

# Ball Joint



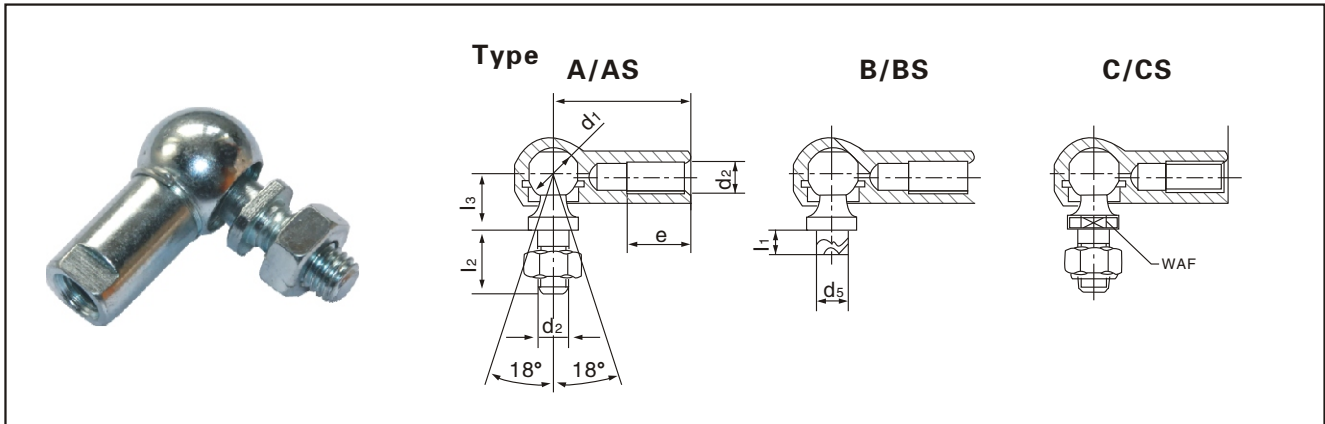
## Main Application:

- Industrial equipment
- Transportation equipment
- Construction equipment
- Agricultural equipment
- Lawn & Garden equipment

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## Angle joint · DIN71802



Ball Dia. d <sub>1</sub>	d <sub>2</sub>	l <sub>2</sub> ± 0.3	l <sub>3</sub> ± 0.3	e Min.	d <sub>5</sub> h11	l <sub>1</sub> ± 0.2	a ± 0.3	WAF h14	Weight Kg/1000pcs for type	
									A and AS C and CS	B and BS
8	M5	10.2	9	10.2	5	4	22	7	15.2	12.85
						7.5				13.35
10	M6	12.5	11	11.5	6	4.5	25	8	25.2	21.3
						8				22
13	M8	16.5	13	14	8	5	30	11	53.1	43.1
						10				45
16	M10 M12	20	16	15.5	10	6	35	13	103.8	82.3
						13				86.6
19	M14 M16	28	20	21.5	14	12	45	16	220.9	181
						18				188.7

### – Material

Ball housing, low carbon steel, zinc plated, yellow/clear or white–blue passivated.

Ball stud, low carbon steel, zinc plated, yellow/clear or white–blue passivated.

Clip, spring steel.

–Alternative: stainless steel

–Special request upon drawing or samples.

### – Note:

–A/B/C type without safety clip on the ball housing

–AS/BS/CS type with safety clip on the ball housing

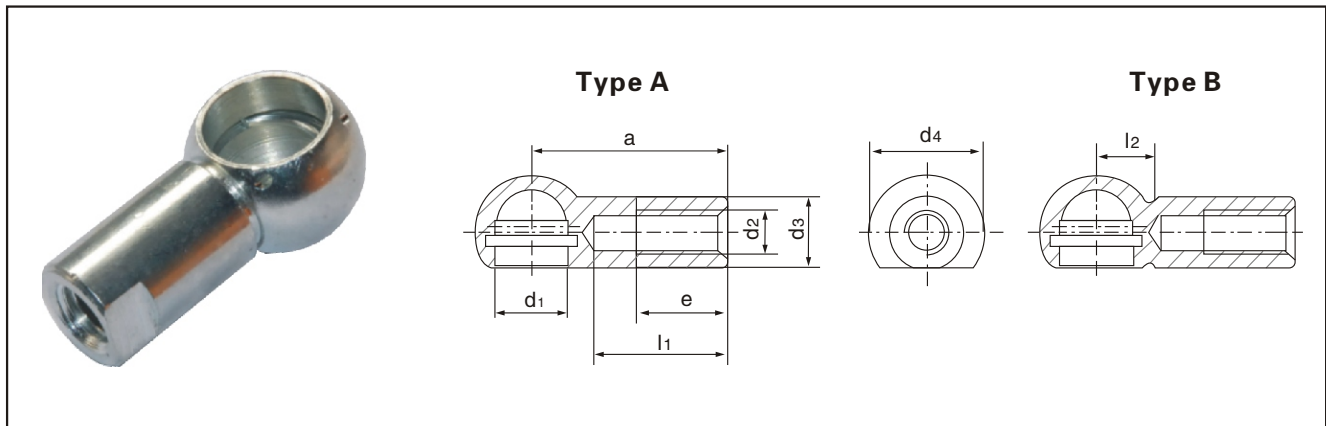
–Spanner surface for type C and CS on the ball stud

–Ball housing with or without spanner surface upon request.

–With or without sealing cap upon request.

–Left–hand thread in the housing possible

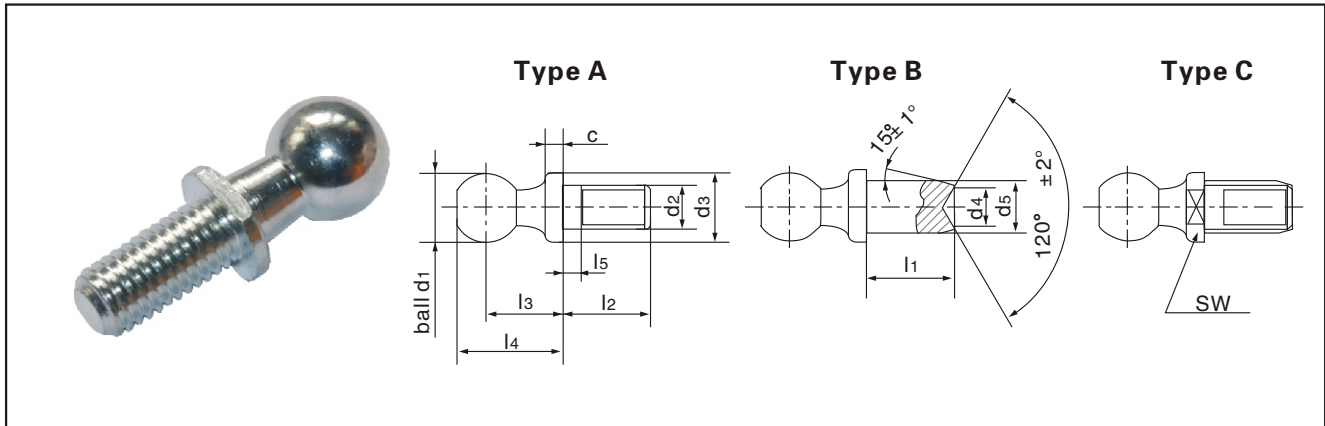
## Ball Socket • DIN71805



d1	d2	a ± 0.3	d3 ± 0.5	d4 ± 0.5	e min.	l1 max.	l2 ± 0.4	Weight Kg/1000pcs for type	
								A	B
8	M5	22	8	12.8	10.2	15	6.3	9.0	8.8
10	M6	25	10	14.8	11.5	17	7.0	14.2	14.1
13	M8	30	13	19.3	14.0	20	9.1	29.0	28.8
16	M10	35	16	24.0	15.5	22	11.4	57.0	56.8
	M12								
19	M14	45	22	30.0	21.5	28	12.5	125.0	124.8
	M16								

