



UNLEASHING  
**POWER**

UNLOCKING  
**VALUE**



CO-1.00INP0326

**Series Q**

Shaft Mounted Gearbox



# SERIES Q

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# SERIES Q

## GENERAL DESCRIPTION

### Series Q

Series Q helical gear speed reducer offers 4 sizes with ratio coverage from 5:1 up to 30:1 providing an efficient and compact drive solution upto 5025 N.m in torque capacity.

The range takes advantage of many years of accumulated design expertise, together with the use of high-quality materials and components; the end-result is a high-quality series of gear reducers offering a high load carrying capacity, high efficiency, quiet running and reliable drive solution.

#### The Range includes:

4 sizes of units:

Q45, Q50, Q60, Q70

#### Standard unit versions available:

- Shaft Mounted
- Torque arm Mounted

#### Input options:

- Input shaft with keyway

#### Output options:

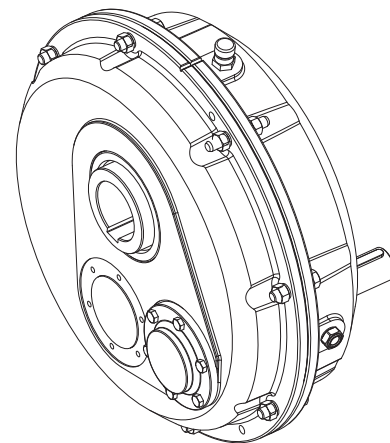
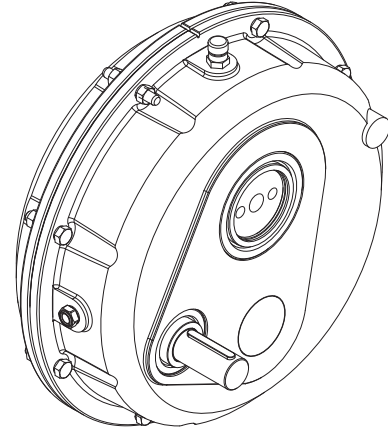
- Output shaft with keyway

#### Design Features include:

The input shaft is supplied with a tapped hole for fitting V-belt pulley or locking washer for V-belt pulley.

The input shaft diameter corresponds to the IEC standard for motor shafts, thus simplifying standardization of V-belt pulleys and couplings. Locating shoulder provided for pulleys and couplings.

The shaft sleeve is supplied with tapped holes for dismounting the reducer as well as locking the reducer to the shaft.



# SERIES Q

## UNIT DESIGNATIONS

| Series | Size of Unit |   |   | No of Reductions | Revision Version | Nominal Overall Ratio |   | Output Shaft Type | Bore Dia. |    |    | Input Shaft | Mounting Position | Back Stop | Motor Option | Motor Power |    | Additional Gearbox Features |    |
|--------|--------------|---|---|------------------|------------------|-----------------------|---|-------------------|-----------|----|----|-------------|-------------------|-----------|--------------|-------------|----|-----------------------------|----|
| 1      | 2            | 3 | 4 | 5                | 6                | 7                     | 8 | 9                 | 10        | 11 | 12 | 13          | 14                | 15        | 16           | 17          | 18 | 19                          | 20 |

Example\*

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Q | 0 | 4 | 5 | 1 | - | 3 | 0 | H | 0 | 4 | 5 | - | 2 | - | G | 1 | X | 1 | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**1 - Series Q**

Range **Q**

**2, 3, 4 - Size of Unit**

|   |   |   |
|---|---|---|
| 0 | 4 | 5 |
| 0 | 5 | 0 |
| 0 | 6 | 0 |
| 0 | 7 | 0 |

**5 - No of Reductions**

|   |
|---|
| 1 |
| 2 |

**6 - Revision Version**

|   |
|---|
| - |
|---|

**7, 8 - Nominal Overall Ratio**

e.g. **3 0**

**9 - Output Shaft type**

**H** Hollow Shaft

**10, 11, 12 - Bore Dia.**

e.g. **0 4 5**

**20 - Additional Gearbox Features**  
Viton Oil Seal, Backstop etc.

**17,18, 19 - Motor Power**  
e.g. **1 X 1**

**16 - Motor Option**

**M** With IEC Motor (loose supply)  
**G** Without Motor

**15 - Backstop**

**-** Without Backstop  
**C** Clockwise  
**A** Anti Clockwise

**14 - Mounting Position**

e.g. **2**

**13 - Input Shaft**

**-** Solid Shaft

\* This Page May Be Photocopied Allowing The Customer To Enter Their Order.

Gear unit selection is made by comparing actual loads with catalogue ratings. Catalogue ratings are based on a standard set of loading conditions, whereas actual load conditions vary according to type of application. Service Factors are therefore used to calculate an equivalent load to compare with catalogue ratings.

i.e. Equivalent Load = Actual Load x Service Factor

### **Mechanical Ratings and Service Factors Fm**

Mechanical ratings measure capacity in terms of life and/or strength, assuming 10 hr/day continuous running under uniform load conditions.

Catalogue ratings allow 100% overload at starting, braking or momentarily during operation up to 10 hours per day. The unit selected must therefore have a catalogue rating at least equal to half maximum overload. Mechanical Service Factor Fm (Table 1) is used to modify the actual load according to daily operating time, and type of loading.

If overloads can be calculated, or accurately assessed, actual loads should be used instead of Fm.

For units subjected to frequent stop/starts overloads in excess of 10 times/day multiply factor Fm.

**Table 1. Mechanical Service Factor (Fm)**

| Start / Stops per hour | Load classification-Driven machine | Duration of service of hours per day |                  |                 |                  |
|------------------------|------------------------------------|--------------------------------------|------------------|-----------------|------------------|
|                        |                                    | $h \leq 0.5$                         | $0.5 < h \leq 2$ | $2 < h \leq 10$ | $10 < h \leq 24$ |
| Up to 10               | Uniform                            | 0.8                                  | 0.9              | 1.0             | 1.25             |
|                        | Moderate                           | 0.9                                  | 1.0              | 1.25            | 1.5              |
|                        | Heavy                              | 1.0                                  | 1.25             | 1.5             | 1.75             |
| $\geq 10$              | Uniform                            | 0.9                                  | 1.0              | 1.25            | 1.5              |
|                        | Moderate                           | 1.0                                  | 1.25             | 1.5             | 1.75             |
|                        | Heavy                              | 1.25                                 | 1.5              | 1.75            | 2.0              |

The values listed in the table must be multiplied by 1.2 under the following conditions:

