








Mounting Elements










Connection Elements

Overview



Connection elements	Technical data	Description	Page
 Connection nipples	Connections : G1/8" - G	to clip on suction pads	3.5
 Connection screws	Connections : G1/8" - G	for suction pads with a fixed body	3.7
 Suction pad retainer SAS	Connections : M5 - M30x1,5	rigid retainer for even surfaces	3.9
 Suction pad retainer SAK	Connections : M12x1 - M30x1,5	articulated retainer for adjusting the suction pads to uneven surfaces	3.11



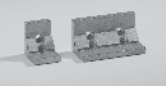
Holders for suction pads	Technical data	Description	Page
 Angle holder HSW	Connections : M 5 - M16	Holder with angle connection for direct connection to drillings	3.13
 Bushing HSB	Connections : G 1/8 - G 1/4	Holder with straight connections for direct connections	3.15
 Joint holder HSG	Connections : M 5 - M 16 G 1/8 - G 1/4	Joint holder for adjustment of the pads to curved surfaces	3.17





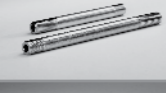



Federstößel	Technical data	Description	Page
 Suspension bolt FSBI-DG	Connections: M8x1 - M20x1,5	- turn-proof aluminum design - mounted on holder or drillings - sets down softly on workpieces	3.19
 Suspension bolt FSBE-DG	Connections: M8x1 - M20x1,5	- turn-proof aluminum design - mounted on holder or drillings - sets down softly on workpieces	3.21
 Suspension bolt FSBB-DG	Connections: M8x1 - M20x1,5	- turn-proof aluminum design - mounted on holder or drillings - sets down softly on workpieces	3.23
 Suspension bolt FSBE	Connections: M16x1,5 - M30x1,5	- mounted on holder or drillings - sets down softly on workpieces	3.25
 Suspension bolt FSBB	Connections: M16x1,5 - M30x1,5	- mounted on holder or drillings - sets down softly on workpieces - even load distribution	3.27
 Suspension bolt FSKE	Connections: M12x1 - M20x1,5	- mounted on hollow profiles - sets down softly on workpieces	3.29
 Suspension bolt FSKB	Connections: M12x1 - M20x1,5	- mounted on hollow profiles - sets down softly on workpieces - even load distribution	3.31

Connection Elements

Overview

Holder for suspension bolt		Technical data		Description	Page
	Holders HFSA			Holders for suspension bolts with slide bushing on aluminum profiles	3.33
	Holders HFSH	for hollow profiles:	30x30 - 60x60	Holders for suspension bolts with slide bushing on hollow profiles	3.35

Profile systems		Technical data		Description	Page
	Design of individual suction spiders			Design of suction spiders to flange onto hoisting gear or robots	3.37
	Aluminum profiles	Dimensions:	40x40 - 100x100	robust and multi-purpose aluminum profiles	3.39
	Connection elements			Angle connections, sliding blocks, covers	3.41

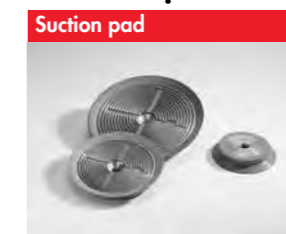
Single components		Technical data		Description	Page
	Slide bushing GS	Bolt diameter:	12 - 20 mm	for individual design of suspension bolts and suction pad connections	3.45
	Cross clamping pieces KKS	Bolt diameter:	12 - 20 mm	for individual design of suspension bolt and suction pad connections	3.47
	Clamping plates KP	Bolt diameter:	12 - 30 mm	for individual design of suspension bolt and suction pad connections	3.49
	Suspension bolts STN	Bolt diameter:	12 - 20 mm	Bolt with integrated vacuum feed and connection nipple	3.51
	Suspension bolts STI	Bolt diameter:	12 - 20 mm	Bolt with integrated vacuum feed and inner thread for threaded union	3.53
	Suspension bolts STG	Bolt diameter:	12 - 30 mm	solid bolt for high duty with separate vacuum feed	3.55
	Pressure springs	Diameter: Spring rates:	12 - 30 mm 0,5 - 500 N/mm	for individual design of suspension bolt characteristics	3.57
	Bolt ends			Connection elements for bolts	3.59

Connection Elements

Modular system

Available connections for suction pads				
Angle connection	Bushing	Joint holder	Suspension bolt FSB	Suspension bolt FSK
				

These holders are used for connecting the suspension bolts FSB to aluminum and hollow profiles.



Connection Elements

Connection nipple for suction pad AN

Description

Connection nipple with outer thread for flat or bellows suction cups in steel, brass or aluminum design.

Application

- to clip on the suction cups. Easy exchange when worn out
- to prevent unintentional pulling off the cups can be equipped with clamps



ANF ... ANA

Article number

Type		Temperature (°C)	Weight (kg)
ANF-6-M5	1.31.1.0011	-10 ... +80	0,002
ANF-6-1/4	1.31.1.0012	-10 ... +80	0,002
ANF-8-M5	1.31.1.0013	-10 ... +80	0,010
ANF-8-1/4	1.31.1.0014	-10 ... +80	0,010
ANF-10-1/4	1.31.1.0026	-10 ... +80	0,012
ANF-16-1/4	1.31.1.0031	-10 ... +80	0,015
ANM-8-1/8	1.31.1.0032	-10 ... +80	0,008
ANM-13-1/4	1.31.1.0033	-10 ... +80	0,012
ANC-1,2-M5	1.31.1.0001	-10 ... +80	0,010
ANC-2,5-M5	1.31.1.0002	-10 ... +80	0,003
ANC-3,5-M5	1.31.1.0003	-10 ... +80	0,010
ANC-4-1/4	1.31.1.0005	-10 ... +80	0,020
ANC-4,5-1/4	1.31.1.0004	-10 ... +80	0,008
ANC-5-1/4	1.31.1.0007	-10 ... +80	0,024
ANC-5,5-1/4	1.31.1.0006	-10 ... +80	0,007
ANC-8-1/4	1.31.1.0008	-10 ... +80	0,008
ANA-9-1/8	1.31.1.0018	-10 ... +80	0,010
ANA-9-1/4	1.31.1.0019	-10 ... +80	0,018
ANA-29-1/4	1.31.1.0020	-10 ... +80	0,021
ANA-32-1/4	1.31.1.0021	-10 ... +80	0,027
ANA-41-1/4	1.31.1.0022	-10 ... +80	0,032

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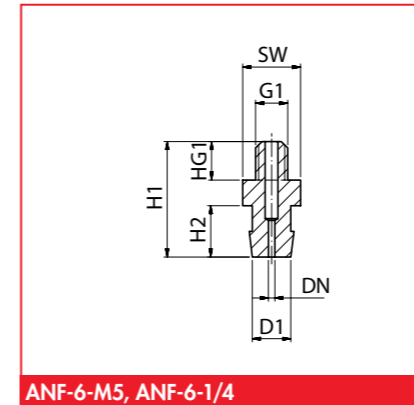
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Connection Elements

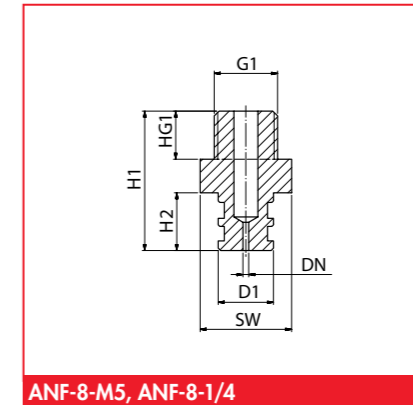
Connection nipple for suction pad AN

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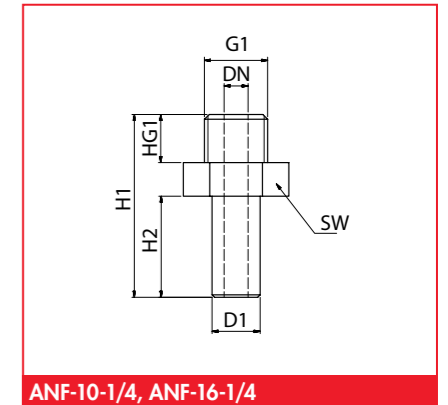
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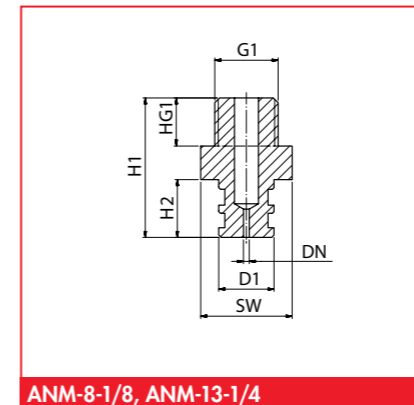
ANF-6-M5, ANF-6-1/4



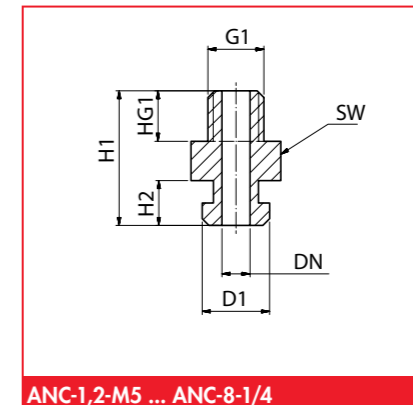
ANF-8-M5, ANF-8-1/4



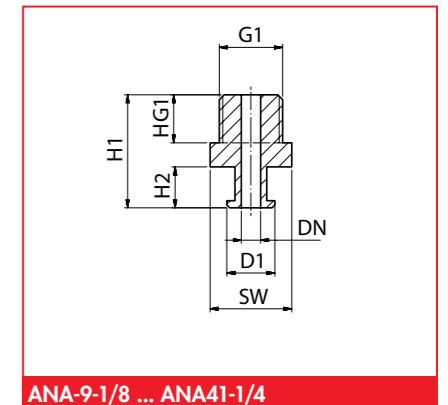
ANF-10-1/4, ANF-16-1/4



ANM-8-1/8, ANM-13-1/4



ANC-1,2-M5 ... ANC-8-1/4



ANA-9-1/8 ... ANA41-1/4

Dimensions

Type	D1	DN	H1	H2	G1	HG1	SW
ANF-6-M5	7	1	18	8	M 5	6	9
ANF-6-1/4	7	4	25	8	G1/4	10	17
ANF-8-M5	11	1	18	12	M 5	6	---
ANF-8-1/4	11,5	5	29	12	G1/4	10	19
ANF-10-1/4	10	5	38	21	G1/4	10	19
ANF-16-1/4	16	5	38	21	G1/4	10	19
ANM-8-1/8	8	3,5	23	8,5	G1/8	7	14
ANM-13-1/4	13	6,5	25	9	G1/4	8	17
ANC-1,2-M5	3	1,2	10,5	2,5	M 5	4,5	8
ANC-2,5-M5	6	2,5	12	4	M 5	4,5	8
ANC-3,5-M5	6,5	3,5	13,5	6,5	M 5	4,5	8
ANC-4-1/4	10	4	23,5	8,5	G1/4	10	17
ANC-4,5-1/4	14	4	23,5	8,5	G1/4	10	17
ANC-5-1/4	14	5	29,5	14,5	G1/4	10	17
ANC-5,5-1/4	M10x1,25	5,5	25	10	G1/4	10	17
ANC-8-1/4	18	8	37	22	G1/4	10	17
ANA-9-1/8	7	3	21	5,5	G1/8	9,5	14
ANA-9-1/4	13	6	26	6	G1/4	10	17
ANA-29-1/4	12	6	29	12	G1/4	12	19
ANA-32-1/4	12	6	26	9	G1/4	12	19
ANA-41-1/4	12	6	46	10	G1/4	10	19

Connection Elements

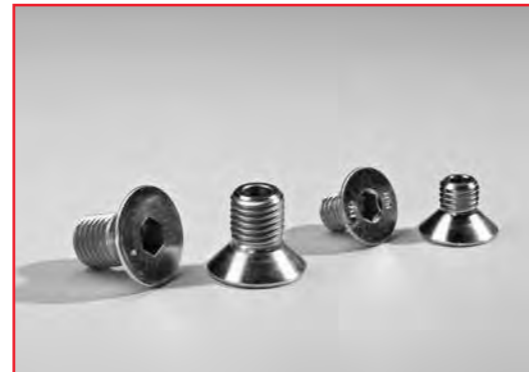
Connection screws for suction pads AS

Description

Robust connection screws for suction pads with body. The screws are available with and without through-hole, depending on the connection to the pad.

Application

- to fasten suction pads with body
- in connection with suction pad retainers SAS/SAK
- in connection with holders for suction pads



AS-M5 ...ASB-M16

Article number

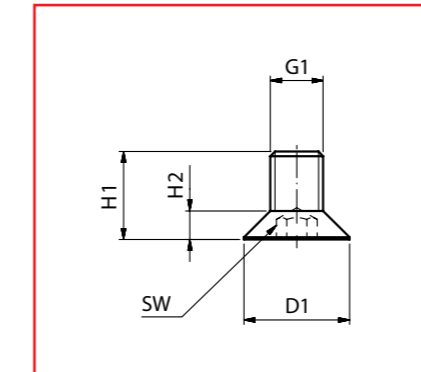
Type		Temperature (°C)	Weight (kg)
AS-M5-20	1.31.2.0108	-10 ... +80	0,004
AS-M8-16	1.31.2.0076	-10 ... +80	0,010
AS-M12-17	1.31.2.0010	-10 ... +80	0,022
AS-M12-20	1.31.2.0011	-10 ... +80	0,025
AS-M16-22	1.31.2.0035	-10 ... +80	0,042
AS-M24x1,5-28	1.31.2.0069	-10 ... +80	0,120
AS-M24x1,5-30	1.31.2.0029	-10 ... +80	0,160
ASB-M5-20	1.31.2.0009	-10 ... +80	0,003
ASB-M8-16	1.31.2.0068	-10 ... +80	0,008
ASB-M12-17	1.31.2.0003	-10 ... +80	0,020
ASB-M12-20	1.31.2.0082	-10 ... +80	0,022
ASB-M12-25	1.31.2.0083	-10 ... +80	0,026
ASB-M16-23	1.31.2.0046	-10 ... +80	0,036

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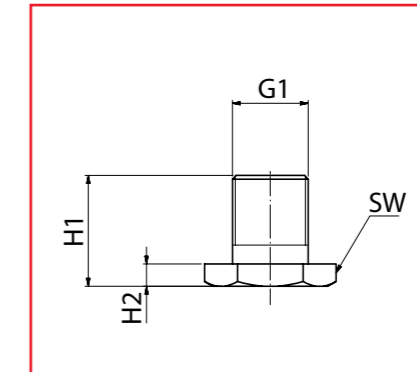
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Connection Elements

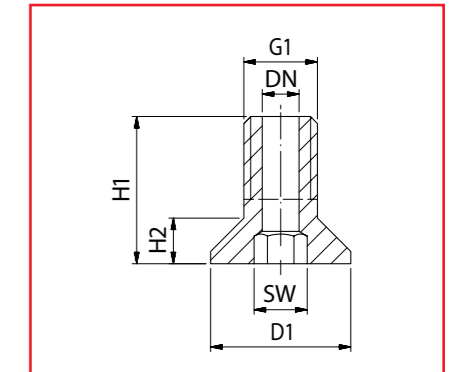
Connection screws for suction pad AS



AS-M5 ... M16



AS-M24x1,5-28



ASB-M5 ... M16

Dimensions

Type	D1	DN	H1	H2	G1	SW
AS-M5-20	11	---	20	3	M5	3
AS-M8-16	18	---	16	5	M8	5
AS-M12-17	27	---	17	7,5	M12	8
AS-M12-20	27	---	20	7,5	M12	8
AS-M16-22	33,5	---	22	8,8	M16	10
AS-M24x1,5-28	---	---	34	6	M24x1,5	36
AS-M24x1,5-30	---	---	42	12	M24x1,5	36
ASB-M5-20	11	2	20	3	M5	3
ASB-M8-16	18	4	16	5	M8	5
ASB-M12-17	27	8	17	7,5	M12	8
ASB-M12-20	27	8	20	7,5	M12	8
ASB-M12-25	27	8	25	7,5	M12	8
ASB-M16-20	33,5	10	23	8,8	M16	10

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Simply move more.

Connection Elements

Rigid suction pad retainer SAS

Description

Stable and robust suction pad retainers made of high-quality aluminum (outer thread in inches) or galvanized steel (metric thread). The suction pad retainers have a through-hole which also serves for an integrated vacuum feed (exceptions see table). For suction plates with a body the retainers are equipped with an o-ring which seals the connection.

