

















4

FIXING ELEMENTS

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General Information

The way of fixing and mounting suction cups and plates depends on several factors. In chapter 1 "Basics" you will find a detailed list, when a spring-mounted or non-spring-mounted mounting is possible resp. necessary.

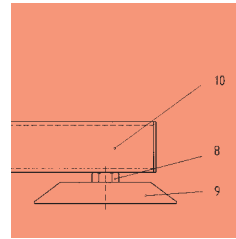
We offer a modular construction system with fixing elements, which can be combined, for our suction cup / plate program.

This guarantees highest flexibility and at the same time a very high functionality.

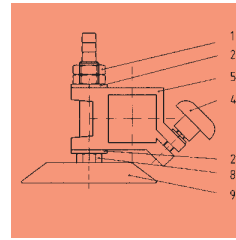
Terms for Mounting Examples

No: Term:

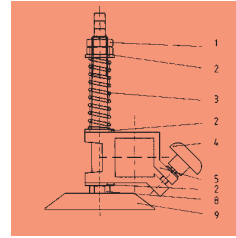
- 1 Nut
- 2 Disk
- 3 Upper spring
- 4 Clamping screw
- 5 Cross clamping piece
- 6 Lower spring
- 7 Suspension bolt
- 8 Connection nipple
- 9 Suction cup
- 10 Distribution pipe
- 11 Suspension (on site)
- 12 Sealing ring
- 13 Hose nipple
- 14 Angle connection
- 15 Upper clamping plate
- 16 Guide bush
- 17 Clamping lever
- 18 Lower clamping plate
- 19 Connection fitting
- 20 Sealing resp. suction plate



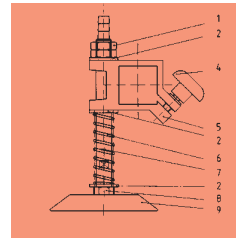
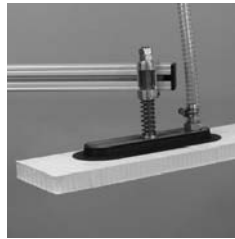
Direct mounting in distribution circuit. The suction cups / plates are directly screwed into hollow profiles by the use of connection nipples or connection screws.



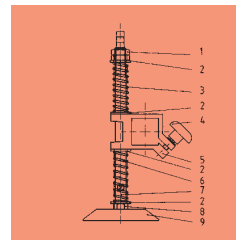
Rigid suspension by use of cross clamping pieces or clamping plates on hollow profiles. For all suction cups and suction plates are corresponding suspension bolt models available, i.e. with incorporated or separated vacuum feeding.



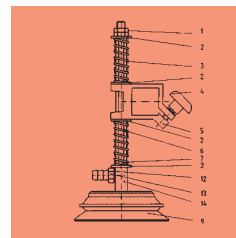
One-sided spring-mounted suspension with upper spring. This fixing element is used when bent parts have to be taken up from even and stable surfaces. An even weight distribution is guaranteed.



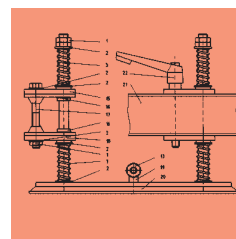
One-sided spring-mounted suspension with lower spring. Recommended for using suction cups / plates on sensitive parts. The springs guarantee a sensitive handling of the materials. Available for cushioning of pushes when lifting goods are cushioning discs.



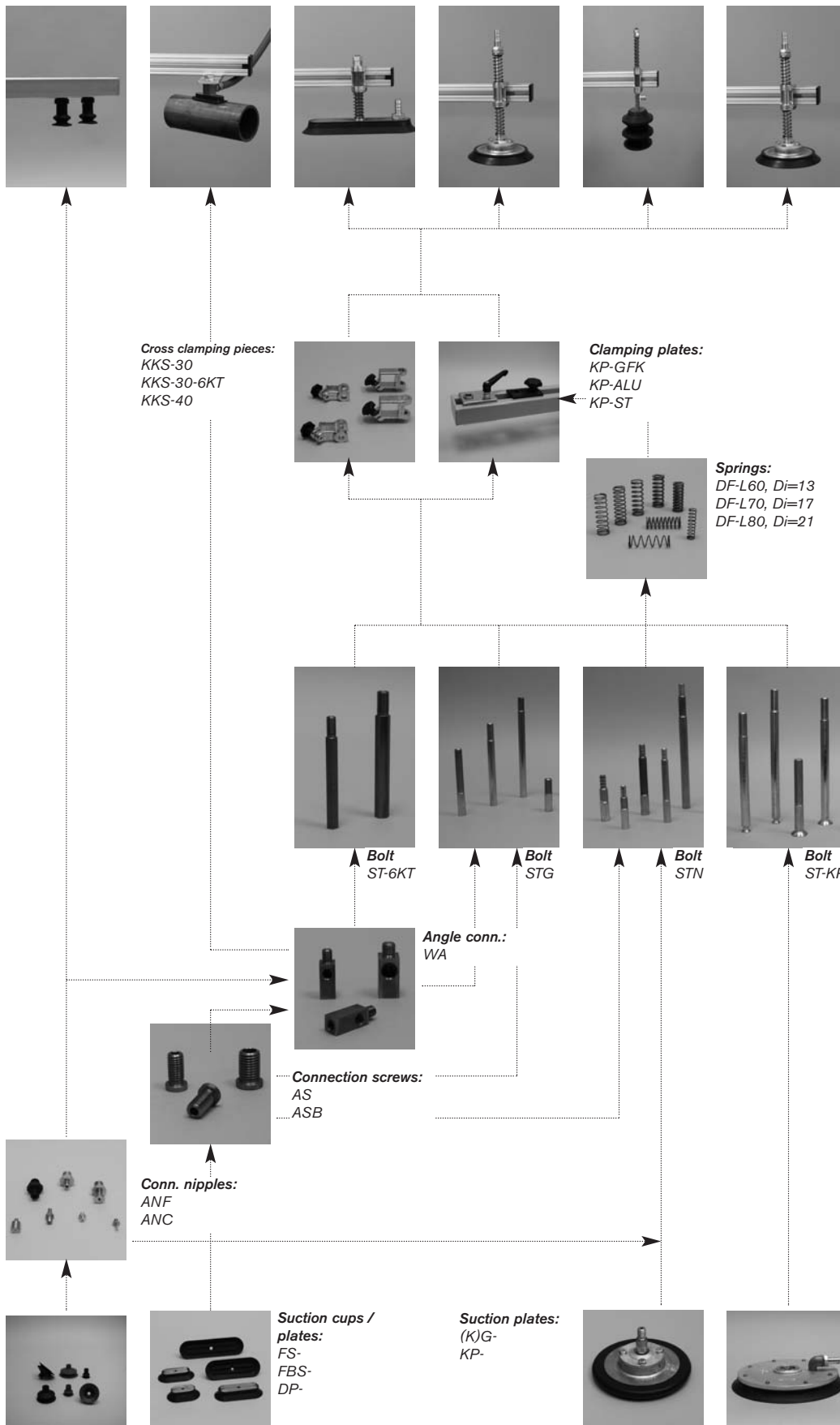
Suspension spring-mounted on both sides with upper and lower spring. The best mounting option for suction cups / plates. This set-up guarantees sensitive handling and an even distribution of weight.



Turn-proof mounting by use of hexagon suspension bolt and clamping piece. Vacuum-fed by means of angle connection or separately on the suction cup / plate. Various lengths of suspension bolts are available for all suspension types.



Turn-proof mounting by means of parallel suspension bolt. Ideal mounting of big oval suction plates with high holding forces in connection with clamping plates. Various lengths of suspension bolts for spring-mounted and non-spring-mounted mounting are available.



Cross clamping pieces:
KKS-30
KKS-30-6KT
KKS-40

Clamping plates:
KP-GFK
KP-ALU
KP-ST

Springs:
DF-L60, Di=13
DF-L70, Di=17
DF-L80, Di=21

Bolt
ST-6KT

Bolt
STG

Bolt
STN

Bolt
ST-KP

Angle conn.:
WA

Connection screws:
AS
ASB

Conn. nipples:
ANF
ANC

Suction cups / plates:
FS-
FBS-
DP-

Suction plates:
(K)G-
KP-

Mounting examples:

- Mounting in distribution line
- Rigid through angle connection
- spring-mounted and turn-proof with hexagon bolt
- Rigid with cross clam. piece
- spring-mounted on one and on both sides

Cross clamping pieces and clamping plates for mounting on profiles 30 x 30 and 40 x 40 or double profiles with distance of 40 mm and 60 mm.

Springs for mounting of suction cups/ plates spring-mounted on one side and both sides. Lengths of suspension bolts depends on mounting.

Bolts in different lengths for different suspensions. With integrated vacuum feeding, in turn-proof version, in connection with angle connection or special versions for all KP-suction plates.

Angle connection as connection element between construction- sided mounting and suction cup / sealing plate / suction plate or between sealing plate and bolts STG / ST-6KT with vacuum feeding on the side.

Connection screw as connection element between sealing plate / suction plate and bolts STN, STG, ST-6KT partly with vacuum flow

Connection nipple for direct mounting of suction cups in the distributor line or as connection element between suction cups and bolts STN, STG, ST-6KT.

Suction cups, sealing and suction plates for various surface structures and work piece dimensions.

Description

Connection nipple with outer thread (M5 or R1/4") for flat suction cups or bellows type cups.

The suction cup has to be stuck on the connection nipple. As a safety feature against unintentional pulling off the suction cup can be clamped on the connection nipple, glued in or secured with a simple clip. When worn out, the suction cups can simply be pulled off and easily be replaced by new ones.

Connection nipples ANC-5.5-R1/4:

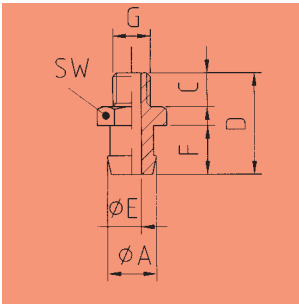
Nipples with threads on both sides for screwing in suction cups with inner thread connections.



