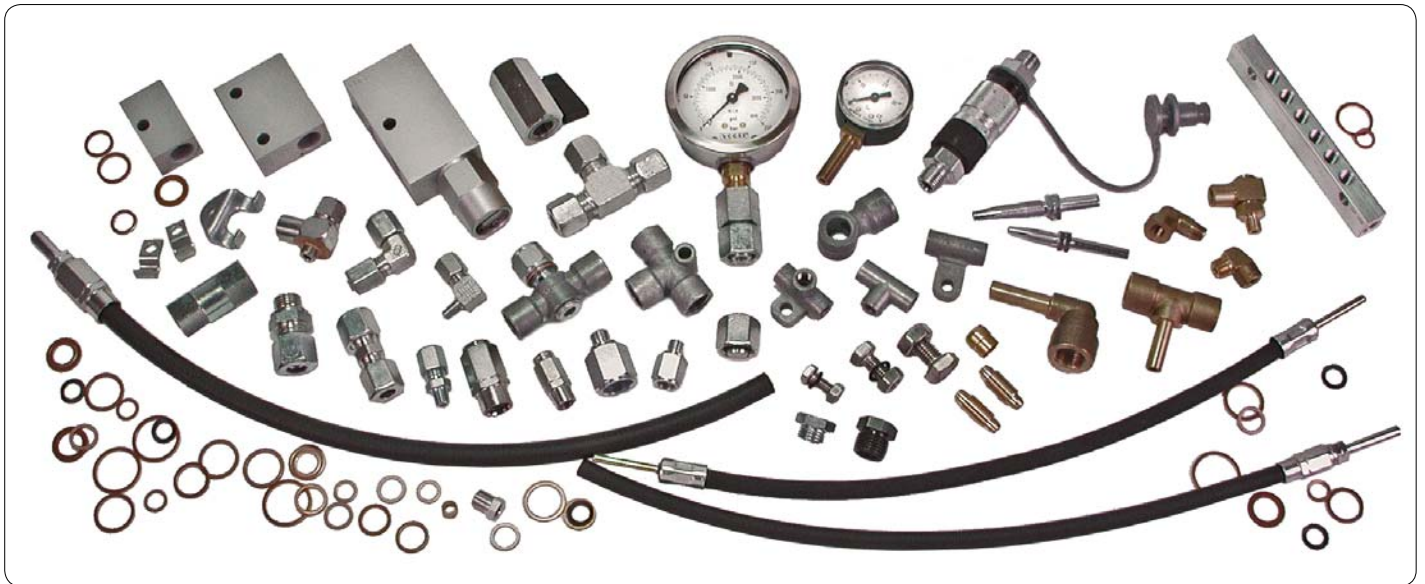


Fittings and Accessories

for Centralized Lubrication Systems and General Use



Fittings for solderless tube connections (double or single tapered rings) are primarily used for single-line centralized lubrication systems (oil and grease, NLGI grades 000, 00) with pressures up to 45 bars.

For higher pressures up to 250 bars, like those occurring especially in progressive centralized lubrication systems (grease up to NLGI grade 2), it is customary to use cutting-sleeve screw unions conforming to DIN 2353 (Page 18–21).

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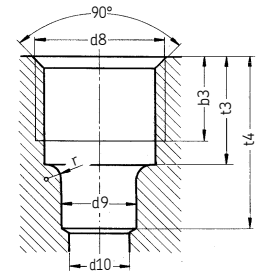
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608-001	23	995-003-042	35	DIN910-R1-8-5.8	12	WVN200-8B32	33
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650-180	22	D301-020-MS	9	DIN936-M20×1.5-5	22	WVN715-R02.5×0.5	25
650-200	22	D406-004-MS	9	DLY930-2	27	WVN715-R04×0.85	25
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714-...-MK	26	DAK506	16	DY958	12	WVN715-R08×1.25	25
716-...(-VS)	26	DAK508	16	DY960	12	WVN716-R04×0.85	25
716-...-M(-VS)	26	DAK510	16	DY961	12	WVN716-R06×1.25	25
716-...-MK	26	DAK510-S1	16	DY962	12	WVN716-R08×1.25	25
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734-...	26	DAT506	15	DZ334	10	WV-R06×0.7 VERZI	24
734-...-K	26	DAT508	15	K1	34	WV-R06×1 VERZI	24
734-...-VS	26	DAT510	15	K3-S2	34	WV-R08×0.7 VERZI	24
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853-380-002(-VS)	27	DIN72573-2×6-ST	23	KW3-S1	34		
853-380-003(-VS)	27	DIN72573-2×8-ST	23	KW3-S3	34		
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Counterbores

DIN 3854/DIN 3862 – for solderless tube connection

Specification of counterbores	for tube diam.	d9 ^{B11}	d10	d8	b3	t3	t4	r
1102 ¹⁾	2.5	2.5	1.5	M6×0.75	4.5	5.5	8.5	1.3
1404	4	4	3	M8×1	6.5	8.5	12.5	1.6
1406	6	6	4.5	M10×1	7	9	14	1.6
1408	8	8	6.5	M14×1.5	9	11.5	18.5	1.6
1410	10	10	8.5	M16×1.5	9	11.5	19.5	1.6
1412	12	12	10.5	M18×1.5	9.5	12	22	1.6

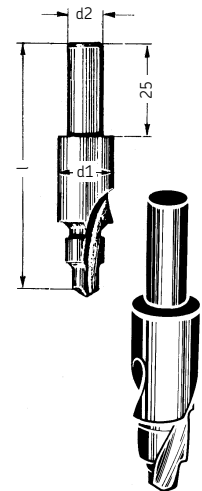


¹⁾ not shown in DIN standard

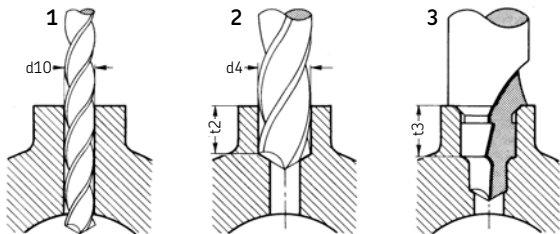
Form counterbores

to tap ports for solderless tube connection

Form counterbore Order No.	tube diam.	for counter-bore	l	d1	d2	d10	d4	Twist drill	
								t2	t3
902-111	2.5	1102	60.5	10		1.5	5	4.5	5.5
904-411	4	1404	65	10		3	6.5	7.5	8.5
906-411	6	1406	66	12	10	4.5	8.5	8	9
908-411	8	1408	70	16		6.5	12	10.5	11.5
910-411	10	1410	72	18		8.5	14	10.5	11.5
912-411	12	1412	75	20		10.5	16	11	12



Provision of counterbore



predrill holes

bore hole to be tapped

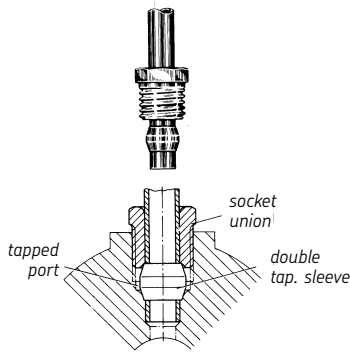
counterbore with form counterbore up to the stop

Form counterbore enlarges bore hole diam. d4 to core hole for ISO thread.

Important note #3:

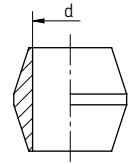
When using a hand drill, take care not to tilt the counterbore out of the drill axis. To avoid damages drill steadily without interruption. Increase pressure slightly at the stop.

Connectors for steel and copper tubing



Double tapered sleeves – DIN 3862

Order No.	for tube diam. d	Material
402-001 *)	2.5	brass
404-001	4	
406-001	6	
408-001	8	
410-001	10	
412-001	12	



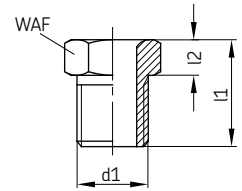
Installation (steel and copper tubing)

1. Push socket union and double tapered sleeve onto tube end.
2. Insert tube end into tapped port up to the stop
3. the stop
4. First tighten socket union finger-tight by hand. Then turn another 1 1/2 turns.

Socket unions – DIN 3871

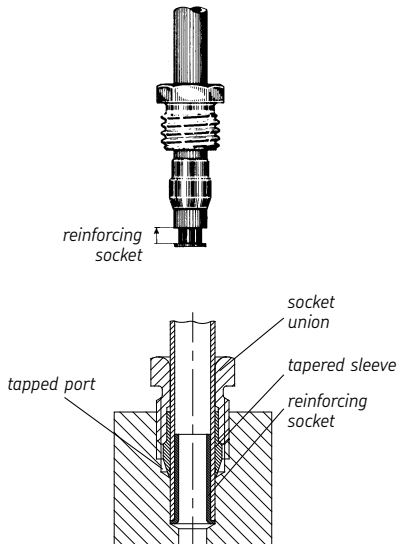
Order No.	for tube diam. d1	l1	l2	WAF	
402-002 *)	2.5	M6×0.75	9	3	7
404-002	4	M8×1	12	4	8
406-002	6	M10×1	13	4	10
408-202	8	M14×1.5	16	4.5	14
410-002	10	M16×1.5	17	5.5	17
412-002	12	M18×1.5	18	6	19

Material: steel, galvanized surface



*) not shown in DIN standard

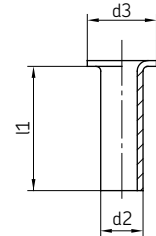
Connectors for steel, copper and plastic tubing



Reinforcing sockets (if plastic tubing is used)

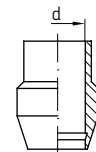
Order No.	for tube	d 2	d 3	l1
402-603	2.5×0.5	1.4	2.3	8
404-603	4×0.85	2.2	3.8	10
406-603	6×1	3.9	5.8	12
406-613	6×1.25	3.4	5.8	12
408-603	8×1.25	5.4	7.8	15
410-603	10×1.5	6.9	9.8	18
412-603	12×1.5	8.9	11.8	20

Material: brass



Tapered sleeves

Order No.	for tube diam. d	Material
402-611	2.5	brass
404-611	4	
406-611	6	
408-611	8	
410-611	10	
412-611	12	



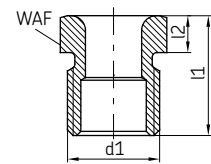
Installation (plastic tubing)

1. Insert reinforcing socket into plastic tube.
2. Push socket union and tapered sleeve onto tube end.
3. Insert tube end into counterbored port up to the stop.
4. First tighten socket union finger-tight by hand. Then turn another 1 1/2 turns.

Socket unions

Order No.	for tube diam.	d1	l1	l2	WAF
402-612	2.5	M6×0.75	9	3	7
404-612	4	M8×1	12	4	8
404-612-MS *)	4	M8×1	12	4	8
406-612	6	M10×1	13	4	10
406-612-MS *)	6	M10×1	13	4	10
408-612	8	M14×1.5	16	4.5	14
408-612-MS *)	8	M14×1.5	16	4.5	14
410-612	10	M16×1.5	17	5.5	17
410-612-MS *)	10	M16×1.5	17	5.5	17
412-612	12	M18×1.5	18	6	19

Material: steel, galvanized surface, *) brass



Adaptors

with cylindrical thread (sealed by flat washer)

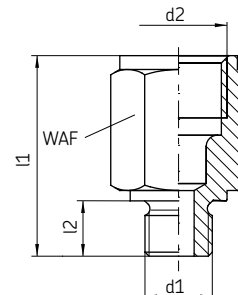
Order No.	Tube diam.	d1	d2 *)	l1	l2	WAF
402-004	2.5	M6	M6×0.75	13	5.5	9
402-003		M6×0.75		13	5.5	9
402-006		M8×1		15	7.5	11
404-061	4	M5	M8×1	20	5.5	11
404-063		M8		22	8	11
404-003		M8×1		18	7.5	11
404-006		M10×1		18	7.5	14
404-040		G 1/8 A		18	8	14
404-162		M12×1		18	9	17
404-164		M14×1.5		18	9	17
406-158	6	M8×1	M10×1	23	7.5	14
406-004		M10×1		18	7.5	14
406-162		M12×1		19	9	17
406-054		G 1/4 A		20	10	17
301-005		M14×1.5		18	9	17
406-166		M16×1.5		19	9	19
406-055		G 3/8 A		21	10	22
408-004	8	M10×1	M14×1.5	28	7.5	17
408-154		G 1/8 A		29	8	17
408-162		M12×1		29	9	17
301-020		G 1/4 A		23	10	17
301-001		M14×1.5		26	9	17
408-005		M16×1.5		22	9	19
408-006		M18×1.5		22	10	22
408-022	M22×1.5	24	12	27		
410-160	10	M10×1	M16×1.5	30	7.5	19
410-162		M12×1		31	9	19
410-163		G 1/4 A		30	10	19
410-164		M14×1.5		29	9	19
410-004		M16×1.5		23	9	19
410-018		M18×1.5		24	10	22
410-171		G 1/2 A		24	12	27
410-022	M22×1.5	24	12	27		
412-162	12	M12×1	M18×1.5	35	9	22
412-163		G 1/4 A		35	10	22
412-164		M14×1.5		33	9	22
412-004		M18×1.5		24	10	22
412-014		M22×1.5		26	12	27

Material: steel, galvanized surface

Order No	Tube diam.	d1	d2 *)	l1	l2	WAF
303-134	4	G 1/4	M10×1	23	7,5	17
303-134	5,5	G 1/4	M14×1,5	22	9	17
D406-004-MS	6	M10×1	M10×1	23	7.5	14
267-001.17		G 1/8 A		24	8	14
406-163		M12×1		19	9	17
D301-005-MS		M14×1.5		20	9	17
406-167		M16×1.5		19	9	19
267-001.19	M18×1.5	21	10	22		
D408-004-MS	8	M10×1	M14×1.5	29	7.5	17
D301-001-MS		M14×1.5		28	9	17
D301-020-MS		G 1/4 A		30	10	17
267-001.13		G 1/2 A		24	12	27

Material: brass

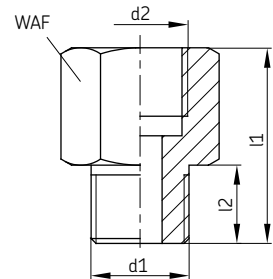
*) Ports tapped for solderless tube connection



Reducing adapters with cylindrical thread (sealed by flat washer)

Order No.	d1	d2	l1	l2	WAF	Material
406-024	M10×1	G 1/8	20	8	14	brass, galvanized surface
401-016-312	M10×1	G 1/4	26.5	7.5	17	brass
406-044-S1 ¹⁾	M10×1 tap.	G 1/4	22.5	8	17	steel, galvanized surface
P-78.01	M12×1	G 1/4	27	8.5	19	steel, galvanized surface
401-013-161	G 1/4 A	G 1/2	40	12	27	steel, galvanized surface
401-019-352	M14×1.5	G 1/8	20	9	17	brass
401-016-371	M16×1.5	G 1/4	30	12	19	steel, galvanized surface
243-001.10	M16×1.5	G 1/2	31	9	27	
267-001.47	G 3/8 A	G 1/4	31	10	22	brass
267-001.60	G 3/8 A	G 1/2	34		27	
267-001.36	M18×1.5	G 3/8	32	10	22	steel, galvanized surface
243-001.20	M18×1.5	G 1/2			27	
401-019-132		G 1/8	24		27	
DZ333		G 1/4	24		27	
401-013-131	G 1/2 A	G 1/2	40.5	12	27	brass
DZ334		G 3/8	31		27	
267-001.03		G 3/4	40		36	
401-011-132	G 1/2 A	G 1	49	14	41	
433-890-131	G 1/2 A	G 1 1/4	53	14	55	steel, galvanized surface
401-013-171	G 3/4 A	G 1/2	41	16	32	
401-013-111	G 1 A	G 1/2	29	18	41	

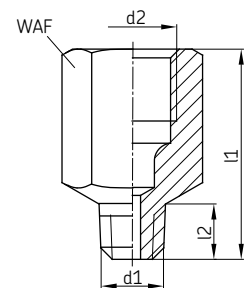
¹⁾ with tapered thread



Adaptors with tapered thread

Tapered threads are used **without washers**, as they are **self-sealing**.
It is not necessary to provide the ports with seal faces.

