemblies with oil plugs, remove the closed cap used for transport and fit it with the breather plug that is supplied with the reduction unit.When the assembly is supplied without a motor, the following precautions must be followed in order to ensure that connections are properly made

**Mounting the motor on the pam B5/B14 flange**

Check that the tolerance of the motor shaft and the motor flange comply with at least one 'normal' class of quality. Carefully clean off any trace of dirt or paint from the shaft, the centering diameter and the face of the flange. Carry out mounting operations making sure not to use force. If this is not possible, check the tolerance of the motor key and ensure that it is correctly fitted. Apply assembly grease to the shaft in order to prevent oxidation or seizure caused by contact.

Good quality motors should be used in order to ensure that the unit works correctly, without vibrations or noise.

Before mounting the unit on the machine, check that the principal shaft of the reduction unit rotates in the right direction.

*Use the oil window, if present, to check that the lubricant reaches the correct level required for the mounting position used.*

## Starting up

The unit should be started up gradually: do not immediately apply the maximum load the machine is able to take ; look for and correct any malfunction that may be caused by incorrect mounting.

Running-in is not essential for the reduction unit to run properly since modern construction techniques for the gears and castings, the extreme cleanliness of the internal parts, and the excellent qualities of the lubricants used, ensure that the internal parts receive a high degree of protection even during the first moments.

## Servicing

The high degree of finish of the internal parts ensures that the unit will work correctly with only a minimum amount of servicing

Generally speaking, the following rules should be followed: periodically check that the exterior of the assembly is clean, especially in the cooling areas; periodically check to see if there are any leaks, especially in the areas around the oil seals.

Assemblies that are lubricated for life and thus do not have any oil plugs do not require any special maintenance except as stated above.

For other assemblies, low maintenance is required with an oil change at 8/10,000 hours of use. The change of oil naturally depends on the type of environment and use to which the unit is put.

Apart from the normal maintenance rules given above, make sure the breather hole in the plug is clean and, using the oil window, periodically check that there is sufficient lubricant.

Should it be necessary to top up with lubricant, use the same type that is already in the reducer or one that is compatible with it.

In case of doubtful incompatibility between lubricants, we recommend you empty out the oil from the gearbox completely and, before refilling with new oil, wash out the unit to remove any residue.

When changing the oil, follow the previous instructions.

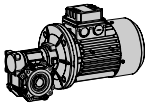
## Troubleshooting

If any problems should arise when starting the unit or during its first few hours of operation, contact the after sales service unit of Motovario.

The table shows a series of problems with a description of possible remedies.

It should be kept in mind however that the information given is for reference only, as all the drives manufactured by Motovario are thoroughly tested and checked before they leave the factory.

Please note that tampering with the assembly without prior authorization from Motovario immediately invalidates the warranty and often makes it impossible to ascertain the causes of a defect or malfunction.

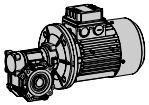


## Troubleshooting

| *PROBLEMS* | CAUSES | ACTION (1) | ACTION (2) |
|---|---|---|---|
| *The motor does not start.* | Problems with power supply. Defective motor. Wrong size of motor. | Check power supply. | Replace electric motor. |
| *Current absorbed by the motor is greater than shown on the data plate.* | Wrong size of motor. | Check the application. | Replace the electric motor and, if necessary, the reduction unit. |
| *Temperature of the motor housing is very high.* | Defective motor. Wrong size of motor. Incorrect mounting of motor | Check the application. | Replace the electric motor and, if necessary, the reduction unit. |
| *Temperature of the reduction unit housing is very high.* | Wrong size of reduction unit. Mounting position does not comply with the order. Incorrect mounting of motor | Check the application. | Correct the working conditions: mounting position and/or lubricant level. |
| *Incorrect rotation speed of the main reducer unit shaft.* | Incorrect reduction ratio. Incorrect polarity of motor. | Check reduction ratio. Check polarity of motor. | Replace reduction unit and/or electric motor. |
| *Oil leak from oil seal.* | Defective oil seal. Oil seal damaged during shipment. Defective motor shaft. | Replace the oil seal. Repair motor shaft (if possible). | Replace the part or return the assembly to Motovario. |
| *Oil leak from joint.* | Flat gasket or O-ring damaged. | Replace damaged gasket or O-ring. | Return the assembly to Motovario. |
| *The main shaft rotates the wrong way.* | Incorrect connection of the electric motor. | Swap two phases of the motor supply. | |
| *Intermittent noise from the gears.* | Dents in the gear wheels. | No practical problem if the noise has no effect on the application. | Return the assembly to Motovario if there is significant noise when laaded. |

## Troubleshooting

| *PROBLEMS* | CAUSES | ACTION (1) | ACTION (2) |
|---|---|---|---|
| *No intermittent noise from the gears.* | Dirty inside the gearbox. | No practical problem if the noise has no effect on the application. | Return the assembly to Motovario if there is significant noise when laaded. |
| *Noise (whine) from the drive assembly.* | Bearings incorrectly adjusted. Gears with mesh errors. Insufficient lubricant. | Check correct quantity of lubricant. | Return the assembly to Motovario. |
| *Electric motor vibrates.* | Measurement of the assembly coupling. | Check geometric tolerance of flange on electric motor. Check tolerance and geometry of key on motor shaft. | Replace electric motor. |



## Critical applications

The performance given in the catalogue correspond to mounting position B3 or similar, ie. when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the above tables that highlight different critical situations for each size of reduction unit.
It is also necessary to take due consideration of and carefully assess the following applications by calling our Technical Service.

- As a speed increasing.
- Use in services that could be hazardous for people if the reduction unit fails.
- Applications with especially high inertia.
- Use as a lifting winch.
- Applications with high dynamic strain on the case of the reduction unit.
- In places with T° under -5°C or over 40°C.
- Use in chemically aggressive environments.
- Use in a salty environment.
- Mounting positions not envisaged in the catalogue.
- Use in radioactive environments.
- Use in environments pressures with
- Avoid applications where even partial immersion of the reduction unit is required.

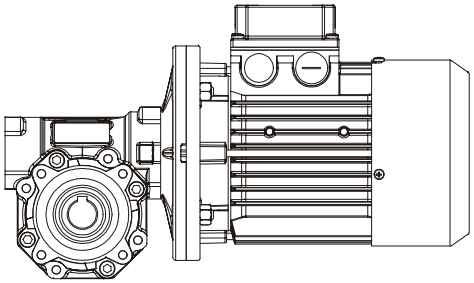
| SW–ISW | 030 | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|
| V5: 1500 < n1 < 3000 | - | - | - | - | B | B | B |
| n1 > 3000 | B | B | B | B | A | A | A |
| V6 | B | B | B | B | B | B | B |

**A** - Application not recommended
**B** - Check the application and/or call our technical service

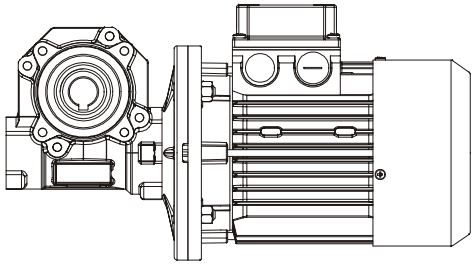
## Mounting position

025 ÷ 150

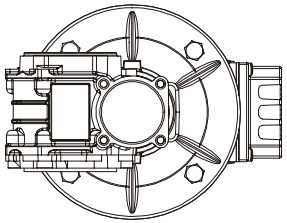
**B3**



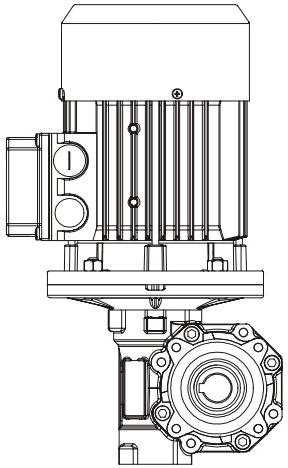
**B8**



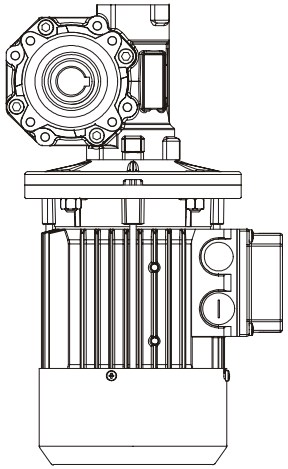
**B6**



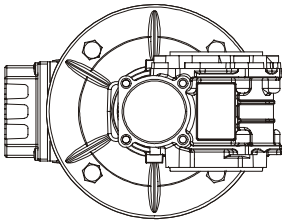
**V5**

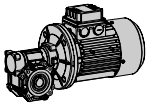


**V6**



**B7**





## Lubrication

| | SW 030 ÷ 105<br>PC 063 ÷ 090 |
|---|---|
| | Olio sintetico |
| **T°C<br>ISO VG...** | **(-25) ÷ (+50)<br>ISO VG320** |
| **AGIP** | TELIUM VSF320 |
| **SHELL** | TIVELA OIL SC320 |
| **ESSO** | S220 |
| **MOBIL** | GLYGOYLE 30 |
| **CASTROL** | ALPHASYN PG320 |
| **BP** | ENERGOL SG-XP320 |

## Lubrication (SW - ISW)

• Size 025 - 030 - 040 - 050 - 063 - 075 - 090 105 gear reducers come pre-filled with IP TELIUM VSF, a synthetic gear oil suitable for permanent lubrication. They can be mounted in any position. Only sizes 075 and 090 should not be installed in mounting positions V5 and V6 without prior consultation with our Technical Advise Service to determine optimal lubrication conditions.

| SW | 030 | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|
| **B3** | 0,04 | 0,08 | 0,15 | 0,3 | 0,55 | 1 | 1,6 |
| **B8** | | | | | | | |
| **B6-B7** | | | | | | | |
| **V5** | | | | | | | |
| **V6** | | | | | | | |

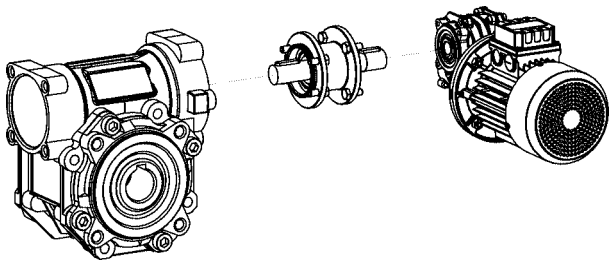
Quantity of oil in litres.

## Lubrication (PC)

- The pre-stage helical modules are supplied complete with life-long lubricant, synthetic oil, AGIP TELIUM VSF, and can therefore be mounted in all the positions.
- Lubrication is separated from that of the worm reduction unit.
- The synthetic lubricant adopted by Motovario can be used in places with temperatures from -25°C to + 50°C.

| PC | 063 | 071 | 080 | 090 |
|---|---|---|---|---|
| **B3 - B8<br>B6 - B7<br>V5 - V6** | 0,05 | 0,07 | 0,15 | 0,16 |

Quantity of oil in litres.

