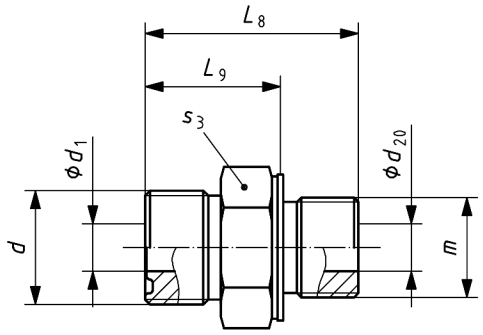
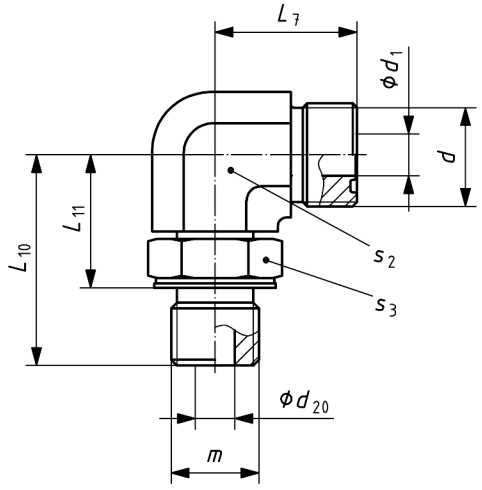
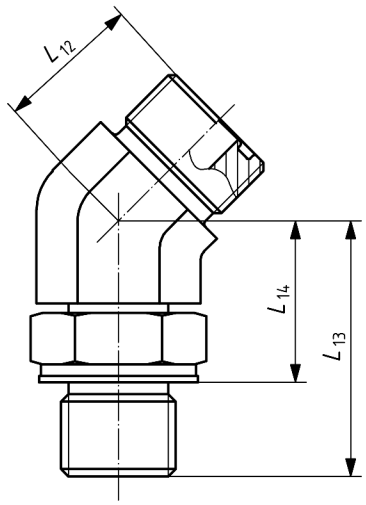


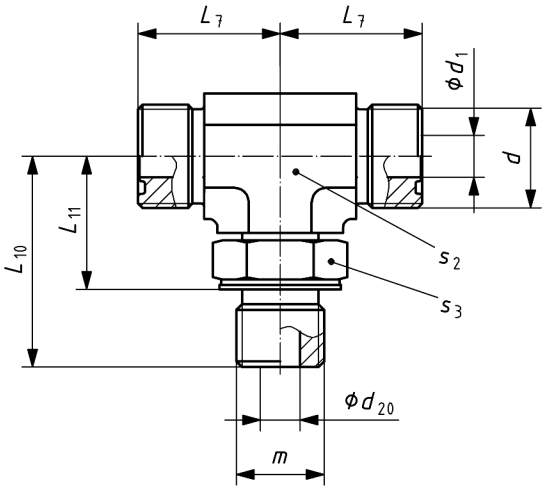
a) Stud (straight) (SDS)



b) 90° adjustable stud elbow (SDE)



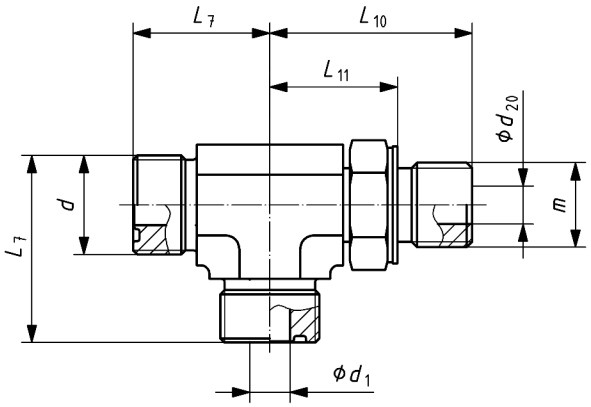
c) 45° adjustable stud elbow (SDE45)



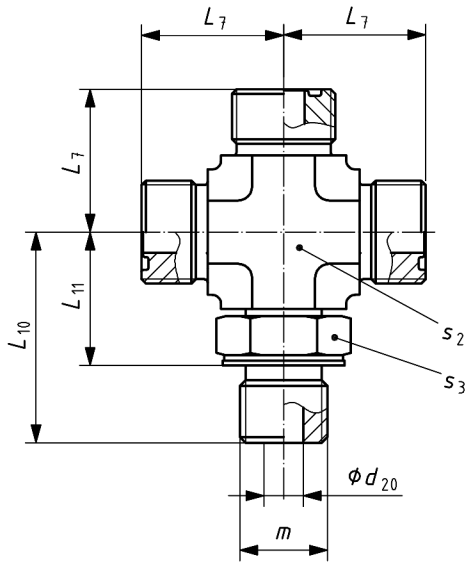
d) Adjustable stud branch tee (SDBT)

For details not shown here, see Figure 2 and Table 6.