Order No.	Tube diam.	d1 ¹⁾	d2 ^{*)}	l1	l2	WAF	Material
402-003K	2.5	M6×0,75 tap.	M6×0.75	11.5	4.5	8	steel, galvanized surface
402-006K		M8×1 tap.		15	8	9	
402-008K		M10×1 tap.		16	7.5	12	
404-662K	4	M6 tap.	M8×1	19	5	11	
404-663K		M6 tap.		20	6	11	
404-673K		M6×0.75 tap.		20	6	11	
404-047K		M7 tap.		20	6	11	
404-003K		M8×1 tap.		17	7.4	11	
404-045		M8×1 tap.		62.5	7.4	11	
404-006K		M10×1 tap.		16	7.4	11	
401-004-512	M10×1 tap.	25	7.4	11			
404-040K	6	R 1/8 tap.	M10×1	16	6	11	
404-054K		R 1/8 tap.		14	9	14	
406-004K	6	M10×1 tap.	M10×1	23	7.4	14	
301-105K		M12×1 tap.		18	7.4	14	
456-004K		R 1/8 tap.		21	6	14	
406-054K		R 1/8 tap.		20	9	17	



¹⁾ Tapered thread according to DIN 158. short, resp. according to DIN 2999

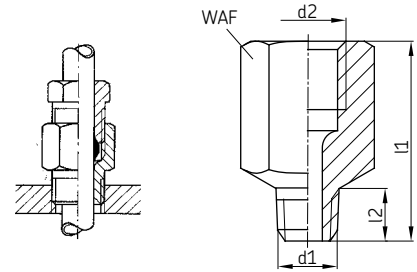
^{*)} Ports tapped for solderless tube connection

Bulkhead connectors

with tapered thread (for sealed tube passage through a wall without tube interruption)

Order No.	Tube diam.	d1 ¹⁾	d2 ^{*)}	l1	l2	WAF
404-003DK	4	M8×1 tap.	M8×1	17	7.4	11
404-006DK	4	M10×1 tap.	M8×1	16	7.4	11
406-004DK	6	M10×1 tap.	M10×1	18	7.4	14
301-001DK	8	M14×1.5 tap.	M14×1.5	24	11	17
410-004DK	10	M16×1.5 tap.	M16×1.5	24	11	19

Material: steel, galvanized surface



¹⁾ Tapered thread according to DIN 158. short

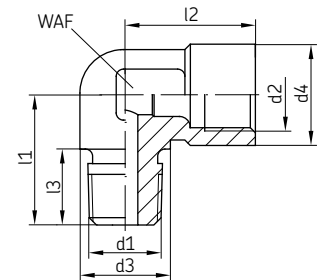
^{*)} Ports tapped for solderless tube connection

Elbows

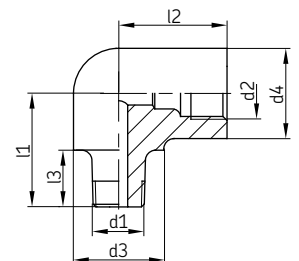
with tapered thread

Order No.	Tube diam.	d1 ¹⁾	d2 ^{*)}	d3	d4	l1	l2	l3	WAF
504-510K	4	M10×1 tap.	M8×1	13	13	21	16	10	14
514-018K	4	R 1/8 tap.	M8×1	13	13	21	16	10	
506-508K	6	M8×1 tap.	M10×1	12.5	14	18	18	10.5	
506-510K	6	M10×1 tap.	M10×1	12.5	14	18	18	10.5	
506-512K	6	M12×1 tap.	M10×1	12.5	14	18	18	10.5	
508-512K	8	M12×1 tap.	M14×1.5	14	19.5	19.5	24	10	

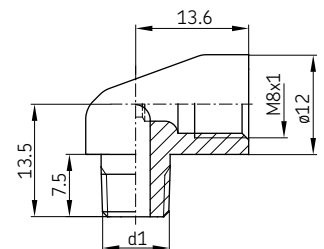
Material: die-cast zinc



Order No.	Tube diam.	d1 ¹⁾	d2 ^{*)}	d3	d4	l1	l2	l3	Material
502-206K	2.5	M6 tap.	M6×0.75	-	8	10	9.5	6	steel
506-202K	6	M10×1 tap.	M10×1	17	17	22	21	11	brass
403-006-651	6	R 1/8 tap.	M10×1	14	14	17	17.5	8.5	steel



Order No.	Tube diam.	d1 ¹⁾	Material
504-200K	4	M6 tap.	brass
504-201K		M8×1 tap.	
504-202K		M10×1 tap.	
504-203K		M6×0.75 tap.	



¹⁾ Tapered thread according to DIN 158. short, resp. according to DIN 2999

^{*)} Ports tapped for solderless tube connection

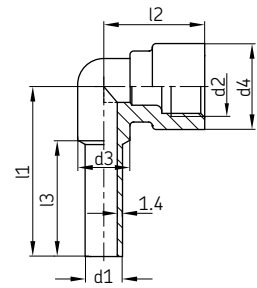
Elbows

with tube end (for installation in counterbores as per DIN 3854/DIN 3862)

Order No.	Tube diam.	d1	d2 *)	d3	d4	l1	l2	l3
DY958	6	6	M10×1	8	14	30.8	21	22
DY960	8	8	M14×1.5	11	18	37	24.5	27
DY961	10	10	M16×1.5	15	23	42.5	26.5	29
DY962	12	12	M18×1.5	15	23	46	26.5	32

Tube end for tube connection

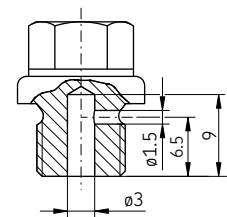
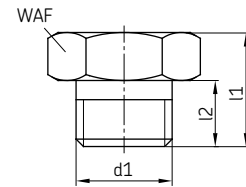
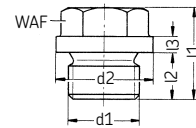
Material: brass



*) Ports tapped for solderless tube connection

Screw plugs

Order No.	d1	d2	l1	l2	l3	WAF	Material
DIN910-R1-8-5.8	G 1/8 A	14	17	8	3	11	steel, galvanized surface
DIN910-R1-4×8-5.8	G 1/4 A	18	17	8	3	14	
DIN910-R3-8-5.8	G 3/8 A	22	21	12	3	17	
DIN910-R1-2-5.8	G 1/2 A	26	26	14	4	19	
DIN910-R3-4-5.8	G 3/4 A	32	30	16	4	24	
DIN910-R1-5.8	G 1 A	39	32	16	5	27	
402-011	M6×0.75		9	5		9	steel, galvanized surface
404-011	M8×1		10	6		11	
406-011	M10×1		12	7		12	
408-211	M12×1		12	7		17	
408-011	M14×1.5		12	7		17	
410-011	M16×1.5		14	8		19	
412-011	M18×1.5		15	10		22	

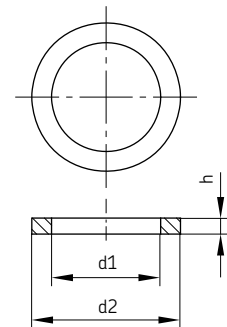


Vent plugs

Order No.	d1	d2	l1	l2	l3	WAF	Material
833-330-016	M 10×1	14	17	8	3	11	steel, galvanized surface
833-330-021	G 1/8 A						

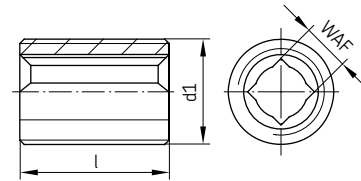
Flat washers

Order No.	d1	d2	h	Suitable for thread mm	inches	Material
DIN7603-A6×10-CU	6.2	9.9	1	M6	-	copper
DIN7603-A8×11.5-CU	8.2	11.4	1	M8	-	
504-019	10.2	13.9	1	M10	G 1/8	
508-215-CU	12.2	15.9	1.4	M12	-	
508-320-CU	12.2	15.9	2	M12	-	
DIN7603-A14×18-CU	14.2	17.9		M14	-	copper
508-108	13.3	17.9		-	G 1/4	
DIN7603-A16×20-CU	16.2	19.9		M16	-	
DIN7603-A17×21-CU	17.2	20.9	1.5	-	G 3/8	
DIN7603-A18×22-CU	18.2	21.9		M18	-	
DIN7603-A20×24-CU	20.2	23.9		M20	-	
DIN7603-A21×26-CU	21.2	25.9		-	G 1/2	
DIN7603-A22×27-CU	22.2	26.9		M22	-	



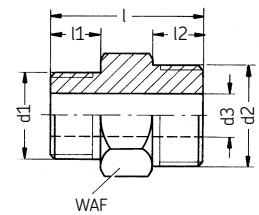
Threaded sockets

Order No.	d1	l	WAF	Material
404-203	M8x1	13	3.5	steel
406-203	M10x1	15	3.5	
406-243-B ¹⁾	M10x1	18	3.5	
408-243-B ¹⁾	M12x1	19	5.5	
458-012	M12x1	17	5.5	
458-012-B ¹⁾	M12x1	17	5.5	
408-023	M14x1.5	18	5.5	
410-003	M16x1.5	19	7	
410-003-B ¹⁾	M16x1.5	19	7	
408-033-S3	G ¹ / ₄ A	15	5.5	

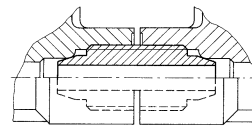


¹⁾ Coated with micro-encapsulated adhesive

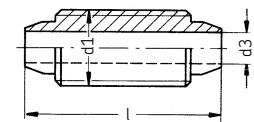
Order No.	d1	d2	d3	l	l1	l2	WAF	Material
406-103	M10x1	M12x1	5	20	6	7	14	steel,
408-103	M12x1	M14x1.5	6	21	7	7	17	galvanized
853-750-024	G ¹ / ₄ A	G ¹ / ₄ A	7	31	10.5	10.5	19	surface



Order No.	d1	d3	l	Material
406-233	M10x1	4	26	brass

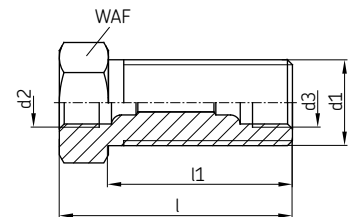


Distributor connection

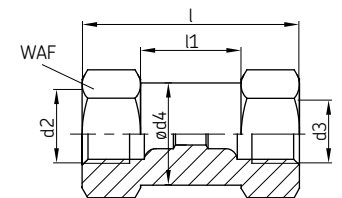


Connectors

Order No.	Tube diam.	d1	d2 ^{*)}	d3 ^{*)}	l	l1	WAF	Material
404-008	4	M14x1.5	M8x1	M8x1	27	19	17	steel, galvanized surface
404-009	4	M14x1.5	M8x1	M8x1	38	30	17	
406-008	6	M14x1.5	M10x1	M10x1	30	20	17	
406-005	6 / 8	M16x1.5	M14x1.5	M10x1	35	23	19	
408-008	8	M20x1.5	M14x1.5	M14x1.5	40	28	24	
410-008	10	M20x1.5	M16x1.5	M16x1.5	42	27	24	
412-008	12	M24x1.5	M18x1.5	M18x1.5	48	33	27	



Order No.	Tube diam.	d2 ^{*)}	d3 ^{*)}	ø d4	l	l1	WAF	Material
404-010	4	M8x1	M8x1	10.8	27	13	11	steel, galvanized surface
406-010	6	M10x1	M10x1	13.8	30	10	14	
406-805	6 / 8	M14x1.5	M10x1	16.8	35	11	17	
408-010	8	M14x1.5	M14x1.5	16.8	40	14	17	
410-010	10	M16x1.5	M16x1.5	18.8	42	13	19	
412-010	12	M18x1.5	M18x1.5	21.8	48	18	22	



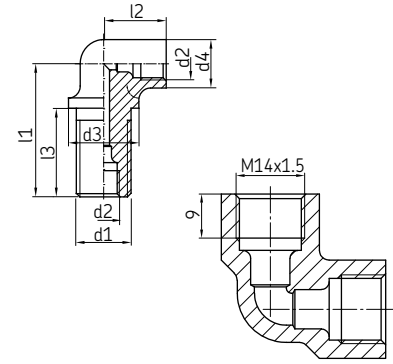
^{*)} Ports tapped for solderless tube connection

