



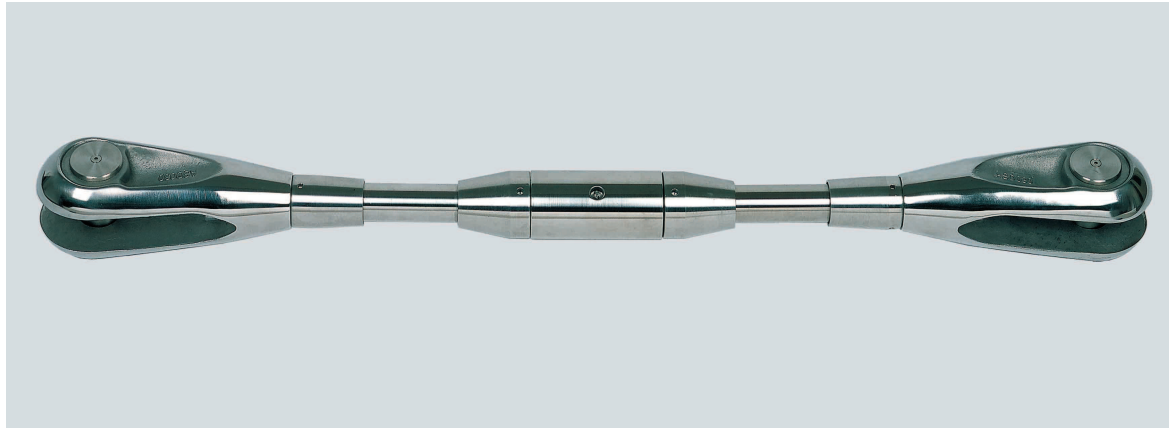
# New Dimensions

ASDO Tie-Rod System  
M12 - M160



**ANKER  
SCHROEDER**

a simple solution – for difficult tasks



## The ASDO Tie-Rod System

Whether for wind bracing, pylon stays or bowstring trusses - the new ASDO tie-rod system offers you optimum:

- Quality
- Aesthetics
- Load-bearing performance
- Functionality
- Economy

### System overview

#### Tie-rod system

**ASDO-S** (carbon steel)  
**ASDO-E** (stainless steel)

#### Compression-rod system

**ASDO-DS** (carbon steel)  
**ASDO-DE** (stainless steel)

### System advantages

- The ASDO system is the only tie-rod and compression-rod system that meets the demanding European Technical Approval CE ETA-04/0038 for nominal sizes up to M160, also in stainless-steel version
- Fork connectors of cast steel in conjunction with high-strength tie-rod enable system loads up to 9,568 kN
- Uniform fork connector design for all nominal sizes
- Identical system components and connection dimension for steel and stainless-steel version
- All components are stable at low temperatures (at least 27 J/-20°C)
- FEM-supported fork connector design with almost homogeneous tension distribution
- Pin lock flush with fork connector contour
- Single rod lengths up to 22 m possible
- Simple visual checking of minimum screw-in depth (no thread cover sleeve or inspection hole required)
- All tie-rod components are also available in hot galvanized version
- Cut or rolled thread version
- Checked pre-tensioning possible

The new  
**Shape** for  
 optimised

Anchors from ANKER-SCHROEDER have proven themselves for many decades in a broad range of structures the world over. With more than 80 years of experience in the anchoring sector and the new ASDO tie-rod system with European Technical Approval, we offer you a complete package for technically and aesthetically perfect solutions for your specific applications.

If you have questions or suggestions, talk to us! We'll be happy to develop special proposals together with you.

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 ASDO-S carbon steel tie-rod system  
 ASDO-E stainless steel tie-rod system

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 Design and installation information

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## The ASDO tie-rod system

### Fork connector

Using computer-supported FEM analysis we have succeeded in creating a new shape and weight-optimized fork connector design. An almost uniform tension distribution over the entire cross-section opens up new application possibilities with regard to material fatigue. The characteristic design in conjunction with the recessed pin lock result in an unmistakable overall concept. The recesses in the flanks on the sides enable the viewer to recognize and understand the force curve.

### Components

The components, consisting of the fork connector, pins, turnbuckle, coupler and circular plate, are designed so that they can absorb higher loads than the tie-rod. To ensure the full load-bearing capacity of the system in the area of the connection design, only connection plates of quality S355J2G3 according to EN 10025 may be used.

As an option, we offer thread cover sleeves as an accessory, these enable a harmonious transition from the tie-rod to the fork connector, turnbuckle or coupler connection components. In addition, the tie-rod thread is hidden and simultaneously locked. Thread cover sleeves for fork connectors are also supplied in a cast finish. In combination with the fork connector a smooth, uniform, appearance results.

### Corrosion protection

Optimum corrosion protection for the systems ASDO-S and ASDO-DS is offered by hot galvanizing according to ISO 1461.

For system sizes up to M 42 we supply forks, pin sets, turnbuckles, couplers and thread cover sleeves hot galvanized as standard. The threads are remachined to size following galvanizing; repairs to zinc coating are made in accordance with the applicable standards. Spanner flats on the tie-rods are pressed following hot galvanizing to prevent brittle fracture.

As an alternative, the systems can also be supplied in a sand-blasted and primed condition.

### Adjustment options

The system length for all ASDO systems is defined as the distance from pin centre to pin centre. The arrangement of opposing right/left-hand threads in the system enables exact adjustment of the length on installation. For smaller diameter systems adjustment is easily carried out by turning the tie-rod in the fork connectors, however, larger diameter systems, due to their high self-weight should always be equipped with a turnbuckle to enable adjustment when installed.

