

PRECISION UNIVERSAL JOINTS



DRIVE  
SOLUTIONS

The background of the entire page is a collage of various universal joints. These are mechanical components used to connect two shafts at an angle to each other. They are shown in different orientations and close-up views, highlighting their metallic surfaces and complex internal structures. The joints are primarily silver or chrome in color.

# Universal joints

## Sit universal joints with plain or needle roller bearings (DIN 808)

Types “E” are with sliding bushes while type “H” has needle roller bearings.

Joints with plain bearings are available in 2 versions:

- **“E” series according with DIN 808;**
- **“EB” series according with DIN 808/7551**

Joints with roller bearings are available in 2 versions:

- **“H” series according with DIN 808;**
- **“HB” series according with DIN 808/7551**

Every execution is made by 2 hubs with forks and a central block.

Between pins and bores there are:

- “E” series: with sliding bushes
- “H” series: with needle roller bearings

In the central blocks of “E” series there are the holes for the lubrication. For the “H” series (for high speed applications) no lubrication is needed, because the roller bearing are maintenance free.

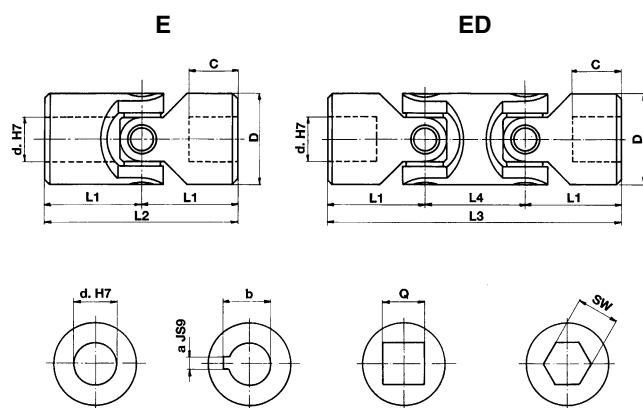
“E” series joint with sliding bushes are used for low-medium speed and when some shock load can occur. For high speed and medium torque, we suggest the type “H” with roller bearings. The maximum working angle is 45° for single joints, 90° for double joints. The maximum speed is 1000 rpm for “E” series, 4000 rpm for “H” series. Every execution can be supply with extensible shaft.



# Precision joints

## Series “E” (DIN 808)

- Wear resistant sliding bushes from cemented and hardened steel.
  - Strong, precise, and versatile; wide application field.
  - Max. angle: 45° type “E”, 90° type “ED”. max. speed 1.000 rpm.
  - Max. temperature 150 °C
  - Standard executions: circular bore
- Special executions on request: bore and keyway, square bore, hexagonal bore



| Part number | Double part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | L4 [mm] | L3 [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Weight [kg] |       |
|-------------|--------------------|--------|--------|---------|---------|--------|---------|---------|--------|--------|--------|---------|-------------|-------|
|             |                    |        |        |         |         |        |         |         |        |        |        |         | E           | ED    |
| GU01E       | GU01ED             | 6      | 16     | 34      | 17      | 8      | 22      | 56      | 2      | 7      | 6      | 6       | 0,05        | 0,08  |
| GU02E       | GU02ED             | 8      | 16     | 40      | 20      | 11     | 22      | 62      | 2      | 9      | 8      | 8       | 0,05        | 0,08  |
| GU03E       | GU03ED             | 10     | 22     | 48      | 24      | 12     | 26      | 74      | 3      | 11,4   | 10     | 10      | 0,10        | 0,15  |
| GU04E       | GU04ED             | 12     | 25     | 56      | 28      | 13     | 30      | 86      | 4      | 13,8   | 12     | 12      | 0,16        | 0,25  |
| GU05E       | GU05ED             | 14     | 28     | 60      | 30      | 14     | 36      | 96      | 5      | 16,3   | 14     | 14      | 0,20        | 0,40  |
| GU1E        | GU1ED              | 16     | 32     | 68      | 34      | 16     | 36      | 104     | 5      | 18,3   | 16     | 16      | 0,30        | 0,45  |
| GU2E        | GU2ED              | 18     | 36     | 74      | 37      | 17     | 40      | 114     | 6      | 20,8   | 18     | 18      | 0,45        | 0,70  |
| GU3E        | GU3ED              | 20     | 42     | 82      | 41      | 18     | 46      | 128     | 6      | 22,8   | 20     | 20      | 0,60        | 1,00  |
| GU4E        | GU4ED              | 22     | 45     | 95      | 47,5    | 22     | 50      | 145     | 6      | 24,8   | 22     | 22      | 0,95        | 1,55  |
| GU5E        | GU5ED              | 25     | 50     | 108     | 54      | 26     | 55      | 163     | 8      | 28,3   | 25     | 25      | 1,20        | 2,00  |
| GU6E        | GU6ED              | 30     | 58     | 122     | 61      | 29     | 68      | 190     | 8      | 33,3   | 30     | 30      | 1,85        | 2,90  |
| GU6E1       | GU6ED1             | 32     | 58     | 130     | 65      | 33     | 68      | 198     | 10     | 35,3   | 30     | 30      | 2,00        | 3,00  |
| GU7E        | GU7ED              | 35     | 70     | 140     | 70      | 35     | 72      | 212     | 10     | 38,3   | ••     | ••      | 3,15        | 4,75  |
| GU8E        | GU8ED              | 40     | 80     | 160     | 80      | 39     | 85      | 245     | 12     | 43,3   | ••     | ••      | 4,60        | 7,20  |
| GU9E        | GU9ED              | 50     | 95     | 190     | 95      | 46     | 100     | 290     | 14     | 53,8   | ••     | ••      | 7,60        | 12,00 |

DIN 808

| Part number | Double part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | L4 [mm] | L3 [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Weight [kg] |      |
|-------------|--------------------|--------|--------|---------|---------|--------|---------|---------|--------|--------|--------|---------|-------------|------|
|             |                    |        |        |         |         |        |         |         |        |        |        |         | E           | ED   |
| GU03EB      | GU03EBD            | 10     | 16     | 52      | 26      | 15     | 22      | 74      | 3      | 11,4   | 8      | 8       | 0,05        | 0,08 |
| GU04EB      | GU04EBD            | 12     | 22     | 62      | 31      | 18     | 26      | 88      | 4      | 13,8   | 10     | 10      | 0,12        | 0,20 |
| GU1EB       | GU1EBD             | 16     | 25     | 74      | 37      | 21     | 30      | 104     | 5      | 18,3   | 12     | 12      | 0,20        | 0,30 |
| GU3EB       | GU3EBD             | 20     | 32     | 86      | 43      | 24     | 38      | 124     | 6      | 22,8   | 16     | 16      | 0,35        | 0,50 |
| GU5EB       | GU5EBD             | 25     | 42     | 108     | 54      | 31     | 48      | 156     | 8      | 28,3   | 20     | 20      | 0,80        | 1,20 |
| GU6EB       | GU6EBD             | 30     | 50     | 132     | 66      | 38     | 56      | 188     | 8      | 33,3   | 25     | 25      | 1,20        | 1,70 |
| GU8EB       | GU8EBD             | 40     | 70     | 166     | 83      | 47     | 72      | 238     | 12     | 43,3   | ••     | ••      | 2,90        | 4,30 |

DIN 808/7551

•• = upon request

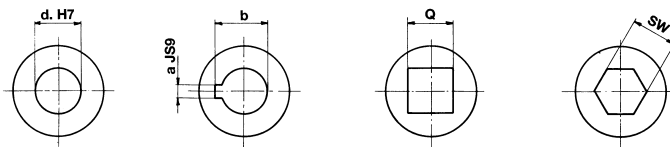
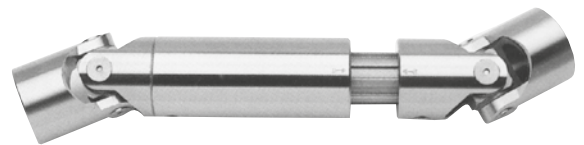
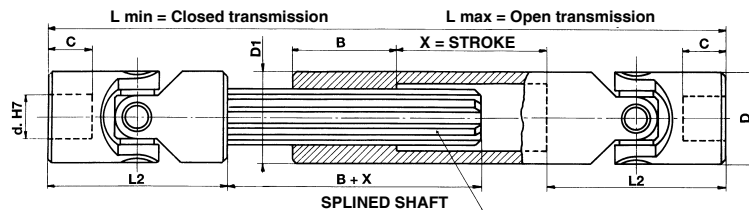
## Extensible transmissions

