




## Joints



# JOINTS

**DIN 808**  
**Universal joints**  
Steel, friction bearing



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**DIN 808-NI**  
**Universal joints**  
Stainless Steel, friction bearing



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**DIN 808**  
**Universal joints**  
Steel, needle bearing



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**GN 9080**  
**Universal joints**  
for ordinary applications



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**GN 808.1**  
**Gaiters**  
for universal joints  
DIN 808



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**GN 808.2**  
**Universal joint shafts with friction bearing**  
with longitudinal compensation



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**GN 808.3**  
**Universal joint shafts with needle bearing**  
with longitudinal compensation




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**GN 648.1**  
**Ball joint heads with female thread**



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**GN 648.2**  
**Ball joints heads with threaded bolt**



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**GN 648.5**  
**Stainless Steel-Ball joint heads with female thread**




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**GN 648.6**  
**Stainless Steel-Ball joint heads with threaded bolt**



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**BJT.**  
**Rod ends**  
Technopolymer



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**GN 648.8**  
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**GN 648.9**  
**Stainless Steel-Ball joints**




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**GN 751.1**  
**Fork joints with rotating shaft**



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**GN 751-ST**  
**Fork joints**  
Steel



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**GN 751-AL**  
**Fork joints**  
Aluminium




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**GN 751-NI**  
**Fork joints**  
Stainless Steel



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**FJT.**  
**Forks**  
Technopolymer



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**DIN 71752**  
**Fork heads**  
Steel



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**DIN 71752-AL**  
**Fork heads**  
Aluminium



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# JOINTS

**DIN 71752-NI**  
**Fork heads**  
Stainless Steel



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**GN 752**  
**Joint pieces**  
Steel



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**GN 752-NI**  
**Joint pieces**  
Stainless Steel



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**DIN 71802**  
**Angled ball joints**  
Steel




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**DIN 71802-NI**  
**Angled ball joints**  
Stainless Steel-Angled ball joints



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**GN 710**  
**Dust caps**  
for angled ball joints  
DIN 71802



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**GN 782**  
**Axial ball joints**



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**GN 784**  
**Swivel ball joints**  
Aluminium



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**GN 784.1**  
**Flanges**  
for mounting clamps with swivel ball joint  
GN 784




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**GN 240**  
**Quick-fit couplings**  
with radial off-set compensation



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**GN 240.1**  
**Quick-fit couplings**  
with radial off-set compensation



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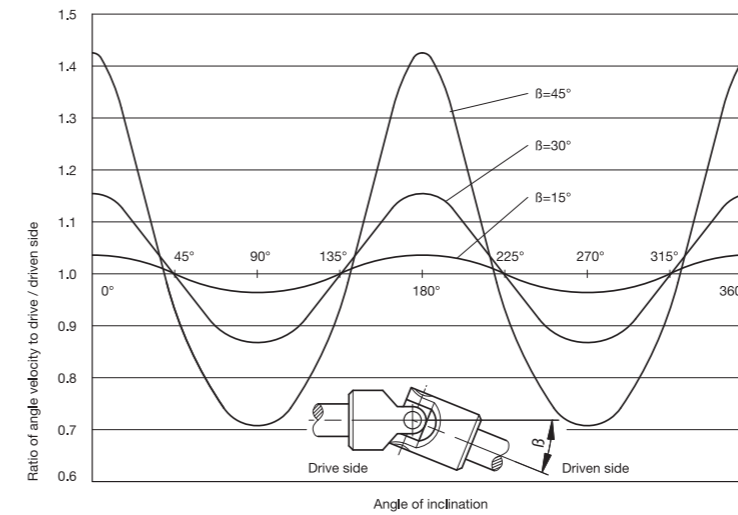
**GN 240.2**  
**Quick-fit couplings**  
with angle- and radial off-set compensation



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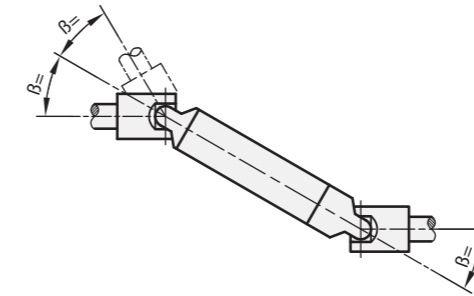
## Universal joints and universal joint shafts

### Mounting information

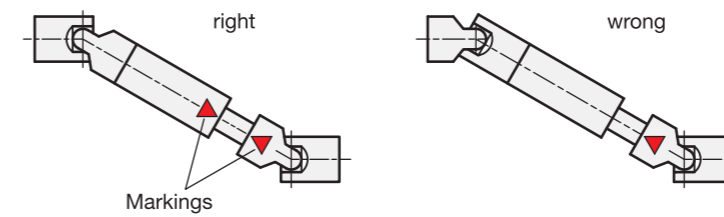


The single universal joints transfer the initial smooth rotation as an irregular rotation. One revolution of the drive shaft via single universal joint will cause the driven shaft to accelerate and decelerate twice. The extent of the irregularity depends on the operating angle  $\beta$ .

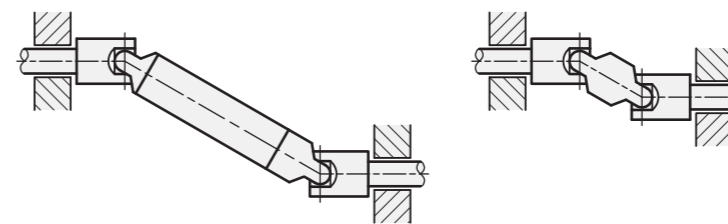
In order to obtain a smooth rotation of the driven shaft two single or one double universal joint is required. In such cases where minor irregularities in the movement are acceptable or where minor operating angles are the norm a single universal joint will do.



For a smooth transfer of a rotating speed, the angle of inclination  $\beta$  must be equal at both ends of the connecting shaft.



Due to a misconnection of the universal joint shafts, the irregular rotation of each joint is not compensated, but strengthened. This allows joint bearings and wedge profiles to be destroyed. For this reason, the markings of the universal joint shaft halves have to be opposite to each other.

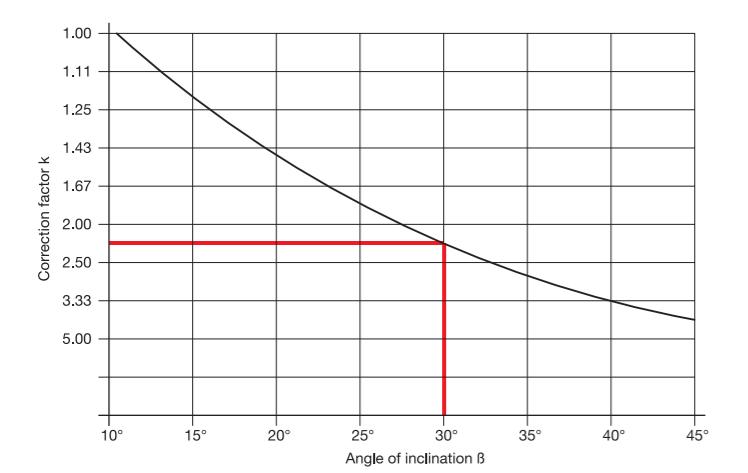
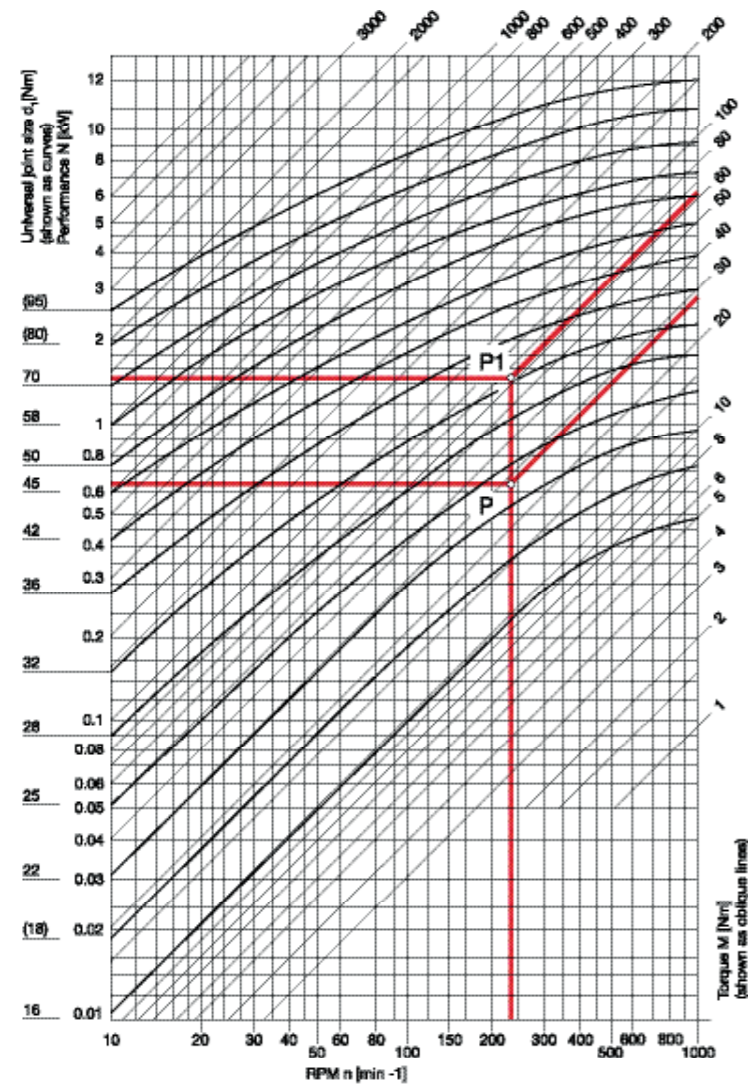


Furthermore the bearings must be as close as possible to the universal joints.

For continuous operation of universal joints with friction bearings adequate lubrication is essential. If drip lubrication is not possible they should be lubricated at least once a day. It is also possible to fit the universal joint with a gaiter GN 808.1 (see page 1131) which can be filled with oil or grease

# Universal joints with friction bearing, Type EG

## Selection of the size



The table shows the transferable output N and/or torques M of universal joints DIN 808, type EG (single friction bearing) in relation to the r.p.m. n.

The values are only applicable to a constant speed of rotation, constant load and an operating inclination angle of max. 10°. They are not applicable to universal joints in Stainless Steel.

For larger inclination angles β a nominal output N increased by the correction coefficient k and/or a nominal torque M has to be selected (see example below).

Conversion formulae:

$$\text{Torque M [Nm]} = 9550 \frac{N \text{ [kW]}}{n \text{ [min}^{-1}\text{]}}$$

$$\text{Output N [kW]} = \frac{M \text{ [Nm]} \times n \text{ [min}^{-1}\text{]}}{9550}$$

1 kW = 1.36 PS      1 PS = 0.736 kW

### Example 1

Output to be transferred N = 0.65 kW  
 R.p.m. n = 230 min<sup>-1</sup>  
 Angle of inclination β = 10°

Correction coefficient k = 1  
 Indicative output N = Nominal output N

Intersection point P is arrived at from 0.65 kW and 230 min<sup>-1</sup> (which corresponds to a torque of 27 Nm).

The next size up universal joint corresponding to point P is the model with a diameter d1 = 25.

### Example 2

Torque to be transferred M = 27 Nm  
 R.p.m. n = 230 min<sup>-1</sup>  
 Angle of inclination β = 30°

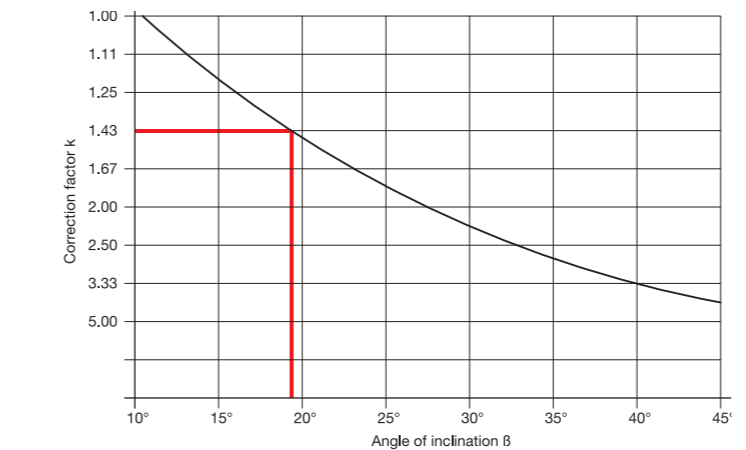
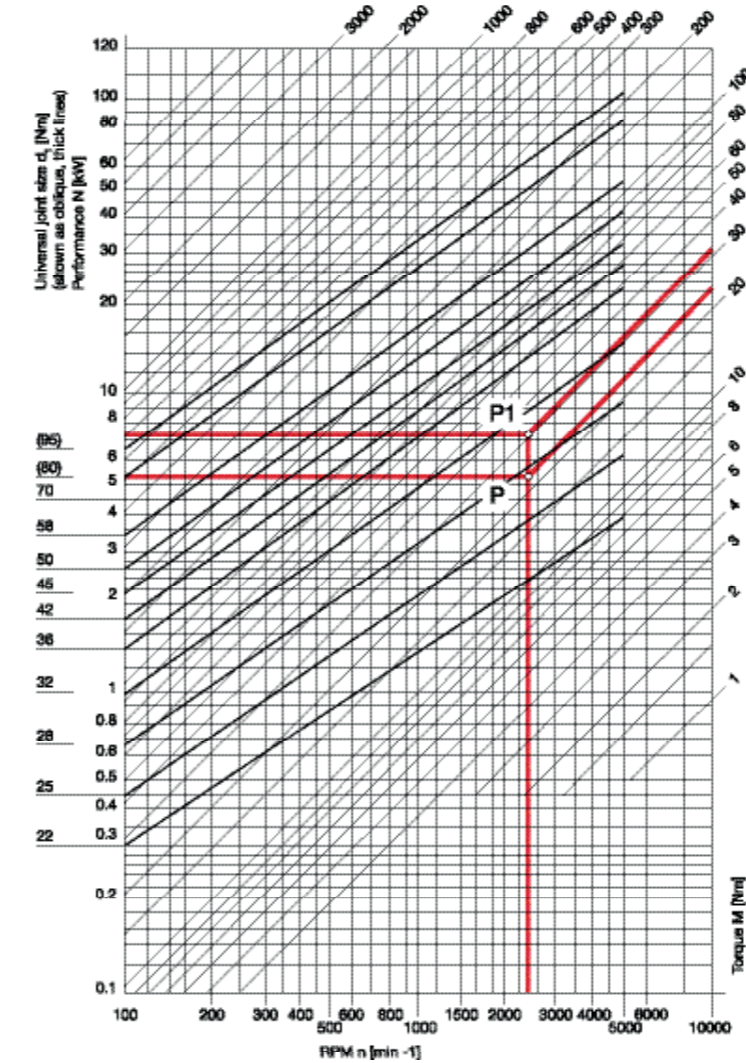
Correction coefficient k = 2.25  
 Indicative torque = 2.25 x 27 Nm = 60 Nm

Intersection point P1 is arrived at from 61 Nm and 230 min<sup>-1</sup> (which is equivalent to an indicative output N = 1.47 kW).

The next size up universal joint corresponding to P1 is the model with a diameter d1 = 36.

# Universal joints with needle bearing, Type EW

## Selection of the size



The table shows the transferable output N and/or torques M of universal joints DIN 808, type EW (single needle bearing) in relation to the r.p.m. n.

The values are only applicable to a constant speed of rotation, constant load and an operating inclination angle of max. 10°.

For larger inclination angles β a nominal output N increased by the correction coefficient k and/or a nominal torque M has to be selected (see example below).

Conversion formulae:

$$\text{Torque M [Nm]} = 9550 \frac{N \text{ [kW]}}{n \text{ [min}^{-1}\text{]}}$$

$$\text{Output N [kW]} = \frac{M \text{ [Nm]} \times n \text{ [min}^{-1}\text{]}}{9550}$$

1 kW = 1.36 PS      1 PS = 0.736 kW

### Example 1

Torque to be transferred N = 5.5 kW  
 R.p.m. n = 2300 min<sup>-1</sup>  
 Angle of inclination β = 10°

Correction coefficient k = 1  
 Indicative output N = Nominal output N

Intersection point P is arrived at from 5.5 kW and 2300 min<sup>-1</sup> (which corresponds to a torque of 23 Nm).

The next size up universal joint corresponding to point P is the model with a diameter d1 = 28.

### Example 2

Torque to be transferred M = 23 Nm  
 R.p.m. n = 2300 min<sup>-1</sup>  
 Angle of inclination β = 18°

Correction coefficient k = 1.43  
 Indicative torque = 1.43 x 23 Nm = 33 Nm

Intersection point P1 is arrived at from 33 Nm and 2300 min<sup>-1</sup> (which is equivalent to an indicative output N = 7.9 kW).

The next size up universal joint corresponding to P1 is the model with a diameter d1 = 32.





## Universal joints

for ordinary applications

### SPECIFICATION

#### Types

- Type **EG**: single, friction bearing
- Type **DG**: double, friction bearing

Steel

- not hardened
- blackened

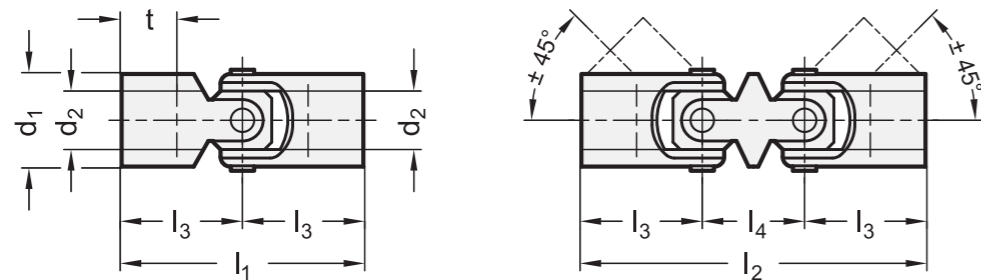
### INFORMATION

Universal joints GN 9080 are a simple and very competitively priced variant.

They can only be used for applications with low revolutions. Typical applications are all types of manual operations such as the adjustment of louvers.