- Material, low carbon steel.
- Alternative, stainless steel 304 or 316
- Surface protection, zinc plate, white/white-blue or yellow passivated.
- For type A with locking ring, type B with locking ring and groove for circlip.
- The manufacturer reserves the right to supply the ball socket with or without spanner surface.
- left hand thread in the housing are available.
- Dimensions are in mm.
- Special versions upon request.

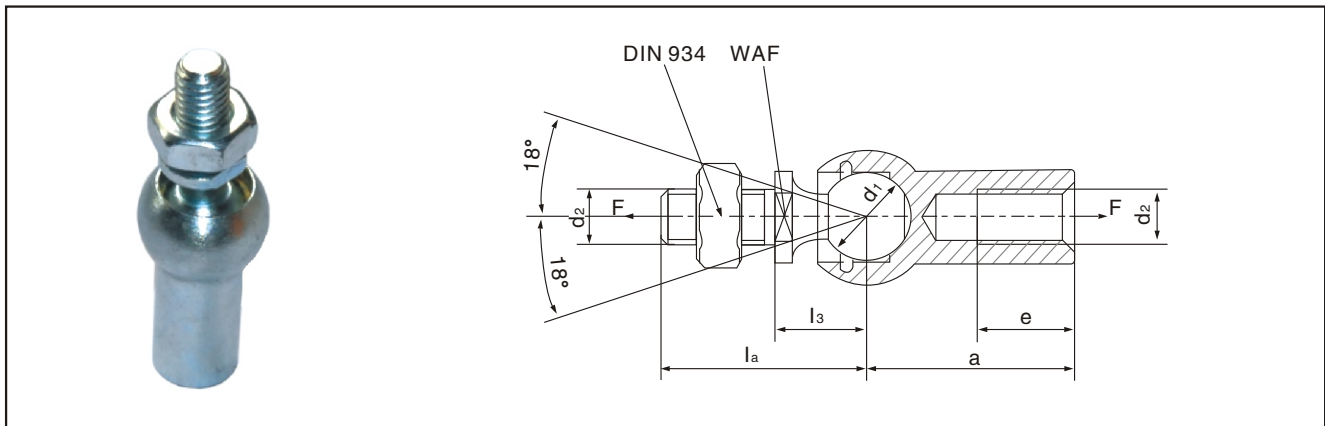
## Ball Stud • DIN71803



d1 h9	D2	l1 ± 0.2	c +0.4/0	d3 h14	d5 h11	d6 0/-0.4	l2 ± 0.3	l3 ± 0.3	l4 ± 0.3	l5 max	SW h14	Weight Kg/1000pcs	
												A and C	B
8	M5	4.0 7.5	2.0	8	5	3	10.2	9	12.5	4.0	7	4.55	3.85 4.35
10	M6	4.5 8.0	2.2	10	6	4	12.5	11	15.5	4.0	8	8.50	7.10 7.80
13	M8	5.0 10.0	2.4	13	8	6	16.5	13	18.5	5.3	11	17.7	14.2 16.0
16	M10 M12	6.0 13.0	2.7	16	10	8	20.0	16	23.0	7.3	13	35.1	23.5 29.6
19	M14 M16	12.0 18.0	3.0	19	14	10	28.0	20	28.5	10.8	16	71.2	56.2 63.7

- Material:Low carbon steel,
- Alternative,stainless steel 304 or 316.
- Ball hardened  $\geq 52\text{HRC}$  or  $\geq 550\text{HV}$  30.
- Surface protection,zinc plate,white/white-blue or yellow passivated.
- For type A and C with screw stud,type B with rivet stud.
- Left hand thread in the housing are available.
- Dimensions are in mm.
- Special versions upon request.

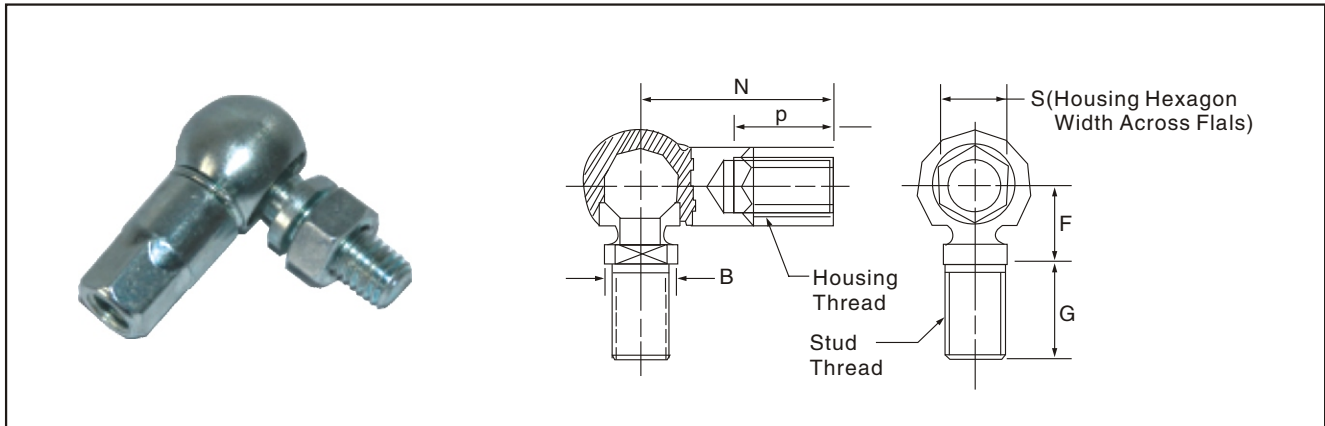
## Axial Joint · AJ series · similar to DIN71802



Part N O.	d <sub>1</sub>	d <sub>2</sub>	A	l <sub>a</sub>	l <sub>3</sub>	e	WAF	Extraction force F in N	Weight Kg/pcs
AJ8	8	M5	22	19.2	9	10.2	7	30	0.015
AJ10	10	M6	25	23.5	11	11.5	8	40	0.025
AJ13	13	M8	30	29.5	13	14	11	60	0.053
AJ16	16	M10	35	36	16	15.5	13	80	0.104
AJ19	19	M14x1.5	45	48	20	21.5	16	100	0.221

- Material, low carbon steel.
- Alternative, stainless steel 304 or 316.
- Surface protection, zinc plate, white/white-blue or yellow passivated.
- The manufacturer reserves the right to supply the ball socket with or without spanner surface.
- Left hand thread in the housing are available.
- Dimensions are in mm.
- Special versions upon request.