### Pretensioning

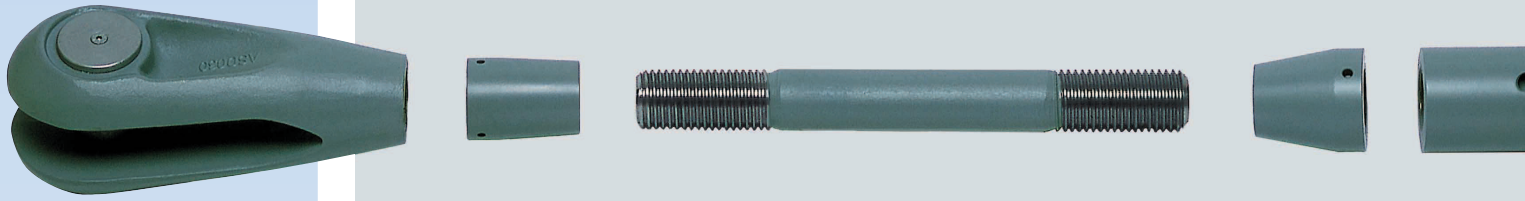
Certain designs or applications require tie-rods to be tensioned after installation to a desired load. Where this is required a turnbuckle is imperative. With it a defined load can be placed into the system by means of the SPA hydraulic tensioning device.

The device is mounted via thread cover sleeves, special nuts or free tie-rod threads. The SPA can be used for all nominal sizes and has basic models with a capacity of 20 to 200 tonnes.

Notification of planned pretensioning must be provided in advance.

# performance





**ASDO 350-S system** (carbon steel)  
**ASDO 520-S system** (carbon steel)  
**ASDO 690-S system** (carbon steel)

## The ASDO-S tie-rod system (carbon steel)

A nominal size range from M12 to M160 and a load range from 31 kN to nearly 10.000 kN characterize the **ASDO** tie-rod system. This diversity enables customtailored economical solutions in supporting structure design.

### The tie-rod

For the tie-rod, the qualities **ASDO 520-S** and **ASDO 690-S** have been newly developed. The higher strengths compared to the conventional S 460 rod result in slimmer diameters with the same load-bearing capacity.

If a large cross-section with low loads is decisive for stiffness or ductility reasons, it is naturally possible to use the conventional tie-rod quality **ASDO 350-S**. In the planning stage **ASDO 520-S** should be assumed as the standard system.

### The technology

The dimensions of the accessory parts are provided in the tables on Page 6/7 of this brochure. The design tensile resistance for the **ASDO-S** system are listed in Table 1.

The possible standard single rod lengths are shown in Table 2.



Charpy impact value at least 27 J at -20° C for all systems

### Loads

Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56	M 60	M 64	M 68	
<b>ASDO 350-S</b>	31	58	90	129	169	206	300	412	480	541	645	745	867	983	1,122	kN
<b>ASDO 520-S</b>	31	79	123	178	232	283	412	565	658	742	886	1,023	1,190	1,349	1,540	kN
<b>ASDO 690-S</b>														1,464	1,672	kN

Nominal size	M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
<b>ASDO 350-S</b>	1,270	1,428	1,595	1,817	2,053	2,288	2,535	2,795	3,067	3,352	3,650	4,284	4,128	4,739	5,209	kN
<b>ASDO 520-S</b>	1,744	1,960	2,189	2,494	2,818	3,162	3,525									kN
<b>ASDO 690-S</b>	1,893	2,128	2,377	2,707	3,059	3,433	3,827	3,965	4,374	4,803	5,252	6,210	7,249	8,368	9,568	kN

**Table 1:**  
Design tensile resistance  $N_{R,d}$   
as per Eurocode EC3 incl. partial  
safety coefficient  $\gamma_M$

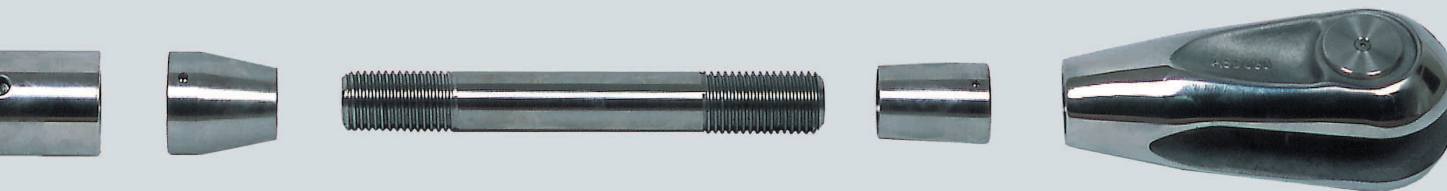
#### Notes on Table 1:

- The values  $F_d$  of the influences may not exceed the values  $N_{R,d}$
- To fully utilize the permissible loads for each system connection plates to the main structure must be made in grade S355 (EN 10025)

Nominal size	M 12 - M 36	M 42 - M 60	M 64 - M 100	M 105 - M 160	
<b>ASDO 350-S</b>	12,000		16,000		mm
<b>ASDO 520-S</b>	12,000		16,000		mm
<b>ASDO 690-S</b>				12,000	mm

### Tie-rod lengths

**Table 2:** Maximum standard  
lengths of single rods, longer  
lengths on request



**ASDO 690-E system** (stainless steel)

## The ASDO-E tie-rod system (stainless steel)

The **ASDO-E** stainless steel tie-rod system offers the perfect combination of corrosion resistance and aesthetics. In combination with materials like steel, wood, textiles or glass, the hand-polished version of the fork connectors and thread cover sleeves gives the system an exacting, individual architectural note. With a nominal size range from M12 to M100, there are virtually no longer any limits to supporting structure design in stainless steel.