Application

- rigid connection on suspension bolt and holders
- smooth, even surfaces



SAS-M8x1-M5 ... SAS-M30x1,5-M24

Article number

Type	
SAS-M8x1-M5	1.31.2.0126
SAS-M8x1-1/8	1.31.2.0124
SAS-M12x1-1/8	1.31.2.0063
SAS-M12x1-1/4	1.31.2.0064
SAS-M12x1-3/8	1.31.2.0125
SAS-M16x1,5-1/4	1.31.2.0102
SAS-M16x1,5-3/8	1.31.2.0103
SAS-M16x1,5-M8*	1.31.2.0100
SAS-M16x1,5-M12*	1.31.2.0101
SAS-M16x1,5-M16*	1.31.2.0072
SAS-M20x1,5-M16*	1.31.2.0073
SAS-M20x1,5-M20**	1.31.2.0027
SAS-M30x1,5-M24**	1.31.2.0028

* Design with o-ring sealing suction pad with body

** w/o integrated vacuum feed

Technical data

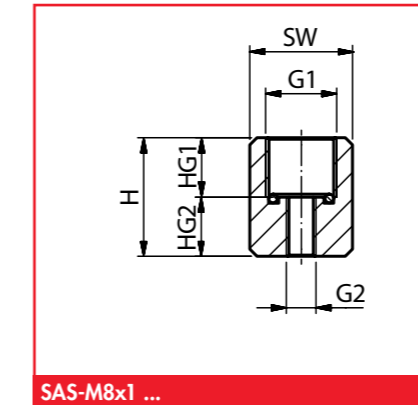
Type	Tensile strain max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
SAS-M8x1-M5	80	4	-10 ... +80	0,009
SAS-M8x1-1/8	80	4	-10 ... +80	0,008
SAS-M12x1-1/8	250	20	-10 ... +80	0,010
SAS-M12x1-1/4	250	20	-10 ... +80	0,012
SAS-M12x1-3/8	250	20	-10 ... +80	0,014
SAS-M16x1,5-1/4	600	60	-10 ... +80	0,025
SAS-M16x1,5-3/8	600	60	-10 ... +80	0,023
SAS-M16x1,5-M8*	250	60	-10 ... +80	0,060
SAS-M16x1,5-M12*	600	60	-10 ... +80	0,074
SAS-M16x1,5-M16*	1.250	60	-10 ... +80	0,078
SAS-M20x1,5-M16*	2.500	120	-10 ... +80	0,102
SAS-M20x1,5-M20**	5.500	120	-10 ... +80	0,993
SAS-M30x1,5-M24**	9.500	350	-10 ... +80	0,918

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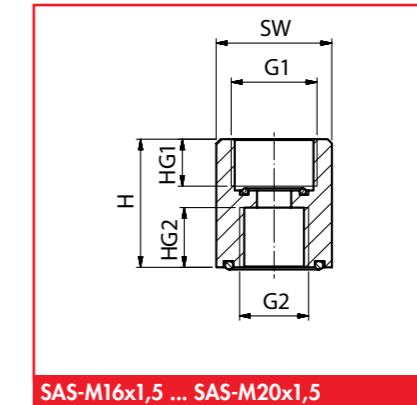
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Connection Elements

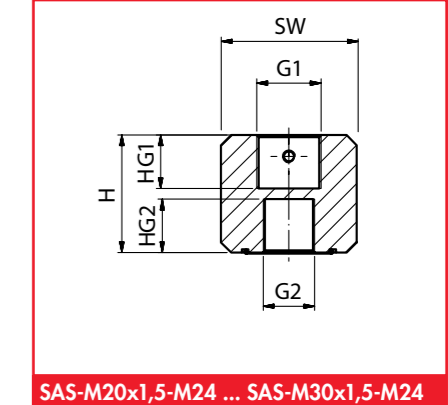
Rigid suction pad retainer SAS



SAS-M8x1 ...



SAS-M16x1,5 ... SAS-M20x1,5



SAS-M20x1,5-M24 ... SAS-M30x1,5-M24

Dimensions

Type	H	G1	G2	HG1	HG2	SW
SAS-M8x1-M5	28	M8x1	M5	10	10	13
SAS-M8x1-1/8	28	M8x1	G1/8	10	10	13
SAS-M12x1-1/8	28	M12x1	G1/8	10	10	15
SAS-M12x1-1/4	28	M12x1	G1/4	10	12	17
SAS-M12x1-3/8	28	M12x1	G3/8	10	12	19
SAS-M16x1,5-1/4	28	M16x1,5	G1/4	10	10	24
SAS-M16x1,5-3/8	28	M16x1,5	G3/8	10	10	24
SAS-M16x1,5-M8*	28	M16x1,5	M8	10	10	24
SAS-M16x1,5-M12*	28	M16x1,5	M12	10	10	24
SAS-M16x1,5-M16*	30	M16x1,5	M16	10	13	24
SAS-M20x1,5-M16*	30	M20x1,5	M16	12	14	27
SAS-M20x1,5-M20**	55	M20x1,5	M20	25	25	55
SAS-M30x1,5-M24**	55	M30x1,5	M24	25	25	55

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Simply move more.

Connection Elements

Articulated suction pad retainer SAK

Description

Stable and robust suction pad retainers made of galvanized steel with integrated vacuum feed for articulated connection of suction pads on suspension bolts. On suction pads with body the connection is sealed with an o-ring. Starting with connection thread M20 a separate vacuum feed is required.

Application

- articulated connection on suspension bolts
- curved, uneven surfaces



SAK-M16x1,5-M8 ... SAK-M30x1,5-M24

Article number

Type	
SAK-M16x1,5-M8	1.31.2.0104
SAK-M16x1,5-M12	1.31.2.0105
SAK-M16x1,5-M16	1.31.2.0049
SAK-M20x1,5-M16	1.31.2.0054
SAK-M20x1,5-M20*	1.31.2.0025
SAK-M30x1,5-M24*	1.31.2.0026

* w/o integrated vacuum feed

Technical data

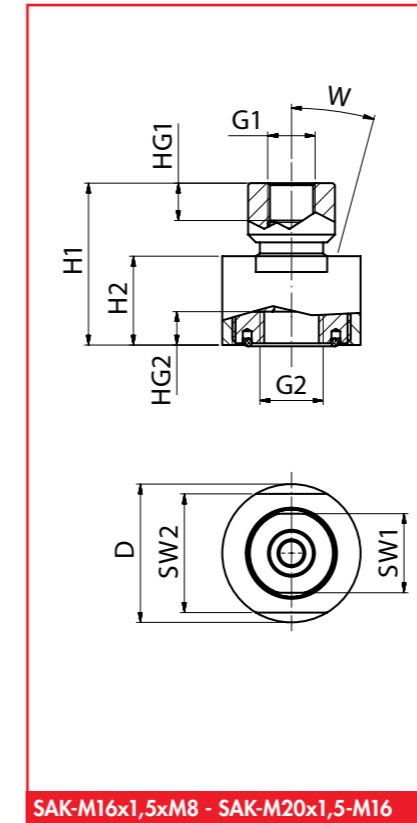
Type	Tensile load max. (N)	Temperature (°C)	Weight (kg)
SAK-M16x1,5-M8	200	-10 ... +80	0,123
SAK-M16x1,5-M12	800	-10 ... +80	0,123
SAK-M16x1,5-M16	1.250	-10 ... +80	0,115
SAK-M20x1,5-M16	2.500	-10 ... +80	0,279
SAK-M20x1,5-M20*	5.500	-10 ... +80	1,309
SAK-M30x1,5-M24*	9.500	-10 ... +80	1,249

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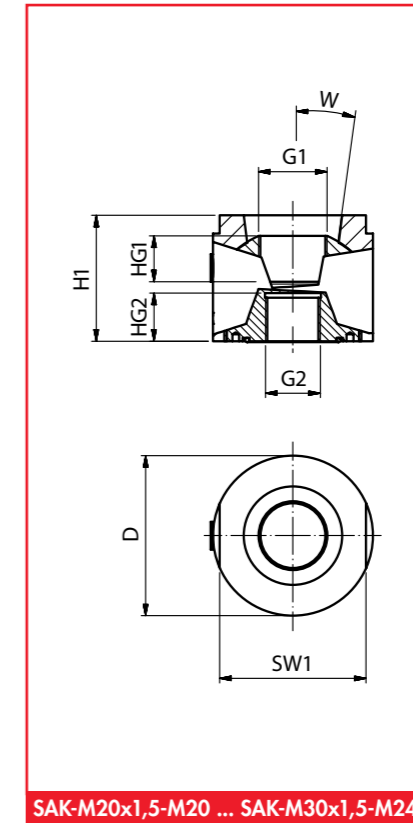
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Connection Elements

Articulated suction pad retainer SAK



SAK-M16x1,5-M8 - SAK-M20x1,5-M16



SAK-M20x1,5-M20 ... SAK-M30x1,5-M24

Dimensions

Type	H1	H3	HG1	HG2	D	W	G1	G2	SW1	SW2
SAK-M16x1,5-M8	41,5	22,5	10	8	35	15°	M16x1,5	M8	20	30
SAK-M16x1,5-M12	41,5	22,5	10	8	35	15°	M16x1,5	M12	20	30
SAK-M16x1,5-M16	41,5	22,5	10	8	35	15°	M16x1,5	M16	20	30
SAK-M20x1,5-M16	50,5	29,5	10	8	50	15°	M20x1,5	M16	25	41
SAK-M20x1,5-M20*	55	---	20	19	70	7°	M20x1,5	M20x1,5	64	---
SAK-M30x1,5-M24*	55	---	20	19	70	7°	M30x1,5	M24x1,5	64	---

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Simply move more.

Holder for Suction Pads

Holding bracket HSW

Description

Stable holder with upper connection thread and lateral vacuum feed made of galvanized steel. The connection screw is included.

Holders with metric connection thread are designed for suction pads with body and are sealed by an o-ring.

Application

- used for limited space applications
- simple and quick installation
- mounted on suspension bolt for a lower vacuum connection



HSW-M12x1-M5 ... HSWO-M16x1,5-M16

Article number

Type	
HSW-M12x1-M5	1.31.3.0012
HSW-M12x1-1/8	1.31.3.0013
HSW-M12x1-1/4	1.31.3.0014
HSW-M16x1,5-1/4	1.31.3.0020
HSW-M16x1,5-3/8	1.31.3.0021
HSWO-M12x1-M8*	1.31.3.0015
HSWO-M16x1,5-M12*	1.31.3.0016
HSWO-M16x1,5-M16*	1.31.3.0019

* design with o-ring sealing

Technical data

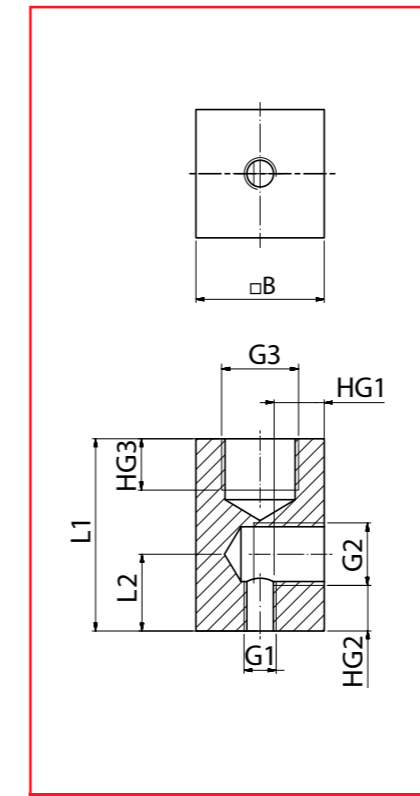
Type	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
HSW-M12x1-M5	250	20	-10 ... +80	0,09
HSW-M12x1-1/8	250	20	-10 ... +80	0,08
HSW-M12x1-1/4	250	20	-10 ... +80	0,16
HSW-M16x1,5-1/4	600	60	-10 ... +80	0,18
HSW-M16x1,5-3/8	600	60	-10 ... +80	0,18
HSWO-M12x1-M8*	250	20	-10 ... +80	0,17
HSWO-M16x1,5-M12*	600	60	-10 ... +80	0,18
HSWO-M16x1,5-M16*	600	60	-10 ... +80	0,18

FEZER

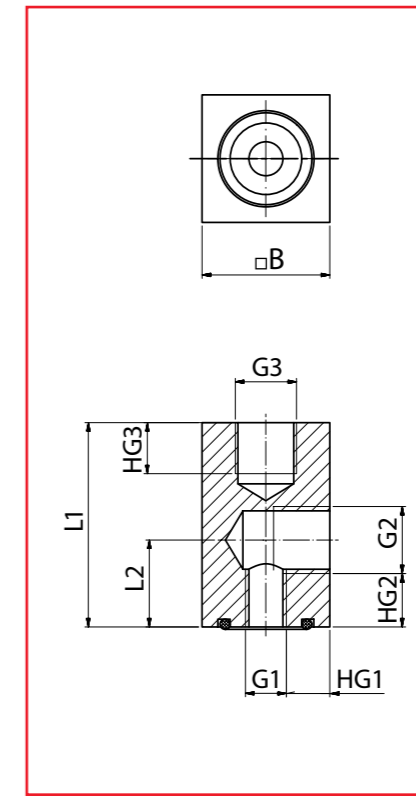
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Holder for Suction Pads

Holding bracket HSW



HSW-M12x1-M5 ... HSW-M16x1-3/8



HSWO-M12x1-M8 ... HSWO-M16x1,5-M16

Dimensions

Type	L1	L2	B	G1	G2	G3	HG1	HG2	HG3
HSW-M12x1-M5	30	12	20	M5	G1/8	M12x1	7,5	7	10
HSW-M12x1-1/8	35	15	20	G1/8	G1/8	M12x1	5	10	10
HSW-M12x1-1/4	40	17	25	G1/4	G1/4	M12x1	6	10	10
HSW-M16x1,5-1/4	50	22	25	G1/4	G1/4	M16x1,5	6	15	12
HSW-M16x1,5-3/8	50	22	25	G3/8	G3/8	M16x1,5	6	13,5	12
HSWO-M12x1-M8*	40	17	25	M8	G1/4	M12x1	8,5	10,5	10
HSWO-M16x1,5-M12*	50	22	25	M12	G1/2	M16x1,5	6,5	11,5	12
HSWO-M16x1,5-M16*	50	22	25	M16	G1/2	M16x1,5	4,5	11,5	12

FEZER

Simply move more.

Holder for Suction Pads

Bushing HSB

Description

Stable connection bushing made of brass with outer thread to be used in limited space conditions. The height adjustment of the bushing can compensate for any unevenness of the workpiece. Bushings with metric threads are designed for connection to suction pads with body and are sealed with an o-ring.

Application

- used for limited space applications
- compensation of height differences
- simple and quick installation
- mounted on suspension bolt for bottom vacuum feed



HSB-1/8-M5 ... HSB-1/2-M16

Article number

Type	
HSB-1/8-M5	1.34.1.0007
HSB-1/8-1/8	1.34.1.0008
HSB-1/4-1/4	1.34.1.0009
HSB-3/8-3/8	1.34.1.0013
HSB-1/8-M8*	1.34.1.0010
HSB-1/4-M12*	1.34.1.0011
HSB-1/2-M16*	1.34.1.0012

* design with o-ring sealing

Technical data

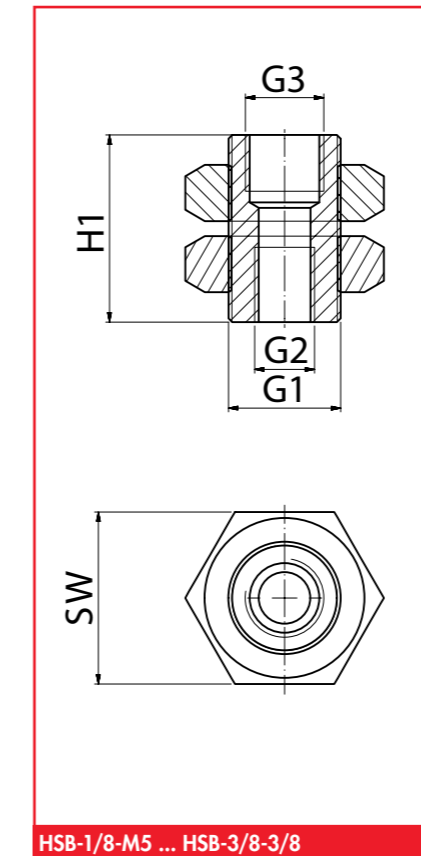
Type	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
HSB-1/8-M5	100	20	-10 ... +80	0,20
HSB-1/8-1/8	200	20	-10 ... +80	0,18
HSB-1/4-1/4	300	20	-10 ... +80	0,28
HSB-3/8-3/8	600	60	-10 ... +80	0,27
HSB-1/8-M8*	200	20	-10 ... +80	0,19
HSB-1/4-M12*	600	60	-10 ... +80	0,32
HSB-1/2-M16*	2.500	60	-10 ... +80	0,48

FEZER

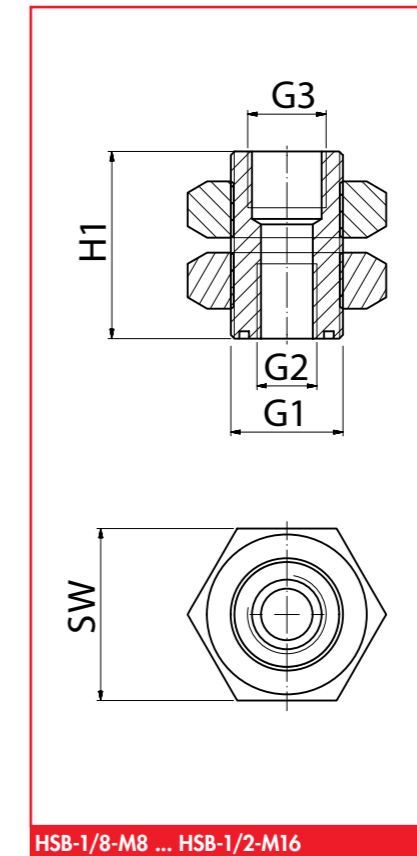
Simply move more.

Holder for Suction Pads

Bushing HSB



HSB-1/8-M5 ... HSB-3/8-3/8



HSB-1/8-M8 ... HSB-1/2-M16

Dimensions

Type	H1	G1	G2	G3	SW
HSB-1/8-M5	50	M16x1,5	M5	G1/8	30
HSB-1/8-1/8	50	M16x1,5	G1/8	G1/8	30
HSB-1/4-1/4	50	M20x1,5	G1/4	G1/4	36
HSB-3/8-3/8	60	M24x1,5	G3/8	G3/8	36
HSB-1/8-M8*	50	M16x1,5	M8	G1/4	30
HSB-1/4-M12*	50	M20x1,5	M12	G1/4	36
HSB-1/2-M16*	60	M30x1,5	M16	G1/2	46

FEZER

Simply move more.

