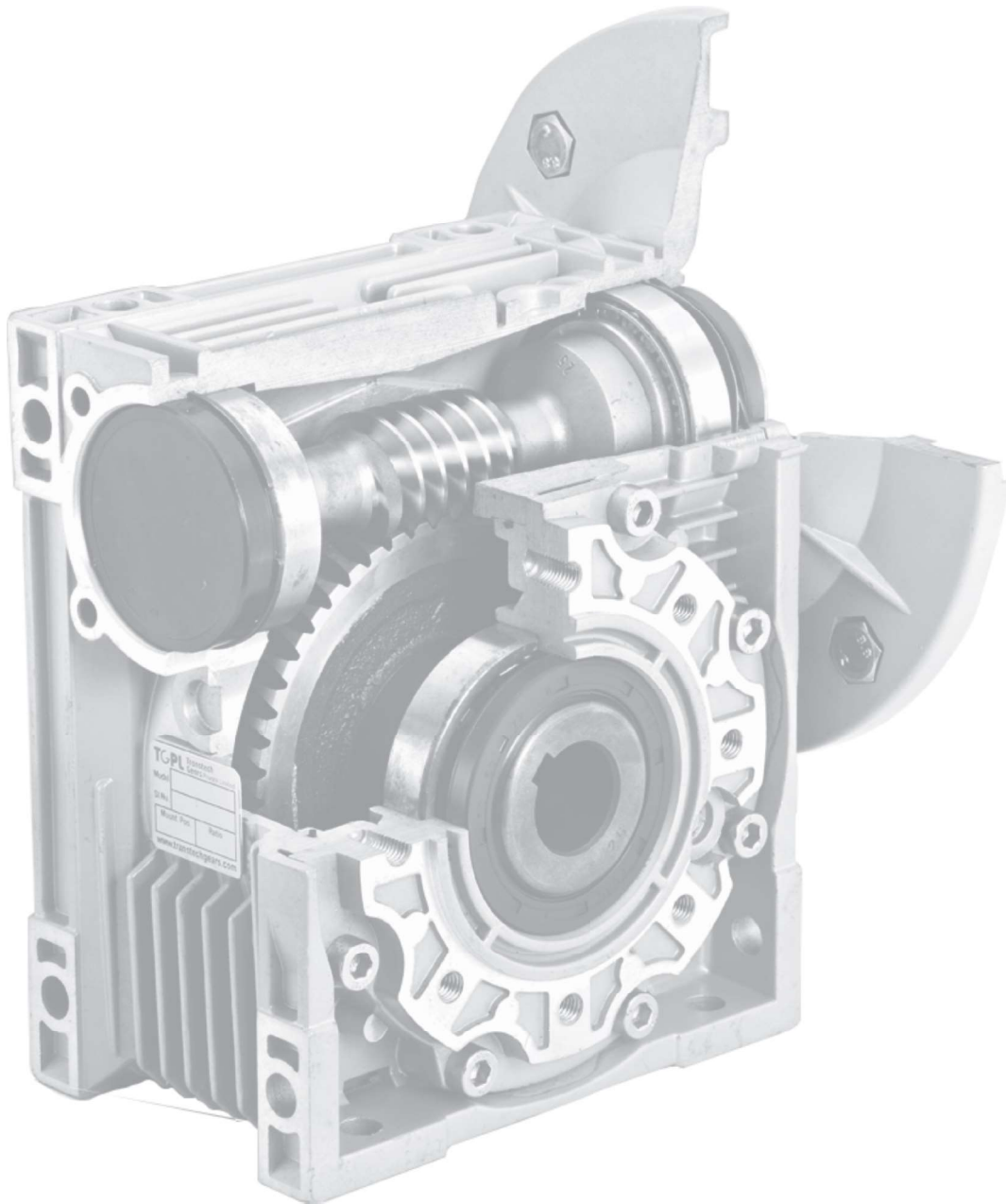


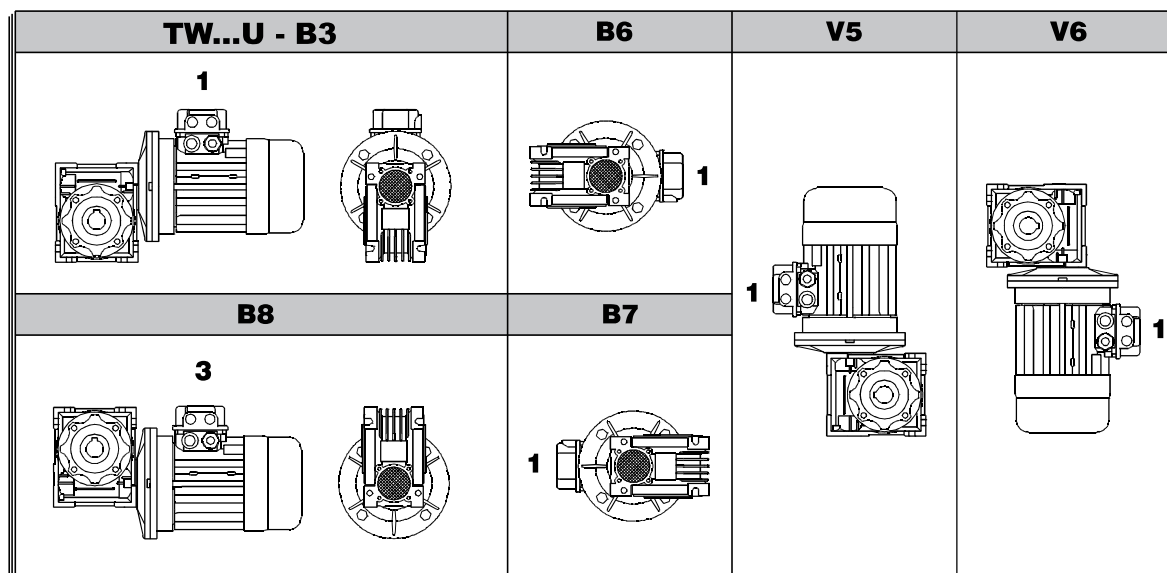
# TW SERIES



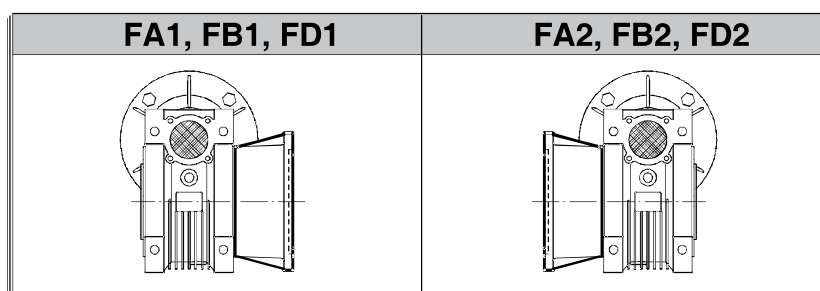
### 3.WORM GEAR BOX

## 3.1 MOUNTING POSITIONS

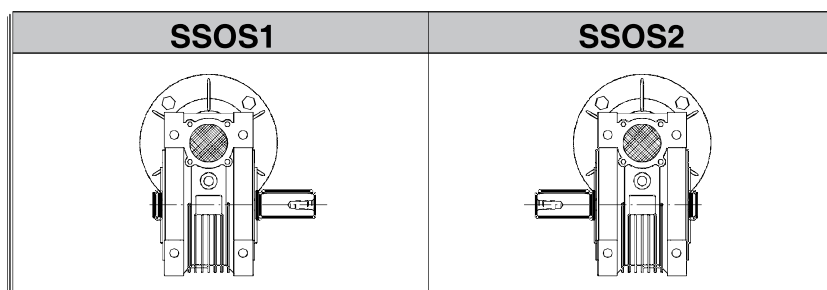
### TW & TW.. ISS Mounting Positions



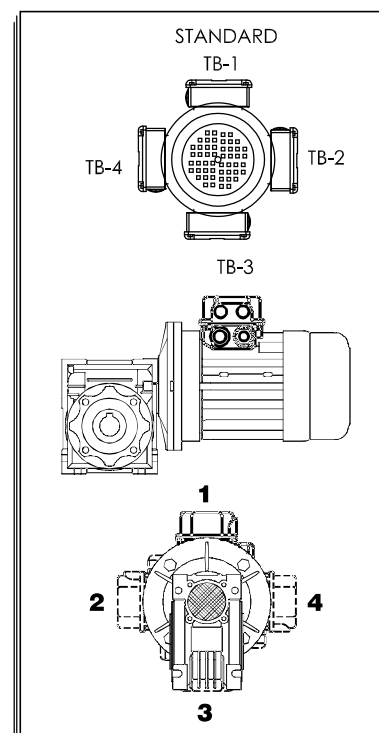
### Position diagram for output flange



### Position diagram for single output shaft



### Position of terminal box



### 3.2 Direction of rotation



### 3.3 LUBRICATION

#### Lubricants detail

| MODEL          | GRADE      |             |            | OIL TYPE      | AMBIENT TEMPERATURE<br>                                                              |
|----------------|------------|-------------|------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | LIGHT DUTY | NORMAL DUTY | HEAVY DUTY |               |                                                                                                                                                                          |
| TW30 TO TW90   | 150        | 220         | 320        | SYNTHETIC OIL | <div style="display: flex; align-items: center;"> <div style="width: 50%; text-align: center;">-15°</div> <div style="width: 50%; text-align: center;">+50°</div> </div> |
| TW110 TO TW150 | 220        | 220         | 320        | MINERAL OIL   |                                                                                                                                                                          |