## Hexagonal Ball Joint · DIN71802



Part Number		Thread	B	F	G	N	P	S
DCM5	SSDCM5	M5 x 0.80	8	9	10.2	22	10.2	7
DCM6	SSDCM6	M6 x 1.00	10	11	12.5	25	11.5	9
DCM8	SSDCM8	M8 x 1.25	13	13	16.5	30	14	11
DCM10	SSDCM10	M10 x 1.50	16	16	20	35	15.5	13
DCM12	SSDCM12	M12 x 1.75	16	16	20	35	15.5	13

**-Based on DIN 71802.**

**-Material:**

Housing:carbon steel.

Ball Stud:carbon steel

Safety clip:Spring steel

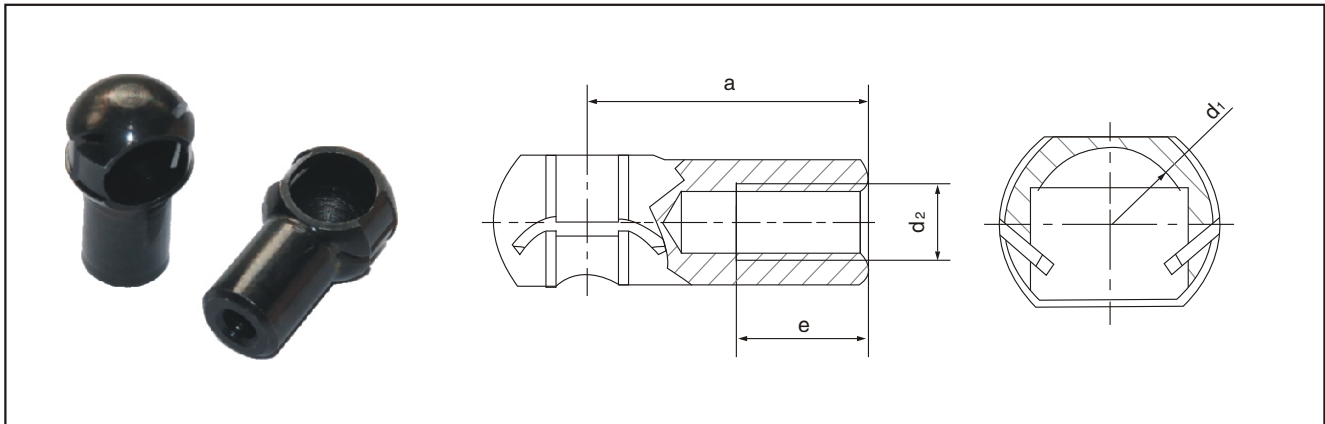
**-Surface treatment:**

Zinc plate,passivated in white-blue or yellow

-Stainless Ball Joint,Please add prefix 'ss'to the part no..

-DCM Ball Joints are also conveniently available without stud for later assembly on to a pre-positioned stud. Compatible with Threaded Ball Studs or Riveted Studs.

## Housing with slits · FG series



Part Number	Ball Dia. $d_1$	length to the center of the ball $a$	Thread $d_2$	Depth of Thread $e$	Radial Trigger Force N	Axial Trigger Force N
FG8	8	22	M5	10.2		
FG1001	10	18	M6	$\geq 8$	$\geq 1200$	$\geq 3500$
FG1002	10	18	M8	$\geq 8.5$	$\geq 1200$	$\geq 3500$
FG1003	10	19	M6	$\geq 8.5$	$\geq 1200$	$\geq 3500$
FG1004	10	25	M6	11.5	$\geq 1200$	$\geq 3500$
FG1301	13	30	M8	14		
FG1302	13	25	M8	9		

**-Material:**

Housing: Carbon steel

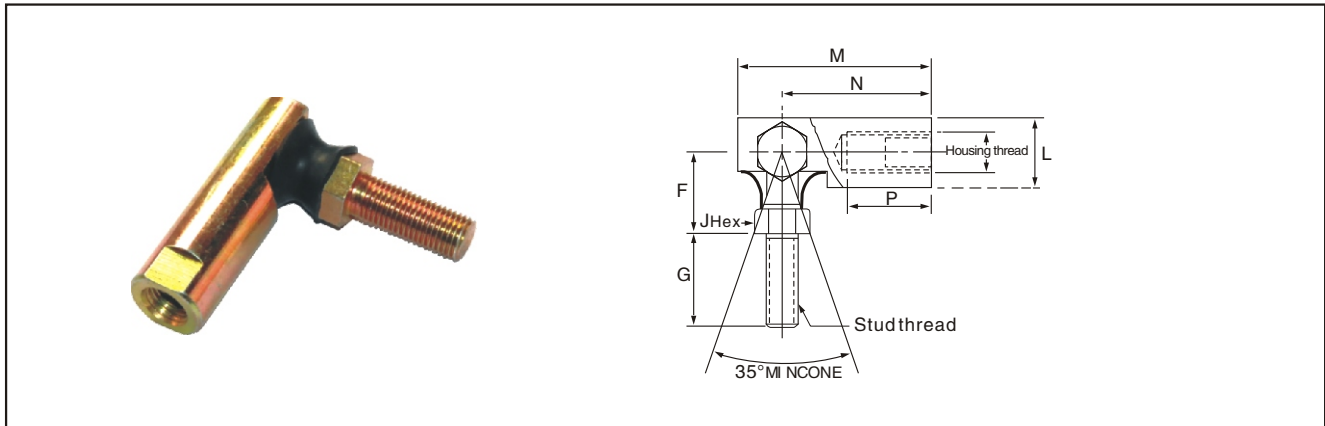
Clip: Spring Steel

**-Surface Treatment:**

Phosphatized and oiled

Optional: Galvanized, passivated in white-blue or black.

## ES Series



Part No .	Housing Thread	Stud Thread	F	G	J	L	M	N	P
ES187	10-32	10-32	0.438	0.438	0.313	0.375	1.063	0.875	0.438
ES250	1/4-28	1/4-28	0.469	0.563	0.375	0.438	1.219	0.969	0.500
ES312	5/16-24	5/16-24	0.531	0.688	0.438	0.500	1.406	1.125	0.563
ES375	3/8-24	3/8-24	0.688	0.875	0.500	0.625	1.688	1.375	0.750
ES438	7/16-20	7/16-20	0.875	1.125	0.625	0.750	2.375	1.938	1.000
ES500	1/2-20	1/2-20	0.875	1.125	0.625	0.750	2.375	1.938	1.000
ES625	5/18-18	5/18-18	1.000	1.125	0.750	0.875	2.578	2.063	1.000

**-Material:**

Ball Stud, carbon steel, case hardened for extended wear life,  
zinc plated, yellow dichromate treated

Body, carbon steel, zinc plated, yellow dichromate treated.