Holder for Suction Pads

Joint holder HSG

Description

Universally suitable joint for installation of suction pads on aluminum and hollow profiles. The joints are adjustable to the workpieces both in height and in tilt angle. For connection to the suction pads please use the designated suction pad retainers.

Application

- in connection with suspension bolt
- inherently stable loads with strongly curved surfaces
- formed parts

Article number

Type	Bolt length	
	75 mm	125 mm
HSG-AL-12x1	1.34.6.0002	1.34.6.0008
HSG-AL-16x1,5	1.34.6.0003	1.34.6.0007
HSG-30-12x1	1.34.6.0004	1.34.6.0009
HSG-30-16x1,5	1.34.6.0005	1.34.6.0010
HSG-40-16x1,5	1.34.6.0006	1.34.6.0011

Technical data

Type	Tensile load max. (N)	Bend.mom. max. (Nm)	Temp. (°C)	Weight (kg)
HSG-AL-12x1	400	30	-10 ... +80	0,24
HSG-AL-16x1,5	600	45	-10 ... +80	0,25
HSG-30-12x1	400	30	-10 ... +80	0,78
HSG-30-16x1,5	600	45	-10 ... +80	0,80
HSG-40-16x1,5	600	45	-10 ... +80	0,72

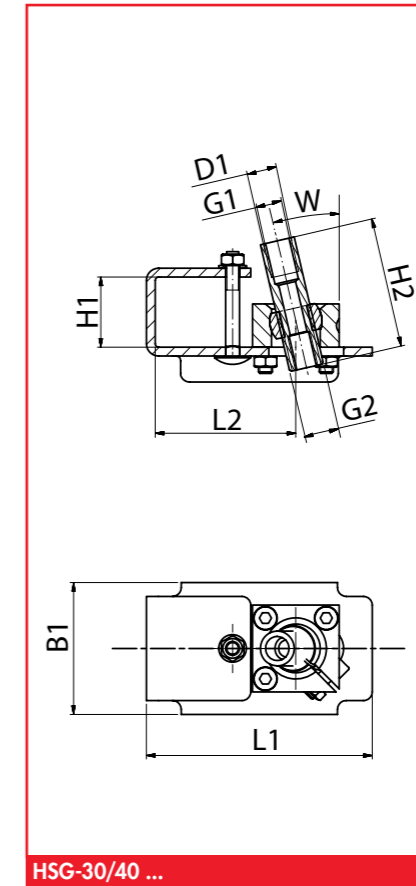
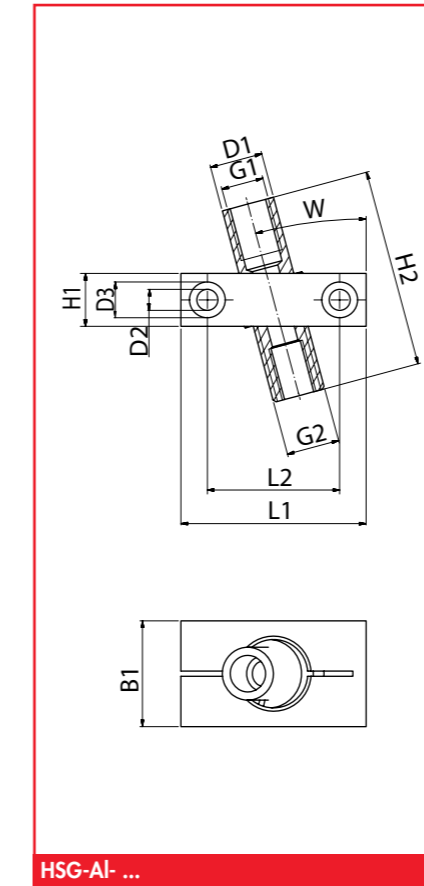
FEZER

Simply move more.



Holder for Suction Pads

Joint holder HSG



Dimensions

Type	L1	L2	B	H1	H2	D1	D2	D3	G1	G2	W
HSG-AL-12x1-75	70	50	40	20	75	12	8	13,5	G1/4	M12x1	15°
HSG-AL-12x1-125	70	50	40	20	125	12	8	13,5	G1/4	M12x1	15°
HSG-AL-16x1,5-75	70	50	40	20	75	16	8	13,5	G1/4	M16x1,5	15°
HSG-AL-16x1,5-125	70	50	40	20	125	16	8	13,5	G1/4	M16x1,5	15°
HSG-30-12x1-75	105	66	66	30,5	75	12	---	---	G1/4	M12x1	13°
HSG-30-12x1-125	105	66	66	30,5	125	12	---	---	G1/4	M12x1	13°
HSG-30-16x1,5-75	105	66	66	30,5	75	12	---	---	G1/4	M16x1,5	13°
HSG-30-16x1,5-125	105	66	66	30,5	125	12	---	---	G1/4	M16x1,5	13°
HSG-40-16x1,5-75	105	66	66	30,5	75	12	---	---	G1/4	M16x1,5	13°
HSG-40-16x1,5-125	105	66	66	30,5	125	12	---	---	G1/4	M16x1,5	13°

FEZER

Simply move more.

Suspension Bolt

with bushing and turn-proof FSBI-DG

FEZER

Simply move more.

Description

Turn-proof suspension bolt made of high-quality aluminum with integrated vacuum feed and internal damping spring. The suspension bolt is hard-coated with a high longevity. The end positions is dampened by an o-ring. The bolt is also sealed with an o-ring against the suction pad retainers.

Application

- applications with high cycle rates
- when using oval suction plates
- soft touchdown on workpieces
- height adjustment via outside thread of the bushing



FSBI-DG-M8x1 ... FSBI-DG-M20x1,5

Article number

Type	Article number
FSBI-DG-M8x1-25	1.34.2.0055
FSBI-DG-M12x1-25	1.34.2.0056
FSBI-DG-M16x1,5-50	1.34.2.0057
FSBI-DG-M20x1,5-50	1.34.2.0058

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)*	Tensile load max. (N)	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSBI-DG-M8x1-25	25	0,138	7,0	200	4	0,002	-10 ... +60	0,058
FSBI-DG-M12x1-25	25	0,176	10,1	800	10	0,003	-10 ... +60	0,084
FSBI-DG-M16x1,5-50	50	0,191	15,3	1.200	25	0,005	-10 ... +60	0,202
FSBI-DG-M20x1,5-50	50	0,224	18,3	2.500	50	0,008	-10 ... +60	0,259

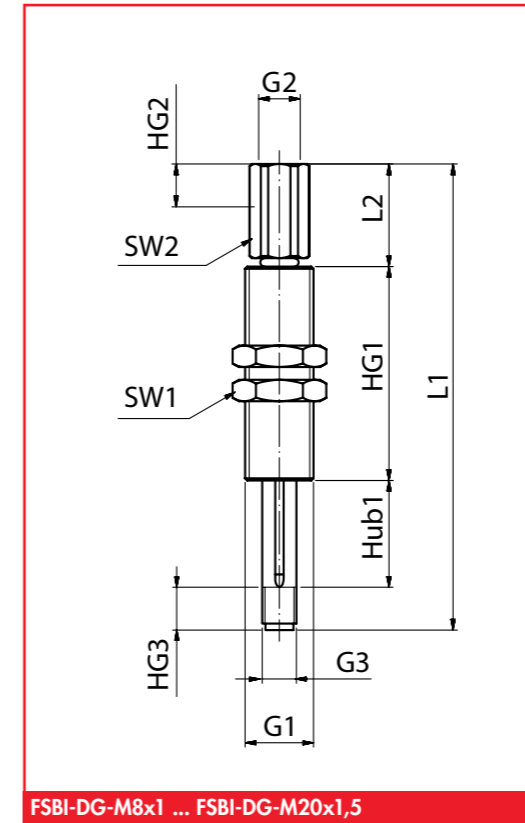
* lower spring force at 50% of bolt stroke

Suspension Bolt

with bushing and turn-proof FSBI-DG

FEZER

Simply move more.



FSBI-DG-M8x1 ... FSBI-DG-M20x1,5

Dimensions

Type	L1	L2	Hub1	G1	G2	G3	HG1	HG2	HG3	SW1	SW2
FSBI-DG-M8x1-25	109	24	25	M16x1,5	G1/8	M8x1	50	10	10	19	13
FSBI-DG-M12x1-25	109	24	25	M20x1,5	G1/8	M12x1	50	10	10	24	13
FSBI-DG-M16x1,5-50	166	25	50	M24x1,5	G3/8	M16x1,5	81	10	10	32	19
FSBI-DG-M20x1,5-50	166	25	50	M30x1,5	G3/8	M20x1,5	81	10	10	36	19

Suspension Bolt

with bushing and turn-proof FSBE-DG

Description

Turn-proof suspension bolt made of high-quality aluminum with internal vacuum feed and lower dampening spring. The bolt is hard-coated with a high longevity. There are various holders for the installation of the suspension bolt. The bolt is sealed with an o-ring against the suction pad retainers.

Application

- applications with high cycle rates
- soft touch-down on workpieces
- use of oval suction plates
- height adjustment via outer thread of the bushing



FSBE-DG-M8x1- ... FSBE-DG-M20x1,5-

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm
FSBE-DG-M8x1	1.34.2.0072	---	---
FSBE-DG-M12x1	1.34.2.0065	1.34.2.0066	---
FSBE-DG-M16x1,5	---	1.34.2.0060	1.34.2.0061
FSBE-DG-M20x1,5	---	1.34.2.0067	1.34.2.0068

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)*	Tensile load max. (N)	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSBE-DG-M8x1-25	25	2,268	57,2	200	4	0,004	-10 ... +60	0,10
FSBE-DG-M12x1-25	25	2,545	63,6	800	10	0,006	-10 ... +60	0,17
FSBE-DG-M12x1-50	50	1,647	82,3	800	10	0,009	-10 ... +60	0,18
FSBE-DG-M16x1,5-50	50	1,944	97,2	1.200	25	0,011	-10 ... +60	0,31
FSBE-DG-M16x1,5-75	75	1,512	113,4	1.200	25	0,013	-10 ... +60	0,32
FSBE-DG-M20x1,5-50	50	3,977	198,8	2.500	50	0,009	-10 ... +60	0,56
FSBE-DG-M20x1,5-75	75	2,574	193,0	2.500	50	0,011	-10 ... +60	0,59

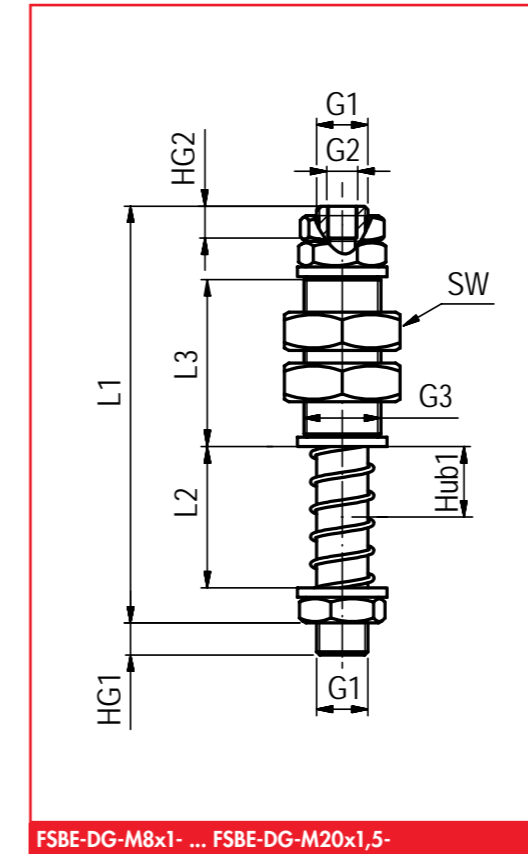
* lower spring force at 50% of bolt stroke

FEZER

Simply move more.

Suspension bolt

with bushing and turn-proof FSBE-DG



FSBE-DG-M8x1- ... FSBE-DG-M20x1,5-

Dimensions

Type	L1	L2	L3	Hub1	G1	G2	G3	HG1	HG2	SW
FSBE-DG-M8x1-25	120	46,5	50	25	M8x1	M5	M16x1,5	10,5	10	19
FSBE-DG-M12x1-25	130	51	50	50	M12x1	M5	M20x1,5	10,5	10	24
FSBE-DG-M12x1-50	155	75	50	75	M12x1	M5	M20x1,5	10,5	10	24
FSBE-DG-M16x1,5-50	185	84	60	25	M16x1,5	G1/8	M24x1,5	10,5	15	32
FSBE-DG-M16x1,5-75	215	114	60	50	M16x1,5	G1/8	M24x1,5	10,5	15	32
FSBE-DG-M20x1,5-50	175	74	60	75	M20x1,5	G1/4	M30x1,5	10,5	15	36
FSBE-DG-M20x1,5-75	215	113,5	60	25	M20x1,5	G1/4	M30x1,5	10,5	15	36

FEZER

Simply move more.

Suspension Bolt

with bushing and turn-proof FSBB-DG

Description

Turn-proof suspension bolt made of high-quality aluminum with integrated vacuum feed and upper and lower dampening spring. The bolt is hard-coated with a high longevity. The suspension bolt can be directly mounted in drillings or with appropriate holders. The bolt is sealed with an o-ring against the suction pad retainers.

Application

- applications with high cycle rates
- soft touch-down on workpieces
- workpieces with uneven surfaces (load compensation)
- use of oval suction plates
- height adjustment via outer thread on the bushing

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm
FSBB-DG-M8x1	1.34.3.0073	---	---
FSBB-DG-M12x1	1.34.3.0066	1.34.3.0067	---
FSBB-DG-M16x1,5	---	1.34.3.0064	1.34.3.0065
FSBB-DG-M20x1,5	---	1.34.3.0070	1.34.3.0071

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)*	Tensile load max. (N)**	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSBB-DG-M8x1-25	25	0,921	24,8	70	4	0,006	-10 ... +60	0,10
FSBB-DG-M12x1-25	25	2,545	63,6	350	10	0,007	-10 ... +60	0,16
FSBB-DG-M12x1-50	50	1,647	47,7	350	10	0,008	-10 ... +60	0,18
FSBB-DG-M16x1,5-50	50	1,944	105,0	1.200	25	0,012	-10 ... +60	0,35
FSBB-DG-M16x1,5-75	75	1,512	118,7	1.200	25	0,014	-10 ... +60	0,37
FSBB-DG-M20x1,5-50	50	3,997	200,8	2.500	50	0,016	-10 ... +60	0,65
FSBB-DG-M20x1,5-75	75	2,574	193,0	2.500	50	0,012	-10 ... +60	0,68

* lower spring force at 50% of bolt stroke

** Tensile load refers to 50% stroke of the upper spring. Mounted suction pads must not exceed these capacities.

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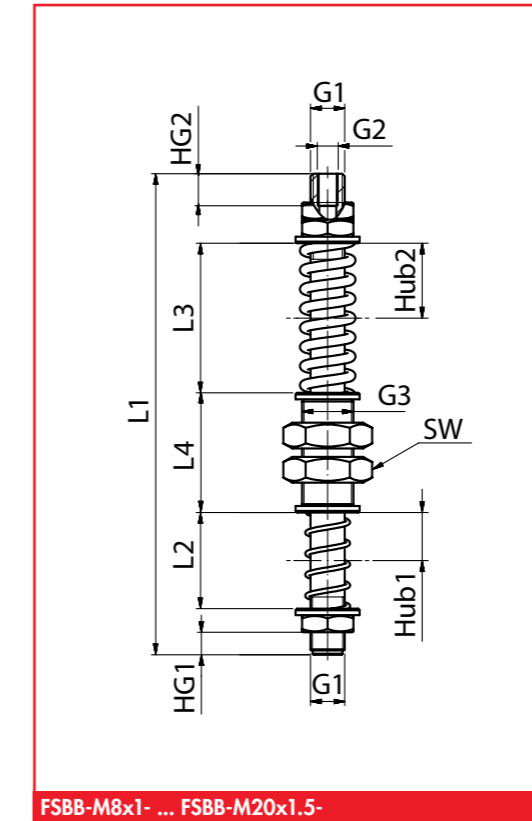
Simply move more.



FSBB-M8x1- ... FSBB-M20x1.5-

Suspension Bolt

with bushing and turn-proof FSBB-DG



FSBB-M8x1- ... FSBB-M20x1.5-

Dimensions

Type	L1	L2	L3	L4	Hub1	Hub2	G1	G2	G3	HG1	HG2	SW
FSBB-DG-M8x1-25	157	39	44,5	50	25	20	M8x1	M5	M16x1,5	10,5	10	24
FSBB-DG-M12x1-25	165	51	41	50	25	20	M12x1	M5	M20x1,5	10,5	10	30
FSBB-DG-M12x1-50	190	73,5	41	50	50	20	M12x1	M5	M20x1,5	10,5	10	30
FSBB-DG-M16x1,5-50	250	81	70	60	50	24	M16x1,5	G1/8	M24x1,5	10,5	15	36
FSBB-DG-M16x1,5-75	280	111,5	70	60	75	24	M16x1,5	G1/8	M24x1,5	10,5	15	36
FSBB-DG-M20x1,5-50	260	74	80	60	50	24	M20x1,5	G1/4	M30x1,5	10,5	15	46
FSBB-DG-M20x1,5-75	300	115	80	60	75	13	M20x1,5	G1/4	M30x1,5	10,5	15	46

FEZER

Simply move more.

Suspension Bolt

with bushing FSBE

FEZER

Simply move more.

Description

Robust suspension bolt with lower dampening spring. The bolt consists of a precision tube with internal vacuum feed, the bushing is made of high-quality brass. The suspension bolt can be directly fastened to drillings or with appropriate holders to aluminum and hollow profiles.

The bolt is sealed with an o-ring against the suction pad retainers.