#### Quantity of Lubricant (Ltrs)

|        | B3   | B6  | B7  | B8  | V5  | V6  |
|--------|------|-----|-----|-----|-----|-----|
| TW 30  | 0.05 |     |     |     |     |     |
| TW 40  | 0.1  |     |     |     |     |     |
| TW 50  | 0.15 |     |     |     |     |     |
| TW 63  | 0.3  |     |     |     |     |     |
| TW 75  | 0.5  |     |     |     |     |     |
| TW 90  | 1    |     |     |     |     |     |
| TW 110 | 3    | 2.5 | 2.5 | 2.2 | 3   | 2.2 |
| TW 130 | 4.5  | 3.5 | 3.5 | 3.3 | 4.5 | 3.3 |
| TW 150 | 7    | 5.4 | 5.4 | 5.1 | 7   | 5.1 |

### 3.4 Efficiency & Irreversibility Character

Efficiency is an important parameter of reducer, Efficiency  $\eta$  depends on the following parameters: 1) helix angle of gearing, 2) driving speed, 3) running-in of gearing, 4) The performance of oil, oil seal and bearing. The mesh data table on shows dynamic efficiency ( $n_1=1400$ ) and static efficiency values. Remember that these values are only achieved after the unit has been run in. Torque values  $Mn_2$  indicated in the catalogue are calculated by considering the steady-state performance of the gearboxes. The actual values mentioned above may be have deflection.

### 3.5 Dynamic irreversibility

Dynamic irreversibility is achieved when the output shaft stops instantly when drive is no longer transmitted through the worm shaft. This condition requires a dynamic efficiency of  $\eta_d < 0.4$

### 3.6 Static irreversibility

Static irreversibility is achieved when the gear reducer at a standstill, the application of a load to the output shaft can't drive the worm shaft. This condition requires a static efficiency of  $\eta_s < 0.5$

| $\eta_d$                       | >0.6                  | 0.5 ~ 0.6                 | 0.4 ~ 0.5                    | <0.4                    |
|--------------------------------|-----------------------|---------------------------|------------------------------|-------------------------|
| <b>DYNAMIC IRREVERSIBILITY</b> | dynamic reversibility | low dynamic reversibility | good dynamic irreversibility | dynamic irreversibility |

| $\eta_s$                      | >0.55                | 0.5 ~ 0.55               | <0.5                   |
|-------------------------------|----------------------|--------------------------|------------------------|
| <b>STATIC IRREVERSIBILITY</b> | static reversibility | low static reversibility | static irreversibility |

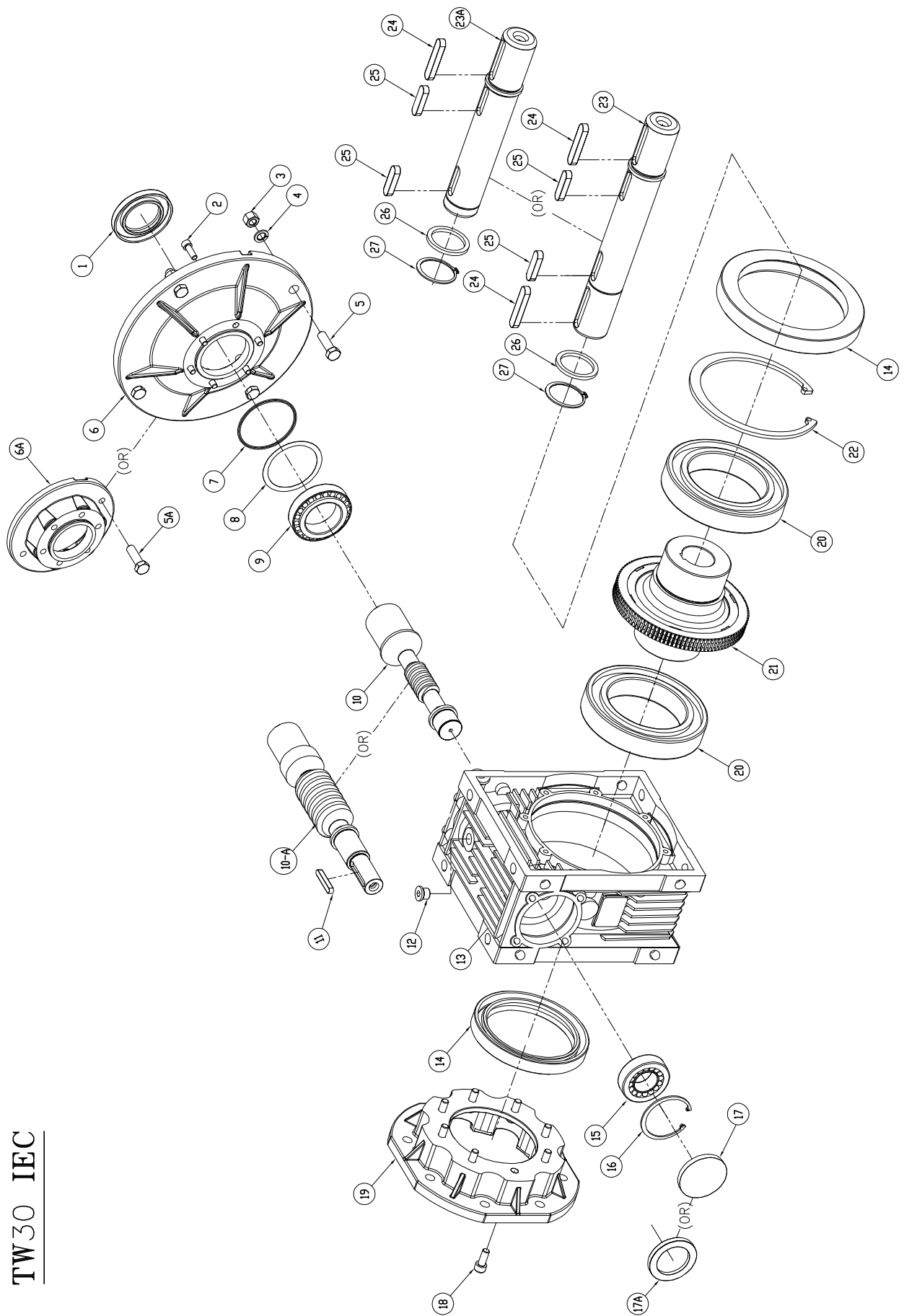
The table shows approximate irreversibility classes. Vibrations and shocks can affect a gear reducer's irreversibility. As it is virtually impossible to provide and guarantee total non reversing, we recommend the use of an external brake with sufficient capability to prevent vibrations in duced starting, where these circumstances are required. For the irreversibility conditions of a combined geared unit one must consider that the efficiency of the group is given by the product of the efficiencies of each single reducer, i.e.:  $\eta_{tot} = \eta_1 \times \eta_2$ .