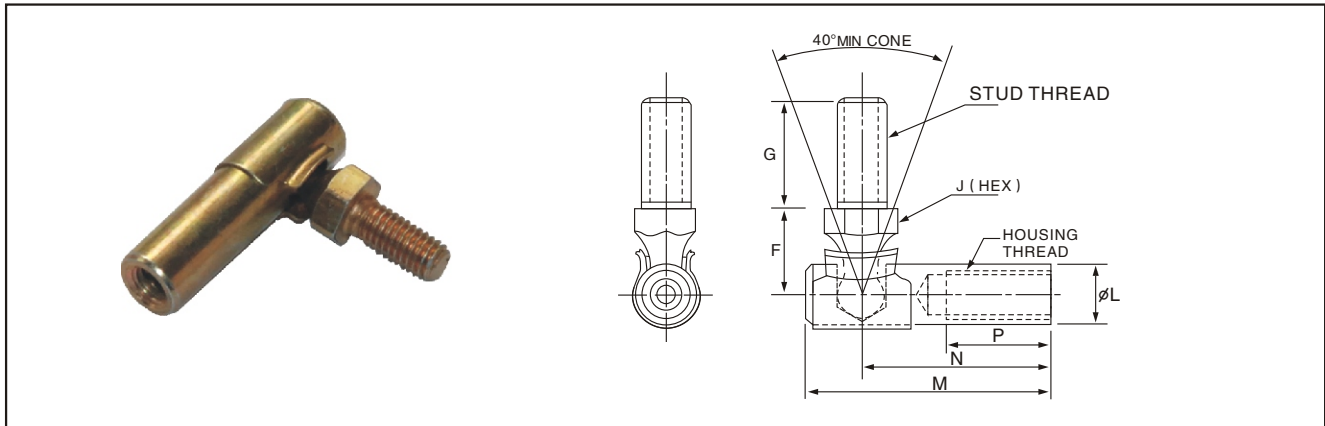
-Alternative: stainless steel.

-Unless otherwise specified, all dimensions are in inches.

-Special request upon drawing or samples.



## PI series



Part No .	Housing Thread	Stud Thread	F	G	J	L	M	N	P
PI3-3	10-32	10-32	0.438	0.438	0.3125	0.3125	1.156	0.875	0.484
PI3-4	10-32	1/4-28	0.438	0.563	0.3125	0.3125	1.156	0.875	0.484
PI4-3	1/4-28	10-32	0.438	0.438	0.3125	0.3125	1.250	0.969	0.531
PI4-4	1/4-28	1/4-28	0.438	0.563	0.3125	0.3125	1.250	0.969	0.531
PI4L-4L	1/4-28	1/4-28	0.562	0.500	0.3125	0.3400	1.750	1.500	1.120

### -Material

Body, carbon steel, heat treated, zinc plated, yellow dichromate treated.

Ball stud, carbon steel, heat treated, zinc plated, yellow dichromate treated.

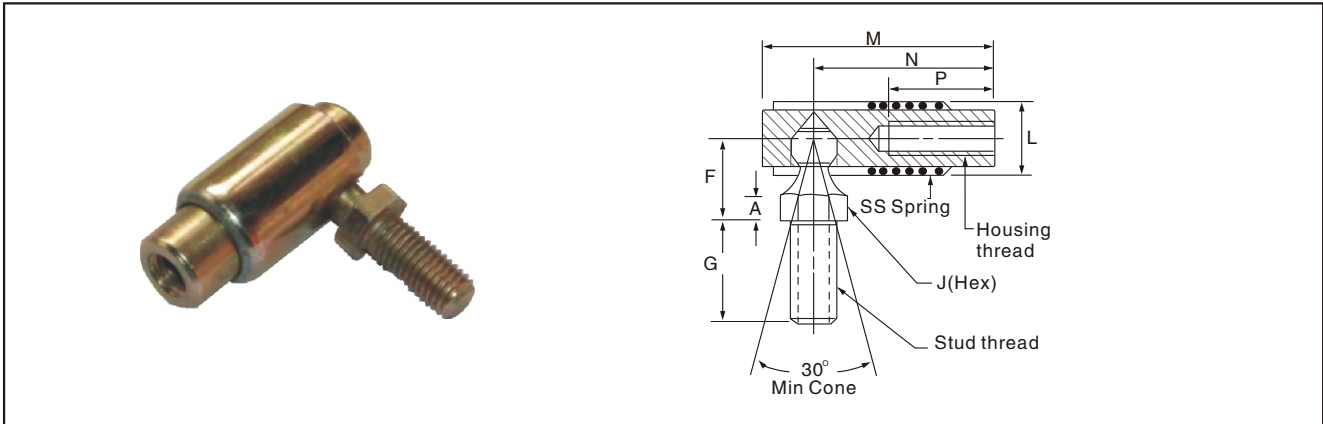
Clip, hardened spring steel.

- Alternative: stainless steel.

- Unless otherwise specified, all dimensions are in inches.

- Special request upon drawing or samples.

## Quick Release • QD series



Part No.	Housing Thread	Stud Thread	A	F	G	J	L	M	N	P	Pull force Min.lb	Shear Force Min.lb
QD187	10-32	10-32	0.125	0.438	0.438	0.312	0.438	1.094	0.906	0.438	430	650
QD250	1/4-28	1/4-28	0.125	0.469	0.562	0.375	0.562	1.250	0.969	0.531	950	800
QD312	5/16-24	5/16-24	0.156	0.531	0.687	0.437	0.625	1.453	1.125	0.605	1000	1000
QD375	3/8-24	3/8-24	0.187	0.687	0.875	0.500	0.750	1.750	1.375	0.812	1250	1250
QD500	1/2-20	1/2-20	0.250	0.875	1.125	0.625	1.000	2.530	2.030	1.000	1900	20000

**-Material:**

Body, carbon steel.

Ball stud, carbon steel, heat treated, zinc plated, yellow dichromate treated.

Sleeve, low carbon steel, zinc plated, yellow dichromate treated.