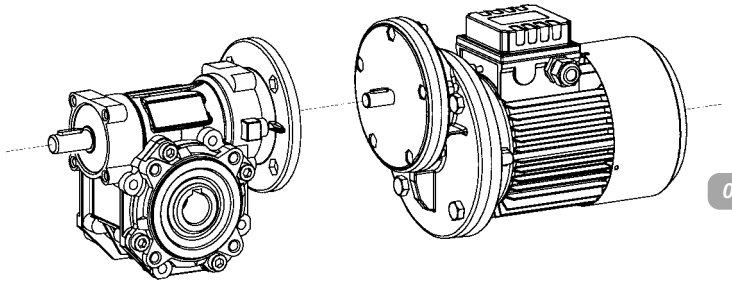


009 For 040÷105

010 For 030÷053

008 For 040÷105

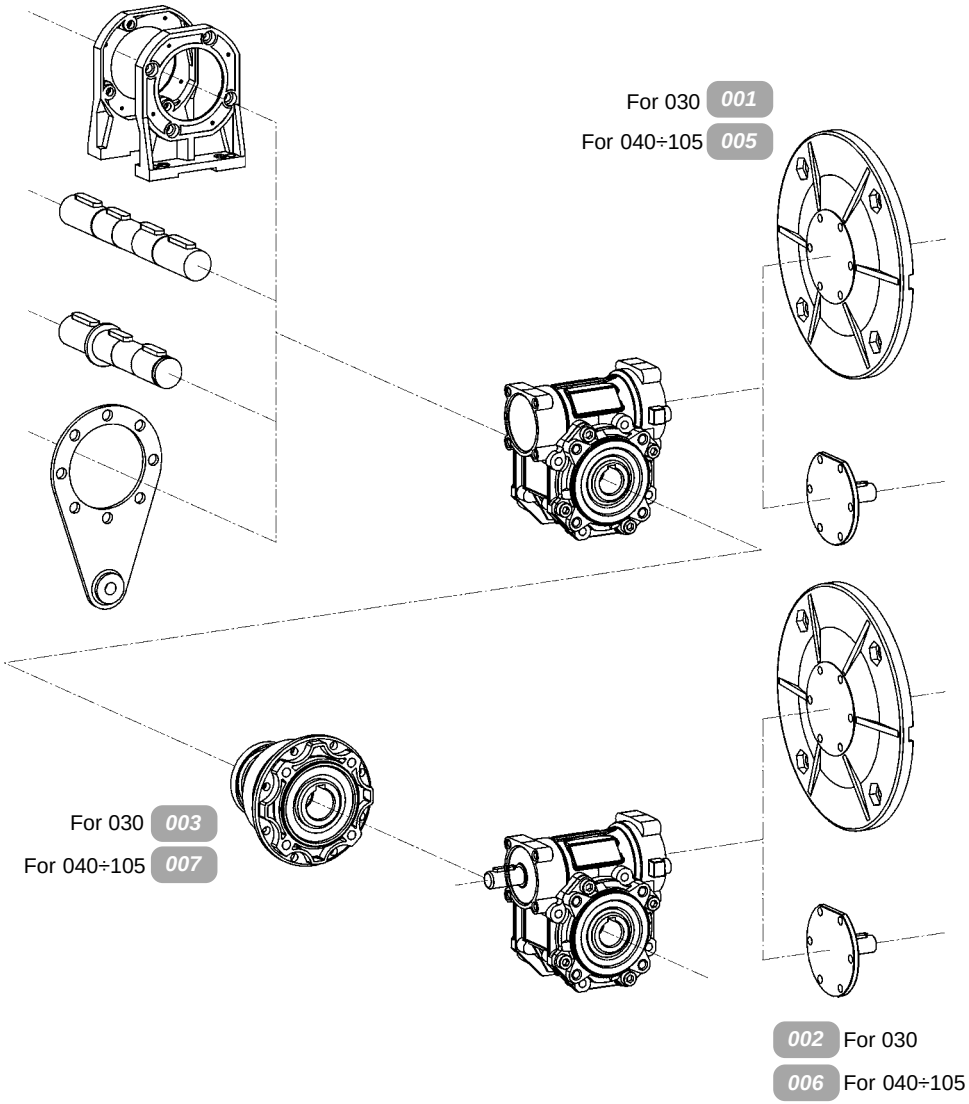
004 For 030



011 For 063÷090

**P = Project of pertinence**
**T = Reference table**
**C = Part number**

Spare parts tables 025÷150



For 030 001

For 040÷105 005

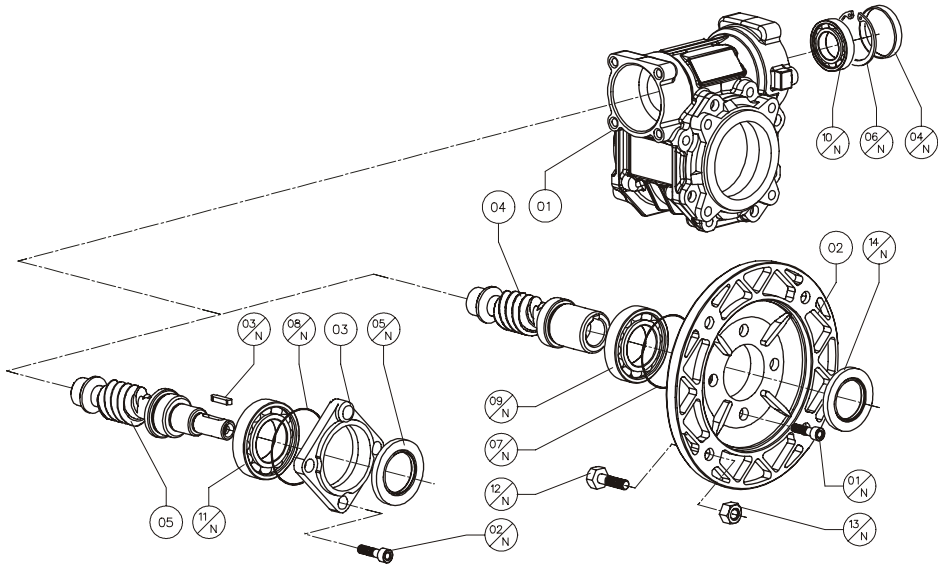
For 030 003

For 040÷105 007

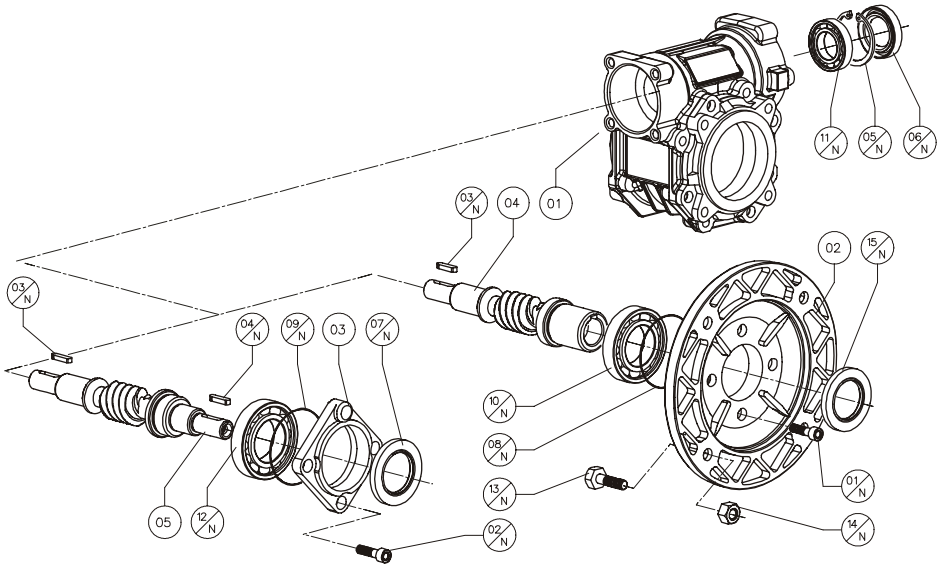
002 For 030

006 For 040÷105

## ST TAV 001 1/1 030




## ST TAV 002 1/1 030



## ST TAV 001 1/1 030

| | P | T | C | Buit | 030 |
|---|---|---|---|---|---|
| | T | 001 | 01 | Casing | T.030.01 |
| | T | 001 | 02 | PAM flange | 9.030.03 |
| | T | 001 | 03 | Gear unit cover | 9.030.06 |
| | T | 001 | 04 | PAM worm | 9.030.14 |
| | T | 001 | 05 | RV worm | 9.030.16 |

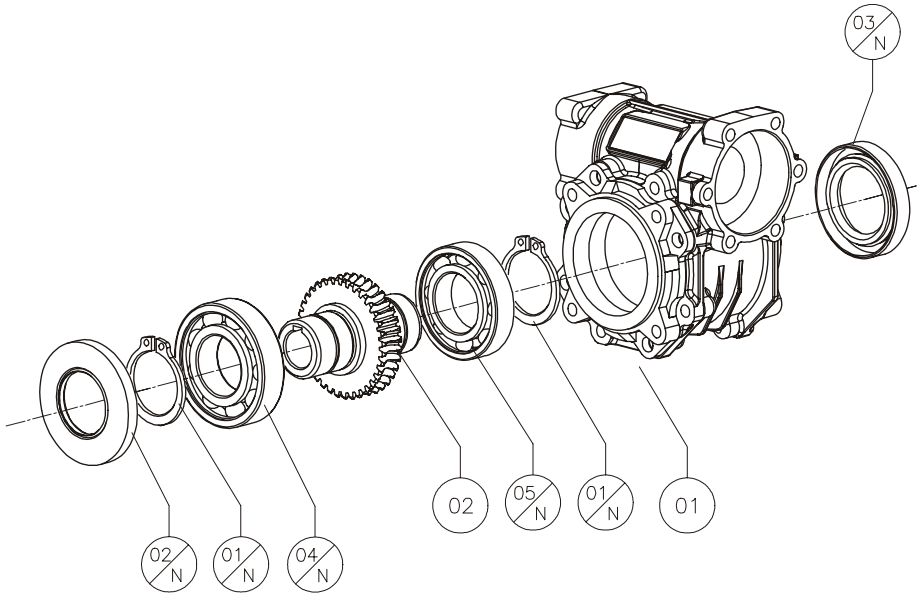
| pam | P | T | C | Commercial | 030 | |
|---|---|---|---|---|---|---|
| | T | 001 | 01 N | Shcs screw DIN 7984 | M6x12 | 4 |
| | T | 001 | 02 N | Shcs screw DIN 7984 | M6x12 | 3 |
| | T | 001 | 03 N | Key DIN 6885 | A 3x3x15 | 1 |
| | T | 001 | 04 N | Circlip DIN 472 | 32 | 1 |
| | T | 001 | 05 N | Oil seal DIN 3760 | AS 12x32x7 | 1 |
| | T | 001 | 06 N | Cap | RCA 32-5 | 1 |
| | T | 001 | 07 N | O-Ring | 2131 | 1 |
| | T | 001 | 08 N | O-Ring | 2131 | 1 |
| | T | 001 | 09 N | Bearing | 61904 | 1 |
| | T | 001 | 10 N | Bearing | 6201 | 1 |
| | T | 001 | 11 N | Bearing | 6301 | 1 |
| 056 B5 | T | 001 | 12 N | Hex screw DIN 931 | M6x20 | 4 |
| | T | 001 | 13 N | Nut DIN 934/6 | M6 | 4 |
| | T | 001 | 14 N | Oil seal DIN 3760 | A 20x30x7 | 1 |
| 063 B5 | T | 001 | 12 N | Hex screw DIN 931 | M8x25 | 4 |
| | T | 001 | 13 N | Nut DIN 934/6 | M8 | 4 |
| | T | 001 | 14 N | Oil seal DIN 3760 | A 20x30x7 | 1 |
| 056 B14 | T | 001 | 12 N | Hex screw DIN 931 | M5x12 | 4 |
| | T | 001 | 13 N | Nut DIN 934/6 | M5 | 4 |
| | T | 001 | 14 N | Oil seal DIN 3760 | A 20x30x7 | 1 |
| 063 B14 | T | 001 | 12 N | Hex screw DIN 931 | M5x12 | 4 |
| | T | 001 | 13 N | Nut DIN 934/6 | M5 | 4 |
| | T | 001 | 14 N | Oil seal DIN 3760 | A 20x30x7 | 1 |

## ST TAV 002 1/1 030

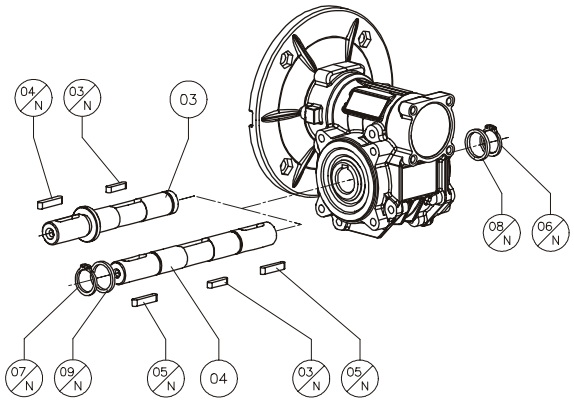
| | P | T | C | Built | 030 |
|---|---|---|---|---|---|
| | T | 002 | 01 | Casing | T.030.01 |
| | T | 002 | 02 | PAM flange | 9.030.03 |
| | T | 002 | 03 | Gear unit cover | 9.030.06 |
| | T | 002 | 04 | Double ext. PAM worm | 9.030.15 |
| | T | 002 | 05 | Double ext. RV worm | 9.030.17 |