### The material

The tie-rod and accessories are manufactured of high-quality duplex steel (material no. 1.4462) and offer excellent resistance to corrosion in structures subjected to heavy exposure to chlorides and sulphur oxides. It must be noted that stainless steel does not provide long-term freedom from maintenance when used in coastal areas or swimming baths. Therefore, the overall structure should ensure easy access to the tie-rod systems. Depending on the environmental influences, these must be treated with suitable cleaners and any minor surface corrosion removed from time to time.

### The surface

Forks and cover sleeves are supplied hand-polished as standard. Tie-rods, turnbuckles, couplers and circular plates can be ordered untreated, electro-brightened or hand-polished.

For the combination of the **ASDO-E** stainless system with carbon steel connection plates or central circular plates, the pin body is provided with a special coating and washers. This provides isolation between the two different metals and prevents bimetallic corrosion. The intention to use stainless steel with carbon steel should be stated at the time of ordering.

### The technology

The dimensions of the accessory and connecting parts are identical to those of the ASDO-S tie-rod system and are contained in the Tables on Page 6/7 of this brochure. The design tensile resistance for the **ASDO-E** system are listed in the following tables.

### Loads

Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	
<b>ASDO 690-E</b>	47	87	136	195	255	311	453	621	724	817	886	kN

Nominal size	M 56	M 60	M 64	M 68	M 72	M 76	M 80	M 85	M 90	M 95	M 100	
<b>ASDO 690-E</b>	1,023	1,190	1,349	1,540	1,744	1,960	2,189	2,494	2,818	3,162	3,525	kN

**Table 3:** Design tensile resistance  $N_{R,d}$  as per Eurocode EC3 incl. partial safety coefficient  $\gamma_M$

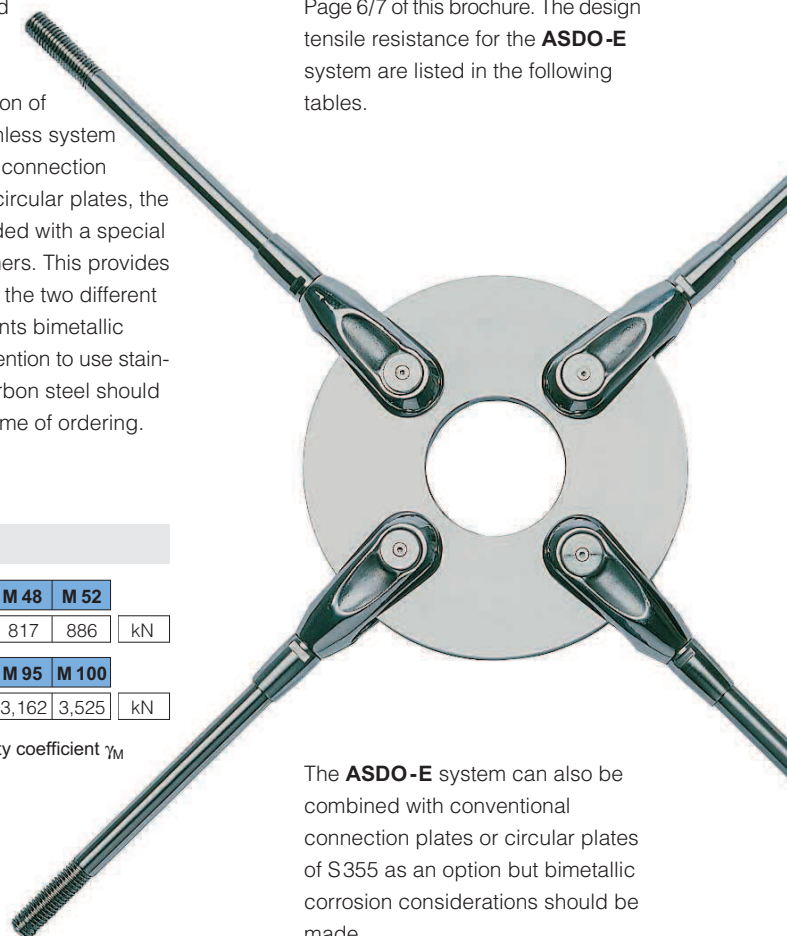
#### Notes on Table 3:

- The values  $F_d$  of the influences may not exceed the values  $N_{R,d}$
- To fully utilize the permissible loads for each system connection plates to the main structure must be made in grade S355 (EN10025)

### Tie-rod lengths

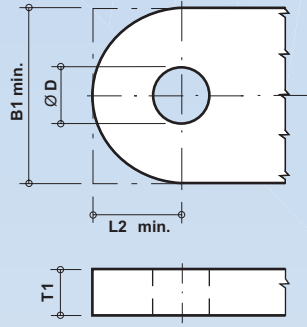
**Table 4:** Standard system, longer lengths and nominal sizes on request

Nominal size	up to M 42	
<b>ASDO 690-E</b>	6,000	mm

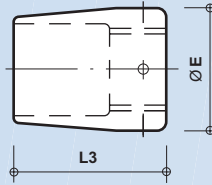


The **ASDO-E** system can also be combined with conventional connection plates or circular plates of S355 as an option but bimetallic corrosion considerations should be made.