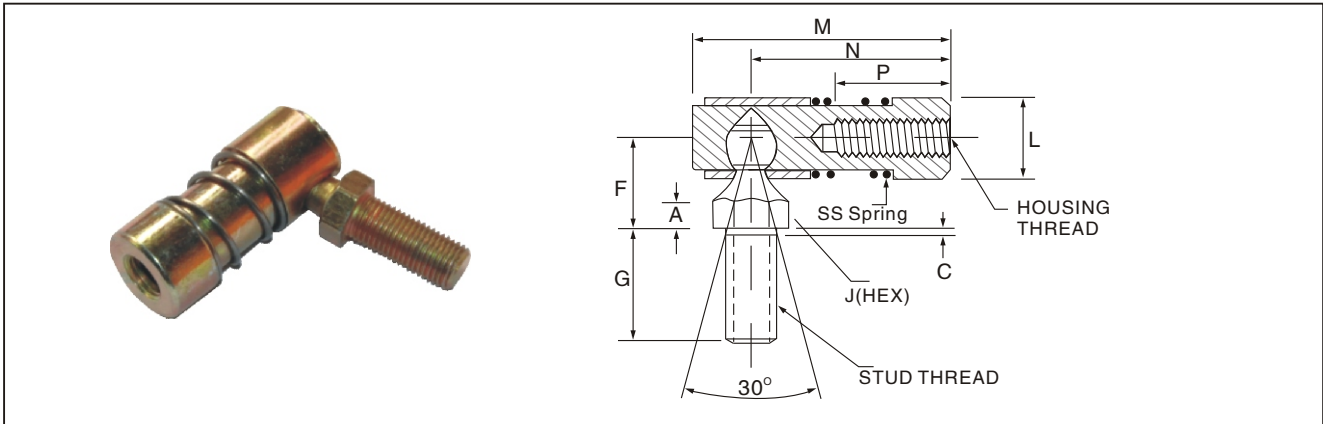
Spring, stainless steel.

-Alternative: stainless steel.

-Unless otherwise specified, all dimensions are in inches.

-Special request upon drawing or samples.

## Quick Disconnect • QI series



Part No .	Housing Thread	Stud Thread	A	F	G	J	L	M	N	P
QI187	10-32	10-32	0.125	0.438	0.438	0.312	0.438	1.094	0.906	0.438
QI250	1/4-28	1/4-28	0.125	0.469	0.562	0.375	0.562	1.250	0.969	0.531
QI312	5/16-24	5/16-24	0.156	0.531	0.687	0.437	0.625	1.453	1.125	0.594
QI375	3/8-24	3/8-24	0.187	0.687	0.875	0.500	0.750	1.750	1.375	0.812
QI500	1/2-20	1/2-20	0.250	0.875	1.125	0.625	1.000	2.530	2.030	1.000

### -Material

Body,carbon steel.

Ball stud,carbon steel,heat treated,zinc plated,  
yellow dichromate treated.

Sleeve,carbon steel,zinc plated,yellow dichromate treated.

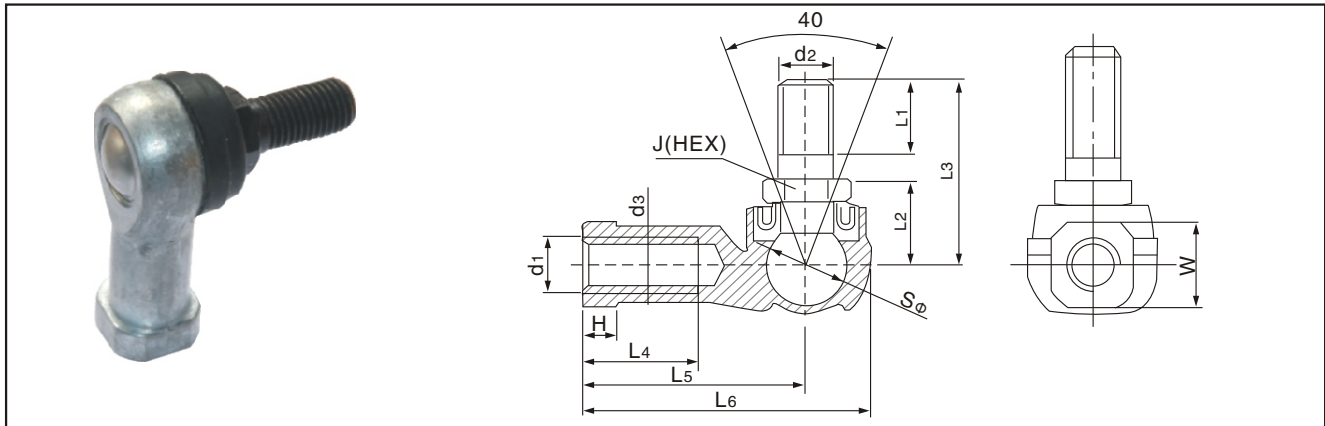
Spring,stainless steel.

-Alternative: stainless steel.

-Unless otherwise specified,all dimensions are in inches.

-Special request upon drawing or samples.

## BL series



Part No .	Dimensions													Static load Capability (kN)	Yield strength (kN)	Weight (g)
	D1	D2	D3	L1	L2	L3	L4	L5	L6	H	W	J	SΦ			
BL M6 × 1	M6 × 1	M6 × 1	10	11	11	26	16	30	38	5	11	10	11.11	9.90	3.92	26
BLM8 × 1.25	M8 × 1.25	M8 × 1.25	13	12	14	31	19	36	45.5	6	14	12	12.7	12.50	6.57	49
BL M10 × 1.25	M10 × 1.25	M10 × 1.25	14.5	15	17	37	23	43	55.5	7	17	14	15.87	18.30	11.30	87
BLM10 × 1.5	M10 × 1.5	M10 × 1.5	14.5	21	17	43	23	43	55.5	7	17	14	15.87	18.30	11.30	90
BLM12 × 1.25	M12 × 1.25	M12 × 1.25	17.5	17	19	42	26	50	64.5	8	19	17	19.05	26.70	16.40	143
BL M12 × 1.75	M12 × 1.75	M12 × 1.75	17.5	24	19	49	26	50	64.5	8	19	17	19.05	26.70	16.40	148
BLM16 × 1.5	M16 × 1.5	M16 × 1.5	22	23	23.5	60	34	64	83	11	24	22	22.22	36.40	26.90	315
BLM16 × 2	M16 × 2	M16 × 2	22	29	23.5	66	34	64	83	11	24	22	22.22	36.40	26.90	325