### Series “E” (DIN 808)

- Joints series “E” type “EA” with wear resistant sliding bushes.
- Min. and max. length upon request:

$$L_{\text{MIN}} \geq \frac{L_{\text{MAX}} + 2 L_2 + B}{2} \quad \text{Stroke } X \geq \frac{L_{\text{MAX}} - 2 L_2 - B}{2}$$

- Standard executions: bore and keyway on both sides  
Special executions on request: circular bore, square bore, hexagonal bore, custom lengths



| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Albero     | D1 [mm] | Weight [kg] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|-------------|
| GU01EA      | 6      | 16     | 34      | 8      | ••        | ••        | ••     | 25     | 2      | 7      | 6      | 6       | SW 8       | 16      | -           |
| GU02EA      | 8      | 16     | 40      | 11     | ••        | ••        | ••     | 25     | 2      | 9      | 8      | 8       | SW 8       | 16      | -           |
| GU03EA      | 10     | 22     | 48      | 12     | 140       | 170       | 30     | 30     | 3      | 11,4   | 10     | 10      | 11 x 14 Z6 | 22      | 0,310       |
|             |        |        |         |        | 160       | 200       | 40     |        |        |        |        |         |            |         | 0,360       |
|             |        |        |         |        | 180       | 240       | 60     |        |        |        |        |         |            |         | 0,380       |
|             |        |        |         |        | 230       | 330       | 100    |        |        |        |        |         |            |         | 0,500       |
| GU04EA      | 12     | 25     | 56      | 13     | 160       | 190       | 30     | 40     | 4      | 13,8   | 12     | 12      | 13 x 16 Z6 | 26      | 0,500       |
|             |        |        |         |        | 180       | 225       | 45     |        |        |        |        |         |            |         | 0,560       |
|             |        |        |         |        | 200       | 270       | 70     |        |        |        |        |         |            |         | 0,620       |
|             |        |        |         |        | 220       | 300       | 80     |        |        |        |        |         |            |         | 0,670       |
|             |        |        |         |        | 250       | 355       | 105    |        |        |        |        |         |            |         | 0,760       |
|             |        |        |         |        | 280       | 420       | 140    |        |        |        |        |         |            |         | 0,840       |
| GU05EA      | 14     | 28     | 60      | 14     | 300       | 450       | 150    | 40     | 5      | 16,3   | 14     | 14      | 13 x 16 Z6 | 29      | 0,900       |
|             |        |        |         |        | 170       | 200       | 30     |        |        |        |        |         |            |         | 0,620       |
|             |        |        |         |        | 180       | 220       | 40     |        |        |        |        |         |            |         | 0,640       |
|             |        |        |         |        | 200       | 260       | 60     |        |        |        |        |         |            |         | 0,720       |
|             |        |        |         |        | 220       | 300       | 80     |        |        |        |        |         |            |         | 0,780       |
|             |        |        |         |        | 250       | 350       | 100    |        |        |        |        |         |            |         | 0,870       |
|             |        |        |         |        | 280       | 420       | 140    |        |        |        |        |         |            |         | 0,960       |
|             |        |        |         |        | 300       | 450       | 150    |        |        |        |        |         |            |         | 1,030       |
| GU1EA       | 16     | 32     | 68      | 16     | 350       | 550       | 200    | 40     | 5      | 18,3   | 16     | 16      | 16 x 20 Z6 | 32      | 1,030       |
|             |        |        |         |        | 400       | 650       | 250    |        |        |        |        |         |            |         | 1,170       |
|             |        |        |         |        | 190       | 220       | 30     |        |        |        |        |         |            |         | 0,900       |
|             |        |        |         |        | 210       | 250       | 40     |        |        |        |        |         |            |         | 0,980       |
|             |        |        |         |        | 240       | 320       | 80     |        |        |        |        |         |            |         | 1,100       |
|             |        |        |         |        | 250       | 350       | 100    |        |        |        |        |         |            |         | 1,140       |
|             |        |        |         |        | 275       | 390       | 115    |        |        |        |        |         |            |         | 1,240       |
|             |        |        |         |        | 300       | 430       | 130    |        |        |        |        |         |            |         | 1,330       |
| GU1EA       | 16     | 32     | 68      | 16     | 380       | 590       | 210    | 40     | 5      | 18,3   | 16     | 16      | 16 x 20 Z6 | 32      | 1,600       |
|             |        |        |         |        | 400       | 630       | 230    |        |        |        |        |         |            |         | 1,730       |

•• = upon request

| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Shaft      | D1 [mm] | Weight [kg] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|-------------|
| GU2EA       | 18     | 36     | 74      | 17     | 230       | 280       | 50     | 40     | 6      | 20,8   | 18     | 18      | 18 x 22 Z6 | 37      | 1,350       |
|             |        |        |         |        | 250       | 320       | 70     |        |        |        |        |         |            |         | 1,460       |
|             |        |        |         |        | 270       | 370       | 100    |        |        |        |        |         |            |         | 1,550       |
|             |        |        |         |        | 290       | 400       | 110    |        |        |        |        |         |            |         | 1,660       |
|             |        |        |         |        | 300       | 415       | 115    |        |        |        |        |         |            |         | 1,710       |
|             |        |        |         |        | 400       | 620       | 220    |        |        |        |        |         |            |         | 2,230       |
|             |        |        |         |        | 500       | 820       | 320    |        |        |        |        |         |            |         | 2,750       |
| GU3EA       | 20     | 42     | 82      | 18     | 250       | 300       | 50     | 45     | 6      | 22,8   | 20     | 20      | 21 x 25 Z6 | 42      | 1,990       |
|             |        |        |         |        | 270       | 340       | 70     |        |        |        |        |         |            |         | 2,120       |
|             |        |        |         |        | 290       | 380       | 90     |        |        |        |        |         |            |         | 2,250       |
|             |        |        |         |        | 320       | 440       | 120    |        |        |        |        |         |            |         | 2,460       |
|             |        |        |         |        | 380       | 560       | 180    |        |        |        |        |         |            |         | 2,860       |
|             |        |        |         |        | 420       | 640       | 220    |        |        |        |        |         |            |         | 3,130       |
|             |        |        |         |        | 500       | 800       | 300    |        |        |        |        |         |            |         | 3,660       |
| GU4EA       | 22     | 45     | 95      | 22     | 250       | 280       | 30     | 45     | 6      | 24,8   | 22     | 22      | 23 x 28 Z6 | 47      | 2,350       |
|             |        |        |         |        | 270       | 320       | 50     |        |        |        |        |         |            |         | 2,510       |
|             |        |        |         |        | 290       | 350       | 60     |        |        |        |        |         |            |         | 2,670       |
|             |        |        |         |        | 330       | 430       | 100    |        |        |        |        |         |            |         | 3,000       |
|             |        |        |         |        | 350       | 470       | 120    |        |        |        |        |         |            |         | 3,160       |
|             |        |        |         |        | 470       | 710       | 240    |        |        |        |        |         |            |         | 4,130       |
|             |        |        |         |        |           |           |        |        |        |        |        |         |            |         |             |
| GU5EA       | 25     | 50     | 108     | 26     | 295       | 345       | 50     | 45     | 8      | 28,3   | 25     | 25      | 26 x 32 Z6 | 52      | 3,390       |
|             |        |        |         |        | 310       | 375       | 65     |        |        |        |        |         |            |         | 3,520       |
|             |        |        |         |        | 350       | 450       | 100    |        |        |        |        |         |            |         | 3,920       |
|             |        |        |         |        | 380       | 500       | 120    |        |        |        |        |         |            |         | 4,200       |
|             |        |        |         |        | 420       | 590       | 170    |        |        |        |        |         |            |         | 4,590       |
|             |        |        |         |        | 460       | 660       | 200    |        |        |        |        |         |            |         | 4,980       |
|             |        |        |         |        | 500       | 745       | 245    |        |        |        |        |         |            |         | 5,370       |
| GU6EA       | 30     | 58     | 122     | 29     | 330       | 380       | 50     | 50     | 8      | 33,3   | 30     | 30      | 32 x 38 Z8 | 58      | 4,900       |
|             |        |        |         |        | 350       | 420       | 70     |        |        |        |        |         |            |         | 5,170       |
|             |        |        |         |        | 370       | 455       | 85     |        |        |        |        |         |            |         | 5,420       |
|             |        |        |         |        | 400       | 510       | 110    |        |        |        |        |         |            |         | 5,850       |
|             |        |        |         |        | 450       | 620       | 170    |        |        |        |        |         |            |         | 6,480       |
|             |        |        |         |        | 500       | 720       | 220    |        |        |        |        |         |            |         | 7,140       |
|             |        |        |         |        | 540       | 795       | 255    |        |        |        |        |         |            |         | 7,690       |
| GU7EA       | 35     | 70     | 140     | 35     | ••        | ••        | ••     | 70     | 10     | 38,3   | ••     | ••      | 36 x 42 Z8 | 70      | -           |
| GU8EA       | 40     | 80     | 160     | 39     | ••        | ••        | ••     | 80     | 12     | 43,3   | ••     | ••      | 42 x 48 Z8 | 80      | -           |
| GU9EA       | 50     | 95     | 190     | 46     | ••        | ••        | ••     | 90     | 14     | 53,8   | ••     | ••      | 46 x 54 Z8 | 95      | -           |