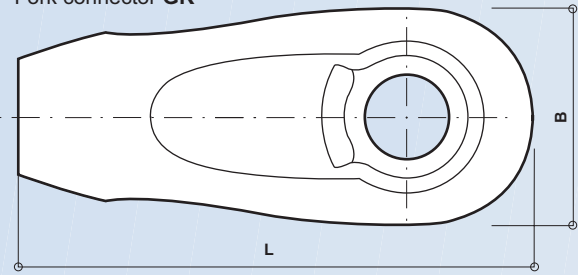
Connection plate **AB**



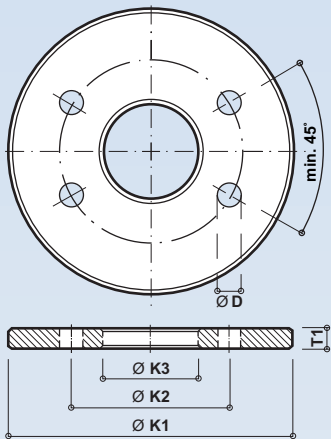
Thread cover sleeve **GGK**  
for fork connector



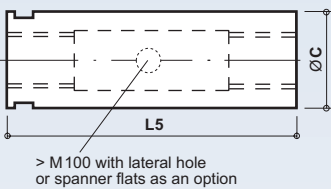
Fork connector **GK**



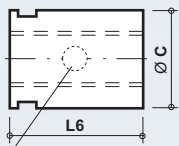
Circular plate **KS**



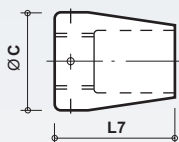
Turnbuckle **SP** with  
adjustment path +/-V



Coupler **MU**



Thread cover sleeve **GSM**  
for turnbuckle and coupler



## Technical data of ASDO system components

**Table 5:** Dimensions for fork connector **GK**, pin set **BG** and thread cover sleeve **GGK** for fork connector

	Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56
	Rod weight	0.9	1.6	2.5	3.6	4.5	5.5	8.0	10.9	12.5	14.2	16.7	19.3
<b>GK</b>	L	77	104	129	155	172	193	232	271	290	310	334	361
	B	33	44	53	65	73	81	98	114	122	130	139	150
	W	31	42	50	61	66	77	90	104	108	119	126	139
	T	12	17	18	23	23	28	33	38	38	44	44	49
	Ø D	13	17	21	25	28	32	38	44	47	50	54	58
	Ø E	17	23	29	35	39	43	52	61	65	70	76	82
	L1	19	26	31	38	42	47	57	66	71	76	81	88
	ME	14	19	24	29	32	36	43	50	54	58	62	67
	N	38	51	64	76	84	95	114	134	143	152	166	181
	+/-V	6	8	10	12	13.5	15	18	21	23	24	25	25
	V total	12	16	20	24	27	30	36	42	45	48	50	50
	Weight*	0.2	0.5	0.9	1.6	2.4	3.2	6	9	11	13	17	21
<b>BG</b>	Ø D1	12	16	20	24	27	30	36	42	45	48	52	56
	L4	30	40	47	57	63	73	85	97	102	111	120	129
<b>GGK</b>	Ø E	17	23	29	35	39	42	51	60	64	69	75	81
	L3	30	40	50	55	60	70	80	95	100	110	115	120

Subject to design changes; \*Weight for fork connector including pin set

**Table 6:** Dimensions for connection plate **AB** in steel quality S355 as per EN 10025; tolerance class A as per EN 10029

	Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56
<b>AB</b>	T1	10	15	15	20	20	25	30	35	35	40	40	45
	B1	41	53	66	78	88	100	119	138	147	156	169	181
	Ø D	13	17	21	25	28	32	38	44	47	50	54	58
	L2	20	27	33	39	44	50	59	69	73	78	84	91

Subject to design changes

**Table 7:** Dimensions for circular plate **KS**

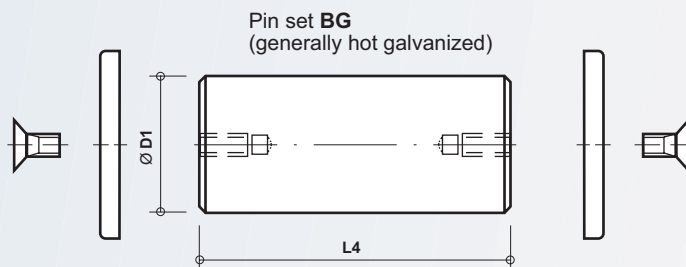
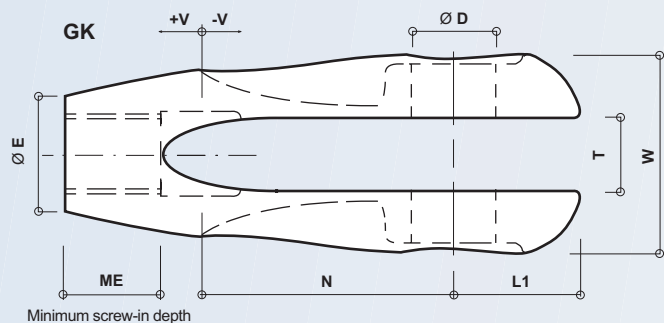
	Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56
<b>KS</b>	T1	10	15	15	20	20	25	30	35	35	40	40	45
	Ø K1	170	215	255	300	335	370	445	520	555	595	635	680
	Ø K2	110	140	170	200	225	250	300	350	375	400	430	460
	Ø K3	60	80	100	120	135	150	180	210	225	240	260	280
	Ø D	13	17	21	25	28	32	38	44	47	50	54	58
	Weight	1.5	3.6	4.9	9	11	17	30	47	54	71	80	103