### -Material:

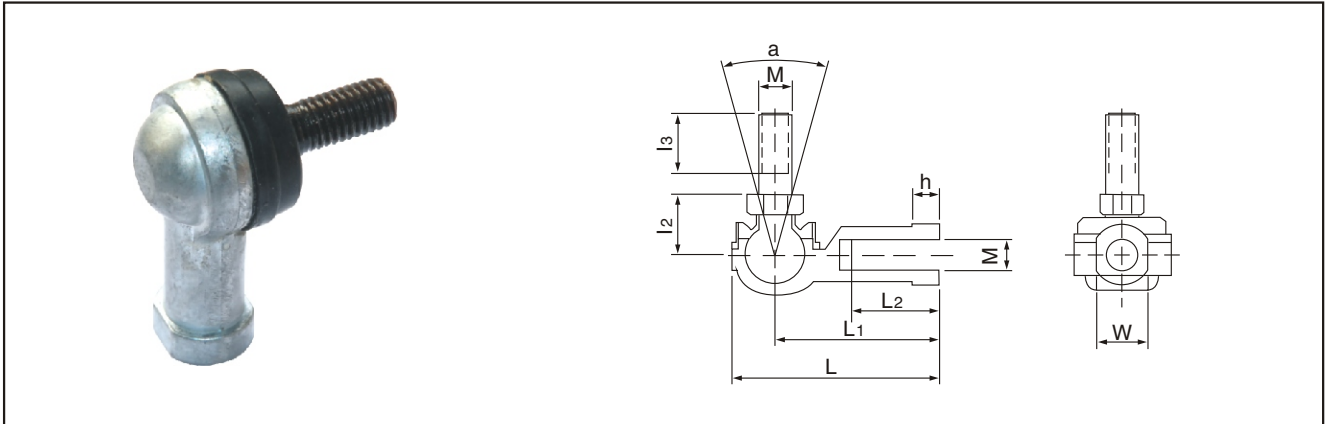
- Housing, High strength zinc alloy;
- Ball, bearing steel Gcr15;
- Shank, low carbon steel 35 or 40Cr;
- Dust cover, NBR rubber

-Left hand thread, please add suffix 'L', e.g. BLM10X1.5L

-Grease is sealed in the boot, high wear resistance

-Work Temperature, -40° C - 120° C

## LHSA Series



Part No .	M	L	L1	L2	l2	l3	W	D1	h	a
LHSA5-RS	M5X0.75	38.5	30	16	12	10	10	10	5	17
LHSA6-RS	M6X1.0	38.5	30	16	12	10	10	10	5	17
LHSA8-RS	M8X1.25	48	36	19	14.5	12.5	13	13	5	18
LHSA10-RS	M10X1.25	57	43	23	16	17	15	15	6.5	19
LHSA12-RS	M12X1.75	67	50	27	20	20	17.5	17.5	6.5	20
LHSA14-RS	M14X2.0	76	57	30	22.5	22	20	20	8	20
LHSA16-RS	M16X1.5	84	64	32	36.5	23	22	22	8	20
LHSA18-RS	M18X1.5	93	71	34	41.5	25	25	25	10	20
LHSA20-RS	M20X1.5	99	77	35	41	25	28	28	10	20
LHSA22-RS	M22X1.5	109	84	41	42	26	30	30	12	20

**-Material:**

Housing, High strength zinc alloy;

Ball, bearing steel GCr15, equivalent to steel SAE 52100

Shank, alloy steel 40Cr;

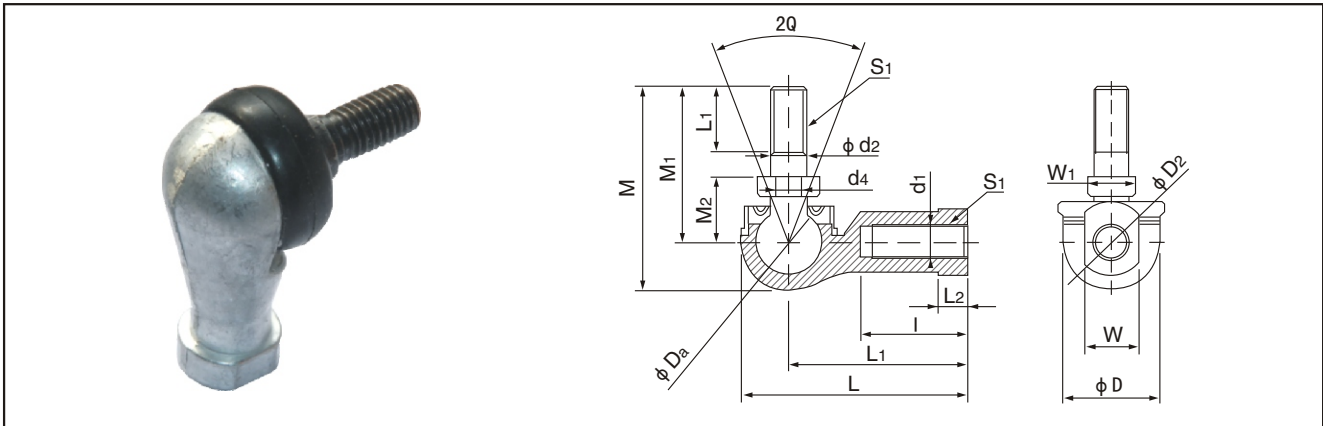
Dust Cover, NBR rubber

-Left hand thread, please add suffix 'L', e.g. LH SA 10L-RS

-Grease is sealed in the boot, high wear resistance

-Work Temperature, -40° C-120° C

## SQ series



Part No.	L	D	M	Thread S1	L1	L	L2	d1	D2	W	d2	M1	M2	L1	d4	Da	Static load capacity kN	Yield strength kN
SQ5D	35	16	29	M5X0.8	27	14	4	9	11	9	5	21	10	8	9	11.112	9.22	2.25
SQ6D	40	19	35.5	M6X1	30	14	5	10	13	11	6	26	11	11	10	12.700	12.10	3.53
SQ8D	48	23	42.5	M8X1.25	36	17	5	12.5	16	14	8	31	14	12	12	15.875	19.10	6.57
SQ10D	57	27	50.5	M10X1.25	43	21	6.5	15	19	17	10	37	17	15	14	19.050	27.50	10.70
SQ10BD	57	27	56.5	M10X1.5	43	21	6.5	15	19	17	10	43	17	21	14	19.050	27.50	10.70
SQ12D	66	31	57.5	M12X1.25	50	25	6.5	17.5	22	19	12	42	19	17	19	22.225	37.50	16.40
SQ12BD	66	31	64.5	M12X1.75	50	25	6.5	17.5	22	19	12	49	19	24	19	22.225	37.50	16.40
SQ14D	75	35	73.5	M14X1.5	57	26	8	20	25	22	14	56	21.5	22	19	25.400	48.90	19.80
SQ14BD	75	35	79.5	M14X2	57	26	8	20	25	22	14	62	21.5	28	19	25.400	48.90	19.80
SQ16D	84	39	79.5	M16X1.5	64	32	8	22	27	22	16	60	23.5	23	22	25.400	48.90	26.90
SQ16BD	84	39	85.5	M16X2	64	32	8	22	27	22	16	66	23.5	29	22	25.400	48.90	26.90
SQ18D	93	44	90	M18X1.5	71	34	10	25	31	27	18	68	26.5	25	23	28.575	61.90	33.30
SQ20D	99	44	90	M20X1.5	77	35	10	27.5	34	30	20	68	27	25	29	28.575	61.90	45.90
SQ22D	109	50	95	M22X1.5	84	41	12	30	37	32	22	70	28	26	27	31.750	75.40	48.00

### -Material:

Housing, High strength zinc alloy;

Ball, bearing steel GCr15, equivalent to steel SAE 52100 ;

Shank, alloy steel 40Cr;