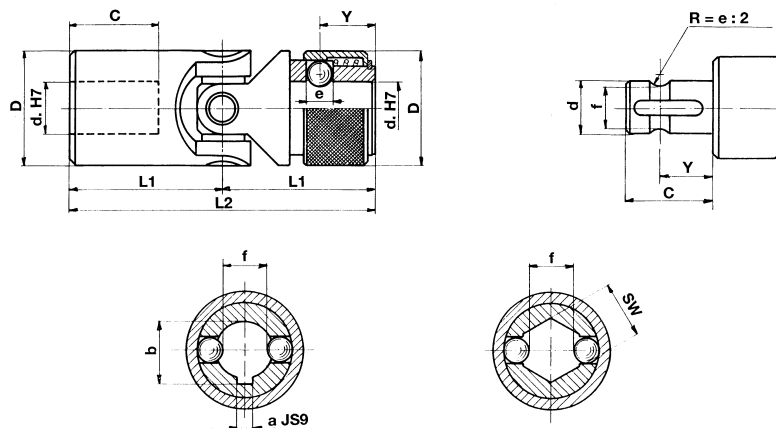
| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Shaft      | D1 [mm] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|
| GU03EBA     | 10     | 16     | 52      | 14     | ••        | ••        | ••     | 25     | 3      | 11,4   | 8      | 8       | SW 8       | 16      |
| GU04EBA     | 12     | 22     | 62      | 18     | ••        | ••        | ••     | 30     | 4      | 13,8   | 10     | 10      | 11 x 14 Z6 | 22      |
| GU1EBA      | 16     | 25     | 74      | 21     | ••        | ••        | ••     | 40     | 5      | 18,3   | 12     | 12      | 13 x 16 Z6 | 26      |
| GU3EBA      | 20     | 32     | 86      | 24     | ••        | ••        | ••     | 40     | 6      | 22,8   | 16     | 16      | 16 x 20 Z6 | 32      |
| GU5EBA      | 25     | 42     | 108     | 31     | ••        | ••        | ••     | 45     | 8      | 28,3   | 20     | 20      | 21 x 25 Z6 | 42      |
| GU6EBA      | 30     | 50     | 132     | 38     | ••        | ••        | ••     | 45     | 8      | 33,3   | 25     | 25      | 26 x 32 Z6 | 52      |
| GU8EBA      | 40     | 70     | 166     | 47     | ••        | ••        | ••     | 75     | 12     | 43,3   | ••     | ••      | 36 x 42 Z8 | 70      |

•• = upon request

## Precision joints

### Series “ER” (sliding bushes)

- Type “ER”: max. speed 1.000 rpm.
- Max. angle 45°.
- Executions:
  - quick coupling side: bore and keyway or hexagonal bore
  - other side: circular bore

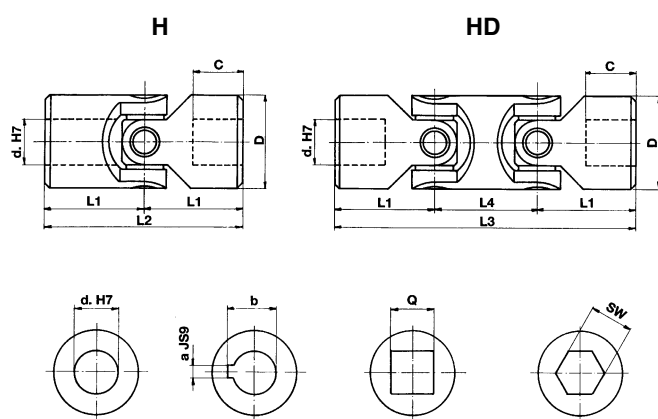


| Part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | Y [mm] | e [mm] | f [mm] | a [mm] | b [mm] | SW [mm] |
|-------------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|---------|
| GU02ER      | 8      | 16     | 52      | 26      | 14     | 9,5    | 3,5    | 6,3    | 2      | 9      | 8       |
| GU03ER      | 10     | 22     | 62      | 31      | 17     | 11,5   | 4      | 8,7    | 3      | 11     | 10      |
| GU04ER      | 12     | 25     | 74      | 37      | 21     | 13,5   | 4      | 11     | 4      | 13,3   | 12      |
| GU05ER      | 14     | 25     | 74      | 37      | 21     | 13,5   | 4      | 13     | 5      | 15,3   | 14      |
| GU1ER       | 16     | 32     | 86      | 43      | 24     | 14     | 6,35   | 14,8   | 5      | 17,3   | 16      |
| GU2ER       | 18     | 36     | 96      | 48      | 28     | 19     | 8      | 16     | 6      | 19,8   | 18      |
| GU3ER       | 20     | 42     | 108     | 54      | 31     | 19     | 8      | 18     | 6      | 22,8   | 20      |
| GU4ER       | 22     | 45     | 120     | 60      | 34     | 20,5   | 10     | 20     | 6      | 24,8   | 22      |
| GU5ER       | 25     | 50     | 132     | 66      | 38     | 20,5   | 10     | 23     | 8      | 28,3   | 25      |
| GU6ER       | 30     | 58     | 166     | 83      | 49     | 25     | 10     | 28     | 8      | 33,3   | 30      |

# High speed precision joints with needle roller bearings

## Series “H” (DIN 808)

- Roller bearings lubricated for life. No maintenance required.
- Precise and versatile, silent and smooth running; wide application field.
- Max. angle: 45° type “H”, 90° type “HD”, max. speed 4.000 rpm.
- Max. temperature: 120 °C
- Standard executions: circular bore  
Special executions on request: bore and keyway, square bore, hexagonal bore



| Part number | Double part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | L4 [mm] | L3 [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Weight [kg] |       |
|-------------|--------------------|--------|--------|---------|---------|--------|---------|---------|--------|--------|--------|---------|-------------|-------|
|             |                    |        |        |         |         |        |         |         |        |        |        |         | H           | HD    |
| GU03H       | GU03HD             | 10     | 22     | 48      | 24      | 12     | 26      | 74      | 3      | 11,4   | 10     | 10      | 0,10        | 0,15  |
| GU04H       | GU04HD             | 12     | 25     | 56      | 28      | 13     | 30      | 86      | 4      | 13,8   | 12     | 12      | 0,16        | 0,25  |
| GU05H       | GU05HD             | 14     | 28     | 60      | 30      | 14     | 36      | 96      | 5      | 16,3   | 14     | 14      | 0,20        | 0,40  |
| GU1H        | GU1HD              | 16     | 32     | 68      | 34      | 16     | 36      | 104     | 5      | 18,3   | 16     | 16      | 0,30        | 0,45  |
| GU2H        | GU2HD              | 18     | 36     | 74      | 37      | 17     | 40      | 114     | 6      | 20,8   | 18     | 18      | 0,45        | 0,70  |
| GU3H        | GU3HD              | 20     | 42     | 82      | 41      | 18     | 46      | 128     | 6      | 22,8   | 20     | 20      | 0,60        | 1,00  |
| GU4H        | GU4HD              | 22     | 45     | 95      | 47,5    | 22     | 50      | 145     | 6      | 24,8   | 22     | 22      | 0,95        | 1,55  |
| GU5H        | GU5HD              | 25     | 50     | 108     | 54      | 26     | 55      | 163     | 8      | 28,3   | 25     | 25      | 1,20        | 2,00  |
| GU6H        | GU6HD              | 30     | 58     | 122     | 61      | 29     | 68      | 190     | 8      | 33,3   | 30     | 30      | 1,85        | 2,90  |
| GU6H1       | GU6HD1             | 32     | 58     | 130     | 65      | 33     | 68      | 198     | 10     | 35,3   | 30     | 30      | 2,00        | 3,00  |
| GU7H        | GU7HD              | 35     | 70     | 140     | 70      | 35     | 72      | 212     | 10     | 38,3   | ••     | ••      | 3,15        | 4,75  |
| GU8H        | GU8HD              | 40     | 80     | 160     | 80      | 39     | 85      | 245     | 12     | 43,3   | ••     | ••      | 4,60        | 7,20  |
| GU9H        | GU9HD              | 50     | 95     | 190     | 95      | 46     | 100     | 290     | 14     | 53,8   | ••     | ••      | 7,60        | 12,00 |