Application

- applications with high cycle rates
- soft touch-down on workpieces
- height adjustment via outer thread of the bushing



FSBE-M12x1- ... FSBE-M30x1,5-

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm	Bolt stroke 100 mm
FSBE-M12x1-M5	1.34.2.0035	1.34.2.0036	1.34.2.0037	---
FSBE-M16x1,5-1/8	1.34.2.0029	1.34.2.0038	1.34.2.0039	---
FSBE-M20x1,5-1/4	1.34.2.0040	1.34.2.0041	1.34.2.0042	---
FSBE-M20x1,5*	---	1.34.2.0069	1.34.2.0070	1.34.2.0071
FSBE-M30x1,5*	---	1.34.2.0073	1.34.2.0074	1.34.2.0075

* w/o integrated vacuum feed

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)**	Tensile load max. (N)	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSBE-M12x1-M5-25	25	2,545	31,8	350	20	0,004	0 ... +80	0,30
FSBE-M12x1-M5-50	50	1,647	41,2	350	20	0,005	0 ... +80	0,32
FSBE-M12x1-M5-75	75	1,120	42,0	350	20	0,006	0 ... +80	0,35
FSBE-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,009	0 ... +80	0,51
FSBE-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,011	0 ... +80	0,55
FSBE-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,013	0 ... +80	0,58
FSBE-M20x1,5-1/4-25	25	6,250	78,1	3.500	100	0,009	0 ... +80	0,93
FSBE-M20x1,5-1/4-50	50	3,977	99,4	3.500	100	0,011	0 ... +80	0,99
FSBE-M20x1,5-1/4-75	75	2,574	96,4	3.500	100	0,013	0 ... +80	1,08
FSBE-M20x1,5-50*	25	6,250	78,1	5.500	120	---	0 ... +80	1,08
FSBE-M20x1,5-75*	50	3,977	99,4	5.500	120	---	0 ... +80	1,12
FSBE-M20x1,5-100*	75	2,574	96,4	5.500	120	---	0 ... +80	1,23
FSBE-M30x1,5-50*	50	15,536	388	9.500	350	---	0 ... +80	3,41
FSBE-M30x1,5-75*	75	10,0	375	9.500	350	---	0 ... +80	3,74
FSBE-M30x1,5-100*	100	6,836	342	9.500	350	---	0 ... +80	4,29

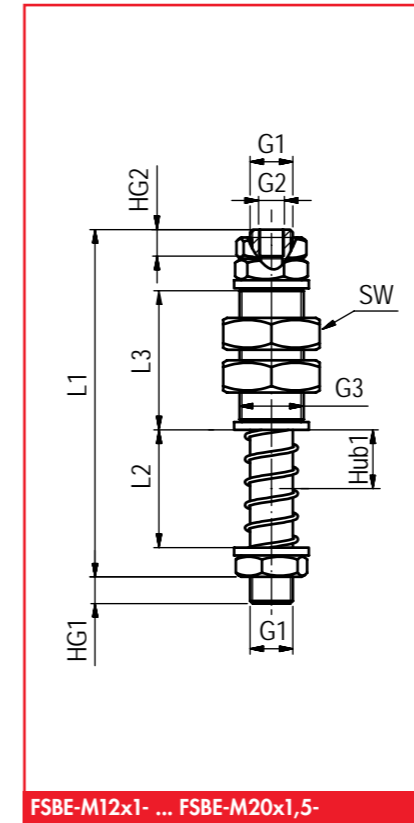
** lower spring force at 50% of bolt stroke

Suspension Bolt

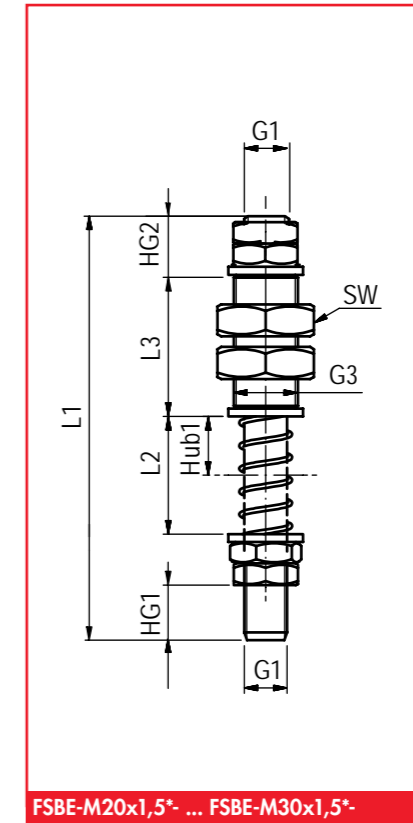
with bushing FSBE

FEZER

Simply move more.



FSBE-M12x1- ... FSBE-M20x1,5-



FSBE-M20x1,5- ... FSBE-M30x1,5-

Dimensions

Type	L1	L2	L3	Hub1	G1	G2	G3	HG1	HG2	SW
FSBE-M12x1-M5-25	130	51	50	25	M12x1	M5	M20x1,5	10,5	10	30
FSBE-M12x1-M5-50	155	75	50	50	M12x1	M5	M20x1,5	10,5	10	30
FSBE-M12x1-M5-75	190	110	50	75	M12x1	M5	M20x1,5	10,5	10	30
FSBE-M16x1,5-1/8-25	140	44	60	25	M16x1,5	G1/8	M24x1,5	10,5	15	36
FSBE-M16x1,5-1/8-50	180	83	60	50	M16x1,5	G1/8	M24x1,5	10,5	15	36
FSBE-M16x1,5-1/8-75	210	115	60	75	M16x1,5	G1/8	M24x1,5	10,5	15	36
FSBE-M20x1,5-1/4-25	150	48	60	25	M20x1,5	G1/4	M30x1,5	10,5	15	46
FSBE-M20x1,5-1/4-50	175	73	60	50	M20x1,5	G1/4	M30x1,5	10,5	15	46
FSBE-M20x1,5-1/4-75	215	113	60	75	M20x1,5	G1/4	M30x1,5	10,5	15	46
FSBE-M20x1,5-50*	175	73	60	25	M20x1,5	---	M30x1,5	10,5	---	46
FSBE-M20x1,5-75*	215	113	60	50	M20x1,5	---	M30x1,5	10,5	---	46
FSBE-M20x1,5-100*	260	158	60	75	M20x1,5	---	M30x1,5	10,5	---	46
FSBE-M30x1,5-50*	270	90	80	50	M30x1,5	---	M42x1,5	35	---	65
FSBE-M30x1,5-75*	320	140	80	75	M30x1,5	---	M42x1,5	35	---	65
FSBE-M30x1,5-100*	410	205	80	100	M30x1,5	---	M42x1,5	35	---	65

Suspension Bolt

with bushing FSBB



Simply move more.

Description

Robust suspension bolt with upper and lower dampening spring. The bolt consists of a precision steel tube with integrated vacuum feed, the bushing is made of high-quality brass. The suspension bolt can be directly fastened to drillings or with appropriate holders to aluminum or hollow profiles. The bolt is sealed with an o-ring against the suction pad retainers.



FSBB-M12x1- ... FSBB-M30x1,5-

Application

- applications with high cycle times
- soft touch-down on workpieces
- workpieces with uneven surfaces (load compensation)
- height adjustment via outer thread of bushing

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm	Bolt stroke 100 mm
FSBB-M12x1-M5	1.34.3.0047	1.34.3.0048	1.34.3.0049	---
FSBB-M16x1,5-1/8	1.34.3.0037	1.34.3.0042	1.34.3.0043	---
FSBB-M20x1,5-1/4	1.34.3.0044	1.34.3.0045	1.34.3.0046	---
FSBB-M20x1,5*	---	1.34.3.0068	1.34.3.0069	1.34.3.0072
FSBB-M30x1,5*	---	1.34.3.0062	1.34.3.0074	1.34.3.0075

* w/o central vacuum feed

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)**	Tensile load max. (N)***	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSBB-M12x1-M5-25	25	2,545	31,8	350	20	0,006	0 ... +80	0,31
FSBB-M12x1-M5-50	50	1,647	41,2	350	20	0,007	0 ... +80	0,33
FSBB-M12x1-M5-75	75	1,120	42,0	350	20	0,008	0 ... +80	0,38
FSBB-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,012	0 ... +80	0,58
FSBB-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,014	0 ... +80	0,63
FSBB-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,016	0 ... +80	0,67
FSBB-M20x1,5-1/4-25	25	6,250	78,1	3.500	100	0,012	0 ... +80	1,05
FSBB-M20x1,5-1/4-50	50	3,977	99,4	3.500	100	0,014	0 ... +80	1,10
FSBB-M20x1,5-1/4-75	75	2,574	96,4	3.500	100	0,016	0 ... +80	1,17
FSBB-M20x1,5-50*	50	6,250	78,1	5.500	120	---	0 ... +80	1,26
FSBB-M20x1,5-75*	75	3,977	99,4	5.500	120	---	0 ... +80	1,36
FSBB-M20x1,5-100*	100	2,574	96,4	5.500	120	---	0 ... +80	1,47
FSBB-M30x1,5-50*	50	15,536	388	9.500	350	---	0 ... +80	4,68
FSBB-M30x1,5-75*	75	10,0	375	9.500	350	---	0 ... +80	4,94
FSBB-M30x1,5-100*	100	6,836	342	9.500	350	---	0 ... +80	5,38

** lower spring force at 50% of bolt stroke

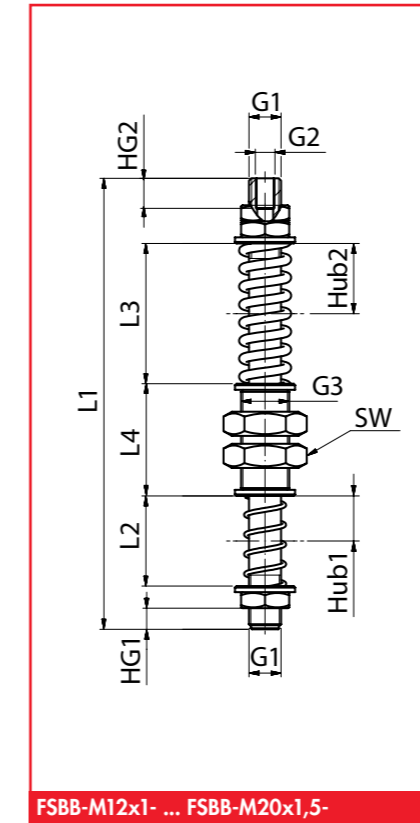
*** Tensile load relates to 50% stroke of the upper pressure spring. Mounted suction pads must not exceed these capacities.

Suspension Bolt

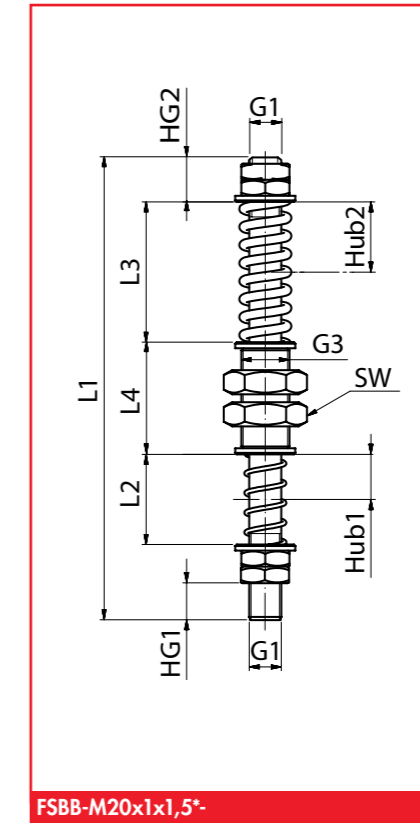
with bushing FSBB



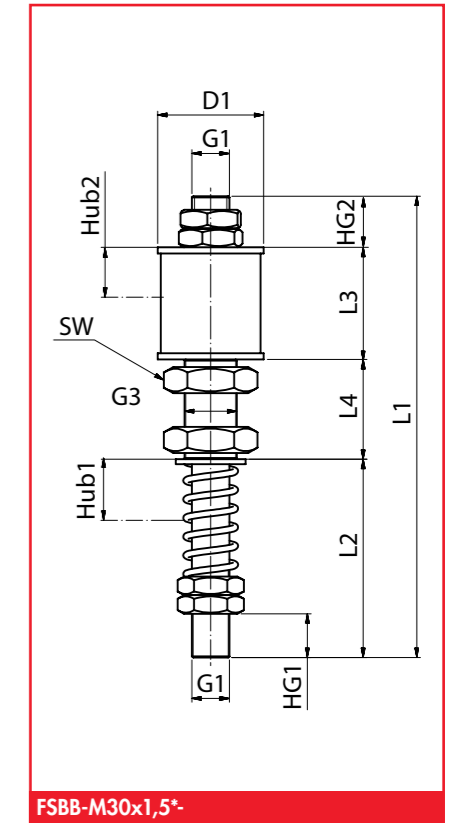
Simply move more.



FSBB-M12x1- ... FSBB-M20x1,5-



FSBB-M20x1,5-



FSBB-M30x1,5*-

Dimensions

Type	L1	L2	L3	L4	Hub1	Hub2	G1	G2	G3	D1	HG1	HG2	SW
FSBB-M12x1-M5-25	165	51	41	50	25	20	M12x1	M5	M20x1,5	---	10,5	10	36
FSBB-M12x1-M5-50	190	74	41	50	50	20	M12x1	M5	M20x1,5	---	10,5	10	36
FSBB-M12x1-M5-75	230	110	41	50	75	20	M12x1	M5	M20x1,5	---	10,5	10	36
FSBB-M16x1,5-1/8-25	210	42	70	63	25	24	M16x1,5	G1/8	M24x1,5	---	10,5	15	36
FSBB-M16x1,5-1/8-50	250	82	70	63	50	24	M16x1,5	G1/8	M24x1,5	---	10,5	15	36
FSBB-M16x1,5-1/8-75	280	112	70	63	75	24	M16x1,5	G1/8	M24x1,5	---	10,5	15	36
FSBB-M20x1,5-1/4-25	235	49	80	63	25	13	M20x1,5	G1/4	M30x1,5	---	10,5	15	46
FSBB-M20x1,5-1/4-50	260	74	80	63	50	13	M20x1,5	G1/4	M30x1,5	---	10,5	15	46
FSBB-M20x1,5-1/4-75	300	115	80	63	75	13	M20x1,5	G1/4	M30x1,5	---	10,5	15	46
FSBB-M20x1,5-50*	260	74	80	63	80	13	M20x1,5	---	M30x1,5	---	10,5	---	46
FSBB-M20x1,5-75*	300	115	80	63	75	13	M20x1,5	---	M30x1,5	---	10,5	---	46
FSBB-M20x1,5-100*	345	160	80	63	100	13	M20x1,5	---	M30x1,5	---	10,5	---	46
FSBB-M30x1,5-50*	370	80	80	83	50	13	M30x1,5	---	M42x1,5	85	35	---	65
FSBB-M30x1,5-75*	410	140	80	83	75	13	M30x1,5	---	M42x1,5	85	35	---	65
FSBB-M30x1,5-100*	480	205	80	83	100	13	M30x1,5	---	M42x1,5	85	35	---	65

Suspension Bolt

with cross clamping piece FSKE

Description

Robust suspension bolt with lower dampening spring. The bolt consists of a galvanized precision steel tube with inner vacuum feed. The cross clamping piece is made of high-quality aluminum with excellent sliding characteristics for profiles 30x30 and 40x40. The bolt is sealing with an o-ring against the suction pad retainers.

Application

- use on closed frame constructions
- applications with high cycle rates
- soft touch-down on workpieces



FSKE-M12x1 ... FSKE-M20x1,5

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm
FSKE-30-M12x1-M5	1.34.2.0045	1.34.2.0046	1.34.2.0047
FSKE-30-M16x1,5-1/8	1.34.2.0048	1.34.2.0049	1.34.2.0050
FSKE-40-M16x1,5-1/8	1.34.2.0028	1.34.2.0043	1.34.2.0044
FSKE-40-M20x1,5-1/4	1.34.2.0051	1.34.2.0052	1.34.2.0053

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spr. force max. (N)*	Tensile load max. (N)	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSKE-30-M12x1-M5-25	25	2,545	31,8	350	20	0,004	0 ... +80	0,30
FSKE-30-M12x1-M5-50	50	1,647	41,2	350	20	0,005	0 ... +80	0,32
FSKE-30-M12x1-M5-75	75	1,120	42,0	350	20	0,006	0 ... +80	0,35
FSKE-30-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,009	0 ... +80	0,38
FSKE-30-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,011	0 ... +80	0,43
FSKE-30-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,013	0 ... +80	0,46
FSKE-40-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,009	0 ... +80	0,42
FSKE-40-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,011	0 ... +80	0,46
FSKE-40-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,013	0 ... +80	0,49
FSKE-40-M20x1,5-1/4-25	25	6,250	78,1	3.500	100	0,018	0 ... +80	0,60
FSKE-40-M20x1,5-1/4-50	50	3,977	99,4	3.500	100	0,021	0 ... +80	0,65
FSKE-40-M20x1,5-1/4-75	75	2,574	96,4	3.500	100	0,024	0 ... +80	0,73

* lower spring force at 50% of bolt stroke

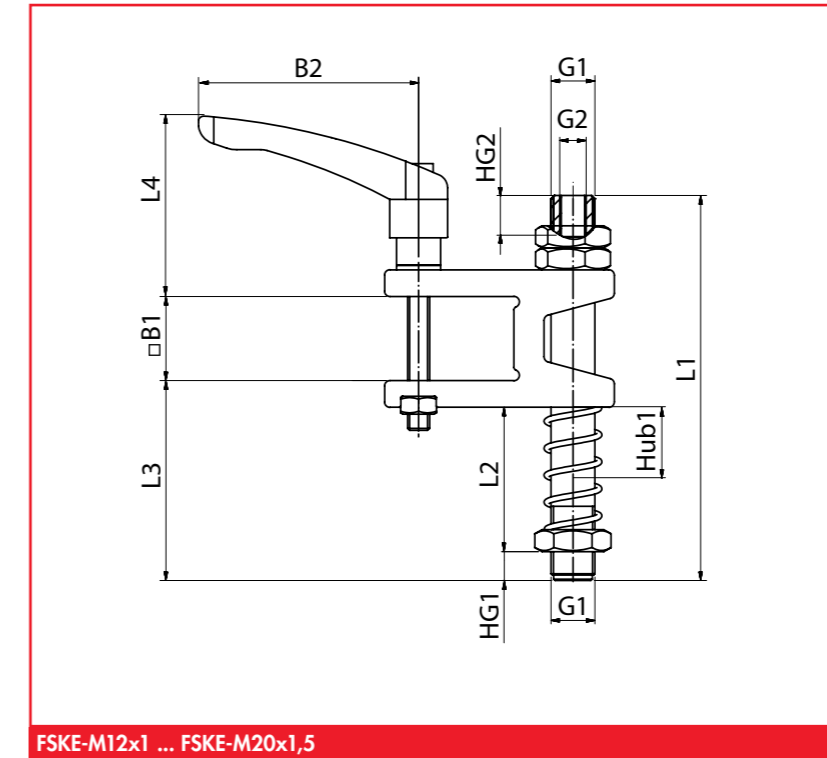
** Tensile load relates to 50% stroke of the upper pressure spring. Mounted suction pads must not exceed these capacities.