- Reverse operations
- Shock loading of extremely high intensity

# SERIES Q

## SYMBOLS AND UNIT OF MEASURE

### PRODUCT SELECTION GUIDE

| Symbol | Description                           | Unit of measure |
|--------|---------------------------------------|-----------------|
| fm     | Service factor                        | -               |
| Fra1   | Overhung load at input shaft midpoint | N               |
| i      | Exact ratio                           | -               |
| in     | Nominal ratio                         | -               |
| M2     | Output torque                         | Nm              |
| M2n    | Nominal Rated torque                  | Nm              |
| n1     | input shaft speed                     | rpm             |
| n2     | Output shaft speed                    | rpm             |
| Pm     | input power                           | kW              |
| M2r    | Required Output torque                | Nm              |
| ta     | Ambient temperature                   | °C              |

### SELECTION EXAMPLE

#### Input Data :

| Parameter         | Unit | Value          |
|-------------------|------|----------------|
| Absorbed power    | kW   | 5.5            |
| Exact ratio       | -    | $n1/n2 = 20.7$ |
| $n1$              | rpm  | 1450           |
| $n2$              | rpm  | 70.0           |
| Shock loading     | -    | Moderate       |
| Start per hour    | -    | 1              |
| Operation per day | hrs  | 12             |

#### 1. Determine Service factor - fm

Mechanical service factor  $f_m = 1.5$

| Start / Stops per hour | Load classification-Driven machine | Duration of service of hours per day |                  |                 |                  |
|------------------------|------------------------------------|--------------------------------------|------------------|-----------------|------------------|
|                        |                                    | $h \leq 0.5$                         | $0.5 < h \leq 2$ | $2 < h \leq 10$ | $10 < h \leq 24$ |
| Up to 10               | Uniform                            | 0.8                                  | 0.9              | 1.0             | 1.25             |
|                        | Moderate                           | 0.9                                  | 1.0              | 1.25            | 1.5              |
|                        | Heavy                              | 1.0                                  | 1.25             | 1.5             | 1.75             |
| $\geq 10$              | Uniform                            | 0.9                                  | 1.0              | 1.25            | 1.5              |
|                        | Moderate                           | 1.0                                  | 1.25             | 1.5             | 1.75             |
|                        | Heavy                              | 1.25                                 | 1.5              | 1.75            | 2.0              |

#### 2. Determine the required output torque

$$M_{2r} = \frac{P_e \times 9550}{n_2}$$

$$= \frac{5.5 \times 9550}{70.00} = 750 \text{ Nm}$$

\*Select the unit with Output torque capacity greater than required output torque (750 Nm)

#### 3. Determine the required rated torque

$$M_{2n} = M_{2r} \times f_m$$

$$= 750 \times 1.5$$

$$= 1126 \text{ Nm}$$

#### 4. Select the Gear Unit

|      | $i_n$ | $i$   | $n1 = 1450$ |       |       |        | $n1 = 960$ |       |       |        | $n1 = 725$ |       |       |        |
|------|-------|-------|-------------|-------|-------|--------|------------|-------|-------|--------|------------|-------|-------|--------|
|      |       |       | $n2$        | $M2$  | $P_m$ | $Fra1$ | $n2$       | $M2$  | $P_m$ | $Fra1$ | $n2$       | $M2$  | $P_m$ | $Fra1$ |
| Q452 | 10.   | 10.21 | 142.02      | 1,020 | 15.56 | 1.18   | 94.03      | 1,210 | 12.22 | 1.34   | 71.01      | 1,260 | 9.61  | 1.69   |
|      | 12.   | 12.38 | 117.12      | 1,120 | 14.09 | 1.18   | 77.54      | 1,210 | 10.08 | 1.34   | 58.56      | 1,260 | 7.92  | 1.69   |
|      | 15.   | 14.74 | 98.37       | 1,205 | 12.73 | 1.18   | 65.13      | 1,255 | 8.78  | 1.34   | 49.19      | 1,305 | 6.89  | 1.69   |
|      | 20.   | 20.33 | 71.32       | 1,255 | 9.61  | 1.18   | 47.22      | 1,305 | 6.62  | 1.34   | 35.66      | 1,325 | 5.07  | 1.69   |
|      | 25.   | 25.00 | 58.00       | 1,305 | 8.13  | 1.18   | 38.40      | 1,355 | 5.59  | 1.34   | 29.00      | 1,365 | 4.25  | 1.69   |
|      | 30.   | 30.45 | 47.62       | 1,305 | 6.67  | 1.18   | 31.53      | 1,355 | 4.59  | 1.34   | 23.81      | 1,365 | 3.49  | 1.69   |

#### Note :

|                |                |
|----------------|----------------|
| Unit selected  | Q452           |
| Nominal Ratio  | 20.            |
| Actual Ratio   | 20.33          |
| Sf of the unit | 9.6/5.5    1.6 |

Check whether required service factor  $f$  (1.5) is less than service factor of selected unit (1.6).

Check whether required rated torque (1126 Nm) is less than output torque of selected unit (1255 Nm).

### 5. Check the output speed

Check that the actual output speed  $n1/n2$  is within range of required output speed

$$n1/i = \frac{1450/20.33}{71.3}$$

### 6. Check the Overhung Load

If sprocket, gear, etc is mounted on the output shaft then refer to Overhung Loads Procedure and compare with allowable overhung load (N) of selected unit

Allowable overhung load (N) must be equal or more than calculated overhung load (P)

|      |     |       | n1 = 1450 |       |       |      | n1 = 960 |       |       |      | n1 = 725 |       |      |      |
|------|-----|-------|-----------|-------|-------|------|----------|-------|-------|------|----------|-------|------|------|
|      | in  | i     | n2        | M2    | Pm    | Fra1 | n2       | M2    | Pm    | Fra1 | n2       | M2    | Pm   | Fra1 |
| Q452 | 10. | 10.21 | 142.02    | 1,020 | 15.56 | 1.18 | 94.03    | 1,210 | 12.22 | 1.34 | 71.01    | 1,260 | 9.61 | 1.69 |
|      | 12. | 12.38 | 117.12    | 1,120 | 14.09 | 1.18 | 77.54    | 1,210 | 10.08 | 1.34 | 58.56    | 1,260 | 7.92 | 1.69 |
|      | 15. | 14.74 | 98.37     | 1,205 | 12.73 | 1.18 | 65.13    | 1,255 | 8.78  | 1.34 | 49.19    | 1,305 | 6.89 | 1.69 |
|      | 20. | 20.33 | 71.32     | 1,255 | 9.61  | 1.18 | 47.22    | 1,305 | 6.62  | 1.34 | 35.66    | 1,325 | 5.07 | 1.69 |
|      | 25. | 25.00 | 58.00     | 1,305 | 8.13  | 1.18 | 38.40    | 1,355 | 5.59  | 1.34 | 29.00    | 1,365 | 4.25 | 1.69 |
|      | 30. | 30.45 | 47.62     | 1,305 | 6.67  | 1.18 | 31.53    | 1,355 | 4.59  | 1.34 | 23.81    | 1,365 | 3.49 | 1.69 |

### 7. Confirm Unit selection

|               |       |
|---------------|-------|
| Unit          | Q452  |
| Nominal Ratio | 20.   |
| Actual Ratio  | 20.33 |

### Maximum Permissible Overhung Loads

When a sprocket, gear etc. is mounted on the shaft, a calculation, as below, must be made to determine the overhung load on the shaft, and the results compared to the maximum permissible overhung loads tabulated. Overhung loads can be reduced by increasing the diameter of the sprocket, gear, etc. If the maximum permissible overhung load is exceeded, the sprocket, gear, etc. should be mounted on a separate shaft, flexibly coupled and supported in its own bearings, or the gear unit shaft should be extended to run in an outboard bearing. Alternatively, a larger gear is often a less expensive solution.