### TECHNICAL INFORMATION

- Cross holes GN 110.1 (see page A17)
- ISO-Fundamental Tolerances (see page A21)



### GN 9080

Description	d1	d2 H8	l1	l2	l3	l4	t±1 max. assembly length of the shaft	Max. torque in Nm	⚖
GN 9080-13-B8-DG	13	B 8	-	60	21	18	12	2	36
GN 9080-16-B10-DG	16	B 10	-	74	26	22	15	3	68
GN 9080-20-B12-DG	20	B 12	-	88	31	26	18	6	132
GN 9080-25-B16-DG	25	B 16	-	104	37	30	22	12	235
GN 9080-32-B20-DG	32	B 20	-	124	43	38	25	24	455
GN 9080-13-B8-EG	13	B 8	42	-	21	-	12	2	25
GN 9080-16-B10-EG	16	B 10	52	-	26	-	15	3	47
GN 9080-20-B12-EG	20	B 12	62	-	31	-	18	6	91
GN 9080-25-B16-EG	25	B 16	74	-	37	-	22	12	164
GN 9080-32-B20-EG	32	B 20	86	-	43	-	25	24	290

## Gaiters

for universal joints DIN 808

### SPECIFICATION

#### Types

- Type **E**: for single joints
- Type **D**: for double joints

Type **E**

Rubber (CR)  
black

Type **D**

Elastomer plastic  
smooth PVC  
black

### INFORMATION

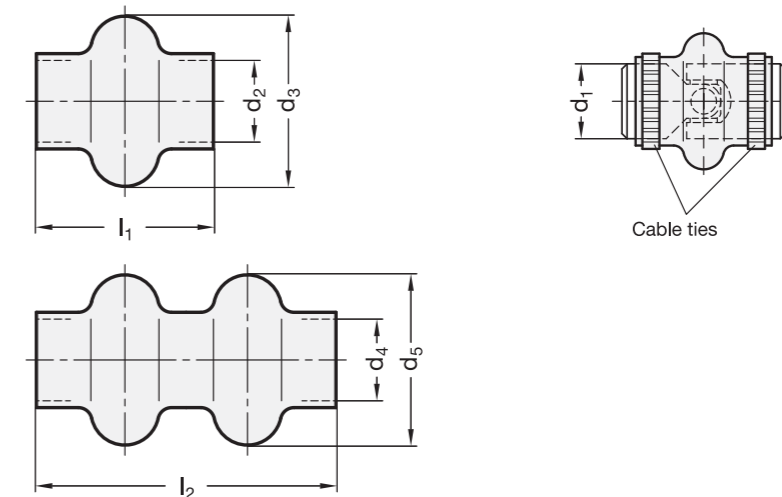
Gaiters GN 808.1 give universal joints full protection against ingress of dirt.

At the same time they can be filled with grease which gives long term lubrication for friction bearings.

The gaiters are secured at each end with two cable ties, which are supplied each sleeve.

### TECHNICAL INFORMATION

- Elastomer characteristics (see page A32)



### GN 808.1

Description	d1	d2	d3	d4	d5	l1	l2	⚖
GN 808.1-16-D	16	-	-	16	35	-	55	10
GN 808.1-22-D	22	-	-	20	36	-	65	11
GN 808.1-25-D	25	-	-	24	44	-	70	25
GN 808.1-28-D	28	-	-	28	51	-	80	25
GN 808.1-32-D	32	-	-	32	62	-	90	51
GN 808.1-42-D	42	-	-	40	73	-	120	84
GN 808.1-50-D	50	-	-	50	90	-	155	101
GN 808.1-16-E	16	15	28	-	-	34	-	7
GN 808.1-22-E	22	20.5	40	-	-	45	-	20
GN 808.1-25-E	25	24.5	48	-	-	50	-	10
GN 808.1-28-E	28	27.5	52	-	-	56	-	20
GN 808.1-32-E	32	30.5	56	-	-	65	-	20
GN 808.1-36-E	36	35.5	66	-	-	72	-	24
GN 808.1-42-E	42	40	75	-	-	82	-	40
GN 808.1-45-E	45	45	84	-	-	95	-	50
GN 808.1-50-E	50	50	92	-	-	108	-	63
GN 808.1-58-E	58	56	100	-	-	122	-	60

## Universal joint shafts with friction bearing with longitudinal compensation

### SPECIFICATION

#### Bore code

- Version **K**: with keyway

Steel blank

Joint bearing areas / pins / bearing sleeves case hardened

### INFORMATION

Universal joint shafts with friction bearing GN 808.2 not only join the offset between two shafts, but also enable the alignment of lengths, which depending on the overall length  $l_1$  enables the corresponding extraction length  $l_2$ . The power transmission is achieved by two universal joints DIN 808 (type EG) (see page 1126) a splined shaft and a sliding sleeve.

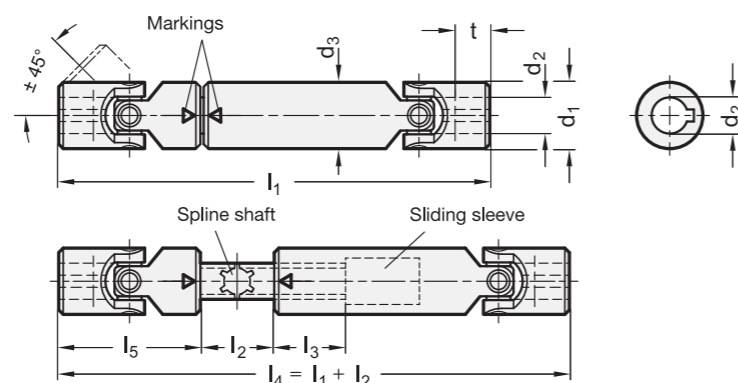
It is important to check the accuracy when connecting the splined shaft to the sliding sleeve: The markings  $\rightarrow$   $\leftarrow$  have to be opposite to each other. Any kind of misconnection leads to an inhomogeneous output and to a quick abrasion.

### ON REQUEST

- different length  $l_1$  -  $l_2$
- Bores without keyway
- Bores with square
- with other or unequal bores

### TECHNICAL INFORMATION

- Permissible r.p.m. and torque (see page 1124)
- Keyway DIN 6885 (see page A16)
- Cross holes GN 110.1 (see page A17)
- ISO-Fundamental Tolerances (see page A21)



### GN 808.2

Description	d1	d2 H7	l1-l2	d3	l3	l5	t	$\Delta$
GN 808.2-22-K10-140-30	22	K 10	140-30	22	30	48	12	310
GN 808.2-22-K10-160-40	22	K 10	160-40	22	30	48	12	368
GN 808.2-22-K10-180-60	22	K 10	180-60	22	30	48	12	400
GN 808.2-25-K12-160-30	25	K 12	160-30	26	40	56	13	502
GN 808.2-25-K12-180-45	25	K 12	180-45	29	40	56	13	554
GN 808.2-25-K12-200-70	25	K 12	200-70	29	40	56	13	620
GN 808.2-25-K12-250-105	25	K 12	250-105	29	40	56	13	770
GN 808.2-28-K14-170-30	28	K 14	170-30	32	40	60	13	630
GN 808.2-28-K14-200-60	28	K 14	200-60	37	40	60	13	719
GN 808.2-28-K14-220-80	28	K 14	220-80	37	40	60	13	785
GN 808.2-28-K14-280-140	28	K 14	280-140	37	40	60	13	965
GN 808.2-32-K16-190-30	32	K 16	190-30	37	40	68	16	900
GN 808.2-32-K16-240-80	32	K 16	240-80	42	40	68	16	1093
GN 808.2-32-K16-275-115	32	K 16	275-115	42	40	68	16	1245
GN 808.2-32-K16-380-210	32	K 16	380-210	42	40	68	16	1600

### GN 808.2

Description	d1	d2 H7	l1-l2	d3	l3	l5	t	$\Delta$
GN 808.2-36-K18-230-50	36	K 18	230-50	52	40	74	17	1368
GN 808.2-36-K18-270-100	36	K 18	270-100	52	40	74	17	1560
GN 808.2-36-K18-290-110	36	K 18	290-110	58	40	74	17	1665
GN 808.2-36-K18-400-220	36	K 18	400-220	58	40	74	17	2225
GN 808.2-42-K20-250-50	42	K 20	250-50	42	45	82	18	1990
GN 808.2-42-K20-320-120	42	K 20	320-120	42	45	82	18	2400
GN 808.2-42-K20-420-220	42	K 20	420-220	42	45	82	18	3130
GN 808.2-45-K22-270-50	45	K 22	270-50	45	50	95	22	2520
GN 808.2-45-K22-330-100	45	K 22	330-100	45	50	95	22	3010
GN 808.2-45-K22-470-240	45	K 22	470-240	45	50	95	22	4140
GN 808.2-50-K25-295-50	50	K 25	295-50	50	50	108	26	3400
GN 808.2-50-K25-350-100	50	K 25	350-100	50	50	108	26	3920
GN 808.2-50-K25-420-170	50	K 25	420-170	50	50	108	26	4605
GN 808.2-58-K30-330-50	58	K 30	330-50	58	60	122	29	4880
GN 808.2-58-K30-400-110	58	K 30	400-110	58	60	122	29	5880

## Universal joint shafts with needle bearing with longitudinal compensation

### SPECIFICATION

#### Bore codes

- Version **K**: with keyway

Steel blank

Joint bearing areas, pins case hardened

### INFORMATION

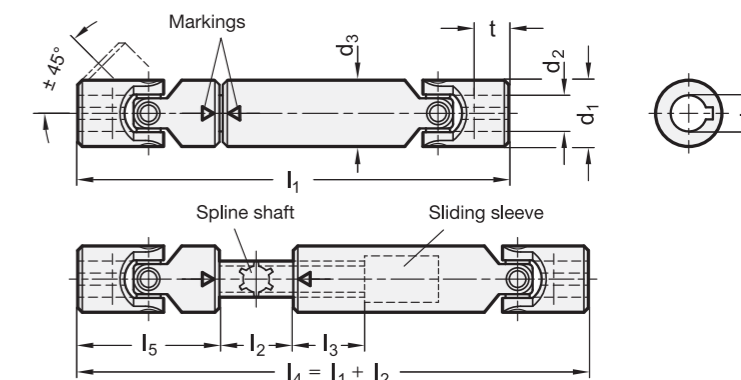
Universal joint shafts with needle bearing GN 808.3 not only join the offset between two shafts, but also enable the alignment of lengths, which depending on the overall length  $l_1$  enables the corresponding extraction length  $l_2$ . The power transmission is achieved by two universal joints DIN 808 (type EW) (see page 1126) a splined shaft and a sliding sleeve. It is important to check the accuracy when connecting the splined shaft to the sliding sleeve. The markings  $\rightarrow$   $\leftarrow$  have to be opposite to each other. Any kind of misconnection leads to an inhomogeneous output and to a quick abrasion.

### ON REQUEST

- different length  $l_1$  -  $l_2$
- Bores without keyway
- Bores with square
- with other or unequal bores

### TECHNICAL INFORMATION

- Permissible r.p.m. and torque (see page 1125)
- Keyway DIN 6885 (see page A16)
- Cross holes GN 110 (see page A17)
- ISO-Fundamental Tolerances (see page A21)



### GN 808.3

Description	d1	d2 H7	l1-l2	d3	l3	l5	t	$\Delta$
GN 808.3-22-K10-140-30	22	K 10	140-30	22	30	48	12	320
GN 808.3-22-K10-160-40	22	K 10	160-40	22	30	48	12	360
GN 808.3-22-K10-180-60	22	K 10	180-60	22	30	48	12	395
GN 808.3-25-K12-160-30	25	K 12	160-30	26	40	56	13	500
GN 808.3-25-K12-180-45	25	K 12	180-45	26	40	56	13	510
GN 808.3-25-K12-200-70	25	K 12	200-70	26	40	56	13	563
GN 808.3-25-K12-250-105	25	K 12	250-105	26	40	56	13	755
GN 808.3-28-K14-170-30	28	K 14	170-30	29	40	60	13	627
GN 808.3-28-K14-200-60	28	K 14	200-60	29	40	60	13	730
GN 808.3-28-K14-220-80	28	K 14	220-80	29	40	60	13	804
GN 808.3-28-K14-280-140	28	K 14	280-140	29	40	60	13	972
GN 808.3-32-K16-190-30	32	K 16	190-30	32	40	68	16	910
GN 808.3-32-K16-240-80	32	K 16	240-80	32	40	68	16	1106
GN 808.3-32-K16-275-115	32	K 16	275-115	32	40	68	16	1250
GN 808.3-32-K16-380-210	32	K 16	380-210	32	40	68	16	1640

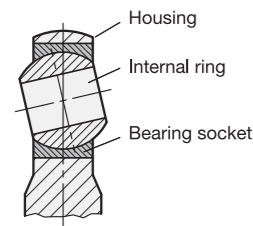
### GN 808.3

Description	d1	d2 H7	l1-l2	d3	l3	l5	t	$\Delta$
GN 808.3-36-K18-230-50	36	K 18	230-50	37	40	74	17	1355
GN 808.3-36-K18-270-100	36	K 18	270-100	37	40	74	17	1575
GN 808.3-36-K18-290-110	36	K 18	290-110	37	40	74	17	1900
GN 808.3-36-K18-400-220	36	K 18	400-220	37	40	74	17	2241
GN 808.3-42-K20-250-50	42	K 20	250-50	42	45	82	18	1947
GN 808.3-42-K20-320-120	42	K 20	320-120	42	45	82	18	2480
GN 808.3-42-K20-420-220	42	K 20	420-220	42	45	82	18	3130
GN 808.3-45-K22-270-50	45	K 22	270-50	47	50	95	22	2540
GN 808.3-45-K22-330-100	45	K 22	330-100	47	50	95	22	3060
GN 808.3-45-K22-470-240	45	K 22	470-240	47	50	95	22	4140
GN 808.3-50-K25-295-50	50	K 25	295-50	52	50	108	26	3375
GN 808.3-50-K25-350-100	50	K 25	350-100	52	50	108	26	3940
GN 808.3-50-K25-420-170	50	K 25	420-170	52	50	108	26	4680
GN 808.3-58-K30-330-50	58	K 30	330-50	58	60	122	29	4900
GN 808.3-58-K30-400-110	58	K 30	400-110	58	60	122	29	5800



# Ball joint heads DIN ISO 12240-4 / DIN 12240-1, Series K

## Technical information



### Steel version

#### Type N

Housing steel, zinc plated  
Pairings  
Internal ring steel, hardened  
Bearing socket brass  
**lubrication possible.**

#### Type W

Housing steel, zinc plated  
Pairings  
Internal ring steel, hardened  
Bearing socket steel, zinc plated with PTFE-insert  
**self lubricated.**

### Features of general use:

For general use, and in particular for continuously changing thrust and shock loads in radial and axial plane.

For general use, especially for application under dynamic operating conditions.  
Load bearing capacity than Type N.

### Stainless Steel version

#### Type NH

Housing Stainless Steel  
Pairings  
Internal ring, hardened, hard chrome plated  
Bearing socket bronze  
**lubrication possible.**

#### Type WH

Housing Stainless Steel  
Pairings  
Internal ring steel, hardened  
Bearing socket bronze, with PTFE-insert  
**self lubricated.**

#### Type WK

Housing Stainless Steel  
Pairings  
Internal ring Stainless Steel, hardened  
Bearing socket Stainless Steel, with PTFE-insert  
**self lubricated.**

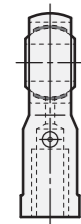
As Type N for use in corrosion endangered area.

As Type W for use in corrosion endangered area.

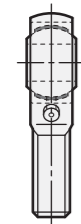
As Type W for use in areas where the highest degree of corrosion resistance is of paramount importance. Such as for instance in the food industry.

### Ball joint heads

with female thread

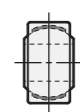


with threaded bolt



### Ball joints

without housing



### Bearing play

Bearing play refers to the amount of play by which the internal ring inside a bearing socket without lubrication can be moved either a radial or an axial plane.

Types N, NH lubrication possible		Types W, WH, WK self lubricated		
d1	Radial bearing play	d1	Radial bearing play	Axial bearing play
5 ... 10	0.005 ... 0.035	5 ... 10	0.005 ... 0.030	2 to 3 times radial play
12 ... 20	0.010 ... 0.040	12 ... 18	0.005 ... 0.035	
22 ... 30	0.010 ... 0.050	20 ... 30	0.005 ... 0.055	

Load applied to obtain the measured results: 100 N at room temperature.

### Lubrication

Ball joint heads of type N (lubrication possible) require regular lubrication. On delivery the ball joint heads are not lubricated. The initial lubrication takes place when installed. Within the temperature range of -20 °C to +125 °C, a multipurpose grease proved to be adequate. Under extreme conditions a high quality grease such as for instance Gleitmo 805 K should be used. Ball joint heads of the type W (self lubricated) **must never be lubricated.** The internal ring moves on a PTFE-insert of the bearing socket.

# Ball joint heads DIN ISO 12240-4 / DIN ISO 12240-1, Series K

## Technical information

### Operating temperature

Ball joint heads of the type N (lubrication possible) can be used within the temperature range -50 °C to +200 °C and if use with a high temperature grease even higher. Ball joint heads of the type W (self lubricated) can be used in the temperature range of -50 °C bis +200 °C. In general use at higher temperature is possible, but this will of course shorten the working life of the head.

### Load values

Load values are bearing related values, arrived at from the raw material data of the basic material of construction used. The latter is used to determine the choice of a ball joint head for a given load. These might, however, have to be reduced to meet the requirements of particular circumstances.