DIN 808

| Part number | Double part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | L4 [mm] | L3 [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Weight [kg] |      |
|-------------|--------------------|--------|--------|---------|---------|--------|---------|---------|--------|--------|--------|---------|-------------|------|
|             |                    |        |        |         |         |        |         |         |        |        |        |         | HB          | HBD  |
| GU04HB      | GU04HBD            | 12     | 22     | 62      | 31      | 18     | 26      | 88      | 4      | 13,8   | 10     | 10      | 0,12        | 0,20 |
| GU1HB       | GU1HBD             | 16     | 25     | 74      | 37      | 21     | 30      | 104     | 5      | 18,3   | 12     | 12      | 0,20        | 0,30 |
| GU3HB       | GU3HBD             | 20     | 32     | 86      | 43      | 24     | 38      | 124     | 6      | 22,8   | 16     | 16      | 0,35        | 0,50 |
| GU5HB       | GU5HBD             | 25     | 42     | 108     | 54      | 31     | 48      | 156     | 8      | 28,3   | 20     | 20      | 0,80        | 1,20 |
| GU6HB       | GU6HBD             | 30     | 50     | 132     | 66      | 38     | 56      | 188     | 8      | 33,3   | 25     | 25      | 1,20        | 1,70 |
| GU8HB       | GU8HBD             | 40     | 70     | 166     | 83      | 47     | 72      | 238     | 12     | 43,3   | ••     | ••      | 2,90        | 4,30 |

DIN 808/7551

•• = upon request

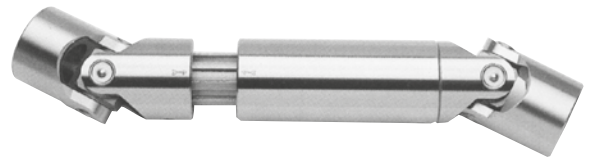
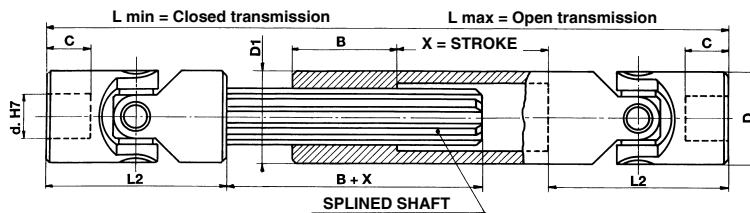
## Extensible transmissions high speed

### Series “H” (DIN 808)

- High speed joints series “H”, type “HA”, with needle roller bearings.
- Min. and max. length upon request:

$$L_{MIN} \geq \frac{L_{MAX} + 2 L_2 + B}{2} \quad \text{Stroke } X \geq \frac{L_{MAX} - 2 L_2 - B}{2}$$

- Standard executions: bore and keyway on both sides  
Special executions on request: circular bore, square bore, hexagonal bore, custom lengths



| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Shaft      | D1 [mm] | Weight [kg] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|-------------|
| GU03HA      | 10     | 22     | 48      | 12     | 140       | 170       | 30     | 30     | 3      | 11,4   | 10     | 10      | 11 x 14 Z6 | 22      | 0,310       |
|             |        |        |         |        | 160       | 200       | 40     |        |        |        |        |         |            |         | 0,360       |
|             |        |        |         |        | 180       | 240       | 60     |        |        |        |        |         |            |         | 0,380       |
|             |        |        |         |        | 230       | 330       | 100    |        |        |        |        |         |            |         | 0,500       |
| GU04HA      | 12     | 25     | 56      | 13     | 160       | 190       | 30     | 40     | 4      | 13,8   | 12     | 12      | 13 x 16 Z6 | 26      | 0,500       |
|             |        |        |         |        | 180       | 225       | 45     |        |        |        |        |         |            |         | 0,560       |
|             |        |        |         |        | 200       | 270       | 70     |        |        |        |        |         |            |         | 0,620       |
|             |        |        |         |        | 220       | 300       | 80     |        |        |        |        |         |            |         | 0,670       |
|             |        |        |         |        | 250       | 355       | 105    |        |        |        |        |         |            |         | 0,760       |
|             |        |        |         |        | 280       | 420       | 140    |        |        |        |        |         |            |         | 0,840       |
| GU05HA      | 14     | 28     | 60      | 14     | 300       | 450       | 150    | 40     | 5      | 16,3   | 14     | 14      | 13 x 16 Z6 | 29      | 0,900       |
|             |        |        |         |        | 170       | 200       | 30     |        |        |        |        |         |            |         | 0,620       |
|             |        |        |         |        | 180       | 220       | 40     |        |        |        |        |         |            |         | 0,640       |
|             |        |        |         |        | 200       | 260       | 60     |        |        |        |        |         |            |         | 0,720       |
|             |        |        |         |        | 220       | 300       | 80     |        |        |        |        |         |            |         | 0,780       |
|             |        |        |         |        | 250       | 350       | 100    |        |        |        |        |         |            |         | 0,870       |
|             |        |        |         |        | 280       | 420       | 140    |        |        |        |        |         |            |         | 0,960       |
|             |        |        |         |        | 300       | 450       | 150    |        |        |        |        |         |            |         | 1,030       |
| GU1HA       | 16     | 32     | 68      | 16     | 350       | 550       | 200    | 40     | 5      | 18,3   | 16     | 16      | 16 x 20 Z6 | 32      | 1,170       |
|             |        |        |         |        | 400       | 650       | 250    |        |        |        |        |         |            |         | 1,330       |
|             |        |        |         |        | 190       | 220       | 30     |        |        |        |        |         |            |         | 0,900       |
|             |        |        |         |        | 210       | 250       | 40     |        |        |        |        |         |            |         | 0,980       |
|             |        |        |         |        | 240       | 320       | 80     |        |        |        |        |         |            |         | 1,100       |
|             |        |        |         |        | 250       | 350       | 100    |        |        |        |        |         |            |         | 1,140       |
|             |        |        |         |        | 275       | 390       | 115    |        |        |        |        |         |            |         | 1,240       |
|             |        |        |         |        | 300       | 430       | 130    |        |        |        |        |         |            |         | 1,330       |
|             |        |        |         |        | 380       | 590       | 210    |        |        |        |        |         |            |         | 1,600       |
|             |        |        |         |        | 400       | 630       | 230    |        |        |        |        |         |            |         | 1,730       |