Permissible overhung loads vary according to the direction of rotation. The values tabulated are for the most unfavorable direction with the unit transmitting full rated power and the load P applied midway along the shaft extension. Hence they can sometimes be increased for a more favorable direction of rotation, or if the power transmitted is less than the rated capacity of the gear unit, or if the load is applied nearer to the gear unit case. Refer to Application Engineering for further details. In any event, the sprocket, gear etc. should be positioned as close as possible to the gear unit case in order to reduce bearing loads and shaft stresses, and to prolong life.

#### **Overhung Load (Newtons)**

$$P = \frac{\text{kW} \times 9,500,000 \times K}{N \times R}$$

#### **Overhung member      K (factor)**

|                        |      |
|------------------------|------|
| Chain sprocket         | 1.00 |
| Spur or helical pinion | 1.25 |
| Vee belt sheave        | 1.50 |
| Flat belt pulley       | 2.00 |

Where

P = equivalent overhung load (Newtons)

kW = power transmitted by the shaft (kilowatts)

N = speed of shaft (rev/min)

R = pitch radius of sprocket, etc. (mm)

K = factor

### For Input Shaft Overhung Loads (Fra1) Consult the Ratings Tables

#### Axial Thrust Capacities (Newtons)

No check or calculation is required if the axial thrust load (FA) towards or away from the unit is under 20% of the permissible overhung load. If the axial thrust exceeds these values or if there is a combination of axial thrust loads and overhung loads, please contact our Application Engineers.

### Lubrication

1. Check that the ventilator is positioned correctly for the intended mounting position.
2. Gear units are supplied without lubricant and must be filled via the ventilator position with the appropriate lubricant until oil escapes through the level plug hole.
  - Please refer to the lubricant quantity table for approximate lubricant quantity
  - Refer to the unit nameplate for the type and grade of lubricant.
  - Refer the table of approved lubricants.
3. Maintenance: Oil levels should be checked and maintained by filling via the ventilator position until oil escapes through the level plug hole

| Lubricant                                   | Ambient temperature range             |             |             |
|---|---------------------------------------|-------------|-------------|
|   | - 5°C - 20°C (E)<br>- 30°C - 20°C (H) | 0°C - 35°C  | 20°C - 50°C |
| EP Mineral Oil<br>(Type E)                  | 5E (VG 220)                           | 6E (VG 320) | 7E (VG 460) |
| Polyalphaolefin based Synthetic<br>(Type H) | 5H (VG 220)                           | 5H (VG 220) | 6H (VG 320) |

### Lubrication Quantities (Litres)

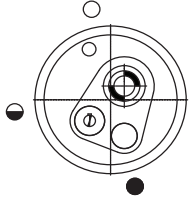
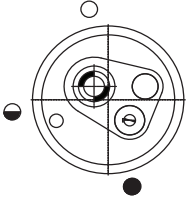
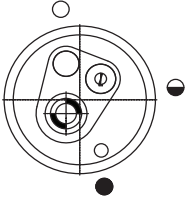
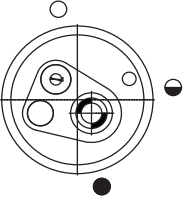
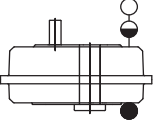
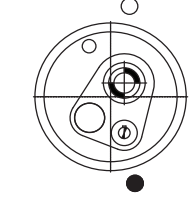
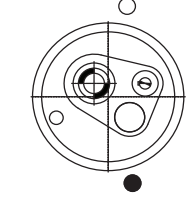
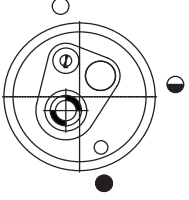
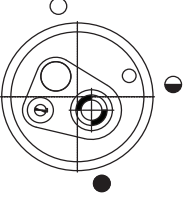
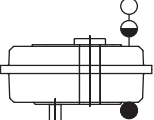
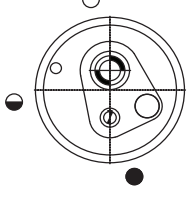
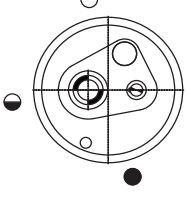
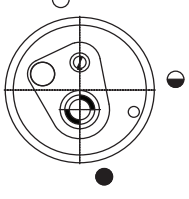
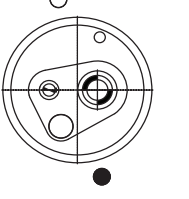
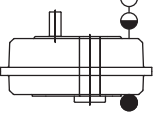
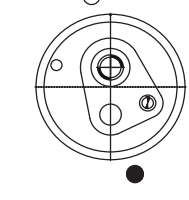
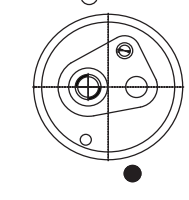
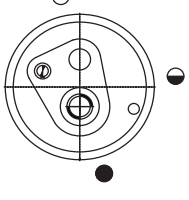
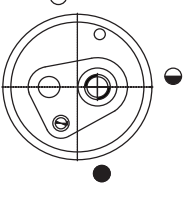
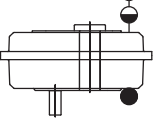
| Single Reduction     |   |      |      |      |      |
|----------------------|---|------|------|------|------|
| Size                 |   | Q451 | Q501 | Q601 | Q701 |
| Mounting<br>Position | 1 | 3.5  | 6.3  | 9.1  | 12.8 |
|                      | 2 | 3.7  | 6.4  | 8.8  | 12.7 |
|                      | 3 | 3.7  | 5.9  | 6.9  | 12.5 |
|                      | 4 | 3.2  | 5.7  | 8.0  | 11.6 |
|                      | 5 | 4.9  | 8.2  | 10.1 | 15.2 |
|                      | 6 | 3.5  | 6.9  | 9.5  | 14.5 |

| Double Reduction     |   |      |      |      |      |
|----------------------|---|------|------|------|------|
| Size                 |   | Q452 | Q502 | Q602 | Q702 |
| Mounting<br>Position | 1 | 3.1  | 5.5  | 8.3  | 11.4 |
|                      | 2 | 3.3  | 5.6  | 8.0  | 11.3 |
|                      | 3 | 3.3  | 5.1  | 6.1  | 11.1 |
|                      | 4 | 2.8  | 4.9  | 7.2  | 10.2 |
|                      | 5 | 4.5  | 7.4  | 9.3  | 13.8 |
|                      | 6 | 3.1  | 6.1  | 8.7  | 13.1 |