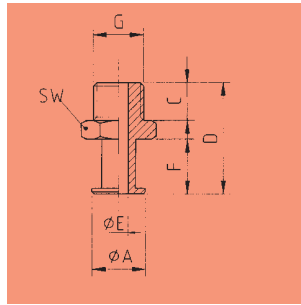
Conn. nipple ANF and ANC

Technical Data	
Type	Weight (g)
ANF-6-M5	2,5
ANF-6-R1/4	21
ANF-8-M5	10
ANF-8-R1/4	10
ANC-1,2-M5	10
ANC-2,5-M5	3
ANC-3,5-M5	10
ANC-4-R1/4	20
ANC-4,5-R1/4	8,5
ANC-5-R1/4	24
ANC-5,5-R 1/4	7
ANC-8-R1/4	8,5
ANA-8-R1/8	10
ANA-9-R1/4	18
ANA-29-R1/4	21
ANA-32-R1/4	27
ANA-41-R1/4	32

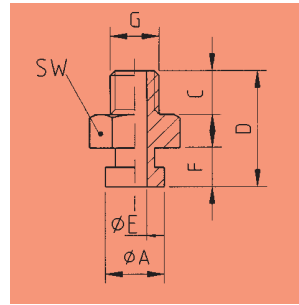
Article numbers	
Type	Connection nipple
ANF-6-M5	1.31.1.0011
ANF-6-R1/4	1.31.1.0012
ANF-8-M5	1.31.1.0013
ANF-8-R1/4	1.31.1.0014
ANC-1,2-M5	1.31.1.0001
ANC-2,5-M5	1.31.1.0002
ANC-3,5-M5	1.31.1.0003
ANC-4-R1/4	1.31.1.0005
ANC-4,5-R1/4	1.31.1.0004
ANC-5-R1/4	1.31.1.0007
ANC-5,5-R1/4	1.31.1.0006
ANC-8-R1/4	1.31.1.0008
ANA-8-R1/8	1.31.1.0018
ANA-9-R1/4	1.31.1.0019
ANA-29-R1/4	1.31.1.0021
ANA-32-R1/4	1.31.1.0020
ANA-41-R1/4	1.31.1.0022



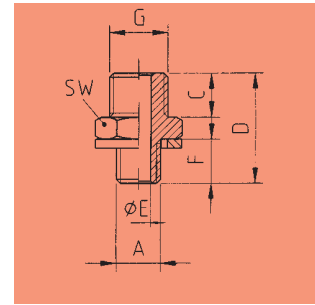
ANF-6-M5 and ANF-6-R1/4



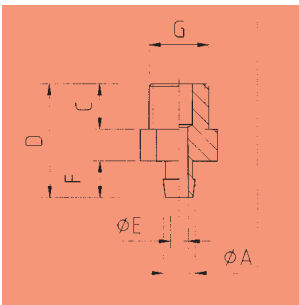
ANF-8-M5



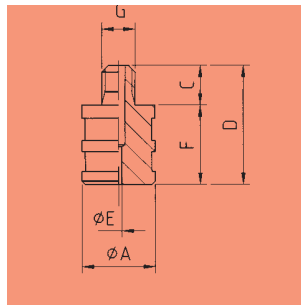
ANF-8-R1/4



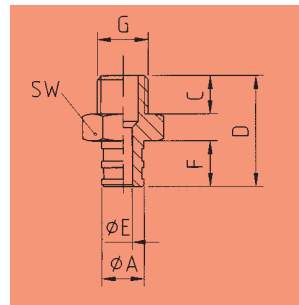
ANC-5,5-R1/4



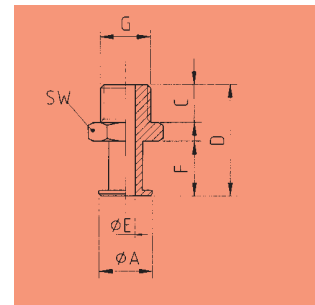
ANC-3,5-M5



ANC-4-R1/4, ANC-4,5-R1/4, ANC-5-R1/4,
ANC-8-R1/4



ANC-1,2-M5, ANC-2,5-M5



ANA-9-R1/8 - ANA-41-R1/4

Dimensions

Type	A	C	D	E	F	G	SW
ANF-6-M5	7	6	18	1	8	M 5	9
ANF-6-R1/4	7	10	25	4	8	R 1/4"	17
ANF-8-M5	11	6	18	1	12	M 5	--
ANF-8-R1/4	11,5	10	29	5	12	R 1/4"	19
ANC-1,2-M5	3	4,5	10,5	1,2	2,5	M 5	8
ANC-2,5-M5	6	4,5	12	2,5	4	M 5	8
ANC-3,5-M5	6,5	4,5	13,5	3,5	6,5	M 5	8
ANC-4-R1/4	10	10	23,5	4	8,5	G 1/4"	17
ANC-4,5-R1/4	14	10	23,5	4	8,5	G 1/4"	17
ANC-5-R1/4	14	10	29,5	5	14,5	G 1/4"	17
ANC-5,5-R1/4	M 10 x 1,25	10	25	5,5	10	G 1/4"	17
ANC-8-R1/4	18	10	37	8	22	G 1/4"	17
ANA-8-R1/8	7	9,5	21	3	5,5	G 1/8"	14
ANA-9-R1/4	13	10	26	6	6	G 1/4"	17
ANA-29-R1/4	12	12	29	6	12	G 1/4"	19
ANA-32-R1/4	12	12	26	6	9	G 1/4"	19
ANA-41-R1/4	12	10	46	6	10	G 1/4"	19

Description

Connection screws made of galvanized steel.
 As a connection element between sealing plate/
 suction plate and bolts STN / STG / ST-6KT or
 between suction plate and angle connection. For
 suction plates, which do not have separate vacu-
 um feeding with passage drill for an integrated
 vacuum feeding through the bolt resp. angle
 connection.



ASB-M5 to ASB-M16



ASB-M12-R3/8 to ASB-M16-R1/2



Connection crews for suction cups/plates

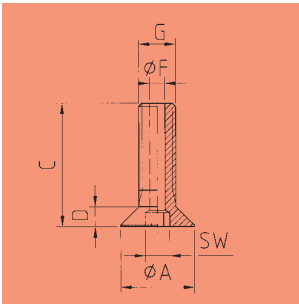
Technical Data		
Type	Weight (g)	Nominal width (mm)
ASB-M12-18	12	6
ASB-M16-25	35	8
ASB-M5	2	2
ASB-M12	16	6
ASB-M16	21	10
ASB-M5-M5	20	2
ASB-M12-M12	30	6
ASB-M12-R3/8	32	6
ASB-M16-R1/2	45	8
AS-M12-18	28	---
AS-M16-25	75	---
AS-M24-32	130	---
AS-M12-20	30	---
AS-M12-25	46	---
AS-M16-25	76	---
AS-M16-30	87	---
AS-M16-60	117	---
AS-M5-M5	22	---
AS-M8-M10	24	---
AS-M12-M12	32	---

Article numbers	
Type	Part No:
ASB-M12-18	1.31.2.0003
ASB-M16-25	1.31.2.0007
ASB-M5	1.31.2.0009
ASB-M12	1.31.2.0002
ASB-M16	1.31.2.0005
ASB-M5-M5	1.31.2.0030
ASB-M12-M12	1.31.2.0031
ASB-M12-R3/8	1.31.2.0004
ASB-M16-R1/2	1.31.2.0008
AS-M12-18	1.31.2.0010
AS-M16-25	1.31.2.0014
AS-M24-32	1.31.2.0029
AS-M12-20	1.31.2.0011
AS-M12-25	1.31.2.0012
AS-M16-25	1.31.2.0013
AS-M16-30	1.31.2.0015
AS-M16-60	1.31.2.0016
AS-M8-M10	1.31.2.0017
AS-M5-M5	1.31.2.0032
AS-M12-M12	1.31.2.0033

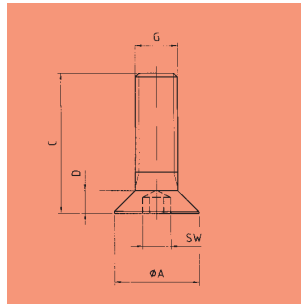
Advice:

Please read the beginning of the chapter "Fixing elements in combination" for usage- and combination possibilities!

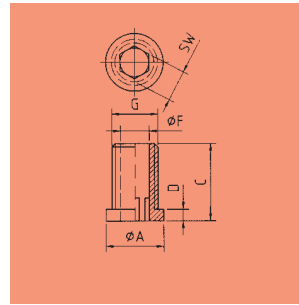
Quick-Joint-System



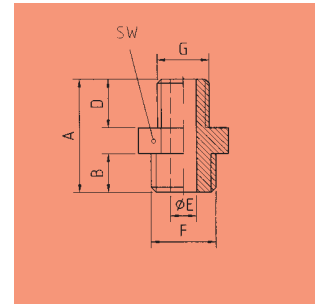
ASB M12-18 and ASB M16-25



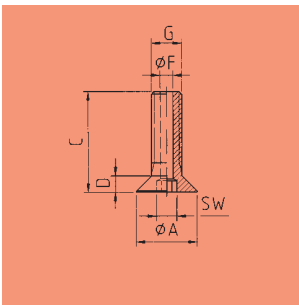
AS M12-20 and AS M24-36



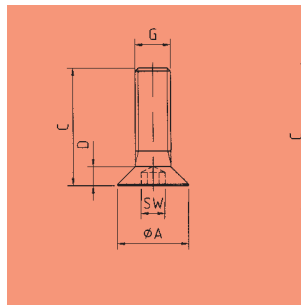
ASB-M12 and ASB-M16



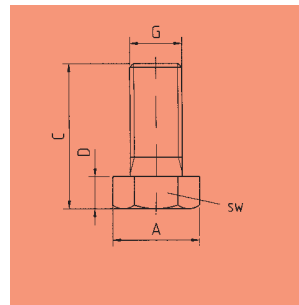
ASB-M12-R3/8, ASB-M16-R1/2,
AS-M5-M5, AS-M8-M10, AS-M12-M12



ASB-M5



AS-M12-20



AS-M12-25, M16-25, M16-30 and M16-60

Dimensions								
Type	A	B	C	D	E	F	G	SW
ASB-M12-18	24	---	18	6,5	---	6	M 12	8
ASB-M16-25	30	---	25	7,5	---	8	M 16	10
ASB-M5	10	---	20	2,8	---	2	M 5	3
ASB-M12	16	---	22	3	---	6	M 12	6
ASB-M16	20	---	27	3	---	8	M 16	8
ASB-M5-M5	15	5	---	5	2	M 5	M 5	8
ASB-M12-M12	30	10	---	10	6	M 12	M 12	18
ASB-M12-R3/8	30	12	---	12	6	R 3/8"	M 12	19
ASB-M16-R1/2	35	12	---	15	8	R 1/2"	M 16	24
AS-M12-18	24	---	18	6,5	---	---	M 12	8
AS-M16-25	30	---	25	7,5	---	---	M 16	10
AS-M24-32	42	---	32	9,5	---	---	M 24	14
AS-M12-20	24	---	26,5	6,5	---	---	M 12	8
AS-M12-25	20,7	---	32,5	7,5	---	---	M 12	19
AS-M16-25	27,7	---	35	10	---	---	M 16	24
AS-M16-30	27,7	---	40	10	---	---	M 16	24
AS-M16-60	27,7	---	70	10	---	---	M 16	24
AS-M8-M10	26	10	---	10	---	M 10	M 8	12
AS-M5-M5	15	5	---	5	---	M 5	M 5	8
AS-M12-M12	30	10	---	10	---	M 12	M 12	18

Description

Stable and robust suction plate retainers for all sealing plates with an even base. The innovative seal between the retainer and the sealing plate guarantees a connection that is absolutely vacuum-tight. No additional sealing materials and work is required. Even if the sealing plates have to be exchanged, the absolute tightness of the system seals is guaranteed.

The cardanic design makes the optimal adaptation of the sealing plates possible, even if the workpieces are uneven. The compensation angle on all sides is 15°.