•• = upon request



| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Shaft      | D1 [mm] | Weight [kg] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|-------------|
| GU2HA       | 18     | 36     | 74      | 17     | 230       | 280       | 50     | 40     | 6      | 20,8   | 18     | 18      | 18 x 22 Z6 | 37      | 1,350       |
|             |        |        |         |        | 250       | 320       | 70     |        |        |        |        |         |            |         | 1,460       |
|             |        |        |         |        | 270       | 370       | 100    |        |        |        |        |         |            |         | 1,550       |
|             |        |        |         |        | 290       | 400       | 110    |        |        |        |        |         |            |         | 1,660       |
|             |        |        |         |        | 300       | 415       | 115    |        |        |        |        |         |            |         | 1,710       |
|             |        |        |         |        | 400       | 620       | 220    |        |        |        |        |         |            |         | 2,230       |
|             |        |        |         |        | 500       | 820       | 320    |        |        |        |        |         |            |         | 2,750       |
| GU3HA       | 20     | 42     | 82      | 18     | 250       | 300       | 50     | 45     | 6      | 22,8   | 20     | 20      | 21 x 25 Z6 | 42      | 1,990       |
|             |        |        |         |        | 270       | 340       | 70     |        |        |        |        |         |            |         | 2,120       |
|             |        |        |         |        | 290       | 380       | 90     |        |        |        |        |         |            |         | 2,250       |
|             |        |        |         |        | 320       | 440       | 120    |        |        |        |        |         |            |         | 2,460       |
|             |        |        |         |        | 380       | 560       | 180    |        |        |        |        |         |            |         | 2,860       |
|             |        |        |         |        | 420       | 640       | 220    |        |        |        |        |         |            |         | 3,130       |
|             |        |        |         |        | 500       | 800       | 300    |        |        |        |        |         |            |         | 3,660       |
| GU4HA       | 22     | 45     | 95      | 22     | 250       | 280       | 30     | 45     | 6      | 24,8   | 22     | 22      | 23 x 28 Z6 | 47      | 2,350       |
|             |        |        |         |        | 270       | 320       | 50     |        |        |        |        |         |            |         | 2,510       |
|             |        |        |         |        | 290       | 350       | 60     |        |        |        |        |         |            |         | 2,670       |
|             |        |        |         |        | 330       | 430       | 100    |        |        |        |        |         |            |         | 3,000       |
|             |        |        |         |        | 350       | 470       | 120    |        |        |        |        |         |            |         | 3,160       |
|             |        |        |         |        | 470       | 710       | 240    |        |        |        |        |         |            |         | 4,130       |
|             |        |        |         |        | 500       | 800       | 300    |        |        |        |        |         |            |         | 4,980       |
| GU5HA       | 25     | 50     | 108     | 26     | 295       | 345       | 50     | 45     | 8      | 28,3   | 25     | 25      | 26 x 32 Z6 | 52      | 3,390       |
|             |        |        |         |        | 310       | 375       | 65     |        |        |        |        |         |            |         | 3,520       |
|             |        |        |         |        | 350       | 450       | 100    |        |        |        |        |         |            |         | 3,920       |
|             |        |        |         |        | 380       | 500       | 120    |        |        |        |        |         |            |         | 4,200       |
|             |        |        |         |        | 420       | 590       | 170    |        |        |        |        |         |            |         | 4,590       |
|             |        |        |         |        | 460       | 660       | 200    |        |        |        |        |         |            |         | 4,980       |
|             |        |        |         |        | 500       | 745       | 245    |        |        |        |        |         |            |         | 5,370       |
| GU6HA       | 30     | 58     | 122     | 29     | 330       | 380       | 50     | 50     | 8      | 33,3   | 30     | 30      | 32 x 38 Z8 | 58      | 4,900       |
|             |        |        |         |        | 350       | 420       | 70     |        |        |        |        |         |            |         | 5,170       |
|             |        |        |         |        | 370       | 455       | 85     |        |        |        |        |         |            |         | 5,420       |
|             |        |        |         |        | 400       | 510       | 110    |        |        |        |        |         |            |         | 5,850       |
|             |        |        |         |        | 450       | 620       | 170    |        |        |        |        |         |            |         | 6,480       |
|             |        |        |         |        | 500       | 720       | 220    |        |        |        |        |         |            |         | 7,140       |
|             |        |        |         |        | 540       | 795       | 255    |        |        |        |        |         |            |         | 7,690       |
| GU7HA       | 35     | 70     | 140     | 35     | ••        | ••        | ••     | 70     | 10     | 38,3   | ••     | ••      | 36 x 42 Z8 | 70      | -           |
| GU8HA       | 40     | 80     | 160     | 40     | ••        | ••        | ••     | 80     | 12     | 43,3   | ••     | ••      | 42 x 48 Z8 | 80      | -           |
| GU9HA       | 50     | 95     | 190     | 50     | ••        | ••        | ••     | 90     | 14     | 53,8   | ••     | ••      | 46 x 54 Z8 | 95      | -           |

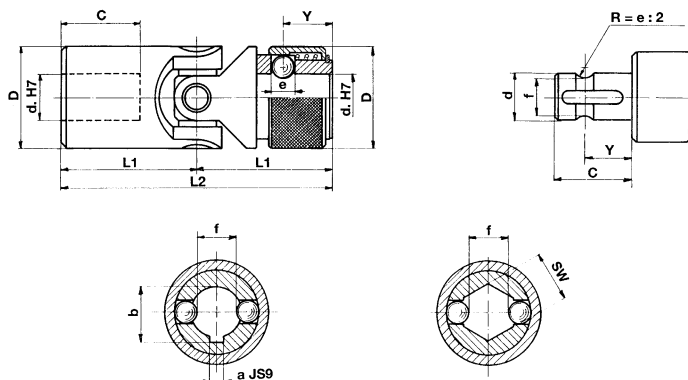
| Part number | d [mm] | D [mm] | L2 [mm] | C [mm] | Lmin [mm] | Lmax [mm] | X [mm] | B [mm] | a [mm] | b [mm] | Q [mm] | SW [mm] | Shaft      | D1 [mm] |
|-------------|--------|--------|---------|--------|-----------|-----------|--------|--------|--------|--------|--------|---------|------------|---------|
| GU04HBA     | 12     | 22     | 62      | 18     | ••        | ••        | ••     | 30     | 4      | 13,8   | 10     | 10      | 11 x 14 Z6 | 22      |
| GU1HBA      | 16     | 25     | 74      | 21     | ••        | ••        | ••     | 40     | 5      | 18,3   | 12     | 12      | 13 x 16 Z6 | 26      |
| GU3HBA      | 20     | 32     | 86      | 24     | ••        | ••        | ••     | 40     | 6      | 22,8   | 16     | 16      | 16 x 20 Z6 | 32      |
| GU5HBA      | 25     | 42     | 108     | 31     | ••        | ••        | ••     | 45     | 8      | 28,3   | 20     | 20      | 21 x 25 Z6 | 42      |
| GU6HBA      | 30     | 50     | 132     | 38     | ••        | ••        | ••     | 45     | 8      | 33,3   | 25     | 25      | 26 x 32 Z6 | 52      |
| GU8HBA      | 40     | 70     | 166     | 47     | ••        | ••        | ••     | 70     | 12     | 43,3   | ••     | ••      | 36 x 42 Z8 | 70      |

•• = upon request

## Precision joints

### Series “HR” (needle roller bearings)

- Type “ER”: max. speed 4.000 rpm.
- Max. angle 45°.
- Executions:
  - quick coupling side: bore and keyway or hexagonal bore
  - other side: circular bore

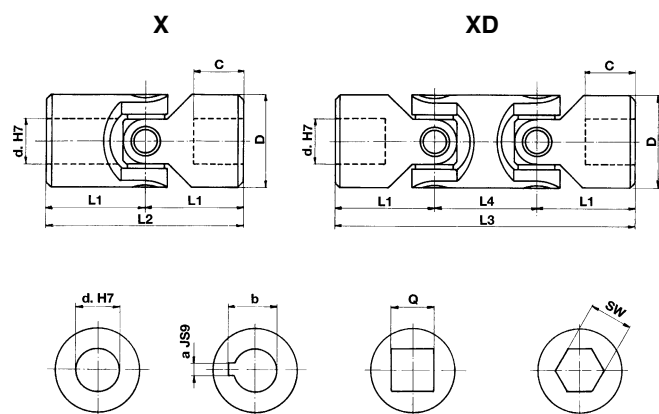


| Part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | Y [mm] | e [mm] | f [mm] | a [mm] | b [mm] | SW [mm] |
|-------------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|---------|
| GU03HR      | 10     | 22     | 62      | 31      | 17     | 11,5   | 4      | 8,7    | 3      | 11     | 10      |
| GU04HR      | 12     | 25     | 74      | 37      | 21     | 13,5   | 4      | 11     | 4      | 13,3   | 12      |
| GU05HR      | 14     | 25     | 74      | 37      | 21     | 13,5   | 4      | 13     | 5      | 15,3   | 14      |
| GU1HR       | 16     | 32     | 86      | 43      | 24     | 14     | 6,35   | 14,8   | 5      | 17,3   | 16      |
| GU2HR       | 18     | 36     | 96      | 48      | 28     | 19     | 8      | 16     | 6      | 19,8   | 18      |
| GU3HR       | 20     | 42     | 108     | 54      | 31     | 19     | 8      | 18     | 6      | 22,8   | 20      |
| GU4HR       | 22     | 45     | 120     | 60      | 34     | 20,5   | 10     | 20     | 6      | 24,8   | 22      |
| GU5HR       | 25     | 50     | 132     | 66      | 38     | 20,5   | 10     | 23     | 8      | 28,3   | 25      |
| GU6HR       | 30     | 58     | 166     | 83      | 49     | 25     | 10     | 28     | 8      | 33,3   | 30      |