# SERIES Q

## MOUNTING POSITION

### Column entry 14 - Mounting Positions

| Q451  |   |   |  | Q451 - 452  |
|---|---|---|--|---|
|    |    |    |    |    |
| 1   | 2   | 3   | 4  | 5   |
| Q452  |   |   |  |   |
|   |   |   |   |   |
| 1   | 2   | 3   | 4  | 6   |
| Q501, Q601, Q701  |   |   |  | Q501, 601, 701 -<br>Q502, Q602, Q702  |
|  |  |  |  |  |
| 1   | 2   | 3   | 4  | 5   |
| Q502, Q602, Q702  |   |   |  |   |
|  |  |  |  |  |
| 1   | 2   | 3   | 4  | 6   |
| ● Oil Level Position  |   | ● Drain Position  |  | ○ Ventilator / Filling  |

## ADDITIONAL GEARBOX FEATURES

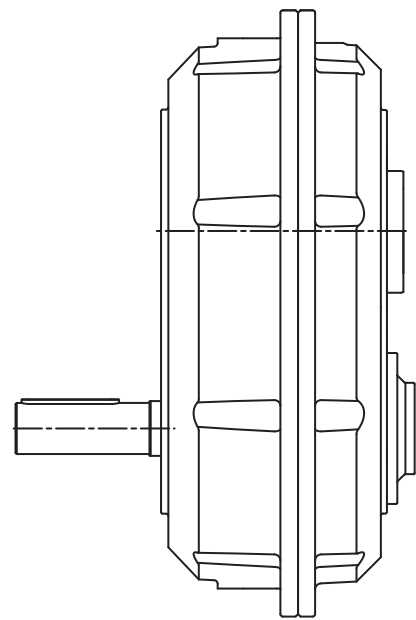
### Column entry 20 Additional Gearbox features

| Column | Lubrication filled with synthetic oil | Oil seal – VITON | Backstop |           | Special |
|--------|---------------------------------------|------------------|----------|-----------|---------|
|        |                                       |                  | DOR - CW | DOR - CCW |         |
| -      |                                       |                  |          |           |         |
| M      | *                                     |                  |          |           |         |
| N      |                                       | *                |          |           |         |
| P      | *                                     | *                |          |           |         |
| Q      | *                                     | *                | *        |           |         |
| R      | *                                     | *                |          | *         |         |
| S      |                                       | *                | *        |           |         |
| T      |                                       | *                |          | *         |         |
| L      |                                       |                  |          |           | *       |

Please refer Application Engineering for details and following additional gearbox features

- Prime paint only
- Special paint
- Special oil (food compatible, bio-degradable, different viscosities, etc)

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**REDUCER  
SERIES Q**

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# SERIES Q

## GEAR REDUCERS RATINGS

|             |           |          | <i>n1 = 1450</i> |           |           |             | <i>n1 = 960</i> |           |           |             | <i>n1 = 725</i> |           |           |             |
|-------------|-----------|----------|------------------|-----------|-----------|-------------|-----------------|-----------|-----------|-------------|-----------------|-----------|-----------|-------------|
|             | <i>in</i> | <i>i</i> | <i>n2</i>        | <i>M2</i> | <i>Pm</i> | <i>Fra1</i> | <i>n2</i>       | <i>M2</i> | <i>Pm</i> | <i>Fra1</i> | <i>n2</i>       | <i>M2</i> | <i>Pm</i> | <i>Fra1</i> |
| <b>Q451</b> | 5.0       | 5.00     | 290.00           | 870       | 26.82     | 1.55        | 192.00          | 970       | 19.80     | 1.75        | 145.00          | 1,035     | 15.95     | 2.21        |
| <b>Q452</b> | 10.       | 10.21    | 142.02           | 1,020     | 15.56     | 1.18        | 94.03           | 1,210     | 12.22     | 1.34        | 71.01           | 1,260     | 9.61      | 1.69        |
|             | 12.       | 12.38    | 117.12           | 1,120     | 14.09     | 1.18        | 77.54           | 1,210     | 10.08     | 1.34        | 58.56           | 1,260     | 7.92      | 1.69        |
|             | 15.       | 14.74    | 98.37            | 1,205     | 12.73     | 1.18        | 65.13           | 1,255     | 8.78      | 1.34        | 49.19           | 1,305     | 6.89      | 1.69        |
|             | 20.       | 20.33    | 71.32            | 1,255     | 9.61      | 1.18        | 47.22           | 1,305     | 6.62      | 1.34        | 35.66           | 1,325     | 5.07      | 1.69        |
|             | 25.       | 25.00    | 58.00            | 1,305     | 8.13      | 1.18        | 38.40           | 1,355     | 5.59      | 1.34        | 29.00           | 1,365     | 4.25      | 1.69        |
|             | 30.       | 30.45    | 47.62            | 1,305     | 6.67      | 1.18        | 31.53           | 1,355     | 4.59      | 1.34        | 23.81           | 1,365     | 3.49      | 1.69        |
| <b>Q501</b> | 5.0       | 5.07     | 286.00           | 1,430     | 43.48     | 2.27        | 189.35          | 1,740     | 35.02     | 2.55        | 143.00          | 1,820     | 27.67     | 3.15        |
| <b>Q502</b> | 10.       | 10.03    | 144.57           | 1,790     | 27.79     | 1.75        | 95.71           | 1,930     | 19.84     | 2.00        | 72.28           | 1,965     | 15.25     | 2.45        |
|             | 12.       | 12.03    | 120.53           | 1,840     | 23.82     | 1.75        | 79.80           | 1,930     | 16.54     | 2.00        | 60.27           | 1,965     | 12.72     | 2.45        |
|             | 15.       | 15.36    | 94.40            | 1,940     | 19.67     | 1.75        | 62.50           | 1,990     | 13.36     | 2.00        | 47.20           | 2,045     | 10.37     | 2.45        |
|             | 20.       | 20.19    | 71.82            | 1,940     | 14.96     | 1.75        | 47.55           | 2,040     | 10.42     | 2.00        | 35.91           | 2,070     | 7.98      | 2.45        |
|             | 25.       | 24.32    | 59.62            | 2,040     | 13.06     | 1.75        | 39.47           | 2,150     | 9.11      | 2.00        | 29.81           | 2,225     | 7.12      | 2.45        |
|             | 30.       | 29.99    | 48.35            | 2,040     | 10.59     | 1.75        | 32.01           | 2,150     | 7.39      | 2.00        | 24.17           | 2,225     | 5.78      | 2.45        |
| <b>Q601</b> | 5.0       | 5.00     | 290.00           | 1,940     | 59.81     | 3.25        | 192.00          | 2,110     | 43.07     | 3.65        | 145.00          | 2,505     | 38.61     | 4.55        |
| <b>Q602</b> | 10.       | 10.16    | 142.72           | 3,170     | 48.59     | 2.65        | 94.49           | 3,270     | 33.18     | 2.95        | 71.36           | 3,285     | 25.18     | 3.65        |
|             | 12.       | 12.32    | 117.69           | 3,170     | 40.07     | 2.65        | 77.92           | 3,270     | 27.37     | 2.95        | 58.85           | 3,285     | 20.76     | 3.65        |
|             | 15.       | 15.21    | 95.33            | 3,270     | 33.48     | 2.65        | 63.12           | 3,370     | 22.84     | 2.95        | 47.67           | 3,460     | 17.71     | 3.65        |
|             | 20.       | 20.53    | 70.63            | 3,320     | 25.18     | 2.65        | 46.76           | 3,470     | 17.43     | 2.95        | 35.31           | 3,500     | 13.27     | 3.65        |
|             | 25.       | 25.31    | 57.29            | 3,370     | 20.73     | 2.65        | 37.93           | 3,505     | 14.28     | 2.95        | 28.64           | 3,555     | 10.94     | 3.65        |
|             | 30.       | 30.80    | 47.08            | 3,370     | 17.04     | 2.65        | 31.17           | 3,520     | 11.78     | 2.95        | 23.54           | 3,560     | 9.00      | 3.65        |
| <b>Q701</b> | 5.0       | 5.00     | 290.00           | 2,660     | 82.00     | 3.75        | 192.00          | 3,060     | 62.46     | 4.25        | 145.00          | 3,530     | 54.41     | 5.25        |
| <b>Q702</b> | 10.       | 10.16    | 142.72           | 3,880     | 59.47     | 3.45        | 94.49           | 4,410     | 44.75     | 3.85        | 71.36           | 4,455     | 34.14     | 4.80        |
|             | 12.       | 12.32    | 117.69           | 4,080     | 51.57     | 3.45        | 77.92           | 4,410     | 36.91     | 3.85        | 58.85           | 4,455     | 28.16     | 4.80        |
|             | 15.       | 15.21    | 95.33            | 4,490     | 45.97     | 3.45        | 63.12           | 4,510     | 30.57     | 3.85        | 47.67           | 4,705     | 24.09     | 4.80        |
|             | 20.       | 20.53    | 70.63            | 4,520     | 34.29     | 3.45        | 46.76           | 4,610     | 23.15     | 3.85        | 35.31           | 4,805     | 18.22     | 4.80        |
|             | 25.       | 25.31    | 57.29            | 4,600     | 28.30     | 3.45        | 37.93           | 4,910     | 20.00     | 3.85        | 28.64           | 5,005     | 15.40     | 4.80        |
|             | 30.       | 30.84    | 47.02            | 4,620     | 23.33     | 3.45        | 31.13           | 4,950     | 16.55     | 3.85        | 23.51           | 5,025     | 12.69     | 4.80        |