FEZER

Simply move more.

Suspension Bolt

with cross clamping piece FSKE



FSKE-M12x1 ... FSKE-M20x1,5

Dimensions

Type	L1	L2	L3	L4	B1	B2	Hub1	G1	G2	HG1	HG2
FSKE-30-M12x1-M5-25	130	51	77	69	30,5	80	25	M12x1	M5	10,5	10
FSKE-30-M12x1-M5-50	155	77	103	69	30,5	80	50	M12x1	M5	10,5	10
FSKE-30-M12x1-M5-75	190	110	136	69	30,5	80	75	M12x1	M5	10,5	10
FSKE-30-M16x1,5-1/8-25	140	45	73	69	30,5	80	25	M16x1,5	G1/8	10,5	15
FSKE-30-M16x1,5-1/8-50	180	85	113	69	30,5	80	50	M16x1,5	G1/8	10,5	15
FSKE-30-M16x1,5-1/8-75	210	115	143	69	30,5	80	75	M16x1,5	G1/8	10,5	15
FSKE-40-M16x1,5-1/8-25	140	44	72	69	40,5	80	25	M16x1,5	G1/8	10,5	15
FSKE-40-M16x1,5-1/8-50	180	83	112	69	40,5	80	50	M16x1,5	G1/8	10,5	15
FSKE-40-M16x1,5-1/8-75	210	113	181	69	40,5	80	75	M16x1,5	G1/8	10,5	15
FSKE-40-M20x1,5-1/4-25	150	48	119	69	40,5	80	25	M20x1,5	G1/4	10,5	15
FSKE-40-M20x1,5-1/4-50	175	73	143	69	40,5	80	50	M20x1,5	G1/4	10,5	15
FSKE-40-M20x1,5-1/4-75	215	113	183	69	40,5	80	75	M20x1,5	G1/4	10,5	15

FEZER

Simply move more.

Suspension Bolt

with cross clamping piece FSKB

FEZER

Simply move more.

Description

Robust suspension bolt with upper and lower dampening spring. The bolt consists of a galvanized precision steel tube with inner vacuum feed. The cross clamping piece is made of high-quality aluminum with excellent sliding characteristics for profiles 30x30 and 40x40. The bolt is sealed with an o-ring against the suction pad retainers.



FSKB-M12 ... FSKB-M20

Application

- use on closed frame constructions
- application with high cycle rates
- soft touch-down on workpieces
- workpieces with uneven surfaces (load compensation)

Article number

Type	Bolt stroke 25 mm	Bolt stroke 50 mm	Bolt stroke 75 mm
FSKB-30-M12x1-M5	1.34.3.0055	1.34.3.0056	1.34.3.0057
FSKB-30-M16x1,5-1/8	1.34.3.0052	1.34.3.0053	1.34.3.0054
FSKB-40-M16x1,5-1/8	1.34.3.0038	1.34.3.0050	1.34.3.0051
FSKB-40-M20x1,5-1/4	1.34.3.0058	1.34.3.0059	1.34.3.0060

Technical data

Type	Bolt stroke (mm)	Spring rate (N/mm)	Spring force max. (N)*	Tensile load max. (N)**	Bending mom. max. (Nm)	Volume (l)	Temperature (°C)	Weight (kg)
FSKB-30-M12x1-M5-25	25	2,545	31,8	350	20	0,006	0 ... +80	0,34
FSKB-30-M12x1-M5-50	50	1,647	41,2	350	20	0,007	0 ... +80	0,38
FSKB-30-M12x1-M5-75	75	1,120	42,0	350	20	0,008	0 ... +80	0,40
FSKB-30-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,012	0 ... +80	0,52
FSKB-30-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,014	0 ... +80	0,57
FSKB-30-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,016	0 ... +80	0,60
FSKB-40-M16x1,5-1/8-25	25	3,711	46,4	1.250	50	0,012	0 ... +80	0,56
FSKB-40-M16x1,5-1/8-50	50	1,944	48,6	1.250	50	0,014	0 ... +80	0,61
FSKB-40-M16x1,5-1/8-75	75	1,512	56,7	1.250	50	0,016	0 ... +80	0,64
FSKB-40-M20x1,5-1/4-25	25	6,250	78,1	3.500	100	0,022	0 ... +80	0,80
FSKB-40-M20x1,5-1/4-50	50	3,977	99,4	3.500	100	0,025	0 ... +80	0,85
FSKB-40-M20x1,5-1/4-75	75	2,574	96,4	3.500	100	0,028	0 ... +80	0,92

* lower spring force at 50% of bolt stroke

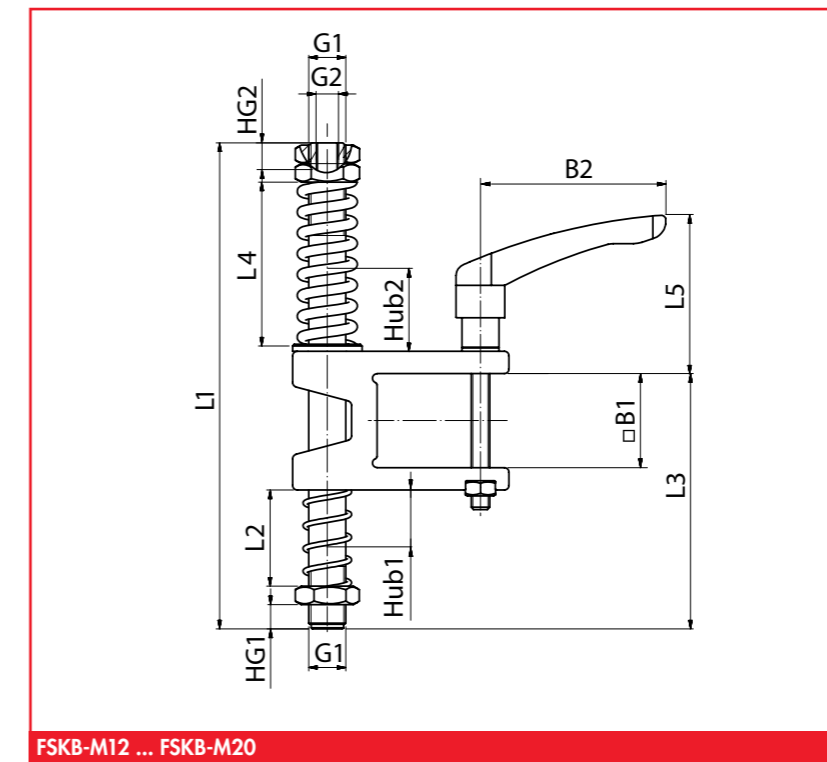
** Tensile load relates to 50% stroke of upper pressure spring. Mounted suction pads must not exceed these capacities.

Suspension Bolt

with cross clamping piece FSKB

FEZER

Simply move more.



FSKB-M12 ... FSKB-M20

Dimensions

Type	L1	L2	L3	L4	L5	B1	B2	Hub1	Hub2	G1	G2	HG1	HG2
FSKB-30-M12x1-M5-25	165	47	72	41	69	30,5	80	25	20	M12x1	M5	10,5	10
FSKB-30-M12x1-M5-50	190	72	97	41	69	30,5	80	50	20	M12x1	M5	10,5	10
FSKB-30-M12x1-M5-75	230	110	136	41	69	30,5	80	75	20	M12x1	M5	10,5	10
FSKB-30-M16x1,5-1/8-25	210	45	73	70	69	30,5	80	25	20	M16x1,5	G1/8	10,5	15
FSKB-30-M16x1,5-1/8-50	250	85	113	70	69	30,5	80	50	20	M16x1,5	G1/8	10,5	15
FSKB-30-M16x1,5-1/8-75	280	115	143	70	69	30,5	80	75	20	M16x1,5	G1/8	10,5	15
FSKB-40-M16x1,5-1/8-25	210	41	110	70	69	40,5	80	25	24	M16x1,5	G1/8	10,5	15
FSKB-40-M16x1,5-1/8-50	250	81	149	70	69	40,5	80	50	24	M16x1,5	G1/8	10,5	15
FSKB-40-M16x1,5-1/8-75	280	111	179	70	69	40,5	80	75	24	M16x1,5	G1/8	10,5	15
FSKB-40-M20x1,5-1/4-25	235	49	120	80	69	40,5	80	25	13	M20x1,5	G1/4	10,5	15
FSKB-40-M20x1,5-1/4-50	260	74	145	80	69	40,5	80	50	13	M20x1,5	G1/4	10,5	15
FSKB-40-M20x1,5-1/4-75	300	115	185	80	69	40,5	80	75	13	M20x1,5	G1/4	10,5	15

1. Basics

1. Basics

1. Holders for Suspension Bolt

for aluminum profiles HFSA

2. Suction Pads

Description

Robust and stable holders made of galvanized steel for installation of suspension bolts on aluminum profiles.

Application

- quick and simple installation with sliding blocks
- limited space
- good adjustment sliding the holders along the slots of the aluminum profiles

3. Mounting Elements

Article number

Type	
HFSAG-8/12	2.33.1.0002
HFSAG-16/20	2.33.1.0001
HFSAW-8/12	2.33.1.0004
HFSAW-16/20	2.33.1.0003

Technical data

Type	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
HFSAG-8/12	350	40	-10 ... +80	0,12
HFSAG-16/20	1.200	60	-10 ... +80	0,35
HFSAW-8/12	350	40	-10 ... +80	0,14
HFSAW-16/20	1.200	60	-10 ... +80	0,42

FEZER

Simply move more.



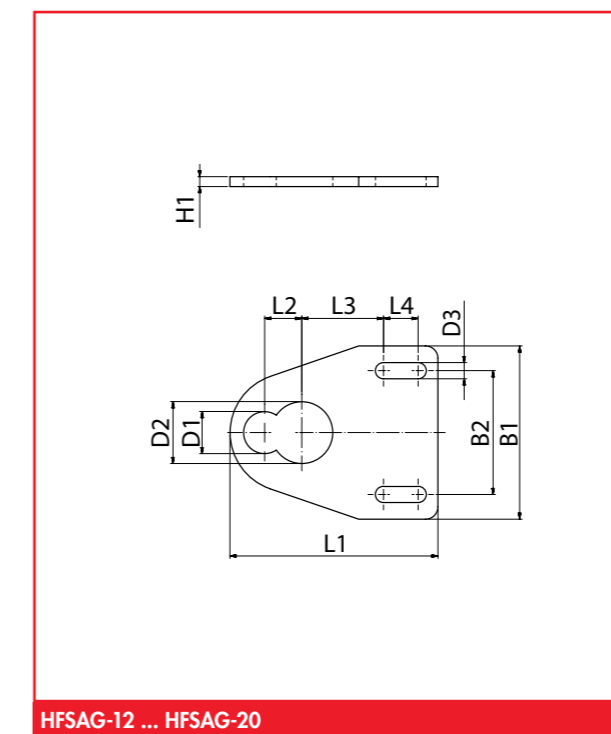
HFSAG-12 ... HFSAW-20

1. Basics

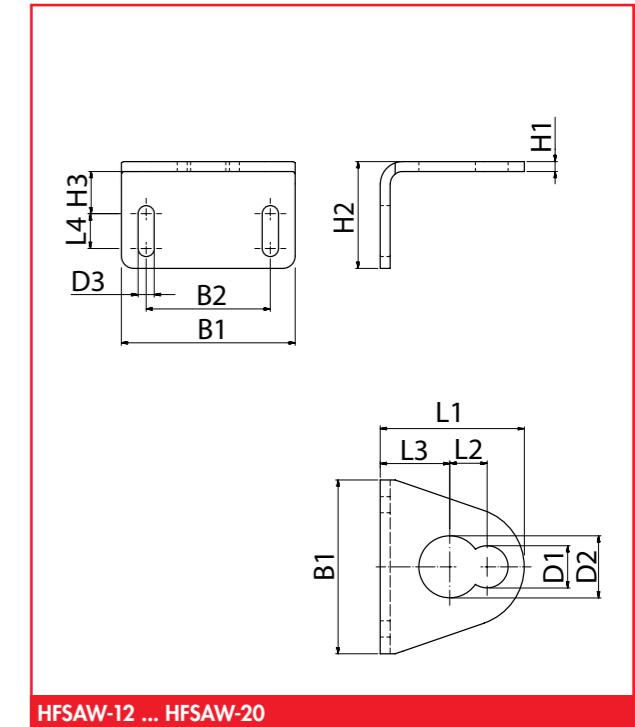
1. Basics

1. Holders for Suspension Bolt

for aluminum profiles HFSA



HFSAG-12 ... HFSAG-20



HFSAW-12 ... HFSAW-20

Dimensions

Type	L1	L2	L3	L4	B1	B2	H1	H2	H3	D1	D2	D3
HFSAG-8/12	84	12	33	14	70	50	4	---	---	17	21	6,5
HFSAG-16/20	114	14	53	10	90	60	8	---	---	25	31	8,5
HFSAW-8/12	58	12	29	14	70	50	4	43	21	17	21	6,5
HFSAW-16/20	79	14	42	10	90	60	8	57	23	25	31	8,5

1. Basics

1. Basics

2. Suction Pads

3. Mounting Elements

4. Vacuum Generators

5. Valve Technology

6. Vacuum Supervision

7. Filter Elements

8. Connection Elements

9. System Technology

1. Basics

1. Basics

2. Suction Pads

3. Mounting Elements

4. Vacuum Generators

5. Valve Technology

6. Vacuum Supervision

7. Filter Elements

8. Connection Elements

9. System Technology

for hollow profiles HFSH

Description

Robust and stable holders made of galvanized steel for installation of suspension bolts on aluminum profiles.

Application

- quick and simple installation, also on closed frame constructions
- limited space
- good adjustment by sliding the holders along the hollow profile
- simple clamping by star or clamping handle

Article number

Type	
HFSH-30-8/12	2.33.1.0091
HFSH-40-8/12	2.33.1.0092
HFSH-40-16/20	2.33.1.0118
HFSH-50-16/20	2.33.1.0093
HFSH-60-16/20	2.33.1.0094

Technical data

Type	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
HFSH-30-8/12	800	50	-10 ... +80	0,48
HFSH-40-8/12	800	50	-10 ... +80	0,69
HFSH-40-16/20	2.000	100	-10 ... +80	0,67
HFSH-50-16/20	2.000	100	-10 ... +80	0,76
HFSH-60-16/20	2.000	100	-10 ... +80	0,85

FEZER

Simply move more.