# Stainless steel joints

## Series “X” (DIN 808)

- Max. speed 250 rpm.
- Max. angle: 45° type “X”, 90° type “XD”.
- Max. temperature 200 °C
- Standard executions: circular bore  
Special executions on request: bore and keyway, square bore, hexagonal bore

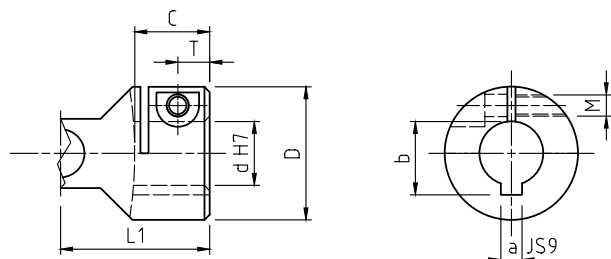


| Part number | Double part number | d [mm] | D [mm] | L2 [mm] | L1 [mm] | C [mm] | L4 [mm] | L3 [mm] | a* [mm] | b* [mm] | Q* [mm] | SW* [mm] | Weight [kg] |      |
|-------------|--------------------|--------|--------|---------|---------|--------|---------|---------|---------|---------|---------|----------|-------------|------|
|             |                    |        |        |         |         |        |         |         |         |         |         |          | X           | XD   |
| GU01X       | GU01XD             | 6      | 16     | 34      | 17      | 8      | 22      | 56      | 2       | 7       | 6       | 6        | 0,05        | 0,08 |
| GU02X       | GU02XD             | 8      | 16     | 40      | 20      | 11     | 22      | 62      | 2       | 9       | 8       | 8        | 0,05        | 0,08 |
| GU03X       | GU03XD             | 10     | 22     | 48      | 24      | 12     | 26      | 74      | 3       | 11,4    | 10      | 10       | 0,10        | 0,15 |
| GU04X       | GU04XD             | 12     | 25     | 56      | 28      | 13     | 30      | 86      | 4       | 13,8    | 12      | 12       | 0,16        | 0,25 |
| GU1X        | GU1XD              | 16     | 32     | 68      | 34      | 16     | 36      | 104     | 5       | 18,3    | 16      | 16       | 0,30        | 0,45 |
| GU3X        | GU3XD              | 20     | 42     | 82      | 41      | 18     | 46      | 128     | 6       | 22,8    | 20      | 20       | 0,60        | 1,00 |
| GU5X        | GU5XD              | 25     | 50     | 108     | 54      | 26     | 55      | 163     | 8       | 28,3    | 25      | 25       | 1,20        | 2,00 |
| GU6X        | GU6XD              | 30     | 58     | 122     | 61      | 29     | 68      | 190     | 8       | 33,3    | 30      | 30       | 1,85        | 2,90 |

\* = check availability

## Special joints with clamping hubs

- Suitable for quick and easy connections
- Suitable on applications with the presence of vibration
- Suitable for single, double and extensible joints
- With seat for the lock nut (type 2)
- Special executions on request

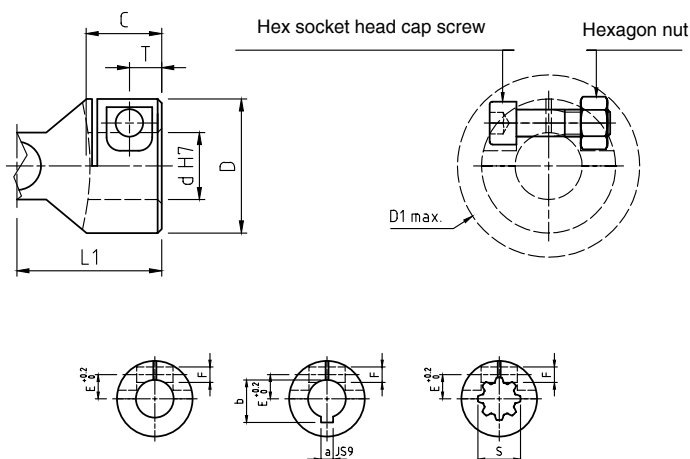


**Type 1**



| Special part number | d [mm] | D [mm] | L1 [mm] | C [mm] | a [mm] | b [mm] | M [mm] | T [mm] | *Ta [Nm] |
|---------------------|--------|--------|---------|--------|--------|--------|--------|--------|----------|
| 03CL1               | 10     | 22     | 24      | 12     | 3      | 11,4   | M4     | 5      | 5        |
| 04CL1               | 12     | 25     | 28      | 13     | 4      | 13,8   | M4     | 6      | 5        |
| 05CL1               | 14     | 28     | 30      | 14     | 5      | 16,3   | M4     | 6      | 5        |
| 1CL1                | 16     | 32     | 34      | 16     | 5      | 18,3   | M5     | 7      | 9        |
| 2CL1                | 18     | 36     | 37      | 17     | 6      | 20,8   | M5     | 7      | 9        |
| 3CL1                | 20     | 42     | 41      | 18     | 6      | 22,8   | M6     | 8      | 16       |
| 4CL1                | 22     | 45     | 47,5    | 22     | 6      | 24,8   | M6     | 8      | 16       |
| 5CL1                | 25     | 50     | 54      | 26     | 8      | 28,3   | M6     | 9,5    | 16       |
| 6CL1                | 30     | 58     | 61      | 29     | 8      | 33,3   | M8     | 11     | 36       |
| 7CL1                | 35     | 70     | 70      | 33     | 10     | 38,3   | M8     | 13     | 36       |
| 8CL1                | 40     | 80     | 80      | 38     | 12     | 43,3   | M10    | 14     | 65       |
| 9CL1                | 50     | 95     | 95      | 46     | 14     | 53,8   | M12    | 17,5   | 100      |

\*Ta = torque screws



**Type 2: clamping hub + lock nut seat**

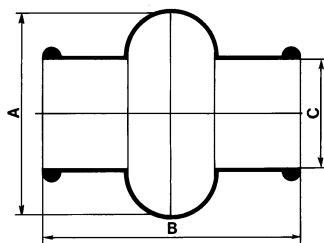


| Special part number | d [mm] | D [mm] | L1 [mm] | C [mm] | a [mm] | b [mm] | F [mm] | T [mm] | E [mm] | *Ta [Nm] | S DIN 5482 | Ingombro max. |
|---------------------|--------|--------|---------|--------|--------|--------|--------|--------|--------|----------|------------|---------------|
| 1CL2                | 16     | 32     | 34      | 16     | 5      | 18,3   | Ø 6,2  | 7      | 9      | M6 = 15  | 17x14 Z9   | Ø 42          |
| 2CL2                | 18     | 36     | 37      | 17     | 6      | 20,8   | Ø 8,2  | 7.5    | 10     | M8 = 25  | 18x15 Z10  | Ø 51          |
| 3CL2                | 20     | 42     | 41      | 18     | 6      | 22,8   | Ø 8,2  | 8      | 12     | M8 = 25  | 20x17 Z12  | Ø 57          |
| 5CL2                | 25     | 50     | 54      | 26     | 8      | 28,3   | Ø 10,2 | 12     | 16     | M10 = 60 | 25x22 Z14  | Ø 68          |

\*Ta = torque screws

## Protection muffs Series “M”

- Special neoprene rubber.
- Resistant to acids, oils, grease, dust and moisture.
- Filled with grease to ensure constant lubrication.



| Part number   | A [mm] | B [mm] | C [mm] | Joint external diameter D [mm] |
|---------------|--------|--------|--------|--------------------------------|
| <b>GUM01M</b> | 28     | 34     | 15     | 16                             |
| <b>GUM02M</b> | 32     | 40     | 16,5   | 18                             |
| <b>GUM03M</b> | 40     | 45     | 20,5   | 22                             |
| <b>GUM04M</b> | 48     | 50     | 24,5   | 25/26                          |
| <b>GUM05M</b> | 52     | 56     | 27,5   | 28/29                          |
| <b>GUM1M</b>  | 56     | 65     | 30,5   | 32                             |
| <b>GUM2M</b>  | 66     | 72     | 35,5   | 36/37                          |
| <b>GUM3M</b>  | 75     | 82     | 40     | 42                             |
| <b>GUM4M</b>  | 84     | 95     | 45     | 45/47                          |
| <b>GUM5M</b>  | 92     | 108    | 50     | 50/52                          |
| <b>GUM6M</b>  | 100    | 122    | 56     | 58                             |

## Selecting criteria

Matching one single joint with two shafts (of which the driving one is rotating at a constant speed), it forms an angle which causes a periodic variation of the driven shaft, exactly four fluctuations per revolution.