### Static load values Co in kN

Co gives the permitted radial static load which can be applied to a ball joint head with the weakest cross section without causing permanent deformation. The Co-values quoted in the catalogue table have been calculated, based on the corresponding raw material specification. Subsequently a random number of the ball joint heads was stress tested at room temperature. Each and every time the stress tests were based on using up to 80 % before the onset of deformation thus leaving a safety factor of 1.25. The static value Co is used to obtain the permissible axial load which in general is limited by the mounting strength of the internal bearing. To obtain the maximum axial load Fa tests were carried out at the largest permissible slant angle and the results obtained are shown in the table below:

Fa = 0.4 Co for type N

Fa = 0.2 Co for types NH, W, WH, WK

d1 Size	GN 648.1		GN 648.2		GN 648.5	GN 648.6		GN 648.8		GN 648.9
	Type N	Type W	Type N	Type W	Type NH/WH/WK	Type NH/WH/WK	Type N	Type W	Type WK	
5	9.9	8	4.3	4.3	11.8	6.2	19.8	12.5	12.5	
6	11.9	8.9	6	6	13.1	8.8	25.8	15.5	15.5	
8	17.1	14.1	11	11	20.7	16.1	42.6	27.8	27.8	
10	21.4	19.3	17.4	17.4	28.3	25.5	60	39.0	39.0	
12	27	23.5	25.5	23.5	34.5	34.5	80	53.5	53.5	
14	24.5	21	24.5	21	39.5	39.5	102.5	70	70	
16	37	32	36.5	32	60.5	60.5	128.5	88	88	
18	43	38.5	43	38.5	73	73	157	106.5	106.5	
20	49.5	44	49.5	44	83	83	188.5	130	130	
22	57	53	57	53	100	100	229	162	162	
25	68	62	68	61	118	118	293	204	204	
30	82	82	82	82	155	155	381	281	281	

### Dynamic load value C in kN

They help to evaluate the length of life for ball joint heads when use under dynamic conditions.

d1 Size	GN 648.1 / GN 648.2		GN 648.5/6		GN 648.8		GN 648.9
	Type N	Type W	Type NH	Type WH/WK	Type N	Type W	Type WK
5	2.5	7.5	3.3	7.5	3.3	7.5	7.5
6	3.2	9.3	4.3	9.3	4.3	9.3	9.3
8	5.4	16.7	7.1	16.7	7.1	16.7	16.7
10	7.5	23.4	10	23.4	10	23.4	23.4
12	10	32	13.5	32	13.5	32.0	32.0
14	13	42	17	42	17	42.0	42.0
16	16	52.5	21.5	52.5	21.5	52.5	52.5
18	19.5	64	26	64	26	64.0	64.0
20	23.5	78	31.5	78	31.5	78.0	78.0
22	29	97	38	97	38	97.0	97.0
25	35	122	47	122	47	122	122
30	64	168	64	168	64	168	168

# Ball joint heads with female thread

## SPECIFICATION

### Types (pairings)

- Type **N**: Brass / Steel lubrication possible
- Type **W**: Steel-PTFE / Steel self lubricated

### Housing Steel

- zinc plated, blue passivated
- d<sub>1</sub> = 5 up to 12: machined
- d<sub>1</sub> = 14 up to 25: forged

### Pairings

Type N (lubrication possible)

Bearing socket  
Brass, CuZn40Al1

Internal ring  
Steel, 100Cr6  
hardened, ground, polished

Type W (self lubricated)

Bearing socket  
Steel, zinc plated  
with PTFE-insert

Internal ring  
Steel, 100Cr6  
hardened, ground, polished



## INFORMATION

Ball joint heads GN 648.1 are similar to DIN ISO 12240-4, series K (formerly DIN 648 K).

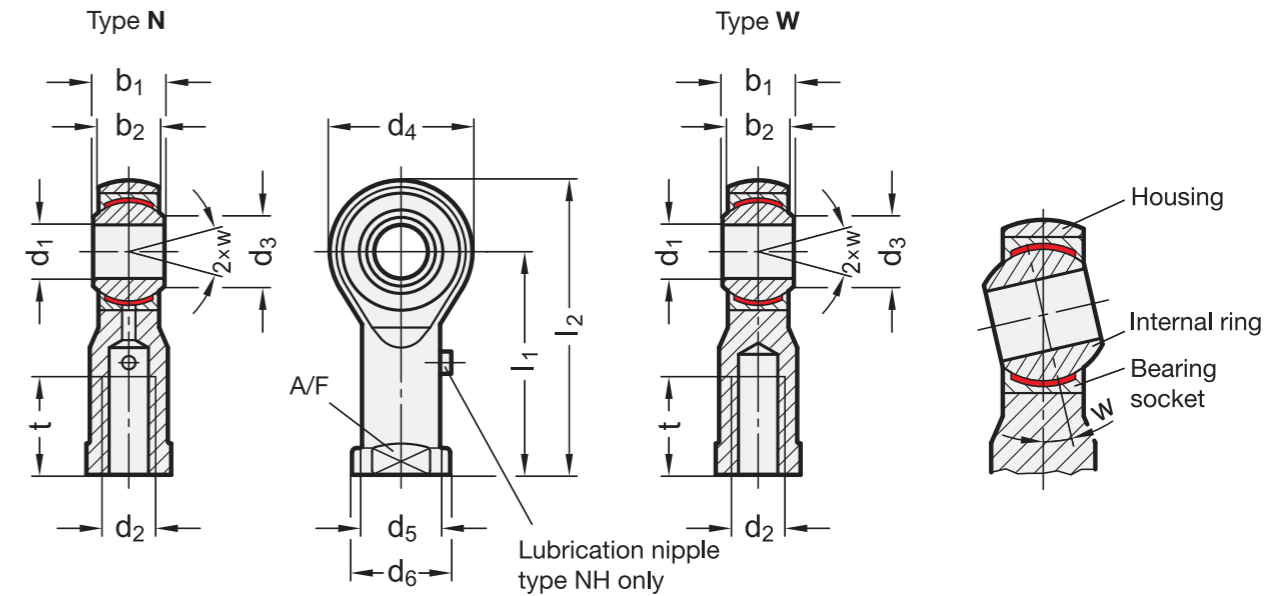
- More information to ball joints as well as load capacity (see page 1134)

## ON REQUEST

- narrow model (ISO 12240-1, series E)

## TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)



\* Complete with type index of the Ball joint heads  
N W

## GN 648.1

Description	d1 H7	d2	b1 -0.12	b2	d3	d4	d5	d6	l1	l2	A/F	t	w	α
GN 648.1-5-M4-*	5	M 4***	8	6	7.7	18	9	11	27	36	9	10	13°	19
GN 648.1-5-M5-*	5	M 5	8	6	7.7	18	9	11	27	36	9	10	13°	20
GN 648.1-5-M5L-*	5	M 5L	8	6	7.7	18	9	11	27	36	9	10	13°	19
GN 648.1-6-M6-*	6	M 6	9	6.75	8.9	20	10	13	30	40	11	12	13°	25
GN 648.1-6-M6L-*	6	M 6L	9	6.75	8.9	20	10	13	30	40	11	12	13°	25
GN 648.1-8-M8-*	8	M 8	12	9	10.4	24	12.5	16	36	48	13	16	14°	45
GN 648.1-8-M8L-*	8	M 8L	12	9	10.4	24	12.5	16	36	48	13	16	14°	45
GN 648.1-10-M10-*	10	M 10	14	10.5	12.9	28	15	19	43	57	17	20	13°	75
GN 648.1-10-M10L-*	10	M 10L	14	10.5	12.9	28	15	19	43	57	17	20	13°	74
GN 648.1-10-M10x1.25-*	10	M 10 x 1.25***	14	10.5	12.9	28	15	19	43	57	17	20	13°	75
GN 648.1-12-M12-*	12	M 12	16	12	15.4	32	17.5	22	50	66	19	22	13°	110
GN 648.1-12-M12L-*	12	M 12L	16	12	15.4	32	17.5	22	50	66	19	22	13°	111
GN 648.1-12-M12x1.25-*	12	M 12 x 1.25***	16	12	15.4	32	17.5	22	50	66	19	22	13°	110
GN 648.1-14-M14-*	14	M 14	19	13.5	16.8	36	20	25	57	75	22	25	16°	167
GN 648.1-14-M14L-*	14	M 14L	19	13.5	16.8	36	20	25	57	75	22	25	16°	167
GN 648.1-16-M16-*	16	M 16	21	15	19.3	42	22	27	64	85	22	28	15°	225
GN 648.1-16-M16L-*	16	M 16L	21	15	19.3	42	22	27	64	85	22	28	15°	224
GN 648.1-16-M16x1.5-*	16	M 16 x 1.5***	21	15	19.3	42	22	27	64	85	22	28	15°	225
GN 648.1-18-M18x1.5-*	18	M 18 x 1.5	23	16.5	21.8	46	25	31	71	94	27	32	15°	318
GN 648.1-18-M18x1.5L-*	18	M 18 x 1.5L	23	16.5	21.8	46	25	31	71	94	27	32	15°	320
GN 648.1-20-M20x1.5-*	20	M 20 x 1.5	25	18	24.3	50	27.5	34	77	102	32	33	14°	405
GN 648.1-20-M20x1.5L-*	20	M 20 x 1.5L	25	18	24.3	50	27.5	34	77	102	32	33	14°	408
GN 648.1-22-M22x1.5-*	22	M 22 x 1.5	28	20	25.8	54	30	37	84	111	32	37	15°	505
GN 648.1-22-M22x1.5L-*	22	M 22 x 1.5L	28	20	25.8	54	30	37	84	111	32	37	15°	512
GN 648.1-25-M24x2-*	25	M 24 x 2	31	22	29.6	60	33.5	42	94	124	36	42	15°	720
GN 648.1-25-M24x2L-*	25	M 24 x 2L	31	22	29.6	60	33.5	42	94	124	36	42	15°	725
GN 648.1-30-M30x2-*	30**	M 30 x 2	37	25	34.8	70	40	51	110	145	41	51	17°	1100
GN 648.1-30-M30x2L-*	30**	M 30 x 2L	37	25	34.8	70	40	51	110	145	41	51	17°	1130

\*\* only available in type W | \*\*\* Cetop

Weight type W

## Ball joints heads with threaded bolt

### SPECIFICATION

#### Types (pairings)

- Type **N**: Brass / Steel lubrication possible
- Type **W**: Steel-PTFE / Steel self lubricated

#### Housing Steel

- zinc plated, blue passivated
- d<sub>1</sub> = 5 up to 12: machined
- d<sub>1</sub> = 14 up to 25: forged

#### Pairings

##### Type N (lubrication possible)

Bearing socket  
Brass, CuZn40Al1

Internal ring  
Steel, 100Cr6  
hardened, ground, polished

##### Type W (self lubricated)

Bearing socket  
Steel, zinc plated  
with PTFE-insert

Internal ring  
Steel, 100Cr6  
hardened, ground, polished



### INFORMATION

Ball joint heads GN 648.2 are similar to DIN ISO 12240-4, series K (formerly DIN 648 K).

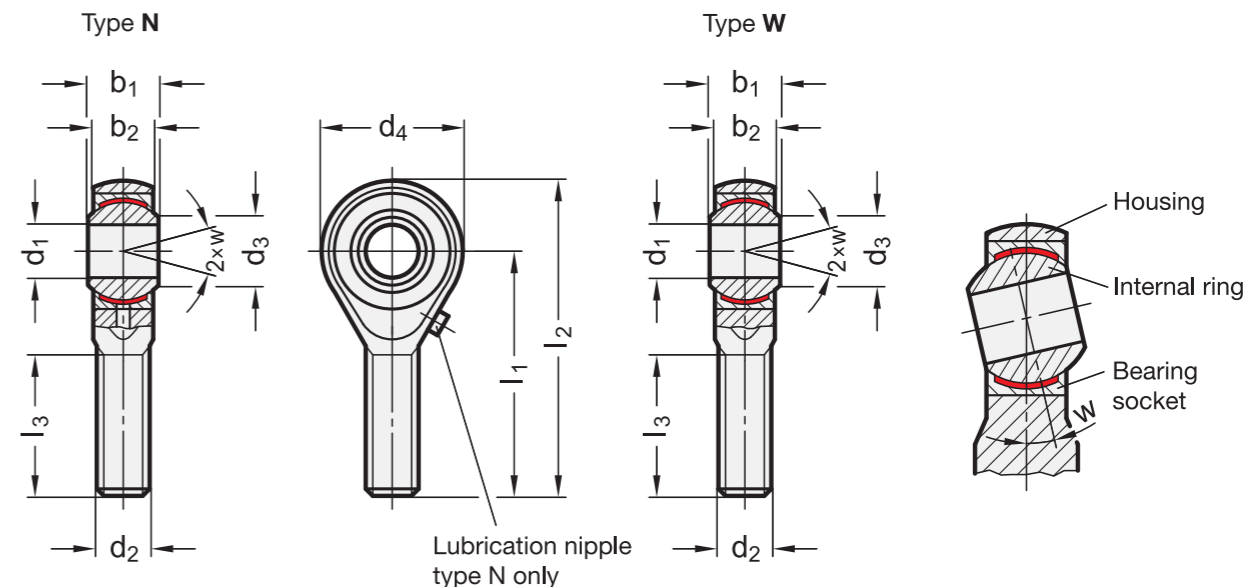
- More information to ball joints as well as load capacity (see page 1134)

### ON REQUEST

- narrow model (ISO 12240-1, series E)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)



\* Complete with type index of the Ball joint heads

N W

### GN 648.2

Description	d1 H7	d2	b1 -0.12	b2	d3	d4	l1	l2	l3	w	⚖️
GN 648.2-5-M5-*	5**	M 5	8	6	7.7	18	33	42	20	13 °	15
GN 648.2-5-M5L-*	5**	M 5L	8	6	7.7	18	33	42	20	13 °	15
GN 648.2-6-M6-*	6	M 6	9	6.75	8.9	20	36	46	22	13 °	20
GN 648.2-6-M6L-*	6	M 6L	9	6.75	8.9	20	36	46	22	13 °	20
GN 648.2-8-M8-*	8	M 8	12	9	10.4	24	42	54	25	14 °	40
GN 648.2-8-M8L-*	8	M 8L	12	9	10.4	24	42	54	25	14 °	40
GN 648.2-10-M10-*	10	M 10	14	10.5	12.9	28	48	62	29	13 °	60
GN 648.2-10-M10L-*	10	M 10L	14	10.5	12.9	28	48	62	29	13 °	60
GN 648.2-12-M12-*	12	M 12	16	12	15.4	32	54	70	33	13 °	90
GN 648.2-12-M12L-*	12	M 12L	16	12	15.4	32	54	70	33	13 °	90
GN 648.2-14-M14-*	14	M 14	19	13.5	16.8	36	60	78	38	16 °	135
GN 648.2-14-M14L-*	14	M 14L	19	13.5	16.8	36	60	78	38	16 °	135
GN 648.2-16-M16-*	16	M 16	21	15	19.3	42	66	87	40	15 °	205
GN 648.2-16-M16L-*	16	M 16L	21	15	19.3	42	66	87	40	15 °	205
GN 648.2-18-M18x1.5-*	18	M 18 x 1.5	23	16.5	21.8	46	72	95	44	15 °	270
GN 648.2-18-M18x1.5L-*	18	M 18 x 1.5L	23	16.5	21.8	46	72	95	44	15 °	270
GN 648.2-20-M20x1.5-*	20	M 20 x 1.5	25	18	24.3	50	78	103	47	14 °	355
GN 648.2-20-M20x1.5L-*	20	M 20 x 1.5L	25	18	24.3	50	78	103	47	14 °	355
GN 648.2-22-M22x1.5-*	22	M 22 x 1.5	28	20	25.8	54	84	111	51	15 °	455
GN 648.2-22-M22x1.5L-*	22	M 22 x 1.5L	28	20	25.8	54	84	111	51	15 °	460
GN 648.2-25-M24x2-*	25	M 24 x 2	31	22	29.6	60	94	124	58	15 °	605
GN 648.2-25-M24x2L-*	25	M 24 x 2L	31	22	29.6	60	94	124	58	15 °	600
GN 648.2-30-M30x2-*	30***	M 30 x 2	37	25	34.8	70	110	145	71	17 °	1020
GN 648.2-30-M30x2L-*	30***	M 30 x 2L	37	25	34.8	70	110	145	71	17 °	1020

\*\* d<sub>1</sub> = 5 type N no lubrication possible | \*\*\* only available in type W

Weight type W

## Stainless Steel-Ball joint heads with female thread

### SPECIFICATION

#### Types (pairings)

- Type **NH**: Bronze / Steel lubrication possible
- Type **WH**: Bronze-PTFE / Steel self lubricated
- Type **WK**: Stainless Steel-PTFE / Stainless Steel, self lubricated

Housing Stainless Steel AISI 431  
forged, polished

#### Pairings

Type NH (lubrication possible)  
Bearing socket Bronze CuSn8

Internal ring Steel 100 Cr6  
hardened, ground, polished

#### hard chrome plated

Type WH (self lubricated)  
Bearing socket Bronze CuSn8  
with PTFE-insert

Internal ring Steel 100Cr6  
hardened, ground, polished

#### hard chrome plated

Type WK (self lubricated)  
Bearing socket, Stainless Steel  
AISI 316Ti with PTFE-insert

Internal ring  
Stainless Steel AISI 420  
hardened, ground, polished

### INFORMATION

Ball joint heads GN 648.5 are similar to DIN ISO 12240-4, series K (formerly DIN 648 K).