SAS-M12 - M16



SAK-M20 - M30



Suction plate retainer SAK-M12 - M16

Article numbers	
Type	rigid design
SAS-M12	1.31.2.0020
SAS-M16	1.31.2.0021
SAS-M20	1.31.2.0027
SAS-M30	1.31.2.0028

Article numbers	
Type	articulated design
SAK-M12	1.31.2.0018
SAK-M16	1.31.2.0019
SAK-M20	1.31.2.0025
SAK-M30	1.31.2.0026

Technical Data rigid design						
	Compensation angle max:	Weight (kg)	Volume (ml)	Connection thread	F _Z (N)	M (Nm)
SAS-M12	---	0,10	0,65	M 12	2.000	40
SAS-M16	---	0,15	1,60	M 16	4.000	75
SAS-M20	---	0,45	---	M 24	8.000	100
SAS-M30	---	0,42	---	M 24	16.000	150

F_Z, M max. tensile load and max. bending force

Technical Data articulated design						
	Compensation angle max:	Weight (kg)	Volume (ml)	Connection thread	F _Z (N)	M (Nm)
SAK-M12	ca. 15°	0,1	1,41	M 12	2.000	40
SAK-M16	ca. 15°	0,27	5,50	M 16	4.000	75
SAS-M20	---	0,10	0,65	M 12	8.000	100
SAS-M30	---	0,15	1,60	M 16	16.000	150

F_Z, M max. tensile load and max. bending force.

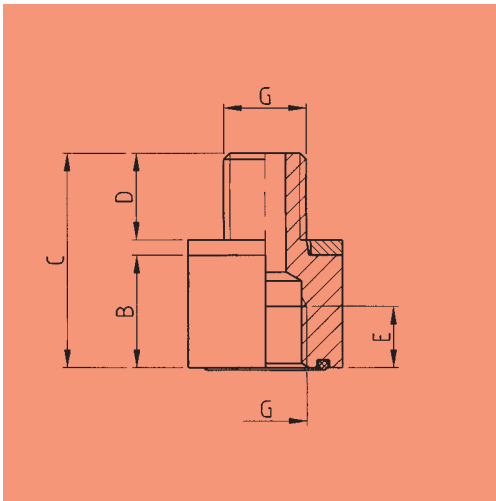
Advice:

Recommended torque for the link between the sealing plates and the suction plate retainer if a connection screw is used

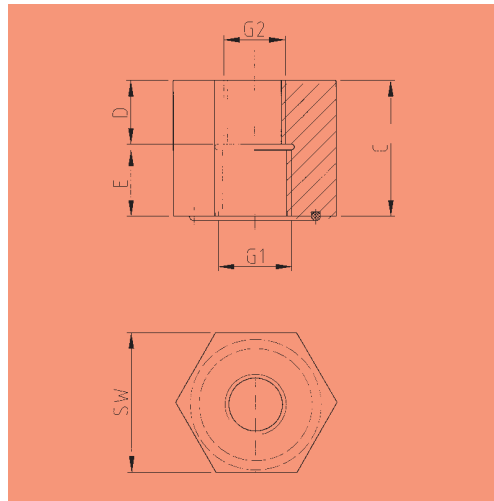
- ASB-M12-18: 70 (Nm)
- AS/ASB-M16-25: 80 (Nm)

SUCTION PLATE RETAINER SAS

Quick-Joint-System



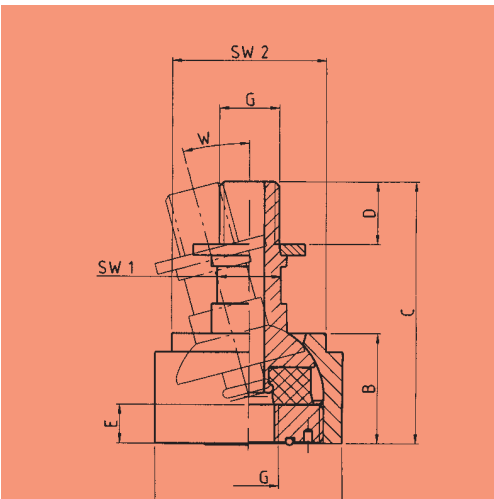
Suction plate retainer SAS-M12 and SAS M16



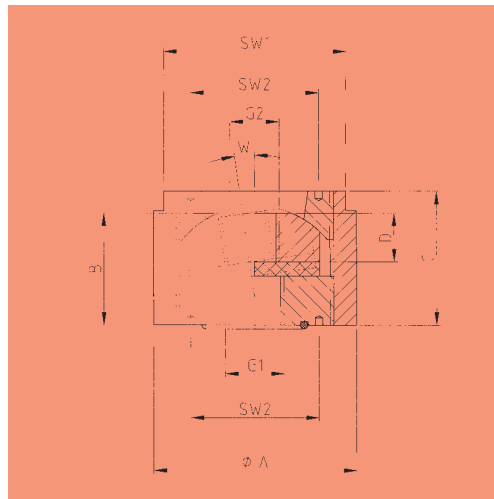
Suction plate retainer SAS-M20 and SAS M30

Dimensions starre Aufnahme

Type	A	B	C	D	E	G	G1	G2	SW 1
SAS-M12	---	20	35	12	10	M 12	---	---	27
SAS-M16	---	22	42	17	12	M 16	---	---	30
SAS-M20	---	---	55	25	25	---	M 24	M 20x1,5	56
SAS-M30	---	---	55	25	25	---	M 24	M 30x1,5	56



Suction plate retainer SAK-M12 and SAK M16



Suction plate retainer SAK-M20 and SAK M30

Dimensions articulated design

Type	A	B	C	D	E	G	G1	G3	SW 1	SW 2	W
SAK-M12	35	22,5	49,5	12	8	M 12			13	30	15°
SAK-M16	50	29,5	70,5	17	10	M 16			17	41	15°
SAK-M20	80	47	55	20	---	---	M24	M20x1,5	74	52	10°
SAK-M30	80	47	55	20	---	---	M24	M30x1,5	74	52	8°

Description

Komplett vormontierte Befestigungssets für den schnellen und sicheren Einbau an Aluminiumprofilen mit T-Nuten. Die Befestigungssets gibt es in ein- und beidseitig gefederter Ausführung je nach Anwendungs- und Belastungsfall der Dichtplatten.

An den Befestigungssets können alle Sauger und Saugplatten angebracht werden. Die Auslegung der Federn erfolgt nach dem Auslegungsschema im Hauptkatalog oder durch unsere Verkaufsspezialisten.

Nicht im Lieferumfang enthalten sind die Nutensteine sowie die Befestigungsschrauben für das Aluminiumprofil.



One-sided install.kit with SAK



Double-sided install.kit with SAS



EBS-AP-M5 installation kits with various suction head designs

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Article numbers			
<i>Installation Kit - angular</i>	<i>Part No:</i>	<i>Installation Kit - straight</i>	<i>Part No:</i>
EBS-E-AW-8-M5-90	1.34.2.0016	EBS-E-AG-M5-90	1.34.2.0012
EBS-B-AW-8-M5-130	1.34.3.0024	EBS-B-AG-M5-130	1.34.3.0020
EBS-E-AW-16-M12-190	1.34.2.0013	EBS-E-AG-M12-190	1.34.2.0009
EBS-B-AW-16-M12-245	1.34.3.0021	EBS-B-AG-M12-245	1.34.3.0017
EBS-E-AW-16-R1/4-190	1.34.2.0014	EBS-E-AG-R1/4-190	1.34.2.0010
EBS-B-AW-16-R1/4-245	1.34.3.0022	EBS-B-AG-R1/4-245	1.34.3.0018
EBS-E-AW-20-M16-205	1.34.2.0015	EBS-E-AG-M16-205	1.34.2.0011
EBS-B-AW-20-M16-310	1.34.3.0023	EBS-B-AG-M16-310	1.34.3.0019

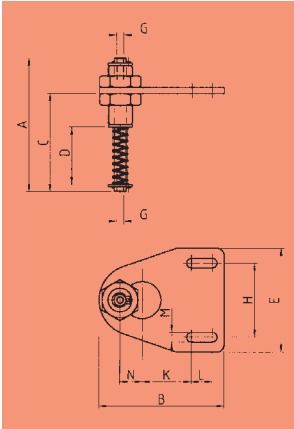
EBS-E Installation kit with springs on one side (bottom)
AW Connection plate angular

EBS-B Installation kit with springs on both sides
AG Connection plate straight

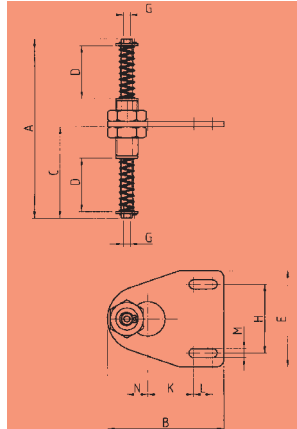
Technical Data						
<i>Installation kit</i>	<i>Weight ca. (g)</i>	<i>Volume (ml)</i>	<i>Connection thread</i>	<i>Diameter</i>	<i>F_Z (N)</i>	<i>M (Nm)</i>
EBS-E-AW-8-M5-90	0,25	0,45	M 5	8	800	2,5
EBS-B-AW-8-M5-130	0,30	0,65	M 5	8	800	2,5
EBS-E-AW-16-M12-190	0,60	16	M 12	16	3.000	20
EBS-B-AW-16-M12-245	0,70	18	M 12	16	3.000	20
EBS-E-AW-16-R1/4-190	0,60	16	R 1/4"	16	2.500	15
EBS-B-AW-16-R1/4-245	0,70	18	R 1/4"	16	2.500	15
EBS-E-AW-20-M16-205	1,20	34	M 16	20	5.000	60
EBS-B-AW-20-M16-310	1,40	44	M 16	20	5.000	60
EBS-E-AG-8-M5-90	0,25	0,45	M 5	8	800	2,5
EBS-B-AG-8-M5-130	0,30	0,65	M 5	8	800	2,5
EBS-E-AG-16-M12-190	0,60	16	M 12	16	3.000	20
EBS-B-AG-16-M12-245	0,70	18	M 12	16	3.000	20
EBS-E-AG-16-R1/4-190	0,60	16	R 1/4"	16	2.500	15
EBS-B-AG-16-R1/4-245	0,70	18	R 1/4"	16	2.500	15
EBS-E-AG-20-M16-205	1,20	34	M 16	20	5.000	60
EBS-B-AG-20-M16-310	1,40	44	M 16	20	5.000	60

F_Z, M max. tensile load and max. bending force.