### 3.7 Mesh Data

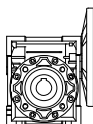
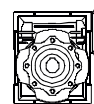
|              | <i>i</i>             | 7.5    | 10     | 15     | 20     | 25     | 30    | 40    | 50    | 60    | 80    | 100   |
|--------------|----------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| <b>TW30</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 1      | 1     | 1     | 1     | 1     |       |       |
|              | <b>m<sub>n</sub></b> | 1.36   | 1.39   | 1.42   | 1.09   | 1.69   | 1.43  | 1.10  | 0.89  | 0.74  |       |       |
|              | <b>Y</b>             | 18°55' | 14°25' | 9°44'  | 7°50'  | 5°33'  | 4°54' | 3°56' | 3°17' | 2°43' |       |       |
|              | <b>η<sub>d</sub></b> | 0.84   | 0.81   | 0.76   | 0.72   | 0.66   | 0.64  | 0.59  | 0.54  | 0.50  |       |       |
|              | <b>η<sub>s</sub></b> | 0.66   | 0.62   | 0.54   | 0.49   | 0.41   | 0.38  | 0.33  | 0.29  | 0.26  |       |       |
| <b>TW40</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 1.87   | 1.95   | 2.00   | 1.54   | 1.26   | 2.04  | 1.55  | 1.27  | 1.06  | 0.80  | 0.65  |
|              | <b>Y</b>             | 23°54' | 18°23' | 12°30' | 10°3'  | 8°45'  | 6°19' | 5°4'  | 4°24' | 3°42' | 2°52' | 2°29' |
|              | <b>η<sub>d</sub></b> | 0.86   | 0.84   | 0.80   | 0.77   | 0.74   | 0.69  | 0.65  | 0.61  | 0.57  | 0.51  | 0.47  |
|              | <b>η<sub>s</sub></b> | 0.70   | 0.66   | 0.59   | 0.54   | 0.51   | 0.44  | 0.39  | 0.36  | 0.32  | 0.27  | 0.24  |
| <b>TW50</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 2.34   | 2.43   | 2.50   | 1.92   | 1.56   | 2.54  | 1.94  | 1.58  | 1.32  | 1.00  | 0.80  |
|              | <b>Y</b>             | 23°49' | 18°19' | 12°27' | 10°3'  | 8°33'  | 6°18' | 5°4'  | 4°18' | 3°38' | 2°52' | 2°17' |
|              | <b>η<sub>d</sub></b> | 0.87   | 0.85   | 0.81   | 0.78   | 0.75   | 0.71  | 0.67  | 0.63  | 0.59  | 0.53  | 0.48  |
|              | <b>η<sub>s</sub></b> | 0.70   | 0.66   | 0.59   | 0.54   | 0.51   | 0.44  | 0.39  | 0.36  | 0.32  | 0.27  | 0.24  |
| <b>TW63</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 2.96   | 3.08   | 3.17   | 2.44   | 1.98   | 3.23  | 2.47  | 1.99  | 1.68  | 1.27  | 1.02  |
|              | <b>Y</b>             | 24°31' | 18°53' | 12°51' | 10°29' | 8°45'  | 6°30' | 5°17' | 4°24' | 3°49' | 2°59' | 2°26' |
|              | <b>η<sub>d</sub></b> | 0.88   | 0.86   | 0.82   | 0.80   | 0.77   | 0.73  | 0.69  | 0.65  | 0.62  | 0.56  | 0.51  |
|              | <b>η<sub>s</sub></b> | 0.70   | 0.66   | 0.59   | 0.55   | 0.51   | 0.44  | 0.40  | 0.36  | 0.33  | 0.28  | 0.24  |
| <b>TW75</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 3.53   | 3.70   | 3.83   | 2.94   | 2.39   | 3.92  | 2.99  | 2.41  | 2.02  | 1.54  | 1.24  |
|              | <b>Y</b>             | 26°38' | 20°37' | 14°5'  | 11°19' | 9°29'  | 7°9'  | 5°43' | 4°46' | 4°1'  | 3°17' | 2°44' |
|              | <b>η<sub>d</sub></b> | 0.88   | 0.87   | 0.84   | 0.81   | 0.79   | 0.76  | 0.72  | 0.68  | 0.64  | 0.59  | 0.55  |
|              | <b>η<sub>s</sub></b> | 0.71   | 0.68   | 0.61   | 0.57   | 0.53   | 0.47  | 0.41  | 0.37  | 0.34  | 0.29  | 0.26  |
| <b>TW90</b>  | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 4.23   | 4.47   | 4.66   | 3.60   | 2.93   | 4.79  | 3.67  | 2.97  | 2.49  | 1.89  | 1.52  |
|              | <b>Y</b>             | 29°5'  | 22°39' | 15°33' | 12°50' | 10°53' | 7°55' | 6°30' | 5°29' | 4°46' | 3°45' | 3°6'  |
|              | <b>η<sub>d</sub></b> | 0.89   | 0.88   | 0.85   | 0.83   | 0.81   | 0.78  | 0.74  | 0.71  | 0.68  | 0.63  | 0.59  |
|              | <b>η<sub>s</sub></b> | 0.72   | 0.69   | 0.63   | 0.59   | 0.56   | 0.49  | 0.44  | 0.41  | 0.37  | 0.32  | 0.28  |
| <b>TW110</b> | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 5.18   | 5.45   | 5.67   | 4.47   | 3.64   | 5.82  | 4.58  | 3.71  | 3.12  | 2.36  | 1.91  |
|              | <b>Y</b>             | 28°15' | 21°57' | 15°2'  | 14°42' | 12°33' | 7°39' | 7°29' | 6°21' | 5°33' | 4°27' | 3°46' |
|              | <b>η<sub>d</sub></b> | 0.89   | 0.88   | 0.86   | 0.85   | 0.83   | 0.79  | 0.77  | 0.74  | 0.72  | 0.67  | 0.63  |
|              | <b>η<sub>s</sub></b> | 0.72   | 0.69   | 0.62   | 0.62   | 0.59   | 0.48  | 0.48  | 0.44  | 0.41  | 0.36  | 0.32  |
| <b>TW130</b> | <b>z<sub>1</sub></b> | 4      | 3      | 2      | 2      | 2      | 1     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 6.11   | 6.45   | 6.72   | 5.24   | 4.28   | 6.91  | 5.36  | 4.35  | 3.65  | 2.76  | 2.23  |
|              | <b>Y</b>             | 28°43' | 22°20' | 15°19' | 13°47' | 11°54' | 7°48' | 6°60' | 6°1'  | 5°16' | 4°8'  | 3°27' |
|              | <b>η<sub>d</sub></b> | 0.90   | 0.89   | 0.87   | 0.85   | 0.84   | 0.80  | 0.78  | 0.75  | 0.73  | 0.68  | 0.64  |
|              | <b>η<sub>s</sub></b> | 0.72   | 0.69   | 0.63   | 0.61   | 0.58   | 0.49  | 0.46  | 0.43  | 0.40  | 0.34  | 0.30  |
| <b>TW150</b> | <b>z<sub>1</sub></b> | 6      | 4      | 3      | 2      | 2      | 2     | 1     | 1     | 1     | 1     | 1     |
|              | <b>m<sub>n</sub></b> | 5.5    | 6.155  | 5.5    | 6.155  | 5      | 4.193 | 6.155 | 5     | 4.193 | 3.17  | 2.55  |
|              | <b>Y</b>             | 32°09' | 24°35' | 17°27' | 12°53' | 11°19' | 9°50' | 6°32' | 5°43' | 4°57' | 3°55' | 3°14' |
|              | <b>η<sub>d</sub></b> | 0.91   | 0.90   | 0.88   | 0.86   | 0.84   | 0.83  | 0.78  | 0.76  | 0.73  | 0.68  | 0.64  |
|              | <b>η<sub>s</sub></b> | 0.73   | 0.71   | 0.66   | 0.60   | 0.57   | 0.54  | 0.45  | 0.42  | 0.39  | 0.33  | 0.29  |

## **3.8 TW SERIES EXPLODED VIEW**

# TW SERIES EXPLODED VIEW



TW30 IEC

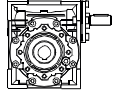
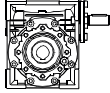
**B5****B14**