Figure 10 — Stud connectors with ISO 6149-2 stud ends



e) Adjustable stud run tee (SDRT)



f) Adjustable stud cross (SDK)

Figure 10 (*continued*)

Table 14 — Dimensions of stud connectors with ISO 6149-2 stud ends

Dimensions in millimetres

Ordering size code [a]	**Tube outside diameter** [b]	d **Thread** [c]	m ISO 6149-2 stud end thread	d_1 [d] ref.	d_{20} [d, e] ref.	L_7 ± 1	L_8 ± 0,5	L_9 ref.	L_{10} ± 1	L_{11} ref.	L_{12} ± 1	L_{13} ± 1	L_{14} ref.	s_2 Forged connector min.	s_2 Connector machined from barstock max.	s_3
6 × M12	6	9/16-18 UNF	M12 × 1,5	4,5	4	21,5	28,5	17,5	33	22	16	30	19	14	17	17
8 × M14	8	5/8-18 UNF	M14 × 1,5	5,5	6	23,5	29,5	18,5	35,5	24,5	17,5	31,5	20,5	17	22	19
10 × M16	10	11/16-16 UN	M16 × 1,5	6,5	7	25	33,5	21	37,5	25	19	33,5	21	17	27	22
12 × M18	12	13/16-16 UN	M18 × 1,5	9,5	9	28	38	24	41	27	20,5	37	23	19	30	24
16 × M22	16	1-14 UNS	M22 × 1,5	12,5	12	33,5	42	27	49	34	23,5	44	29	24	36	27
20 × M27	20	1 3/16-12 UN	M27 × 2	15,5	15	37,5	48,5	30	55,5	37	26	50,5	32	27	41	32
22 × M30 [f]	22	1 5/16-12 UN	M30 × 2[f]	18	17	41,5	50	31,5	59,5	41	30	52,5	34	36	46	36
25 × M33	25	1 7/16-12 UN	M33 × 2	20,5	20	41,5	52	33,5	59,5	41	30	52,5	34	36	46	41
30 × M42	30	1 11/16-12 UN	M42 × 2	26	26	44,5	54,5	35,5	63	44	32	54	35	41	55	50
38 × M48	38	2-12 UN	M48 × 2	32	32	49	57	35,5	71,5	50	37	56,5	35	50	60	55

[a] Code given is for straights and elbows. For tees, add the third size in accordance with 6.6. For example, a size 6 SDRT with equal size ends will have a size code of 6 × M12 × 6.

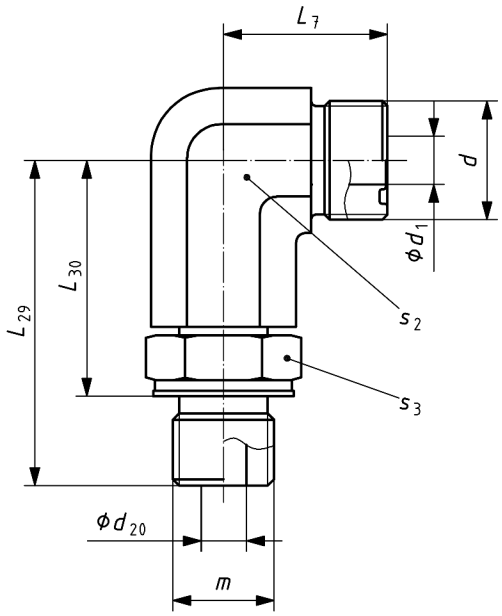
[b] See Table 1 for corresponding inch tube sizes.

[c] In accordance with ISO 68-2 and ISO 5864:1993, Class 2A, and Annex A, except for 1-14 UNS. See Annex A for 1-14 UNS thread dimensions.

[d] For SDS, the smaller of d_1 or d_{20} may go all the way through the connector, or the connector may have a transition area approximately halfway through the hex.

[e] For tolerances, see ISO 6149-2:—, dimension d_3.

[f] M30 × 2 port and stud end will be added to the next editions of ISO 6149-1 and ISO 6149-2.



Stud end is in accordance with ISO 6149-2.