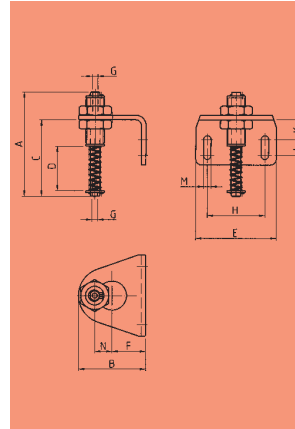
INSTALLATION KITS FOR SUCTION HEADS/PLATES for aluminium profiles



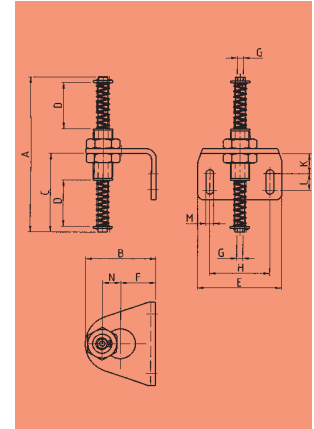
EBS-E-AG-8-M5-90



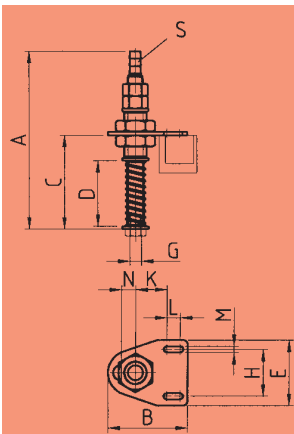
EBS-B-AG-8-M5-130



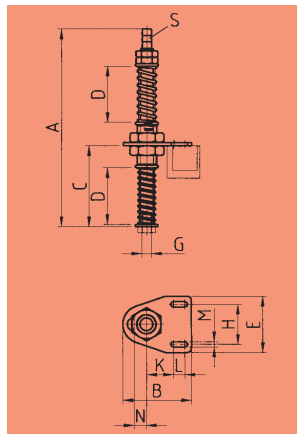
EBS-E-AW-8-M5-90



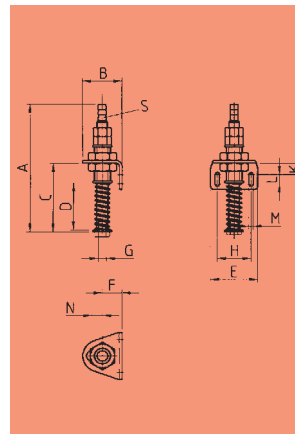
EBS-B-AW-8-M5-130



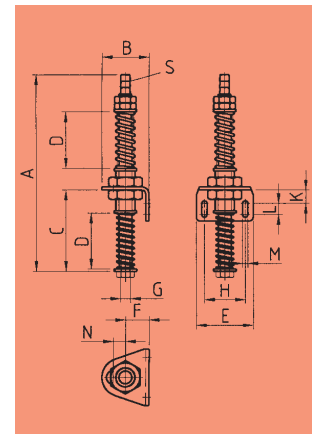
EBS-E-AG-16 and 20



EBS-B-AG-16 and 20



EBS-E-AW-16 and 20



EBS-B-AW-16 and 20

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Dimensions													
Type	A	B	C	D	E	F	G	H	K	L	M	N	S
EBS-E-AW-8-M5-90	90	58	66	38,6	70	29	M 5	50	16,9	14	6,5	15	---
EBS-B-AW-8-M5-130	130	58	66	38,6	70	29	M 5	50	16,9	14	6,5	15	---
EBS-E-AW-16-M12-190	190	58	102	70	70	29	M 12	50	16,9	14	6,5	15	LW 10
EBS-B-AW-16-M12-245	245	58	102	70	70	29	M 12	50	16,9	14	6,5	15	LW 10
EBS-E-AW-16-R1/4-190	190	58	102	70	70	29	R 1/4"	50	16,9	14	6,5	15	LW 10
EBS-B-AW-16-R1/4-245	245	58	102	70	70	29	R 1/4"	50	16,9	14	6,5	15	LW 10
EBS-E-AW-20-M16-205	205	68	115	80	90	38	M 16	60	16,7	10	8,5	---	LW 1/2"
EBS-B-AW-20-M16-310	310	68	115	80	90	38	M 16	60	16,7	10	8,5	---	LW 1/2"
EBS-E-AG-8-M5-90	90	84	43,4	38,6	70	---	M 5	50	33	14	6,5	15	---
EBS-B-AG-8-M5-130	130	84	66	38,6	70	---	M 5	50	33	14	6,5	15	---
EBS-E-AG-16-M12-190	190	84	73	70	70	---	M 12	50	33	14	6,5	15	LW 10
EBS-B-AG-16-M12-245	245	84	100	70	70	---	M 12	50	33	14	6,5	15	LW 10
EBS-E-AG-16-R1/4-190	190	84	73	70	70	---	R 1/4"	50	33	14	6,5	15	LW 10
EBS-B-AG-16-R1/4-245	245	84	73	70	70	---	R 1/4"	50	33	14	6,5	15	LW 10
EBS-E-AG-20-M16-205	205	114	83	80	90	---	M 16	60	50	10	8,5	---	LW 1/2"
EBS-B-AG-20-M16-310	310	114	83	80	90	---	M 16	60	50	10	8,5	---	LW 1/2"

Description

Completely premounted mounting sets in the rigid version, spring mounted on one or both sides for fast and safe mounting of suction plates and suction cups on square profiles 30 x 30 or 40 x 40.

The mounting sets consist of :

- Suspension bolt with lower connection thread M5, M12, M16 or R 1/4" and hose nipple turned onto it.
- upper and / or lower spring (option)
- cross clamping piece with clamping screw
- disks and nuts.



Mounting example rigid suspension



Mounting example, suspension spring-mounted on one side



Mounting example, suspension spring mounted on both sides

Article numbers	
Type	Part no.
EBS-S-30-12-M5-90	1.34.1.0001
EBS-E-30-12-M5-150	1.34.2.0001
EBS-B-30-12-M5-210	1.34.3.0001
EBS-S-30-16-M12-115	1.34.1.0002
EBS-E-30-16-M12-190	1.34.2.0002
EBS-B-30-16-M12-245	1.34.3.0002
EBS-S-30-16-R1/4-115	1.34.1.0003
EBS-E-30-16-R1/4-190	1.34.2.0003
EBS-B-30-16-R1/4-245	1.34.3.0003

Technical Data					
Mounting set for Profile 30 x 30	Weight ca. (g)	Volume (ml)	Conn. thread	F _Z (N)	M (Nm)
EBS-S-30-12-M5-90	240	1	M 5	800	2,5
EBS-E-30-12-M5-150	300	2	M 5	800	2,5
EBS-B-30-12-M5-210	360	3	M 5	800	2,5
EBS-S-30-16-M12-115	310	11	M 12	3.000	20
EBS-E-30-16-M12-190	450	16	M 12	3.000	20
EBS-B-30-16-M12-245	530	18	M 12	3.000	20
EBS-S-30-16-R1/4-115	310	11	R 1/4"	2.500	15
EBS-E-30-16-R1/4-190	450	16	R 1/4"	2.500	15
EBS-B-30-16-R1/4-245	530	18	R 1/4"	2.500	15

F_Z, M max. tensile load and max. bending force.

Article numbers	
Type	Part no.
EBS-S-40-16-M12-115	1.34.1.0004
EBS-E-40-16-M12-245	1.34.2.0005
EBS-B-40-16-M12-245	1.34.3.0008
EBS-S-40-16-R1/4-115	1.34.1.0005
EBS-E-40-16-R1/4-245	1.34.2.0006
EBS-B-40-16-R1/4-245	1.34.3.0009
EBS-S-40-20-M16-120	1.34.1.0006
EBS-E-40-20-M16-205	1.34.2.0007
EBS-B-40-20-M16-310	1.34.3.0010

Technical Data					
Mounting set for Profile 40 x 40	Weight ca. (g)	Volume (ml)	Conn. thread	F _Z (N)	M (Nm)
EBS-S-40-16-M12-115	390	11	M 12	3.000	20
EBS-E-40-16-M12-245	575	18	M 12	3.000	20
EBS-B-40-16-M12-245	625	18	M 12	3.000	20
EBS-S-40-16-R1/4-115	390	11	R 1/4"	2.500	15
EBS-E-40-16-R1/4-245	575	18	R 1/4"	2.500	15
EBS-B-40-16-R1/4-245	625	18	R 1/4"	2.500	15
EBS-S-40-20-M16-120	530	22	M 16	5.000	65
EBS-E-40-20-M16-205	720	34	M 16	5.000	65
EBS-B-40-20-M16-310	885	44	M 16	5.000	65

F_Z, M max. tensile load and max. bending force.

Abbreviations:

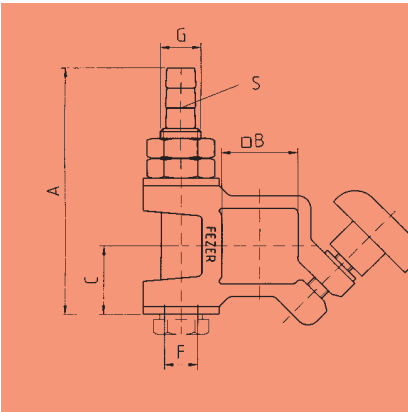
- EBS-S Mounting set rigid
- EBS-E Mounting set spring mounted on one side (below)
- EBS-B Mounting set spring mounted on both sides

Advice:

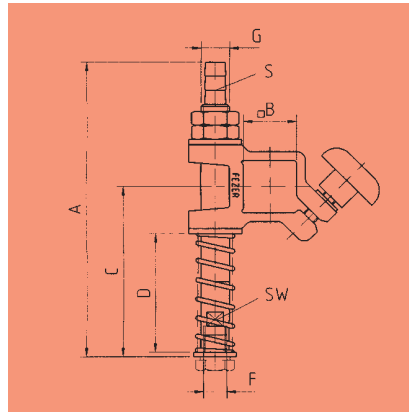
If spring-mounted mounting sets are required please indicate in any case the application conditions.
Our experienced sales personal will stipulate the required springs for you.

MOUNTING SET FOR SUCTION HEADS/PLATES

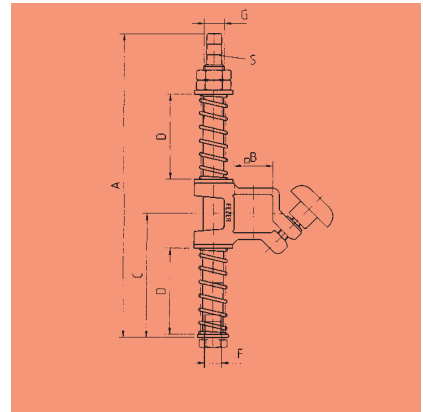
for square profiles



Mounting set rigid EBS-S



Mounting set spring-loaded on one side EBS-E



Mounting set spring-loaded on both sides EBS-B

Dimensions							
Type	A	B	C	D	F	G	S
EBS-S-30-12-M5-90	90	30	27	---	M 5	M 12	10
EBS-E-30-12-M5-150	150	30	80	50	M 5	M 12	10
EBS-B-30-12-M5-210	210	30	76 - 83	48 - 55	M 5	M 12	10
EBS-S-30-16-M12-115	115	30	27	---	M 12	M 16	10
EBS-E-30-16-M12-190	190	30	100	70	M 12	M 16	10
EBS-B-30-16-M12-245	245	30	100	70	M12	M 16	10
EBS-S-30-16-R1/4-115	115	30	27	---	R 1/4"	M 16	10
EBS-E-30-16-R1/4-190	190	30	100	70	R 1/4"	M 16	10
EBS-B-30-16-R1/4-245	245	30	100	70	R 1/4"	M 16	10

Dimensions							
Type	A	B	C	D	F	G	S
EBS-S-40-16-M12-115	115	40	29	---	M 12	M 16	10
EBS-E-40-16-M12-245	245	40	152	120	M 12	M 16	10
EBS-B-40-16-M12-245	245	40	102	70	M 12	M 16	10
EBS-S-40-16-R1/4-115	115	40	29	---	R 1/4"	M 16	10
EBS-E-40-16-R1/4-245	245	40	152	120	R 1/4"	M 16	10
EBS-B-40-16-R1/4-245	245	40	102	70	R 1/4"	M 16	10
EBS-S-40-20-M16-120	120	40	33	---	M 16	M 20	1/2"
EBS-E-40-20-M16-205	204	40	116	80	M 16	M 20	1/2"
EBS-B-40-20-M16-310	310	40	116	80	M 16	M 20	1/2"

Description

Angle connections made of galvanized steel.