Subject to design changes

**Table 8:** Dimensions for turnbuckle **SP**, coupler **MU** and thread cover sleeve **GSM** for turnbuckle or coupler

	Nominal size	M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56
<b>SP</b>	Ø C	20	27	36	42	48	51	60	70	76	83	89	95
	L5	53	70	88	106	119	132	158	185	198	211	225	234
	+/-V	12	16	20	24	27	30	36	42	45	48	50	50
	V total	24	32	40	48	54	60	72	84	90	96	100	100
	Weight	0.1	0.2	0.4	0.7	1.1	1.3	2.1	3.4	4.4	5.6	6.9	8.2
<b>MU</b>	Ø C	20	27	36	42	48	51	60	70	76	83	89	95
	L6	29	39	48	58	65	72	87	101	108	116	125	135
	Weight	0.1	0.2	0.3	0.4	0.6	0.7	1.2	1.9	2.5	3.2	4.0	4.8
<b>GSM</b>	Ø C	20	27	36	42	48	52	63	70	80	83	90	95
	L7	30	40	50	55	60	70	80	95	100	110	115	120

Subject to design changes



M 60	M 64	M 68	M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
22.2	25.3	28.5	32.0	35.6	39.5	44.5	49.9	55.6	61.7	68.0	74.6	81.5	88.8	104.2	120.8	138.7	157.8	kg/m
386	412	438	463	489	516	547	579	610	645	677	709	742	773	837	901	966	1,031	mm
159	172	182	193	203	219	230	243	258	271	287	301	316	330	354	381	410	436	mm
149	159	167	179	191	196	211	226	237	248	259	271	284	303	327	351	375	405	mm
54	59	59	64	69	74	79	84	89	94	96	101	106	116	126	136	146	156	mm
62	66	70	74	78	82	87	92	97	102	108	113	118	123	133	143	153	163	mm
88	93	100	105	111	115	124	131	136	146	155	161	169	176	190	206	220	236	mm
93	100	106	112	119	128	133	140	150	160	167	175	184	191	207	222	239	255	mm
72	77	82	86	91	96	102	108	114	120	126	132	138	144	156	168	180	192	mm
196	210	225	240	254	267	287	306	321	340	359	377	395	413	449	486	522	559	mm
25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	mm
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	mm
26	32	40	47	58	63	74	92	105	127	162	195	230	265	332	400	470	536	kg
60	64	68	72	76	80	85	90	95	100	105	110	115	120	130	140	150	160	mm
140	151	157	166	175	182	195	205	218	229	241	250	261	277	301	323	344	365	mm
87	92	99	104	110	113	122	129	134	143	152	158	166	173	187	202	216	232	mm
120	135	135	135	135	140	140	140	140	140	140	140	140	140	140	140	140	140	mm

M 60	M 64	M 68	M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
50	55	55	60	65	70	75	80	85	90	90	95	100	110	120	130	140	150	mm
194	206	219	231	244	256	272	287	303	319	337	353	369	384	415	447	478	509	mm
62	66	70	74	78	82	87	92	97	102	108	113	118	123	133	143	153	163	mm
97	103	109	115	122	128	136	144	151	159	169	176	184	192	208	223	239	254	mm

M 60	M 64	M 68	M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
50	55	55	60	65	70	75	80	85	90	90	95	100	110	120	130	140	150	mm
740	785	825	870	930	975	1,045	1,090	1,160	1,205	1,275	1,345	1,390	1,460	1,575	1,690	1,810	1,925	mm
500	530	560	590	630	660	705	740	785	820	865	910	945	990	1,070	1,150	1,230	1,310	mm
300	320	340	360	380	400	425	450	475	500	525	550	575	600	650	700	750	800	mm
62	66	70	74	78	82	87	92	97	102	108	113	118	123	133	143	153	163	mm
136	168	185	224	279	330	407	469	567	644	723	852	953	1,160	1,470	1,831	2,261	2,737	kg

M 60	M 64	M 68	M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
102	108	114	121	127	133	140	152	159	171	178	191	194	203	219	241	254	273	mm
244	254	263	273	282	292	304	326	338	350	387	399	411	423	447	471	495	519	mm
50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	mm
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	mm
9.7	11	13	15	17	20	22	30	33	41	48	59	60	68	84	110	126	155	kg
102	108	114	121	127	133	140	152	159	171	178	191	194	203	219	241	254	273	mm
144	154	164	173	183	192	204	226	238	250	287	299	311	323	347	371	395	419	mm
5.9	7.1	8.4	10	12	13	15	21	24	30	39	48	50	57	71	94	108	134	kg
102	108	114	121	127	133	140	152	159	171	178	191	194	203	219	241	254	273	mm
120	135	135	135	135	140	140	140	140	140	140	140	140	140	140	140	140	140	mm



## The ASDO-D compression-rod system

The **ASDO-D** compression-rod system offers a matching addition to the ASDO tension tie-rod system. The fork connectors are designed so that they transmit both tensile and compressive forces. Tensile and compression elements resulting from the supporting structure planning can therefore be executed in a uniform design.

### The design

The compression rod features a pipe design (pipe with welded-on threaded ends) or a solid rod solution (round rod with screwed-on threaded ends). Entire compression-rod systems or fork connectors as separate components can be supplied.

Design for corrosion protection can be found in the section "Corrosion protection" on Page 3.

When planning the compression rod in stainless-steel design, please consult us beforehand.