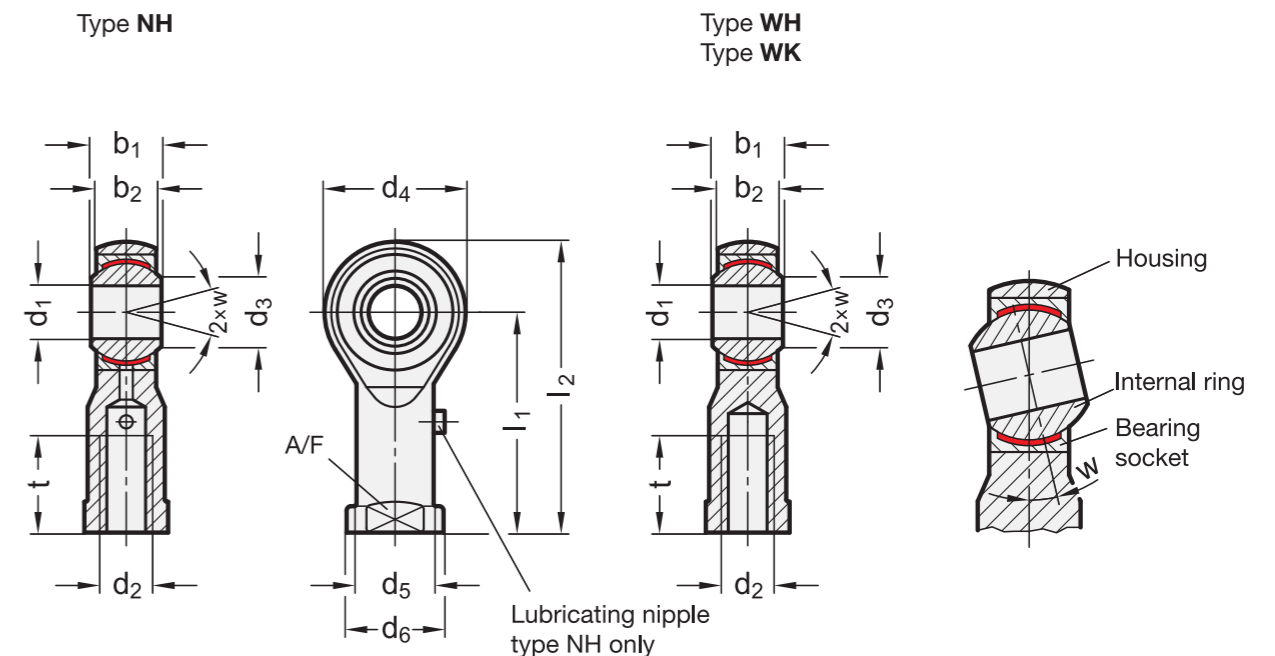
- More information to ball joints as well as load capacity (see page 1134)

### ON REQUEST

- narrow model (ISO 12240-1, series E)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A26)



\* Complete with type index of the Ball joint heads

NH WH WK

### GN 648.5

### STAINLESS STEEL

Description	d1 H7	d2	b1 -0.12	b2	d3	d4	d5	d6	l1	l2	A/F	t	w	α
GN 648.5-5-M5-*	5	M 5	8	6	7.7	18	9	11	27	36	9	10	13°	19
GN 648.5-5-M5L-*	5	M 5L	8	6	7.7	18	9	11	27	36	9	10	13°	19
GN 648.5-6-M6-*	6	M 6	9	6.75	8.9	20	10	13	30	40	11	12	13°	26
GN 648.5-6-M6L-*	6	M 6L	9	6.75	8.9	20	10	13	30	40	11	12	13°	26
GN 648.5-8-M8-*	8	M 8	12	9	10.4	24	12.5	16	36	48	13	16	14°	48
GN 648.5-8-M8L-*	8	M 8L	12	9	10.4	24	12.5	16	36	48	13	16	14°	47
GN 648.5-10-M10-*	10	M 10	14	10.5	12.9	28	15	19	43	57	17	20	13°	76
GN 648.5-10-M10L-*	10	M 10L	14	10.5	12.9	28	15	19	43	57	17	20	13°	75
GN 648.5-12-M12-*	12	M 12	16	12	15.4	32	17.5	22	50	66	19	22	13°	112
GN 648.5-12-M12L-*	12	M 12L	16	12	15.4	32	17.5	22	50	66	19	22	13°	111
GN 648.5-14-M14-*	14	M 14	19	13.5	16.8	36	20	25	57	75	22	25	16°	165
GN 648.5-14-M14L-*	14	M 14L	19	13.5	16.8	36	20	25	57	75	22	25	16°	163
GN 648.5-16-M16-*	16	M 16	21	15	19.3	42	22	27	64	85	22	28	15°	227
GN 648.5-16-M16L-*	16	M 16L	21	15	19.3	42	22	27	64	85	22	28	15°	225
GN 648.5-18-M18x1.5-*	18	M 18 x 1.5	23	16.5	21.8	46	25	31	71	94	27	32	15°	309
GN 648.5-18-M18x1.5L-*	18	M 18 x 1.5L	23	16.5	21.8	46	25	31	71	94	27	32	15°	308
GN 648.5-20-M20x1.5-*	20	M 20 x 1.5	25	18	24.3	50	27.5	34	77	102	32	33	14°	401
GN 648.5-20-M20x1.5L-*	20	M 20 x 1.5L	25	18	24.3	50	27.5	34	77	102	32	33	14°	400
GN 648.5-22-M22x1.5-*	22	M 22 x 1.5	28	20	25.8	54	30	37	84	111	32	37	15°	517
GN 648.5-22-M22x1.5L-*	22	M 22 x 1.5L	28	20	25.8	54	30	37	84	111	32	37	15°	517
GN 648.5-25-M24x2-*	25	M 24 x 2	31	22	29.6	60	33.5	42	94	124	36	42	15°	734
GN 648.5-25-M24x2L-*	25	M 24 x 2L	31	22	29.6	60	33.5	42	94	124	36	42	15°	732
GN 648.5-30-M30x2-*	30	M 30 x 2	37	25	34.8	70	40	51	110	145	41	51	17°	1130
GN 648.5-30-M30x2L-*	30	M 30 x 2L	37	25	34.8	70	40	51	110	145	41	51	17°	1130

Weight type NH

## Stainless Steel-Ball joint heads with threaded bolt

### SPECIFICATION

#### Types (pairings)

- Type **NH**: Bronze / Steel lubrication possible
- Type **WH**: Bronze-PTFE / Steel self lubricated
- Type **WK**: Stainless Steel-PTFE / Stainless Steel self lubricated

Housing Stainless Steel AISI 431  
forged, polished

#### Pairings

Type NH (lubrication possible)  
Bearing socket Bronze CuSn8

Internal ring Steel 100 Cr6  
hardened, ground, polished

#### hard chrome plated

Type WH (self lubricated)  
Bearing socket Bronze CuSn8  
with PTFE-insert

Internal ring Steel 100Cr6  
hardened, ground, polished

#### hard chrome plated

Type WK (self lubricated)  
Bearing socket, Stainless Steel AISI 316Ti  
with PTFE-insert

Internal ring  
Stainless Steel AISI 420  
hardened, ground, polished



### INFORMATION

Ball joint heads GN 648.6 are similar to DIN ISO 12240-4, series K (formerly DIN 648 K).

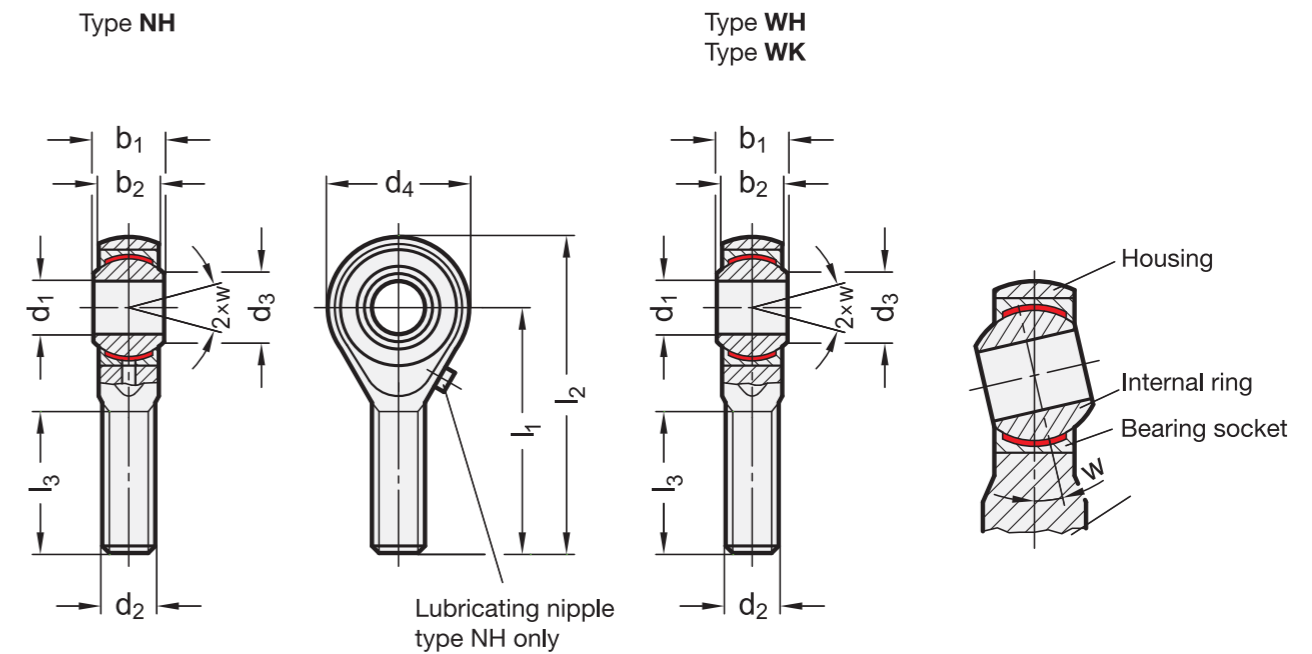
- More information to ball joints as well as load capacity (see page 1134)

### ON REQUEST

- narrow model (ISO 12240-1, series E)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A24)



\* Complete with type index of the Ball joint heads

NH WH WK

### GN 648.6

### STAINLESS STEEL

Description	d1 H7	d2	b1 -0.12	b2	d3	d4	l1	l2	l3	w	α
GN 648.6-5-M5-*	5**	M 5	8	6	7.7	18	33	42	20	13°	15
GN 648.6-5-M5L-*	5**	M 5L	8	6	7.7	18	33	42	20	13°	15
GN 648.6-6-M6-*	6	M 6	9	6.75	8.9	20	36	46	22	13°	20
GN 648.6-6-M6L-*	6	M 6L	9	6.75	8.9	20	36	46	22	13°	20
GN 648.6-8-M8-*	8	M 8	12	9	10.4	24	42	54	25	14°	40
GN 648.6-8-M8L-*	8	M 8L	12	9	10.4	24	42	54	25	14°	40
GN 648.6-10-M10-*	10	M 10	14	10.5	12.9	28	48	62	29	13°	63
GN 648.6-10-M10L-*	10	M 10L	14	10.5	12.9	28	48	62	29	13°	62
GN 648.6-12-M12-*	12	M 12	16	12	15.4	32	54	70	33	13°	96
GN 648.6-12-M12L-*	12	M 12L	16	12	15.4	32	54	70	33	13°	95
GN 648.6-14-M14-*	14	M 14	19	13.5	16.8	36	60	78	38	16°	133
GN 648.6-14-M14L-*	14	M 14L	19	13.5	16.8	36	60	78	38	16°	135
GN 648.6-16-M16-*	16	M 16	21	15	19.3	42	66	87	40	15°	203
GN 648.6-16-M16L-*	16	M 16L	21	15	19.3	42	66	87	40	15°	202
GN 648.6-18-M18x1.5-*	18	M 18 x 1.5	23	16.5	21.8	46	72	95	44	15°	278
GN 648.6-18-M18x1.5L-*	18	M 18 x 1.5L	23	16.5	21.8	46	72	95	44	15°	278
GN 648.6-20-M20x1.5-*	20	M 20 x 1.5	25	18	24.3	50	78	103	47	14°	354
GN 648.6-20-M20x1.5L-*	20	M 20 x 1.5L	25	18	24.3	50	78	103	47	14°	351
GN 648.6-22-M22x1.5-*	22	M 22 x 1.5	28	20	25.8	54	84	111	51	15°	460
GN 648.6-22-M22x1.5L-*	22	M 22 x 1.5L	28	20	25.8	54	84	111	51	15°	463
GN 648.6-25-M24x2-*	25	M 24 x 2	31	22	29.6	60	94	124	58	15°	631
GN 648.6-25-M24x2L-*	25	M 24 x 2L	31	22	29.6	60	94	124	58	15°	610
GN 648.6-30-M30x2-*	30	M 30 x 2	37	25	34.8	70	110	145	71	17°	1030
GN 648.6-30-M30x2L-*	30	M 30 x 2L	37	25	34.8	70	110	145	71	17°	1020

\*\* d1 = 5 type NH no lubrication possible

Weight type NH

## Rod ends

### Technopolymer

#### MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer.

#### ROD SPHERICAL CAP

Polyamide-based self-lubricating technopolymer (PA).

#### STANDARD EXECUTIONS

- **BJT:** with threaded hole.
- **BJT-p:** with threaded pin.

#### FEATURES AND APPLICATIONS

BJT. rod ends are remarkably suitable for rotary, oscillating and linear movements even in particularly aggressive environments and when water or humidity, fine dusts, dirt, fabrics and machining residues are present.

The shaft rotary movement can take place directly on the inner diameter of the spherical cap, made of self-lubricating material.

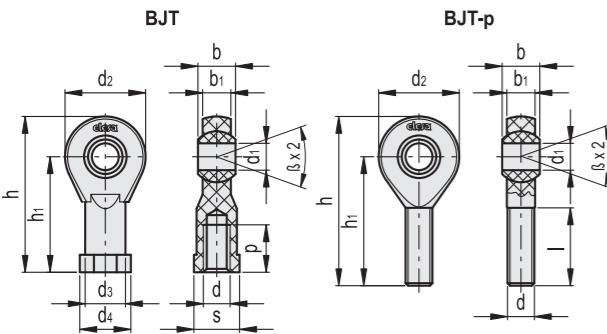
Features of the technopolymer rod ends:

- totally corrosion resistant even in the presence of chemicals;
- high strength to saline mist;
- high mechanical strength to the applied loads;
- lightness combined with high-rigidity;
- maintenance free;
- compensation of possible misalignments;
- absorption of vibrations and transverse stresses;
- noise minimization.



Resistance tests	Max static load under traction		Max transverse load	
	short term [N]	continuous [N]	short term [N]	continuous [N]
Description				
BJT-M6	1400	700	400	200
BJT-M8	2100	1050	700	350
BJT-M10	3100	1550	800	400
BJT-M10x1.25	3100	1550	800	400
BJT-M12	3600	1800	900	450
BJT-M12x1.25	3600	1800	900	450
BJT-M14	4000	2000	1000	500
BJT-p-M6-36	1000	500	100	50
BJT-p-M8-42	1700	850	200	100
BJT-p-M10-48	2500	1250	300	150
BJT-p-M10x1.25-48	2500	1250	300	150
BJT-p-M12-54	2700	1350	400	200
BJT-p-M12x1.25-54	2700	1350	400	200
BJT-p-M14-61	3400	1700	700	350

The strength values are the result of lab tests carried out under room temperature (23°C).



Code	Description	d	p	d1E10	d2	d3	d4	b	b1	h	h1	s	[Nm]*	[Nm]#	min. thread tightening depth [mm]	Max. oscillation angle β	⚠
470001	BJT-M6	M6	12	6	20	10	13	9	7	40	30	11	1.5	10	8	29°	5
470011	BJT-M8	M8	16	8	24	13	16	12	9	48	36	14	10	12	11	25°	9
470021	BJT-M10	M10	20	10	30	15	19	14	10.5	58	43	17	15	20	13	25°	15
470022	BJT-M10x1.25	M10x1.25	20	10	30	15	19	14	10.5	58	43	17	6	20	13	25°	15
470031	BJT-M12	M12	22	12	34	18	22	16	12	67	50	19	20	30	15	25°	20
470032	BJT-M12x1.25	M12x1.25	22	12	34	18	22	16	12	67	50	19	15	30	15	25°	20
470041	BJT-M14	M14	25	14	38	20	25	19	13.5	76	57	22	25	35	17	25°	31

Code	Description	d	d1E10	d2	l	b	b1	h	h1	[Nm]*	[Nm]#	min. thread tightening depth [mm]	Max. oscillation angle β	⚠
470101	BJT-p-M6-36	M6	6	20	21	9	7	46	36	0.5	10	15	29°	4
470111	BJT-p-M8-43	M8	8	24	25	12	9	55	43	2	12	18	25°	7
470121	BJT-p-M10-48	M10	10	30	28	14	10.5	63	48	5	20	20	25°	13
470122	BJT-p-M10x1.25-48	M10x1.25	10	30	28	14	10.5	63	48	3	20	20	25°	13
470131	BJT-p-M12-54	M12	12	34	32	16	12	71	54	6	30	22	25°	18
470132	BJT-p-M12x1.25-54	M12x1.25	12	34	32	16	12	71	54	6	30	22	25°	18
470141	BJT-p-M14-61	M14	14	38	36	19	13.5	80	61	12	35	25	25°	26

\* Max. thread tightening torque

# Max. cap tightening torque

## Ball joints

### SPECIFICATION

#### Types (pairings)

- Type **N**: Bronze / Steel, lubrication possible
- Type **W**: Steel-PTFE / Steel, self lubricated

#### Pairings

Type N (lubrication possible)  
Bearing socket  
Brass, CuSn8

Internal ring Steel 100 Cr6  
hardened, ground, polished

Type W (self lubricated)  
Bearing socket  
Steel, zinc plated  
with PTFE-insert

Internal ring  
Steel, 100Cr6  
hardened, ground, polished



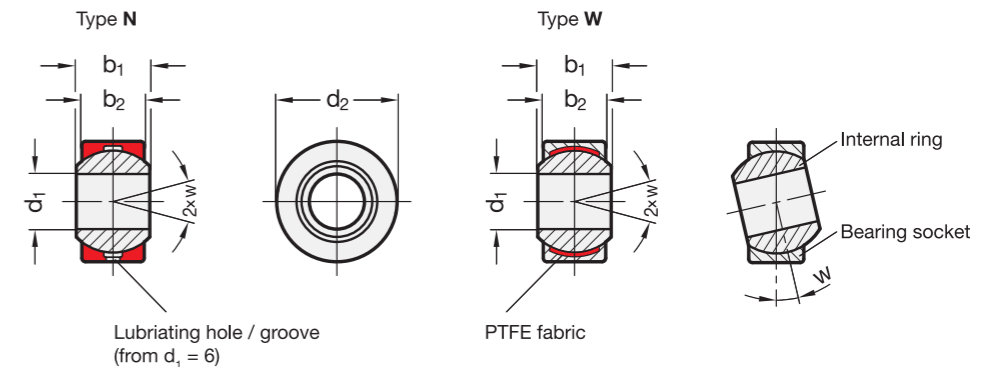
### INFORMATION

Ball joints GN 648.8 are similar to DIN ISO 12240-4, series K. These ball joints are integrated in the ball joint heads GN 648.1 (see page 1136) and GN 648.2 (see page 1138).