HFSH-30 ... HFSH-40

1. Basics

1. Basics

2. Suction Pads

3. Mounting Elements

4. Vacuum Generators

5. Valve Technology

6. Vacuum Supervision

7. Filter Elements

8. Connection Elements

9. System Technology

1. Basics

1. Basics

2. Suction Pads

3. Mounting Elements

4. Vacuum Generators

5. Valve Technology

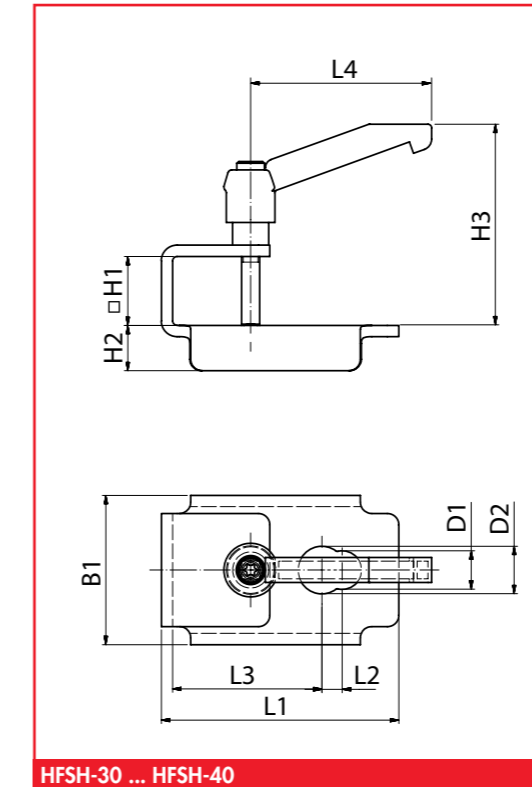
6. Vacuum Supervision

7. Filter Elements

8. Connection Elements

9. System Technology

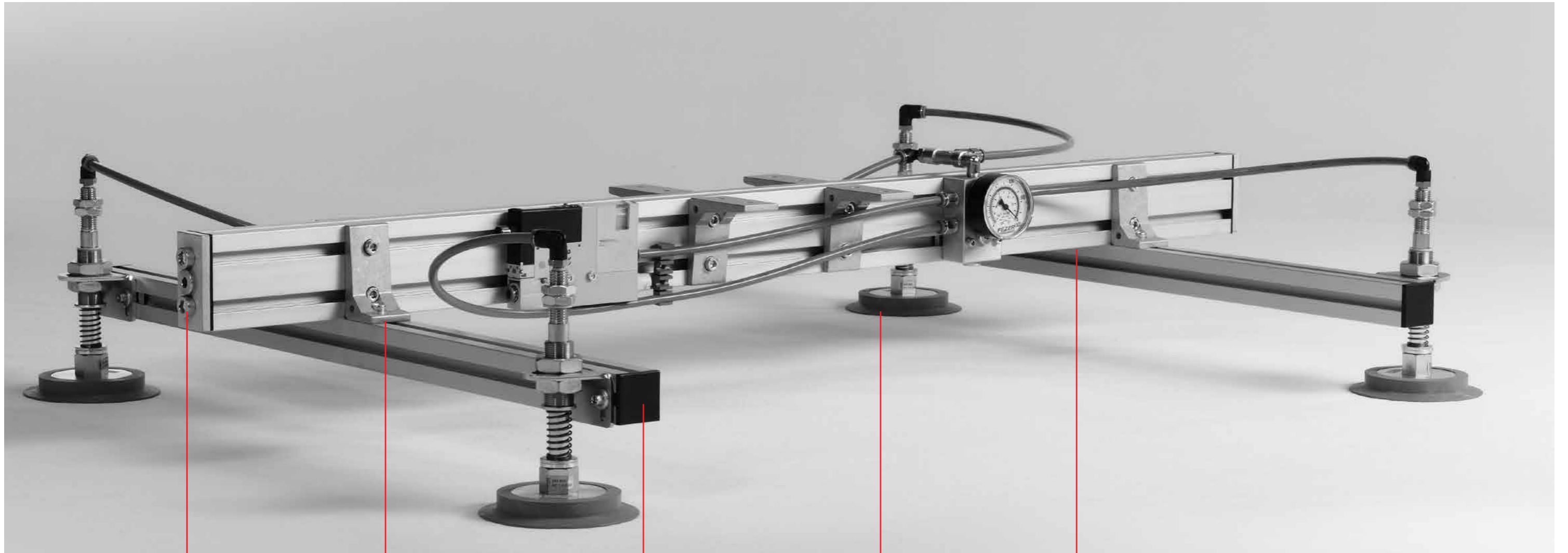
for hollow profiles HFSH



HFSH-30 ... HFSH-40

Dimensions

Type	L1	L2	L3	L4	B1	H1	H2	H3	D1	D2
HFSH-30-8/12	105	10	66	80	66	30,5	20	95	17	21
HFSH-40-8/12	125	10	81	80	76	40,5	20	105	17	21
HFSH-40-16/20	125	15	81	80	76	40,5	20	105	25	31
HFSH-50-16/20	135	15	91	80	76	50,5	20	117	25	31
HFSH-60-16/20	145	15	101	80	76	60,5	20	127	25	31



Cover plates

To allow to use the aluminum profiles also as safety tanks, rubber covers can be added.

Connection elements

To connect the aluminum profiles robust and stable connection elements are available. These can be fastened and adjusted by sliding blocks.

Cover elements

To cover the aluminum profiles and to guard against sharp edges stable plastic covers are available for all aluminum profiles.

Vacuum components

The vacuum components can be either fastened directly on the slots or installed with appropriate holders. The slots allow to adjust the mounted components as required.

Aluminum profiles

There is a variety of aluminum profiles available which can mostly be combined at will. Depending on the requirements and the weight to be transported, the suitable sizes can be calculated accordingly.

Description

For the design of individual suction spiders there is a variety of aluminum profiles and connection elements available. All connections can be screwed on, which allows an easy and adjustable combination.

Profile Systems

Aluminum profiles ALHP

Description

Stable and robust AL profiles for the design of individual suction frames which are flanged onto any type of hoisting gear. The AL profiles are available for sizes 40mm and 50mm. The profiles of the 50 series can be bolted together with vacuum-dense flange plates and thus be used as safety tanks.

Application

- design of suction frames and load lifting devices
- connected to suction pads by suspension bolts and appropriate holders



ALHP-40x40 ... ALHP 100x100

Article number

Type	metre pieces
ALHP-40x40	6.11.3.0119
ALHP-40x80	6.11.3.0117
ALHP-80x80	6.11.3.0116
ALHP-50x50	6.11.3.0148
ALPH-50x100	6.11.3.0138
ALPH100x100	6.11.3.0103

Technical data

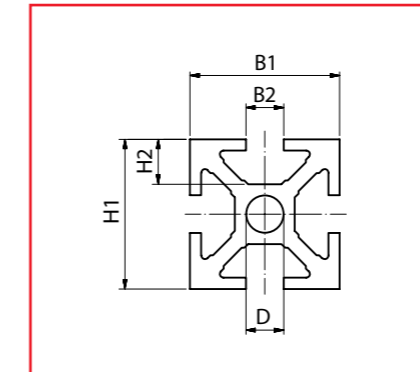
Type	Material	Area A (cm ²)	Area moment		Resistance moment		Weight (kg)
			I _x (cm ⁴)	I _y (cm ⁴)	W _x (cm ³)	W _y (cm ³)	
ALHP-40x40	AlMgSi 0,5 F25	7,42	12,13	12,13	6,06	6,06	2,00
ALHP-40x80	AlMgSi 0,5 F25	13,40	83,26	83,26	22,62	20,84	3,62
ALHP-80x80	AlMgSi 0,5 F25	17,60	149,64	149,64	31,94	31,94	4,75
ALHP-50x50	AlMgSi 0,5 F25	10,84	29,90	29,90	11,96	11,96	2,85
ALPH-50x100	AlMgSi 0,5 F25	18,06	199,96	55,38	39,99	22,15	4,87
ALPH100x100	AlMgSi 0,5 F25	26,55	334,80	334,80	66,96	66,96	7,00

FEZER

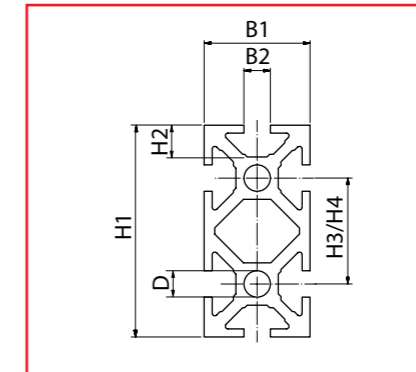
Simply move more.

Profile Systems

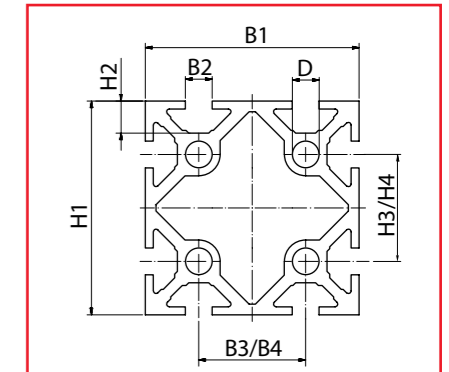
Aluminum profiles ALHP



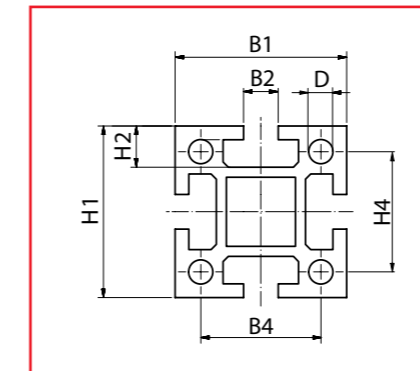
ALHP-40x40



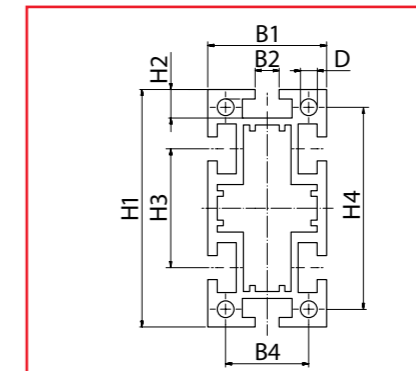
ALHP-40x80



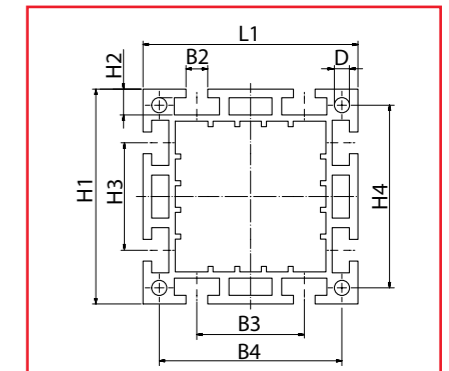
ALHP-80x80



ALHP-50x50



ALHP-50x100



ALHP-100x100

Dimensions

Type	B1	B2	B3	B4	H1	H2	H3	H4	D
ALHP-40x40	40	10,1	---	---	40	12	---	---	10
ALHP-40x80	40	10,1	---	---	80	12	40	40	10
ALHP-80x80	80	10,1	40	40	80	12	40	40	10
ALHP-50x50	50	10,1	---	35	50	12	---	35	7
ALPH-50x100	50	10,1	---	35	100	12	50	85	7
ALPH100x100	100	10,1	50	85	100	12	50	85	7

FEZER

Simply move more.

Profile Systems

Connection elements for AL profiles

FEZER
Simply move more.

Angle connectors WV

Solid aluminum connection piece for angle connection of AL profiles.

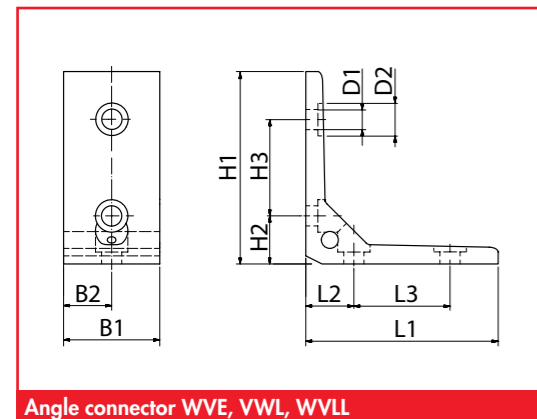
- WVE angle connector, single
- WVL angle connector, single long
- WVLL angle connector, double long
- WVB angle connector, wide



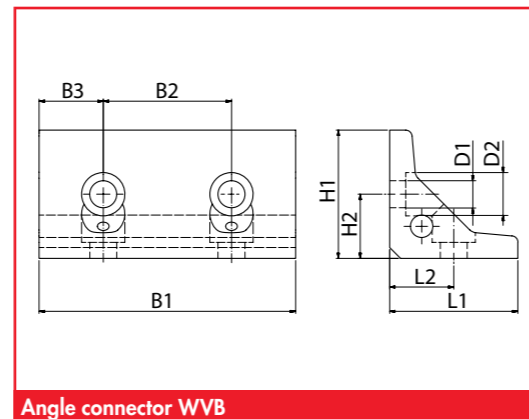
Angle connectors WV- ... WVL-

Article number

Type	Angle connector WVE	Angle connector WVL	Angle connector WVLL	Angle connector WVB
for ALHP-40	6.21.1.1374	6.21.1.1697	6.21.1.1698	6.21.1.0872
for ALHP-50	6.21.1.1677	6.21.1.1699	6.21.1.1700	6.21.1.1678



Angle connector WVE, VWL, WVLL



Angle connector WVB

Dimensions

Type	L1	L2	L3	B1	B2	B3	H1	H2	H3	D1	D2
WVE-40	40	20	---	40	20	---	40	20	---	8,4	13,5
WVL-40	40	20	---	40	20	---	80	20	40	8,4	13,5
WVLL-40	80	20	40	40	20	---	80	20	40	8,4	13,5
WVB-40	40	20	---	80	40	20	40	20	---	8,4	13,5
WVE-50	50	25	---	50	25	---	50	25	---	8,4	13,5
WVL-50	85	25	---	40	20	---	85	25	50	8,4	13,5
WVLL-50	85	25	50	40	20	---	85	25	50	8,4	13,5
WVB-50	50	25	---	100	50	25	50	25	---	8,4	13,5

Profilsysteme

Connection elements for AL profiles

FEZER
Simply move more.

Sliding blocks NS

Sliding blocks for AL profiles in galvanized steel design

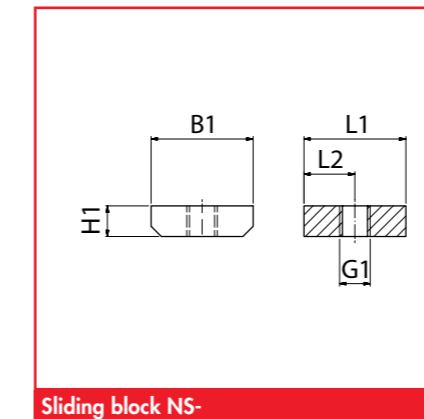
- NS single sliding block
- NSN single sliding block for later assembly
- NSL long sliding block



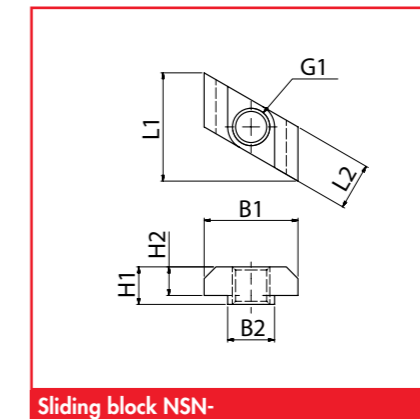
Nutensteine

Article number

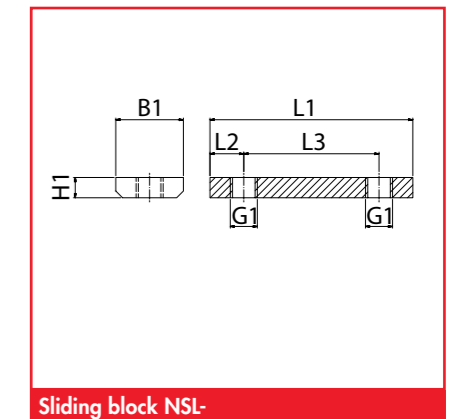
Type	M4	M5	M6	M8
NS-	6.21.1.1423	6.21.1.0813	6.21.1.0804	6.21.1.0790
NSN-	6.21.1.1690	6.21.1.1691	6.21.1.1529	6.21.1.1394
NSL-M8-40	---	---	---	6.21.1.1022
NSL-M8-50	---	---	---	6.21.1.1132



Sliding block NS-



Sliding block NSN-



Sliding block NSL-

Dimensions

Type	L1	L2	L3	B1	B2	H1	H2	G1
NS-M4	20	10	---	20	---	6	---	M4
NS-M5	20	10	---	20	---	6	---	M5
NS-M6	20	10	---	20	---	6	---	M6
NS-M8	20	10	---	20	---	6	---	M8
NSN-M4	20	10	---	20	10	8	6,1	M4
NSN-M5	20	10	---	20	10	8	6,1	M5
NSN-M6	23,1	10	---	20	10	8	6,1	M6
NSN-M8	23,1	10	---	20	10	8	6,1	M8
NSL-M8-40	60	10	40	20	---	6	---	M8
NSL-M8-50	70	10	50	20	---	6	---	M8

Profile Systems

Connection elements for AL profiles

FEZER
Simply move more.

Covers ADK

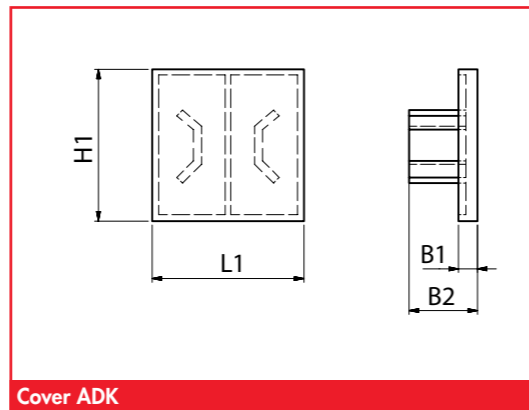
Plastic covers to close open AL profile ends



Abdeckkappen

Article number

Type	
ADK-40x40	6.21.9.0077
ADK-80x40	6.21.9.0070
ADK-80x80	6.21.9.0124
ADK-50x50	6.21.9.0048
ADK-100x50	6.21.9.0130
ADK-100x100	6.21.9.0034



Cover ADK

Dimensions

Type	L1	H1	B1	B2
ADK-40x40	40	40	5	18
ADK-80x40	80	40	5	18
ADK-80x80	80	80	5	18
ADK-50x50	50	50	5	18
ADK-100x50	100	50	5	18
ADK-100x100	100	100	5	18

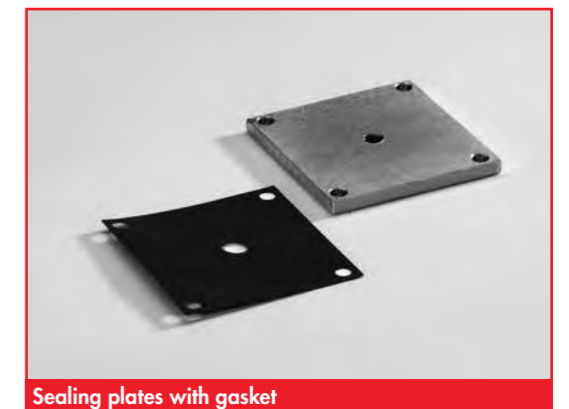
Profile Systems

Connection elements for AL profiles

FEZER
Simply move more.