The difference between the maximum and the minimum speed of the driven shaft depends on the angle formed by the two shafts. The difference grows when increasing of the angle  $\alpha$ . To have a homokinetic transmission, you have to fit either two opposite single joints (paying attention that the two central yokes lie on the same plane and the angles are equal) or a double joint.

The irregularity caused by the former articulation is cancelled by the latter. The overall length resulting from the coupling of the two single joints is even more reduced using a double joint. In other words, the double joint is to be considered the shortest homokinetic transmission. For low speed applications (max 1.000 rpm) joint with plain bearings (rubbing bearings) are suggested: types E/EB. They are able to support shock loads, drive reserves, irregular runnings and relatively high torques. The working angles must be reduced in operation between 500 and 1.000 rpm. For high rotation speeds, relatively low torques or wide angles, joints with needle roller bearings (type V - H) are preferred. They can reach 5.000 rpm always relating to the angle.

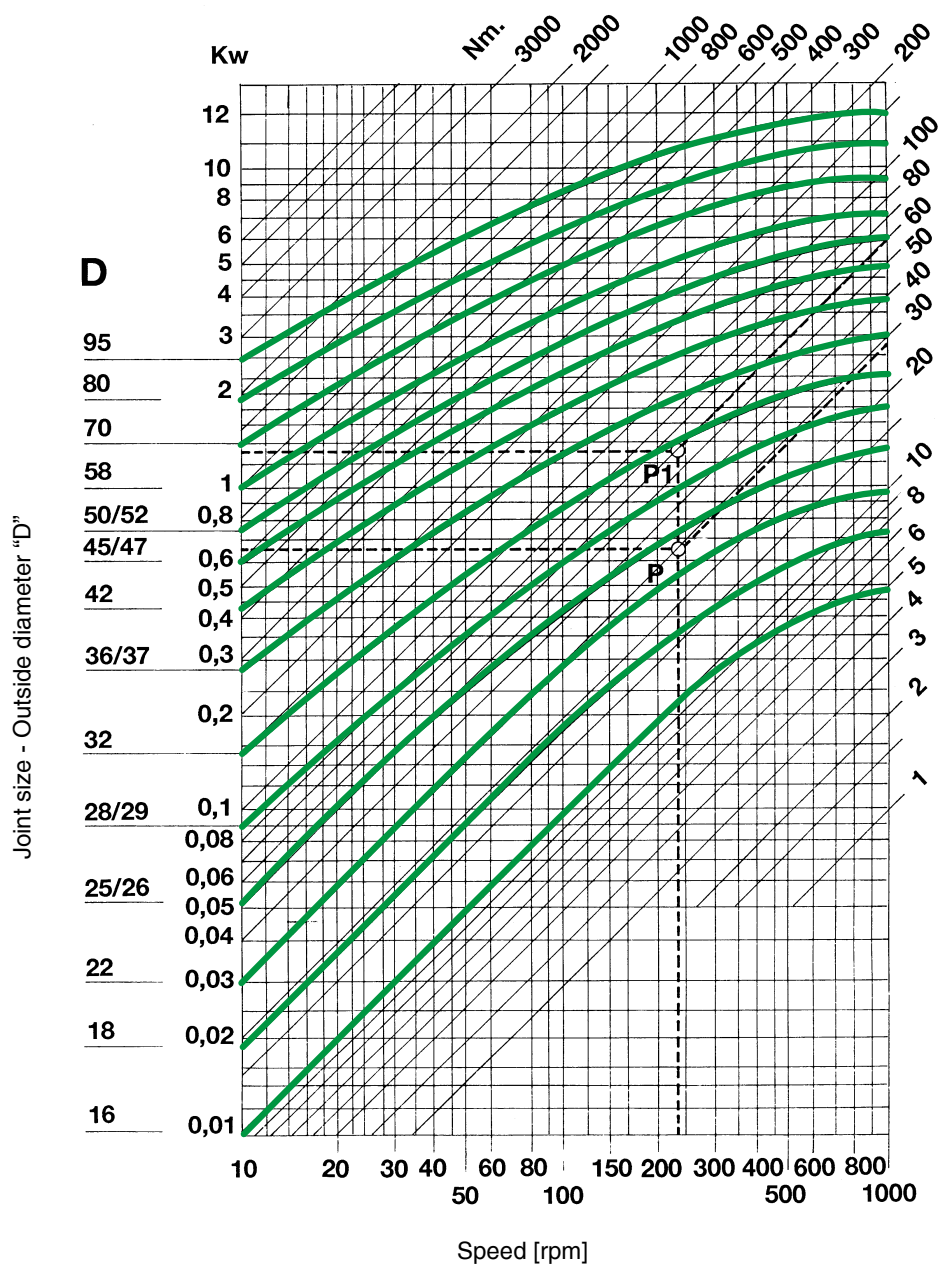
### How to read diagrams

The joint capacity to transmit a regular torque at a constant load with no shocks for a more or less long period, mainly depends on the number of revolutions per minute and the inclination angle  $\alpha$  of the two axes. The following diagrams are based upon the criteria below. Each curve corresponds to the joint size (outside diameter D) and represents the torque that the joint can transmit depending upon speed and working angle  $\alpha$ . The diagrams can be directly read if angle  $\alpha$  is  $10^\circ$ ; for wider angles, torques are reduced, therefore the values are to be corrected using correction factors (F) relating to the angle shown in the table.

### Note:

Diagrams values are merely indicative. Each application has its own particular motion characteristics, such as: shock loads, motion reversals, connected masses, type of starting, presence of elastic joints, stops and starts, etc. We, therefore, suggest calling our technical department.

## Diagram for joints Series "E"



Torque  $M_T$  in [Nm]

| WORKING ANGLE<br>"α"  | 5°   | 10°  | 15°  | 20°  | 25°  | 30°  | 35°  | 40°  | 45°  |
|-----------------------|------|------|------|------|------|------|------|------|------|
| CORRECTION FACTOR "F" | 1,25 | 1,00 | 0,80 | 0,65 | 0,55 | 0,45 | 0,38 | 0,30 | 0,25 |

### EXAMPLE

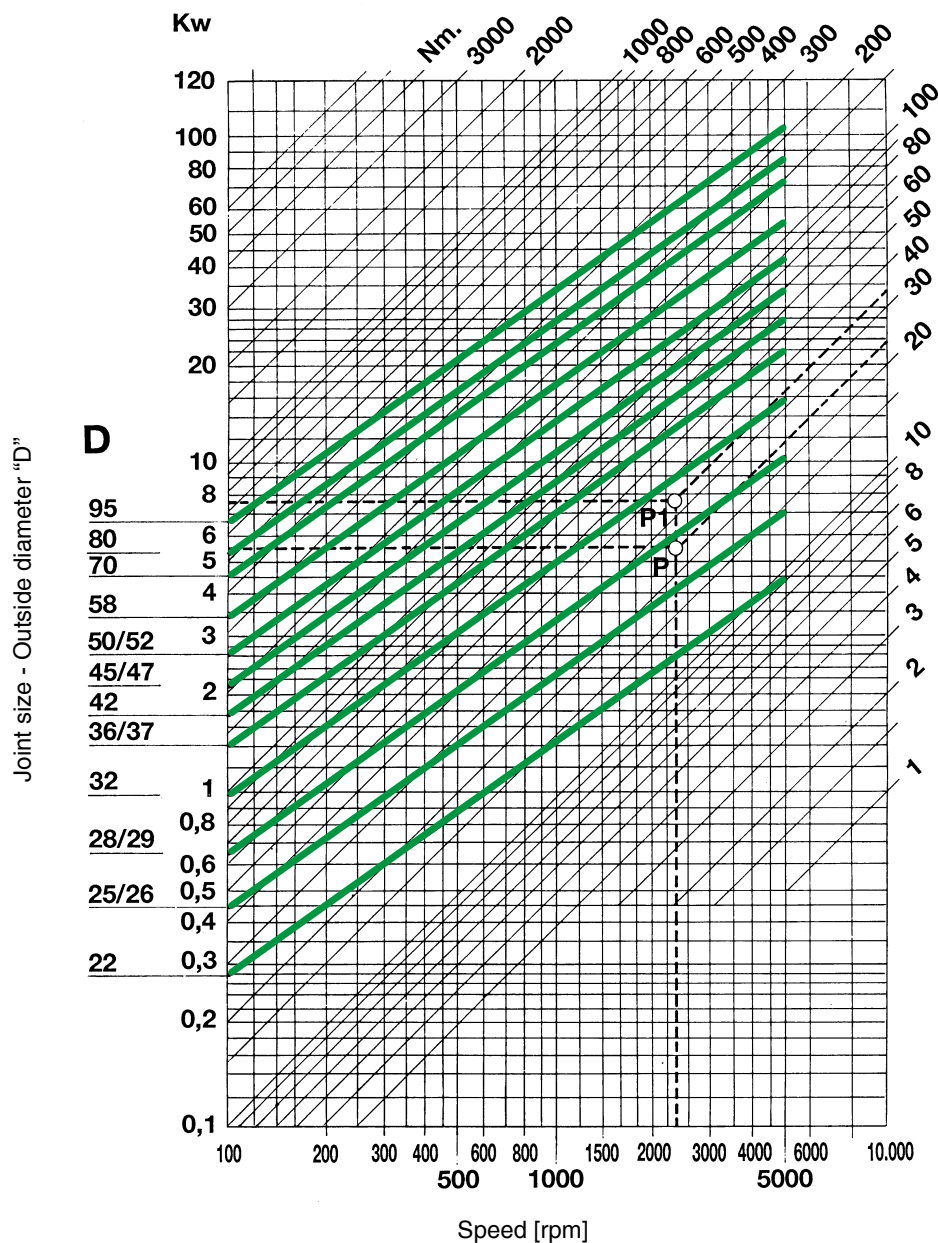
- Power: 0,65 kW
- Speed: 230 rpm
- With working angle  $\alpha = 10^\circ$ , Factor  $F = 1,00$  ( $0,65 \text{ kW} : 1,00 = 0,65 \text{ kW}$ ) we get point P and Torque  $M_T = 27 \text{ Nm}$  corresponding to joint size  $D = 25/26 \text{ mm}$  (type 04E, 1EB)
- With working angle  $\alpha = 30^\circ$ , Factor  $F = 0,45$  ( $0,65 \text{ kW} : 0,45 = 1,44 \text{ kW}$ ) we get point P1 and Torque  $M_T = 60 \text{ Nm}$  corresponding to joint size  $D = 32 \text{ mm}$  (type 1E, 3EB).