Suitable for space-saving mounting of suction cups / plates / sealing plates. A vacuum feeder is integrated in the side of the angle connection.

Serves as a connection element between sealing plate, connection screw and suspension bolt STG, or for turn-proof mounting with suspension bolt ST-6KT, when a lateral vacuum feeding is required.



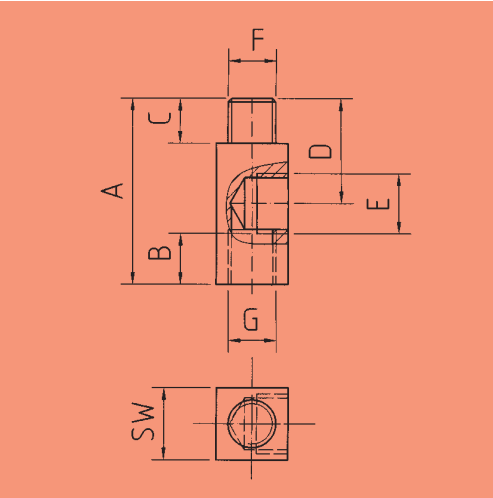
Mounting example suction cup with angle connection



Angle connection WA-M12-M5 to WA-M16-M16

Article numbers	
Type	
WA-M8-M5	1.31.3.0005
WA-M12-M5	1.31.3.0002
WA-M12-R1/4	1.31.3.0003
WA-M12-M12	1.31.3.0001
WA-M16-M16	1.31.3.0004

Technical Data		
Type	Weight (g)	Nominal width (mm)
WA-M8-M5	32	4,1
WA-M12-M5	30	4,1
WA-M12-R1/4	25	10,1
WA-M12-M12	19	10,1
WA-M16-M16	32	13,8



Angle connection WA

Dimensions								
Type	A	B	C	D	E	F	G	SW
WA-M8-M5	52,5	15	15	30,5	R 1/4"	M 8	M 5	18
WA-M12-M5	52,5	15	15	30,5	R 1/4"	M 12	M 5	18
WA-M12-R1/4	52,5	15	15	30,5	R 1/4"	M 12	R 1/4	18
WA-M12-M12	52,5	15	15	30,5	R 1/4"	M 12	M 12	18
WA-M16-M16	62	17	15	35	R 1/2"	M 16	M 16	24

Hinweis:

For possibilities of use and combination, please look at the beginning of the chapter "Fixing Elements in Combination"!

Description

Slide attachment in brass for installation on plates or sections with a drill-hole. The slide attachments are height-adjustable by means of the outer thread of the guide bushing, making it possible to compensate for unevenness and evening out the level of the connected sealing plates.



Mounting example

The slide attachments can be ideally combined with our fastening plates and angle sections for installation on aluminium sections.

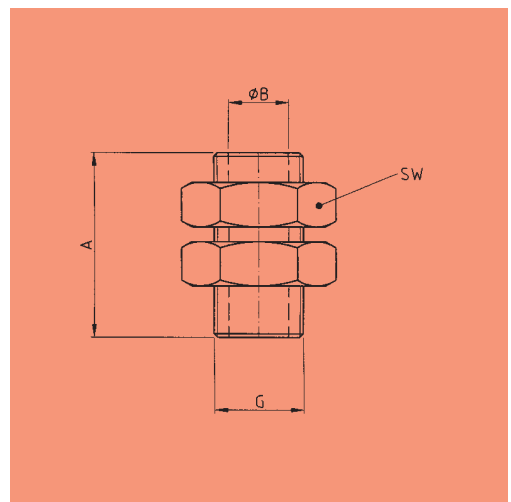


Slide attachment SBF-8 to SBF-20

4
Fixing elements

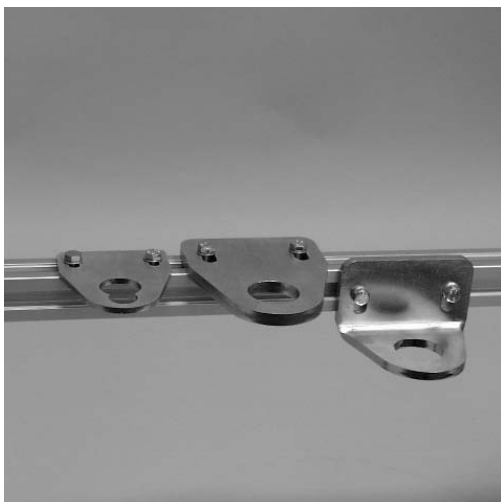
Technical Data				
	Weight (kg)	Bolt diameter	Outer diameter	Adjustable height
SBF-8	0,10	8 mm	16 mm	20 mm
SBF-16	0,25	16 mm	24 mm	20 mm
SBF-20	0,45	20 mm	30 mm	22 mm

Article numbers	
Type	Part No:
SBF-8	1.33.1.0003
SBF-16	1.33.1.0001
SBF-20	1.33.1.0002



Suction plate retainers SAK-M12 and SAK M16

Dimensions				
Type	A	B	G	SW
SBF-8	40	8,1	M 16x1,5	24
SBF-16	50	16,1	M 24x1,5	36
SBF-20	60	20,1	M 30x1,5	46



Befestigungsplatten BFP und BFW

Description

Multi-purpose fastening elements made from galvanised steel, especially for installation on aluminium sections. As the elements may be adjusted along the section grooves as desired, a high degree of flexibility is achieved, particularly if suction plates have to be rapidly adapted to various dimensions. A variety of different suction plate arrangements can be obtained, particularly in combination with the SBF slide fastening elements.

The fastening screws and sliding blocks are not automatically supplied.

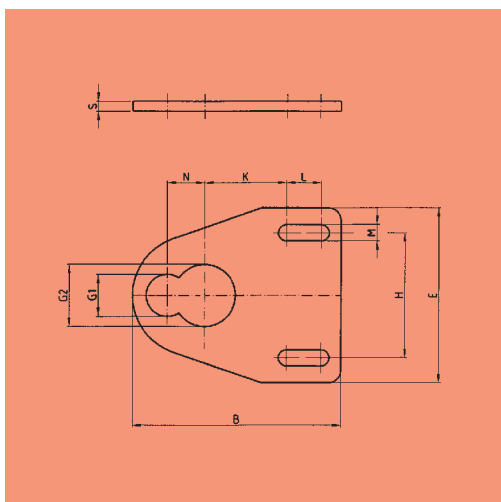
Article numbers

Type	Article number
BFP 8-16	2.33.1.0002
BFP 20	2.33.1.0001
BFW 8-16	2.33.1.0004
BFW 20	2.33.1.0003

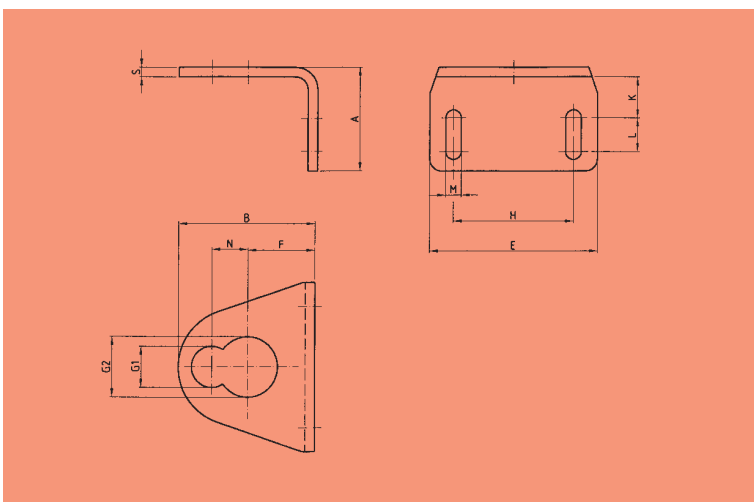
Technical Data

Type	Weight (kg)	Fixing screws	max. load horizontal (N)	suitable bolt connection
BFP 8-16	0,12	M 6	1.500	SBF 8 - 16
BFP 20	0,35	M 8	3.000	SBF 20
BFW 8-16	0,12	M 6	1.500	SBF 8 - 16
BFW 20	0,35	M 8	3.000	SBF 20

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Fixing elements



Fastening plate BFP



Angle section BFW

Dimensions

Type	A	B	E	G1	G2	H	K	L	M	N	S
BFP 8-16	---	84	70	17	25	50	33	14	6,5	15	4
BFP 20	---	114	90	31	---	60	50	10	8,5	---	8
BFW 8-16	43	58	70	17	25	50	33	14	6,5	15	4
BFW 20	68	57	90	31	---	60	50	10	8,5	---	6

Description

Robust die-cast aluminium clamping element.

Suitable for mounting of suction cups and suction plates to square profiles (30 x 30 and 40 x 40). When using as a turn-proof for oval suction cups/ plates, the clamping pieces are also available with hexagon guide for hexagon suspension bolts. All cross clamping pieces are delivered with clamping screw and star grip. The clamping guarantees a discretionary adjusting of the suction cups / plates.