Cover plates VSP and sealing plates ADP

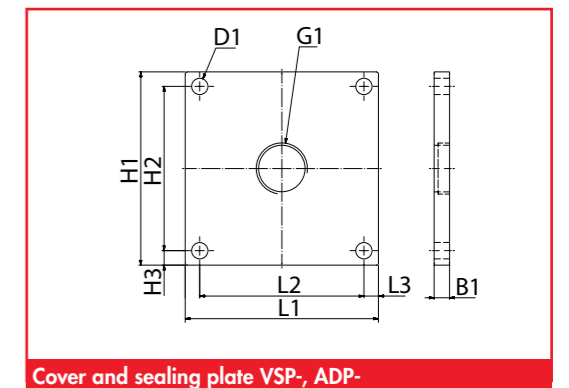
stable covers for vacuum-dense sealing of AL profiles (for use as safety tank, etc.). The plates have a central connection thread or hole and can be closed by a blind plug.



Sealing plates with gasket

Article number

Type for profile:	Cover plate VSP with connection	Sealing plate ADP-
80x80	5.21.9.0260	5.21.9.0264
100x50	5.21.9.0261	5.21.9.0265
100x100	5.21.9.0262	5.21.9.0266



Cover and sealing plate VSP-, ADP-

Dimensions

Type	L1	L2	L3	H1	H2	H3	B1	D1	G1
VSP-80x80	80	40	20	80	40	20	8	12,5	G1/2
VSP-100x50	100	85	7,5	50	35	7,5	8	8,5	G3/4
VSP-100x100	100	85	7,5	100	85	7,5	8	8,5	G3/4
ADP-80x80	80	40	20	80	40	20	2	12,5	20
ADP-100x50	100	85	7,5	50	35	7,5	2	8,5	27
ADP-100x100	100	85	7,5	100	85	7,5	2	8,5	27

Single Components

Slide bushing SBF

Description

Robust slide bushing made of high-quality brass alloy which can be fastened by an outside thread and is height-adjustable.

Application

- for individual installation of suspension bolts
- connection to drillings or appropriate holders
- for bolt diameter 8, 12, 16, 20 and 30 mm



SBF-M16x1,5-8 ... SBF-M42x1,5-30

Article number

Type	
SBF-M16x1,5-8	1.331.0003
SBF-M20x1,5-12	1.331.0007
SBF-M24x1,5-16	1.331.0001
SBF-M30x1,5-20	1.331.0002
SBF-M42x1,5-30	1.331.0014

Technical data

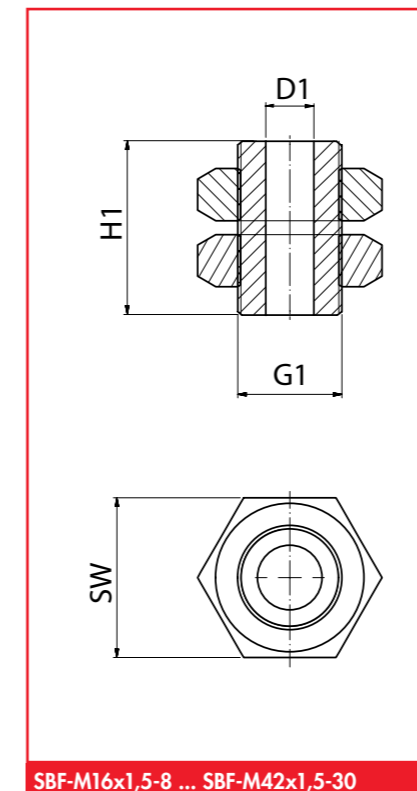
Type	Tensile load max. (N)	Temperature (°C)	Weight (kg)
SBF-M16x1,5-8	200	-10 ... +60	0,10
SBF-M20x1,5-12	800	-10 ... +60	0,16
SBF-M24x1,5-16	2.500	-10 ... +60	0,26
SBF-M30x1,5-20	5.500	-10 ... +60	0,47
SBF-M42x1,5-30	9.500	-10 ... +60	1,20

FEZER

Simply move more.

Single Components

Slide bushing SBF



SBF-M16x1,5-8 ... SBF-M42x1,5-30

Dimensions

Type	H1	D1	G1	SW
SBF-M16x1,5-8	40	8,2	M16x1,5	24
SBF-M20x1,5-12	50	12,2	M20x1,5	30
SBF-M24x1,5-16	60	16,2	M24x1,5	36
SBF-M30x1,5-20	60	20,2	M30x1,5	46
SBF-M42x1,5-30	80	30,3	M42x1,5	65

FEZER

Simply move more.

Single Components

Cross clamping pieces KKS

Description

Robust cross clamping piece made of high-quality aluminum for bolt connection to hollow profiles. The cross clamping pieces are available in several sizes for various bolt diameters. All cross clamping pieces are supplied with clamping lever.

Application

- for individual installation of suspension bolts to fasten to hollow profiles
- for bolt diameters 8, 12, 16 and 20 mm
- can be adjusted and clamped by levers



KKS-30-12 ... KKS-40-20

Article number

Type	Article number
KKS-30-12	1.33.2.0136
KKS-30-16	1.33.2.0135
KKS-40-16	1.33.2.0111
KKS-40-20	1.33.2.0120

Technical data

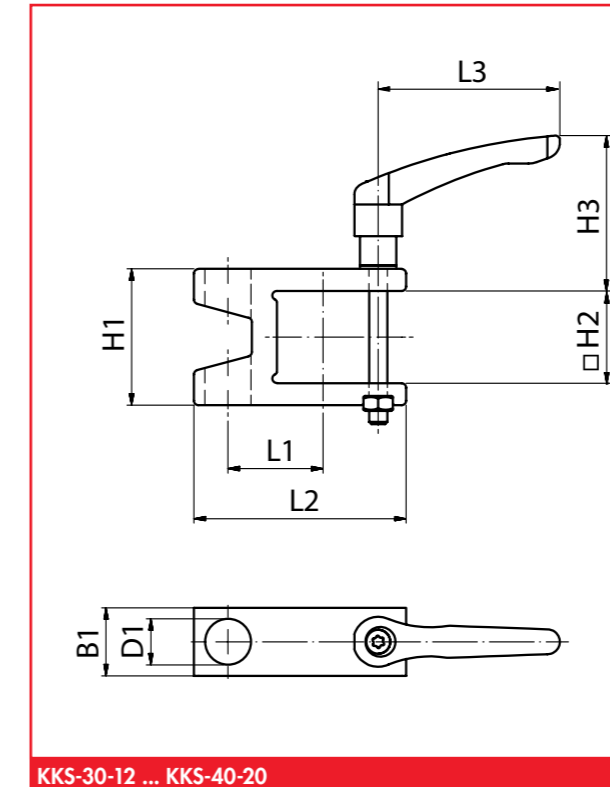
Type	Profile dims (mm)	Bolt-Ø (mm)	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
KKS-30-12	30x30	12	1.250	50	0 ... 80	0,20
KKS-30-16	30x30	16	1.250	50	0 ... 80	0,20
KKS-40-16	40x40	16	2.500	100	0 ... 80	0,25
KKS-40-20	40x40	20	2.500	100	0 ... 80	0,25

FEZER

Simply move more.

Single Components

Cross clamping pieces KKS



KKS-30-12 ... KKS-40-20

Dimensions

Type	L1	L2	L3	B1	H1	H2	H3	D1
KKS-30-12	36,5	83,5	80	25	50	30,5	69	12,2
KKS-30-16	36,5	83,5	80	25	50	30,5	69	16,2
KKS-40-16	41,5	92,5	80	25	60	40,5	69	16,2
KKS-40-20	41,5	92,5	80	30	60	40,5	69	20,2

FEZER

Simply move more.

Single Components

Clamping plates KP

Description

Robust clamping plate made of aluminum or steel for the individual installation of suspension bolts. The clamping plates consist of a top and bottom clamping part, each with a brass bushing and a clamping screw to fasten the plates to the hollow profiles. The clamping plates are mounted between two profiles and easily adjustable and fastened.

Application

- suspension bolt assembly between two parallel profiles with a distance of 40 mm
- for bolt diameters 12, 16, 20 and 30mm
- can be adjusted and fastened



KP-AL-16 ... KP-ST-30

Article number

Type	Complete set	Clamping plate top	Clamping plate bottom	Bushing 16 mm	Bushing 20 mm	Bushing 30 mm
KP-AL-16	1.33.2.0105	1.33.2.0102	1.33.2.0104	2.33.1.0005	---	---
KP-AL-20	1.33.2.0108	1.33.2.0102	1.33.2.0104	---	2.33.1.0006	---
KP-ST-20	1.33.2.0052	1.33.2.0037	1.33.2.0038	---	2.33.1.0020	---
KP-ST-30	1.33.2.0058	1.33.2.0059	1.33.2.0045	---	---	1.33.2.0060

Technical data

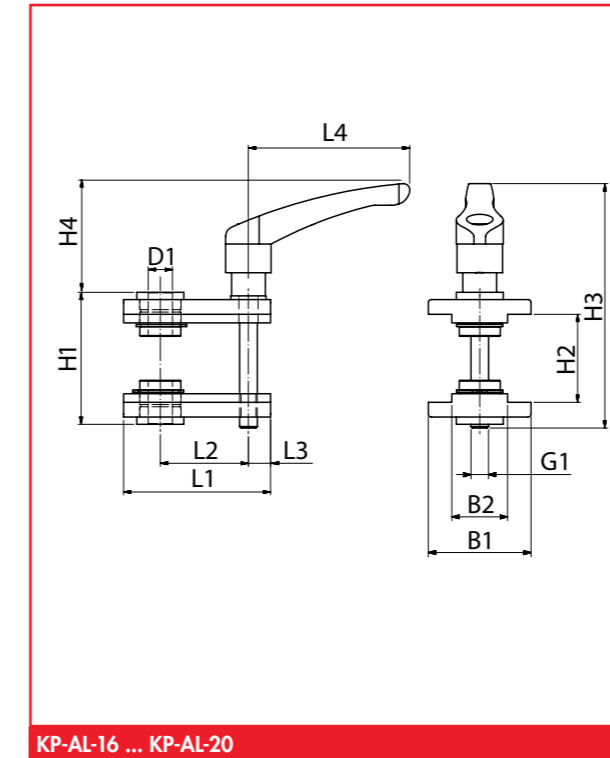
Type	Prof.distance (mm)	Profile height (mm)	Bolt-Ø (mm)	Clamping screw	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Weight (kg)
KP-AL-16	40	50 - 60	16	M12x90	1.250	50	0 ... +80	1,2
KP-AL-20	40	50 - 60	20	M12x90	2.500	100	0 ... +80	1,2
KP-ST-20	40	70 - 100	20	M12x120	5.500	100	0 ... +80	1,1
KP-ST-30	40	70 - 100	30	M12x120	9.500	300	0 ... +80	1,1

FEZER

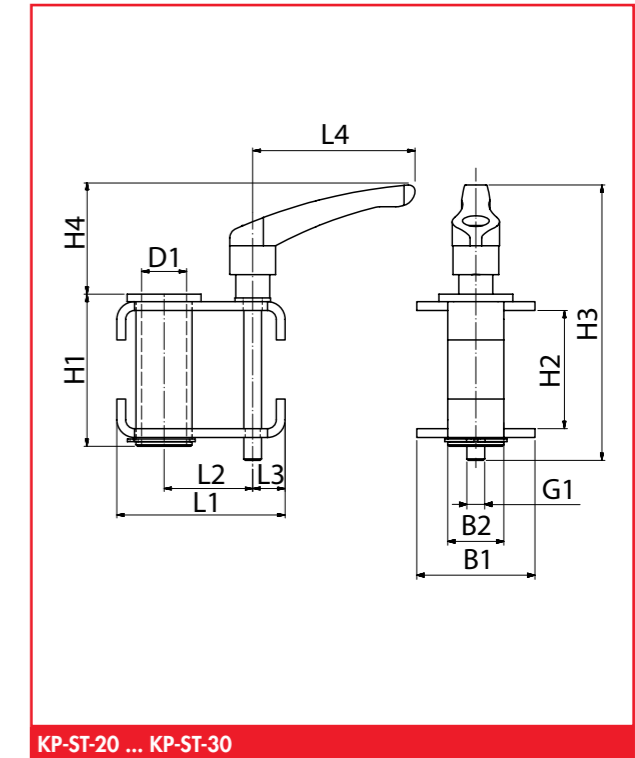
Simply move more.

Single Components

Clamping plates KP



KP-AL-16 ... KP-AL-20



KP-ST-20 ... KP-ST-30

Dimensions

Type	L1	L2	L3	L4	B1	B2	H1	H2	H3	H4	D1
KP-AL-16	100	60	15	80	70	38	90	60	167	59	16,5
KP-AL-20	100	60	15	80	70	38	90	60	167	59	20,5
KP-ST-20	114	60	22	80	80	38	122	100	197	59	20,5
KP-ST-30	114	60	22	80	80	38	132	100	197	59	30,5

FEZER

Simply move more.

Single Components

Suspension bolt STN

Description

Suspension bolt made of a precise steel tube with integrated vacuum feed and hose nipple. The bolts are available in three lengths, uncushioned, one-sided or both-sided cushioned. For connecting them to suction pads there are various suction pad retainers available. The bolts have a groove which can be sealed with an o-ring.

Application

- single bolt for individual assembly
- for suction pads with central vacuum feed
- for installation on cross clamping pieces or clamping plates



STN-M12x1 ... STN-M20x1,5

Article number

Type	Length: short (uncushioned assembly)	Length: medium (single-side cushioning)	Length: long (both-side cushioning)
STN-M12x1	1.32.3.0118	1.32.3.0119	1.32.3.0120
STN-M16x1,5	1.32.3.0115	1.32.3.0114	1.32.3.0091
STN-M20x1,5	1.32.3.0116	1.32.3.0089	1.32.3.0090

Technical data

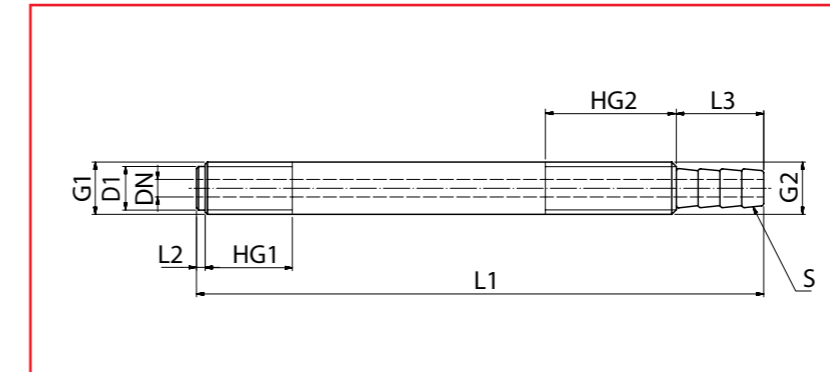
Type	Bolt length (mm)	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Volume (l)	Weight (kg)
STN-M12x1-130	130	1.000	20	0 ... +80	0,004	0,09
STN-M12x1-190	190	1.000	20	0 ... +80	0,005	0,14
STN-M12x1-260	260	1.000	20	0 ... +80	0,007	0,20
STN-M16x1,5-130	130	2.500	50	0 ... +80	0,007	0,13
STN-M16x1,5-200	200	2.500	50	0 ... +80	0,010	0,22
STN-M16x1,5-280	280	2.500	50	0 ... +80	0,015	0,31
STN-M20x1,5-150	150	5.500	100	0 ... +80	0,012	0,24
STN-M20x1,5-230	230	5.500	100	0 ... +80	0,018	0,39
STN-M20x1,5-310	310	5.500	100	0 ... +80	0,025	0,53

FEZER

Simply move more.

Single Components

Suspension bolt STN



STN-M12x1 ... STN-M20x1,5

Dimensions

Type	L1	L2	L3	D1	DN	G1	G2	HG1	HG2	S
STN-M12x1-130	130	2	20	10	4	M12x1	M12x1	20	20	6
STN-M12x1-190	190	2	20	10	4	M12x1	M12x1	20	20	6
STN-M12x1-260	260	2	20	10	4	M12x1	M12x1	20	20	6
STN-M16x1,5-130	130	2	25	14	8	M16x1,5	M16x1,5	25	24	10
STN-M16x1,5-200	200	2	25	14	8	M16x1,5	M16x1,5	25	24	10
STN-M16x1,5-280	280	2	25	14	8	M16x1,5	M16x1,5	25	24	10
STN-M20x1,5-150	150	2	25	18	10	M20x1,5	M20x1,5	25	30	1/2
STN-M20x1,5-230	230	2	25	18	10	M20x1,5	M20x1,5	25	30	1/2
STN-M20x1,5-310	310	2	25	18	10	M20x1,5	M20x1,5	25	30	1/2

FEZER

Simply move more.

Single Components

Suspension bolt STI

Description

Suspension bolt made of a precise steel tube with integrated vacuum feed and outer thread for plug connections. The bolts are available in three lengths, uncushioned, one-sided or both-sided cushioned. For connecting them to suction pads there are various suction pad retainers available. The bolts have a groove which can be sealed with an o-ring.