## PARTS LIST FOR TW30 (IEC)

| PART NO. | PART DESCRIPTION                              | QTY | TW30                            |
|----------|-----------------------------------------------|-----|---------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 20x30x7                         |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 4   | M5x12                           |
| 3 & 4    | NUT & SPRING WASHER                           | 4   | M8                              |
| 5        | HEX SCREW                                     | 4   | M8x25                           |
| 5A       | HEX SCREW                                     | 4   | M5x14                           |
| 6        | INPUT - 63 B5 FLANGE                          | 1   | 30 IEC 63 B5                    |
| 6A       | INPUT - 63 B14 FLANGE                         | 1   | 30 IEC 63 B14                   |
| 7        | O-RING                                        | 1   | 37x34x2                         |
| 8        | ADJUST SPACER                                 | 1   | 37x30x0.2                       |
| 9        | INPUT BEARING                                 | 1   | 6005                            |
| 10       | WORM SHAFT                                    | 1   | 30 WORM SHAFT                   |
| 10A      | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 30 WORM SHAFT (NON DRIVEN SIDE) |
| 11       | KEY                                           | 1   | 5x5x30                          |
| 12       | OIL PLUG                                      | 1   | M10x1.5                         |
| 13       | ALUMINUM CASING                               | 1   | 30 CASING                       |
| 14       | OUTPUT OIL SEAL                               | 2   | 25x47x7                         |
| 15       | NON DRIVEN SIDE BEARING                       | 1   | 6002                            |
| 16       | CIRCLIP                                       | 1   | 32x1.5                          |
| 17       | DUMMY COVER                                   | 1   | 32x6                            |
| 17A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 15x32x7                         |
| 18       | HEX SCREW                                     | 4   | M5x10                           |
| 19       | OUTPUT FLANGE                                 | 1   | 30 FA                           |
| 20       | OUTPUT BEARING                                | 2   | 6904                            |
| 21       | WORM WHEEL                                    | 1   | 30 WORM WHEEL                   |
| 22       | CIRCLIP                                       | 1   | 47x1.5                          |
| 23       | DOUBLE OUTPUT SHAFT                           | 1   | 30 DOS                          |
| 23A      | SINGLE OUTPUT SHAFT                           | 1   | 30 SSOS                         |
| 24       | KEY                                           | 1   | M5x25                           |
| 25       | KEY                                           | 1   | M5x25                           |
| 26       | SPACER                                        | 1   | 23x14,x2                        |
| 27       | SHAFT CIRCLIP (A) TYPE                        | 1   | 14x1                            |

## TW30 ISS

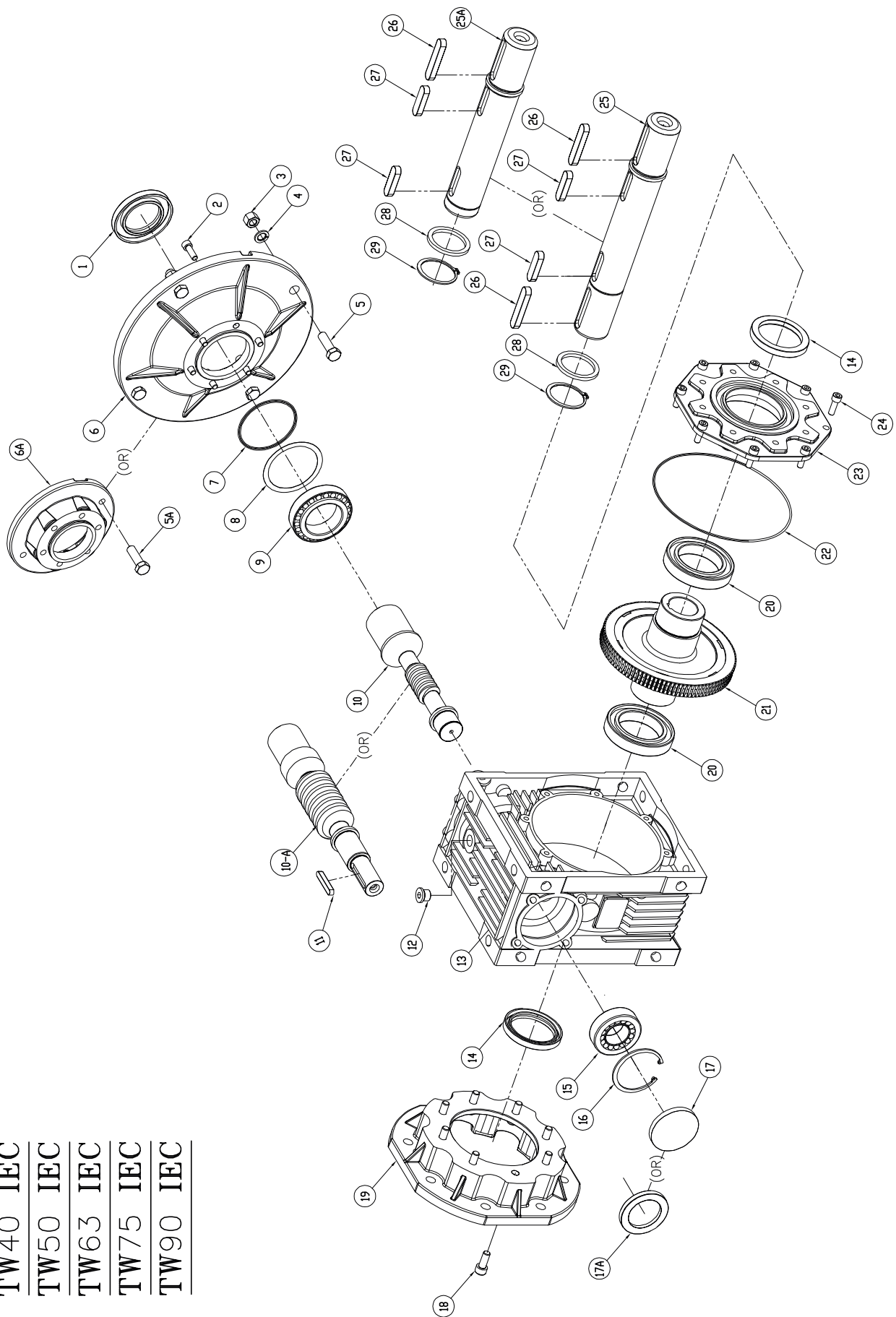




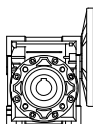
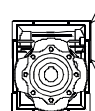
## PARTS LIST FOR TW30 (ISS)

| PART NO. | PART DESCRIPTION                              | QTY | TW30                            |
|----------|-----------------------------------------------|-----|---------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 20x30x7                         |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 4   | 5x12                            |
| 3        | ISS INPUT FLANGE                              | 1   | 30 ISS FLANGE                   |
| 4        | O-RING                                        | 1   | 37x34x2                         |
| 5        | ADJUST SPACER                                 | 1   | 37x30x0.2                       |
| 6        | INPUT BEARING                                 | 1   | 6005                            |
| 7        | KEY                                           | 1   | 4x4x18                          |
| 8        | WORM SHAFT                                    | 1   | 30 WORM SHAFT                   |
| 8A       | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 30 WORM SHAFT (NON DRIVEN SIDE) |
| 9        | KEY                                           | 1   | 5x5x30                          |
| 10       | OIL PLUG                                      | 1   | M10x1.5                         |
| 11       | ALUMINIUM CASING                              | 1   | 30 CASING                       |
| 12       | OUTPUT OIL SEAL                               | 2   | 25x47x7                         |
| 13       | NON DRIVEN SIDE BEARING                       | 1   | 6002                            |
| 14       | CIRCLIP                                       | 1   | 32x1.5                          |
| 15       | DUMMY COVER                                   | 1   | 32x6                            |
| 15A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 15x32x7                         |
| 16       | HEX SCREW                                     | 4   | M5x10                           |
| 17       | OUTPUT FLANGE                                 | 1   | 30 FA                           |
| 18       | OUTPUT BEARING                                | 2   | 6904                            |
| 19       | WORM WHEEL                                    | 1   | 30 WORM WHEEL                   |
| 20       | CIRCLIP                                       | 1   | 47x1.5                          |
| 21       | DOUBLE OUTPUT SHAFT                           | 1   | 30 DOS                          |
| 21A      | SINGLE OUTPUT SHAFT                           | 1   | 30 SSOS                         |
| 22       | KEY                                           | 1   | M5x25                           |
| 23       | KEY                                           | 1   | M5x25                           |
| 24       | SPACER                                        | 1   | 23x14.2x2                       |
| 25       | SHAFT CIRCLIP (A) TYPE                        | 1   | 14x1                            |