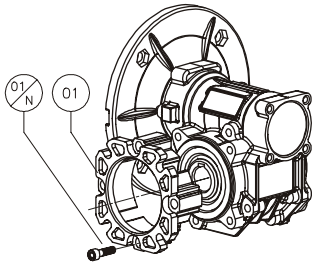
| pam | P | T | C | Commercial | 030 | |
|---|---|---|---|---|---|---|
| | T | 002 | 01 N | Shcs screw DIN 7984 | M6x12 | 4 |
| | T | 002 | 02 N | Shcs screw DIN 7984 | M6x12 | 3 |
| | T | 002 | 03 N | Key DIN 6885 | A 3x3x15 | 1 |
| | T | 002 | 04 N | Key DIN 6885 | A 3x3x15 | 1 |
| | T | 002 | 05 N | Circlip DIN 472 | 32 | 1 |
| | T | 002 | 06 N | Oil Seal DIN 3760 | AS 12x32x7 | 1 |
| | T | 002 | 07 N | Oil Seal DIN 3760 | AS 12x32x7 | 1 |
| | T | 002 | 08 N | O-Ring | 2131 | 1 |
| | T | 002 | 09 N | O-Ring | 2131 | 1 |
| | T | 002 | 10 N | Bearing | 61904 | 1 |
| | T | 002 | 11 N | Bearing | 6201 | 1 |
| | T | 002 | 12 N | Bearing | 6301 | 1 |
| 056 B5 | T | 002 | 13 N | Hex screw DIN 931 | M6x20 | 4 |
| | T | 002 | 14 N | Nut DIN 934/6 | M6 | 4 |
| | T | 002 | 15 N | Oil Seal DIN 3760 | A 20x30x7 | 1 |
| 063 B5 | T | 002 | 13 N | Hex screw DIN 931 | M8x25 | 4 |
| | T | 002 | 14 N | Nut DIN 934/6 | M8 | 4 |
| | T | 002 | 15 N | Oil Seal DIN 3760 | A 20x30x7 | 1 |
| 056 B14 | T | 002 | 13 N | Hex screw DIN 931 | M5x12 | 4 |
| | T | 002 | 14 N | Nut DIN 934/6 | M5 | 4 |
| | T | 002 | 15 N | Oil Seal DIN 3760 | A 20x30x7 | 1 |
| 063 B14 | T | 002 | 13 N | Hex screw DIN 931 | M5x12 | 4 |
| | T | 002 | 14 N | Nut DIN 934/6 | M5 | 4 |
| | T | 002 | 15 N | Oil Seal DIN 3760 | A 20x30x7 | 1 |

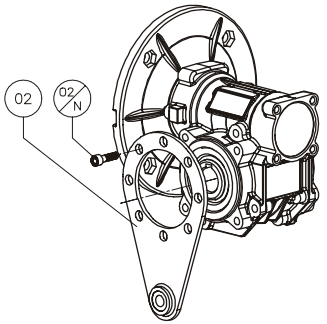
## ST TAV 003 1/1 030




## ST TAV 004 1/1 030



## ST TAV 003 1/1 030

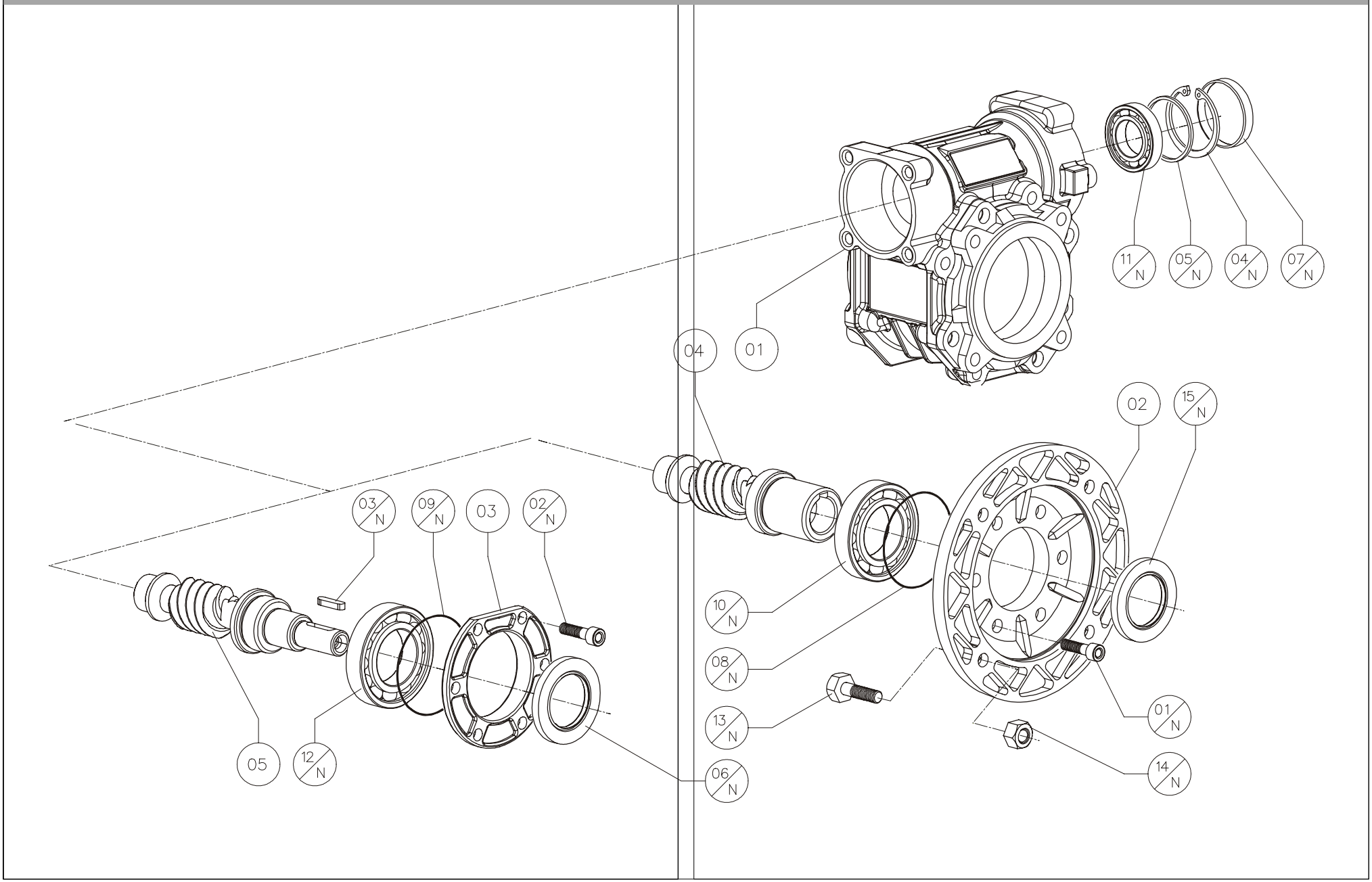
| P | T | C | Built | 030 |
|---|---|---|---|---|
| T | 003 | 01 | Casing | T.030.01 |
| T | 003 | 02 | Worm Wheel | 9.030.11 |

| P | T | C | Commercial | 030 | |
|---|---|---|---|---|---|
| T | 003 | 01 N | Circlip | 25 DIN 471 | 1 |
| T | 003 | 02 N | Oil seal DIN 3760 | AS 25x47x7 | 1 |
| T | 003 | 03 N | Oil seal DIN 3760 | AS 25x35x7 | 1 |
| T | 003 | 04 N | Bearing | 16003 | 1 |
| T | 003 | 05 N | Bearing | 61905 | 1 |

## ST TAV 004 1/1 030

| P | T | C | Built | 030 |
|---|---|---|---|---|
| T | 004 | 01 | Output flange F | 9.030.04 |
| T | 004 | 02 | Torque arm | 9.030.05 |
| T | 004 | 03 | Single output Shaft | 9.030.21 |
| T | 004 | 04 | Double output Shaft | 9.030.22 |

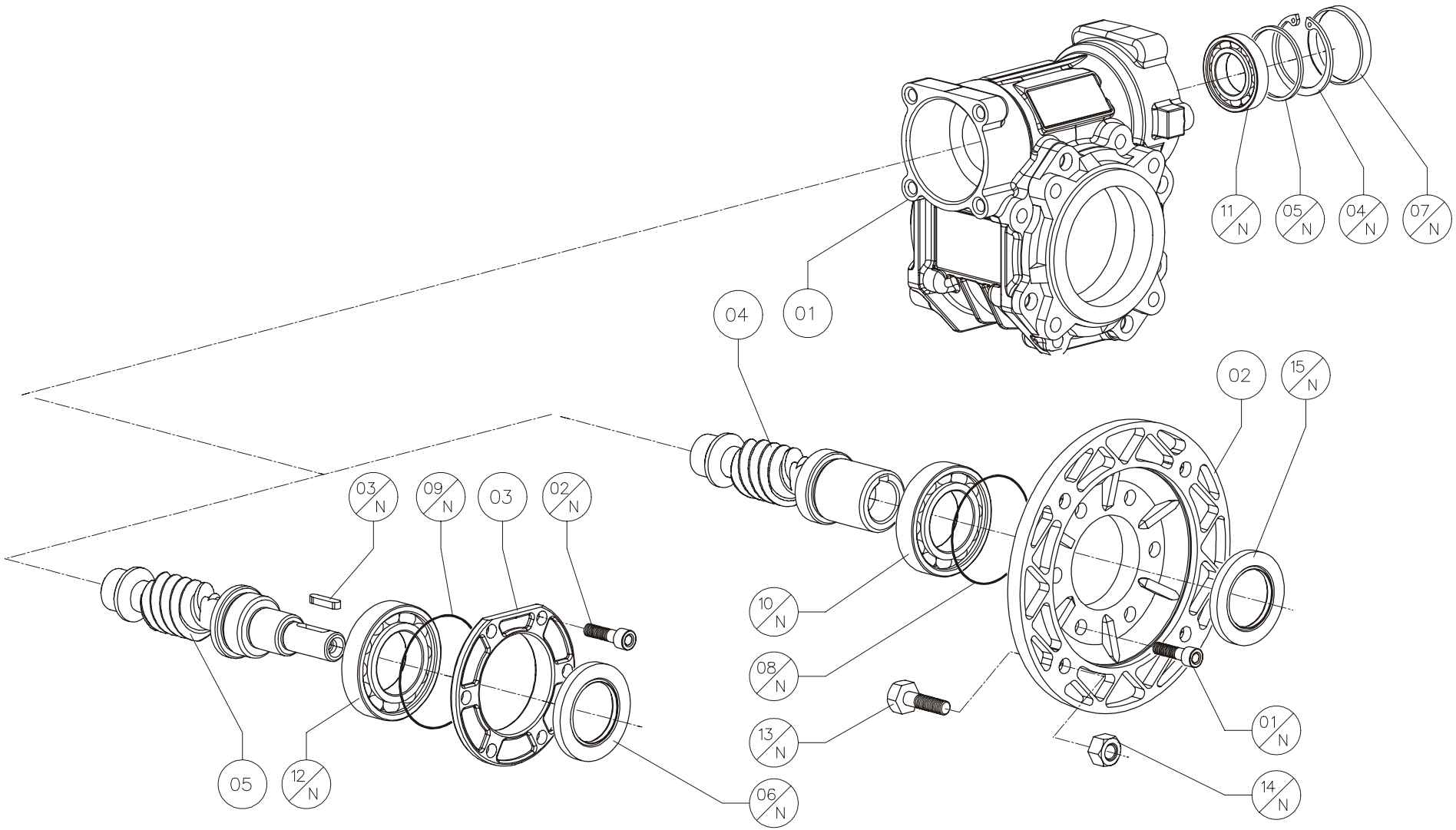
| P | T | C | Commercial | 030 | |
|---|---|---|---|---|---|
| T | 004 | 01 N | Shcs screw DIN 7984 | M6x12 | 4 |
| T | 004 | 02 N | Shcs screw DIN 7984 | M6x12 | 4 |
| T | 004 | 03 N | Key DIN 6885 | A 5x5x25 | 1 |
| T | 004 | 04 N | Key DIN 6885 | A 5x5x20 | 1 |
| T | 004 | 05 N | Key DIN 6885 | A 5x5x20 | 1 |
| T | 004 | 06 N | Circlip DIN 471 | 14 | 1 |
| T | 004 | 07 N | Circlip DIN 471 | 14 | 1 |
| T | 004 | 08 N | Spacer DIN 988 | 14x20x1,5 | 1 |
| T | 004 | 09 N | Spacer DIN 988 | 14x20x1,5 | 1 |