- More information to ball joints as well as load capacity (see page 1134)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)



\* Complete with type index of the Ball joints

N W

### GN 648.8

Description	d1 H7	d2 h6	b1 -0.2	b2	w	⚠
GN 648.8-5-13-*	5	13	8	6	13°	9
GN 648.8-6-16-*	6	16	9	6.75	13°	12
GN 648.8-8-19-*	8	19	12	9	14°	24
GN 648.8-10-22-*	10	22	14	10.5	13°	38
GN 648.8-12-26-*	12	26	16	12	13°	59
GN 648.8-14-28-*	14	28**	19	13.5	16°	85
GN 648.8-16-32-*	16	32	21	15	15°	116
GN 648.8-18-35-*	18	35	23	16.5	15°	154
GN 648.8-20-40-*	20	40	25	18	14°	202
GN 648.8-22-42-*	22	42	28	20	15°	230
GN 648.8-25-47-*	25	47	31	22	15°	254
GN 648.8-30-55-*	30	55	37	25	17°	362

\*\* DIN ISO 12240-1: Ø 29

## Stainless Steel-Ball joints

### SPECIFICATION

#### Type

Type **WK**: Stainless Steel-PTFE / Stainless Steel, self lubricated

Pairing

Type WK (self lubricated)

Bearing socket

Stainless Steel AISI 316Ti  
with PTFE-insert

Internal ring

Stainless Steel AISI 420  
hardened, ground, polished

### INFORMATION

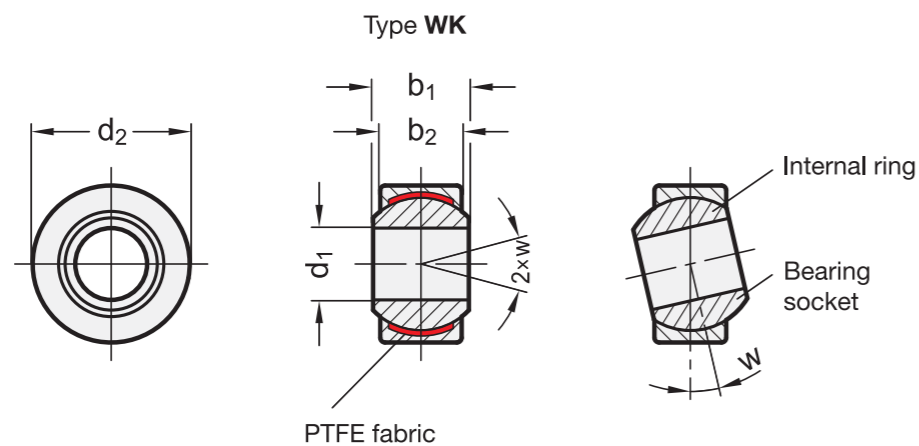
Stainless Steel-Ball joints GN 648.9 are similar to DIN ISO 12240-4, series K.

These ball joints are integrated in the ball joint heads GN 648.5 (see page 1140) and GN 648.6 (see page 1142).

- More information to ball joints as well as load capacity (see page 1134)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)



### GN 648.9

STAINLESS STEEL

Description	d1 H7	d2 h6	b1 -0.2	b2	w	α
GN 648.9-5-13-WK	5	13	8	6	13°	8
GN 648.9-6-16-WK	6	16	9	6.75	13°	12
GN 648.9-8-19-WK	8	19	12	9	14°	22
GN 648.9-10-22-WK	10	22	14	10.5	13°	36
GN 648.9-12-26-WK	12	26	16	12	13°	40
GN 648.9-14-28-WK	14	28*	19	13.5	16°	81
GN 648.9-16-32-WK	16	32	21	15	15°	111
GN 648.9-18-35-WK	18	35	23	16.5	15°	150
GN 648.9-20-40-WK	20	40	25	18	14°	140
GN 648.9-22-42-WK	22	42	28	20	15°	259
GN 648.9-25-47-WK	25	47	31	22	15°	355
GN 648.9-30-55-WK	30	55	37	25	17°	350

\* DIN ISO 12240-1: Ø 29

## Fork joints

with rotating shaft

### SPECIFICATION

#### Types

- Type **A**: without pin
- Type **KL**: Pin with KL-shaft safety
- Type **SL**: Pin with SL-shaft safety

Steel

- Tensile strength class 5
- zinc plated, blue passivated

Shaft safetys

- Spring steel
- hardened and tempered
- zinc plated, blue passivated

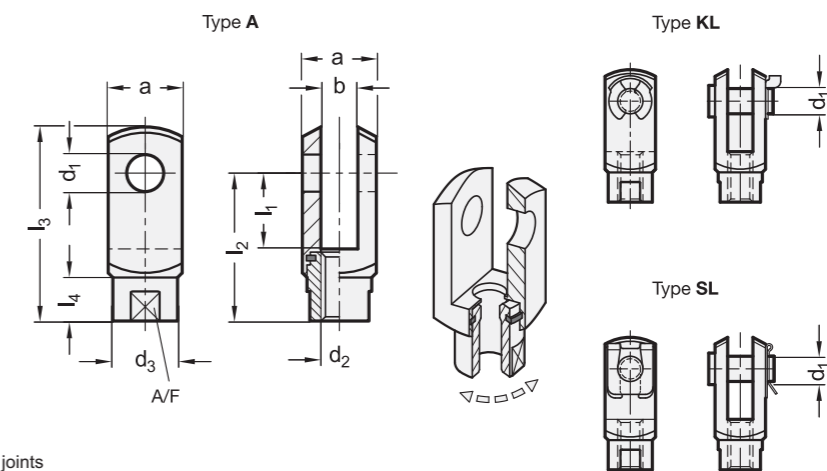
### INFORMATION

Fork joints GN 751.1 basically correspond to the fork head of DIN 71752 (Type A), but, unlike the DIN element, they have a rotating shaft and an additional bolt with axial shaft lock (Type KL and SL) which can be mounted and dismantled without tools (see page 1152).

The rotating shaft allows non-dynamic radial movements to be compensated, movements which may occur e.g. when using cable winches. Also, there is no need for the otherwise necessary alignment of joint heads during assembly.

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Strength values of nuts (see page A20)



\* Complete with type index of the Fork joints

A KL SL

### GN 751.1

Description	d1 H9/h11	l1	d2	a	b	d3	l2	l3	l4	A/F	Static max. load in N ≈	α
GN 751.1-5-10-M5-*	5	10	M 5	10	5	9	20	26	4	7	800	9
GN 751.1-5-20-M5-*	5	20	M 5	10	5	9	30	36	4	7	800	12
GN 751.1-6-12-M6-*	6	12	M 6	12	6	10	24	31	5.5	9	2400	15
GN 751.1-6-24-M6-*	6	24	M 6	12	6	10	36	43	5.5	9	2400	22
GN 751.1-8-16-M8-*	8	16	M 8	16	8	14	32	42	8	12	3400	38
GN 751.1-8-32-M8-*	8	32	M 8	16	8	14	48	58	8	12	3400	53
GN 751.1-10-20-M10-*	10	20	M 10	20	10	18	40	52	11.5	16	6000	74
GN 751.1-10-40-M10-*	10	40	M 10	20	10	18	60	72	11.5	16	6000	102
GN 751.1-12-24-M12-*	12	24	M 12	24	12	20	48	62	14	18	14000	122
GN 751.1-12-48-M12-*	12	48	M 12	24	12	20	72	86	14	18	14000	174

Weight type A

## Fork joints

### SPECIFICATION

#### Version in Steel

##### Types

Type **B**: Snap on spring pin  
Type **KL**: Pin with KL-shaft safety  
Type **SL**: Pin with SL-shaft safety  
(only for  $d_1 = 4 \dots 16$ )

##### Steel

- Tensile strength class 5
- zinc plated, blue passivated

##### Shaft safetys

- spring sheet metal
- hardened and tempered
- zinc plated, blue passivated

#### Version in Aluminium

##### Types

- Type **KL**: Pin with side mount ring
- Type **SL**: Pin with safety clip

##### Aluminium **AL**

anodized, black

##### KL- / SL-shaft safetys

- Spring steel
- hardened and tempered
- zinc plated, blue passivated

#### Version in Stainless Steel

##### Type

- Type **A**: Pin with reatining ring

##### Stainless Steel AISI 303 **NI**

uncoated

Safety circlip DIN 471

Stainless Steel

German Material No. 1.4122

### INFORMATION

Fork joints GN 751 consist of a fork head according DIN 71752 and a pin with KL-shaft (Type KL and SL) a pin with snap-on spring (Type B). Both versions can be dismantled without tools and monitor.

Size  $d_1 = 12$  is supplied with a fine thread M12x1.5 according to DIN. In practice, however, M12x1.25 is preferred. Standard DIN 71752 does not foresee size  $d_1 = 20$ .

### ON REQUEST

Fork heads in accordance with DIN 71752 (see page 1152) with  $d_1 = 25, 30, 35, 42$  and  $50$  (only Steel Version).



### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A26)

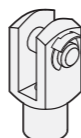
#### Types of fork joint shafts

Snap-on spring



The snap-on spring pin is easily mounted and dismantled. It is therefore particularly suitable for applications where the articulated connection needs to be loosened often.

KL-shaft safety

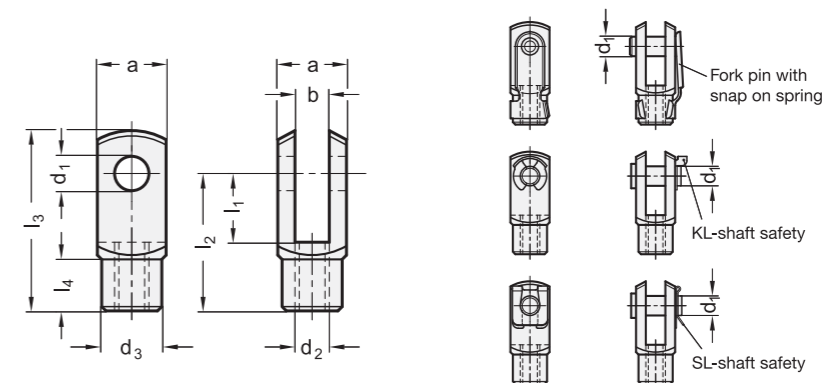


The pin with side mount ring can be fitted and dismantled without tools, i. e. by hand.

SL-shaft safety



The pin with safety clip requires a tool for dismantling (e.g. a screw driver). It is therefore better secured.



\* Complete with type index of Fork joints

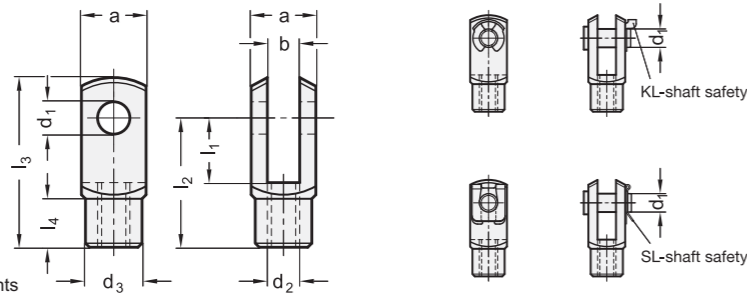
**B**      **KL**      **SL**

### GN 751-ST

Description	$d_1$ H9/h11	$l_1$	$d_2$	$a$	$b$	$d_3$	$l_2$	$l_3$	$l_4$	$\Delta$
GN 751-4-8-M4-*	4	8	M 4	8	4	8	16	21	6	7
GN 751-4-16-M4-*	4**	16	M 4	8	4	8	24	29	6	11
GN 751-5-10-M5L-*	5	10	M 5L	10	5	9	20	26	7.5	14
GN 751-5-10-M5-*	5	10	M 5	10	5	9	20	26	7.5	13
GN 751-5-20-M5L-*	5	20	M 5L	10	5	9	30	36	7.5	18
GN 751-5-20-M5-*	5	20	M 5	10	5	9	30	36	7.5	15
GN 751-6-12-M6L-*	6	12	M 6L	12	6	10	24	31	9	20
GN 751-6-12-M6-*	6	12	M 6	12	6	10	24	31	9	20
GN 751-6-24-M6L-*	6	24	M 6L	12	6	10	36	43	9	30
GN 751-6-24-M6-*	6	24	M 6	12	6	10	36	43	9	27
GN 751-8-16-M8L-*	8	16	M 8L	16	8	14	32	42	12	50
GN 751-8-16-M8F-*	8	16	M 8F = M8x1	16	8	14	32	42	12	49
GN 751-8-16-M8-*	8	16	M 8	16	8	14	32	42	12	48
GN 751-8-32-M8L-*	8	32	M 8L	16	8	14	48	58	12	65
GN 751-8-32-M8F-*	8	32	M 8F = M8x1	16	8	14	48	58	12	66
GN 751-8-32-M8-*	8	32	M 8	16	8	14	48	58	12	64
GN 751-10-20-M10L-*	10	20	M 10L	20	10	18	40	52	15	90
GN 751-10-20-M10F-*	10	20	M 10F = M10x1.25	20	10	18	40	52	15	90
GN 751-10-20-M10-*	10	20	M 10	20	10	18	40	52	15	93
GN 751-10-40-M10L-*	10	40	M 10L	20	10	18	60	72	15	120
GN 751-10-40-M10F-*	10	40	M 10F = M10x1.25	20	10	18	60	72	15	120
GN 751-10-40-M10-*	10	40	M 10	20	10	18	60	72	15	125
GN 751-12-24-M12L-*	12	24	M 12L	24	12	20	48	62	18	148
GN 751-12-24-M12F-*	12	24	M 12F = M12x1.25	24	12	20	48	62	18	151
GN 751-12-24-M12-*	12	24	M 12	24	12	20	48	62	18	140
GN 751-12-48-M12L-*	12	48	M 12L	24	12	20	72	86	18	206
GN 751-12-48-M12F-*	12	48	M 12F = M12x1.25	24	12	20	72	86	18	204
GN 751-12-48-M12-*	12	48	M 12	24	12	20	72	86	18	200
GN 751-14-28-M14L-*	14	28	M 14L	28	14	24	56	72	22.5	221
GN 751-14-28-M14F-*	14	28	M 14F = M14x1.5	28	14	24	56	72	22.5	218
GN 751-14-28-M14-*	14	28	M 14	28	14	24	56	72	22.5	219
GN 751-14-56-M14L-*	14	56	M 14L	28	14	24	85	101	22.5	302
GN 751-14-56-M14F-*	14	56	M 14F = M14x1.5	28	14	24	85	101	22.5	298
GN 751-14-56-M14-*	14	56	M 14	28	14	24	85	101	22.5	300
GN 751-16-32-M16L-*	16	32	M 16L	32	16	26	64	83	24	340
GN 751-16-32-M16F-*	16	32	M 16F = M16x1.5	32	16	26	64	83	24	340
GN 751-16-32-M16-*	16	32	M 16	32	16	26	64	83	24	339
GN 751-16-64-M16L-*	16	64	M 16L	32	16	26	96	115	24	467
GN 751-16-64-M16F-*	16	64	M 16F = M16x1.5	32	16	26	96	115	24	471
GN 751-16-64-M16-*	16	64	M 16	32	16	26	96	115	24	467
GN 751-20-40-M20L-*	20**	40	M 20L	40	20	34	80	105	30	675
GN 751-20-40-M20-*	20**	40	M 20	40	20	34	80	105	30	660

\*\* in type B not available from stock



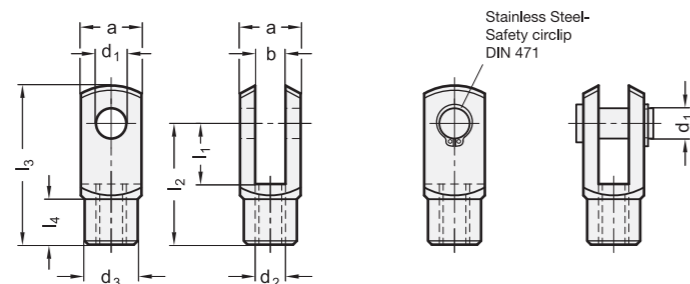


\*Complete with type index of Fork joints  
KL SL

**GN 751-AL**

Description	d1 H9/h11	l1	d2	a	b	d3	l2	l3	l4	⚖
GN 751-4-8-M4-*-AL	4	8	M 4	8	4	8	16	21	6	6
GN 751-4-16-M4-*-AL	4**	16	M 4	8	4	8	24	29	6	11
GN 751-5-10-M5-*-AL	5	10	M 5	10	5	9	20	26	7.5	10
GN 751-5-20-M5-*-AL	5**	20	M 5	10	5	9	30	36	7.5	18
GN 751-6-12-M6-*-AL	6	12	M 6	12	6	10	24	31	9	20
GN 751-6-24-M6-*-AL	6**	24	M 6	12	6	10	36	43	9	28
GN 751-8-16-M8-*-AL	8	16	M 8	16	8	14	32	42	12	48
GN 751-8-32-M8-*-AL	8**	32	M 8	16	8	14	48	58	12	62
GN 751-10-20-M10-*-AL	10	20	M 10	20	10	18	40	52	15	92
GN 751-10-40-M10-*-AL	10**	40	M 10	20	10	18	60	72	15	123
GN 751-12-24-M12-*-AL	12	24	M 12	24	12	20	48	62	18	144
GN 751-12-48-M12-*-AL	12**	48	M 12	24	12	20	72	86	18	197
GN 751-14-28-M14-*-AL	14	28	M 14	28	14	24	56	72	22.5	220
GN 751-14-56-M14-*-AL	14**	56	M 14	28	14	24	85	101	22.5	298
GN 751-16-32-M16-*-AL	16	32	M 16	32	16	26	64	83	24	335
GN 751-16-64-M16-*-AL	16**	64	M 16	32	16	26	96	115	24	460

\*\* not available from stock, requires a minimum order quantity



**GN 751-NI**

Description	d1 H9/h11	l1	d2	a	b	d3	l2	l3	l4	⚖
GN 751-4-8-M4-A-NI	4	8	M 4	8	4	8	16	21	6	6
GN 751-4-16-M4-A-NI	4	16	M 4	8	4	8	24	29	6	8
GN 751-5-10-M5-A-NI	5	10	M 5	10	5	9	20	26	7.5	10
GN 751-5-20-M5-A-NI	5	20	M 5	10	5	9	30	36	7.5	19
GN 751-6-12-M6-A-NI	6	12	M 6	12	6	10	24	31	9	20
GN 751-6-24-M6-A-NI	6	24	M 6	12	6	10	36	43	9	25
GN 751-8-16-M8-A-NI	8	16	M 8	16	8	14	32	42	12	46
GN 751-8-32-M8-A-NI	8	32	M 8	16	8	14	48	58	12	60
GN 751-10-20-M10-A-NI	10	20	M 10	20	10	18	40	52	15	85
GN 751-10-40-M10-A-NI	10	40	M 10	20	10	18	60	72	15	121
GN 751-12-24-M12-A-NI	12	24	M 12	24	12	20	48	62	18	145
GN 751-12-48-M12-A-NI	12	48	M 12	24	12	20	72	86	18	200
GN 751-14-28-M14-A-NI	14	28	M 14	28	14	24	56	72	22.5	220
GN 751-14-56-M14-A-NI	14	56	M 14	28	14	24	85	101	22.5	280
GN 751-16-32-M16-A-NI	16	32	M 16	32	16	26	64	83	24	328
GN 751-16-64-M16-A-NI	16	64	M 16	32	16	26	96	115	24	400
GN 751-20-40-M20-A-NI	20	40	M 20	40	20	34	80	105	30	680

**STAINLESS STEEL**

**Forks**

**Technopolymer**

**MATERIAL**

Glass-fibre reinforced polyamide based (PA) technopolymer.

**STANDARD EXECUTIONS**

Threaded hole.