# TW SERIES EXPLODED VIEW



TW40 IEC  
 TW50 IEC  
 TW63 IEC  
 TW75 IEC  
 TW90 IEC

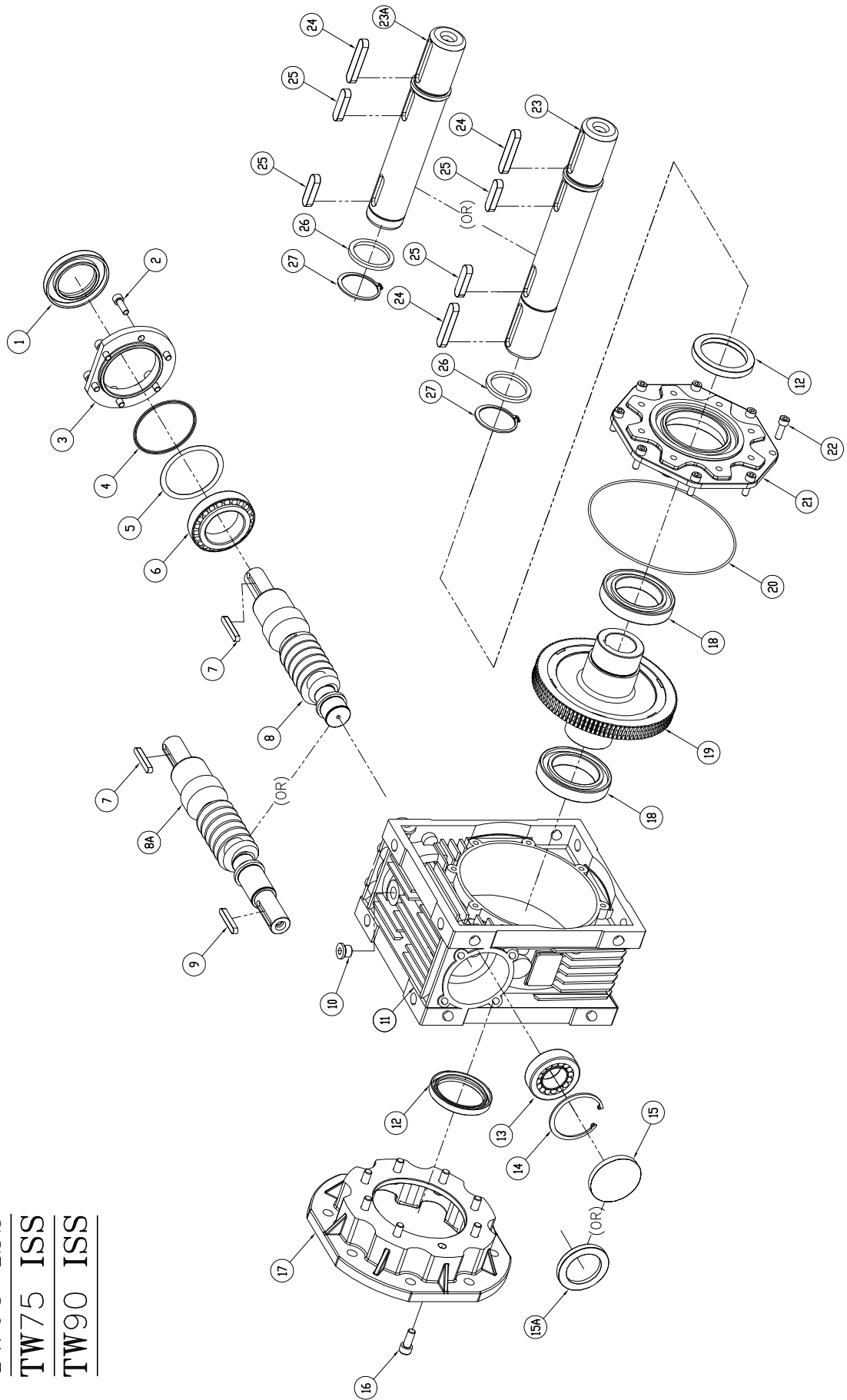
**B5****B14**

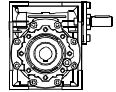
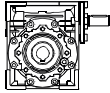
## PARTS LIST FOR TW40, TW50, TW63, TW75 & TW90 (IEC)

| PART NO. | PART DESCRIPTION                              | QTY | TW40                            | TW50                            | TW63                            | TW75                                          | TW90                                          |
|----------|-----------------------------------------------|-----|---------------------------------|---------------------------------|---------------------------------|-----------------------------------------------|-----------------------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 25x35x7                         | 30x47x7                         | 35x52x7                         | 40x60x8                                       | 40x60x8                                       |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 6   | M6x16                           | M6x16                           | M8x16                           | M8x20                                         | M8x20                                         |
| 3 & 4    | NUT & SPRING WASHER                           | 4   | M8 (63&71)                      | M8 (63&71), M10 (80)            | M8 (71), M10 (80&90)            | M8 (71), M10 (80&90) & M12 (100&112)          | M8 (71), M10 (80&90) & M12 (100&112)          |
| 5        | HEX SCREW                                     | 4   | M8x25 (63&71)                   | M8x25 (63&71), M10x30 (80)      | M8x25 (71), M10x30 (80&90)      | M8x25 (71), M10x30 (80&90) & M12x35 (100&112) | M8x25 (71), M10x30 (80&90) & M12x35 (100&112) |
| 5A       | HEX SCREW                                     | 4   | M5x14 (63)<br>M6x16 (71)        | M5x23 (63)<br>M6x20 (71 & 80)   | M6x25(71),M6x22 (80)&M8x25(90)  | M6x22(80),<br>M8x25(90,100&112)               | M8x30(100)                                    |
| 6        | INPUT - B5 FLANGE                             | 1   |                                 |                                 |                                 |                                               |                                               |
|          | 63 B5                                         |     | 40 IEC 63 B5                    | 50 IEC 63 B5                    | -                               | -                                             | -                                             |
|          | 71 B5                                         |     | 40 IEC 71 B5                    | 50 IEC 71 B5                    | 63 IEC 71 B5                    | 75 IEC 71 B5                                  | 90 IEC 71 B5                                  |
|          | 80 & 90 B5                                    |     | -                               | 50 IEC 80 B5                    | 63 IEC 80&90 B5                 | 75 IEC 80&90 B5                               | 90 IEC 80&90 B5                               |
|          | 100 & 112 B5                                  |     | -                               | -                               | -                               | 75 IEC 100&112 B5                             | 90 IEC 100&112 B5                             |
| 6A       | INPUT - B14 FLANGE                            | 1   |                                 |                                 |                                 |                                               |                                               |
|          | 63 B14                                        |     | 40 IEC 63 B14                   | 50 IEC 63 B14                   | -                               | -                                             | -                                             |
|          | 71 B14                                        |     | 40 IEC 71 B14                   | 50 IEC 71 B14                   | 63 IEC 71 B14                   | -                                             | -                                             |
|          | 80 B14                                        |     | -                               | 50 IEC 80 B14                   | 63 IEC 80 B14                   | 75 IEC 80 B14                                 | 90 IEC 80 B14                                 |
|          | 90 B14                                        |     | -                               | -                               | 63 IEC 90 B14                   | 75 IEC 90 B14                                 | 90 IEC 90 B14                                 |
|          | 100 & 112 B14                                 |     | -                               | -                               | -                               | 75 IEC 100&112 B14                            | 90 IEC 100&112 B14                            |
| 7        | O-RING                                        | 1   | 44x47x2                         | 55x52x2                         | 62x59x2                         | 68x65x2                                       | 68x65x2                                       |
| 8        | ADJUST SPACER                                 | 1   | 46x36.5x0.2                     | 54x46.5x0.2                     | 63x46.5x0.2                     | 68x62.3x0.2                                   | 68x62.5x0.2                                   |
| 9        | INPUT BEARING                                 | 1   | 6005                            | 6006                            | 6007                            | 32008 or 6008                                 | 32008 or 6008                                 |
| 10       | WORM SHAFT                                    | 1   | 40 WORM SHAFT                   | 50 WORM SHAFT                   | 63 WORM SHAFT                   | 75 WORM SHAFT                                 | 90 WORM SHAFT                                 |
| 10A      | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 40 WORM SHAFT (NON DRIVEN SIDE) | 50 WORM SHAFT (NON DRIVEN SIDE) | 63 WORM SHAFT (NON DRIVEN SIDE) | 75 WORM SHAFT (NON DRIVEN SIDE)               | 90 WORM SHAFT (NON DRIVEN SIDE)               |
| 11       | KEY                                           | 1   | 5x5x25                          | 5x5x25                          | 6x6x30                          | 8x7x40                                        | 8x7x50                                        |
| 12       | OIL PLUG                                      | 2   | M10x1                           | M10x1                           | M16x1.5                         | M16x1.5                                       | M16x1.5                                       |
| 13       | ALUMINIUM CASING                              | 1   | 40 CASING                       | 50 CASING                       | 63 CASING                       | 75 CASING                                     | 90 CASING                                     |
| 14       | OUTPUT OIL SEAL                               | 2   | 30x40x7                         | 40x62x8                         | 45x65x8                         | 50x72x8                                       | 60x85x10                                      |
| 15       | NON DRIVEN SIDE BEARING                       | 1   | 6203                            | 6204                            | 6205                            | 30206 or 6206                                 | 30206 or 6206                                 |
| 16       | CIRCLIP                                       | 1   | 40x1.5                          | 47x1.5                          | 52x1.5                          | 62x2                                          | 62x2                                          |
| 17       | DUMMY COVER                                   | 1   | 40x7                            | 47x7                            | 52x7                            | 62x7                                          | 62x7                                          |
| 17A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 17x40x7                         | 20x47x7                         | 25x52x7                         | 30x62x7                                       | 30x62x7                                       |
| 18       | HEX SCREW                                     | 8   | M6x16                           | M8x16                           | M8x16                           | M8x20                                         | M10x25                                        |
| 19       | OUTPUT FLANGE                                 | 1   |                                 |                                 |                                 |                                               |                                               |
|          | FA (or) FB                                    |     | 40 FA (or) FB                   | 50 FA (or) FB                   | 63 FA (or) FB                   | 75 FA (or) FB                                 | 90 FA                                         |
|          | FD                                            |     | -                               | -                               | -                               | -                                             | 90 FD                                         |
| 20       | OUTPUT BEARING                                | 2   | 6006                            | 6008                            | 6009                            | 6010                                          | 6012                                          |
| 21       | WORM WHEEL                                    | 1   | 40 WORM WHEEL                   | 50 WORM WHEEL                   | 63 WORM WHEEL                   | 75 WORM WHEEL                                 | 90 WORM WHEEL                                 |
| 22       | O-RING                                        | 1   | 68x65x2                         | 85x82x2                         | 110x107x2                       | 135x132x2                                     | 165x162x2                                     |
| 23       | OUTPUT COVER                                  | 1   | 40 O/P COVER                    | 50 O/P COVER                    | 63 O/P COVER                    | 75 O/P COVER                                  | 90 O/P COVER                                  |
| 24       | HEX SCREW                                     | 8   | M6x16                           | M6x16                           | M8x16                           | M8x20                                         | M8x20                                         |
| 25       | DOUBLE OUTPUT SHAFT                           | 1   | 40 DOS                          | 50 DOS                          | 63 DOS                          | 75 DOS                                        | 90 DOS                                        |
| 25A      | SINGLE OUTPUT SHAFT                           | 1   | 40 SSOS                         | 50 SSOS                         | 63 SSOS                         | 75 SSOS                                       | 90 SSOS                                       |
| 26       | KEY                                           | 1   | 6x6x30                          | 8x7x40                          | 8x7x40                          | 8x7x50                                        | 10x8x70                                       |
| 27       | KEY                                           | 1   | 6x6x30                          | 8x7x34                          | 8x7x40                          | 8x7x40                                        | 10x8x45                                       |
| 28       | SPACER                                        | 1   | 28x18.2x2                       | 43x25.2x2                       | 43x25.2x2                       | 50x28.2x2                                     | 50x35.2x2                                     |
| 29       | SHAFT CIRCLIP (A) TYPE                        | 1   | 18x1.2                          | 25x1.2                          | 25x1.2                          | 28x1.5                                        | 35x1.5                                        |