11/N
05/N
04/N
07/N
04
01
02
15/N
03/N
09/N
03
02/N
10/N
08/N
13/N
01/N
14/N
06/N
05
12/N

| P | T | C | Built | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|---|---|
| T | 005 | 01 | Casing | T9.040.01 | T.050.01 | T9.063.01 | T.075.01 | T.090.01 | T.105.01 |
| T | 005 | 02 | PAM flange | 9.040.03 | 9.050.03 | 9.063.03 | 9.075.03 | 9.075.03 | 9.110.03 |
| T | 005 | 03 | Gear unit cover | 9.040.06 | 9.050.06 | 9.063.06 | 9.075.06 | 9.075.06 | 9.110.06 |
| T | 005 | 04 | PAM worm | 9.040.14 | 9.050.14 | 9.063.14 | 9.075.14 | 9.09014 | 9.110.14 |
| T | 005 | 05 | RV worm | 9.040.16 | 9.050.16 | 9.063.16 | 9.075.16 | 9.09016 | 9.110.16 |

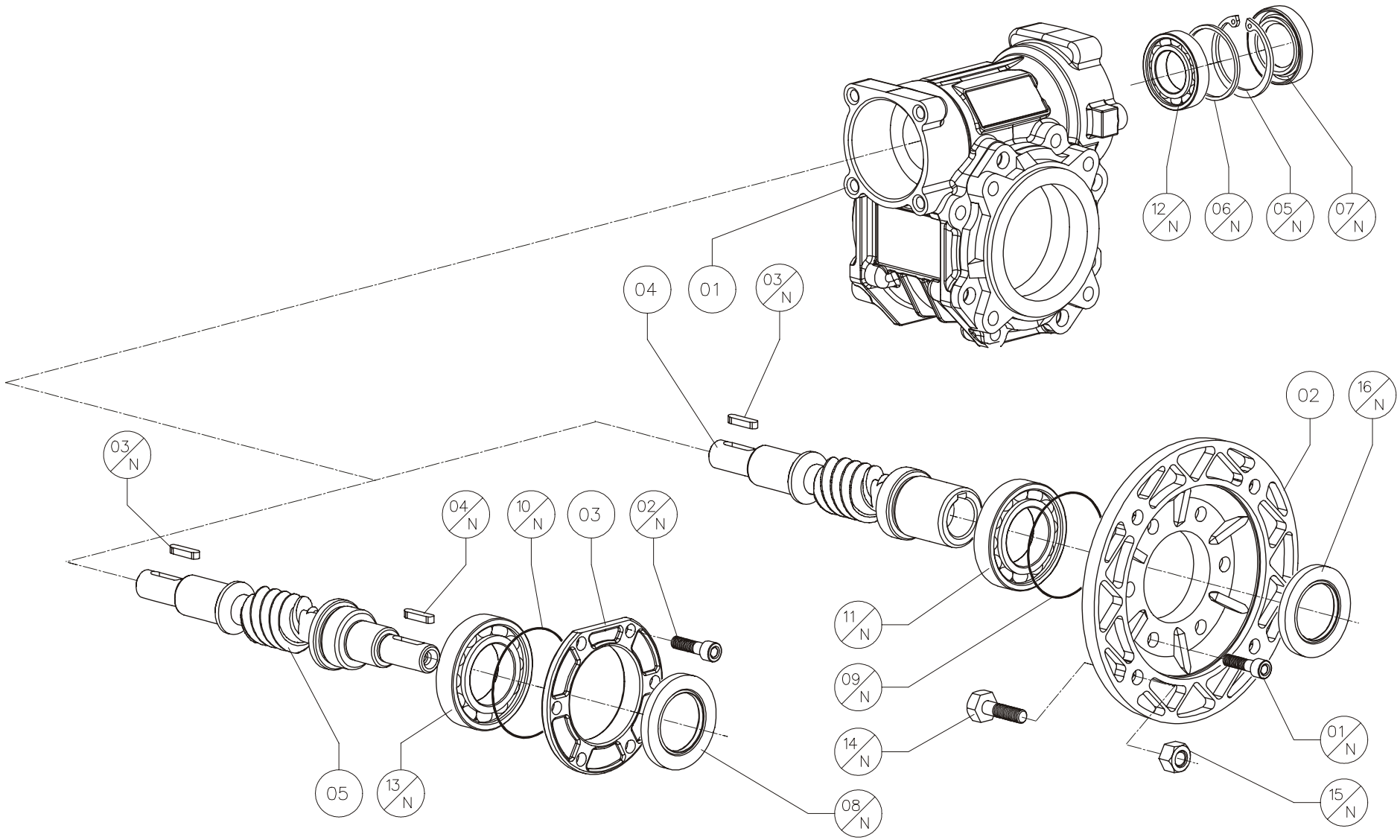
| pam | P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | 005 | 01 N | Screw DIN 912 | M6x12*** | 6 | M6x14 | 6 | M8x18 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20* | 6 |
| | T | 005 | 02 N | Screw DIN 912 | M6x12*** | 6 | M6x14 | 6 | M8x18 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20* | 6 |
| | T | 005 | 03 N | Key DIN 6885 | A 4x4x15 | 1 | A 5x5x20 | 1 | A 6x6x30 | 1 | A 8x7x35 | 1 | A 8x7x35 | 1 | A 8x7x45 | 1 |
| | T | 005 | 04 N | Circlip DIN 472 | 40 | 1 | 47 | 1 | 52 | 1 | 62 | 1 | 62 | 1 | 72 | 1 |
| | T | 005 | 05 N | Spacer DIN 988 | - | - | 37x47x2,5 | 1 | 42x52x2,5 | 1 | 50x62x3 | 1 | 50x62x3 | 1 | 56x72x3 | 1 |
| | T | 005 | 06 N | Oil seal DIN 3760 | AS 17x40x7 | 1 | AS 20x47x7 | 1 | AS 25x52x7 | 1 | AS 30x62x7 | 1 | AS 30x62x7 | 1 | AS 35x72x10 | 1 |
| | T | 005 | 07 N | Cap | RCA 40x7 | 1 | RCA 47x7 | 1 | RCA 52x7 | 1 | RCA 62x7 | 1 | RCA 62x7 | 1 | RCA 72x10 | 1 |
| | T | 005 | 08 N | O-Ring | 2162 | 1 | 2200 | 1 | 3225 | 1 | 2250 | 1 | 2250 | 1 | 2300 | 1 |
| | T | 005 | 09 N | O-Ring | 2162 | 1 | 2200 | 1 | 3225 | 1 | 2250 | 1 | 2250 | 1 | 2300 | 1 |
| | T | 005 | 10 N | Bearing | 6005 | 1 | 6006 | 1 | 6005 | 1 | 32008 | 1 | 32008 | 1 | 32010 | 1 |
| | T | 005 | 11 N | Bearing NMRV | 6203 | 1 | 6204 | 1 | 6205 | 1 | 30206 | 1 | 32206 | 1 | 32207 | 1 |
| | T | 005 | 11 N | Bearing NRV | 6203 | 1 | 6204 | 1 | 30205 | 1 | 30206 | 1 | 32206 | 1 | 32207 | 1 |
| | T | 005 | 12 N | Bearing | 6303 | 1 | 6006 | 1 | 30305 | 1 | 32008 | 1 | 32008 | 1 | 30307 | 1 |
| 056 B5 | T | 005 | 13 N | Hex screw DIN 931 | M6x20 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | M6 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | - | - | - | - | - | - | - | - | - | - |
| 063 B5 | T | 005 | 13 N | Hex screw DIN 931 | M8x25 | 4 | M8x25 | 4 | - | - | - | - | - | - | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | M8 | 4 | M6 | 4 | - | - | - | - | - | - | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | - | - | - | - | - | - | - | - |
| 071 B5 | T | 005 | 13 N | Hex screw DIN 931 | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | - | - | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | M8 | 4 | M8 | 4 | M8 | 4 | M8 | 4 | - | - | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | - | - | - | - |
| 080 B5 | T | 005 | 13 N | Hex screw DIN 931 | - | - | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |
| 090 B5 | T | 005 | 13 N | Hex screw DIN 931 | - | - | - | - | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | - | - | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | - | - | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |
| 100-112 B5 | T | 005 | 13 N | Hex screw DIN 931 | - | - | - | - | - | - | M12x35 | 4 | M12x35 | 4 | M12x35 | 4 |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | - | - | - | - | M12 | 4 | M12 | 4 | M12 | 4 |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | - | - | - | - | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |

* Torx Screw TC DIN 7984


11 N
05 N
04 N
07 N
04
01
02
15 N
03 N
09 N
03
02 N
10 N
08 N
13 N
01 N
05
12 N
06 N
14 N

| pam | P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 132 B5 | T | 005 | 13 N | Hex screw DIN 931 | - | - | - | - | - | - | - | - | - | - | M12x45 | 4 |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | - | - | - | - | - | - | - | - | M12 | 4 |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | - | - | - | - | - | - | - | - | A 50x72x10 | 1 |
| 063 B14 | T | 005 | 13 N | Hex screw DIN 931 | M5x20 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | M5 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | - | - | - | - | - | - | - | - | - | - |
| 071 B14 | T | 005 | 13 N | Hex screw DIN 931 | M6x16 | 4 | M6x16 | 4 | M6x25 | 4 | - | - | - | - | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | M6 | 4 | M6 | 4 | M6 | 4 | - | - | - | - | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | A 35x52x7 | 1 | - | - | - | - | - | - |
| 080 B14 | T | 005 | 13 N | Hex screw DIN 931 | - | - | M6x20 | 4 | M6x25 | 4 | M6x25 | 4 | M6x25 | 4 | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | M6 | 4 | M6 | 4 | M6 | 4 | M6 | 4 | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |
| 090 B14 | T | 005 | 13 N | Hex screw DIN 931 | - | - | - | - | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | - | - | M8 | 4 | M8 | 4 | M8 | 4 | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | - | - | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |
| 100-112 B14 | T | 005 | 13 N | Hex screw DIN 931 | - | - | - | - | - | - | M8x25 | 4 | M8x25 | 4 | - | - |
| | T | 005 | 14 N | Nut DIN 934/6 | - | - | - | - | - | - | M8 | 4 | M8 | 4 | - | - |
| | T | 005 | 15 N | Oil seal DIN 3760 | - | - | - | - | - | - | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |

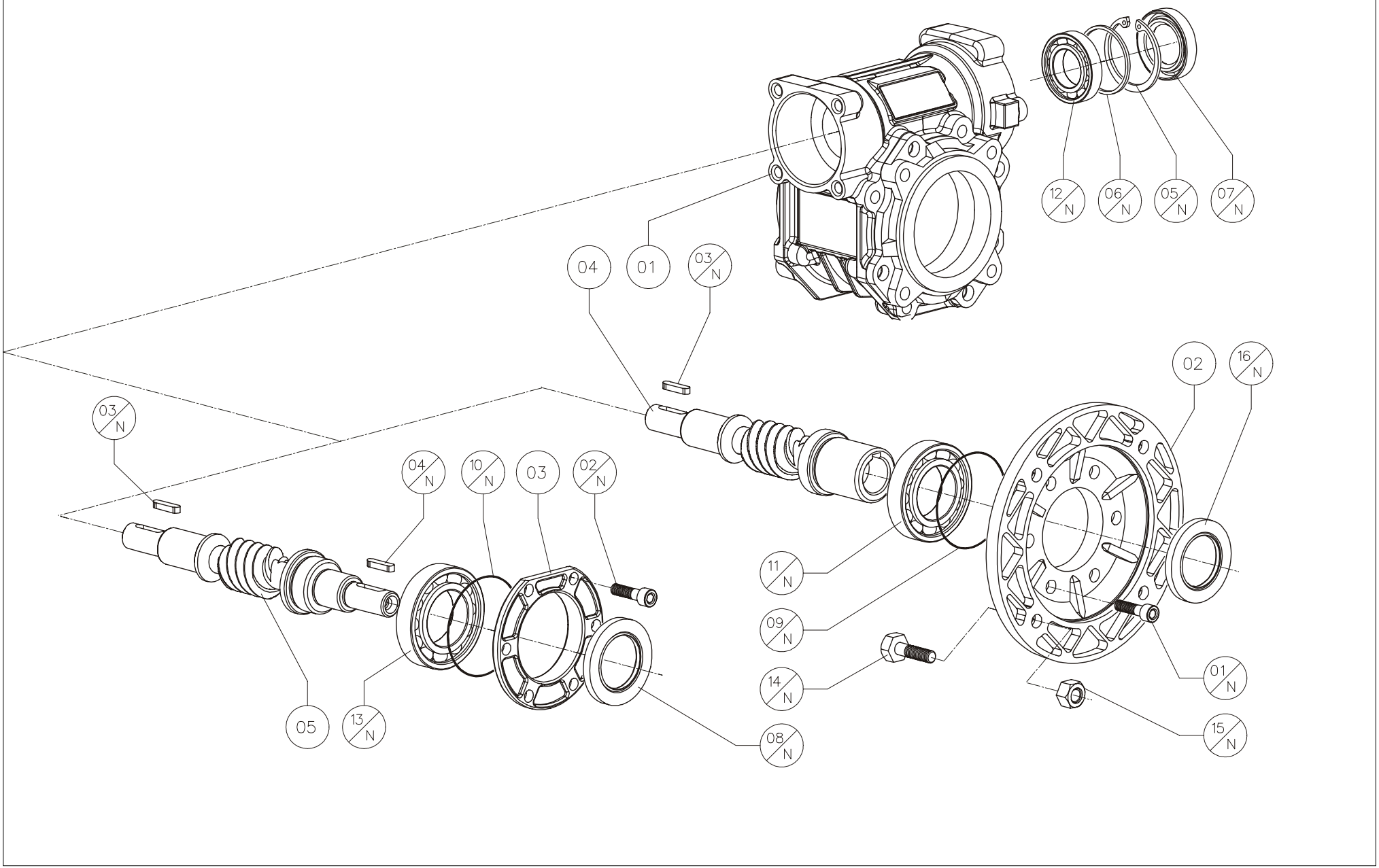
* Torx Screw TC DIN 7984


12/N
06/N
05/N
07/N
04
01
03/N
02
16/N
03/N
04/N
10/N
03
02/N
11/N
09/N
14/N
01/N
15/N
05
13/N
08/N

| P | T | C | Built | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|---|---|
| T | 006 | 01 | Casing | T.040.01 | T.050.01 | T.063.01 | T.075.01 | T.090.01 | 9.105.01 |
| T | 006 | 02 | PAM flange | 9.040.03 | 9.050.03 | 9.063.03 | 9.075.03 | 9.075.03 | 9.110.03 |
| T | 006 | 03 | Gear unit cover | 9.040.06 | 9.050.06 | 9.063.06 | 9.075.06 | 9.075.06 | 9.110.06 |
| T | 006 | 04 | Double ext. PAM worm | 9.040.15 | 9.050.15 | 9.063.15 | 9.075.15 | 9.090.15 | 9.110.15 |
| T | 006 | 05 | Double ext. RV worm | 9.040.17 | 9.050.17 | 9.063.17 | 9.075.17 | 9.090.17 | 9.110.17 |

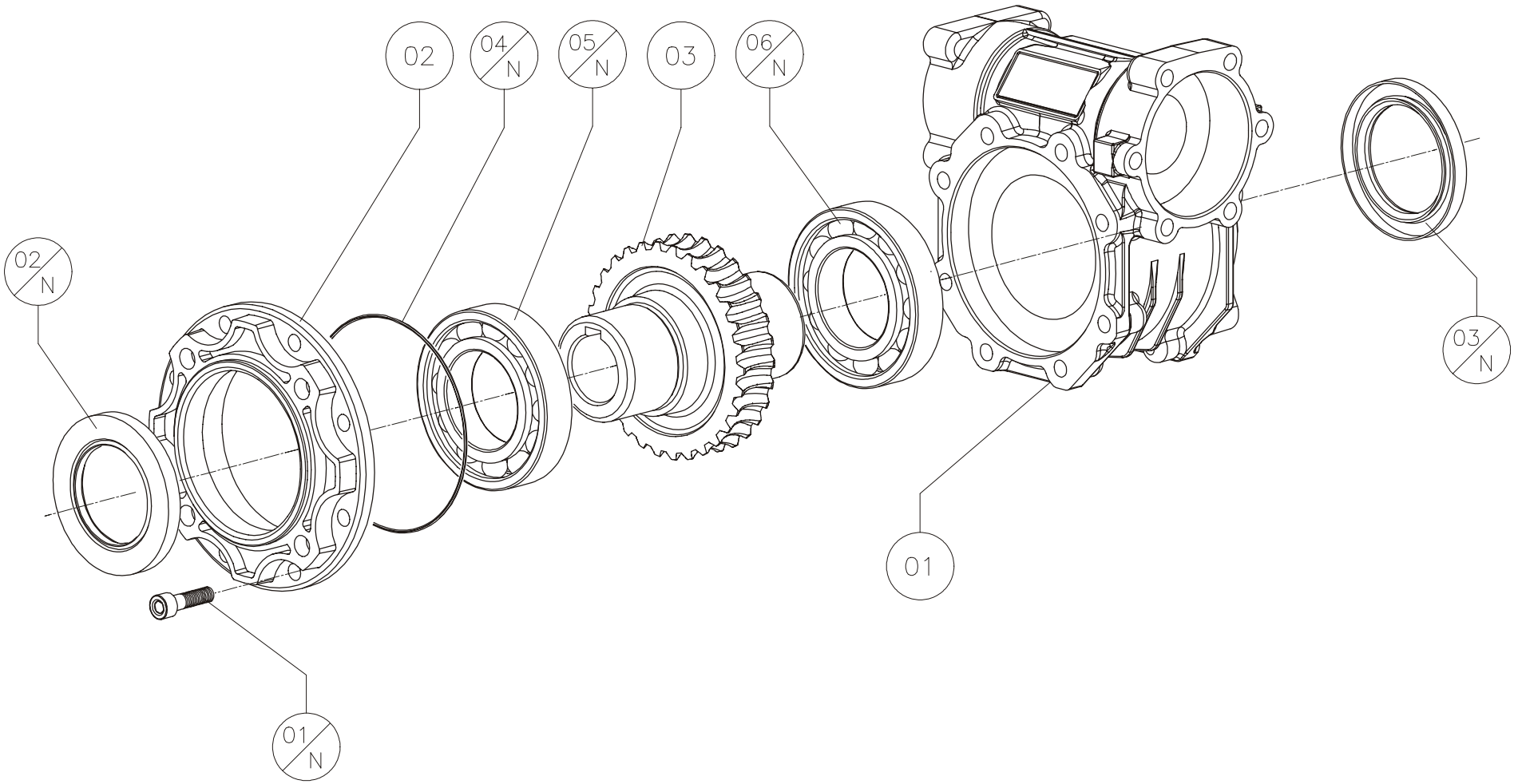
| pam | P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | 006 | 01 N | Screw DIN 912 | M6x12*** | 6 | M6x14 | 6 | M8x18 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20* | 6 |
| | T | 006 | 02 N | Screw DIN 912 | M6x12*** | 6 | M6x14 | 6 | M8x18 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20* | 6 |
| | T | 006 | 03 N | Key DIN 6885 | A 4x4x15 | 1 | A 5x5x20 | 1 | A 6x6x30 | 1 | A 8x7x35 | 1 | A 8x7x35 | 1 | A 8x7x45 | 1 |
| | T | 006 | 04 N | Key DIN 6885 | A 4x4x15 | 1 | A 5x5x20 | 1 | A 6x6x30 | 1 | A 8x7x35 | 1 | A 8x7x35 | 1 | A 8x7x45 | 1 |
| | T | 006 | 05 N | Circlip DIN 472 | 40 | 1 | 47 | 1 | 52 | 1 | 62 | 1 | 62 | 1 | 72 | 1 |
| | T | 006 | 06 N | Spacer DIN 988 | - | - | 37x47x2,5 | 1 | 42x52x2,5 | 1 | 50x62x3 | 1 | 50x62x3 | 1 | 56x72x3 | 1 |
| | T | 006 | 07 N | Oil seal DIN 3760 | AS 17x40x7 | 1 | AS 20x47x7 | 1 | AS 25x52x7 | 1 | AS 30x62x7 | 1 | AS 30x62x7 | 1 | AS 35x72x10 | 1 |
| | T | 006 | 08 N | Oil seal DIN 3760 | AS 17x40x7 | 1 | AS 20x47x7 | 1 | AS 25x52x7 | 1 | AS 30x62x7 | 1 | AS 30x62x7 | 1 | AS 35x72x10 | 1 |
| | T | 006 | 09 N | O-Ring | 2162 | 1 | 2200 | 1 | 3225 | 1 | 2250 | 1 | 2250 | 1 | 2300 | 1 |
| | T | 006 | 10 N | O-Ring | 2162 | 1 | 2200 | 1 | 3225 | 1 | 2250 | 1 | 2250 | 1 | 2300 | 1 |
| | T | 006 | 11 N | Bearing | 6005 | 1 | 6006 | 1 | 6007 | 1 | 32006 | 1 | 32006 | 1 | 32010 | 1 |
| | T | 006 | 12 N | Bearing NMRV | 6203 | 1 | 6204 | 1 | 6205 | 1 | 30206 | 1 | 32206 | 1 | 32207 | 1 |
| | T | 006 | 12 N | Bearing NRV | 6203 | 1 | 6204 | 1 | 30205 | 1 | 30206 | 1 | 32206 | 1 | 32207 | 1 |
| | T | 006 | 13 N | Bearing | 6303 | 1 | 6006 | 1 | 30305 | 1 | 32006 | 1 | 32006 | 1 | 30307 | 1 |
| 056 B5 | T | 006 | 14 N | Hex screw DIN 931 | M6x20 | 4 | - | - | - | - | - | - | - | - | - | - |
| 056 B5 | T | 006 | 15 N | Nut DIN 934/6 | M6 | 4 | - | - | - | - | - | - | - | - | - | - |
| 056 B5 | T | 006 | 16 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | - | - | - | - | - | - | - | - | - | - |
| 063 B5 | T | 006 | 14 N | Hex screw DIN 931 | M8x25 | 4 | M8x25 | 4 | - | - | - | - | - | - | - | - |
| 063 B5 | T | 006 | 15 N | Nut DIN 934/6 | M8 | 4 | M6 | 4 | - | - | - | - | - | - | - | - |
| 063 B5 | T | 006 | 16 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | - | - | - | - | - | - | - | - |
| 071 B5 | T | 006 | 14 N | Hex screw DIN 931 | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | - | - | - | - |
| 071 B5 | T | 006 | 15 N | Nut DIN 934/6 | M8 | 4 | M8 | 4 | M8 | 4 | M8 | 4 | - | - | - | - |
| 071 B5 | T | 006 | 16 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | - | - | - | - |
| 080 B5 | T | 006 | 14 N | Hex screw DIN 931 | - | - | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 |
| 080 B5 | T | 006 | 15 N | Nut DIN 934/6 | - | - | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 |
| 080 B5 | T | 006 | 16 N | Oil seal DIN 3760 | - | - | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |
| 090 B5 | T | 006 | 14 N | Hex screw DIN 931 | - | - | - | - | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 | M10x30 | 4 |
| 090 B5 | T | 006 | 15 N | Nut DIN 934/6 | - | - | - | - | M10 | 4 | M10 | 4 | M10 | 4 | M10 | 4 |
| 090 B5 | T | 006 | 16 N | Oil seal DIN 3760 | - | - | - | - | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |
| 100-112 B5 | T | 006 | 14 N | Hex screw DIN 931 | - | - | - | - | - | - | M12x35 | 4 | M12x35 | 4 | M12x35 | 4 |
| 100-112 B5 | T | 006 | 15 N | Nut DIN 934/6 | - | - | - | - | - | - | M12 | 4 | M12 | 4 | M12 | 4 |
| 100-112 B5 | T | 006 | 16 N | Oil seal DIN 3760 | - | - | - | - | - | - | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x68x8 | 1 |