Dust Cover, NBR rubber

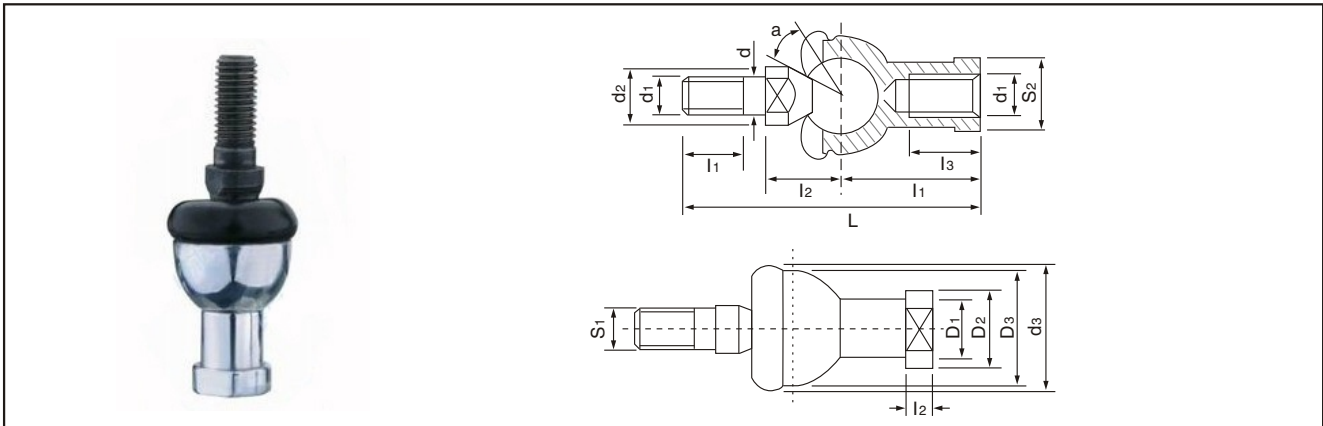
-Left hand thread, please add suffix 'L', e.g. SQL16D

-Grease is sealed in the boot, high wear resistance

-Work Temperature, -40°C-120°C

-All dimension are in mm.

## SQZ series



Part No .	D	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	S <sub>1</sub>	L	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	S <sub>2</sub>	A	Load ratings kN	Weight kg
SQZ5RS	5	M5x0.8	9	20	8	11	7	46	24	4	12	9	11	17	9	15	2.8	0.025
SQZ6RS	6	M6x1.0	10	20	11	12.2	8	55.2	28	5	15	10	13	20	11	15	3.7	0.041
SQZ8RS	8	M8x1.25	12	24	12	16	10	65	32	5	16	12.5	16	24	14	15	5.8	0.075
SQZ10RS	10	M10x1.25	14	30	15	19.5	11	74.5	35	6.5	18	15	19	28	17	15	8.4	0.12
SQZ10RS-1	10	M10x1.5	14	30	21	19.5	11	80.5	35	6.5	18	15	19	28	17	15	8.4	0.12
SQZ12RS	12	M12x1.25	17	32	17	21	15	84	40	6.5	20	17.5	22	32	19	15	11	0.18
SQZ12RS-1	12	M12x1.75	17	32	24	21	15	91	40	6.5	20	17.5	22	32	19	15	11	0.18
SQZ14RS	14	M14x1.5	19	38	22	23.5	17	103	45	8	25	20	25	36	22	11	15	0.27
SQZ14RS-1	14	M14x2.0	19	38	28	23.5	17	109	45	8	25	20	25	36	22	11	15	0.27
SQZ16RS	16	M16x1.5	22	44	23	25.5	19	112	50	8	27	22	27	40	22	11	15	0.36
SQZ16RS-1	16	M16x2.0	22	44	29	25.5	19	118	50	8	27	22	27	40	22	11	15	0.36
SQZ18RS	18	M18x1.5	23	45	25	31	20	130.5	58	10	32	25	31	45	27	11	19	0.54
SQZ20RS	20	M20x1.5	27	50	25	29	24	133	63	10	38	27.5	34	45	30	7.5	19	0.57
SQZ22RS	22	M22x1.5	27	52	26	33	24	145	70	12	43	30	37	50	32	7.5	23	0.76

-Material:

Housing, High strength zinc alloy;

Ball, bearing steel GCr15, equivalent to steel SAE 52100 ;

Shank, alloy steel 40Cr;

Dust Cover, NBR rubber

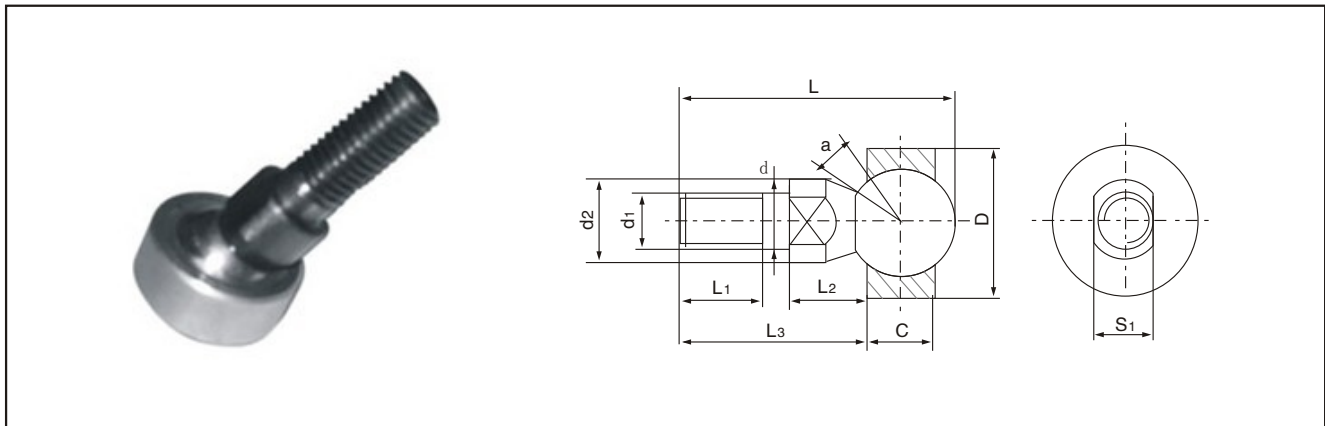
-Left hand thread, please add suffix 'L', e.g. SQZ16LRS

-Grease is sealed in the boot, high wear resistance

-Work Temperature, -40°C-120°C

-All dimension are in mm.