# TW SERIES EXPLODED VIEW

TW40 ISS  
TW50 ISS  
TW63 ISS  
TW75 ISS  
TW90 ISS

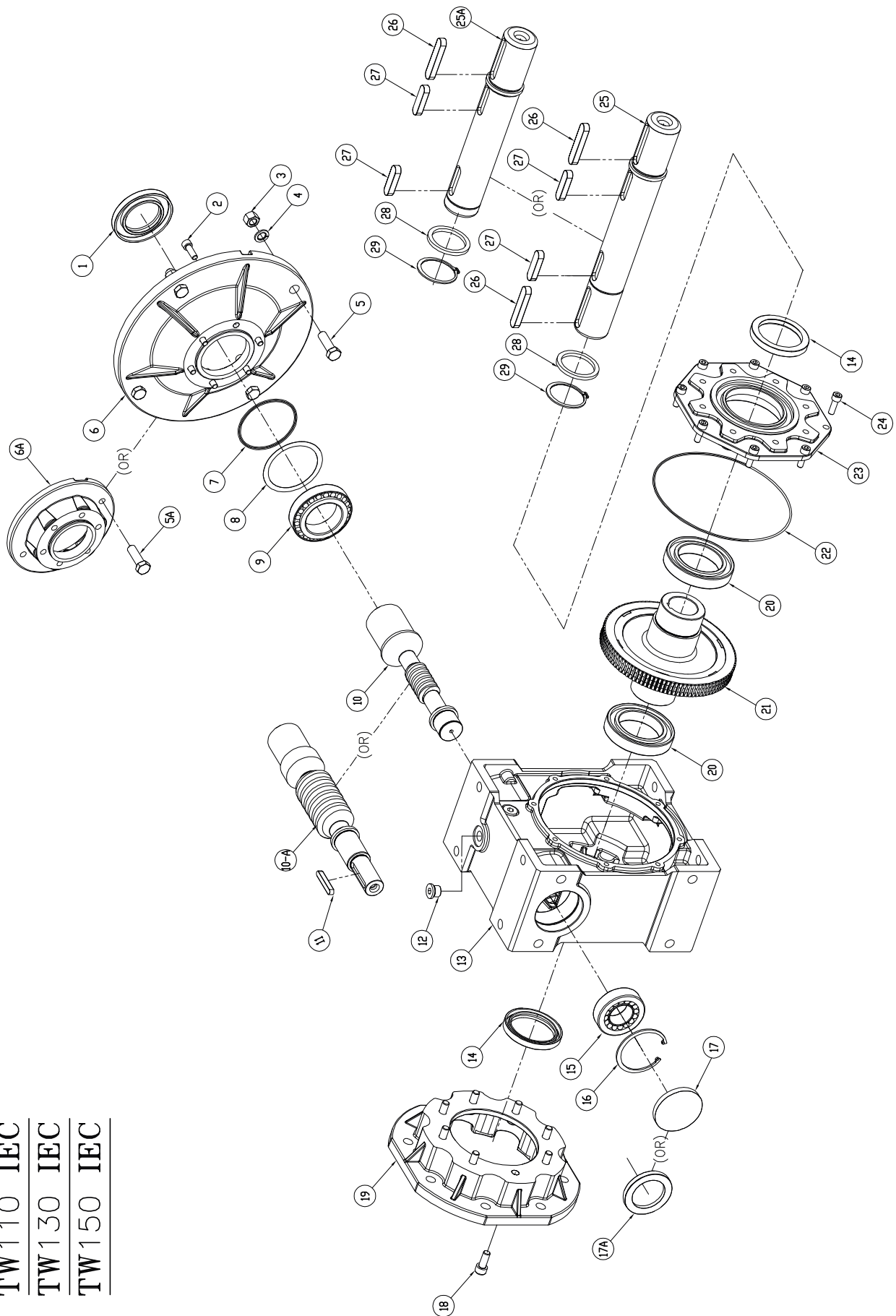




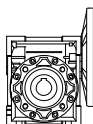
## PARTS LIST FOR TW40, TW50, TW63, TW75 & TW90 (ISS)