Elbow connectors

Order No.	Tube diam.	d1	d2 ^{*)}	d3	d4	l1	l2	l3	Material
504-003	4		M8×1	18	12	33	16	22	die-cast zinc
504-103	4	M14×1.5	M8×1	18	12	33	18	22	brass
506-004	6		M10×1	16.5	14	27	17.5	15	brass

Order No.	Tube diam.	d2 ^{*)}	d3	d4	l1	l2	Material
408-013	8	M14×1.5	20	20	23.5	23.5	die-cast zinc
410-013	10	M16×1.5	21	21	26	26	

^{*)} Ports tapped for solderless tube connection



Bracketed connectors

Order No.	Tube diam.	Material
504-004	4	die-cast zinc

Order No.	Tube diam.	Material
506-010	6	brass

Order No.	Tube diam.	d ^{*)}	b	h	l	Material
DAR506	6	M10×1	15	20	12	aluminum
DAR508	8	M14×1.5	20	25	15	

Order No.	Tube diam.	d1 ^{*)}	d2 ^{*)}	Material
DAR510	10	M16×1.5	M16×1.5	steel, galvanized surface
DAR510-S1	8 / 10	M14×1.5	M16×1.5	

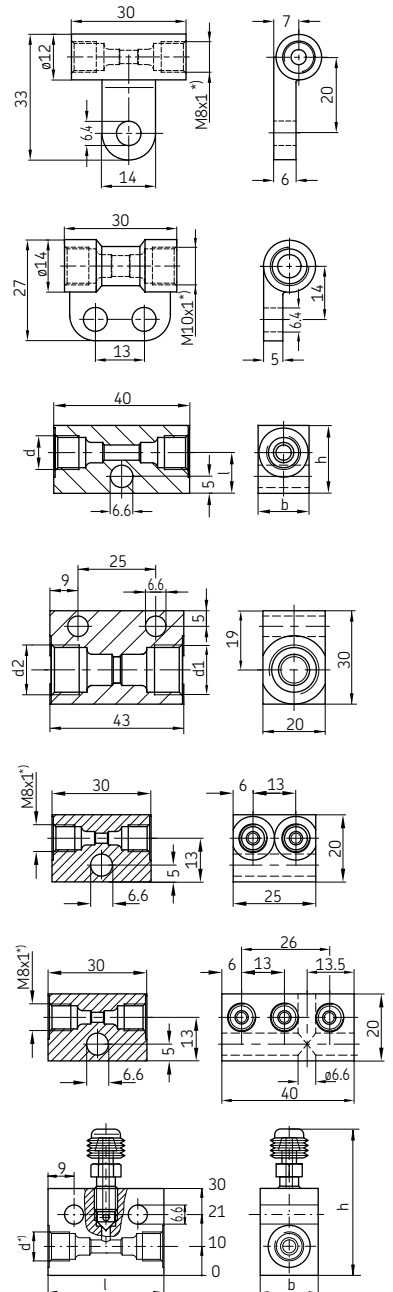
Order No.	Tube diam.	Material
DAR524	4	steel, galvanized surface

Order No.	Tube diam.	Material
DAR534	4	steel, galvanized surface

Tube-to-tube-connector with air vent

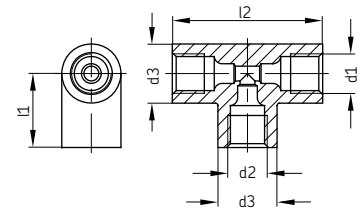
Order No.	Tube diam.	d ^{*)}	b	h	l	Material body
995-001-104	4	M8×1	20	50	40	aluminum
995-001-106	6	M10×1				

^{*)} Ports tapped for solderless tube connection

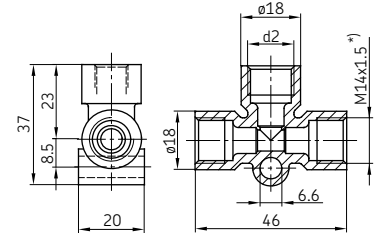


Tee connectors

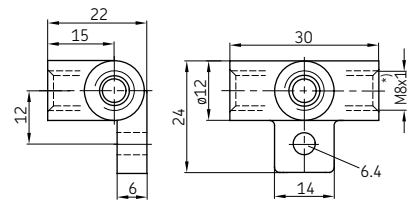
Order No.	Tube diam.	d1 *)	d2 *)	d3	l1	l2	Material
504-008	4	M8×1	M8×1	12	15	30.5	die-cast zinc
506-408	6 / 4	M10×1	M8×1	14	18	36	
506-008	6	M10×1	M10×1	14	18	36	
510-102	10	M16×1.5	M16×1.5	20	25	50	



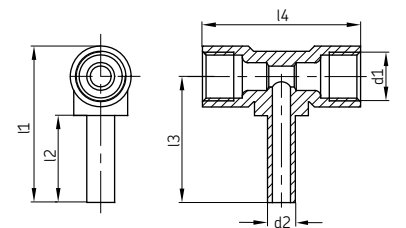
Order No.	Tube diam.	d2 *)	Material
508-602-2	8 / 6	M10×1	die-cast zinc
508-002-2	8	M14×1.5	



Order No.	Tube diam.	Material
504-045	4	die-cast zinc

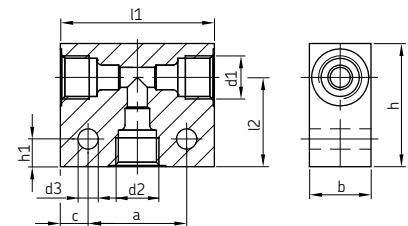


Order No.	Tube diam.	d1 *)	d2	l1	l2	l3	l4	Material
DY964	6	M10×1	6	40	22	32	37	brass
DY966	8	M14×1.5	8	45	25	36	46	

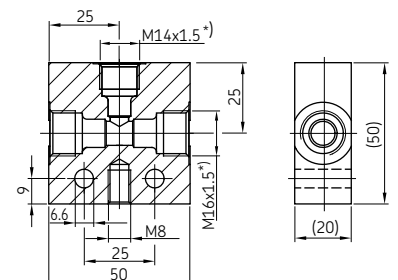


Order No.	Tube diam.	d1 *)	d2	d3	a	b	c	h	h1	l1	l2
DAT506	6	M10×1	M10×1	6.6	22	20	9	30	9	40	20
DAT508	8	M14×1.5	M14×1.5	6.6	32	20	9	40	9	50	29
DAT510 ¹⁾	10	M16×1.5	M16×1.5	7	25	20	13.5	40	15	52	29
DAT510-S5	6	M16×1.5	M10×1	7	25	25	13.5	40	15	52	29
DAT512	12	M18×1.5	M18×1.5	6.6	42	25	9	40	9	60	29

Material: aluminum, ¹⁾ steel, galvanized surface



Order No.	Tube diam.	Material
DAT510-S1	8 (1×) 10 (2×)	steel, galvanized surface



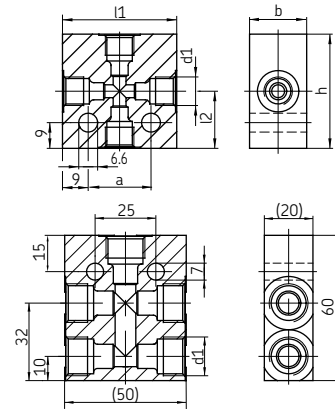
¹⁾ Ports tapped for solderless tube connection

Cross joints

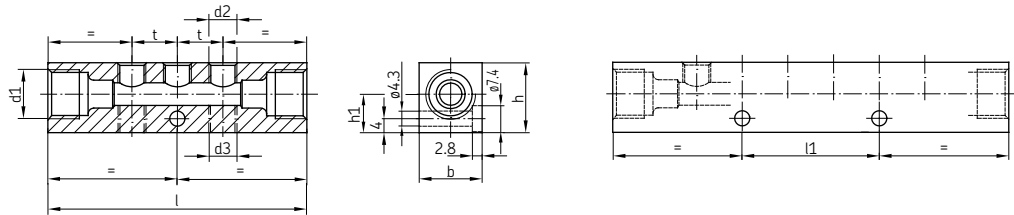
Order No	Tube diam.	d1 *)	a	b	h	l1	l2	Material
DAK504-S1	4/6	M10×1/M8×1	22	20	40	40	20	aluminum
DAK506	6	M10×1	22	20	40	40	20	
DAK508	8	M14×1.5	32	20	50	50	25	
DAK510	10	M16×1.5	25	20	56	50	28	
DAK512	12	M18×1.5	42	25	60	60	30	

Order No.	Tube diam.	d1 *)	Material
DAK510-S1	10	M16×1.5	steel, galvanized surface

*) Ports tapped for solderless tube connection



Distributor manifold



Order No.	Number of port	Main tube port tube diam.	d1 *)	d2	d3	l	l1	h	h1	b	t
321-661	1	6	M10×1	M10×1	-	41	-	20	11	18	-
322-541	2	4	M8×1	2× M8×1	-	49	-	17	10.5	13	13
322-561	2	6	M10×1	2× M8×1	-	52	-	17	10.5	13	13
322-581	2	8	M14×1.5	2× M8×1	-	61	-	20	11	18	13
322-661	2	6	M10×1	2× M10×1	-	58	-	20	11	18	17
322-661-S1	2	8	M14×1.5	2× M10×1	-	72	-	20	11	18	22
323-541	3	4	M8×1	3× M8×1	-	62	-	17	10.5	13	13
323-561	3	6	M10×1	3× M8×1	-	65	-	17	10.5	13	13
323-581	3	8	M14×1.5	3× M8×1	-	74	-	20	11	18	13
323-661	3	6	M10×1	3× M10×1	-	75	-	20	11	18	17
323-661-S1	3	8	M14×1.5	3× M10×1	-	94	-	20	11	18	22
324-561	4	6	M10×1	4× M8×1	-	78	-	17	10.5	13	13
324-581	4	8	M14×1.5	4× M8×1	-	87	-	20	11	18	13
324-761	4	6	M10×1	4× M10×1	-	92	34	20	11	18	17
324-861	4	6	M10×1	2× M10×1	2× M10×1	58	-	20	11	18	17
325-565	5	6	M10×1	5× M8×1	-	91	-	17	10.5	13	13
325-861	5	6	M10×1	5× M10×1	-	109	51	20	11	18	17
326-562	6	6	M10×1	6× M8×1	-	104	52	20	11	18	13
326-581	6	8	M14×1.5	6× M8×1	-	113	39	20	11	18	13
326-661	6	6	M10×1	6× M10×1	-	126	68	20	11	18	17
326-663	6	6	M10×1	3× M10×1	3× M10×1	75	17	20	11	18	17
327-564	7	6	M10×1	7× M8×1	-	117	39	20	11	18	13
327-761	7	6	M10×1	7× M10×1	-	143	85	20	11	18	17
328-561	8	6	M10×1	8× M8×1	-	130	52	17	10.5	13	13
328-581	8	8	M14×1.5	8× M8×1	-	139	65	20	11	18	13
328-761	8	6	M10×1	8× M10×1	-	160	102	20	11	18	17
328-861	8	6	M10×1	4× M10×1	4× M10×1	92	34	20	11	18	17
329-761	9	6	M10×1	9× M10×1	-	177	119	20	11	18	17
329-561	10	6	M10×1	10× M8×1	-	156	78	17	10.5	13	13
330-581-S1	10	8	M14×1.5	10× M8×1	-	201	85	20	11	18	17
330-761	10			10× M10×1	-	194	136				
330-861	10			5× M10×1	5× M10×1	109	51				
331-761	11			11× M10×1	-	211	153				
332-761	12			12× M10×1	-	228	170				
332-861	12			6× M10×1	6× M10×1	126	68				
334-861	14	6	M10×1	7× M10×1	7× M10×1	143	85	20	11	18	17
336-861	16			8× M10×1	8× M10×1	160	102				
338-861	18			9× M10×1	9× M10×1	177	119				
340-861	20			10× M10×1	10× M10×1	194	136				
342-861	22			11× M10×1	11× M10×1	211	153				
344-861	24			12× M10×1	12× M10×1	228	170				

*) Ports tapped for solderless tube connection

Material: aluminum alloy

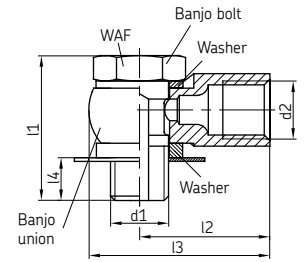
Banjo fittings

Elbow	Order No.	Tube diam.	d1	d2 *)	l1	l2	l3	l4	WAF
	502-161 ¹⁾	2.5	M6	M6×0.75	20	13	19	4.5	9
	502-101 ¹⁾	2.5	M6×0.75	M6×0.75	18	13	19	5	9
	502-102 ¹⁾	2.5	M8×1	M6×0.75	20	14	21	6.5	11
	504-161 ¹⁾	4	M6	M8×1	20	17	24	4.1	9
	504-162 ¹⁾	4	M6×0.75	M8×1	18	17	24	4.5	9
	504-411 ¹⁾	4	M8	M8×1	23	18	25	7.5	11
	504-401 ¹⁾	4	M8×1	M8×1	20	18	25	7	11
	504-101	4	M8×1	M8×1	26	18	25	6.5	11
	504-102	4	M10×1	M8×1	26	19	27.5	6.5	14
	504-108	4	G 1/8 A	M8×1	27	19	27.5	6.8	14
	506-140	6	M10×1	M10×1	26	21	28.5	6.5	14
	506-142	6	M12×1	M10×1	34	25	35.2	7.5	17
	506-012	6	M14×1.5	M10×1	34	25	35.2	7.5	17
	506-145	6	M16×1.5	M10×1	35	30	41	8.7	19
	506-108	6	G 1/8 A	M10×1	27	21	28.5	7	14
	506-214	6	G 1/4 A	M10×1	35	25	35.2	8.5	17
	508-142	8	M12×1	M14×1.5	34	27	37	7.5	17
	508-144	8	M14×1.5	M14×1.5	34	27	37	7.5	17
	508-145	8	M16×1.5	M14×1.5	35	30	41	8.7	19
	508-024	8	G 1/4 A	M14×1.5	35	27	37	8.5	17
	510-142	10	M12×1	M16×1.5	34	30	40	7.5	17
	510-145	10	M16×1.5	M16×1.5	35	30	41	10.7	19
	510-024	10	G 1/4 A	M16×1.5	35	30	40	7.5	17