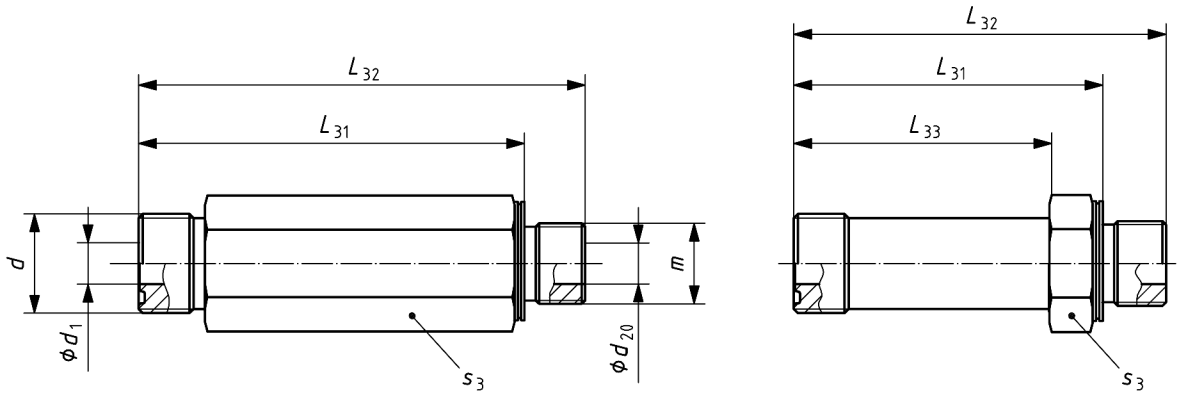
Figure 11 — Long drop elbow stud connector (SDEL) with ISO 6149-2 stud ends

Table 15 — Dimensions of long drop elbow stud connectors with ISO 6149-2 stud ends

Dimensions in millimetres

Ordering size code	**Tube outside diameter**	d **Thread**	m ISO 6149-2 stud end thread	d_1 ref.	d_{20} [a] ref.	L_7 ± 1	L_{29} ± 1	L_{30} ref.	s_2 Forged connector min.	s_2 Connector machined from barstock max.	s_3
6 × M12	6	9/16-18 UNF	M12 × 1,5	4,5	4	21,5	56,5	45,5	14	17	17
8 × M14	8	5/8-18 UNF	M14 × 1,5	5,5	6	23,5	56,5	45,5	17	22	19
10 × M16	10	11/16-16 UN	M16 × 1,5	6,5	7	25	66,5	54	17	27	22
12 × M18	12	13/16-16 UN	M18 × 1,5	9,5	9	28	75	61	19	30	24
16 × M22	16	1-14 UNS	M22 × 1,5	12	12	33,5	88	73	24	36	27
20 × M27	20	1 3/16-12 UN	M27 × 2	15,5	15	37,5	100,5	82,5	27	41	32
22 × M30	22	1 5/16-12 UN	M30 × 2	18	17	41,5	108	89,5	36	46	36
25 × M33	25	1 7/16-12 UN	M33 × 2	20,5	20	41,5	114,5	96	36	46	41
30 × M42	30	1 11/16-12 UN	M42 × 2	26	26	44,5	126,5	107,5	41	55	50
38 × M42	38	2-12 UN	M48 × 2	32	32	49	142	120,5	50	60	55

[a] For tolerances, see ISO 6149-2:—, dimension d_3.



Stud end in accordance with ISO 6149-2.

Figure 12 — Long stud connector (SDSL) with ISO 6149-2 stud ends

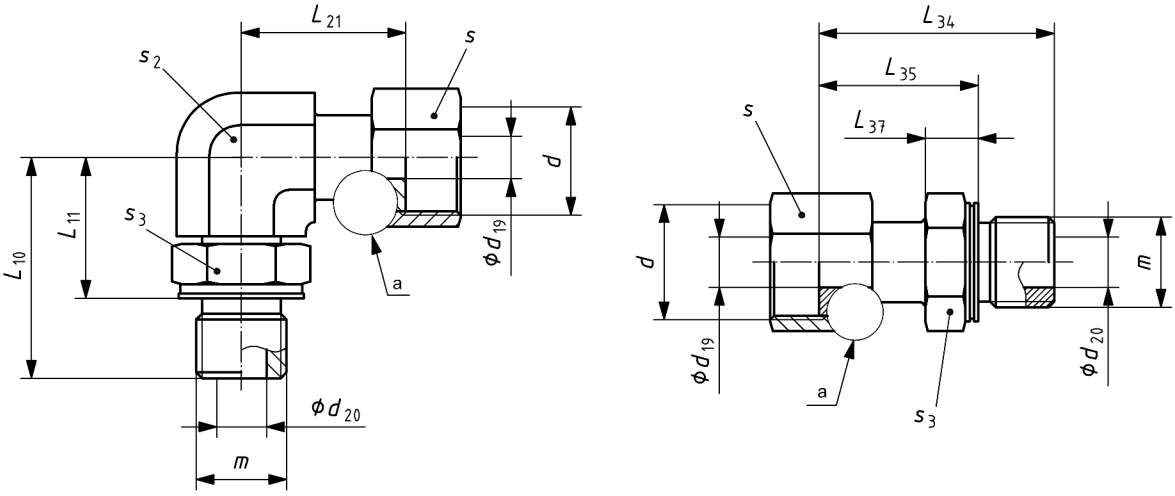
Table 16 — Dimensions for long stud connectors with ISO 6149-2 stud ends