### Systems

#### Compression-rod system

**ASDO-DS** (carbon steel)  
**ASDO-DE** (stainless steel)

### The technology

The dimensions for fork connectors and related connection plates are shown in the tables on Page 6/7. The design compression resistance for the **ASDO-D** system are listed in Table 9 and result from the calculation of the compression rods in the thread cross-section. For the compression rods themselves, which have a maximum tensile strength equal to grade S355 steel, design strengths according to EC3 must be calculated in individual cases. The resulting value for the design compression resistance must not drop below the related value in Table 9, or must be applied as a major limit value for the entire system.

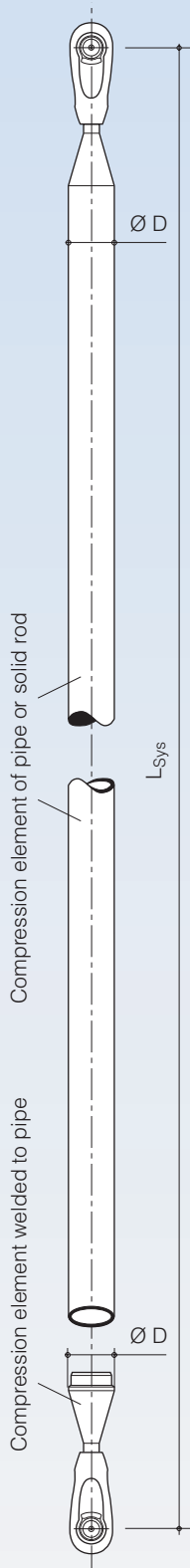
### Loads

Nominal size		M 12	M 16	M 20	M 24	M 27	M 30	M 36	M 42	M 45	M 48	M 52	M 56	M 60	M 64	M 68	
Ø D	≤ 100	13	28	41	62	84	104	157	220	261	284	346	402	474	541	624	kN
	> 100 ≤ 150	12	24	36	54	74	91	137	193	229	249	303	353	416	475	548	kN
	> 150 ≤ 200	11	23	35	52	71	87	132	185	220	239	292	339	400	457	527	kN
	> 200 ≤ 250	11	23	34	51	69	86	129	182	216	235	286	333	394	449	518	kN
Nominal size		M 72	M 76	M 80	M 85	M 90	M 95	M 100	M 105	M 110	M 115	M 120	M 130	M 140	M 150	M 160	
Ø D	≤ 100	715	811	915	1,050	1,195	1,354	1,518									kN
	> 100 ≤ 150	628	713	805	924	1,053	1,193	1,339	1,441	1,601	1,770	1,947	2,327	2,739	3,187		kN
	> 150 ≤ 200	604	686	774	889	1,012	1,147	1,287	1,385	1,539	1,701	1,872	2,237	2,633	3,064	3,525	kN
	> 200 ≤ 250	594	675	761	874	996	1,129	1,267	1,363	1,514	1,674	1,842	2,202	2,592	3,017	3,472	kN

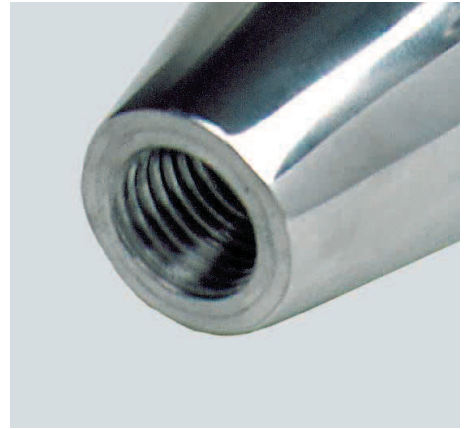
**Table 9:** Design compression resistance  $N_{R,d}$  as per Eurocode EC3 incl. partial safety coefficient  $\gamma_M$

#### Notes on Table 9:

- The values  $F_d$  of the influences may not exceed the values  $N_{R,d}$
- To fully utilize the permissible loads for each system connection plates to the main structure must be made in grade S355 (EN10025)



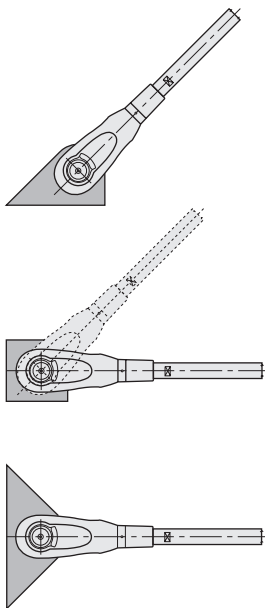




## Design information

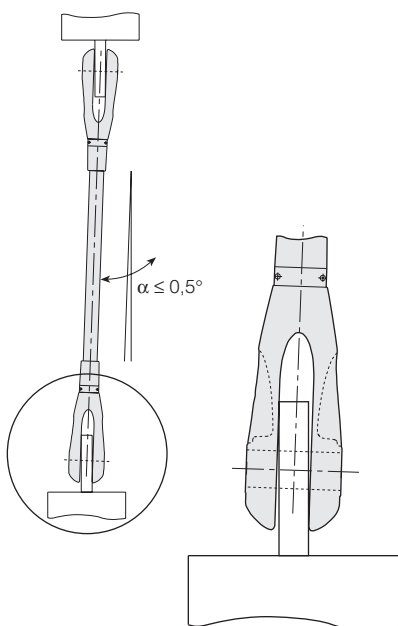
### Connection plate

The shape of the connection plate is dependent on the load transfer to the supporting structure. The illustrations at the right show a few of these different connection solutions. The specifications for the design development are contained in Table 6 on Page 6/7 and must be applied to all ASDO systems. Connection plates must generally be produced in steel grade S355 according to EN 10025. For connection plates in stainless steel, the 0.2% proof stress must be equivalent or greater than grade S355. Connection plates must be purchased in the tolerance class A according to EN 10029.