* Torx Screw TC DIN 7984


12/N
06/N
05/N
07/N
04
01
03/N
02
16/N
03/N
04/N
10/N
03
02/N
11/N
09/N
14/N
01/N
15/N
05
13/N
08/N

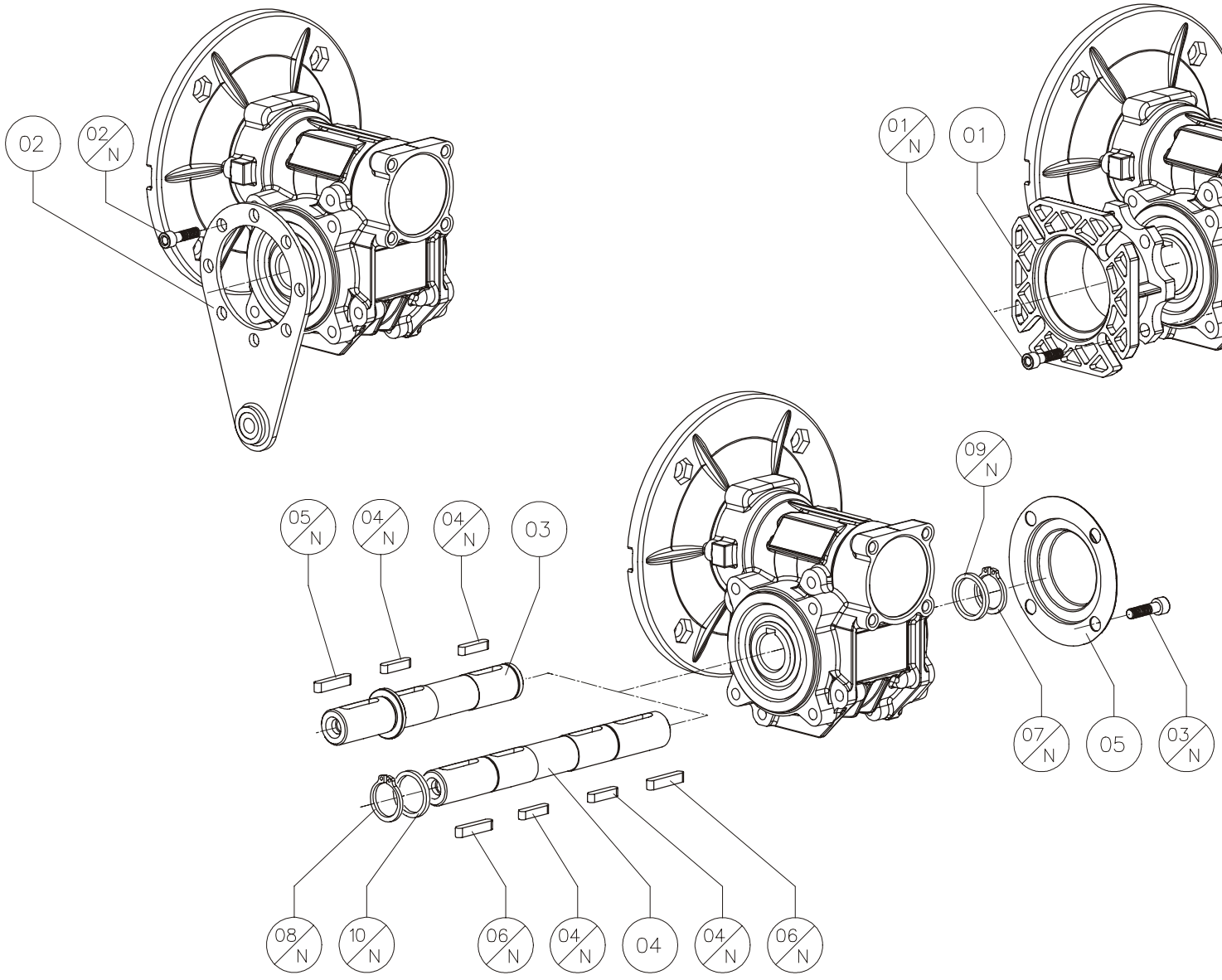
| pam | P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 132 B5 | T | 006 | 14 N | Hex screw DIN 931 | - | - | - | - | - | - | - | - | - | - | M12x45 | 4 |
| | T | 006 | 15 N | Nut DIN 934/6 | - | - | - | - | - | - | - | - | - | - | M12 | 4 |
| | T | 006 | 16 N | Oil seal DIN 3760 | - | - | - | - | - | - | - | - | - | - | A 50x72x10 | 1 |
| 063 B14 | T | 006 | 14 N | Hex screw DIN 931 | M5x20 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 006 | 15 N | Nut DIN 934/6 | M5 | 4 | - | - | - | - | - | - | - | - | - | - |
| | T | 006 | 16 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | - | - | - | - | - | - | - | - | - | - |
| 071 B14 | T | 006 | 14 N | Hex screw DIN 931 | M6x16 | 4 | M6x16 | 4 | M6x25 | 4 | - | - | - | - | - | - |
| | T | 006 | 15 N | Nut DIN 934/6 | M6 | 4 | M6 | 4 | M6 | 4 | - | - | - | - | - | - |
| | T | 006 | 16 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | A 30x47x7 | 1 | A 35x52x7 | 1 | - | - | - | - | - | - |
| 080 B14 | T | 006 | 14 N | Hex screw DIN 931 | - | - | M6x20 | 4 | M6x25 | 4 | M6x25 | 4 | M6x25 | 4 | - | - |
| | T | 006 | 15 N | Nut DIN 934/6 | - | - | M6 | 4 | M6 | 4 | M6 | 4 | M6 | 4 | - | - |
| | T | 006 | 16 N | Oil seal DIN 3760 | - | - | A 30x47x7 | 1 | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |
| 090 B14 | T | 006 | 14 N | Hex screw DIN 931 | - | - | - | - | M8x25 | 4 | M8x25 | 4 | M8x25 | 4 | - | - |
| | T | 006 | 15 N | Nut DIN 934/6 | - | - | - | - | M8 | 4 | M8 | 4 | M8 | 4 | - | - |
| | T | 006 | 16 N | Oil seal DIN 3760 | - | - | - | - | A 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |
| 100-112 B14 | T | 006 | 14 N | Hex screw DIN 931 | - | - | - | - | - | - | M8x25 | 4 | M8x25 | 4 | - | - |
| | T | 006 | 15 N | Nut DIN 934/6 | - | - | - | - | - | - | M8 | 4 | M8 | 4 | - | - |
| | T | 006 | 16 N | Oil seal DIN 3760 | - | - | - | - | - | - | A 40x60x10 | 1 | A 40x60x10 | 1 | - | - |

* Torx Screw TC DIN 7984


02
04/N
05/N
03
06/N
02/N
03/N
01
01/N

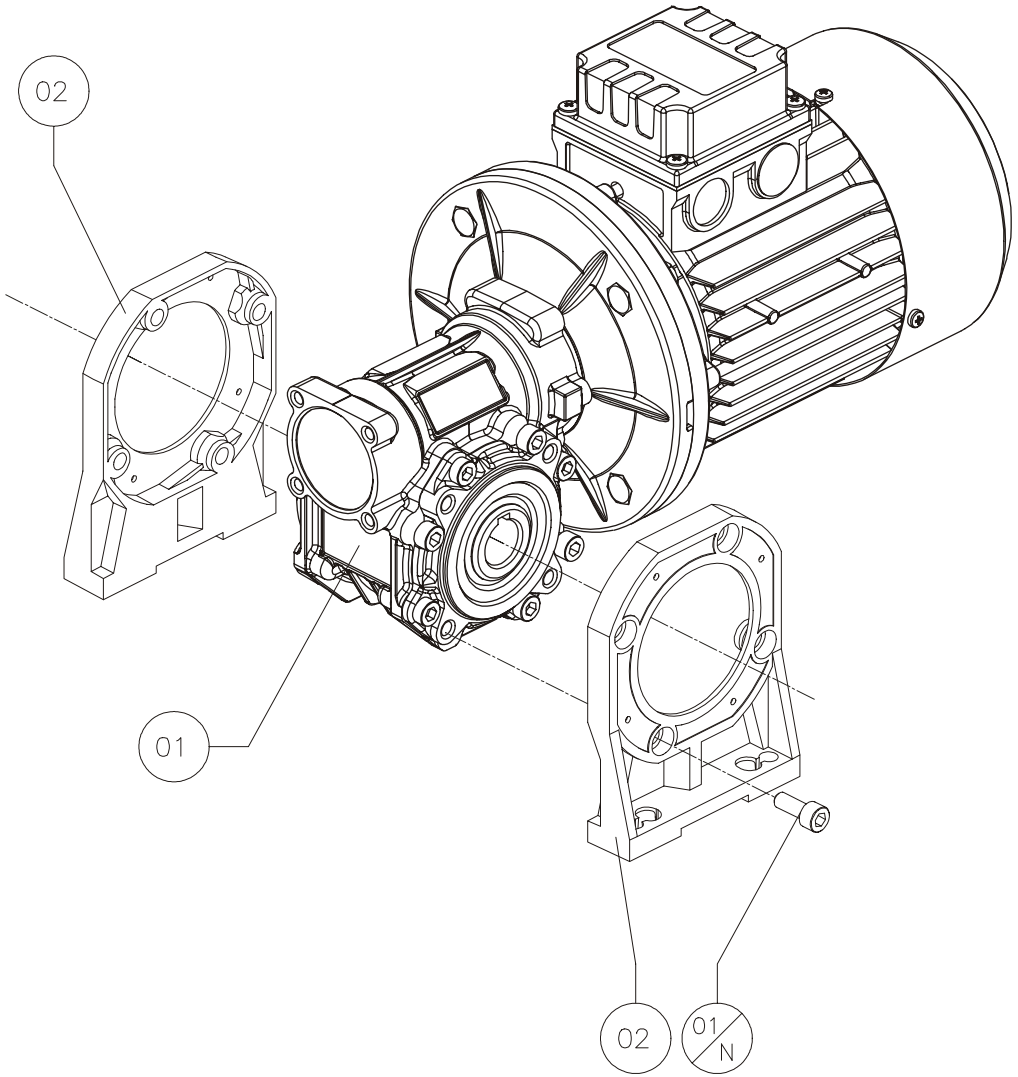
| P | T | C | Buit | 040 | 050 | 063 | 075 | 090 | *105* |
|---|---|---|---|---|---|---|---|---|---|
| **T** | **007** | **01** | Casing | T.040.01 | T.050.01 | T.063.01 | T.075.01 | T.090.01 | T.105.01 |
| **T** | **007** | **02** | Bearing support cover | T.040.02 | T.050.02 | T.063.02 | T.075.02 | T.090.02 | T.105.02 |
| **T** | **007** | **03** | Worm Wheel | 9.040.11 | 9.050.11 | 9.063.11 | 9.075.11 | 9.09011 | 9.110.11 |

| P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | *105* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **T** | **007** | **01 N** | Screw DIN 912 | M6x12*** | 8 | M6x14 | 8 | M8x18 | 8 | M8x20 | 8 | M8x20 | 8 | M8x20* | 8 |
| **T** | **007** | **02 N** | Oil seal DIN 3760 | AS 30x40x7 | 1 | AS 40x62x8 | 1 | AS 45x65x10 | 1 | AS 50x72x10 | 1 | AS 60x85x8 | 1 | AS 65x85x10 | 1 |
| **T** | **007** | **03 N** | Oil seal DIN 3760 | AS 30x40x7 | 1 | AS 40x62x8 | 1 | AS 45x65x10 | 1 | AS 50x72x10 | 1 | AS 60x85x8 | 1 | AS 65x85x10 | 1 |
| **T** | **007** | **04 N** | O-Ring | 2250 | 1 | 2300 | 1 | 540 | 1 | 3500 | 1 | 3625 | 1 | 3750 | 1 |
| **T** | **007** | **05 N** | Bearing | 6006 | 1 | 6008 | 1 | 6009 | 1 | 6010 | 1 | 6012 | 1 | 6013 | 1 |
| **T** | **007** | **06 N** | Bearing | 6006 | 1 | 6008 | 1 | 6009 | 1 | 6010 | 1 | 6012 | 1 | 6013 | 1 |

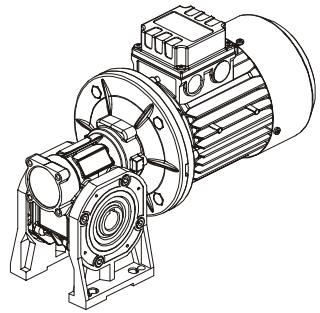

02
02/N
01/N
01
09/N
05/N
04/N
04/N
03
07/N
05
03/N
08/N
10/N
06/N
04/N
04
04/N
06/N

| P | T | C | Built | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|---|---|
| T | 008 | 01 | Output flange | 9.040.04 | 9.050.04 | 9.063.04 | 9.075.04 | 9.090.04 | 9.110.04 |
| T | 008 | 02 | Torque arm | 9.040.05 | 9.050.05 | 9.063.05 | 9.075.05 | 9.090.05 | 9.110.05 |
| T | 008 | 03 | Single output Shaft | 9.040.21 | 9.050.21 | 9.063.21 | 9.075.21 | 9.090.21 | 9.110.21 |
| T | 008 | 04 | Double output Shaft | 9.040.22 | 9.050.22 | 9.063.22 | 9.075.22 | 9.090.22 | 9.110.22 |
| T | 008 | 05 | Protection cap | 9.040.94 | 9.050.94 | 9.063.94 | 9.075.94 | 9.090.94 | 9.110.94 |