- **FJT+PC:** with clip pin.
- **FJT+S:** with pin and seeger ring.

**FEATURES AND APPLICATIONS**

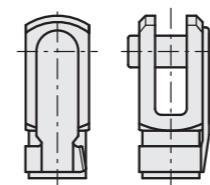
FJT. forks are remarkably suitable for actuation for example of pneumatic cylinders even when water and humidity are present.

Features of the technopolymer forks:

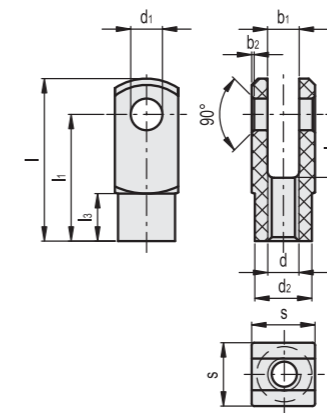
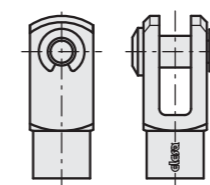
- totally corrosion resistant even when humidity and chemicals are present;
- high strength to saline mist;
- high mechanical strength to the applied loads;
- lightness combined with high-rigidity;
- resistant to continuous washing cycles with solvents and detergents, so they are suitable, for example, in applications in the food and pharmaceutical sectors;
- excellent shock-absorbing features;
- noise minimization.



**FJT+PC**



**FJT+S**



Resistance tests	Max static load under traction		Max transverse load	
	short term [N]	continuous [N]	short term [N]	continuous [N]
Description				
FJT-M6	1300	650	300	150
FJT-M8	2100	1050	650	325
FJT-M10	3000	1500	800	400
FJT-M10x1.25	3000	1500	800	400
FJT-M12	3500	1750	900	450
FJT-M12x1.25	3500	1750	900	450
FJT-M14	6100	3050	1000	500

The strength values are the result of lab tests carried out under room temperature (23°C).

**FJT-PC**

Code	Description	d6H	d1	d2	l	l1	l2	l3	b1	b2	s	⚖
470201	FJT-M6+PC	M6	6	10	31	24	12	9	6	0.5	12	4
470211	FJT-M8+PC	M8	8	14	42	32	16	12	8	0.5	16	9
470221	FJT-M10+PC	M10	10	18	52	40	20	15	10	0.5	20	16
470222	FJT-M10x1.25+PC	M10x1.25	10	18	52	40	20	15	10	0.5	20	16
470231	FJT-M12+PC	M12	12	20	62	48	24	18	12	0.5	24	28
470232	FJT-M12x1.25+PC	M12x1.25	12	20	62	48	24	18	12	0.5	24	28
470241	FJT-M14+PC	M14	14	24	72	56	28	22.5	14	0.5	27	42

**FJT-S**

Code	Description	d6H	d1	d2	l	l1	l2	l3	b1	b2	s	⚖
470301	FJT-M6+S	M6	6	10	31	24	12	9	6	0.5	12	3
470311	FJT-M8+S	M8	8	14	42	32	16	12	8	0.5	16	8
470321	FJT-M10+S	M10	10	18	52	40	20	15	10	0.5	20	15
470322	FJT-M10x1.25+S	M10x1.25	10	18	52	40	20	15	10	0.5	20	15
470331	FJT-M12+S	M12	12	20	62	48	24	18	12	0.5	24	25
470332	FJT-M12x1.25+S	M12x1.25	12	20	62	48	24	18	12	0.5	24	25
470341	FJT-M14+S	M14	14	24	72	56	28	22.5	14	0.5	27	41

## Fork heads

### SPECIFICATION

#### Version in Steel

Steel

- Tensile strength class 5
- zinc plated, blue passivated

#### Version in Aluminium

Aluminium **AL**  
anodized, black

#### Version in Stainless Steel

Stainless Steel AISI 303 **NI**  
blank

### INFORMATION

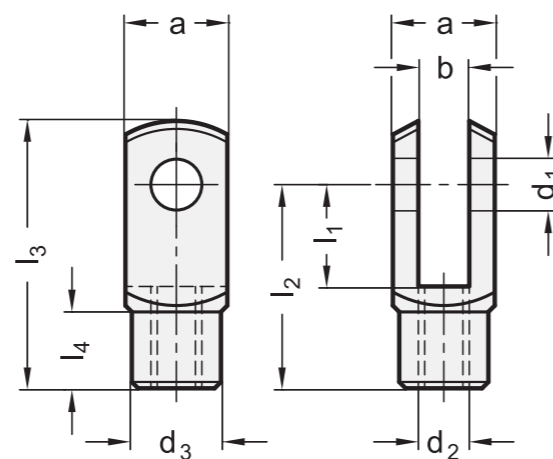
Size  $d_1=12$  is supplied with a fine thread M12 x1.5 according to DIN. In practice, however, M12 x1.25 is preferred. DIN 71752 does not foresee size  $d_1=20$ .

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A26)
- Strength values of nuts (see page A20)

### ON REQUEST

- Fork heads in accordance with DIN 71752 with  $d_1 = 25, 30, 35, 42$  and 50 (only Steel-Version)
- Fork heads in accordance with DIN 71752 with  $d_1 = 30$  and 35 (only Stainless Steel-Version)



\* Complete with type index of the Fork heads (AL or NI)

**AL**      **NI**  
Aluminium    Stainless Steel

### DIN 71752

### STAINLESS STEEL

Description	d1 H9/h11	l1	d2	a	b	d3	l2	l3	l4
DIN 71752-4-8-M4-*	4**	8	M 4	8	4	8	16	21	6
DIN 71752-4-16-M4-*	4**	16	M 4	8	4	8	24	29	6
DIN 71752-5-10-M5-*	5**	10	M 5	10	5	9	20	26	7.5
DIN 71752-5-20-M5-*	5**	20	M 5	10	5	9	30	36	7.5
DIN 71752-6-12-M6-*	6**	12	M 6	12	6	10	24	31	9
DIN 71752-6-24-M6-*	6**	24	M 6	12	6	10	36	43	9
DIN 71752-8-16-M8-*	8**	16	M 8	16	8	14	32	42	12
DIN 71752-8-32-M8-*	8**	32	M 8	16	8	14	48	58	12
DIN 71752-10-20-M10-*	10**	20	M 10	20	10	18	40	52	15
DIN 71752-10-40-M10-*	10**	40	M 10	20	10	18	60	72	15
DIN 71752-12-24-M12-*	12**	24	M 12	24	12	20	48	62	18
DIN 71752-12-48-M12-*	12**	48	M 12	24	12	20	72	86	18
DIN 71752-14-28-M14-*	14**	28	M 14	28	14	24	56	72	22.5
DIN 71752-14-56-M14-*	14**	56	M 14	28	14	24	85	101	22.5
DIN 71752-16-32-M16-*	16**	32	M 16	32	16	26	64	83	24
DIN 71752-16-64-M16-*	16**	64	M 16	32	16	26	96	115	24
DIN 71752-20-40-M20-*	20**	40	M 20	40	20	34	80	105	30

Weight type AL

\*\* Aluminium not available from stock, requires a minimum order quantity

### DIN 71752-Steel

Description	d1 H9/h11	l1	d2	a	b	d3	l2	l3	l4	⚙
DIN 71752-4-8-M4	4	8	M 4	8	4	8	16	21	6	5
DIN 71752-4-16-M4	4	16	M 4	8	4	8	24	29	6	7
DIN 71752-5-10-M5	5	10	M 5	10	5	9	20	26	7.5	9
DIN 71752-5-10-M5L	5	10	M 5L	10	5	9	20	26	7.5	9
DIN 71752-5-20-M5	5	20	M 5	10	5	9	30	36	7.5	13
DIN 71752-5-20-M5L	5	20	M 5L	10	5	9	30	36	7.5	13
DIN 71752-6-12-M6	6	12	M 6	12	6	10	24	31	9	14
DIN 71752-6-12-M6L	6	12	M 6L	12	6	10	24	31	9	11
DIN 71752-6-24-M6	6	24	M 6	12	6	10	36	43	9	21
DIN 71752-6-24-M6L	6	24	M 6L	12	6	10	36	43	9	21
DIN 71752-8-16-M8	8	16	M 8	16	8	14	32	42	12	36
DIN 71752-8-16-M8L	8	16	M 8L	16	8	14	32	42	12	36
DIN 71752-8-16-M8F	8	16	M 8F = M8x1	16	8	14	32	42	12	36
DIN 71752-8-32-M8	8	32	M 8	16	8	14	48	58	12	52
DIN 71752-8-32-M8L	8	32	M 8L	16	8	14	48	58	12	52
DIN 71752-8-32-M8F	8	32	M 8F = M8x1	16	8	14	48	58	12	52
DIN 71752-10-20-M10	10	20	M 10	20	10	18	40	52	15	72
DIN 71752-10-20-M10L	10	20	M 10L	20	10	18	40	52	15	72
DIN 71752-10-20-M10F	10	20	M 10F = M10x1.25	20	10	18	40	52	15	72
DIN 71752-10-40-M10	10	40	M 10	20	10	18	60	72	15	102
DIN 71752-10-40-M10L	10	40	M 10L	20	10	18	60	72	15	102
DIN 71752-10-40-M10F	10	40	M 10F = M10x1.25	20	10	18	60	72	15	102
DIN 71752-12-24-M12	12	24	M 12	24	12	20	48	62	18	117
DIN 71752-12-24-M12L	12	24	M 12L	24	12	20	48	62	18	117
DIN 71752-12-24-M12F	12	24	M 12F = M12x1.25	24	12	20	48	62	18	117
DIN 71752-12-48-M12	12	48	M 12	24	12	20	72	86	18	165
DIN 71752-12-48-M12L	12	48	M 12L	24	12	20	72	86	18	165
DIN 71752-12-48-M12F	12	48	M 12F = M12x1.25	24	12	20	72	86	18	165
DIN 71752-14-28-M14	14	28	M 14	28	14	24	56	72	22.5	171
DIN 71752-14-28-M14L	14	28	M 14L	28	14	24	56	72	22.5	171
DIN 71752-14-28-M14F	14	28	M 14F = M14x1.5	28	14	24	56	72	22.5	171
DIN 71752-14-56-M14	14	56	M 14	28	14	24	85	101	22.5	248
DIN 71752-14-56-M14L	14	56	M 14L	28	14	24	85	101	22.5	248
DIN 71752-14-56-M14F	14	56	M 14F = M14x1.5	28	14	24	85	101	22.5	248
DIN 71752-16-32-M16	16	32	M 16	32	16	26	64	83	24	267
DIN 71752-16-32-M16L	16	32	M 16L	32	16	26	64	83	24	267
DIN 71752-16-32-M16F	16	32	M 16F = M16x1.5	32	16	26	64	83	24	267
DIN 71752-16-64-M16	16	64	M 16	32	16	26	96	115	24	393
DIN 71752-16-64-M16L	16	64	M 16L	32	16	26	96	115	24	393
DIN 71752-16-64-M16F	16	64	M 16F = M16x1.5	32	16	26	96	115	24	393
DIN 71752-20-40-M20	20	40	M 20	40	20	34	80	105	30	520
DIN 71752-20-40-M20L	20	40	M 20L	40	20	34	80	105	30	520

## Joint pieces

Steel / Stainless Steel, for fork joints GN 751

### SPECIFICATION

Steel

- Tensile strength class 5
- zinc plated, blue passivated

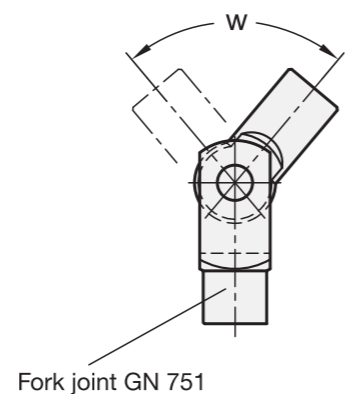
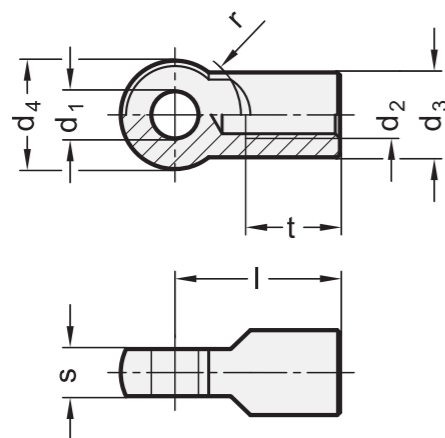
Stainless Steel AISI 303 NI

### INFORMATION

Joint pieces GN 752 are designed to be used in combination with for heads DIN 71752 (see page 1152) and GN 751 (see page 1148) respectively fork joints.

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A26)
- Strength values of nuts (see page A20)



Fork joint GN 751

### GN 752

Description	d1 H9	d2	d3	d4	l	r	s -0.2	t min.	w min.	⚖
GN 752-6-M6	6	M 6	10	14	22	8.5	6	12	218°	11
GN 752-8-M8	8	M 8	14	18	29	12	8	16	218°	27
GN 752-10-M10	10	M 10	18	23	35	14	10	20	212°	56
GN 752-12-M12	12	M 12	20	27	43	17	12	24	216°	88
GN 752-14-M14	14	M 14	24	30	50	19	14	28	214°	100
GN 752-16-M16	16	M 16	26	36	56	22	16	32	216°	197

### GN 752-NI

### STAINLESS STEEL

Description	d1 H9	d2	d3	d4	l	r	s -0.2	t min.	w min.	⚖
GN 752-6-M6-NI	6	M 6	10	14	22	8.5	6	12	218°	11
GN 752-8-M8-NI	8	M 8	14	18	29	12	8	16	218°	28
GN 752-10-M10-NI	10	M 10	18	23	35	14	10	20	212°	56
GN 752-12-M12-NI	12	M 12	20	27	43	17	12	24	216°	88
GN 752-14-M14-NI	14	M 14	24	30	50	19	14	28	214°	141
GN 752-16-M16-NI	16	M 16	26	36	56	22	16	32	216°	197

## Angled ball joints

with threaded ball and rivet ball shanks

### SPECIFICATION

Version in Steel

Types

- Type **CS**: with threaded ball shank with safety catch
- Type **C**: with threaded ball shank without safety catch
- Type **BS**: with rivet ball shank, with safety catch
- Type **B**: with rivet ball shank, without safety catch

Steel

- Tensile strength class 5
- zinc plated, colourless passivated

Ball

Steel

- hardened
- ball seat lubricated

Version in Stainless Steel

Types

- Type **CSN**: with threaded ball shank, with safety catch
- Type **CN**: with threaded ball shank, without safety catch

Stainless Steel AISI 303

Ball

Stainless Steel

- not hardened
- ball seat greased

### INFORMATION

Angled ball joints DIN 71802 consist of a ball socket DIN 71805 and a ball shank DIN 71803.

The angle of rotation for the type with safety catch (Types CS, BS, CSN) is 15°, without safety catch (Types C, B, CN) is 18°.

For assembly the ball is pushed through the circlip which acts as a retainer. Should the retaining force (see pull-off force in the table above) between ball and socket not be sufficient, this can be increased by adding a safety catch, which can easily be fitted.

To protect the angled ball point, a dust cap GN 710 (see page 1158) can be added.

The hexagon nut is part of the angled ball joints.

Dust caps GN 710 (see page 1158) have to be ordered separately.

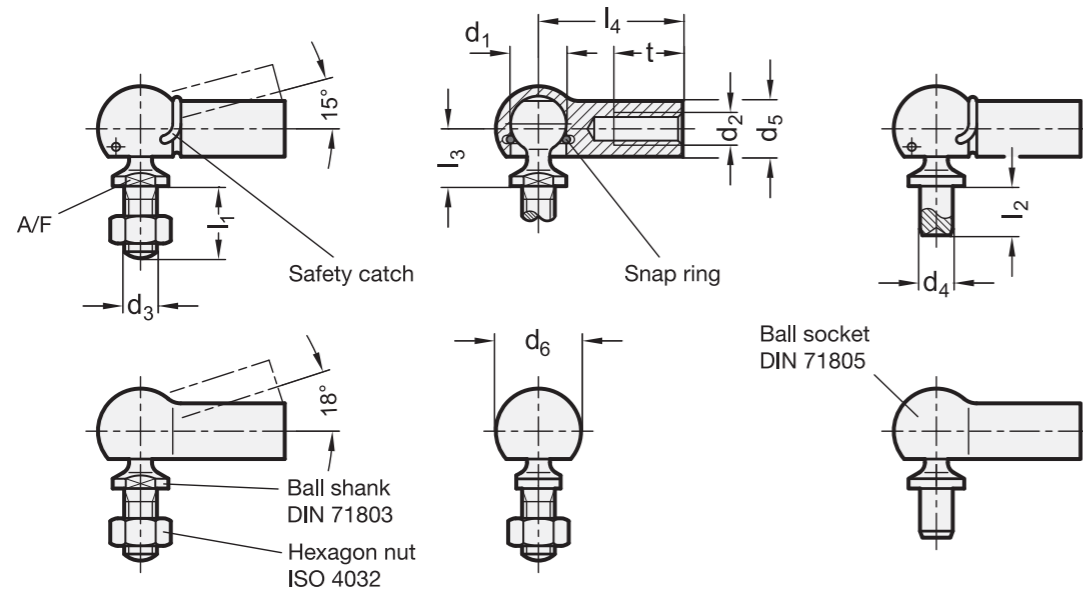
### ON REQUEST

- smooth specification (Ball seat with play)
- Ball studs DIN 71803
- Ball sockets DIN 71805
- Axial joints (ball socket and ball shank in one axis)

### TECHNICAL INFORMATION

- ISO-Fundamental Tolerances (see page A21)
- Stainless Steel characteristics (see page A26)
- Strength values of nuts (see page A20)