**Pm** = Input Power (kW)  
**M2** = Output Torque (Nm)

**n1** = Input Speed (rpm)  
**n2** = Output Speed (rpm)

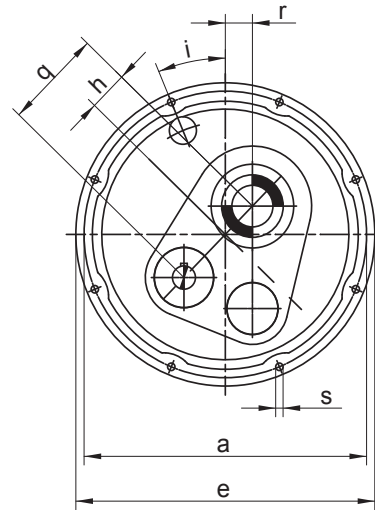
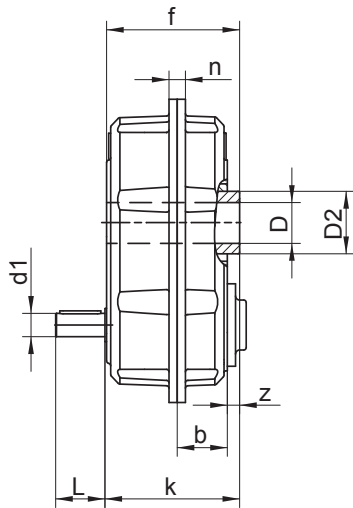
**i** = Exact Ratio  
**Fra1** = Overhung Load - Input shaft (kN)

**Note** : Gearbox efficiency is applied on input power (Pm)

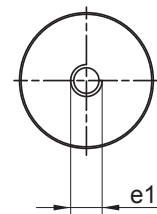
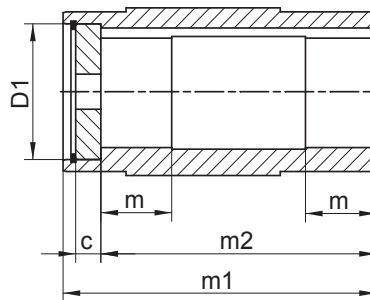
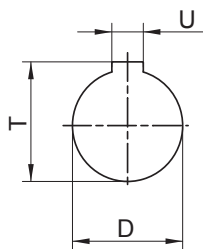
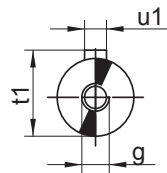
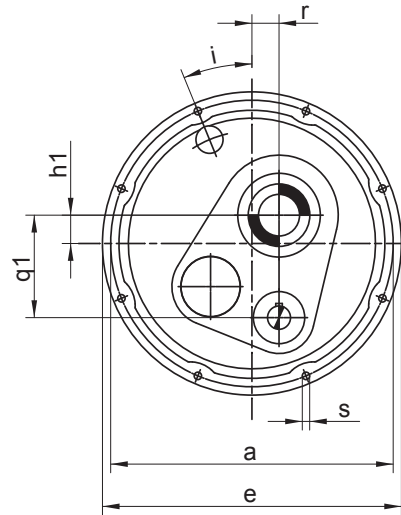
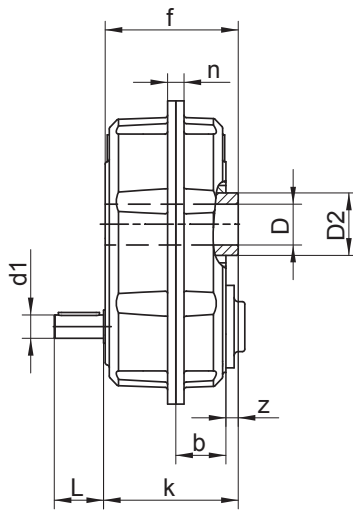
# SERIES Q