## SQD series



Part No.	d	d <sub>1</sub>	d <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L	S <sub>1</sub>	C	D	R1s	a	Load ratings kN	Weight kg
		6g		min							min	≈		
SQD5	5	M5x0.8	9	8	8.0	19.0	27.5	7	6.0	16	0.3	25	2.0	0.014
SQD6	6	M6x1.0	10	11	8.8	23.5	33.5	8	6.75	18	0.3	25	3.2	0.021
SQD8	8	M8x1.25	12	12	11.6	28.6	41.0	10	9.0	22	0.3	25	5.7	0.042
SQD10	10	M10x1.25	14	15	14.2	34.2	49.0	11	10.5	26	0.3	25	9.2	0.067
SQD10-1	10	M10x1.5	14	21	14.2	40.2	55.0	11	10.5	26	0.3	25	9.2	0.067
SQD12	12	M12x1.25	17	17	15.1	38.1	55.1	15	12.0	30	0.5	25	14.0	0.108
SQD12-1	12	M12x1.75	17	24	15.1	45.1	62.1	15	12.0	30	0.5	25	14.0	0.108
SQD14	14	M14x1.5	19	22	16.8	51.3	70.7	17	13.5	34	0.5	20	19.0	0.167
SQD14-1	14	M14x2.0	19	28	16.8	57.3	76.7	17	13.5	34	0.5	20	19.0	0.167
SQD16	16	M16x1.5	22	23	18.0	54.5	76.3	19	15.0	38	0.5	20	26.0	0.238
SQD16-1	16	M16x2.0	22	29	18.0	60.5	82.3	19	15.0	38	0.5	20	26.0	0.238

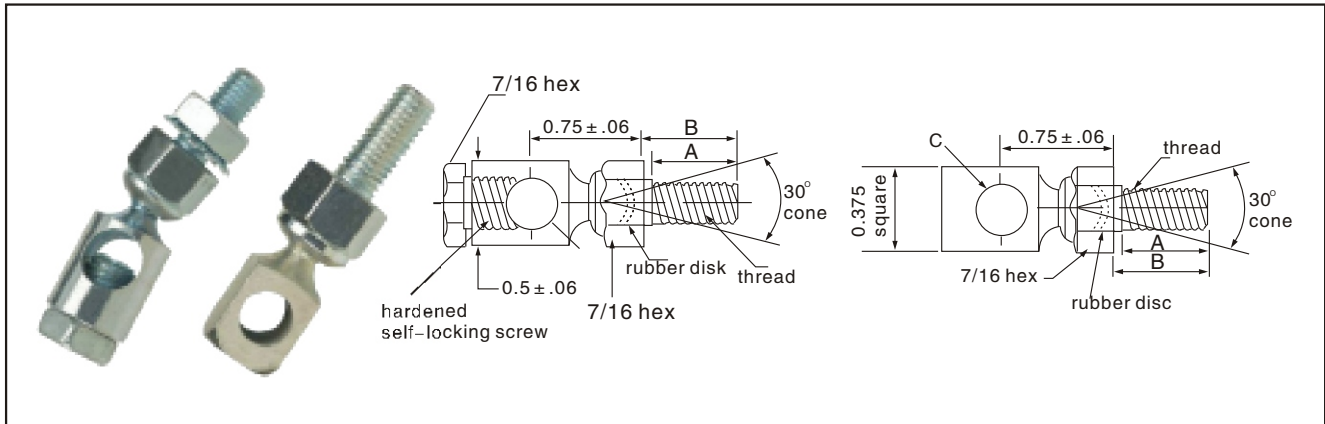
**-Material:**

- housing, high strength zinc alloy;
- ball, GCr15, equivalent to SAE52100;
- stud, Alloy steel 40Cr, black oxidized;

-All dimensions are in mm



## Damper Control • DC&DH series

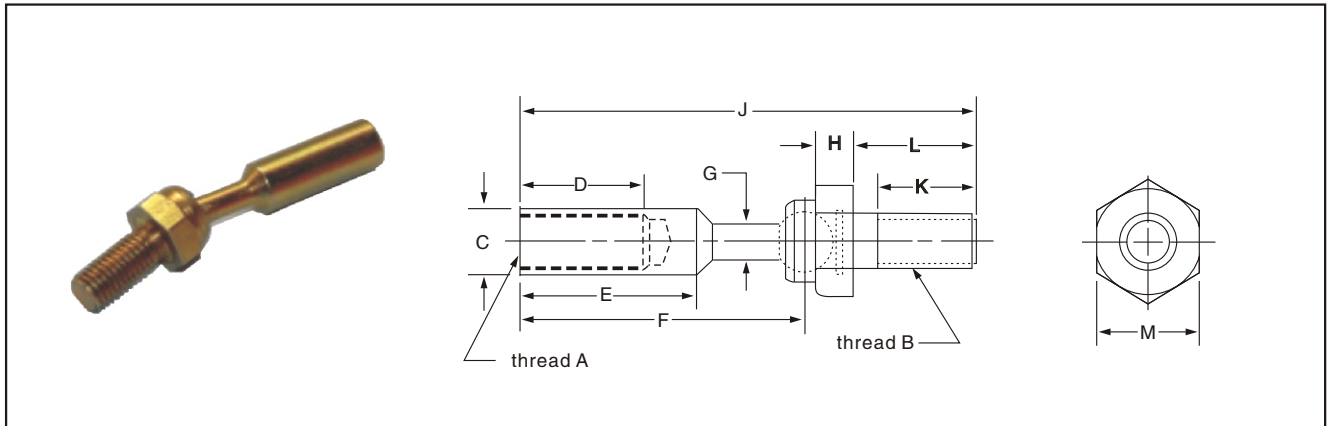


Part No .	Thread	A	B	C
DC-3F-312-320	10-32	0.250	0.312	0.320
DC-4F-437-320	1/4-28	0.328	0.437	0.320
DC-4F-562-320	1/4-28	0.500	0.562	0.320
DC-4C-437-320	1/4-20	0.328	0.437	0.320
DC-4C-562-320	1/4-20	0.453	0.562	0.320
DC-5F-625-320	5/16-24	0.516	0.625	0.320
DC-5F-750-320	5/16-24	0.641	0.750	0.320
DH-4C-437-257	1/4-20	0.328	0.437	0.257
DH-4F-562-257	1/4-28	0.500	0.562	0.257

### - Material:

- Ball Joint Head & Base
  - Low Carbon Steel
  - Zinc Plated, Clear Chromate Treated
- Buna N Rubber Disc (provides vibration-free operation)
- Self Locking Screw
  - Low Carbon Steel, Heat Treated
  - Zinc Plated, Clear Chromate Treated
- Alternative: stainless steel.
- Unless otherwise specified, all dimensions are in inches.
- Special request upon drawing or samples.

## Damper Control · DS series



Part No.	Male Thread	Female Thread	C	D	E	F	G	H	J	K	L	M
DS101	1/4-28	1/4-28	0.31	0.56	0.81	1.31	0.17	0.17	2.09	0.50	0.56	0.438
DS101S	1/4-20	1/4-20	0.31	0.56	0.81	1.31	0.17	0.17	2.09	0.50	0.56	0.438
DS102	5/16-24	5/16-24	0.44	0.73	0.98	1.31	0.21	0.17	2.40	0.69	0.75	0.438

**-Material:**

- Low carbon steel,
- Zinc plate, yellow / clear passivated.