\* Complete with type index of the Angled ball joints  
BS B

DIN 71802-B/BS

Description	d1 H9/h9	d2	l2	d4 h11	d5	d6	l3	l4	t min.	A/F	min. pull-off force in N	⚖
DIN 71802-8-M5L-4-*	8	M 5L	4	5	8	12.8	8.5	22	10.5	7	30	13
DIN 71802-8-M5-4-*	8	M 5	4	5	8	12.8	8.5	22	10.5	7	30	13
DIN 71802-8-M5L-7.5-*	8	M 5L	7.5	5	8	12.8	8.5	22	10.5	7	30	14
DIN 71802-8-M5-7.5-*	8	M 5	7.5	5	8	12.8	8.5	22	10.5	7	30	14
DIN 71802-10-M6L-4.5-*	10	M 6L	4.5	6	10	14.8	10.5	25	11.5	8	40	20
DIN 71802-10-M6-4.5-*	10	M 6	4.5	6	10	14.8	10.5	25	11.5	8	40	20
DIN 71802-10-M6L-8-*	10	M 6L	8	6	10	14.8	10.5	25	11.5	8	40	23
DIN 71802-10-M6-8-*	10	M 6	8	6	10	14.8	10.5	25	11.5	8	40	23
DIN 71802-13-M8L-5-*	13	M 8L	5	8	13	19.3	12	30	14	11	60	44
DIN 71802-13-M8-5-*	13	M 8	5	8	13	19.3	12	30	14	11	60	44
DIN 71802-13-M8L-10-*	13	M 8L	10	8	13	19.3	12	30	14	11	60	46
DIN 71802-13-M8-10-*	13	M 8	10	8	13	19.3	12	30	14	11	60	47
DIN 71802-16-M10L-6-*	16	M 10L	6	10	16	24	15	35	15.5	13	80	80
DIN 71802-16-M10-6-*	16	M 10	6	10	16	24	15	35	15.5	13	80	88
DIN 71802-16-M10L-13-*	16	M 10L	13	10	16	24	15	35	15.5	13	80	80
DIN 71802-16-M10-13-*	16	M 10	13	10	16	24	15	35	15.5	13	80	89
DIN 71802-16-M12L-6-*	16	M 12L	6	10	16	24	15	35	15.5	13	80	90
DIN 71802-16-M12-6-*	16	M 12	6	10	16	24	15	35	15.5	13	80	96
DIN 71802-16-M12L-13-*	16	M 12L	13	10	16	24	15	35	15.5	13	80	80
DIN 71802-16-M12-13-*	16	M 12	13	10	16	24	15	35	15.5	13	80	80
DIN 71802-19-M14FL-12-*	19	M 14FL	12	14	22	30	19.5	45	21.5	16	100	200
DIN 71802-19-M14F-12-*	19	M 14F	12	14	22	30	19.5	45	21.5	16	100	200
DIN 71802-19-M14FL-18-*	19	M 14FL	18	14	22	30	19.5	45	21.5	16	100	190
DIN 71802-19-M14F-18-*	19	M 14F	18	14	22	30	19.5	45	21.5	16	100	190

Weight type B

\* Complete with type index of the Angled ball joints  
CS C

DIN 71802-C/CS

Description	d1 H9/h9	d2	d3	d5	d6	l1	l3	l4	t min.	A/F	min. pull-off force in N	⚖
DIN 71802-8-M5-*	8	M 5	M 5	8	12.8	10	8.5	22	10.5	7	30	14
DIN 71802-8-M5L-*	8	M 5L	M 5	8	12.8	10	8.5	22	10.5	7	30	15
DIN 71802-10-M6-*	10	M 6	M 6	10	14.8	12.5	10.5	25	11.5	8	40	25
DIN 71802-10-M6L-*	10	M 6L	M 6	10	14.8	12.5	10.5	25	11.5	8	40	25
DIN 71802-13-M8-*	13	M 8	M 8	13	19.3	16.5	12	30	14	11	60	49
DIN 71802-13-M8L-*	13	M 8L	M 8	13	19.3	16.5	12	30	14	11	60	50
DIN 71802-16-M10-*	16	M 10	M 10	16	24	20	15	35	15.5	13	80	90
DIN 71802-16-M10L-*	16	M 10L	M 10	16	24	20	15	35	15.5	13	80	95
DIN 71802-16-M12-*	16	M 12	M 12	16	24	20	15	35	15.5	13	80	100
DIN 71802-16-M12L-*	16	M 12L	M 12	16	24	20	15	35	15.5	13	80	100
DIN 71802-19-M14F-*	19	M 14F = M 14x1.5L	M 14 x 1.5	22	30	28	19.5	45	21.5	16	100	217
DIN 71802-19-M14FL-*	19	M 14 FL = M 14x1.5 L	M 14 x 1.5	22	30	28	19.5	45	21.5	16	100	220

Weight type C

\* Complete with type index of the Angled ball joints  
CSN CN

DIN 71802-CN/CSN

Description	d1 H9/h9	d2	d3	d5	d6	l1	l3	l4	t min.	A/F	min. pull-off force in N	⚖
DIN 71802-8-M5-*	8	M 5	M 5	8	12.8	10	8.5	22	10.5	7	30	10
DIN 71802-8-M5L-*	8	M 5L	M 5	8	12.8	10	8.5	22	10.5	7	30	15
DIN 71802-10-M6-*	10	M 6	M 6	10	14.8	12.5	10.5	25	11.5	8	40	20
DIN 71802-10-M6L-*	10	M 6L	M 6	10	14.8	12.5	10.5	25	11.5	8	40	25
DIN 71802-13-M8-*	13	M 8	M 8	13	19.3	16.5	12	30	14	11	60	50
DIN 71802-13-M8L-*	13	M 8L	M 8	13	19.3	16.5	12	30	14	11	60	50
DIN 71802-16-M10-*	16	M 10	M 10	16	24	20	15	35	15.5	13	80	98
DIN 71802-16-M10L-*	16	M 10L	M 10	16	24	20	15	35	15.5	13	80	95
DIN 71802-16-M12-*	16	M 12	M 12	16	24	20	15	35	15.5	13	80	102
DIN 71802-16-M12L-*	16	M 12L	M 12	16	24	20	15	35	15.5	13	80	102
DIN 71802-19-M14F-*	19	M 14F = M 14x1.5L	M 14 x 1.5	22	30	28	19.5	45	21.5	16	100	218
DIN 71802-19-M14FL-*	19	M 14 FL = M 14x1.5 L	M 14 x 1.5	22	30	28	19.5	45	21.5	16	100	219

Weight type CN

## Dust caps

for angled ball joints DIN 71802

### SPECIFICATION

- Rubber
- temperature resistant up to 110 °C
  - black

### INFORMATION

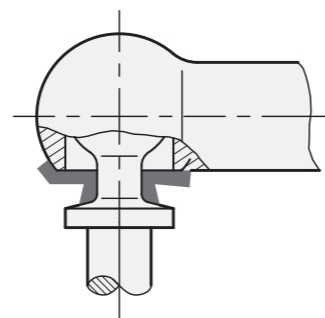
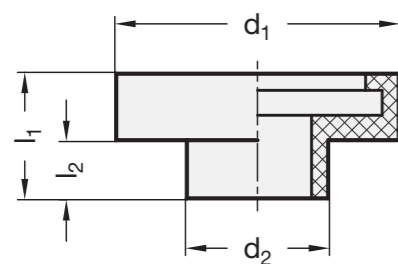
Dust caps GN 710 prevent the entering of dirt into angled ball joints DIN 71802 (see page 1155).

### ON REQUEST

- Angled ball joints with mounted dust cap

### TECHNICAL INFORMATION

- Elastomer characteristics (see page A32)



### GN 710

Description	d1	d2	l1	l2	For angled ball joints DIN 71802 Size (d1)	⚖
GN 710-12	12	5.5	4.5	1.5	8	1
GN 710-13,5	13.5	7	6.5	3.5	10	1
GN 710-17,5	17.5	8.5	7.5	3.5	13	1
GN 710-22	22	10.5	8.5	4.5	16	2
GN 710-25,5	25.5	12.5	12.5	7	19	2

## Axial ball joints

### SPECIFICATION

#### Types

- Type **KS**: Ball with male thread
- Type **KI**: Ball with female thread

#### Identification No.

- No. **1**: Mounting socket with female thread
- No. **2**: Mounting socket with male thread

#### Steel

zinc plated, blue passivated

#### Brake piece

Technopolymer (Polyamide PA)

### INFORMATION

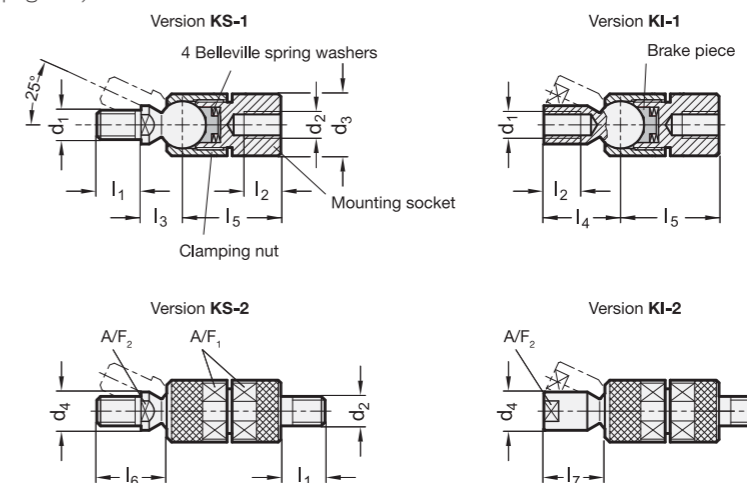
The clamping nut of the axial ball joints GN 782 can be set to give a required thrust on the Belleville spring washers in order to increase the resistance to the ball movement.

At the same time the Belleville spring washers act as safety washers for the screws.

Once the max. thrust to the Belleville spring washers is reached the ball arm is firmly immobilised in position over the clamping nut and screw.

### TECHNICAL INFORMATION

- Plastic characteristics (see page A2)



### GN 782

Description	d1	d2	d3	d4	l1	l2	l3	l4	l5 +1.0/-0.3	l6 ≈	l7 ≈	A/F 1	A/F 2	recommended tightening torque in Nm≈	⚖
GN 782-M6-KS-1	M 6	M 6	17	8.5	10	8	11	20	25	16.8	16	15	7	15	46
GN 782-M6-KI-1	M 6	M 6	17	8.5	10	8	11	20	25	16.8	16	15	7	15	46
GN 782-M8-KS-1	M 8	M 8	19	11	12	10	12.5	23	29.5	19.5	18	17	9	20	68
GN 782-M8-KI-1	M 8	M 8	19	11	12	10	12.5	23	29.5	19.5	18	17	9	20	67
GN 782-M10-KS-1	M 10	M 10	21	13	15	12	14	26	33.5	23.5	20	19	11	35	95
GN 782-M10-KI-1	M 10	M 10	21	13	15	12	14	26	33.5	23.5	20	19	11	35	95
GN 782-M12-KS-1	M 12	M 12	28	16	18	15	20	34	44	27.7	28	25	14	45	220
GN 782-M12-KI-1	M 12	M 12	28	16	18	15	20	34	44	27.7	28	25	14	45	220
GN 782-M6-KS-2	M 6	M 6	17	8.5	10	8	11	20	25	16.8	16	15	7	15	50
GN 782-M6-KI-2	M 6	M 6	17	8.5	10	8	11	20	25	16.8	16	15	7	15	50
GN 782-M8-KS-2	M 8	M 8	19	11	12	10	12.5	23	29.5	19.5	18	17	9	20	76
GN 782-M8-KI-2	M 8	M 8	19	11	12	10	12.5	23	29.5	19.5	18	17	9	20	75
GN 782-M10-KS-2	M 10	M 10	21	13	15	12	14	26	33.5	23.5	20	19	11	35	110
GN 782-M10-KI-2	M 10	M 10	21	13	15	12	14	26	33.5	23.5	20	19	11	35	108
GN 782-M12-KS-2	M 12	M 12	28	16	18	15	20	34	44	27.7	28	25	14	45	252
GN 782-M12-KI-2	M 12	M 12	28	16	18	15	20	34	44	27.7	28	25	14	45	252

## Swivel ball joints

### Aluminum

#### SPECIFICATION

##### Types

- Type **A**: Ball with female thread
- Type **B**: Ball with male thread

##### Identification no.

- No. **1**: Clamping with adjustable hand lever (only for  $d_1 = 39$  and  $49$ )
- No. **2**: Clamping set with screw

Housing  
Aluminum  
anodized black **ELS**

Base plate, ball  
Aluminium, blank

Adjustable hand lever (Identification no. 1)

- Zinc die casting, plastic coated, silver RAL 9006, textured finish
- Threaded stud and retaining screw, Stainless Steel AISI 303

Set screw (Identification no. 2)  
Stainless Steel AISI 304



#### INFORMATION

GN 784 swivel ball joints allow precise and variable adjustment of the ball pivot within the rotation range. This is a particular advantage when adjusting scanners, cameras, lighting, monitors, etc.

Thanks to the efficient clamping mechanism, only small amounts of torque on the clamping screw result in comparatively strong clamping pressure on the ball. This force is easily applied by the clamping lever (Identification no. 1).

The ball joint can be mounted from below with the  $d_4$  internal thread or together with the GN 784.1 (see page 1162) flange, available as an accessory, using three through-holes from above.

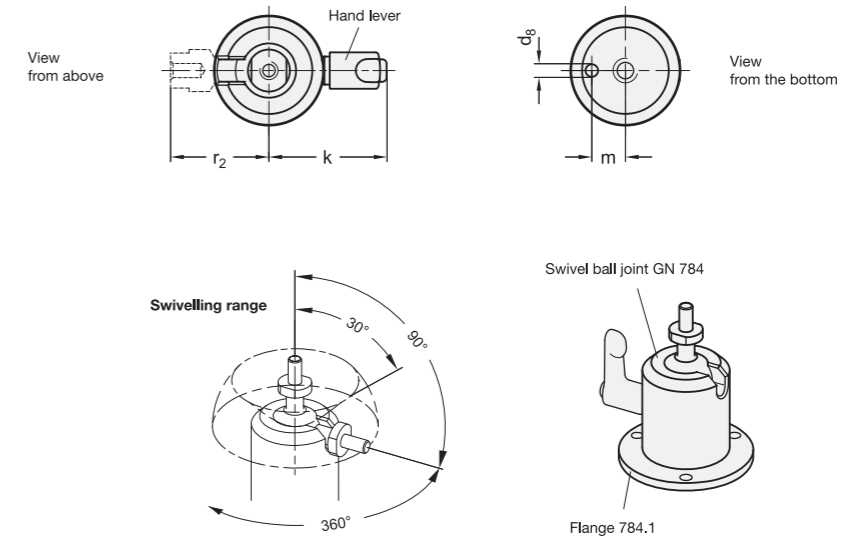
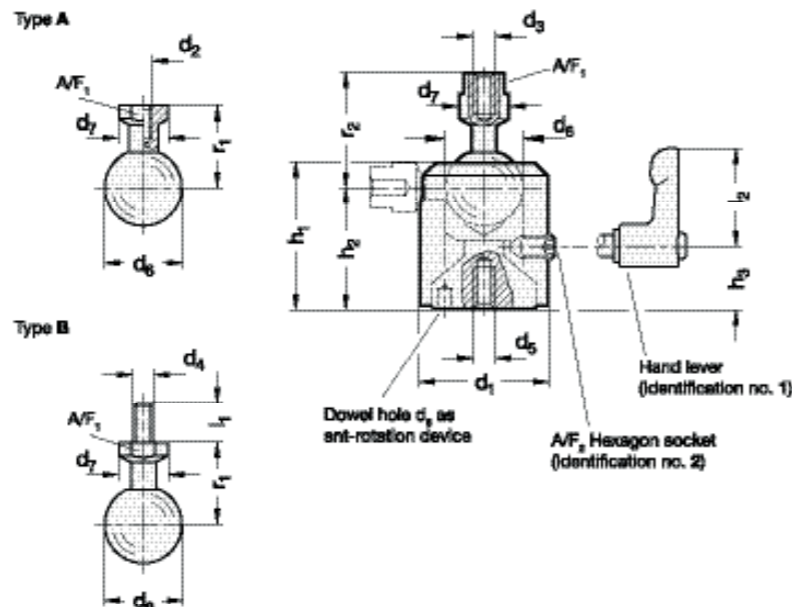
For a permanent high stop torque, the contact surfaces of the balls must be kept free of grease. Exceeding the recommended tightening torque increases the securing of the ball joint in its end position, but may result in increased wear and potential failure of the clamping mechanism.