Mounting example



Cross clamping piece KKS-40-20 S



Cross clamping piece KKS

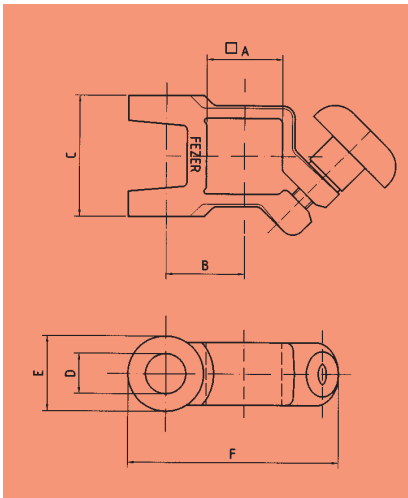
Article numbers

Type	
KKS-30-12	1.33.2.0001
KKS-30-16	1.33.2.0002
KKS-30-6KT-14	1.33.2.0004
KKS-40-16	1.33.2.0005
KKS-40-20	1.33.2.0006
KKS-40-20 S	1.33.2.0031
KKS-50-20 S	1.33.2.0032
KKS-50-30 S	1.33.2.0033
KKS-60-30 S	1.33.2.0034

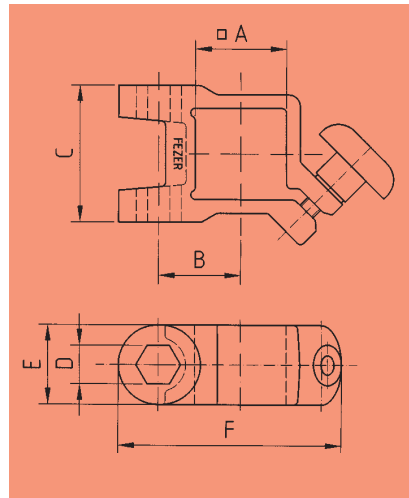
Technical Data

Type	Weight (kg)	Profile dimensions (mm)	Bolt (mm)	F _Z (N)	M (Nm)
KKS-30-12	0,11	30x30	∅ 12	1.000	40
KKS-30-16	0,11	30x30	∅ 16	1.000	40
KKS-30-6KT-14	0,11	30x30	6-kt-14	1.000	40
KKS-40-16	0,15	40x40	∅ 16	5.000	70
KKS-40-20	0,19	40x40	∅ 20	5.000	70
KKS-40-20 S	0,8	40x40	∅ 20	5.000	100
KKS-50-20 S	1,4	50x50	∅ 20	6.000	120
KKS-50-30 S	1,3	50x50	∅ 30	7.500	140
KKS-60-30 S	1,8	60x60	∅ 30	7.500	180

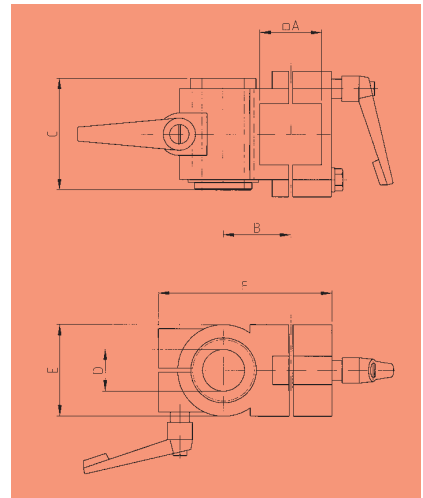
F_Z, M max. tensile load and max. bending force..



Cross clamping piece KKS-30-12 to 40-20 for round bolts



Cross clamping piece KKS-30-6KT-14 for hexagonal bolts



Cross clamping piece KKS-40-20S to 60-30S

Dimensions						
Type	A	B	C	D	E	F
KKS-30-12	30	31	48	12	30	83,5
KKS-30-16	30	31	48	16	30	83,5
KKS-30-6KT-14	30	31	48	14	30	83,5
KKS-40-16	40	36	52	16	30	95,5
KKS-40-20	40	36	60	20	35	98
KKS-40-20-S	40	47	85	20	60	117
KKS-50-20 S	50	70	96	20	86	149
KKS-50-30 S	50	70	96	30	86	149
KKS-60-30 S	60	80	110	30	100	170

Description

Very light and robust clamping plates from GFK for mounting of suction plates.

The clamping plates are suitable for mounting suction plates between two profiles. The clamping guarantees that the suction plates can easily be adjusted and brought into the right position.

Please read "suspension bolts" and "springs" in this chapter for fitting suspension bolts and springs.



Clamping plates KP-GFK



Clamping plates KP-ST



Clamping plates KP-AL, mounting example

Article numbers

Type	Complete set	Clamping plate KP-top	Clamping plate KP-bottom	Socket FB 16 mm	Socket FB 20 mm	Socket FB 30 mm	Socket FB 40 mm
KPK-GFK-16	1.33.2.0021	1.33.2.0014	1.33.2.0016	---	---	---	---
KPK-GFK-20	1.33.2.0022	1.33.2.0015	1.33.2.0017	---	---	---	---
KPK-AL-16	1.33.2.0018	1.33.2.0035	1.33.2.0036	2.33.1.0005	---	---	---
KPK-AL-20	1.33.2.0019	1.33.2.0012	1.33.2.0013	---	2.33.1.0006	---	---
KPK-ST-30	1.33.2.0023	1.33.2.0025	1.33.2.0026	---	---	2.33.1.0007	---
KPK-ST-40	1.33.2.0024	1.33.2.0025	1.33.2.0026	---	---	---	2.33.1.0008

Technical Data

Type	Clamping screw	Weight (kg)	Profile distance (mm)	Clamp. height (mm)	Bolt (mm)	F _Z (N)	M (Nm)
KPK-GFK-16	M12x90	0,294	40	55 - 75	Ø 16	2.000	50
KPK-GFK-20	M12x90	0,29	40	55 - 75	Ø 20	2.000	50
KPK-AL-16	M12x90	0,957	40	55 - 70	Ø 16	8.000	150
KPK-AL-20	M12x120	0,929	40	70 - 100	Ø 20	8.000	150
KPK-ST-30	M16x120	6,54	60	70 - 100	Ø 30	15.000	200
KPK-ST-40	M16x180	6,44	60	100 - 160	Ø 40	20.000	350

F_Z, M max. tensile load and max. bending force..

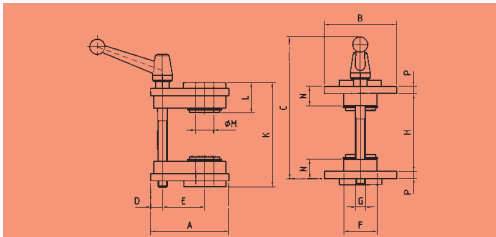
Mounting Advice:

When mounting with two bolts, only one side can be firmly clamped. The other side has to remain flexible, so the bolts will not tilt. The clamping piece on the flexible side can be adjusted with a screw and nut.

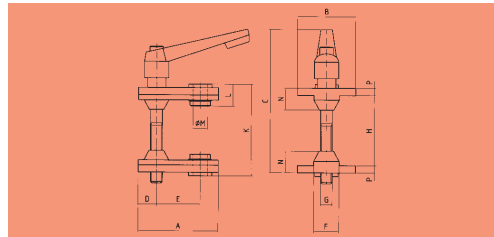
Abbreviations:

- KP Clamping plate
- FB Guide bush, either for
Bolt diameter 16 mm or 20 mm
- KH Clamping lever M 12
- KPK Complete set consisting of upper and lower
clamping plate, guide bush and clamping lever

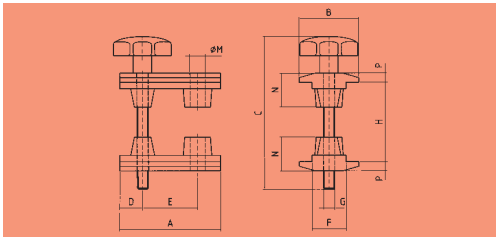
CLAMPING PLATES KP-GFK-AL-ST



Clamping plate KP-ST with clamping screw



Clamping plate ALU with clamping screw



Clamping plate KP-GFK with clamping screw

Dimensions Clamping plates KP-ST

Type	A	B	C	D	E	F	G	H	K	L	M	N	P
KP-ST-17-OBEN	130	120	---	20	70	55	17	100-160	145-205	---	---	32	12
KP-ST-M16-UNTEN	130	120	---	20	70	55	M 16	100-160	145-205	---	---	32	12
FB-SR-30	---	---	---	---	---	---	---	---	---	50	30,5	---	---
FB-SR-40	---	---	---	---	---	---	---	---	---	50	40,5	---	---
KH-M16x120	---	---	205	---	---	---	M 16	---	---	---	---	---	---
KH-M16x180	---	---	265	---	---	---	M 16	---	---	---	---	---	---

Dimensions Clamping plates KP-AL

Type	A	B	C	D	E	F	G	H	K	L	M	N	P
KP-ALU-13-OBEN	110	80	---	25	60	35	13	50-100	80-130	---	---	30	10
KP-ALU-M12-UNTEN	110	80	---	25	60	35	M 12	50-100	80-130	---	---	30	10
FB-SR-16	---	---	---	---	---	---	---	---	---	30	16	---	---
FB-SR-20	---	---	---	---	---	---	---	---	---	30	20	---	---
KH-M12x90	---	---	170	---	---	---	M 12	---	---	---	---	---	---
KH-M12x120	---	---	200	---	---	---	M 12	---	---	---	---	---	---

Dimensions Clamping plates KP-GFK

Type	A	B	C	D	E	F	G	H	M	N	P
KP-GFK-13-OBEN-16	110	65	--	25	60	37	13	55 - 75	16,5	37	10
KP-GFK-13-OBEN-20	110	65	--	25	60	37	13	55 - 75	20,5	37	10
KP-GFK-M12-UNTEN-16	110	65	--	25	60	37	M 12	55 - 75	16,5	37	10
KP-GFK-M12-UNTEN-20	110	65	--	25	60	37	M 12	55 - 75	20,5	37	10
KS-M12x90	--	--	132	--	--	--	M 12	--	--	--	--

with drilled hole and nipple for integrated vacuum feeding

Description

Suspension bolt with central vacuum feeding and connection nipple.

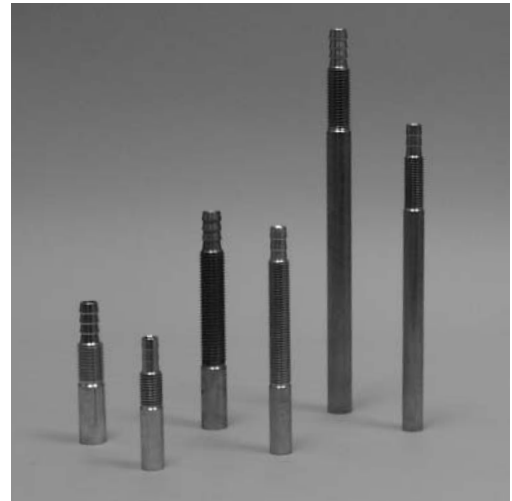
Suitable for fixing suction cups and plates with central connection thread. The bolts consist of a high-precision steel tube and a connection nipple. The suspension bolts are available in different lengths, which, in connection with the cross clamping pieces and clamping plates are suitable for different suspensions of suction cups and plates. Special lengths on request.