Pin holes in the connection plates must be produced mechanically.

### Installation tolerances



When installing the system, it must be ensured that the deflection does not exceed 0,5° from its plane. This prevents impermissible bending in the fork connectors and connection plates

The installation of an ASDO tie-rod system with connection ends twisted in opposite directions requires particular precision to ensure the necessary alignment is maintained during manufacture and erection. Therefore, it is recommended that a design of the connection ends with the same orientation always be provided.

### Delivery and assembly

Depending on the transport length, the ASDO tie-rod system is generally delivered preassembled. The fork connectors, turnbuckles and couplers are screwed onto the tie-rod, and the minimum screw-in depth must be checked at the building site by the customer. When lifting in the tie-rod system, sufficient support must be provided over the system length in order to prevent excessive bending.

During installation the pins must be fitted free of secondary bending, driving in with a hammer is not permitted as this could damage the system.

The required system length is adjusted by means of open-end spanners by turning the tie-rod or the turnbuckle.

Locking thread cover sleeves are locked at the fork connector, turnbuckle or coupler and hide any exposed thread. A common 'C' spanner can be used for this purpose and will be included with the order on request.

With corrosion-protected parts, surface damage may result during transport and handling. We cannot assume any guarantee for such damage or the subsequent costs. The damaged areas must be correctly repaired by the customer to ensure full corrosion protection.

☐ Query  
☐ Order

Shipping is charged extra, all prices are ex works Dortmund;  
the General Terms and Conditions of ANKER-SCHROEDER.DE ASDO GmbH



**Tie-rod System CE ETA-04/0038**

Internet: [www.asdo.de](http://www.asdo.de)

e-mail: [info@asdo.de](mailto:info@asdo.de)

Forms can be downloaded directly at [www.asdo.de](http://www.asdo.de)

**Customer address :**

Reference: \_\_\_\_\_  
Project: \_\_\_\_\_  
Company: \_\_\_\_\_  
Street: \_\_\_\_\_  
Postal Code / City: \_\_\_\_\_  
Tel.: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Name: \_\_\_\_\_

**Delivery address :**

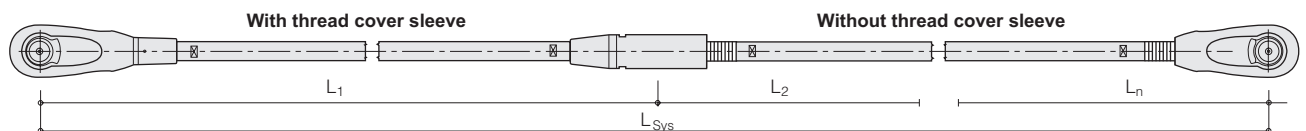
Company: \_\_\_\_\_  
Street 1: \_\_\_\_\_  
Street 2: \_\_\_\_\_  
Postal Code / City: \_\_\_\_\_  
Tel.: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Attn.: \_\_\_\_\_  
Delivery date: \_\_\_\_\_

**1 Systems**

ASDO **350-S** ..... Tie-rod system, steel .....  
ASDO **520-S** ..... Tie-rod system, steel .....  
ASDO **690-S** ..... Tie-rod system, steel .....  
ASDO **690-E** ..... Tie-rod system, stainless steel .....  
ASDO- **DS** ..... Compression-rod system, steel .....  
ASDO- **DE** ..... Compression-rod system, stainless steel .....

**Max. lengths of single rods  $L_{max}$  (longer on request)**

**M 12 - M 36**  $L_{max} = 12,000$  mm; **M 42 - M160** :  $L_{max} = 16,000$  mm  
**M 12 - M 36**  $L_{max} = 12,000$  mm; **M 42 - M100** :  $L_{max} = 16,000$  mm  
**M 64 - M 160**  $L_{max} = 12,000$  mm  
**M 12 - M 42**  $L_{max} = 6,000$  mm; **> M 42** on request  
In case of queries or orders for these systems, please consult us beforehand.



**2 1 Set**

consists of

tie-rod in single or multi-piece design / 2 x fork connectors R+L thread including pin set/  
accessories (optional) such as thread cover sleeve, turnbuckle, coupler or circular plate

**3 Hot**

**galvanizing**

according to DIN EN ISO 1461: tie-rod threads are undercut and recut to size following galvanizing, pin sets are generally hot  
galvanized, fork connector, turnbuckle and coupler through nominal size M42 in hot galvanized design as standard

Item	ASDO system 1	Set Qty. 2	Nom. size M	System length $L_{sys}$ mm	Hot galvanizing 3		Thread cover sleeves		Remarks: e.g. individual lengths $L_1, L_2 \dots L_n$ e.g. circular plate with angle specification $\alpha$ etc.
					Yes	No	Yes	No	
1									
2									
3									
4									
5									
6									
7									
8									
Examples	520-S	25	M 65	35.000	X			X	$L_1 = 3,000$ mm; $L_2 = 16,000$ mm, with turnbuckle + coupler, pretensioning option $F_v = 20$ t, compl. hot galvanized
	E	40	M 42	7.000		X	X		with circular plate, $\alpha = 57^\circ$ , tie-rods untreated, circular plate hand-polished