Application

- single bolt for individual assembly
- for installation on cross clamping pieces and clamping plates



STI-M8x1 ... STI-M20x1,5

Article number

Type	Length: short (uncushioned assembly)	Length: medium (one-sided cushioning)	Length: long (both-sided cushioning)
STI-M8x1	1.32.4.0101	1.32.4.0102	1.32.4.0103
STI-M12x1	1.32.4.0104	1.32.4.0105	1.32.4.0106
STI-M16x1,5	1.32.4.0107	1.32.4.0108	1.32.4.0109
STI-M20x1,5	1.32.4.0110	1.32.4.0111	1.32.4.0112

Technical data

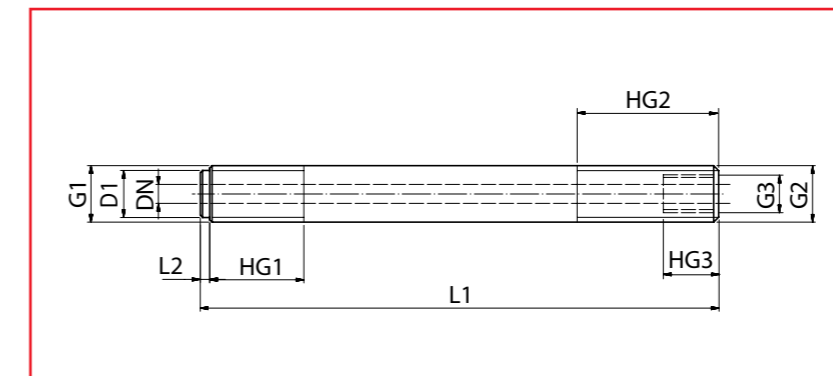
Type	Bolt length (mm)	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Volume (l)	Weight (kg)
STI-M8x1-95	95	500	5	0 ... +80	0,001	0,04
STI-M8x1-145	145	500	5	0 ... +80	0,002	0,05
STI-M8x1-195	195	500	5	0 ... +80	0,003	0,06
STI-M12x1-95	95	1.000	20	0 ... +80	0,004	0,08
STI-M12x1-155	155	1.000	20	0 ... +80	0,005	0,12
STI-M12x1-215	215	1.000	20	0 ... +80	0,007	0,18
STI-M16x1,5-125	125	2.500	50	0 ... +80	0,007	0,11
STI-M16x1,5-195	195	2.500	50	0 ... +80	0,010	0,20
STI-M16x1,5-265	265	2.500	50	0 ... +80	0,015	0,29
STI-M20x1,5-125	125	5.500	100	0 ... +80	0,012	0,22
STI-M20x1,5-205	205	5.500	100	0 ... +80	0,018	0,37
STI-M20x1,5-285	285	5.500	100	0 ... +80	0,025	0,51

FEZER

Simply move more.

Single Components

Suspension bolt STI



STI-M8x1 ... STI-M20x1,5

Dimensions

Type	L1	L2	D1	DN	G1	G2	G3	HG1	HG2	HG3
STI-M8x1-95	95	2	6	2	M8x1	M8x1	M5	20	20	10
STI-M8x1-145	145	2	6	2	M8x1	M8x1	M5	20	20	10
STI-M8x1-195	195	2	6	2	M8x1	M8x1	M5	20	20	10
STI-M12x1-95	95	2	10	4	M12x1	M12x1	M5	20	20	10
STI-M12x1-155	155	2	10	4	M12x1	M12x1	M5	20	20	10
STI-M12x1-215	215	2	10	4	M12x1	M12x1	M5	20	20	10
STI-M16x1,5-125	125	2	14	8	M16x1,5	M16x1,5	G1/8	25	25	15
STI-M16x1,5-195	195	2	14	8	M16x1,5	M16x1,5	G1/8	25	25	15
STI-M16x1,5-265	265	2	14	8	M16x1,5	M16x1,5	G1/8	25	25	15
STI-M20x1,5-125	125	2	18	10	M20x1,5	M20x1,5	G1/4	25	30	15
STI-M20x1,5-205	205	2	18	10	M20x1,5	M20x1,5	G1/4	25	30	15
STI-M20x1,5-285	285	2	18	10	M20x1,5	M20x1,5	G1/4	25	30	15

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Single Components

Suspension bolt STG

Description

Bolt made of solid precision steel tube. The bolts are suitable for suction pads with a lateral vacuum feed and are Die Stößel eignen sich für Sauggreifer mit separater Vakuumzuführung and available in three lengths, uncushioned, one-sided or both-sided cushioned. For connecting them to suction pads various suction pad retainers are available.

Application

- single bolt for individual assembly
- for installation with cross clamping pieces and clamping plates



STG-M12x1 ... STG-M30x1,5

Article number

Type	Length: short (uncushioned assembly)	Length: medium (one-sided cushioning)	Length: long (both-sided cushioning)
STG-M12x1	1.32.2.0096	1.32.2.0097	1.32.2.0098
STG-M16x1,5	1.32.2.0090	1.32.2.0091	1.32.2.0092
STG-M20x1,5	1.32.2.0093	1.32.2.0094	1.32.2.0095
STG-M30x1,5	---	1.32.2.0026	1.32.2.0027

Technical data

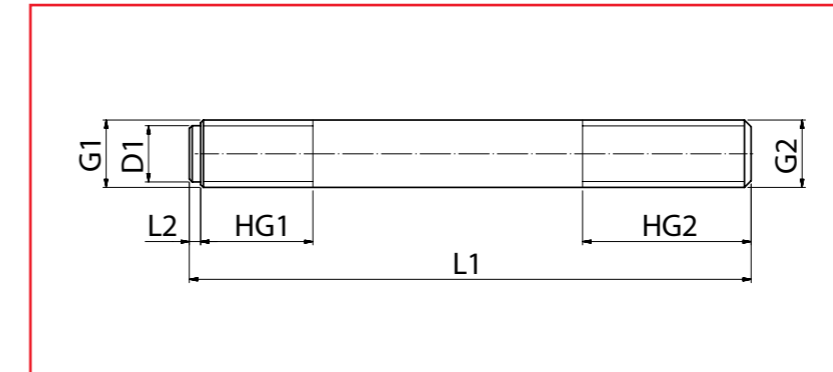
Type	Bolt length (mm)	Tensile load max. (N)	Bending mom. max. (Nm)	Temperature (°C)	Volume (l)	Weight (kg)
STG-M12x1-100	100	1.000	25	0 ... +80	---	0,10
STG-M12x1-160	160	1.000	25	0 ... +80	---	0,14
STG-M12x1-230	230	1.000	25	0 ... +80	---	0,20
STG-M16x1,5-105	105	2.500	60	0 ... +80	---	0,17
STG-M16x1,5-175	175	2.500	60	0 ... +80	---	0,27
STG-M16x1,5-255	255	2.500	60	0 ... +80	---	0,40
STG-M20x1,5-120	120	5.500	120	0 ... +80	---	0,29
STG-M20x1,5-200	200	5.500	120	0 ... +80	---	0,49
STG-M20x1,5-280	280	5.500	120	0 ... +80	---	0,69
STG-M30x1,5-205	205	9.500	350	0 ... +80	---	1,14
STG-M30x1,5-370	370	9.500	350	0 ... +80	---	2,05

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Single Components

Suspension bolt STG



STG-M12x1 ... STG-M30x1,5

Dimensions

Type	L1	D1	G1	G2	HG1	HG2
STG-M12x1-100	100	10	M12x1	M12x1	20	30
STG-M12x1-160	160	10	M12x1	M12x1	20	30
STG-M12x1-230	230	10	M12x1	M12x1	20	50
STG-M16x1,5-105	105	14	M16x1,5	M16x1,5	25	35
STG-M16x1,5-175	175	14	M16x1,5	M16x1,5	25	35
STG-M16x1,5-255	255	14	M16x1,5	M16x1,5	25	55
STG-M20x1,5-120	120	18	M20x1,5	M20x1,5	25	40
STG-M20x1,5-200	200	18	M20x1,5	M20x1,5	25	40
STG-M20x1,5-280	280	18	M20x1,5	M20x1,5	25	55
STG-M30x1,5-205	205	---	M30x1,5	M30x1,5	20	50
STG-M30x1,5-370	370	---	M30x1,5	M30x1,5	20	50

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Single Components

Pressure springs DF

Description

Special pressure springs for cushioned suspension of suction pads. The pressure springs are available for all bolts.

Application

- soft touchdown on workpieces
- even load distribution



DF-L50 ... DF-165

Article number

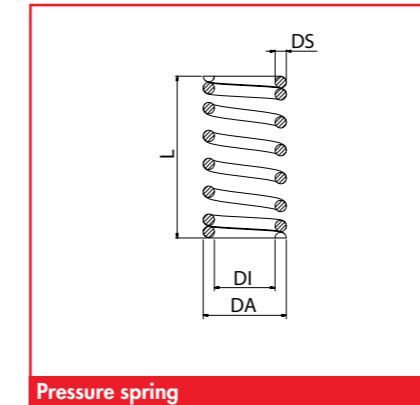
Type	Pressure spring for bolt-Ø 8mm	Pressure spring for bolt-Ø 12mm	Pressure spring for bolt-Ø 16mm	Pressure spring for bolt-Ø 20mm	Pressure spring for bolt-Ø 30mm
DF-L50-DI10-DS0,7	6.21.4.0241				
DF-L50-DI9-DS1	6.21.4.0234				
DF-L60-DI13-DS0,9		6.21.4.0024			
DF-L60-DI13-DS1,4		6.21.4.0023			
DF-L60-DI13-DS2		6.21.4.0240			
DF-L70-DI17-DS1,5			6.21.4.0025		
DF-L70-DI17-DS2			6.21.4.0026		
DF-L70-DI17-DS2,5			6.21.4.0027		
DF-L70-DI17-DS3			6.21.4.0028		
DF-L70-DI17-DS3,5			6.21.4.0029		
DF-L70-DI17-DS4			6.21.4.0030		
DF-L70-DI17-DS4,5			6.21.4.0031		
DF-L80-DI21-DS2				6.21.4.0033	
DF-L80-DI21-DS2,5				6.21.4.0034	
DF-L80-DI21-DS3				6.21.4.0035	
DF-L80-DI21-DS3,5				6.21.4.0036	
DF-L80-DI21-DS4				6.21.4.0037	
DF-L80-DI21-DS4,5				6.21.4.0038	
DF-L80-DI21-DS5				6.21.4.0039	
DF-L80-DI21-DS5,5				6.21.4.0040	
DF-L80-DI21-DS6				6.21.4.0041	
DF-L80-DI21-DS6,5				6.21.4.0042	
DF-L80-DI21-DS8				6.21.4.0044	
DF-L80-DI21-DA50-EL				6.21.4.0092	
DF-L80-DI21-DA80-EL				6.21.4.0083	
DF-L100-DI32-DS5					6.21.4.0065
DF-L102-DI33-DS6					6.21.4.0243
DF-L110-DI33-DS8					6.21.4.0242
DF-L100-DI31-DA80-EL					6.21.4.0069

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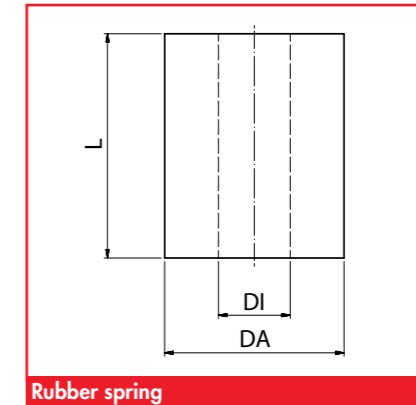
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Single Components

Pressure spring DF



Pressure spring



Rubber spring

Dimensions and technical data

Type	Spring length L (mm)	Outer-Ø DA (mm)	Inner-Ø DI (mm)	Wire strength DS (mm)	max. Spring force (N)	max. Spring way (mm)	Spring rate (N/mm)	Weight (kg)
DF-L50-DI9-DS0,7	50	11,4	10	0,7	9,3	35	0,265	0,001
DF-L50-DI9-DS1	50	11	9	1,0	34	35	0,921	0,002
DF-L60-DI13-DS0,9	60	14,8	13	0,9	22	50	0,43	0,003
DF-L60-DI13-DS1,4	60	15,8	13	1,4	71	41	1,74	0,007
DF-L60-DI13-DS2	60	17	13	2	175	43	4,02	0,011
DF-L70-DI17-DS1,5	70	23	17	1,5	70	54	1,30	0,009
DF-L70-DI17-DS2	70	21	17	2	160	49	3,30	0,011
DF-L70-DI17-DS2,5	70	22	17	2,5	330	45	7,33	0,018
DF-L70-DI17-DS3	70	23	17	3	520	38	13,7	0,035
DF-L70-DI17-DS3,5	70	24	17	3,5	690	31	22,3	0,057
DF-L70-DI17-DS4	70	25	17	4	1.010	28	36,0	0,068
DF-L70-DI17-DS4,5	70	26	17	4,5	1.300	24	54,2	0,086
DF-L80-DI21-DS2	80	25	21	2	160	51	3,14	0,015
DF-L80-DI21-DS2,5	80	26	21	2,5	190	47	4,04	0,030
DF-L80-DI21-DS3	80	27	21	3	350	38	9,21	0,044
DF-L80-DI21-DS3,5	80	28	21	3,5	480	31	15,5	0,062
DF-L80-DI21-DS4	80	29	21	4	670	30	22,3	0,075
DF-L80-DI21-DS4,5	80	30	21	4,5	900	23	19,1	0,098
DF-L80-DI21-DS5	80	31	21	5	1.170	19	61,6	0,146
DF-L80-DI21-DS5,5	80	32	21	5,5	1.450	17	85,3	0,270
DF-L80-DI21-DS6	80	33	21	6	1.740	15	116,0	0,325
DF-L80-DI21-DS6,5	80	34	21	6,5	2.070	13	159,2	0,374
DF-L80-DI21-DS8	80	37	21	8	3.170	8	396,2	0,510
DF-L80-DI21-DA50-EL	80	50	21	---	6.000	30	200	0,650
DF-L80-DI21-DA80-EL	80	80	21	---	12.000	30	400	0,520
DF-L100-DI32-DS5	94	42	32	5	817	55	15,0	0,384
DF-L100-DI33-DS6	102	45	33	6	740	30	24,3	0,526
DF-L100-DI33-DS8	110	49	33	8	3.000	34	74	0,685
DF-L100-DI31-DA80-EL	100	80	31	---	18.000	40	450	0,750

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Single Components

Bolt end elements

Description

Discs, nuts and damping elements for individual assembly of suspension bolts. Generally a nut and disc are placed at the lower bolt end and a disc and 2 nuts at the top end. The nuts are countered to give a secure fixation. If required additional damping rings can be added.



Bolt end elements

Article number

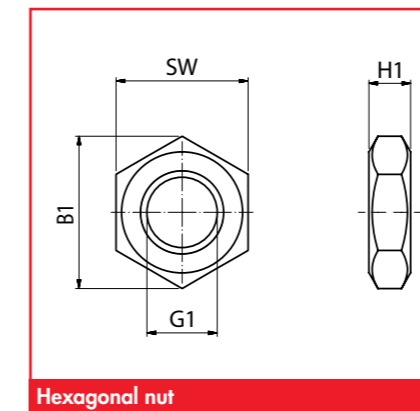
Type	Accessory for bolt M8x1	Accessory for bolt M12x1	Accessory for bolt M16x1,5	Accessory for bolt M20x1,5	Accessory for bolt M30x1,5
Nut	6.21.1.1695	6.21.1.1692	6.21.1.1693	6.21.1.0454	6.21.1.1694
Flat nut	6.21.1.1688	6.21.1.1645	6.21.1.0035	6.21.1.0037	6.21.1.0746
Disc U-	6.21.1.0012	6.21.1.0002	6.21.1.0004	6.21.1.0005	6.21.1.0008
Damping element DE-	6.21.2.0357	6.21.2.0189	6.21.2.0442	6.21.2.0322	6.21.2.0382

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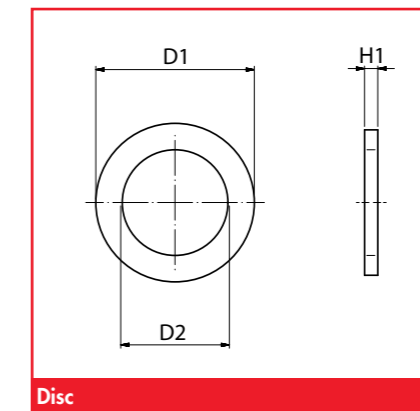
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Single Components

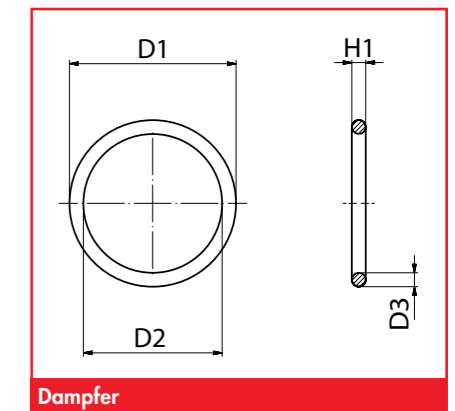
Bolt end elements



Hexagonal nut



Disc



Dampfer

Technical data

Type	D1	D2	D3	H1	G1	B1	SW
Nut M8x1	---	---	---	6,8	M8x1	14,4	13
Nut M12x1	---	---	---	10,8	M12x1	20	18
Nut M16x1,5	---	---	---	14,8	M16x1,5	26,8	24
Nut M20x1,5	---	---	---	18	M20x1,5	33	30
Nut M30x1,5	---	---	---	25,6	M30x1,5	50,9	46
Flat nut M8x1	---	---	---	4	M8x1	14,4	13
Flat nut M12x1	---	---	---	6	M12x1	20	18
Flat nut M16x1,5	---	---	---	8	M16x1,5	26,8	24
Flat nut M20x1,5	---	---	---	10	M20x1,5	33	30
Flat nut M30x1,5	---	---	---	15	M30x1,5	50,9	46
Disc U-8	16	8,4	---	1,8	---	---	---
Disc U-12	24	13	---	2,7	---	---	---
Disc U-16	30	17	---	3,3	---	---	---
Disc U-20	37	21	---	3,3	---	---	---
Disc U-30	56	31	---	4,3	---	---	---
Damping element DE-8	12	8	2	2	---	---	---
Damping element DE-12	16	12	2	2	---	---	---
Damping element DE-16	22	16	2	2	---	---	---
Damping element DE-20	26	20	2	2	---	---	---
Damping element DE-30	38	30	3	3	---	---	---

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