| PART NO. | PART DESCRIPTION                              | QTY | TW40                            | TW50                            | TW63                            | TW75                            | TW90                            |
|----------|-----------------------------------------------|-----|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 25x35x7                         | 30x47x7                         | 35x52x7                         | 40x60x8                         | 40x60x8                         |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 1   | M6x16                           | M6x16                           | M8x16                           | M8x20                           | M8x20                           |
| 3        | INPUT ISS FLANGE                              | 1   | 40 I/P ISSFL                    | 50 I/P ISS FL                   | 63 I/P ISS FL                   | 75 I/P ISS FL                   | 90 I/P ISS FL                   |
| 4        | O-RING                                        | 1   | 44x47x2                         | 55x52x2                         | 62x59x2                         | 68x65x2                         | 68x65x2                         |
| 5        | ADJUST SPACER                                 | 1   | 46x36.5x0.2                     | 54x46.5x0.2                     | 63x46.5x0.2                     | 68x62.3x0.2                     | 68x62.5x0.2                     |
| 6        | INPUT BEARING                                 | 8A  | 6005                            | 6006                            | 6007                            | 32008 or 6008                   | 32008 or 6008                   |
| 7        | KEY                                           | 1   | 4x4x16                          | 5x5x25                          | 6x6x30                          | 8x7x40                          | 8x7x40                          |
| 8        | WORM SHAFT                                    | 1   | 40 WORM SHAFT                   | 50 WORM SHAFT                   | 63 WORM SHAFT                   | 75 WORM SHAFT                   | 90 WORM SHAFT                   |
| 8A       | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 40 WORM SHAFT (NON DRIVEN SIDE) | 50 WORM SHAFT (NON DRIVEN SIDE) | 63 WORM SHAFT (NON DRIVEN SIDE) | 75 WORM SHAFT (NON DRIVEN SIDE) | 90 WORM SHAFT (NON DRIVEN SIDE) |
| 9        | KEY                                           | 1   | 5x5x25                          | 5x5x25                          | 6x6x30                          | 8x7x40                          | 8x7x50                          |
| 10       | OIL PLUG.                                     | 2   | M10x1                           | M10x1                           | M16x1.5                         | M16x1.5                         | M16x1.5                         |
| 11       | ALUMINIUM CASING                              | 1   | 40CASING                        | 50 CASING                       | 63 CASING                       | 75 CASING                       | 90 CASING                       |
| 12       | OUTPUT OIL SEAL                               | 2   | 30x40x7                         | 40x62x8                         | 45x65x8                         | 50x72x8                         | 60x85x10                        |
| 13       | NON DRIVEN SIDE BEARING                       | 1   | 6203                            | 6204                            | 6205                            | 30206 or 6206                   | 30206 or 6206                   |
| 14       | CIRCLIP                                       | 1   | 40x1.5                          | 47x1.5                          | 52x1.5                          | 62x2                            | 62x2                            |
| 15       | DUMMY COVER                                   | 1   | 40x7                            | 47x7                            | 52x7                            | 62x7                            | 62x7                            |
| 15A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 17x40x7                         | 20x47x7                         | 25x52x7                         | 30x62x7                         | 30x62x7                         |
| 16       | HEX SCREW                                     | 8   | M6x16                           | M8x16                           | M8x16                           | M8x20                           | M10x25                          |
| 17       | OUTPUT FLANGE                                 | 1   |                                 |                                 |                                 |                                 |                                 |
|          | FA (or) FB                                    |     | 40 FA (or) FB                   | 50 FA (or) FB                   | 63 FA (or) FB                   | 75 FA (or) FB                   | 90 FA                           |
|          | FD                                            |     | -                               | -                               | -                               | -                               | 90 FD                           |
| 18       | OUTPUT BEARING                                | 2   | 6006                            | 6008                            | 6009                            | 6010                            | 6012                            |
| 19       | WORM WHEEL                                    | 1   | 40 WORM WHEEL                   | 50 WORM WHEEL                   | 63 WORM WHEEL                   | 75 WORM WHEEL                   | 90 WORM WHEEL                   |
| 20       | O-RING                                        | 1   | 68x65x2                         | 85x82x2                         | 110x107x2                       | 135x132x2                       | 165x162x2                       |
| 21       | OUTPUT COVER                                  | 1   | 40 O/P COVER                    | 50 O/P COVER                    | 63 O/P COVER                    | 75 O/P COVER                    | 90 O/P COVER                    |
| 22       | HEX SCREW                                     | 8   | M6x16                           | M6x16                           | M8x16                           | M8x20                           | M8x20                           |
| 23       | DOUBLE OUTPUT SHAFT                           | 1   | 40 DOS                          | 50 DOS                          | 63 DOS                          | 75 DOS                          | 90 DOS                          |
| 23A      | SINGLE OUTPUT SHAFT                           | 1   | 40 SSOS                         | 50 SSOS                         | 63 SSOS                         | 75 SSOS                         | 90 SSOS                         |
| 24       | KEY                                           | 1   | 6x6x30                          | 8x7x40                          | 8x7x40                          | 8x7x50                          | 10x8x70                         |
| 25       | KEY                                           | 1   | 6x6x30                          | 8x7x34                          | 8x7x40                          | 8x7x40                          | 10x8x45                         |
| 26       | SPACER                                        | 1   | 28x18.2x2                       | 43x25.2x2                       | 43x25.2x2                       | 50x28.2x2                       | 50x35.2x2                       |
| 27       | SHAFT CIRCLIP ( A ) TYPE                      | 1   | 18x1.2                          | 25x1.2                          | 25x1.2                          | 28x1.5                          | 35x1.5                          |

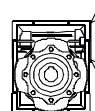
## TW SERIES EXPLODED VIEW



|       |     |
|-------|-----|
| TW110 | IEC |
| TW130 | IEC |
| TW150 | IEC |



**B5**



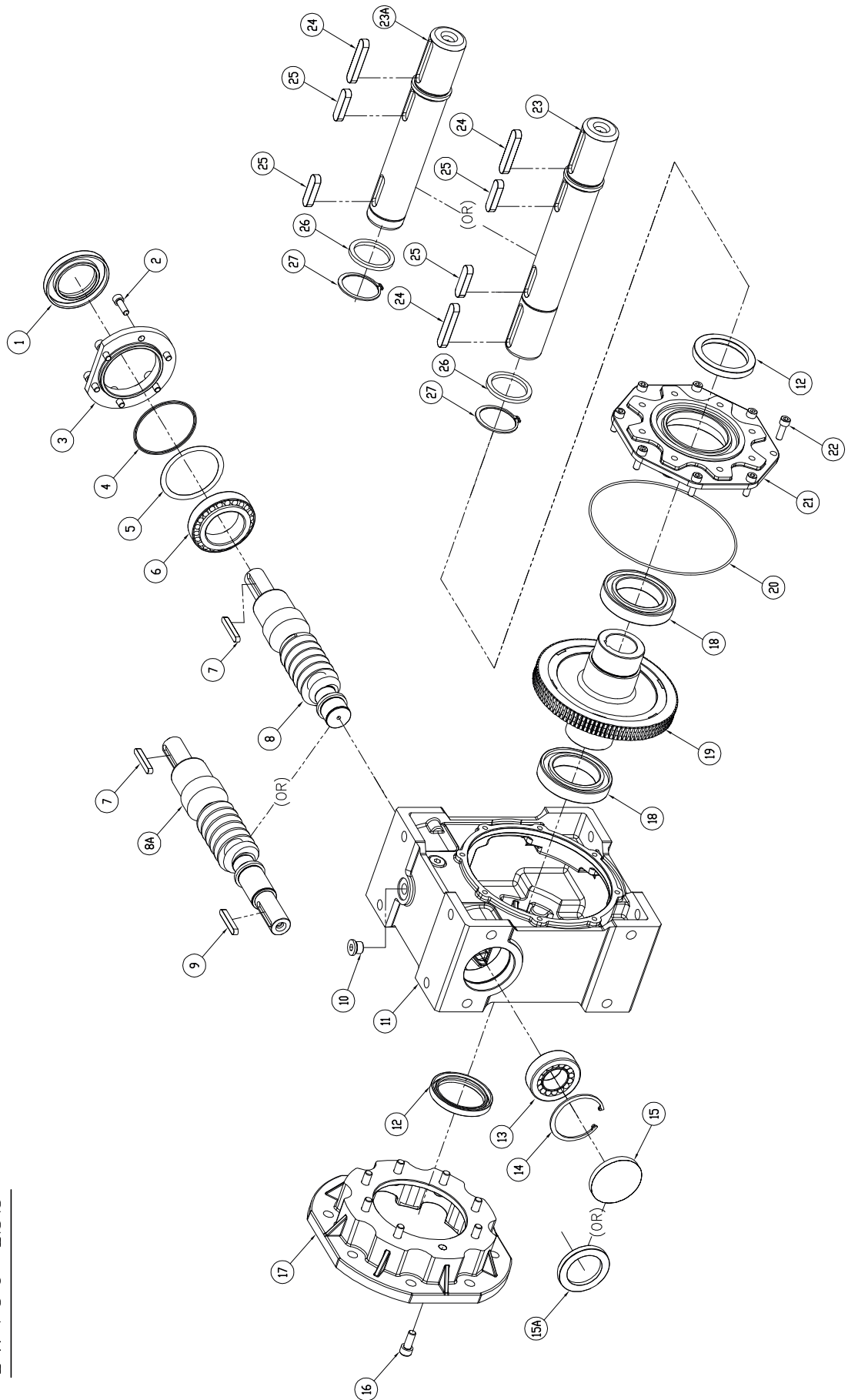
**B14**

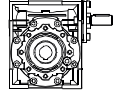
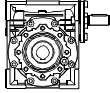
**PARTS LIST FOR TW110, TW130 & TW150 GEAR BOXES (IEC)**