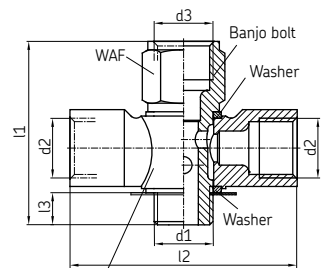
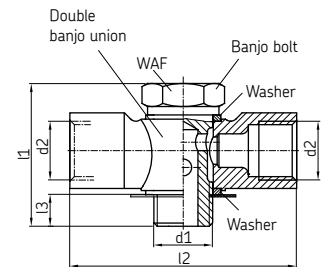
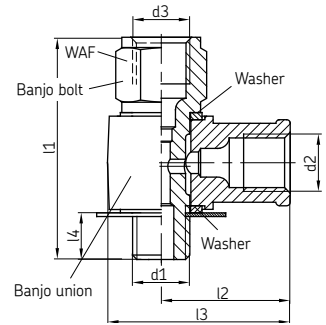
L-type	Order No.	Tube diam.	d1	d2 *)	d3 *)	l1	l2	l3	l4	WAF
	504-114	4	M8×1	M8×1	M8×1	31	18	25.5	6.5	11
	504-115	4	M10×1	M8×1	M8×1	31	19	27.5	6.5	14
	504-105	4 / 6	M10×1	M8×1	M10×1	33	19	27.5	6.5	14
	405-619-061	4 / 6	G 1/8 A	M8×1	M10×1	33	19	27.5	6.3	14
	506-114	6	M10×1	M10×1	M10×1	33	21	28.5	6.3	14
	506-342	6	M12×1	M10×1	M10×1	38	25	35.2	7.5	17
	506-101	6	M14×1.5	M10×1	M10×1	40	25	35.2	7.5	17
	586-342	6 / 8	M12×1	M10×1	M14×1.5	44	25	35.2	7.5	17
	506-013	6 / 8	M14×1.5	M10×1	M14×1.5	43	25	35.2	7.5	17
	506-345	6 / 10	M12×1	M10×1	M16×1.5	48.5	25	35	7.7	19
	506-346	6 / 10	M16×1.5	M10×1	M16×1.5	50	30	41	8.7	19
	508-342	8	M12×1	M14×1.5	M14×1.5	44	27	37	7.5	17
	508-012	8	M14×1.5	M14×1.5	M14×1.5	43	27	37	7.5	17
	508-034	8	G 1/4 A	M14×1.5	M14×1.5	44	27	37	7.5	17
	568-342	8 / 6	M12×1	M14×1.5	M10×1	38	27	37	7.5	17
	508-304	8 / 6	M14×1.5	M14×1.5	M10×1	40	27	37	7.5	17
	508-345	8 / 10	M12×1	M14×1.5	M16×1.5	48.5	27	37	7.7	19
	508-346	8 / 10	M16×1.5	M14×1.5	M16×1.5	50	30	41	8.7	19
	510-342	10	M12×1	M16×1.5	M16×1.5	48.5	30	40	7.5	19
	510-344	10	M16×1.5	M16×1.5	M16×1.5	50	30	41	8.7	19
	510-343	10	G 1/4 A	M16×1.5	M16×1.5	48.5	30	40	7.5	19
	510-346	10 / 6	M16×1.5	M16×1.5	M10×1	50	30	41	8.7	19
	510-341	10 / 8	M12×1	M16×1.5	M14×1.5	44	30	40	7.5	17

Tee	Order No.	Tube diam.	d1	d2 *)	l1	l2	l3	WAF
	504-109	4	M8×1	M8×1	26	38	6.5	11
	504-112	4	M10×1	M8×1	26	38	6.5	14
	506-242	6	M12×1	M10×1	34	48	7.5	17
	506-025	6	M14×1.5	M10×1	34	48	7.5	17
	508-242	8	M12×1	M14×1.5	34	54	7.5	17
	508-013	8	M14×1.5	M14×1.5	34	54	7.5	17
	508-025	8	G 1/4 A	M14×1.5	35	54	7.5	17
	510-242	10	M12×1	M16×1.5	34	60	7.5	17

Cross	Order No.	Tube diam.	d1	d2 *)	d3 *)	l1	l2	l3	WAF
	504-110	4	M8×1	M8×1	M8×1	31	38	6.5	11
	504-111	4	M10×1	M8×1	M8×1	31	38	6.5	14
	504-106	4 / 6	M10×1	M8×1	M10×1	33	38	6.5	14
	506-442	6	M12×1	M10×1	M10×1	38	48	7.5	17
	506-014	6	M14×1.5	M10×1	M10×1	40	48	7.5	17
	586-442	6 / 8	M12×1	M10×1	M14×1.5	44	48	7.5	17
	506-026	6 / 8	M14×1.5	M10×1	M14×1.5	43	48	7.5	17
	508-442	8	M12×1	M14×1.5	M14×1.5	44	54	7.5	17
	508-014	8	M14×1.5	M14×1.5	M14×1.5	43	54	7.5	17
	568-442	8 / 6	M12×1	M14×1.5	M10×1	38	54	7.5	17
	508-305	8 / 6	M14×1.5	M14×1.5	M10×1	40	54	7.5	17
	510-442	10	M12×1	M16×1.5	M16×1.5	48.5	60	7.5	19



¹⁾ Miniature design



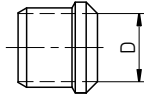
*) Ports tapped for solderless tube connection

Cutting sleeve screw unions acc. to DIN 2353

Cutting sleeves

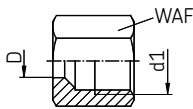
Order No. D (tube diam.)

406-331 ¹⁾	6
406-301	6
408-301	8
410-301	10
412-301	12

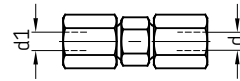


Union nuts

Order No.	D (tube diam.)	d1	WAF
406-332 ¹⁾	6	M10×1	12
406-302	6	M12×1.5	14
408-302	8	M14×1.5	17
410-302	10	M16×1.5	19
412-302	12	M18×1.5	22



Straight connectors (tube to tube)

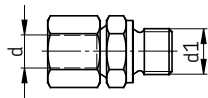


Reducing connectors

Order No.	Tube diam. d, d1	Tube diam.		
		d	d1	
404-404 ¹⁾	4	504-410 ¹⁾	6	4
406-406	6	504-412 ¹⁾	8	4
408-408	8	506-410	8	6
410-410	10	506-412	10	6
412-412	12	508-410	10	8
415-415	15	506-413	12	6
418-418	18	508-412	12	8
		510-410	12	10
		508-413	15	8
		510-412	15	10
		512-410	15	12
		510-413	18	10
		512-412	18	12
		515-410	18	15

Straight screw-in connectors

Order No.	Tube diam. d	d1
404-413 ¹⁾	4	M8×1 tap.
404-403 ¹⁾	4	M10×1 tap.
406-403	6	M10×1
406-413	6	M14×1.5
406-463W	6	G ³ / ₈ A
408-413	8	M14×1.5
410-403	10	M14×1.5
410-413	10	M16×1.5
410-463	10	M18×1.5
412-423	12	M14×1.5
412-403	12	M16×1.5
412-433	12	M18×1.5
412-453	12	M18×1.5
415-403	15	M18×1.5
418-403	18	M22×1.5
406-443 ¹⁾	6	M6 tap.
406-433 ¹⁾	6	M8×1 tap.
406-423 ¹⁾	6	M10×1 tap.
441-008-511 ¹⁾	8	M10×1 tap.
410-443	10	M10×1 tap.

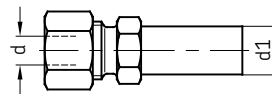


The cutting sleeve screw unions shown correspond to the L-series (light version).

- ¹⁾ LL-series (extra light version)
- ²⁾ S-series (heavy duty version)

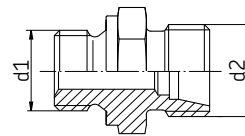
404-403W ¹⁾	4	R ¹ / ₈ tap.
408-423W ¹⁾	8	R ¹ / ₈ tap.
415-423W	15	R ³ / ₈ tap.
406-403W	6	G ¹ / ₈ A
406-423W	6	G ¹ / ₈ A
408-403W	8	G ¹ / ₄ A
408-413W	8	G ³ / ₈ A
408-453W	8	G ¹ / ₂ A
410-403W	10	G ¹ / ₄ A
410-413W	10	G ³ / ₈ A
410-433W	10	G ¹ / ₂ A
410-443W	10	R ¹ / ₈ tap.
412-423W	12	G ¹ / ₄ A
412-403W	12	G ³ / ₈ A
412-453W	12	G ¹ / ₂ A
415-403W	15	G ¹ / ₄ A
415-433W ²⁾	15	G ³ / ₈ A
415-443W	15	G ³ / ₄ A
418-403W	18	G ¹ / ₂ A
441-015-171	15	G ³ / ₄ A
441-022-171	22	G ³ / ₄ A

Reducing connectors



Order No.	Tube diam. d	ø d1
408-406	6	8
410-406	6	10
443-706-121	6	12
443-706-151	6	15
443-706-181	6	18
410-408	8	10
443-708-121	8	12
443-708-151	8	15
443-708-181	8	18
443-710-061	10	8
412-410	10	12
415-410	10	15
443-710-181	10	18
443-712-151	12	15
418-412	12	18
422-412	12	22
443-715-181	15	18

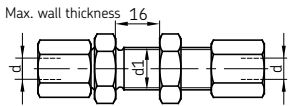
Straight screw-in glands with short threaded end



Order No.	Tube diam. d	d1	d2
406-323	6	M10×1 tap.	M10×1
408-313	8	M14×1.5	M14×1.5
410-313	10	M16×1.5	M16×1.5
410-323	10	M14×1.5	M16×1.5

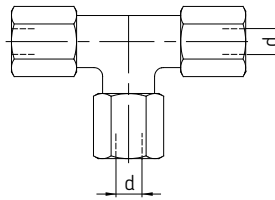
Cutting sleeve screw unions acc. to DIN 2353

Straight bulkhead connectors



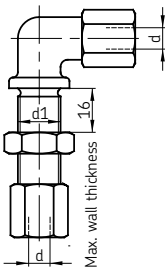
Order No.	Tube diam. d	ø d1
406-416	6	12.5
408-416	8	14.5
410-416	10	16.5
412-416	12	18.5
415-416	15	22.5
418-416	18	26.5
422-416	22	30.5

Tee connectors



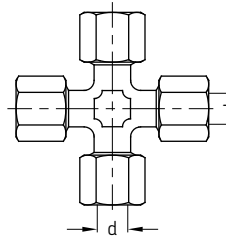
Order No.	Tube diam. d
96-6904-0058 ¹⁾	4
406-407	6
408-407	8
410-407	10
412-407	12
415-407	15
418-407	18
422-407	22

Elbow bulkhead connectors



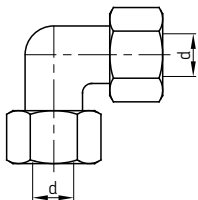
Order No.	Tube diam. d	ø d1
406-409	6	12.5
408-409	8	14.5
410-409	10	16.5
412-409	12	18.5
415-409	15	22.5
418-409	18	26.5
443-190-901	22	30.5

Four-way connectors



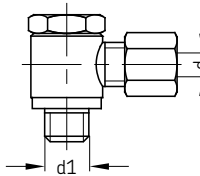
Order No.	Tube diam. d
96-2106-0058	6
446-308-001	8
446-310-001	10
446-312-001	12
446-315-001	15
96-0718-0058	18

Elbow connectors



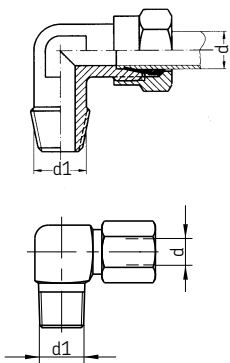
Order No.	Tube diam. d
406-404	6
96-0408-0058	8
410-404	10
412-404	12
443-215-001	15
443-218-001	18
443-290-001	22

Banjo fittings



Order No.	Tube diam. d	d1
445-519-041	4	G 1/8 A
445-529-041 ¹⁾	4	M8x1
445-519-061	6	G 1/8 A
445-531-061	6	M10x1
445-516-061	6	G 3/4 A
445-516-081	8	G 1/4 A
445-516-101	10	G 1/4 A
445-535-101	10	M14x1.5
445-521-122	12	G 3/8 A
445-513-181	18	G 1/2 A
445-517-222	22	G 3/4 A

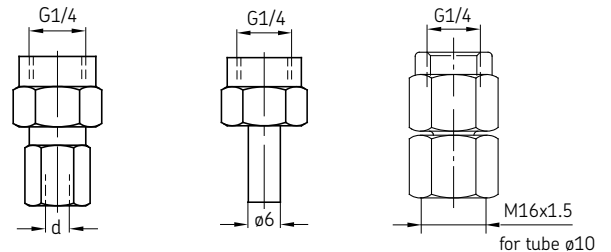
Elbow screw-in connectors



Order No.	Tube diam. d	d1
404-425 ¹⁾	4	M10x1 tap.
406-445 ¹⁾	6	M6 tap.
406-435 ¹⁾	6	M8x1 tap.
406-425 ¹⁾	6	M10x1 tap.
406-405	6	M10x1 tap.
408-405	8	M12x1.5 tap.
408-425 ¹⁾	8	M10x1 tap.
410-405	10	M14x1.5 tap.
410-425 ²⁾	10	M16x1.5 tap.
412-405	12	M16x1.5 tap.
415-405	15	M18x1.5 tap.
406-405W	6	R 1/8 tap.
406-515W	6	R 3/4 tap.
408-425W	8	R 1/8 tap.
408-405W	8	R 1/4 tap.
410-405W	10	R 1/4 tap.
412-405W	12	R 3/8 tap.
415-405W	15	R 1/2 tap.
418-405W	18	R 1/2 tap.