Example rigid suspension



Example suspension spring mounted on both sides



Suspension bolt with connection nipple for integrated vacuum feeding

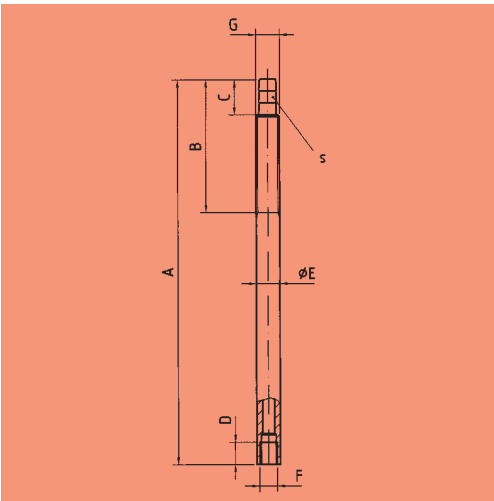
Article numbers	
Type	Bolt
STN-12-M5-90	1.32.3.0013
STN-12-M5-150	1.32.3.0011
STN-12-M5-210	1.32.3.0012
STN-16-M12-115	1.32.3.0014
STN-16-M12-190	1.32.3.0017
STN-16-M12-245	1.32.3.0018
STN-16-M12-285	1.32.3.0019
STN-16-R1/4-115	1.32.3.0025
STN-16-R1/4-190	1.32.3.0026
STN-16-R1/4-245	1.32.3.0027
STN-16-R1/4-285	1.32.3.0028
STN-20-M16-120	1.32.3.0031
STN-20-M16-205	1.32.3.0032
STN-20-M16-310	1.32.3.0033

Technical Data				
Bolt	Weight (kg)	Volume (ml)	F _Z (N)	M (Nm)
STN-12-M5-90	0,09	1	500	25
STN-12-M5-150	0,14	2	500	25
STN-12-M5-210	0,20	3	500	25
STN-16-M12-115	0,15	11	3.000	30
STN-16-M12-190	0,25	16	3.000	30
STN-16-M12-245	0,28	18	3.000	30
STN-16-M12-285	0,30	20	3.000	30
STN-16-R1/4-115	0,15	11	2.500	25
STN-16-R1/4-190	0,25	16	2.500	25
STN-16-R1/4-245	0,28	18	2.500	25
STN-16-R1/4-285	0,30	25	2.000	25
STN-20-M16-120	0,25	22	5.000	65
STN-20-M16-205	0,39	34	5.000	65
STN-20-M16-310	0,50	44	5.000	65

F_Z, M max. tensile load and max. bending force..

SUSPENSION BOLT STN

with drilled hole and nipple for integrated vacuum feeding



Suspension bolt STN with nipple

Dimensions								
Type	A	B	C	D	E	F	G	S (LW)
STN-12-M5-90	90	50	20	15	12	M 5	M 12	6
STN-12-M5-150	150	50	20	15	12	M 5	M 12	6
STN-12-M5-210	210	50	20	15	12	M 5	M 12	6
STN-16-M12-115	115	70	24	15	16	M 12	M 16	10
STN-16-M12-190	190	75	24	15	16	M 12	M 16	10
STN-16-M12-245	245	75	24	15	16	M 12	M 16	10
STN-16-M12-285	285	95	24	15	16	M 12	M 16	10
STN-16-R1/4-115	115	70	24	15	16	R 1/4"	M 16	10
STN-16-R1/4-190	190	75	24	15	16	R 1/4"	M 16	10
STN-16-R1/4-245	245	75	24	15	16	R 1/4"	M 16	10
STN-16-R1/4-285	285	95	24	15	16	R 1/4"	M 16	10
STN-20-M16-120	120	65	30	20	20	M 16	M 20	1/2"
STN-20-M16-205	205	75	30	20	20	M 16	M 20	1/2"
STN-20-M16-310	310	95	30	20	20	M 16	M 20	1/2"

Recommended clamping elements				
Type	Cross clamping piece	Part. No:	Clamping plate	Part. No:
STN-12-M5-...	KKS-30-12	1.33.2.0001	---	---
STN-16-M12-...	KKS-30-16	1.33.2.0002	KPK-GFK-16-90	1.33.2.0021
STN-16-R1/4-...	KKS-40-16	1.33.2.0005	KPK-GFK-16-90	1.33.2.0021
STN-20-M16-...	KKS-40-20	1.33.2.0006	KPK-AL-20-100	1.33.2.0019

with connection thread and separate vacuum feeding

Description

Massive suspension bolt with inner thread for mounting suction plates and sealing plates with separate vacuum feeding.

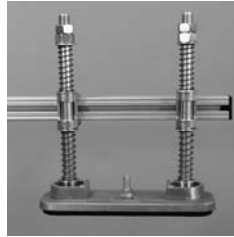
The suction/ sealing plate can be mounted on the suspension bolt either with a connection screw (suction plates with separate vacuum feeding), or with a connection screw and angle connection with integrated vacuum feeding.

The suspension bolts are available in different lengths, which, in connection with the cross clamping pieces and clamping plates, are suitable for different suspensions.

Special lengths on request.



Example, one-spring loaded



Mounting example, suspension spring-mounted on one side



Suspension bolt with connection thread for suction/ sealing plates

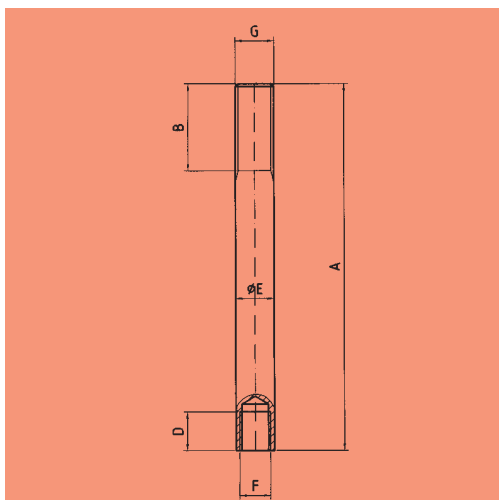
Article numbers	
Type	Bolt
STG-12-M8-125	1.32.2.0003
STG-12-M8-185	1.32.2.0004
STG-16-M12-165	1.32.2.0005
STG-16-M12-260	1.32.2.0006
STG-20-M16-175	1.32.2.0008
STG-20-M16-280	1.32.2.0009
STG-20-M20-175	1.32.2.0024
STG-20-M20-280	1.32.2.0025
STG-30-M30-205	1.32.2.0026
STG-30-M30-310	1.32.2.0027

Technical Data				
Bolt	Weight (kg)	Volume (ml)	F _Z (N)	M (Nm)
STG-12-M8-125	0,11	---	1.000	30
STG-12-M8-185	0,16	---	1.000	30
STG-16-M12-165	0,29	---	3.000	40
STG-16-M12-260	0,37	---	3.000	40
STG-20-M16-175	0,45	---	5.000	80
STG-20-M16-280	0,61	---	5.000	80
STG-20-M20-175	0,45	---	7.500	100
STG-20-M20-280	0,61	---	7.500	100
STG-30-M30-205	1,14	---	10.000	150
STG-30-M30-310	1,72	---	10.000	150

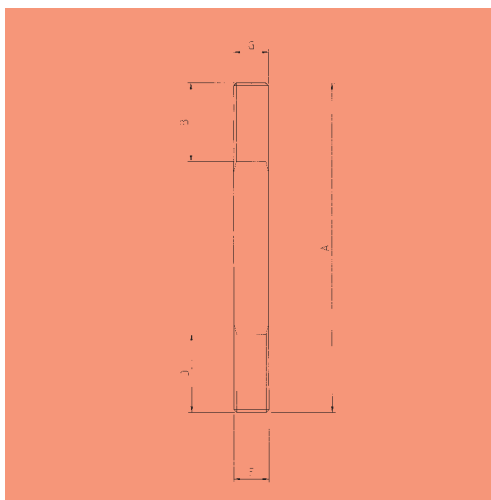
F_Z, M max. tensile load and max. bending force..

SUSPENSION BOLT STG

with connection thread and separate vacuum feeding



Suspension bolt STG with outside thread / inside thread



Suspension bolt STG with outside thread both sides

Dimensions						
Type	A	B	D	E	F	G
STG-12-M8-125	125	50	15	12	M 8	M 12
STG-12-M8-185	185	50	15	12	M 8	M 12
STG-16-M12-165	165	50	15	16	M 12	M 16
STG-16-M12-260	260	65	15	16	M 12	M 16
STG-20-M16-175	175	45	20	20	M 16	M 20
STG-20-M16-280	280	80	20	20	M 16	M 20
STG-20-M20-175	175	45	40	20	M 20x1,5	M 20x1,5
STG-20-M20-280	280	80	40	20	M 20x1,5	M 20x1,5
STG-30-M30-205	205	50	40	30	M 30x1,5	M 30x1,5
STG-30-M30-310	310	100	40	30	M 30x1,5	M 30x1,5

Recommended Clamping elements						
Type	Cross clamping piece	Part. No:	Clamping plate	Part. No:	Angle connector	Part. No:
STG-12-M8-...	KKS-30-12	1.33.2.0001	---	---	WA-M8-M5	1.31.3.0005
STG-16-M12-...	KKS-30-16	1.33.2.0002	KPK-GFK-16-90	1.33.2.0021	WA-M12-M12	1.31.3.0001
STG-20-M16-...	KKS-40-20	1.33.2.0006	KPK-AL-20-90	1.33.2.0020	WA-M16-M16	1.31.3.0004
STG-20-M20-...	KKS-40-20 S	1.33.2.0031	KPK-AL-20-120	1.33.2.0019	---	---
STN-30-M30-...	KKS-60-30 S	1.33.2.0034	KPK-ST-30-120	1.33.2.0023	---	---

Description

Massive suspension bolt with special threads for KP-suction plates.

Because of their special mounting geometry, these suspension bolts are only suitable for all cardanically mounted KP-suction plates. The suspension bolts are available in different lengths, which, in connection with the cross clamping pieces and clamping plates, are suitable for different suspensions.

Special lengths on request.

Version KPL:

Suitable for oval and rectangular KP-suction plates with two suspension bolts, as well as round KP-suction plates up to a diameter of 250 mm. Maximum holding force per suspension bolt: 1500 N.

Version KPS:

Suitable for round KP-suction plates with a diameter of over 250 mm, as well as for the KPS-suction plates.

Version KPT:

Suitable for round KP-suction plates with a diameter over 450 mm, as well as for the suction plate KPHL 450 x 850 in perbunane black and silicone transparent.

Lengths and versions of suspension bolts on request.