## DIMENSIONS - Q45

Single Reduction



Double Reduction



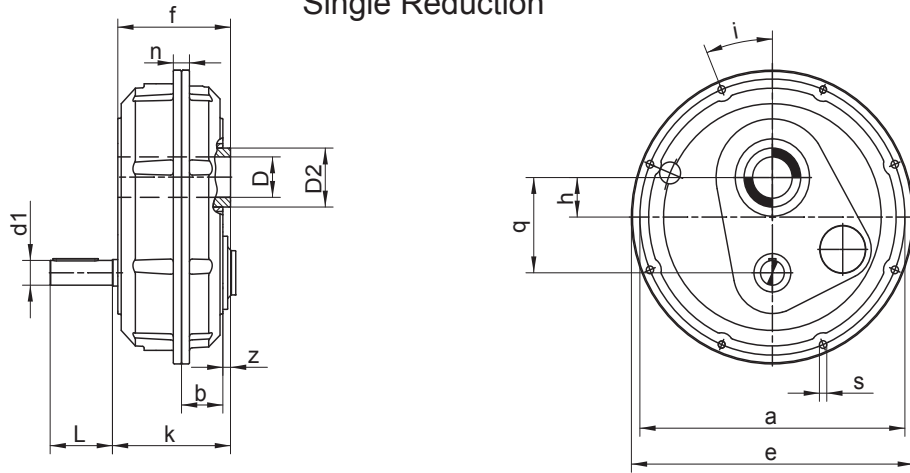
| Size | a   | e   | q   | h  | q1  | h1 | i      | r  | s | k   | b  | z  | f   | n  | D2 |
|------|-----|-----|-----|----|-----|----|--------|----|---|-----|----|----|-----|----|----|
| Q451 | 344 | 364 | 120 | 47 | -   | -  | 22°30' | 33 | 9 | 164 | 61 | 15 | 162 | 20 | 75 |
| Q452 | 344 | 364 | -   | -  | 123 | 34 | 22°30' | 33 | 9 | 164 | 61 | 15 | 162 | 20 | 75 |

| Size         | D (G7) | U  | T    | c  | e1  | m1  | D1 | m2  | m  | d1 (h6) | L  | u1 | t1 | g        |
|--------------|--------|----|------|----|-----|-----|----|-----|----|---------|----|----|----|----------|
| Q451<br>Q452 | 45     | 14 | 48.8 | 14 | M16 | 162 | 60 | 140 | 35 | 28      | 60 | 8  | 31 | M10 x 22 |
|              | 50     | 14 | 53.8 | 14 | M16 | 162 | 60 | 140 | 35 | 28      | 60 | 8  | 31 | M10 x 22 |
|              | 55     | 16 | 59.8 | 14 | M16 | 162 | 65 | 140 | 35 | 28      | 60 | 8  | 31 | M10 x 22 |

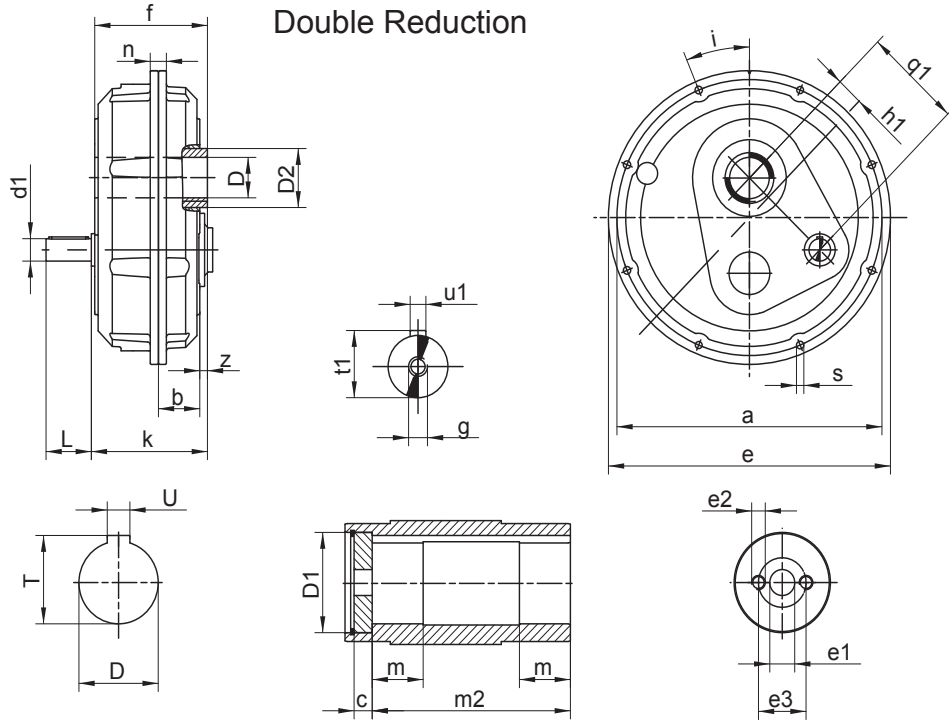
# SERIES Q

## DIMENSIONS - Q50 - Q60 - Q70

Single Reduction



Double Reduction



| Size | a   | e   | q   | h  | q1  | h1 | i      | s  | k     | b  | z    | f     | n    | D2  |
|------|-----|-----|-----|----|-----|----|--------|----|-------|----|------|-------|------|-----|
| Q501 | 410 | 434 | 140 | 61 | -   | -  | 26°30' | 11 | 190   | 65 | 14.5 | 182   | 24   | 85  |
| Q502 | 410 | 434 | -   | -  | 143 | 40 | 26°30' | 11 | 190   | 65 | 14.5 | 182   | 24   | 85  |
| Q601 | 468 | 498 | 162 | 67 | -   | -  | 22°30' | 13 | 208.5 | 73 | 13.5 | 199   | 28.5 | 100 |
| Q602 | 468 | 498 | -   | -  | 174 | 47 | 22°30' | 13 | 205   | 73 | 13.5 | 199   | 28.5 | 100 |
| Q701 | 520 | 550 | 182 | 74 | -   | -  | 22°30' | 13 | 227.5 | 86 | 14.5 | 223.5 | 28   | 120 |
| Q702 | 520 | 550 | -   | -  | 189 | 52 | 22°30' | 13 | 227.5 | 86 | 14.5 | 223.5 | 28   | 120 |