- ¹⁾ LL-series
(extra light version)
²⁾ S-series
(heavy duty version)

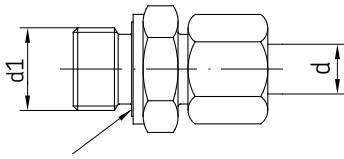
Connectors for pressure gauges



Order No.	Tube diam. d	Order No.	Order No.
406-411	6	248-610.01	441-106-162
408-411	8		441-108-162
410-411	10		441-110-163
412-411	12		441-112-162

Cutting-sleeve screw unions with Elastic washer and E02 function nut

Straight screw-in connectors with Elastic washer and E02 function nut

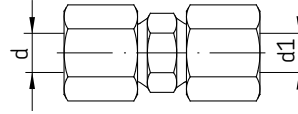


EOLASTIC washer

Order No.	Tube diam. d	d1
471-004-191 ¹⁾	4	G 1/8 A
471-004-311 ¹⁾		M10x1
471-006-192	6	G 1/8 A
471-006-161		G 1/4 A
471-006-311		M10x1
471-006-351		M14x1.5
471-008-161	8	G 1/4 A
471-008-211		G 3/8 A
471-008-351		M14x1.5
471-008-391		M18x1.5
471-010-161	10	G 1/4 A
471-010-211		G 3/8 A
471-010-312		M10x1
471-010-351		M14x1.5
471-010-391		M18x1.5
471-012-161	12	G 1/4 A
471-012-211		G 3/8 A
471-012-391		M18x1.5
471-015-131	15	G 1/2 A

¹⁾ LL-series (extra light version)

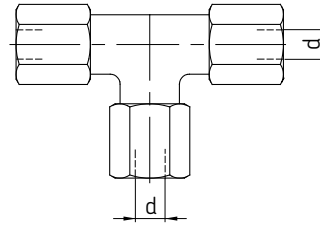
Straight connectors (tube to tube) with E02 function nut



Order No. Tube diam. d, d1

474-506-061	6
474-508-081	8
474-510-101	10
474-512-121	12
474-515-151	15
474-518-181	18

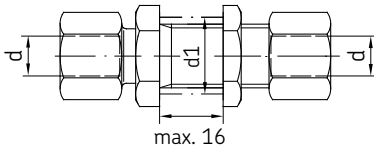
Tee connectors with E02 function nut



Order No. Tube diam. d

476-006-001	6
476-008-001	8
476-010-001	10
476-012-001	12
476-015-001	15

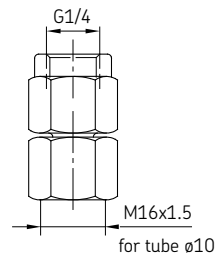
Straight bulkhead connectors with E02 function nut



Order No.	Tube diam. d	d1
474-606-331	6	12.5
474-608-351	8	14.5
474-610-351	10	16.5
474-612-391	12	18.5
474-615-431	15	22.5
474-618-441	18	26.5

Max. operating pressure 315 bars

Connectors for pressure gauges with E02 function nut

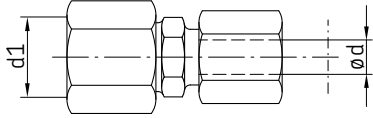


Order No. Tube diam. d

441-106-163	6
471-108-163	8
471-110-163	10
471-112-163	12

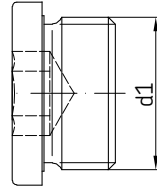
Cutting-sleeve screw unions with Eolastic washer and E02 function nut

Reducing connectors with E02 function nut



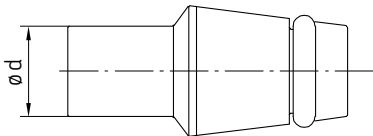
Order No.	Tube diam. d	d1
473-806-351	6	M14×1.5
473-806-391	6	M20×1.5
473-808-371	8	M16×1.5
473-808-392	8	
473-810-391	10	M18×1.5
473-810-371	10	

Screw plugs



Order No.	d1
466-411-001	G 1 A
466-413-001	G 1/2 A
466-416-001	G 3/4 A
466-418-001	G 3/4 A
466-419-001	G 1/8 A
466-431-001	M10×1
466-435-003	M14×1.5
466-439-001	M18×1.5

Cone plug



Order No.	Tube diam. d
460-706-001	6
460-708-001	8
460-710-001	10
460-712-001	12

Vent plug

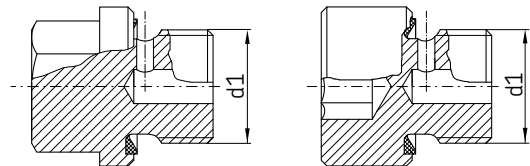


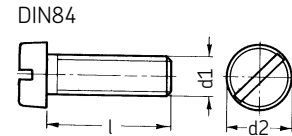
Fig. 1

Fig. 2

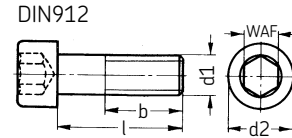
Order No.	d1	Figure
466-431-006	M10×1	1
466-431-005	M10×1	2
466-431-009	G 1/8	2

Fixing bolts

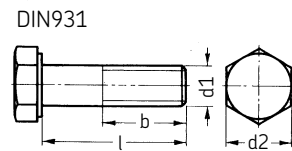
Order No	d1	l	d2	Material
DIN84-M3×5-4.8	M3	5	5.5	steel
DIN84-M5×8-4.8	M5	8	8.5	
DIN84-M5×16-4.8	M5	16	8.5	
DIN84-M5×20-4.8	M5	20	8.5	
DIN84-M6×16-4.8	M6	16	10	
DIN84-M6×20-4.8	M6	20	10	
DIN84-M6×25-4.8	M6	25	10	



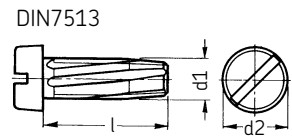
Order No.	d1	l	d2	b	WAF	Material
DIN912-M4×20-8.8	M4	20	7	14	3	steel
DIN912-M6×16-8.8	M6	16	10	18	5	
DIN912-M6×25-8.8	M6	25	10	18	5	
DIN912-M6×60-8.8	M6	60	10	18	5	
DIN912-M8×16-8.8	M8	16	13	12	6	



Order No.	d1	l	b	WAF	Material
DIN931-M6×30-5.8	M6	30	18	10	steel

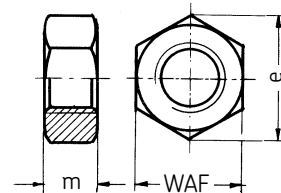


Order No.	d1	l	d2	Material
DIN7513-BM4×20	M4	20	7	steel
DIN7513-BM4×25	M4	25	7	
DIN7513-BM5×10	M5	10	8.5	
DIN7513-BM6×16	M6	16	10	
DIN7513-BM6×25	M6	25	10	



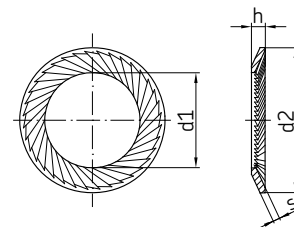
Nuts

Order No.	Thread	m	WAF	e	Material
DIN934-M5-8	M5	4	8	9.2	steel
DIN934-M6-8	M6	5	10	11.5	
DIN936-M14×1.5-5	M14×1.5	8	22	25.4	
DIN936-M16×1.5-5	M16×1.5	8	24	27.7	
DIN936-M20×1.5-5	M20×1.5	9	30	34.6	



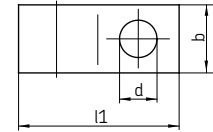
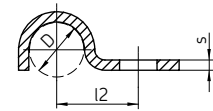
Lock washer

Order No.	for bolt	d1	d2	s	h	Material
650-050	M5	5.3	9	0.6	0.9	spring steel
650-060	M6	6.4	10	0.7	0.9	
650-080	M8	8.4	13	0.8	1.2	
650-100	M10	10.5	16	1	1.5	
650-120	M12	13	18	1.1	1.5	
650-140	M14	15	22	1.2	1.8	
650-160	M16	17	24	1.3	1.9	
650-180	M18	19	27	1.5	2.2	
650-200	M20	21	30	1.5	2.2	

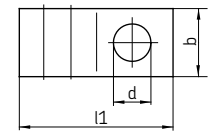
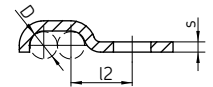


Fixing clips

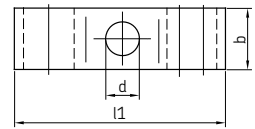
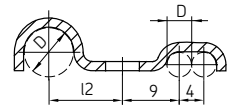
Order No.	for tube diam. ø D	b	d	l1	l2	s
602-001	2.5	10	3.5	11.25	5	1.5
604-001	4	10	5.5	18.5	9	1.5
606-010	6	10	5.5	20.5	10	1.5
608-001	8	10	5.5	23.5	12	1.5
610-001	10 or 1/8"	10	5.5	25.5	13	1.5
612-001	12	20	6.8	35	18	2



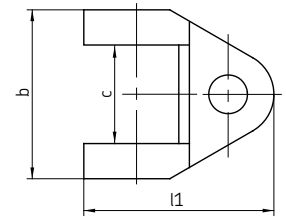
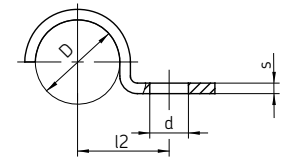
Order No.	for tube diam. ø D	for tube diam.	b	d	l1	l2	s
602-002	2.5	2	10	3.5	13.8	5	1.5
604-002	4	2	10	5.5	22.6	9	1.5
604-003	4	3	10	5.5	26.6	9	1.5



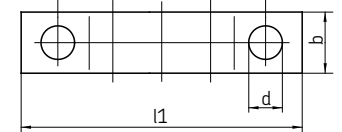
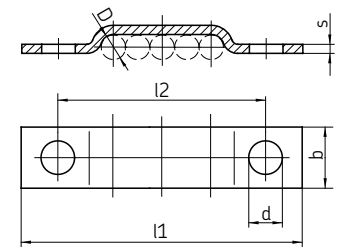
Order No.	for tube diam. ø D	b	d	l1	l2	s
608-003	8 / 4	10	5.5	34	12	1.5



Order No.	for tube diam. or socket diam. of tee ø D	b	c	d	l1	l2	s
604-004	12	24	14	5.5	27	13	1.5
606-014	14 or 1/4"	30	15	6.3	32.5	16	2
608-004	18 or 3/8"	36	20	7	40	21	2
610-004	20 or 1/2"	36	20	7	40	21	2



Order No.	for tube diam. ø D	for tube diam.	b	d	l1	l2	s	Material
604-014	4	4		5.5	42	30	1.5	
604-015	4	5		5.5	46	34	1.5	
604-016	4	6		5.5	50	38	1.5	
604-018	4	8		5.5	58	46	1.5	
DIN 72573-2x6-ST	6	2	10	4.8	39	27	1	
DIN 72573-3x6-ST	6	3	10	4.8	45	33	1	
DIN 72573-4x6-ST	6	4	10	4.8	51	39	1	
DIN 72573-5x6-ST	6	5	10	4.8	57	45	1	
DIN 72573-6x6-ST	6	6	10	4.8	64	52	1	mild steel
DIN 72573-2x8-ST	8	2	10	4.8	43	31	1	
DIN 72573-3x8-ST	8	3	10	4.8	51	39	1	
DIN 72573-4x8-ST	8	4	10	4.8	59	47	1	
DIN 72573-5x8-ST	8	5	10	4.8	68	56	1	
DIN 72573-6x8-ST	8	6	10	4.8	76	64	1	
DIN 72573-2x10-ST	10	2	10	4.8	45	33	1	
DIN 72573-3x10-ST	10	3	10	4.8	55	43	1	
DIN 72573-4x10-ST	10	4	10	4.8	67	55	1	
DIN 72573-5x10-ST	10	5	10	4.8	77	65	1	



Steel tubing

Order No.	$\varnothing da$ ± 0.05	s ± 0.03	Minimum bending radius r bent with mandrel	Minimum bending radius r bent with grooved disk	Design pressure [bar]	Burst pressure [bar]
WV-R02.5x0.5 VERKU	2.5	0.5	5	–	580	1410
WV-R04x0.7 VERZI	4	0.7	8	7	500	1220
WV-R06x0.7 VERZI	6	0.7	25	12	320	850
WV-R06x1 VERZI	6	1	25	12	500	1250
WV-R08x0.7 VERZI	8	0.7	46	19	230	675
WV-R08x1 VERZI	8	1	46	19	340	840
WV-R010x1 VERZI	10 ^{*)}	1	76	27	270	660

^{*)} $\varnothing da \pm 0.07$ VERKU = copper-plated
VERZI = 25 μm galvanization yellow passivated. Length delivered 5 m. Stainless steel tubing on request.

EN10305-4, Cr6 free

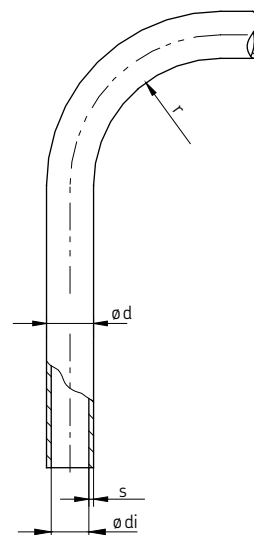
Order No.	$\varnothing da$ ± 0.08	s	Minimum bending radius r with manual bending device ¹⁾	Minimum bending radius r with electrical bending device
982-120-040	4	1	–	10
982-120-060	6	1	16	9
982-120-080	8	1	22	12
982-120-100	10	1	27	15
982-120-120	12	1.5	29	18
982-120-150	15	1.5	–	22.5
982-120-180	18	1.5	–	36

Seamless cold-drawn tube for hydraulic and delivery lines according to EN10305-4

¹⁾ Tube bending device, order No. 248-803.20

Material properties:

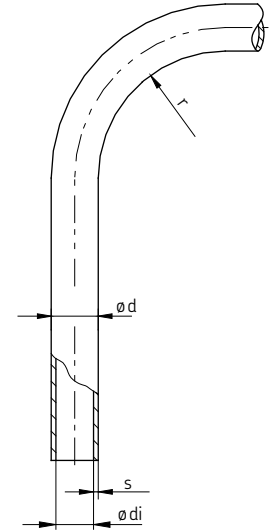
- galvanic zinc coating (blue-white) on the outside
- thick-film passivated
- deposit thickness 9-12 μm
- Cr6 free



Plastic tubing

WVN715, without plasticizer WVN716, flexible (containing plasticizer)

Order No. ¹⁾	ø da	s	ø di ^{+0.15 -0.05}	Smallest permissible bending radius r bent		Perm. operating press. ³⁾ [bar]	Burst press. [bar]
				freehand	with fixture ²⁾		
WVN715-R02.5x0.5	2.5	0.5	1.5	25	9	66	198
WVN715-R04x0.85	4	0.85	2.3	38	14	72	216
WVN715-R06x1	6 ±0.1	1	4	63	21	53	159
WVN715-R06x1.25	6	1.25	3.5	63	21	70	210
WVN715-R08x1.25	8	1.25	5.5	76	28	49	147
WVN715-R010x1.5	10	1.5	7	89	35	47	141
WVN715-R012x1	12 ±0.15	1	10	110	45	24	72
WVN715-R012x1.5	12	1.5	9	110	45	38	114
WVN716-R04x0.85	4	0.85	2.3	38	14	36	108
WVN716-R06x1.25	6 ±0.1	1.25	3.5	63	21	35	105
WVN716-R08x1.25	8	1.25	5.5	80	30	25	75



Color: natural colors, black lettering. Tubing available in green, red, black or brown on request.
 Tubing with other dimensions or also filled with NLGI grade 2 grease or fluid grease on request.