| PART NO. | PART DESCRIPTION                              | QTY | Tw110                            | Tw130                            | Tw150                            |
|----------|-----------------------------------------------|-----|----------------------------------|----------------------------------|----------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 50x68x8                          | 50x68x8                          | 90x120x12                        |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 6   | M8x20                            | M8x20                            | M12x30                           |
| 3 & 4    | NUT & SPRING WASHER                           | 4   | M10 (90), M12 (100&112)          | M10 (90), M12 (100&112)          | M12 (100&112, 132)               |
| 5        | HEX SCREW                                     | 4   | M12x45                           | M12x45                           | M12x45                           |
| 5A       | HEX SCREW                                     | 4   | M8x30(100)                       | M8x30(100)                       | -                                |
| 6        | INPUT - B5 FLANGE                             | 1   |                                  |                                  |                                  |
|          | 80 & 90 B5                                    |     | 110 IEC 90 B5                    | 110 IEC 90 B5                    |                                  |
|          | 100 & 112 B5                                  |     | 110 IEC 100 & 112 B5             | 130 IEC 100 & 112 B5             | 150 IEC 100 & 112 B5             |
|          | 132 B5                                        |     |                                  |                                  | 150 IEC 132 B5                   |
| 6A       | INPUT - B14 FLANGE                            | 1   |                                  |                                  |                                  |
|          | 90 B14                                        |     | 110 IEC 90 B14                   |                                  |                                  |
|          | 100 & 112 B14                                 |     | 110 IEC 100 & 112 B14            | 110 IEC 100 & 112 B14            | -                                |
| 7        | O-RING                                        | 1   | 80x77x2.5                        | 80x77x2.5                        | -                                |
| 8        | ADJUST SPACER                                 | 1   | 80x71.5x0.25                     | 80x71.5x0.25                     | 110x100x0.2                      |
| 9        | INPUT BEARING                                 | 1   | 32010                            | 32010                            | 30212                            |
| 10       | WORM SHAFT                                    | 1   | 110 WORM SHAFT                   | 130 WORM SHAFT                   | 150 WORM SHAFT                   |
| 10A      | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 110 WORM SHAFT (NON DRIVEN SIDE) | 130 WORM SHAFT (NON DRIVEN SIDE) | 150 WORM SHAFT (NON DRIVEN SIDE) |
| 11       | KEY                                           | 1   | 8x7x50                           | 8x7x50                           | 10x8x70                          |
| 12       | OIL PLUG                                      | 2   | M16x1.5                          | M16x1.5                          | M16x1.5                          |
| 13       | CASING                                        | 1   | 110 CASING                       | 130 CASING                       | 150 CASING                       |
| 14       | OUTPUT OIL SEAL                               | 2   | 65x85x10                         | 70x90x10                         | 90x120x12                        |
| 15       | NON DRIVEN SIDE BEARING                       | 1   | 32207                            | 32207                            | 30209                            |
| 16       | CIRCLIP                                       | 1   | 72x2.5                           | 72x2.5                           | 85x3                             |
| 17       | DUMMY COVER                                   | 1   | 72x10                            | 72x10                            | 85x10                            |
| 17A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 35x72x7                          | 35x72x7                          | 45x85x10                         |
| 18       | HEX SCREW                                     | 8   | M10x25                           | M12x30                           | M12x30                           |
| 19       | OUTPUT FLANGE                                 | 1   | 110 FA (or) FB                   | 130 FA                           | 150 FA                           |
| 20       | OUTPUT BEARING                                | 2   | 6013                             | 6014                             | 6018                             |
| 21       | WORM WHEEL                                    | 1   | 110 WORM WHEEL                   | 130 WORM WHEEL                   | 150 WORM WHEEL                   |
| 22       | O-RING                                        | 1   | 200x197x3                        | 240x236x2.5                      | -                                |
| 23       | OUTPUT COVER                                  | 1   | 110 O/P COVER                    | 130 O/P COVER                    | 150 O/P COVER                    |
| 24       | HEX SCREW                                     | 8   | M8x25                            | M8x25                            | M12x35                           |
| 25       | DOUBLE OUTPUT SHAFT                           | 1   | 110 DOS                          | 130 DOS                          | 150 DOS                          |
| 25A      | SINGLE OUTPUT SHAFT                           | 1   | 110 SSOS                         | 130 SSOS                         | 150 SSOS                         |
| 26       | KEY                                           | 1   | 12x8x70                          | 14x9x70                          | 14x9x70                          |
| 27       | KEY                                           | 1   | 12x8x50                          | 14x9x50                          | 14x9x50                          |
| 28       | SPACER                                        | 1   | 55x42.2x2                        | 60x45.2x2                        | 65x50.2x2.5                      |
| 29       | SHAFT CIRCLIP (A) TYPE                        | 1   | 42x1.75                          | 45x1.75                          | 50x2                             |

# TW SERIES EXPLODED VIEW

TW110 ISS  
TW130 ISS  
TW150 ISS





## PARTS LIST FOR TW110, TW130 & TW150 GEAR BOXES (ISS)

| PART NO. | PART DESCRIPTION                              | QTY | Tw110                            | Tw130                            | Tw150                            |
|----------|-----------------------------------------------|-----|----------------------------------|----------------------------------|----------------------------------|
| 1        | INPUT OIL SEAL                                | 1   | 50x68x8                          | 50x68x8                          | 90x120x12                        |
| 2        | HEX SCREW FOR INPUT FLANGE                    | 6   | M8x20                            | M8x20                            | M12x30                           |
| 3        | ISS INPUT FLANGE                              | 1   | 110 ISS I/P FL                   | 130 ISS I/P FL                   | 150 ISS I/P FL                   |
| 4        | O-RING                                        | 1   | 80x77x2.5                        | 80x77x2.5                        | 110x100x0.2                      |
| 5        | ADJUST SPACER                                 | 1   | 80x71.5x0.25                     | 80x71.5x0.25                     | -                                |
| 6        | INPUT BEARING                                 | 1   | 32010                            | 32010                            | 30212                            |
| 7        | KEY                                           | 1   | 8x7x50                           | 8x7x50                           | 10x8x70                          |
| 8        | WORM SHAFT                                    | 1   | 110 WORM SHAFT                   | 130 WORM SHAFT                   | 150 WORM SHAFT                   |
| 8A       | WORM SHAFT ( NON DRIVEN SIDE EXTENDED SHAFT ) | 1   | 110 WORM SHAFT (NON DRIVEN SIDE) | 130 WORM SHAFT (NON DRIVEN SIDE) | 150 WORM SHAFT (NON DRIVEN SIDE) |
| 9        | KEY                                           | 1   | 8x7x50                           | 8x7x50                           | 10x8x70                          |
| 10       | OIL PLUG                                      | 2   | M16x1.5                          | M16x1.5                          | M16x1.5                          |
| 11       | CASING                                        | 1   | 110 CASING                       | 130 CASING                       | 150 CASING                       |
| 12       | OUTPUT OIL SEAL                               | 2   | 65x85x10                         | 70x90x10                         | 90x120x12                        |
| 13       | NON DRIVEN SIDE BEARING                       | 1   | 32207                            | 32207                            | 30209                            |
| 14       | CIRCLIP                                       | 1   | 72x2.5                           | 72x2.5                           | 85x3                             |
| 15       | DUMMY COVER                                   | 1   | 72x10                            | 72x10                            | 85x10                            |
| 15A      | NON DRIVEN SIDE OIL SEAL                      | 1   | 35x72x7                          | 35x72x7                          | 45x85x10                         |
| 16       | HEX SCREW                                     | 8   | M10x25                           | M12x30                           | M12x30                           |
| 17       | OUTPUT FLANGE                                 | 1   | 110 FA (or) FB                   | 130 FA                           | 150 FA                           |
| 18       | OUTPUT BEARING                                | 2   | 6013                             | 6014                             | 6018                             |
| 19       | WORM WHEEL                                    | 1   | 110 WORM WHEEL                   | 130 WORM WHEEL                   | 150 WORM WHEEL                   |
| 20       | O-RING                                        | 1   | 200x197x3                        | 240x236x2.5                      | -                                |
| 21       | OUTPUT COVER                                  | 1   | 110 O/P COVER                    | 130 O/P COVER                    | 150 O/P COVER                    |
| 22       | HEX SCREW                                     | 8   | M8x25                            | M8x25                            | M12x35                           |
| 23       | DOUBLE OUTPUT SHAFT                           | 1   | 110 DOS                          | 130 DOS                          | 150 DOS                          |
| 23A      | SINGLE OUTPUT SHAFT                           | 1   | 110 SSOS                         | 130 SSOS                         | 150 SSOS                         |
| 24       | KEY                                           | 1   | 12x8x70                          | 14x9x70                          | 14x9x70                          |
| 25       | KEY                                           | 1   | 12x8x50                          | 14x9x50                          | 14x9x50                          |
| 26       | SPACER                                        | 1   | 55x42.2x2                        | 60x45.2x2                        | 65x50.2x2.5                      |
| 27       | SHAFT CIRCLIP (A) TYPE                        | 1   | 42x1.75                          | 45x1.75                          | 50x2                             |