Dimensions in millimetres

Ordering size code	Tube outside diameter	d Thread	m ISO 6149-2 stud end thread	d_1 [a] ref.	d_{20} [b] ref.	L_{31} ref.	L_{32} ± 0,5	L_{33} ± 0,5	s_3
6 × M12	6	9/16-18 UNF	M12 × 1,5	4,5	4	41,5	52,5	34	17
8 × M14	8	5/8-18 UNF	M14 × 1,5	5,5	6	41,5	52,5	33	19
10 × M16	10	11/16-16 UN	M16 × 1,5	6,5	7	45,5	58	35,5	22
12 × M18	12	13/16-16 UN	M18 × 1,5	9,5	9	54	68	43	24
16 × M22	16	1-14 UNS	M22 × 1,5	12,5	12	63,5	78,5	52	27
20 × M27	20	1 3/16-12 UN	M27 × 2	15,5	15	77	95,5	64	32
22 × M30	22	1 5/16-12 UN	M30 × 2	18	17	81,5	100	67,5	36
25 × M33	25	1 7/16-12 UN	M33 × 2	20,5	20	86,5	105	70,5	41
30 × M42	30	1 11/16-12 UN	M42 × 2	26	26	102,5	121,5	84,5	50
38 × M48	38	2-12 UN	M48 × 2	32	32	115	136,5	97	55

[a] The smaller of d_1 or d_{20} may go all the way through the connector, or the connector may have a transition area approximately halfway through the hex.

[b] For tolerances, see ISO 6149-2:—, dimension d_3.



a) Swivel 90° adjustable stud elbow (SDSWE) [b] **b) Stud straight swivel (SDSWS)** [b]

For dimensions not shown, see ISO 6149-2 or Figure 8 and Table 12.

[a] Method of attachment of swivel nut is optional with the manufacturer.

[b] Face shall be flush or exposed when nut is fully retracted.

Figure 13 — Swivel stud connectors (SDSWE and SDSWS) with ISO 6149-2 stud ends

Table 17 — Dimensions of swivel stud connectors with ISO 6149-2 stud ends

Dimensions in millimetres

Ordering size code	Tube outside diameter	d Thread	m ISO 6149-2 stud end thread	d_{19} [a] ref.	d_{20} [b] ref.	L_{10} ref.	L_{11} ref.	L_{21} ref.	L_{34} ± 0,8	L_{35} ref.	L_{37} min.	s	s_2 Forged connection min.	s_2 Connection machined from barstock max.	s_3
6 × M12	6	9/16-18 UNF	M12 × 1,5	4	4	33	22	26,5	37	26	7,5	17	14	17	17
8 × M14	8	5/8-18 UNF	M14 × 1,5	5,5	6	35,5	24,5	28	38	27	8,5	19	17	22	19
10 × M16	10	11/16-16 UN	M16 × 1,5	6,5	7	37,5	25	29	40,5	28	9	22	17	27	22
12 × M18	12	13/16-12 UN	M18 × 1,5	9	9	41	27	38	49,5	35,5	11	24	19	30	24
16 × M22	16	1-14 UNS	M22 × 1,5	11,5	12	49	34	41	53	38	11,5	30	24	36	27
20 × M27	20	1 3/16-12 UN	M27 × 1,5	14	15	55,5	37	46,5	59,5	41	12	36	27	41	32
22 × M30	22	1 5/16-12 UN	M30 × 2	18	17	59,5	41	53,5	63	44,5	14	41	36	41	36
25 × M33	25	1 7/16-12 UN	M33 × 2	20	20	59,5	41	53,5	67,5	49	16	41	36	46	41
30 × M42	30	1 11/16-12 UN	M42 × 2	26	26	63	44	58	68	49	16	50	41	55	50
38 × M48	38	2-12 UN	M48 × 2	32	32	71,5	50	61	70,5	49	16	60	50	60	55

[a] For SDSWS connectors, the smaller of d_{19} and d_{20} may go all the way through the connector, or the connector may have a transition area approximately halfway through the hex.

[b] For tolerances, see ISO 6149-2:—, dimension d_3.