Important note: For screwed tubing joints only use unions with reinforcing sockets!

Material WVN715: optionally polyamide 11 (PA 11) without plasticizer or polyamide 12 (PA 12) without plasticizer to DIN 73378.
 PA 12 H: polyamide 12 without plasticizer, stabilized against thermal ageing.
 (black tubing) PA 12 HL: polyamide 12 without plasticizer, stabilized against lightrelated and thermal ageing.

Material WVN716: optionally polyamide 11 (PA 11) without plasticizer or polyamide 12 (PA 12) without plasticizer to DIN 73378.
 PA 12 PH: polyamide 12 with plasticizer, stabilized against thermal ageing.
 (black tubing) PA 12 PHL: polyamide 12 with plasticizer, stabilized against lightrelated and thermal ageing.

Material properties:

- very good resistance and insensitivity to oils, greases, lubricants, all fuels, chlorinefree detergents and solvents.
- At room temperature good resistance to diluted mineral acids, organic acids, bases and saline solutions ⁴⁾
- inappropriate for concentrated mineral acids, concentrated acetic acid, phenols, cresols, chlorinated hydrocarbons, chlorine, acetones and ketones.

Permissible operating temperature: approx. -60 °C to +80 °C

¹⁾ The desired length. e.g. 50 meters, has to be added to the order No. **Order example: WVN716R06x1.25x50M**

²⁾ These minimal radii can be produced with the help of appropriate bending devices.
 The tubing has to be heated to 150° for this purpose. The maximum duration of heating is 20 seconds.

³⁾ The operating pressures were determined by using DIN 73 378 acc. to the formula $P = \frac{20 \cdot \sigma_V \cdot s \text{ (rated)}}{dm}$.

s = rated wall thickness [mm];
 dm = da - s;
 σ_V = reference tension N/mm² at 23 °C

At higher temperatures the pressure drops in keeping with the pressure efficiency as per DIN 73378.

Temperature ra [°C]	Pressure efficiency [%]
up to 30	83
up to 40	72
up to 50	64
up to 60	57
up to 70	52
up to 80	47

⁴⁾ In borderline cases it is advisable to contact SKF Lubrication Systems.

Hoses

for main lines, operating pressure: 45 bars (for short time only)

Standard		Metalbraided				Tube diam. d1	Thread d3	Rubber d2	Metal-braided d4	Max. increase in volume at = 80 bars [cm ³ /m]
Order No. ²⁾	With tapered sleeve and socket union on both ends Order No.	Order No. ²⁾	With tapered sleeve and socket union on both ends Order No.	Order No.						
714-...(-VS)	714-...-K	714-...-M(-VS)	714-...-MK	4	M8×1	11	12 ±0.5	2.5		
716-...(-VS)	716-...-K	716-...-M(-VS)	716-...-MK	6	M10×1	13	14 ±0.8	3.6		
718-...(-VS)	718-...-K	718-...-M(-VS)	718-...-MK	8	M14×1.5	15	16 ±0.8	4.4		

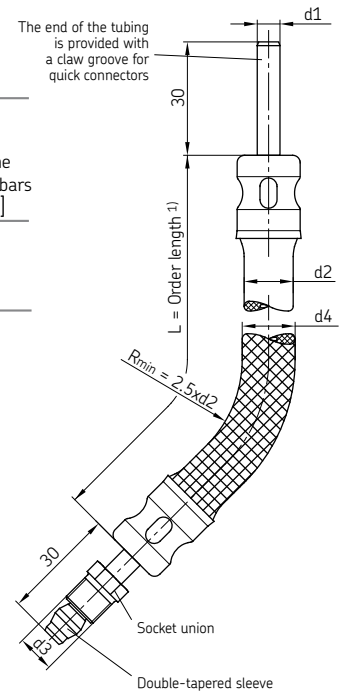
Material: Hose: mineraloilresistant CR rubber inside; 2 layers of braided rayon; outside rubber conditionally oilresistant, resistant to light cracks and ozone.
Metal braid: galvanized steel wire; tube ends: galvanized steel tubing.

for secondary lines, operating pressure 15 bars (for short time only)

Standard		Tube diam. d1	Thread d3	Rubber d2	
Order No.	With claw groove for quick connectors Order No.				With tapered sleeve and socket union on both ends Order No.
734-... ³⁾	734-...-VS ³⁾	734-...-K ³⁾	4	M8×1	8.8

Material: Hose: oilproof rubber inside and outside with a layer of braided rayon
Tube ends: steel tubing
The ends of the tubing are bonded to the hose and cannot be detached.

Permissible operating temperature: -30 °C to +70 °C



¹⁾ Order length in mm; other lengths available.

Standardized lengths ±5 mm with ø 4 tubing: 180, 220, 260, 300, 380, 420, 450, 500, 580
with ø 6 tubing: 220, 300, 340, 380, 420, 500, 580
with ø 8 tubing: 340, 450, 580

Order examples:

Standard with socket unions and tapered sleeves, ø4 tubing, 300 mm lang, Best.-Nr.: 714-300-K
Standard, ø4 tubing with claw groove for quick connectors, 300 mm long, order No.: 714-300-VS
Metal-braided, ø6 tubing, 420 mm lng, order No.: 716-420-M
Metal-braided, ø8 tubing, with claw groove for quick connectors, 450 mm long, order No.: 718-450-M-VS

²⁾ For Version with claw groove on ends of tubing for quick connectors, order No.: ...-VS

³⁾ **Important note:** To avoid damages do not use these hoses as main lines but only to connect distributors to lube points.

Hoses suitable for self-installation, operating pressure 45 bars

Tube diam. d1	① Male body Order No.	WAF	② Shell Order No.	WAF	③ Hose Order No. ¹⁾	Hose diam. d2	Increase in volume at = 40 bars [cm ³ /m]
4	406-704-001(-VS) ²⁾	8	406-804-001	14	WVN701-4	11	1
6	406-706-001(-VS) ²⁾	8	406-806-001	17	WVN701-6	13	1.4
8	406-708-001(-VS) ²⁾	10	406-808-001	19	WVN701-8	15	1.4

¹⁾ Please quote length when ordering. Max. length available 20 m.

²⁾ For Version with claw groove on ends of tubing for quick connectors, order No.: ...-VS

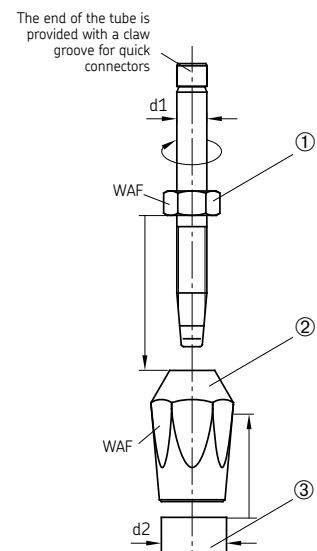
Material: Hose: Perbunan, resistant to mineral oils, with two layers of braided rayon
Male body: steel, galvanized
Shell: brass

Permissible operating temperature: -40 °C to +70 °C

Installation instructions

- Apply thin film of oil to thread and inside of hose of parts ① ② ③ to be connected.
- Clamp shell ② in vise and screw in hose ③ by turning it to the left up to the stop.

c) **Important note:** To avoid damages screw in male body ① with a wrench up to the stop. Do not tighten!



High pressure hoses, operating pressure: 280 – 330 bars

Order No.	Tube diam.	Hose diam.	Length ¹⁾		Permissible operating pressure [bar]	Burst pressure [bar]
	∅ d1	∅ d2	l1	l2		
SLH6-180	6	10	180	22	210	840
SLH8-180	8	11.8	180	30	210	830
SLH10-180	10	14	180	30	175	690

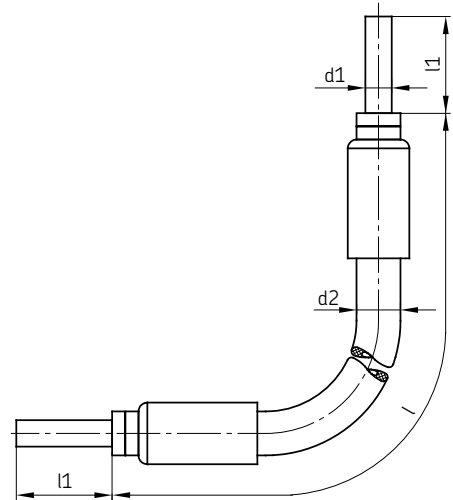
¹⁾ Order length in mm; other lengths available.

Order example: highpressure hose SLH8, 600 mm long, order No.: SLH8-600

Material: Inner liner: PA 11/12 or PE-E
 Reinforcement: 1 braided layer of synthetic fibre with high tensile strength
 Outer cover: PA 11/12

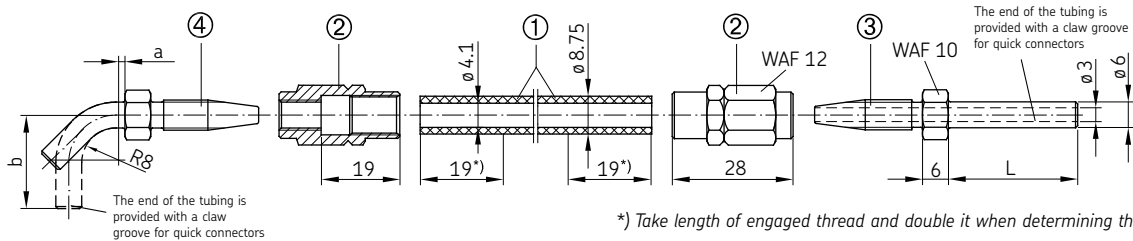
Resistant to mineral oils.

Permissible operating temperature: -40 °C to +100 °C



High pressure hoses for self-installation, operating pressure: 325 bars / 130 bars

for main lines (connection: pump – feeder) and secondary lines (connection: feeder – lubrication point)



^{*)} Take length of engaged thread and double it when determining the length of the hose.

Designation	Order No.	L	a	b
① High press. hose, max. length supplied 50 m	982-750-091			
High press. hose, max. length supplied 50 m filled with NLGI grade 2 grease	982-750-091+AF2			
② Sleeve	853-540-010			
③ Tube stud, straight	853-370-002(-VS) ¹⁾	20		
	853-380-002(-VS) ¹⁾	30		
	853-390-002(-VS) ¹⁾	66		
④ Tube stud, 45° angle	853-380-004(-VS) ¹⁾		2	35
Tube stud, 90° angle	853-380-003(-VS) ¹⁾		13	47
	853-390-003(-VS) ¹⁾			

Technical data:

Hose: operating pressure 325 bars
 burst pressure 800 bars
 min. bending radius 35 mm

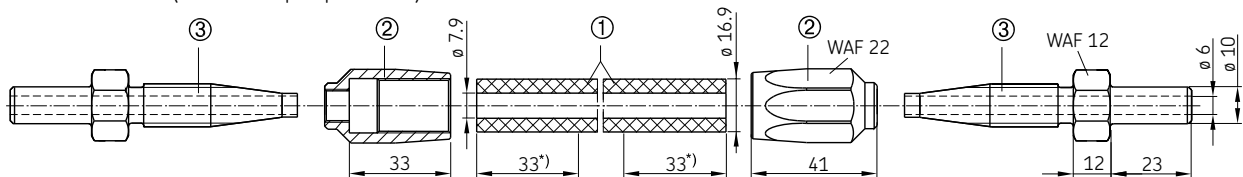
Material:

Hose:
 Inner lining: unplasticized polyester
 Inner layer: braided synthetic fibers
 Outer cover: weatherproof polyurethane
 Sleeve, tube stud: steel, galvanized

Permissible operating temperature: -30 °C to +70 °C

¹⁾ Version with claw groove on ends of tubing for quick connectors, order No.: ...-VS

for main lines (connection: pump – feeder)



^{*)} Take length of engaged thread and double it when determining the length of the hose.

Designation	Order No.
① High press. hose, max. length supplied 100 m	WVN711-10
High press. hose, max. length supplied 50 m filled with NLGI grade 2 grease	WVN711-10+AF2
② Sleeve	406-810-002
③ Tube stud	406-710-002

Technical data: Hose: operating pressure 130 bars
 burst pressure 315 bars
 min. bending radius 55 mm

Material:

Hose:
 Inner lining: Perbunan
 Inner layer: diagonally woven synthetic fibers
 Outer cover: weatherproof neoprene
 Sleeve: aluminum alloy
 Tube stud: steel, galvanized

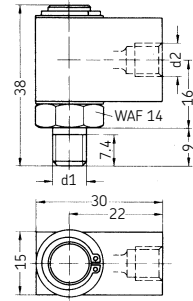
Permissible operating temperature: -40 °C to +100 °C

Rotating joints

Rotating joints connect fixed tubing with oscillating and rotating machine parts.