Suspension bolts KPL, KPS, KPT

Article numbers

Type	Bolt
ST-KPL-20-M20-130	1.32.1.0012
ST-KPL-20-M20-200	1.32.1.0013
ST-KPL-20-M20-300	1.32.1.0014
ST-KPS-20-M20-120	1.32.1.0030
ST-KPS-20-M20-200	1.32.1.0031
ST-KPS-20-M20-300	1.32.1.0032
ST-KPT-30-M30	on request
ST-KPT-40-M40	on request

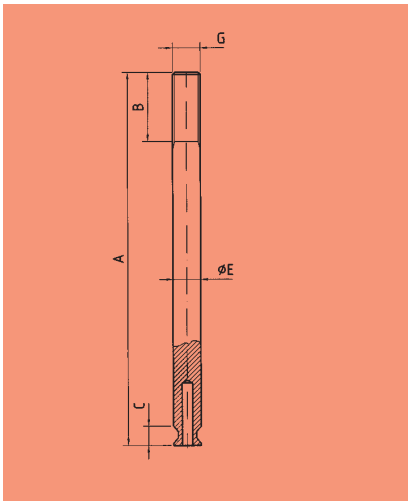
Technical Data

Bolt	Weight (kg)	Volume (ml)	F _Z (N)	M (Nm)
ST-KPL-20-M20-130	0,25	---	2.500	30
ST-KPL-20-M20-200	0,56	---	2.500	30
ST-KPL-20-M20-300	0,68	---	2.500	40
ST-KPS-20-M20-120	0,25	---	6.500	40
ST-KPS-20-M20-200	0,58	---	6.500	80
ST-KPS-20-M20-300	0,70	---	6.500	80
ST-KPT-30-M30	Anfrage	---	12.500	100
ST-KPT-40-M40	Anfrage	---	18.000	100

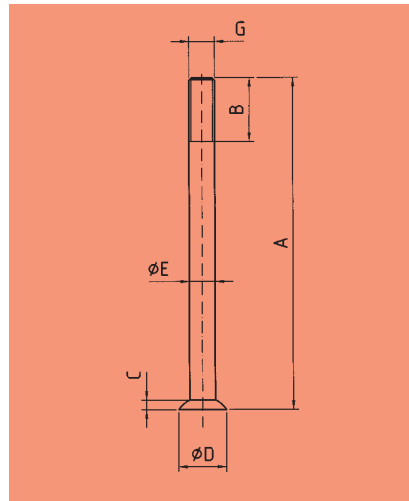
F_Z, M max. tensile load and max. bending force..

SUSPENSION BOLT ST-KPL, KPS, KPT

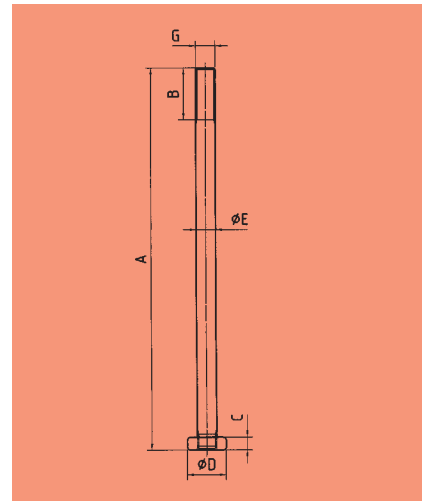
for KP suction plates with separate vacuum feeding



Suspension bolt, design KPL



Suspension bolt, design KPS



Suspension bolt, design KPT

Dimensions

Type	A	B	C	D	E	G
ST-KPL-20-M20-130	130	110	14	--	20	M 20
ST-KPL-20-M20-200	200	50	14	--	20	M 20
ST-KPL-20-M20-300	300	80	14	--	20	M 20
ST-KPS-20-M20-120	120	110	7,5	37,5	20	M 20
ST-KPS-20-M20-200	200	50	7,5	37,5	20	M 20
ST-KPS-20-M20-300	300	80	7,5	37,5	20	M 20
ST-KPT-30-M30	1)	80	20	60	30	M 30
ST-KPT-40-M40	1)	80	20	60	40	M 40

1) Length of bolt depending on application and enquiry!

Recommended Clamping elements

Type	Cross clamping piece	Part. No:	Clamping plate	Part. No:
ST-KPL-20-...	KKS-40-20	1.33.2.0006	KPK-AL-20-120	1.33.2.0019
ST-KPS-20-...	KKS-40-20 S	1.33.2.0031	KPK-AL-20-120	1.33.2.0019
ST-KPT-30-...	KKS-60-30 S	1.33.2.0034	KPK-ST-30-120	1.33.2.0023
ST-KPT-40-...	---	---	KPK-ST-40-180	1.33.2.0024

turn-proof version for separate vacuum feeding

Description

Hexagon suspension bolt for turn-proof mounting of oval and rectangular suction cups and suction plates.

In connection with cross clamping pieces KKS-6KT-30/40 these suspension bolts guarantee an easy and absolutely turn-proof mounting possibility of suction cups and plates. The suspension bolts are available in different standard lengths, which, in connection with the cross clamping pieces, are suitable for various suspension. The vacuum feeding is either effectuated separately or through angle connections WA, which can be mounted on the suspension bolts. Special lengths optional.



Mounting example



6KT-suspension bolt for turn-proof mounting of suction cups/ plates

4
 Fixing
 elements

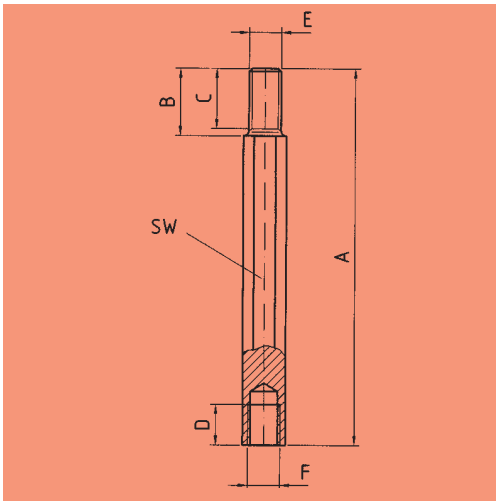
Article numbers	
Type	Bolt
ST-6KT-14-140	1.32.2.0001
ST-6KT-14-215	1.32.2.0002

Technical Data				
Bolt	Weight (kg)	Volume (ml)	F _Z (N)	M (Nm)
ST-6KT-14-140	0,18	---	1.000	30
ST-6KT-14-215	0,28	---	1.000	30

F_Z, M max. tensile load and max. bending force..

HEXAGON SUSPENSION BOLT ST-6KT

Turn-proof version for separate vacuum feeding



Hexagon suspension bolt

Dimensions							
Type	A	B	C	D	E	F	SW
ST-6KT-14-140	140	30	25	15	M 12	M 12	14
ST-6KT-14-215	215	35	30	15	M 12	M 12	14

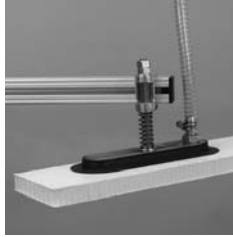
4
 Fixing
 elements

Recommended Clamping pieces				
Type	Cross clamping piece	Part. No:	Angle connection	Part.-No:
ST6KT...	KKS-30-6KT-14	1.33.2.0004	WA-M12-R1/4	1.31.3.0003

Description

Special springs for mounting of suction plates with spring-mounted suspension.

The suspension of the suction cups / plates through springs guarantees a sensitive setting on the work piece (lower spring), and an even weight distribution when using more suction cups / plates (upper spring). Springs are available fitting all suspension bolts with inner diameters of 13 mm, 17 mm and 21 mm. Please read page 5.21 for dimensioning!



Example spr.-mounted below



Spring made of elastomere DF.-EL



Springs with different lengths and thicknesses

Article numbers				
Type	Pressure spring for bolt 12 mm	Pressure spring for bolt 16 mm/6-KT	Pressure spring for bolt 20 mm	Pressure spring for bolt 30 mm
DF-L60-DI13-DS0,9	6.21.4.0024			
DF-L60-DI13-DS1,4	6.21.4.0023			
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-L94-DI32-DS5				6.21.4.0065
DF-L100-DI38-DS10				6.21.4.0009
DF-L165-DI38-DS10				6.21.4.0019
DF-L100-DI33-EL				6.21.4.0069

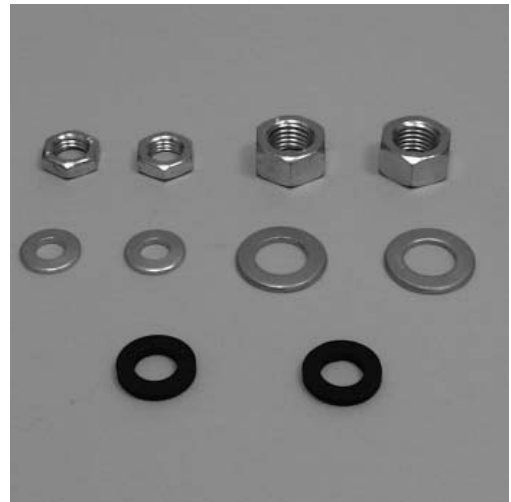
Technical Data						
Type	Spring length	Inner	Wire thickness	max. spring	max. elasticity	Spring rate
	(mm)	diameter (mm)	(mm)	force (N)	(mm)	(N/ mm)
DF-L60-DI13-DS0,9	60	13	0,9	22	50	0,43
DF-L60-DI13-DS1,4	60	13	1,4	71	41	1,74
DF-L70-DI17-DS1,5	70	17	1,5	70	54	1,3
DF-L70-DI17-DS2	70	17	2,0	160	49	3,3
DF-L70-DI17-DS2,5	70	17	2,5	330	45	7,33
DF-L70-DI17-DS3	70	17	3,0	520	38	13,7
DF-L70-DI17-DS3,5	70	17	3,5	690	31	22,3
DF-L70-DI17-DS4	70	17	4,0	1.010	28	36
DF-L70-DI17-DS4,5	70	17	4,5	1.300	24	54,2
DF-L80-DI21-DS2	80	21	2,0	160	51	3,14
DF-L80-DI21-DS2,5	80	21	2,5	190	47	4,04
DF-L80-DI21-DS3	80	21	3,0	350	38	9,21
DF-L80-DI21-DS3,5	80	21	3,5	480	31	15,48
DF-L80-DI21-DS4	80	21	4,0	670	30	22,33
DF-L80-DI21-DS4,5	80	21	4,5	900	23	39,13
DF-L80-DI21-DS5	80	21	5,0	1.170	19	61,58
DF-L80-DI21-DS5,5	80	21	5,5	1.450	17	85,29
DF-L80-DI21-DS6	80	21	6,0	1.740	15	116,0
DF-L80-DI21-DS6,5	80	21	6,5	2.070	13	159,23
DF-L80-DI21-DS8	80	21	8,0	3.170	8	396,25
DF-L90-DI33-DS5	90	33	5,0	817	55	15
DF-L90-DI33-DS6,3	90	33	6,3	1.456	37	39,2
DF-L90-DI33-DS8	90	33	8,0	1.617	40	52,1
DF-L100-DI30-EL	100	30	---	18.000	40	450

Description

Suspension bolts and other connection elements should be mounted and secured with a nut, counter nut and washer.
 When suction cup/plate mounting is spring-mounted on one side, a cushion disk should be used on the non-spring-mounted side. The cushion disk catches slight pushes when lifting resp. setting down.



Counter nuts on the bolt



Accessories for suction cup and suction plate mounting

4
 Fixing
 elements

Article numbers				
Type	Accessory for susp. bolt		Accessory for susp. bolt	
	12 mm	16 mm	20 mm	30 mm
Hexagon nut DIN 439	6.21.1.0032	6.21.1.0034	6.21.1.0036	6.21.1.0480
Hexagon nut DIN 934	6.21.1.0451	6.21.1.0452	6.21.1.0453	6.21.1.0481
Disk DIN 1440	6.21.1.0002	6.21.1.0016	6.21.1.0017	6.21.1.0482
Cushion disk	2.32.1.0001	2.32.1.0002	2.32.1.0003	2.32.1.0004