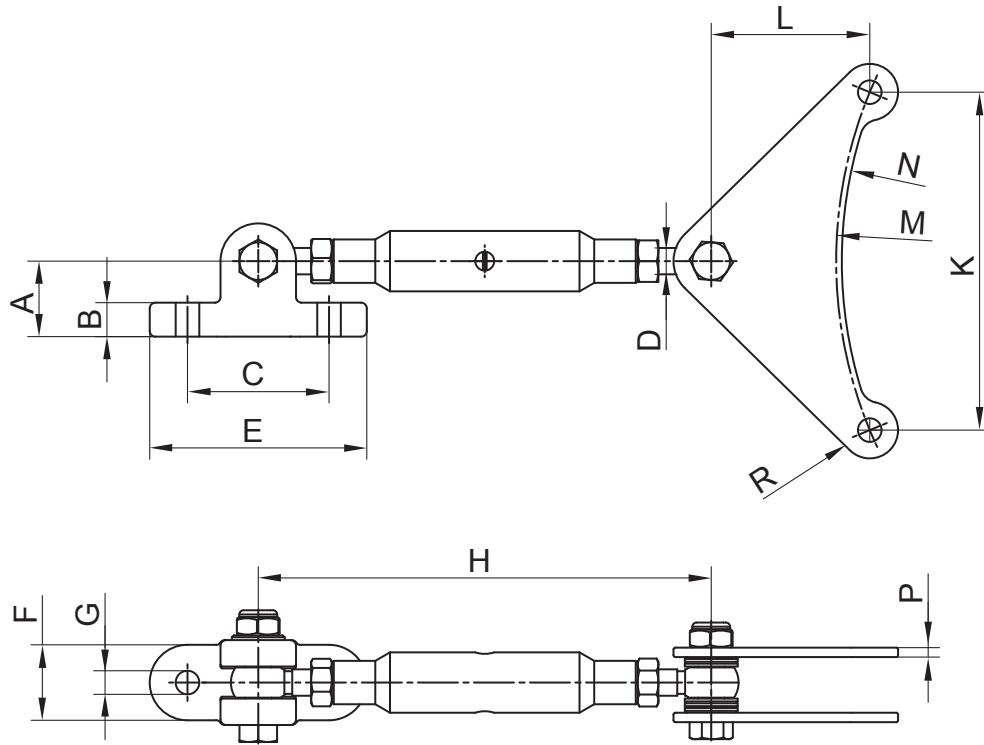
| Size         | D(G7) | U  | T    | c  | e1  | e2  | e3 | m1  | D1  | m2  | m  | d1(h6) | L   | u1 | t1   | g        |
|--------------|-------|----|------|----|-----|-----|----|-----|-----|-----|----|--------|-----|----|------|----------|
| Q501<br>Q502 | 50    | 14 | 53.8 | 14 | M16 | -   | -  | 182 | 60  | 160 | 40 | 38     | 80  | 10 | 41   | M12 x 28 |
|              | 55    | 16 | 59.3 | 14 | M16 | -   | -  | 182 | 65  | 160 | 40 | 38     | 80  | 10 | 41   | M12 x 28 |
|              | 60    | 18 | 64.4 | 14 | 17  | M12 | 42 | 182 | 70  | 160 | 40 | 38     | 80  | 10 | 41   | M12 x 28 |
| Q601<br>Q602 | 60    | 18 | 64.4 | 14 | 17  | M12 | 42 | 199 | 70  | 175 | 45 | 42     | 110 | 12 | 45   | M12 x 28 |
|              | 70    | 20 | 74.9 | 16 | 22  | M16 | 50 | 199 | 85  | 175 | 45 | 38     | 80  | 10 | 41   | M12 x 28 |
| Q701<br>Q702 | 70    | 20 | 74.9 | 16 | 22  | M16 | 50 | 223 | 85  | 193 | 50 | 48     | 110 | 14 | 51.5 | M16 x 36 |
|              | 85    | 22 | 90.4 | 18 | 22  | M16 | 65 | 223 | 100 | 193 | 50 | 42     | 110 | 12 | 45   | M12 x 28 |

# SERIES Q

## ACCESSORIES

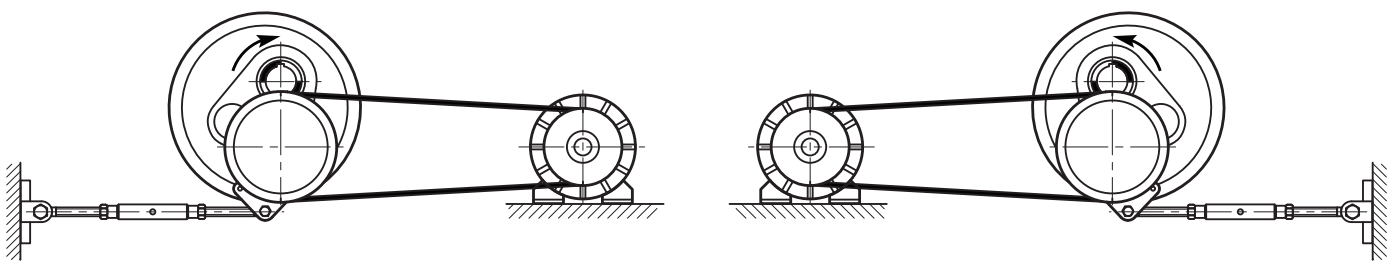
## TORQUE ARM

### Dimensions



| Size | A  | B  | C  | D   | E   | F  | G    | H    |      | K   | L   | M   | N   | R    | P |
|------|----|----|----|-----|-----|----|------|------|------|-----|-----|-----|-----|------|---|
|      |    |    |    |     |     |    |      | min. | max. |     |     |     |     |      |   |
| Q45  | 35 | 16 | 70 | M12 | 106 | 36 | 10.5 | 210  | 310  | 132 | 57  | 172 | 164 | 8.5  | 5 |
| Q50  | 40 | 18 | 75 | M14 | 115 | 40 | 12.5 | 240  | 360  | 157 | 70  | 205 | 195 | 10.5 | 5 |
| Q60  | 40 | 18 | 75 | M14 | 115 | 40 | 12.5 | 240  | 360  | 179 | 84  | 234 | 231 | 12.5 | 5 |
| Q70  | 45 | 20 | 85 | M16 | 135 | 50 | 14.5 | 260  | 410  | 199 | 100 | 260 | 250 | 12.5 | 6 |

### Torque Arm Mounting



## ACCESSORIES

## BACK STOP

### Mounting of Backstop

The reducer units listed below can be fitted with an internal backstop, this has no effect of the external unit size. The backstop device incorporates high quality centrifugal lift off sprags which are wear free above the lift off speed ( $n_{min}$ ). To ensure correct operation input speed must exceed lift off speed.