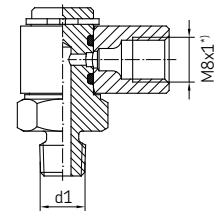
Order No.	Tube outside diam.	d1	d2 *)	Max. Speed [rpm]	Max. pressure oil [bar]	Max. pressure air [bar]
401-504-192	4	G 1/8 A	M8x1			
401-504-292	4	M8x1	M8x1	100	30	8
401-506-313	6	M10x1	M10x1			

Flow media: mineral oils, oiled compressed air



Banjo fitting, rotatable

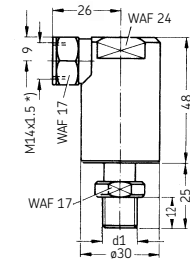
Order No.	Tube outside diam.	d1
405-549-049	4	M8x1 tap.
405-551-049	4	M10x1 tap.



Order No.	Tube outside diam.	d1	Max. speed [rpm]	Max. pressure oil [bar]	Max. pressure air [bar]
DLY930-2	8	G 1/4 A	1400	20 ¹⁾	8
DLY931		R 1/4 tap.			

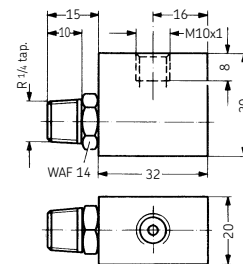
Flow media: mineral oils, oiled compressed air

¹⁾ 30 bars in singleline centralized lubrication systems for a short time.



Order No.	Tube outside diam.	Max. speed [rpm]	Max. pressure [bar]
DLY932	6	1400	5

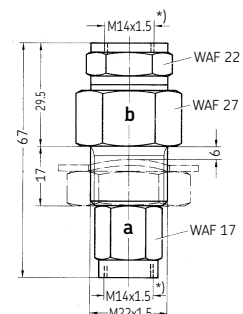
Flow medium: mineral oil



Order No.	Tube outside diam.	Max. speed [rpm]	Max. pressure [bar]
408-120	8	Part a rotating in part b	20

Flow medium: mineral oil

The rotating joint is also available with nut DIN936M22x1.5 and spring washer DIN137-B22.

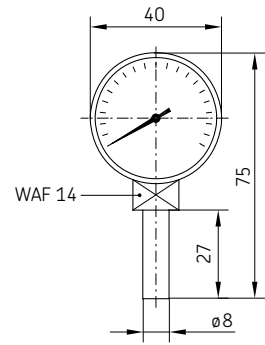


^{*)} Ports tapped for solderless tube connection

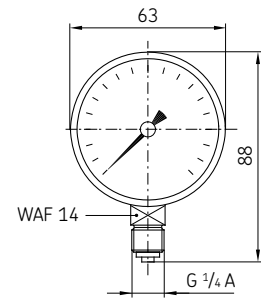
Pressure gauges

Order No.	Indication range	
248-602.25	0-10 bars	
169-102-506	0-25 bars / 0-360 psi	
248-602.20	0-40 bars	for grease
169-104 008	0-40 bars	for oil
169-106-004	0-60 bars	

Fixed by means of a double tapered sleeve and socket union (solderless tube connection) in counterbore acc. to DIN 3854/DIN 3862.



Order No.	Indication range	Adaptor Order No.	d
169-100-100	-1-0 bar		
169-101-004	0-10 bars		
248-604.00	0-25 bars		
248-602.00	0-40 bars		
248-603.00	0-60 bars	301-134	M10×1
169-106-007	0-6 Mpa		
248-601.00	0-100 bars	301-034	M14×1.5
169-116-000	0-160 bars		
169-120-000	0-250 bars		
248-605.00	0-400 bars		

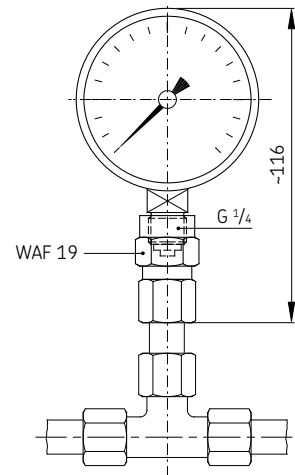


Washer, order No. 248-610.02, must be ordered separately for every pressure gauge.

Damped version with glycerine filling

Order No.	Indication range	Mounting position
248-604.10	0-25 bars	
169-106-003	0-60 bars / 0-800 psi	
248-603.10	0-60 bars	
169-106-009	0-6 Mpa	vertically
248-601.10	0-100 bars / 0-1450 psi	
169-110-009	0-10 Mpa	
169-125-000	0-250 bars / 0-3600 psi	
169-140-001	0-400 bars	

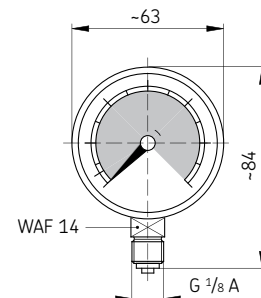
Washer, order No. 248-610.02, must be ordered separately for every pressure gauge.



Version with visualization

Order No.	Indication range	Mounting position
169-101-607	0-16 bars / 0-1.6 MPa	
169-104-011	0-40 bars / 0-4 MPa	
169-106-011	0-60 bars / 0-6 MPa	vertically
169-110-010	0-100 bars / 0-10 MPa	

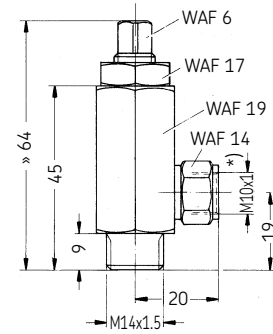
Washer, order No. 248-610.02, must be ordered separately for every pressure gauge.



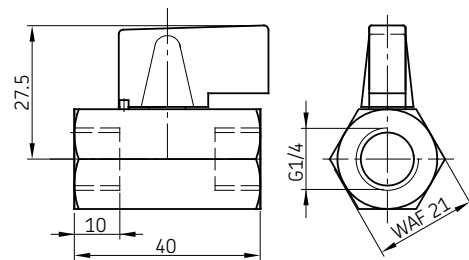
Shut-off valves

Order No.	Max. pressure [bar]	Max. temperature [°C]	Spindleway
202-085-5	60	80	max. 3 revs.

Direction of flow optional



Order No.	Max. pressure [bar]	Max. temperature [°C]
161-600-036	16	90



^{*)} Ports tapped for solderless tube connection

Quick-disconnect couplings

Coupling, complete

Order No.	Tube diam.	d1 *)	l2	Flow direction
207-168-2	6	M10x1	62	optional
207-188-2	8	M14x1.5	66,5	

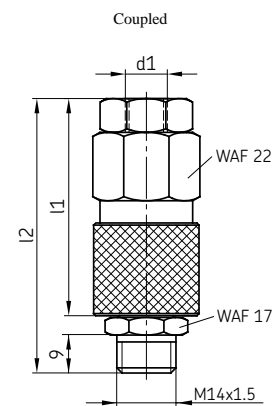
Outer coupling member

Order No.	Tube diam.	l1
207-168.U7	6	48.5
207-188.U11	8	53

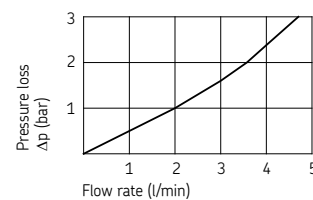
Inner coupling member

Order No.	207-168.U2
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Both coupling members are shut off when disconnected!



Pressure loss as a function of the flow rate based on an operating oil viscosity of 140 mm²/s



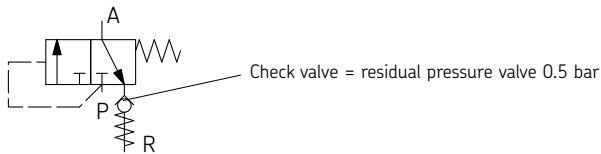
^{*)} Ports tapped for solderless tube connection

Relief valves

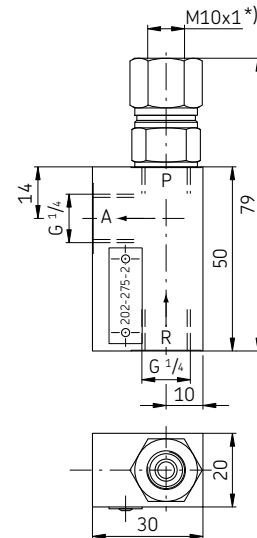
These valves are installed in distributor systems fitted with a pump without pressure relief equipment, mainly in the main line downstream from the pump.

With longer main lines and high viscosity oils, the pressure relief time, which influences the reversing of the distributors, can become too long. The installation of the second relief valve at a suitable position in the main line, e.g. at half the main line length, may remedy this problem..

Order No. 202-275-2



A = Outlet
P = Inlet
R = Return

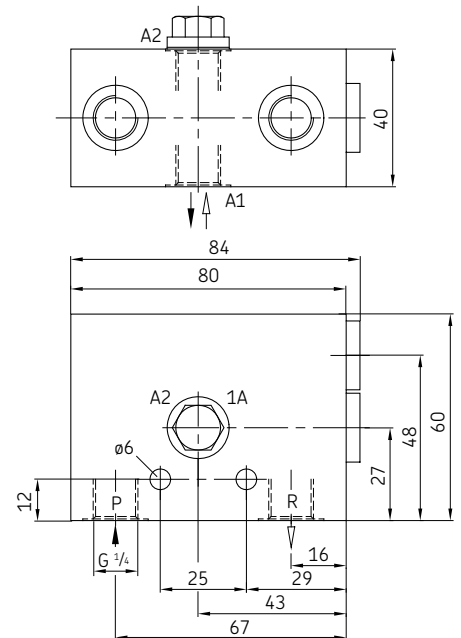
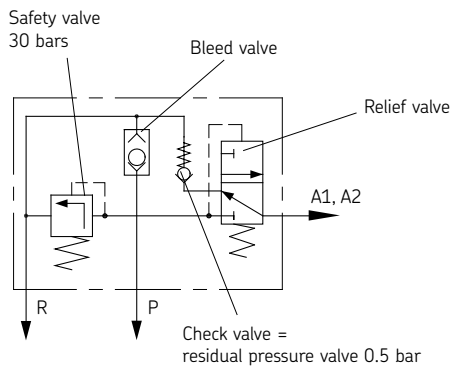
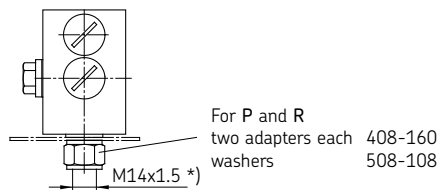


Relief valve with bleed valve and safety valve

Order No. 202-175-30

Adaptors *) for tube diam. 6: Order No. 406-054
for tube diam. 8: Order No. 301-020
for tube diam. 10: Order No. 410-163

Fitted to reservoir



*) Ports tapped for solderless tube connection

Safety valves, adjustable (poppet valve)

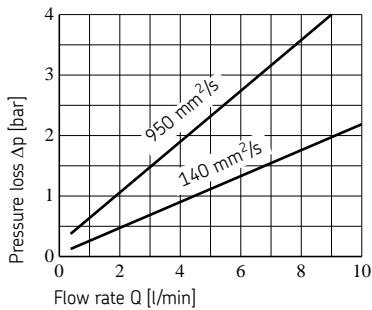
Hydraulic characteristics

Order No.	Rated flow rate [l/min]	Adjustable pres. range [bar]	Operating pres. max. [bar]	Oil temperature max.	Viscosity range mm ² /s	Seal
WVN200-10E6		1 to 6	40			NBR
WVN200-10E12		3 to 12	40			NBR
WVN200-10E12-S8	see	3 to 12	40			FKM (FPM)
WVN200-10E25	pressure-	4 to 25	40	80 °C	20 to 1000	NBR
WVN200-10E25-S8	loss	4 to 25	40			FKM (FPM)
WVN200-10E35	parameter	4 to 35	40			NBR
WVN200-10E60		12 to 60	70			NBR
WVN200-10E60-S8		12 to 60	70			FKM (FPM)

General characteristics

Design: poppet valve with hydraulic cushioning directly controlled
 Lubricant: oil
 Connecting thread: G 1/4
 Mounting position: optional

Pressure loss parameter



With increasing flow rate, the pressure upstream from the valve will also rise in accordance with the curves.

Adaptors *)

for valves **WVN200-10E6 to WVN200-10E35**

for tube diam. 8: Order No. 301-020
 for tube diam. 10: Order No. 410-163
 for tube diam. 12: Order No. 412-163

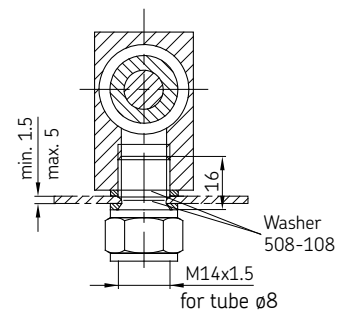
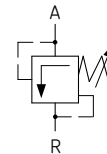
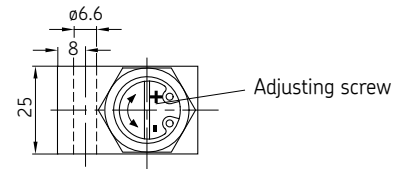
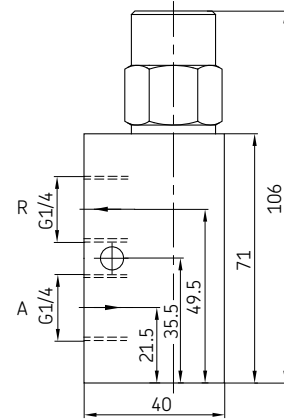
Washer: Order No. 508-108

for valve **WVN200-10E60**

for tube diam. 8: Order No. 408-403W
 for tube diam. 10: Order No. 410-403W

Washer: Order No. 508-108

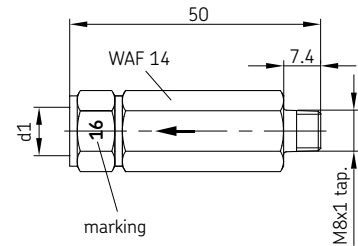
If installed on a reservoir, use **two special adaptors 408-160** with long tube ends.