Consider that:

$$M_T = 9.550 \times \frac{\text{Power [kW]}}{\text{rpm}} \quad [\text{Nm}]$$

$$M_T = 7.020 \times \frac{\text{Power [CV]}}{\text{rpm}} \quad [\text{Nm}]$$

## Diagram for joints Series “H” - High Speed



Torque  $M_T$  in [Nm]

| WORKING ANGLE<br>“ $\alpha$ ” | 5°   | 10°  | 15°  | 20°  | 25°  | 30°  | 35°  | 40°  | 45°  |
|-------------------------------|------|------|------|------|------|------|------|------|------|
| CORRECTION FACTOR “F”         | 1,25 | 1,00 | 0,90 | 0,80 | 0,70 | 0,50 | 0,40 | 0,30 | 0,25 |

### EXAMPLE

- Power: 5,5 kW
- Speed: 2300 rpm
- With working angle  $\alpha = 10^\circ$ , Factor  $F = 1,00$  (5,5 kW : 1,00 = 5,5 kW) we get point P and Torque  $M_T = 23$  Nm corresponding to joint size  $D = 28/29$  mm (type 05H, 1HB)
- With working angle  $\alpha = 25^\circ$ , Factor  $F = 0,70$  (5,5 kW : 0,70 = 7,85 kW) we get point P1 and Torque  $M_T = 33$  Nm corresponding to joint size  $D = 32$  mm (type 1H, 3HB).

Consider that:

$$M_T = 9.550 \times \frac{\text{Power [kW]}}{\text{rpm}} \quad [\text{Nm}]$$

$$M_T = 7.020 \times \frac{\text{Power [CV]}}{\text{rpm}} \quad [\text{Nm}]$$



## Instructions for a correct mounting

Fig. 1

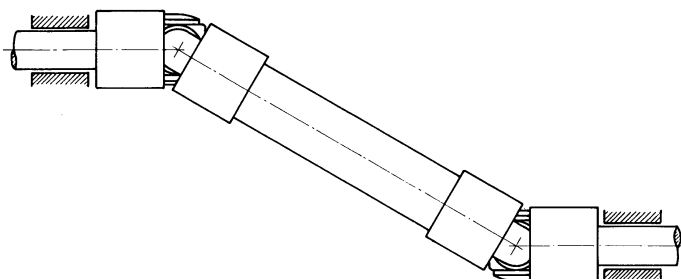
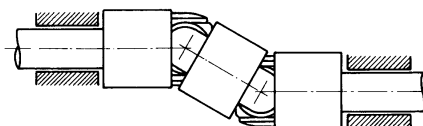
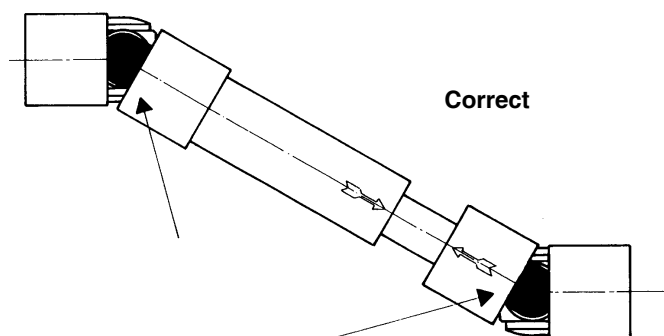


Fig. 2



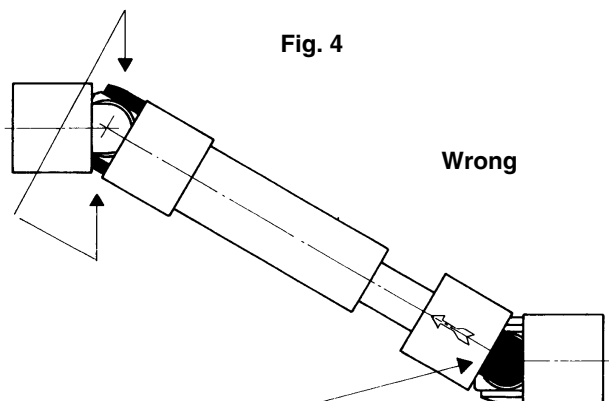
To obtain a uniform rotary motion, always use two opposite single joints or one double joint. The pillow blocks must be positioned as close as possible to the joints (see Picture 1 and 2).

Fig. 3



Correct

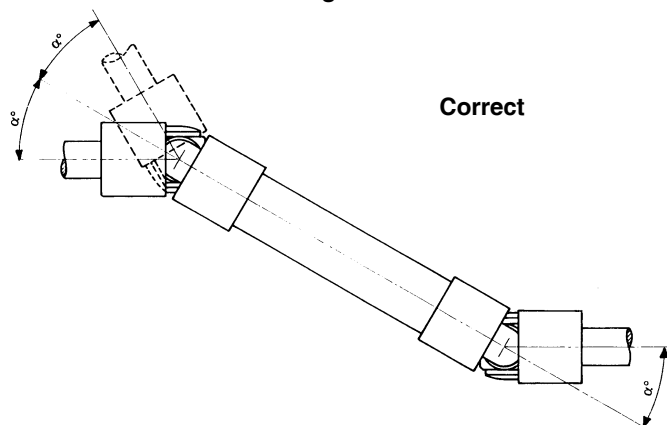
Fig. 4



Wrong

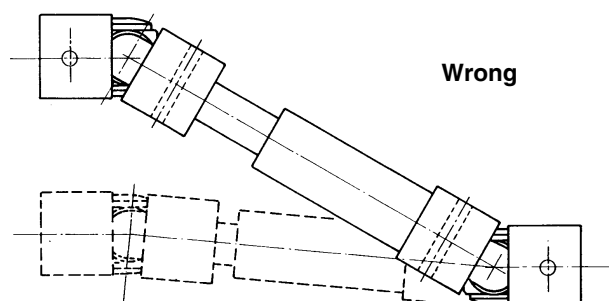
When using two opposite single joints, respect the alignment of the inside yokes. In extensible transmissions also pay attention to the arrows stamped tally (see Picture 3 CORRECT, Picture 4 WRONG).

Fig. 5



Correct

Fig. 6



Wrong

The joints angle  $\alpha$  must be equal (see Picture 5). The shafts can be moved one from the other either parallel or symmetrically. Pin holes must not be executed over the yokes to avoid damage (see Picture 6).