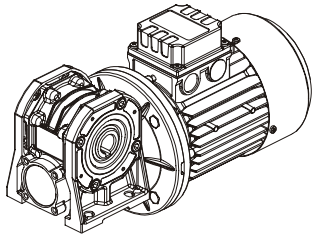
| P | T | C | Commercial | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | 008 | 01 N | Srew DIN 912 | M6x14 | 4 | M8x16 | 4 | M8x18 | 8 | M8x20 | 8 | M10x25 | 8 | M10x25 | 8 |
| T | 008 | 02 N | Srew DIN 912 | M6x14 | 4 | M8x12 | 4 | M8x18 | 8 | M8x18 | 8 | M10x20 | 8 | M10x20 | 8 |
| T | 008 | 03 N | Screw DIN (see notes) | M6x12* | 4 | M8x14*** | 4 | M8x16** | 4 | M8x18** | 4 | M10x16** | 4 | M10x16** | 4 |
| T | 008 | 04 N | Key DIN 6885 | A 6x6x20 | 1 | A 8x7x30 | 1 | A 8x7x30 | 1 | A 8x7x30 | 1 | A10x8x35 | 1 | A 12x8x40 | 1 |
| T | 008 | 05 N | Key DIN 6885 | A 6x6x30 | 1 | A 8x7x35 | 1 | A 8x7x35 | 1 | A 8x7x45 | 1 | A10x8x60 | 1 | A 12x8x60 | 1 |
| T | 008 | 06 N | Key DIN 6885 | A 6x6x30 | 1 | A 8x7x35 | 1 | A 8x7x35 | 1 | A 8x7x45 | 1 | A10x8x60 | 1 | A 12x8x60 | 1 |
| T | 008 | 07 N | Circlip DIN 471 | 18 | 1 | 25 | 1 | 25 | 1 | 28 | 1 | 35 | 1 | 42 | 1 |
| T | 008 | 08 N | Circlip DIN 471 | 18 | 1 | 25 | 1 | 25 | 1 | 28 | 1 | 35 | 1 | 42 | 1 |
| T | 008 | 09 N | Spacer DIN 988 | 18x25x1,5 | 1 | 25x35x2 | 1 | 25x35x2 | 1 | 28x40x2 | 1 | 35x45x2,5 | 1 | 42x52x2,5 | 1 |
| T | 008 | 10 N | Spacer DIN 988 | 18x25x1,5 | 1 | 25x35x2 | 1 | 25x35x2 | 1 | 28x40x2 | 1 | 35x45x2,5 | 1 | 42x52x2,5 | 1 |



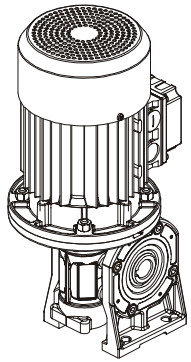

PA
PAS



PA
PAS

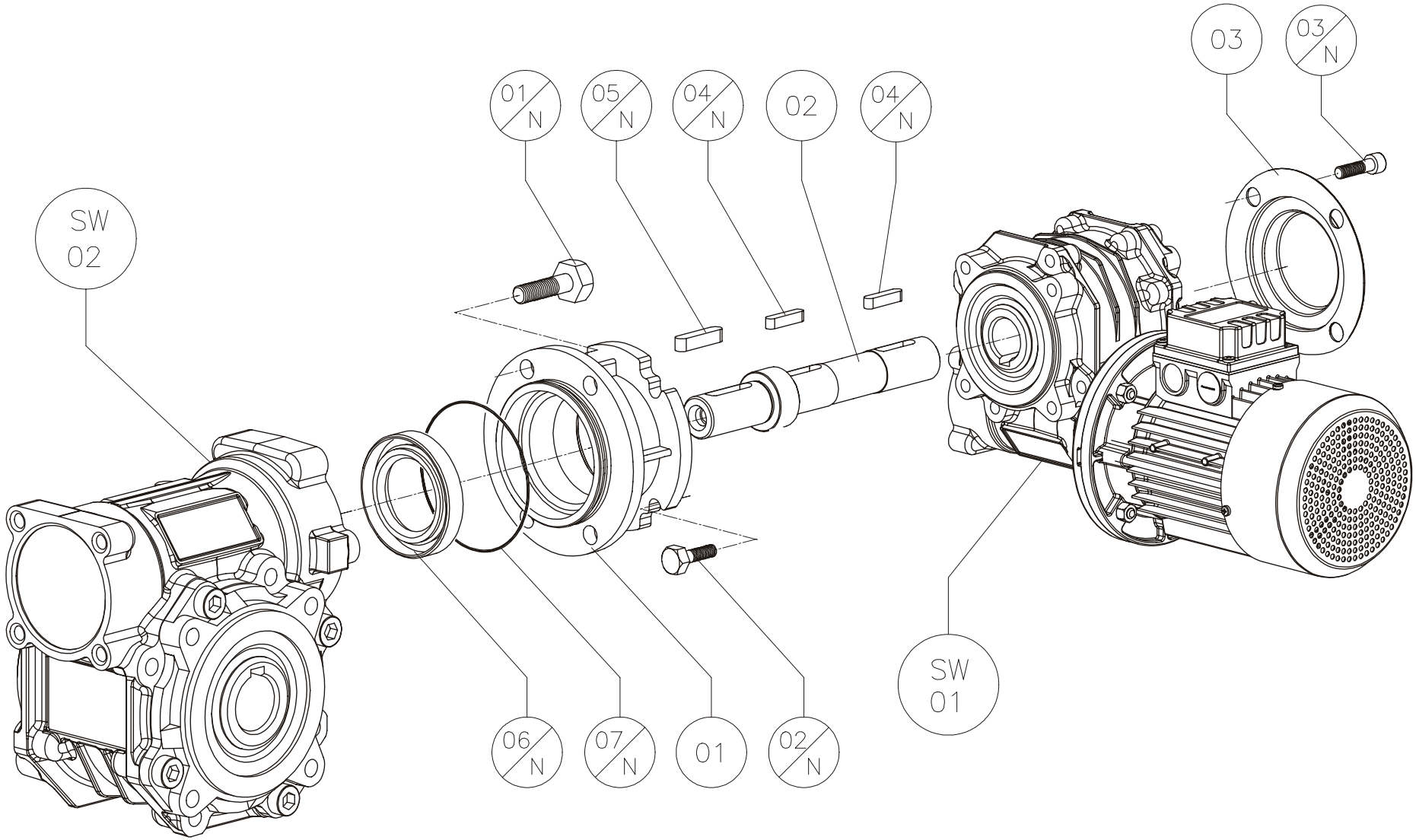


PA
PAS



| P | T | C | Built | 030 | 040 | 050 | 063 | 075 | 090 | 105 |
|---|---|---|---|---|---|---|---|---|---|---|
| T | 009 | 01 | Casing | T.030.01 | T.040.01 | T.050.01 | T.063.01 | T.075.01 | T.090.01 | T.105.01 |
| T | 009 | 02 | Foot | T.030.08 | T.040.08 | T.050.08 | T.063.08 | T.075.08 | T.090.08 | T.105.08 |
| T | 009 | 02 | Foot | - | T.040.08_1 | T.050.08_1 | - | - | T.090.08_1 | T.105.08_1 |

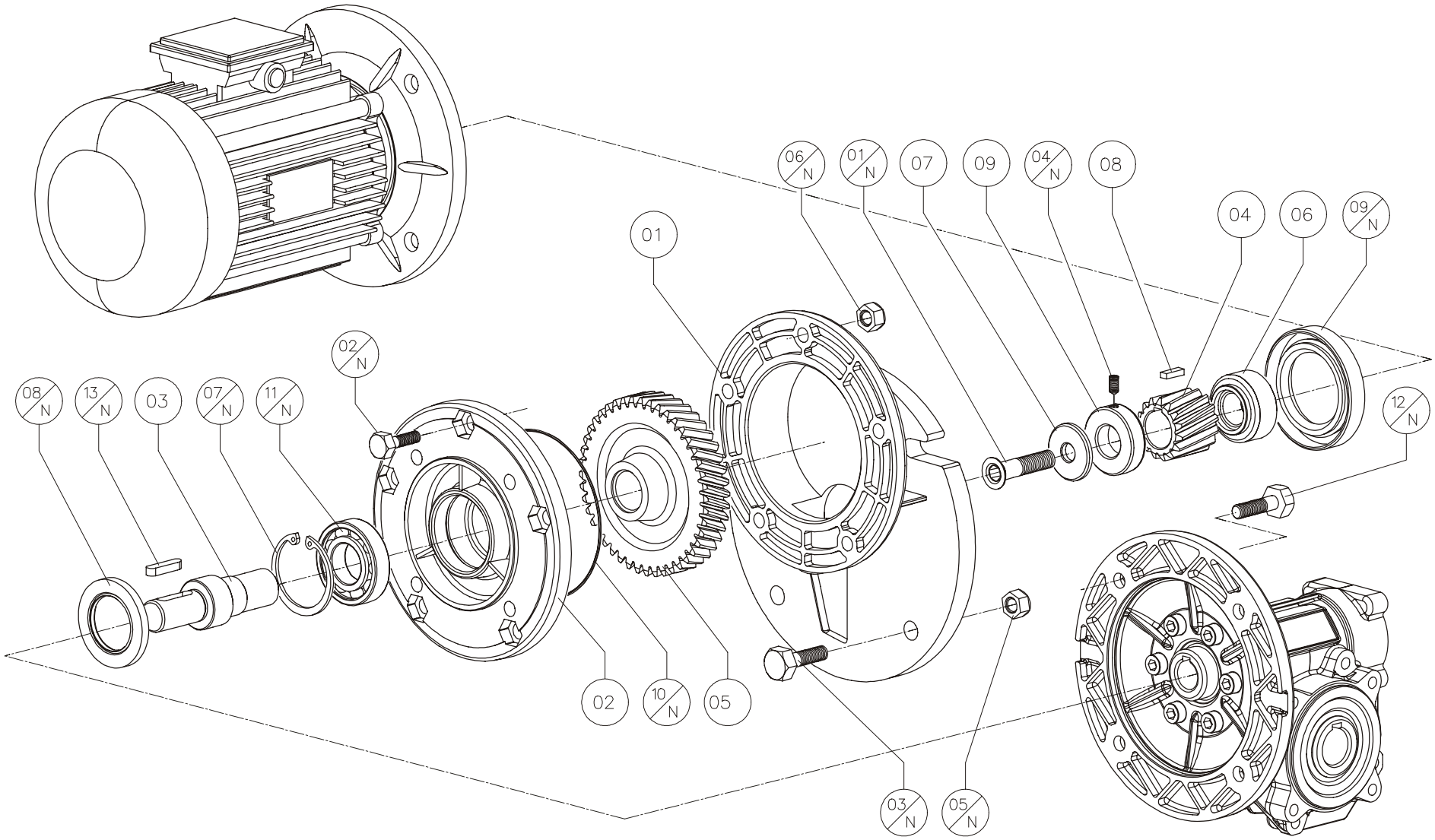
| P | T | C | Commercial | 030 | | 040 | | 050 | | 063 | | 075 | | 090 | | 105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | 009 | 01/N | Srew DIN 7984 | M6x12 | 8 | M6x14 | 8 | M6x18 | 8 | M8x20 | 8 | M8x22 | 8 | M10x25 | 8 | M8x25 | 16 |