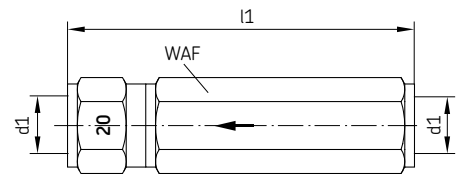
*) Ports tapped for solderless tube connection

Safety valves, (ball valves) for flow rates from 0.5 to 2 l/min

Order No.	Tube diam.	Opening pressure [bar]	Marking	d1 ^{*)}
WVN200-4A0.4	4	0.4	04	M8×1
WVN200-4A5		5	5	
WVN200-4A8		8	8	
WVN200-4A12		12	12	
WVN200-4A16		16	16	
WVN200-4A25	25	25	25	
WVN200-4A0.4-S1	6	0.4	04	M10×1

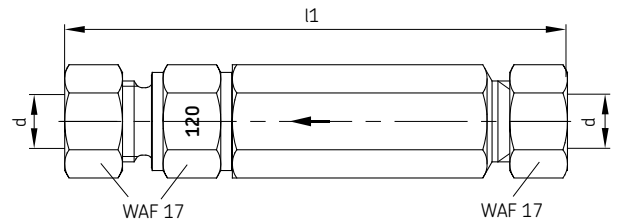


Order No.	Tube diam.	Opening pressure [bar]	Marking	d1 ^{*)}	l1	WAF
WVN200-6B0.5	6	0.5	05	M10×1	61	14
WVN200-6B3		3	3			
WVN200-6B8		8	8			
WVN200-6B12		12	12			
WVN200-6B16		16	16			
WVN200-6B20		20	20			
WVN200-6B40	40	40	40			
WVN200-8B0	8	0.04	0	M14×1.5	71	17
WVN200-8B3		3	3			
WVN200-8B5		5	5			
WVN200-8B12		12	12			
WVN200-8B16		16	16			
WVN200-8B20		20	20			
WVN200-8B32	32	32	32			
WVN200-10B0	10	0.04	0	M16×1.5	80	19
WVN200-10B0.5		0.5	05			
WVN200-10B1		12	12			
WVN200-10B32		32	32			
161-212-054 ¹⁾	8	20	20	M14×1.5	84.5	17



¹⁾ This valve is designed as a plunger valve.
Because of this design it can also be used for regulating tasks,
whereas the ball valves should be used as safety valves.

Order No.	Tube diam. d	Opening pressure [bar]	Marking	l1
WVN200-8D50	8	50	50	84
WVN200-8D75		75	75	
WVN200-8D120		120	120	
WVN200-8D220		220	220	
WVN200-10D120-S1	10	120	120	87
WVN200-10D220-S1		220	220	



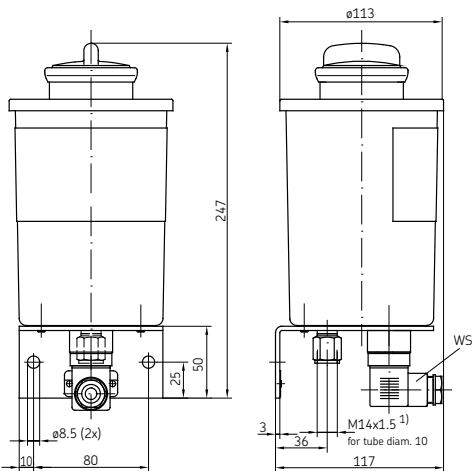
Cutting sleeve screw unions according to DIN 2353

^{*)} Ports tapped for solderless tube connection

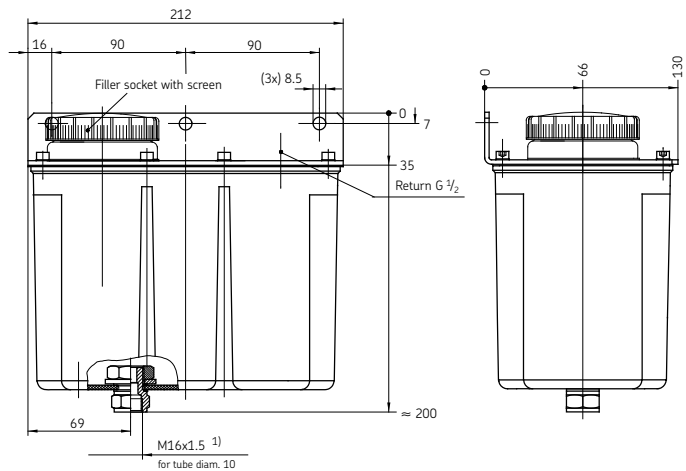
Oil reservoirs – plastic

Plastic reservoirs

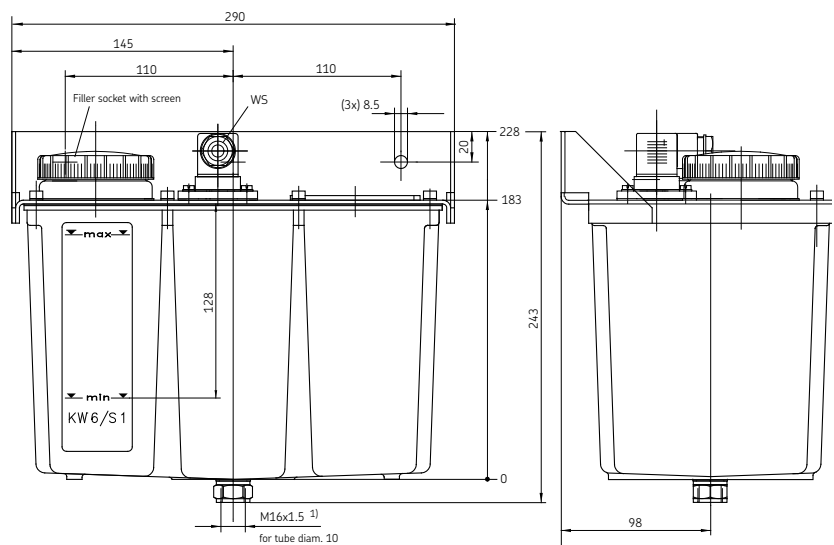
Order No.	Reservoir capacity [liters]	Level indicator WS	Type of contact	Seal material
K1 KW1 KW1-S2	1	– for min. filling level for min. filling level	– changeover NC	NBR
K3-S2 KW3-S1 KW3-S3 KW3-S5	3	– for min. filling level for min. and max. filling level for min. filling level with advance warning	– changeover 1 NC, 1 NO 2 NCs	NBR
K6-S5 KW6-S1 KW6-S2 KW6-S81 KW6-V57	6	– for min. filling level for min. filling level with advance warning for min. filling level for min. filling level with advance warning	– changeover 2 NCs changeover 2 NCs	NBR NBR NBR FKM (FPM) NBR



1-liter reservoir (shown: KW1)



3-liter reservoir (shown: K3-S2)



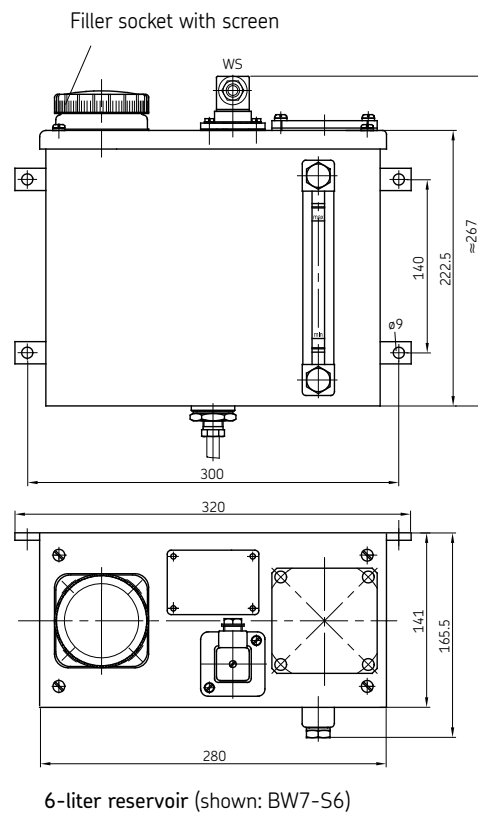
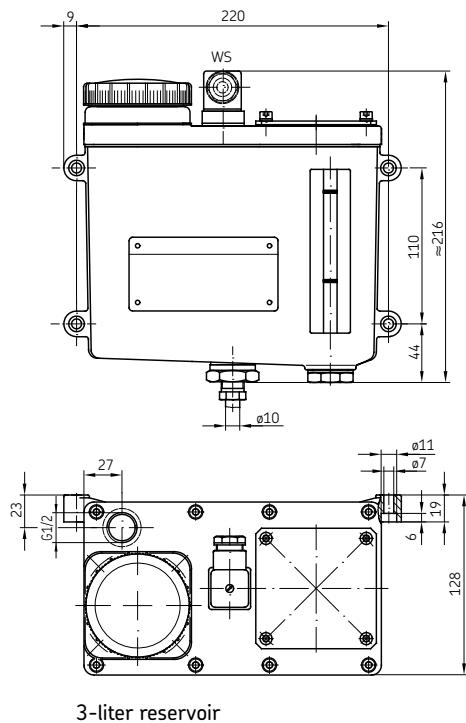
6-liter reservoir (shown: KW6-S1)

¹⁾ Ports tapped for solderless tube connection to DIN 2367

Oil reservoirs – metal

Metal reservoirs

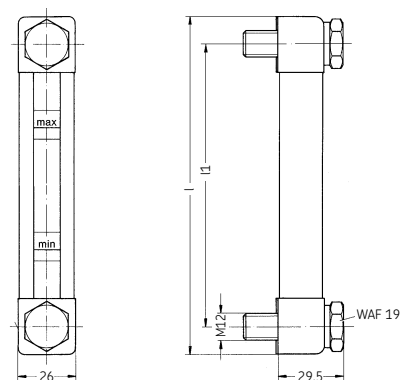
Order No.	Reservoir capacity [liters]	Level indicator WS	Type of contact	Seal material
B3-S1	3	–	–	NBR
BW3-S9		for min. filling level with advance warning	2 NOs	NBR
BW3-S81		for min. filling level	changeover	FKM (FPM)
162-210-005		for min. filling level	changeover	NBR
B7	6	–	–	NBR
BW7-S6		for min. and max. filling level	2 NCs	NBR
BW7-S7		for min. filling level with advance warning	2 NCs	NBR
BW7-S8		for min. filling level	changeover	FKM (FPM)
BW7-S11		for min. filling level with advance warning	1 NO, 1 NC	NBR
BW7-S12		for min. filling level with advance warning	1 NO, 1 NC	NBR
162-310-005	for min. filling level	changeover	NBR	



Oil level gauges for metal reservoir

Order No.	Reservoir capacity [liters]	l	l1
995-003-044	6	152	127
995-003-040	6	190	165
995-003-041	15 and 30	215	190
995-003-042	50	279	254
995-003-043	100	305	280

Type: NBR
FKM (FPM) on request



Filler coupling for oil and fluid grease

Coupling plug

Order No.	Fig.	øA	L	Respective dust cover Order No.	Respective coupling socket Order No.
995-001-501	1	G ¹ / ₄	57.5	995-001-503	995-002-073
995-001-502	1	G ¹ / ₂	82	995-001-504	995-001-950
995-000-705	2	G ¹ / ₄	-	-	995-001-500
995-001-260	3	G ¹ / ₂	83	-	-

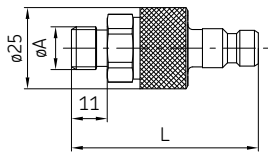


Fig. 1

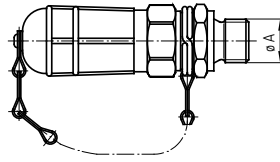


Fig. 2

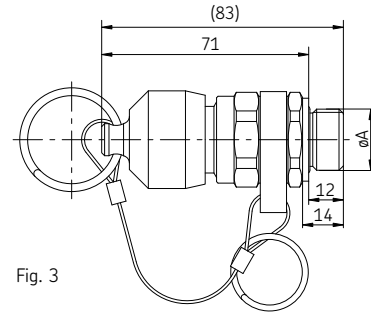


Fig. 3

Topping-up pumps

Order No.	Drum (kg)	Medium	Operating	Trolley	Fig.
169-000-004	15				
169-000-012	10				
169-000-016	20	NLGI 1,2	manually operated	no	-
169-000-056	25				
169-000-082	25 / 50	00/000	manually operated	yes	
169-000-084	25	00/000	manually operated	yes	1
169-000-042	25	NLGI 1,2	manually operated	yes	
169-000-054	50				
169-000-342	25	NLGI 1,2	manually operated	no	
169-000-018	25	00 to 2	pneum. operated	yes	-
169-000-260	300 ml	000	manually operated	no	2

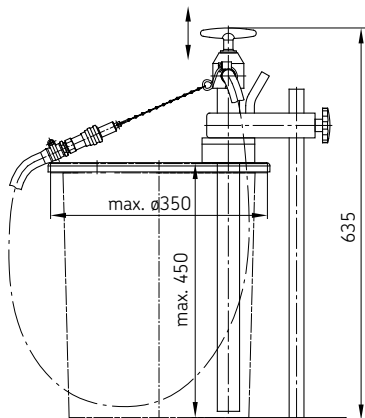


Fig. 1

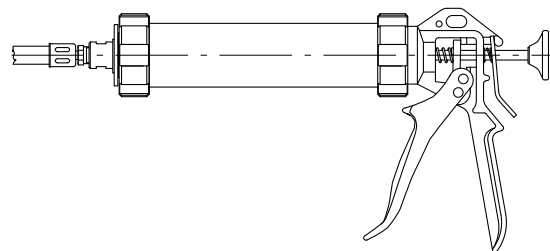


Fig. 2

Order No. 1-0103-EN

Subject to change without notice! (07/2009)

Important product usage information

All products from SKF may be used only for their intended purpose as described in this brochure and in any instructions. If operating instructions are supplied with the products, they must be read and followed.

Not all lubricants are suitable for use in centralized lubrication systems. SKF does offer an inspection service to test customer supplied lubricant to determine if it can be used in a centralized system. SKF lubrication systems or their components are not approved for use with gases, liquefied gases, pressurized gases in solution and fluids with a vapor pressure exceeding normal atmospheric pressure (1013 mbars) by more than 0.5 bar at their maximum permissible temperature.

Hazardous materials of any kind, especially the materials classified as hazardous by European Community Directive EC 67/548/EEC, Article 2, Par. 2, may only be used to fill SKF centralized lubrication systems and components and delivered and/or distributed with the same after consulting with and receiving written approval from SKF.

Leaflet

1-0103-1-EN Quick connectors

1-9201-EN Transport of Lubricants in Centralized Lubrication Systems

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