#### ON REQUEST

- Clamping with star knob DIN 6335 (see page 234)

#### TECHNICAL INFORMATION

- Stainless Steel characteristics (see page A26)



#### GN 784

Description	d1	d2	r1	d3	r2	d4	l1	d5	d6	d7	d8	h1	h2	h3	k	l2	m	A/F/A/F 1 2	Tigh- tening torque in Nm ≈	Stop torque on the ball in Nm ≈	⚖	
GN 784-23-M4-A-2-ELS	23	M 4*	17.3	-	-	-	-	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	30
GN 784-23-M5-A-2-ELS	23	-	-	M 5**	24.8	-	-	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	35
GN 784-23-1/4-A-2-ELS	23	-	-	1/4**	24.8	-	-	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	30
GN 784-31-M5-A-2-ELS	31	M 5*	21.5	-	-	-	-	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	70
GN 784-31-M6-A-2-ELS	31	-	-	M 6**	32.5	-	-	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	70
GN 784-31-1/4-A-2-ELS	31	-	-	1/4**	32.5	-	-	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	73
GN 784-39-M5-A-1-ELS	39	M 5*	25.5	-	-	-	-	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	159
GN 784-39-M5-A-2-ELS	39	M 5*	25.5	-	-	-	-	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	159
GN 784-39-M6-A-1-ELS	39	-	-	M 6**	36.2	-	-	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	164
GN 784-39-M6-A-2-ELS	39	-	-	M 6**	36.2	-	-	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	150
GN 784-39-M8-A-1-ELS	39	-	-	M 8**	40.5	-	-	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	165
GN 784-39-M8-A-2-ELS	39	-	-	M 8**	40.5	-	-	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	130
GN 784-39-3/8-A-1-ELS	39	-	-	3/8***	40.5	-	-	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	133
GN 784-39-3/8-A-2-ELS	39	-	-	3/8***	40.5	-	-	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	128
GN 784-49-M8-A-1-ELS	49	M 8*	30.8	-	-	-	-	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	285
GN 784-49-M8-A-2-ELS	49	M 8*	30.8	-	-	-	-	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	260
GN 784-49-3/8-A-1-ELS	49	-	-	3/8***	44.8	-	-	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	290
GN 784-49-3/8-A-2-ELS	49	-	-	3/8***	44.8	-	-	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	274
GN 784-49-M10-A-1-ELS	49	-	-	M 10**	51.8	-	-	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	300
GN 784-49-M10-A-2-ELS	49	-	-	M 10**	51.8	-	-	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	275
GN 784-23-M5-B-2-ELS	23	-	17.3	-	-	M 5	8	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	32
GN 784-23-M6-B-2-ELS	23	-	17.3	-	-	M 6	10	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	40
GN 784-23-1/4-B-2-ELS	23	-	17.3	-	-	1/4	10	M 5***	14	11	2.5	26.6	21.7	10.6	-	-	7	9	2.5	1.5	4.5	29
GN 784-31-M6-B-2-ELS	31	-	21.5	-	-	M 6	10	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	80
GN 784-31-M8-B-2-ELS	31	-	21.5	-	-	M 8	12	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	80
GN 784-31-1/4-B-2-ELS	31	-	21.5	-	-	1/4	10	M 6***	18	14	3.5	35.5	29.6	14.9	-	-	9	12	3	2.5	6.5	70
GN 784-39-M6-B-1-ELS	39	-	25.5	-	-	M 6	10	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	160
GN 784-39-M6-B-2-ELS	39	-	25.5	-	-	M 6	10	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	130
GN 784-39-M8-B-1-ELS	39	-	25.5	-	-	M 8	12	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	161
GN 784-39-M8-B-2-ELS	39	-	25.5	-	-	M 8	12	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	160
GN 784-39-3/8-B-1-ELS	39	-	25.5	-	-	3/8	12	M 8***	24	15	4.5	45	37.2	18.9	44	30	12	13	-	4	16	165
GN 784-39-3/8-B-2-ELS	39	-	25.5	-	-	3/8	12	M 8***	24	15	4.5	45	37.2	18.9	-	-	12	13	4	4	16	165
GN 784-49-M8-B-1-ELS	49	-	30.8	-	-	M 8	12	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	289
GN 784-49-M8-B-2-ELS	49	-	30.8	-	-	M 8	12	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	287
GN 784-49-M10-B-1-ELS	49	-	30.8	-	-	M 10	15	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	290
GN 784-49-M10-B-2-ELS	49	-	30.8	-	-	M 10	15	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	264
GN 784-49-3/8-B-1-ELS	49	-	30.8	-	-	3/8	12	M 8***	28	19.5	4.5	56	46.1	24	49	30	16	17	-	4	20	294
GN 784-49-3/8-B-2-ELS	49	-	30.8	-	-	3/8	12	M 8***	28	19.5	4.5	56	46.1	24	-	-	16	17	4	4	20	294

\*usable depth of thread min. 1.5 x d2 | \*\* usable depth of thread min. 1.5 x d3 | \*\*\* usable depth of thread min. 1.5 x d5

## Flanges

for mounting clamps with swivel ball joint GN 784

### SPECIFICATION

Stainless Steel AISI 304  
matte, tumbled finish **MT**

Countersunk screw DIN 7991  
Stainless Steel AISI 304

Half-length tapered groove pin DIN 8745  
Stainless Steel AISI 304

### INFORMATION

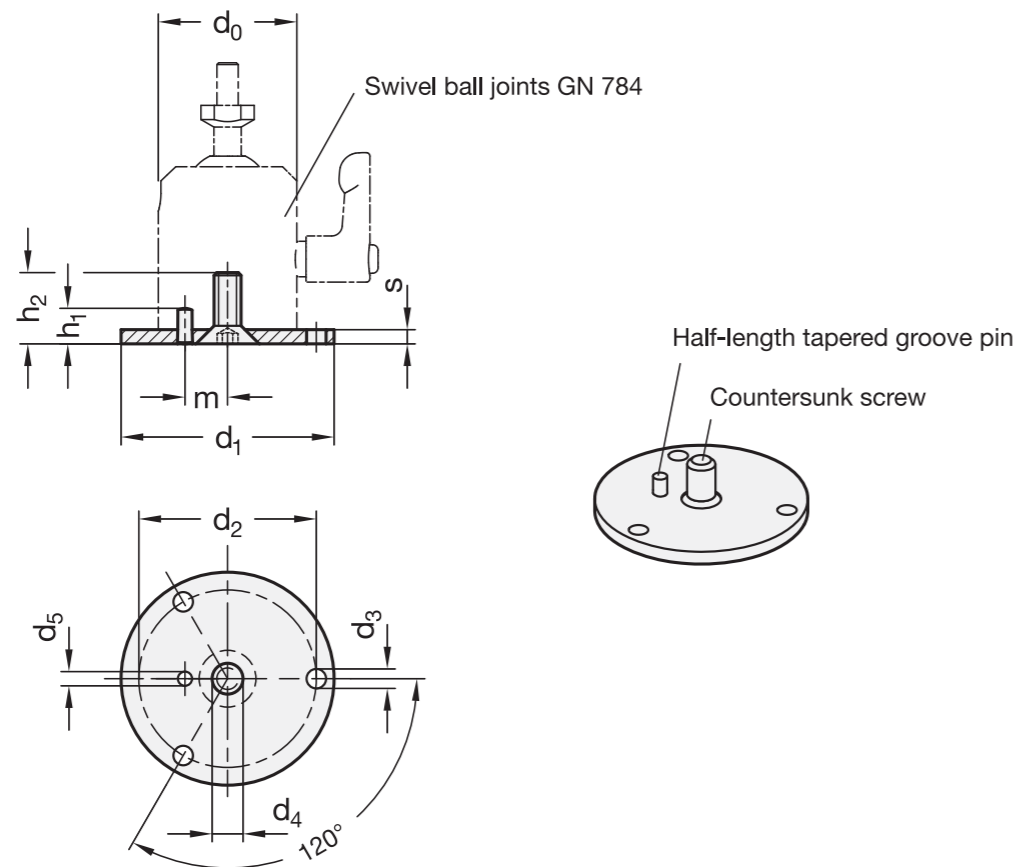
The GN 784.1 flanges are mounted from below into the GN 784 swivel ball joints (see page 1160). A half-length tapered groove pin prevents any rotation.

The flange enables the swivel ball joints to be mounted on the upper surface. The  $d_2$  section with the three  $d_3$  drill holes is configured so that standard screws with washers can be used.

The half-length tapered groove pin is mounted on the flange. The countersunk screw is included separately.

### TECHNICAL INFORMATION

- Stainless Steel characteristics (see page A26)



### GN 784.1

STAINLESS STEEL

Description	d0	d1	d2	d3	d4	d5	h1	h2	m	s	⚠
GN 784.1-42-MT	23	42	32.5	4.5	M5	2	6	8.5	7	2.5	29
GN 784.1-49-MT	31	49	40	4.5	M6	3	6	10.5	9	3	46
GN 784.1-60-MT	39	60	50	5.5	M8	4	10	14.6	12	4	91
GN 784.1-70-MT	49	70	60	5.5	M8	4	10	14.6	16	4	122

## Quick-fit couplings

with radial off-set compensation

### SPECIFICATION

#### Types

- Type **A**: with male thread
- Type **B**: with female thread

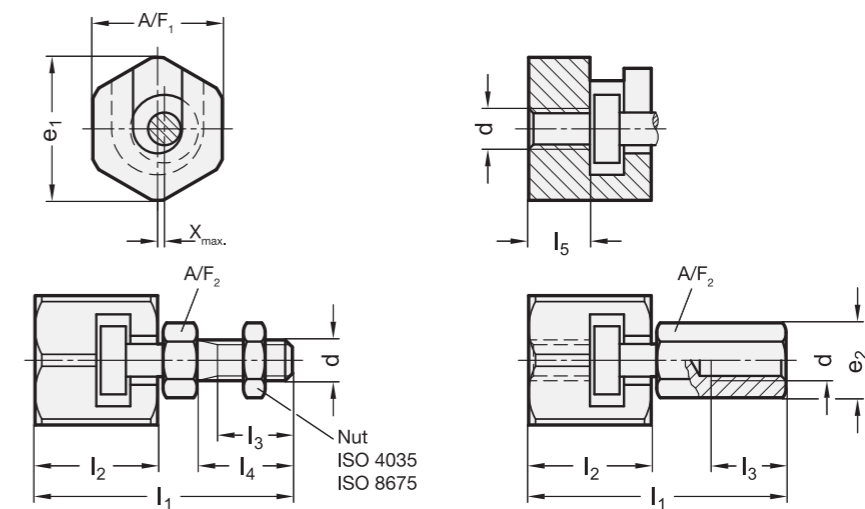
#### Steel

- tempered
- phosphated

### INFORMATION

Quick-fit couplings GN 240 have been designed for the purpose of compensating a radial shaft off-set ( $x$ ). A typical application is the axial link to a piston rod of a cylinder operating in any type of fixture or system.

The coupling is **not** designed for the transfer of torque.



### GN 240

Description	d	e1	e2 ≈	l1 ≈	l2	l3 min.	l4	l5 +1.0	A/F 1	A/F 2	x	Max. pull-/push load in kN	⚠
GN 240-M6-A	M6	21	11	37.5	18	11	14	9	19	10	0.6	2.5	42
GN 240-M8-A	M8	26	14.5	45	22.5	13.5	17	11.5	24	13	0.7	4.5	84
GN 240-M10-A	M10	30	19	56	29	16	20	16	27	17	0.7	6.5	144
GN 240-M10x1,25-A	M10x1.25	30	19	56	29	16	20	16	27	17	0.7	6.5	144
GN 240-M12-A	M12	32.5	21	66.5	34	21	25	17	30	19	0.8	10	205
GN 240-M12x1,25-A	M12x1.25	32.5	21	66.5	34	21	25	17	30	19	0.8	10	205
GN 240-M16-A	M16	39	27	83	42	25	30	23	36	24	1	18	384
GN 240-M16x1,5-A	M16x1.5	39	27	83	42	25	30	23	36	24	1	18	385
GN 240-M20-A	M20	44	34	93.5	45.5	29	35	23.5	41	30	1	30	568
GN 240-M20x1,5-A	M20x1.5	44	34	93.5	45.5	29	35	23.5	41	30	1	30	568
GN 240-M6-B	M6	21	11	37.5	18	11	14	9	19	10	0.6	2.5	45
GN 240-M8-B	M8	26	14.5	45	22.5	13.5	17	11.5	24	13	0.7	4.5	89
GN 240-M10-B	M10	30	19	56	29	16	20	16	27	17	0.7	6.5	155
GN 240-M10x1,25-B	M10x1.25	30	19	56	29	16	20	16	27	17	0.7	6.5	155
GN 240-M12-B	M12	32.5	21	66.5	34	21	25	17	30	19	0.8	10	220
GN 240-M12x1,25-B	M12x1.25	32.5	21	66.5	34	21	25	17	30	19	0.8	10	220
GN 240-M16-B	M16	39	27	83	42	25	30	23	36	24	1	18	397
GN 240-M16x1,5-B	M16x1.5	39	27	83	42	25	30	23	36	24	1	18	398
GN 240-M20-B	M20	44	34	93.5	45.5	29	35	23.5	41	30	1	30	599
GN 240-M20x1,5-B	M20x1.5	44	34	93.5	45.5	29	35	23.5	41	30	1	30	594

## Quick-fit couplings

with radial off-set compensation

### SPECIFICATION

#### Types

- Type **A**: with male thread
- Type **B**: with female thread

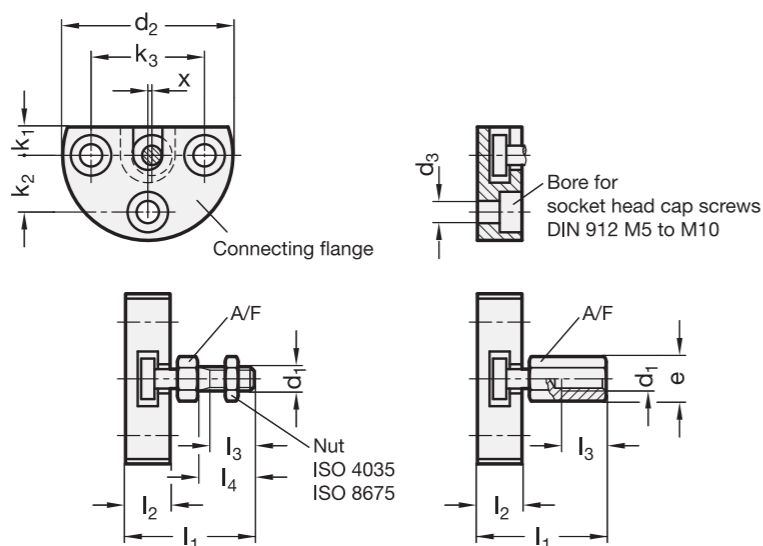
#### Steel

- tempered
- phosphated

### INFORMATION

Quick-fit couplings GN 240.1 have been designed for the purpose of compensating a radial shaft off-set (x). A typical application is the axial link to a piston rod of a cylinder operating in any type of fixture or system.

The coupling is **not** designed for the transfer of torque.



### GN 240.1

Description	d1	d2	d3	e ≈	k1	k2	k3	l1 ≈	l2	l3 min.	l4	A/F	x Max. shaft off set	Max. pull-/ push load in kN	⚖
GN 240.1-M6-A	M6	42	5.5	-	7	14	28	30.5	11	11	14	10	0.6	2.5	73
GN 240.1-M8-A	M8	48	6.5	-	8	16	32	35.5	13	13.5	17	13	0.7	4.5	116
GN 240.1-M10-A	M10	50	6.5	-	9	17	34	43	16	16	20	17	0.7	6.5	173
GN 240.1-M10x1,25-A	M10x1.25	50	6.5	-	9	17	34	43	16	16	20	17	0.7	6.5	174
GN 240.1-M12-A	M12	55	6.5	-	10	19	38	53	20.5	21	25	19	0.8	10	261
GN 240.1-M12x1,25-A	M12x1.25	55	6.5	-	10	19	38	53	20.5	21	25	19	0.8	10	262
GN 240.1-M16-A	M16	65	9	-	12.5	22.5	45	64	23	25	30	24	1	18	431
GN 240.1-M16x1,5-A	M16x1.5	65	9	-	12.5	22.5	45	64	23	25	30	24	1	18	433
GN 240.1-M20-A	M20	80	11	-	17	28	56	74	26	29	35	30	1	30	815
GN 240.1-M20x1,5-A	M20x1.5	80	11	-	17	28	56	74	26	29	35	30	1	30	816
GN 240.1-M6-B	M6	42	5.5	11	7	14	28	30.5	11	11	-	10	0.6	2.5	76
GN 240.1-M8-B	M8	48	6.5	14.5	8	16	32	35.5	13	13.5	-	13	0.7	4.5	122
GN 240.1-M10-B	M10	50	6.5	19	9	17	34	43	16	15	-	17	0.7	6.5	184
GN 240.1-M10x1,25-B	M10x1.25	50	6.5	19	9	17	34	43	16	15	-	17	0.7	6.5	184
GN 240.1-M12-B	M12	55	6.5	21	10	19	38	53	20.5	17.5	-	19	0.8	10	276
GN 240.1-M12x1,25-B	M12x1.25	55	6.5	21	10	19	38	53	20.5	17.5	-	19	0.8	10	276
GN 240.1-M16-B	M16	65	9	27	12.5	22.5	45	64	23	22	-	24	1	18	449
GN 240.1-M16x1,5-B	M16x1.5	65	9	27	12.5	22.5	45	64	23	22	-	24	1	18	449
GN 240.1-M20-B	M20	80	11	34	17	28	56	74	26	25	-	30	1	30	845
GN 240.1-M20x1,5-B	M20x1.5	80	11	34	17	28	56	74	26	25	-	30	1	30	845

## Quick-fit couplings

with angle- and radial off-set compensation

### SPECIFICATION

#### Steel

- tempered
- phosphated

Retaining ring (spring)  
Stainless Steel AISI 631

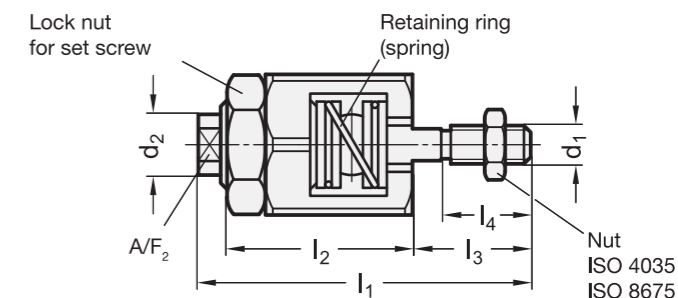
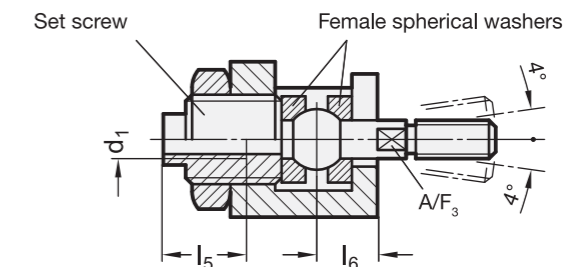
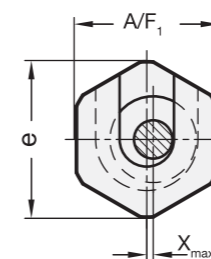
### INFORMATION

Quick-fit couplings GN 240.2 have been designed to compensate a **radial** and **angular** off-set. Furthermore they are axially freely adjustable via the set screw.

A typical application is the axial link to a piston rod of a cylinder operating in any type of fixture or system.

The coupling is renowned by its very compact construction without any loose components.

It is **not** designed for the transfer of torque.



### GN 240.2

Description	d1	d2	e	l1 ≈	l2	l3	l4	l5 min.	l6	A/F 1	A/F 2	A/F 3	x	Max. pull-/ push load in kN	⚖
GN 240.2-M6	M6	9.5	24.5	52	29	18.5	14	13	9.5	22	8	5	0.6	2.5	75
GN 240.2-M8	M8	15	30	63	33	23.5	18	16	11.5	27	13	7	0.7	4.5	135
GN 240.2-M10	M10	21	44	81	43	30.5	22	24	16	41	18	12	0.7	6.5	400
GN 240.2-M10x1,25	M10x1.25	21	44	81	43	30.5	22	24	16	41	18	12	0.7	6.5	403
GN 240.2-M12	M12	21	44	85	43	34.5	26	24	16	41	18	12	0.8	10	405
GN 240.2-M12x1,25	M12x1.25	21	44	85	43	34.5	26	24	16	41	18	12	0.8	10	409
GN 240.2-M16	M16	32	60	121	62	45	34	34	26	55	27	18	1	18	1090
GN 240.2-M16x1,5	M16x1.5	32	60	121	62	45	34	34	26	55	27	18	1	18	1094
GN 240.2-M20	M20	32	60	129	62	53	42	34	26	55	27	18	1	30	1136
GN 240.2-M20x1,5	M20x1.5	32	60	129	62	53	42	34	26	55	27	18	1	30	1143