SW
02
01
N
05
N
04
N
02
04
N
03
03
N
SW
01
06
N
07
N
01
02
N

| P | T | C | Built | 030+040 | 030+050 | 030+063 | 040+075 | 040+090 | 050+105 |
|---|---|---|---|---|---|---|---|---|---|
| T | 010 | 01 | Combination flange | 9.030.07.040 | 9.030.07.050 | 9.030.07.063 | 9.040.07.075 | 9.040.07.075 | 9.050.07.110 |
| T | 010 | 02 | Connection shaft | 9.030.23.14 | 9.030.23.14 | 9.030.23.14 | 9.040.23.19 | 9.040.23.19 | 9.050.23.24/28 |
| T | 010 | 03 | Protection cap | | | | 9.040.94 | 9.040.94 | 9.050.94 |

| P | T | C | Commercial | 030+040 | | 030+050 | | 030+063 | | 040+075 | | 040+090 | | 050+105 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | 010 | 01 N | Hex screw DIN 931 | M6x16 | 6 | M6x16 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20 | 6 | M8x20 | 6 |
| T | 010 | 02 N | Hex screw DIN 931 | M6x16 | 4 | M6x16 | 4 | M6x16 | 4 | M6x16 | 4 | M6x16 | 4 | M8x16 | 4 |
| T | 010 | 03 N | Screw DIN (see notes) | - | - | - | - | - | - | M6x12* | 4 | M6x12* | 4 | M8x14*** | 4 |
| T | 010 | 04 N | Key DIN 6885 | A 5x5x25 | 1 | A 5x5x25 | 1 | A 5x5x25 | 1 | A 6x6x20 | 1 | A 6x6x20 | 1 | A 8x7x30 | 1 |
| T | 010 | 05 N | Key DIN 6885 | A 5x5x20 | 1 | A 5x5x20 | 1 | A 5x5x20 | 1 | A 6x6x30 | 1 | A 6x6x30 | 1 | A 8x7x35 | 1 |
| T | 010 | 05 N | Key DIN 6885 | - | - | - | - | - | - | - | - | - | - | A 8x7x45 | 1 |
| T | 010 | 06 N | Oil seal DIN 3760 | AS 25x35x7 | 1 | AS 30x47x7 | 1 | AS 35x52x7 | 1 | A 40x60x10 | 1 | A 40x60x10 | 1 | A 50x72x10 | 1 |
| T | 010 | 07 N | O-Ring | 2162 | 1 | 2200 | 1 | 3225 | 1 | 2250 | 1 | 2250 | 1 | 2300 | 1 |

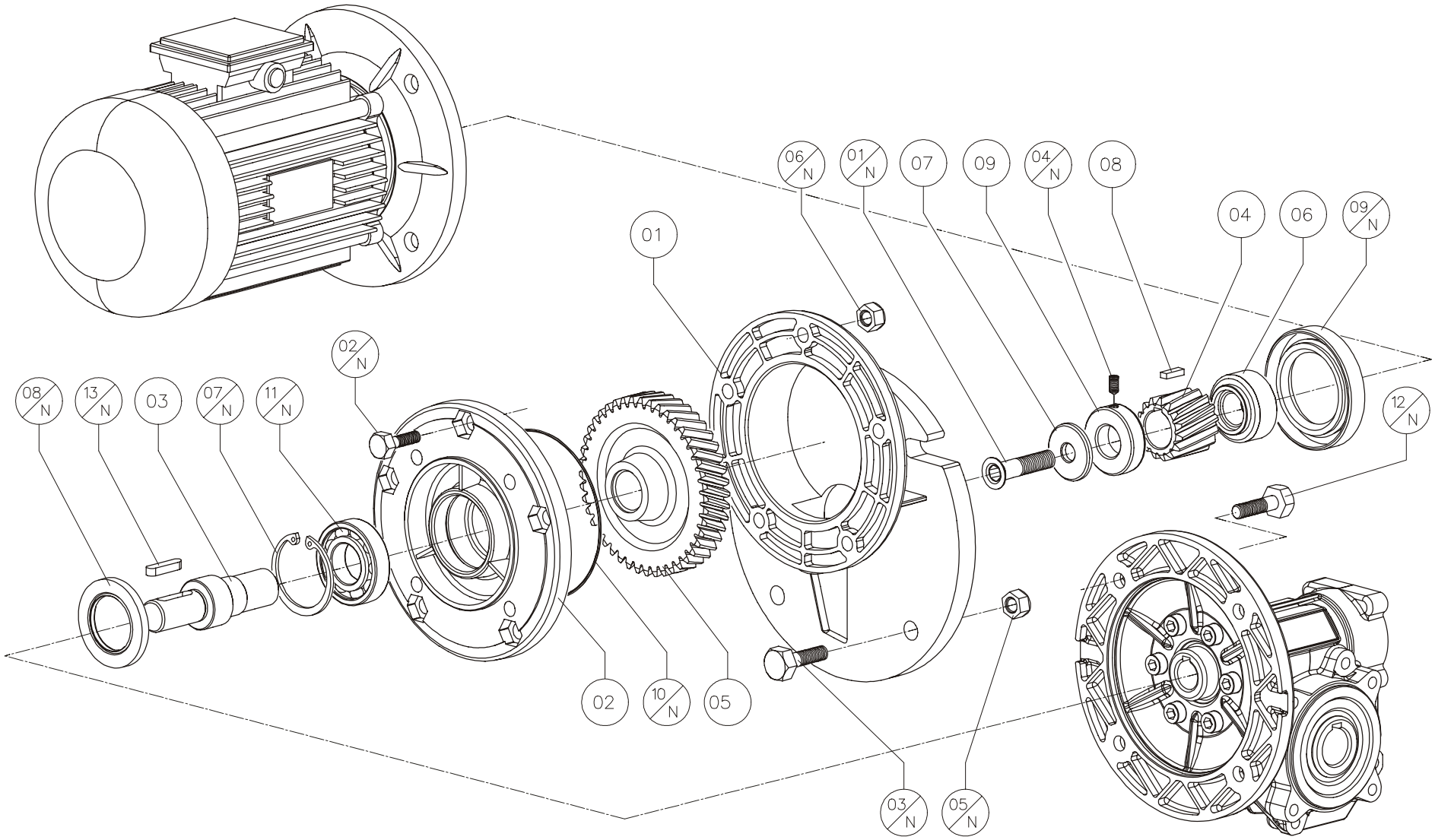
| ST | TAV 011 1/2 | 040 ÷ 105 |
|---|---|---|



| P | T | C | Built | 063 | 071 | 080 | 090 |
|---|---|---|---|---|---|---|---|
| T | 011 | 01 | Pre-stage unit casing | 2.063.21 | 2.071.21 | 2.080.21 | 2.080.21 |
| T | 011 | 02 | Cover | 2.063.22 | 2.071.22 | 2.080.22 | 2.080.22 |
| T | 011 | 03 | Low speed shaft | 2.063.23 | 2.071.23 | 2.080.23 | 2.080.23 |
| T | 011 | 04 | Hollow pinion | 2.063.24 | 2.071.24 | 2.080.24 | 2.080.24 |
| T | 011 | 05 | Gear | 2.063.25 | 2.071.25 | 2.080.25 | 2.080.25 |
| T | 011 | 06 | Bush | 2.063.26 | 2.071.26 | 2.080.26 | 2.080.26 |
| T | 011 | 07 | Washer | 2.063.27 | 2.071.27 | 2.080.27 | 2.080.27 |
| T | 011 | 08 | Special key | 2.063.28 | 2.071.28 | 2.080.28 | 2.080.28 |
| T | 011 | 09 | Stop ring | - | - | - | 2.080.30 |

| SW | P | T | C | Commercial | 063 | | 071 | | 080 | | 090 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | 011 | 01 N | Screw DIN 7991 | M4x12 | 1 | M5x12 | 1 | M6x12 | 1 | M6x12 | 1 |
| | T | 011 | 02 N | Hex screw DIN 931 | M6x20 | 5 | M6x20 | 5 | M8x25 | 5 | M8x25 | 5 |
| | T | 011 | 03 N | Hex screw DIN 931 | M8x30 | 4 | M8x30 | 4 | M10x35 | 4 | M10x35 | 4 |
| | T | 011 | 04 N | Screw DIN 916 | - | - | - | - | - | - | M4x5 | 1 |
| | T | 011 | 05 N | Nut DIN 934/6 | M8 | 4 | M8 | 4 | M10 | 4 | M10 | 4 |
| | T | 011 | 06 N | Nut DIN 934/6 | M6 | 5 | M6 | 5 | M8 | 5 | M8 | 5 |
| | T | 011 | 07 N | Circlip DIN 472 | 35 | 1 | 40 | 1 | 52 | 1 | 52 | 1 |
| | T | 011 | 08 N | Oil seal DIN 3760 | AS 20x35x7 | 1 | A 22x40x7 | 1 | AS 30x52x7 | 1 | AS 30x52x7 | 1 |
| | T | 011 | 09 N | Oil seal DIN 3760 | AS 25x40x7 | 1 | AS 30x47x7 | 1 | A 42x62x8 | 1 | A 42x62x8 | 1 |
| | T | 011 | 10 N | O-ring | 2262 | 1 | 2325 | 1 | 2400 | 1 | 2400 | 1 |
| | T | 011 | 11 N | Bearing | 6202 | 1 | 6203 | 1 | 6205 | 1 | 6205 | 1 |
| 040 | T | 011 | 12 N | Hex screw DIN 931 | M6x16 | 4 | - | - | - | - | - | - |
| 040 | T | 011 | 13 N | Key DIN 6885 | (Ø11) A 4x4x15 | 1 | - | - | - | - | - | - |
| 040 | T | 011 | 13 N | Key DIN 6885 | (Ø14) A 5x5x20 | 1 | - | - | - | - | - | - |
| 050 | T | 011 | 12 N | Hex screw DIN 931 | M6x16 | 4 | M6x25 | 4 | - | - | - | - |
| 050 | T | 011 | 13 N | Key DIN 6885 | (Ø11) A 4x4x15 | 1 | (Ø14) A 5x5x20 | 1 | - | - | - | - |
| 050 | T | 011 | 13 N | Key DIN 6885 | (Ø14) A 5x5x20 | 1 | (Ø19) A 6x6x30 | 1 | - | - | - | - |
| 063 | T | 011 | 12 N | Hex screw DIN 931 | M6x16 | 4 | M6x25 | 4 | - | - | - | - |
| 063 | T | 011 | 13 N | Key DIN 6885 | (Ø11) A 4x4x15 | 1 | (Ø14) A 5x5x20 | 1 | - | - | - | - |
| 063 | T | 011 | 13 N | Key DIN 6885 | (Ø14) A 5x5x20 | 1 | (Ø19) A 6x6x30 | 1 | - | - | - | - |
| 075 | T | 011 | 12 N | Hex screw DIN 931 | - | - | M6x25 | 4 | M8x25 | 4 | M8x25 | 4 |
| 075 | T | 011 | 13 N | Key DIN 6885 | - | - | (Ø14) A 5x5x20 | 1 | (Ø19) A 6x6x30 | 1 | (Ø24) A 8x7x35 | 1 |
| 075 | T | 011 | 13 N | Key DIN 6885 | - | - | (Ø19) A 6x6x30 | 1 | (Ø24) A 8x7x35 | 1 | (Ø19) A 6x6x30 | 1 |
| 075 | T | 011 | 13 N | Key DIN 6885 | - | - | | | (Ø28) A 8x7x45 | 1 | (Ø28) A 8x7x45 | 1 |

| ST | TAV 011 1/2 | 040 ÷ 105 |
|---|---|---|



| SW | P | T | C | Commercial | 063 | | 071 | | 080 | | 090 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 090 | T | 011 | 12 N | Hex screw DIN 931 | - | - | M6x25 | 4 | M8x25 | 4 | M8x25 | 4 |
| | T | 011 | 13 N | Key DIN 6885 | - | - | (Ø14) A 5x5x20 | 1 | (Ø19) A 6x6x30 | 1 | (Ø24) A 8x7x35 | 1 |
| | T | 011 | 13 N | Key DIN 6885 | - | - | (Ø19) A 6x6x30 | 1 | (Ø24) A 8x7x35 | 1 | (Ø19) A 6x6x30 | 1 |
| | T | 011 | 13 N | Key DIN 6885 | - | - | - | - | (Ø28) A 8x7x45 | 1 | (Ø28) A 8x7x45 | 1 |
| 105 | 9 | 011 | 12 N | Hex screw DIN 931 | - | - | - | - | M8x25 | 4 | M8x25 | 4 |
| | 9 | 011 | 13 N | Key DIN 6885 | - | - | - | - | (Ø19) A 6x6x30 | 1 | (Ø24) A 8x7x35 | 1 |
| | 9 | 011 | 13 N | Key DIN 6885 | - | - | - | - | (Ø24) A 8x7x35 | 1 | (Ø19) A 6x6x30 | 1 |
| | 9 | 011 | 13 N | Key DIN 6885 | - | - | - | - | (Ø28) A 8x7x45 | 1 | (Ø28) A 8x7x45 | 1 |

Via Qattropassi, 1/ 3 - 41043 Formigine (MO) Italy
Tel. +39 59579700
Fax +39 59579710
(Home page) www.motovario.it
(e-mail) info@ motovario.it

ISO 9001 - Cert n°0129