City: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

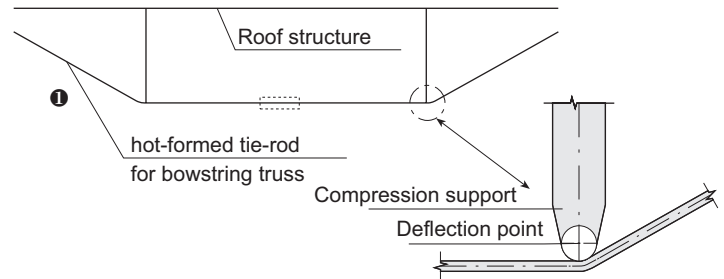


## Special solutions with ASDO tension elements

In addition to the ASDO tie-rod system with its general building supervision approval, ANKER-SCHROEDER also offers the development and delivery of special design solutions. Such solutions should be chosen when it is important to realize tension elements that have a "simple" shape but are required to fulfill demanding technical requirements, e.g.:

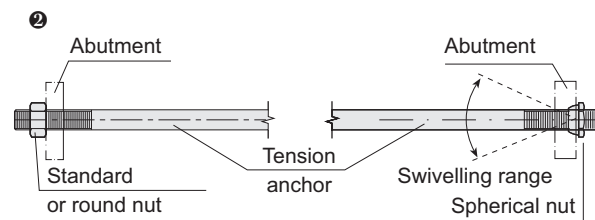
### 1. Bow String trusses with a curved design

- Minimum number of gusset plate connections
- Simple design of deflection points
- Slim design over the entire length
- Low preservation costs and effort



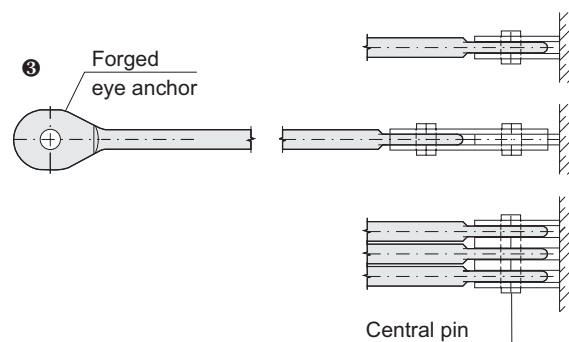
### 2. Connection via standard nut or spherical nut

- Simple, economical design
- Additional joint effect when spherical nut used
- System adjustable via thread ends
- Simplest option for system pretensioning



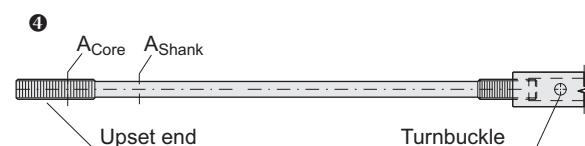
### 3. Connection via eye anchor

- Slim design with use of parallel tie-rod groups by means of central pin
- Low maintenance costs and effort due to minimal number of threads
- Load transmission at butting points free of bending moments by means of hinge joints - ideal for large spans
- Fast, simple assembly



### 4. Upset ends

- Additional safety in thread due to larger cross-sectional ratio of thread core to shank
- Stress concentration through thread is considerably reduced
- Ideal for dynamic load requirements
- Complete covering of outer and inner thread possible



For the above special designs, approval in individual cases is generally not necessary. Proof of all components and the choice of the steel types is carried out according to the guidelines for dimensioning and design of steel structures (DIN 18800). Possible use should be clarified with the respectively responsible testing institute in advance in each case.

We'll be happy to support you in the process... Just ask us!



M 12 – M 160



**ANKER  
SCHROEDER**

# The proof of great<sup>ness</sup> lies in the details

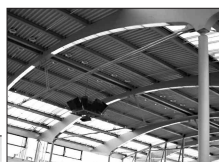


**Airsid-Center, Zürich**  
Compression element

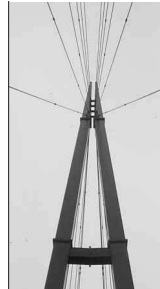
Photo:  
Tuchschmid AG,  
Frauenfeld, Switzerland



**Cargo-Lifter, Brand, Transverse Bracing**



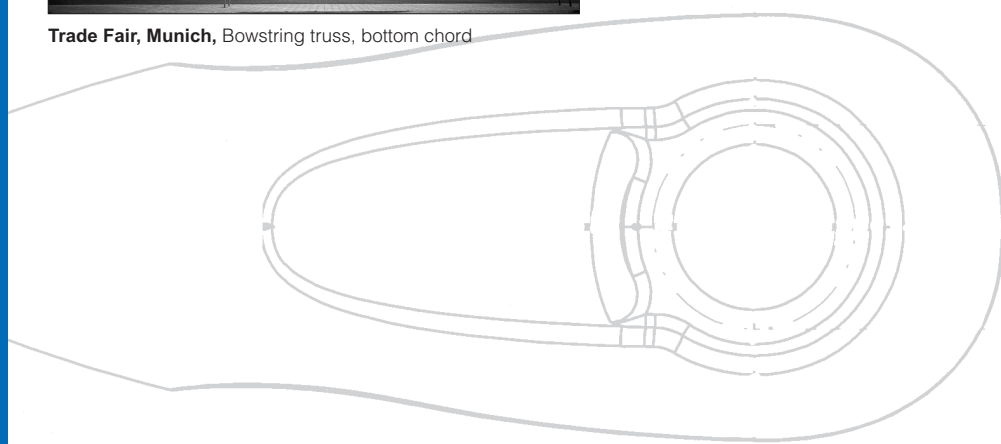
**Trade Fair, Munich, Bowstring truss, bottom chord**



**Bridge over Cracauer Wehr,  
Pylon Stays**



**Trade Fair, Erfurt, Suspension Stays**



**ASDO**

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