Suitable for ambient temperature  $-40^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

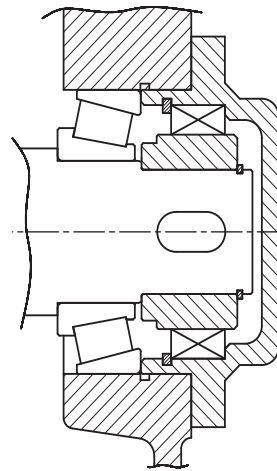
### Column 15 entry

For reducer backstop modules enter:

**A** for CW rotation

**C** for CW rotation

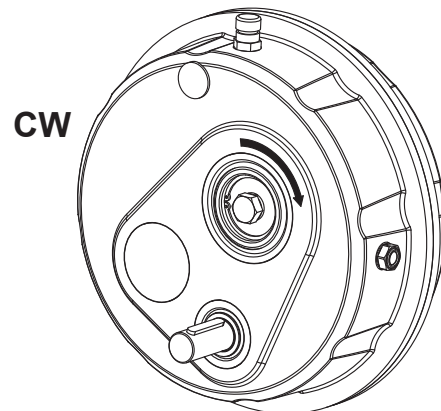
| Size | Rated Locking Torque ('T max') (at inputshaft) (Nm) |
|------|---|
| Q451 | 360   |
| Q452 | 360   |
| Q501 | 610   |
| Q502 | 610   |
| Q601 | 610   |
| Q602 | 610   |
| Q701 | 1450  |
| Q702 | 714   |



Rotation of output shaft must be specified when ordering as viewed from the input shaft end (as shown in the diagram)

CW - Free Rotation – Clockwise  
 Locked – Anticlockwise

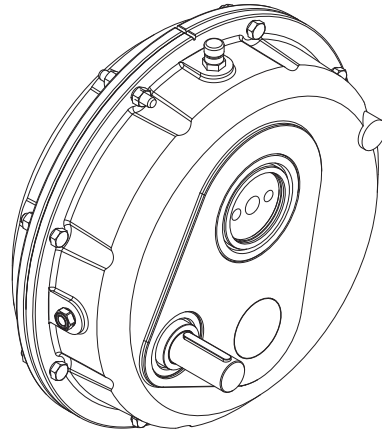
AC - Free Rotation – Anticlockwise  
 Locked – Anticlockwise



# SERIES Q

## SHIPPING SPECIFICATION

| Size | Weight (kg) |
|------|-------------|
| Q451 | 36          |
| Q452 | 40          |
| Q501 | 56          |
| Q502 | 63          |
| Q601 | 85          |
| Q602 | 93          |
| Q701 | 113         |
| Q702 | 125         |



### IMPORTANT

#### Product Safety Information

**General** - The following information is important in ensuring safety. It must be brought to the attention of personnel involved in the selection of power transmission equipment, those responsible for the design of the machinery in which it is to be incorporated and those involved in its installation, use and maintenance.

Our equipment will operate safely provided it is selected, installed, used and maintained properly. As with any power transmission equipment proper precautions must be taken as indicated in the following paragraphs, to ensure safety.

**Potential Hazards** - these are not necessarily listed in any order of severity as the degree of danger varies in individual circumstances. It is important therefore that the list is studied in its entirety:-

- 1) Fire/Explosion
  - (a) Oil mists and vapour are generated within gear units. It is therefore dangerous to use naked lights in the proximity of gearbox openings, due to the risk of fire or explosion.
  - (b) In the event of fire or serious overheating (over 300 oC), certain materials (rubber, plastics, etc.) may decompose and produce fumes. Care should be taken to avoid exposure to the fumes, and the remains of burned or overheated plastic/rubber materials should be handled with rubber gloves.
- 2) Guards - Rotating shafts and couplings must be guarded to eliminate the possibility of physical contact or entanglement of clothing. It should be of rigid construction and firmly secured.
- 3) Noise - High speed gearboxes and gearbox driven machinery may produce noise levels which are damaging to the hearing with prolonged exposure. Ear defenders should be provided for personnel in these circumstances. Reference should be made to the Department of Employment Code of Practice for reducing exposure of employed persons to noise.
- 4) Lifting - Where provided (on larger units) only the lifting points or eyebolts must be used for lifting operations (see maintenance manual or general arrangement drawing for lifting point positions). Failure to use the lifting points provided may result in personal injury and/or damage to the product or surrounding equipment. Keep clear of raised equipment.
- 5) Lubricants and Lubrication
  - (a) Prolonged contact with lubricants can be detrimental to the skin. The manufacturer's instruction must be followed when handling lubricants.
  - (b) The lubrication status of the equipment must be checked before commissioning. Read and carry out all instructions on the lubricant plate and in the installation and maintenance literature. Heed all warning tags. Failure to do so could result in mechanical damage and in extreme cases risk of injury to personnel.
- 6) Electrical Equipment - Observe hazard warnings on electrical equipment and isolate power before working on the gearbox or associated equipment, in order to prevent the machinery being started.
- 7) Installation, Maintenance and Storage
  - (a) In the event that equipment is to be held in storage, for a period exceeding 6 months, prior to installation or commissioning, we must be consulted regarding special preservation requirements. Unless otherwise agreed, equipment must be stored in a building protected from extremes of temperature and humidity to prevent deterioration.

The rotating components (gears and shafts) must be turned a few revolutions once a month (to prevent bearings brinelling).
  - (b) External gearbox components may be supplied with preservative materials applied, in the form of a "waxed" tape overwrap or wax film preservative. Gloves should be worn when removing these materials. The former can be removed manually, the latter using white spirit as a solvent.

Preservatives applied to the internal parts of the gear units do not require removal prior to operation.
  - (c) Installation must be performed in accordance with the manufacturer's instructions and be undertaken by suitably qualified personnel.
  - (d) Before working on a gearbox or associated equipment, ensure that the load has been removed from the system to eliminate the possibility of any movement of the machinery and isolate power supply. Where necessary, provide mechanical means to ensure the machinery cannot move or rotate. Ensure removal of such devices after work is complete.
  - (e) Ensure the proper maintenance of gearboxes in operation. Use only the correct tools and our approved spare parts for repair and maintenance. Consult the Maintenance Manual before dismantling or performing maintenance work.
- 8) Hot Surfaces and Lubricants
  - (a) During operation, gear units may become sufficiently hot to cause skin burns. Care must be taken to avoid accidental contact.
  - (b) After extended running the lubricant in gear units and lubrication systems may reach temperatures sufficient to cause burns. Allow equipment to cool before servicing or performing adjustments.
- 9) Selection and Design
  - (a) Where gear units provide a backstop facility, ensure that back-up systems are provided if failure of the backstop device would endanger personnel or result in damage.
  - (b) The driving and driven equipment must be correctly selected to ensure that the complete machinery installation will perform satisfactorily, avoiding system critical speeds, system torsional vibration, etc.
  - (c) The equipment must not be operated in an environment or at speeds, powers, torques or with external loads beyond those for which it was designed.
  - (d) As improvements in design are being made continually the contents of this catalogue are not to be regarded as binding in detail, and drawings and capacities are subject to alterations without notice.

The above guidance is based on the current state of knowledge and our best assessment of the potential hazards in the operation of the gear units. Any further information or clarification required may be obtained by contacting our Application Engineers.







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