INSTALLATION GUIDE FOR ASDO ARCHITECTURAL STRUCTURAL TIE BARS

The **ASDO** System is a prefabricated tension rod system which meets the demanding European Technical Assessment **ETA-04/0038**. The customer is advised not to adapt the system (e.g. by welding, bending etc) without consultation with Anker Schroeder. Any changes to the delivered system may render the warranty and the approval of the system invalid. Only the use of approved ASDO components is permitted for compliance with the ETA (fork ends for compression-rod systems can be delivered separately).

Anker Schroeder do not accept any liability or warranty for defects in the tie bar system caused due to faulty storage, handling, modifications, installation or assembly by the customer.

For the latest information regarding the ASDO system please refer to our website at **www.Anker.de**

Overview

- connection plates should be manufactured in S355J2 steel acc. EN 10025
- for external applications corrosion protection is recommended (e.g. galvanisation, painting etc)
- assembly and adjustment of fittings should be performed when the system is straight and not heavily loaded (long lengths or large diameter bars will require intermediate supports, e.g. trestles)
- pins should be connected without impact or drifting, receiving holes in the structure should be checked to ensure that the pin is able to pass cleanly through
- pin set screws must be secured using Loctite or equivalent chemical locking compound after installation
- if the structure is subject to excessive vibration different pin and thread locking cover design may be required – please contact our technical department for more information
- note: The ETA does not cover use of the ASDO system in dynamic load situations. ASDO can assist you with data from existing fatigue tests

Before Installation

- check that the tendon is in factory delivered conditions (please inform Anker Schroeder immediately you suspect not)
- back off all lock covers as far as possible
- if necessary clean and lubricate all visible threads
- assemble any split lengths to design length

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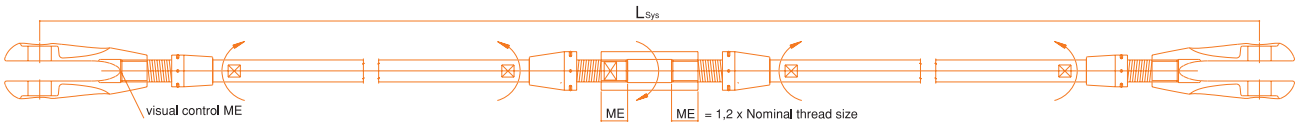
Assembly

It is important that the minimum depth of engagement of each tie rod thread is checked prior to installation. If fittings are not fully assembled onto thread, i.e. the length of thread engaged is less than ME the system will not have full load capacity.

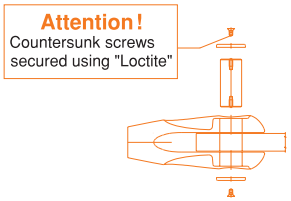


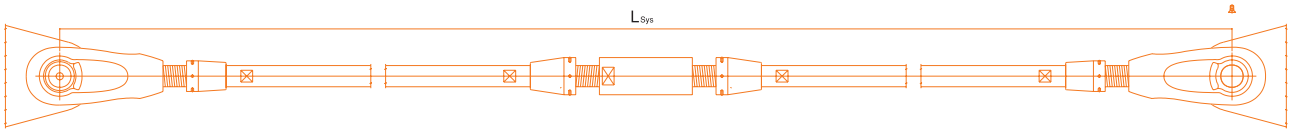
Minimum engagement ME [mm] = 1.2 x Nominal thread size
e.g. for M56 ME = 67mm

Table A gives the main dimensions for all components as a check during assembly.

- tie bar to fork end
  - the fork end is sufficiently assembled when the bar end is visible in the jaw opening of the fork end
  - fork ends should be set to the design position as per Table A
  - fork threads can be left or right hand as the design requires
- tie bar to turnbuckle
  - turnbuckles should be set as per Table A – nb ensure that turnbuckles are 'even' in assembly, i.e. tie bar is screwed equally to each end
- tie bar to coupler
  - couplers should have tie-bars screwed 50% each end
- final 'pin-to-pin' Lsys length check
  - check assembled pin-to-pin length is as design or as built connection points in the structure
  - adjustment can be made to the design length by using fork ends and turnbuckles always ensuring that the minimum thread engagement ME is maintained

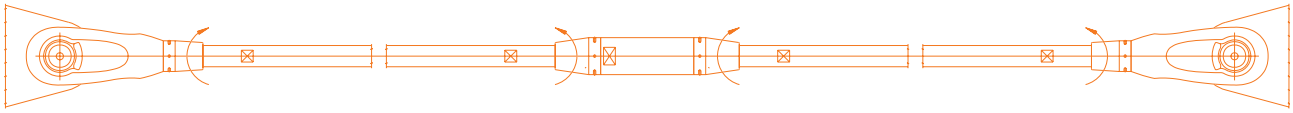
Installation





- support system length during lifting (intermediate supports may be required for long lengths, e.g. by use of a stiff lifting beam)
- install first fork end and pin set to first connection plate, placing the fork over the connection plate and fixing the pin; pin cap retaining screws should be secured using "Loctite" or similar
- offer other end of tie bar to connection plate - adjust tendon length with turnbuckle or bar as required
- install second fork end and pin set on second end; pin cap retaining screws should be secured using "Loctite" or similar
- ensure tie bar is nominally tensioned "hand tight" and all slack removed by adjustment of the turnbuckle or bars

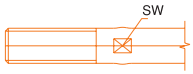
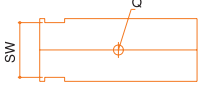
After Installation



- check that the minimum thread engagement ME acc. table A has been maintained for all parts
- tighten all lock covers via hook spanner
- where required seal between fork end and lock cover or gap between tie bar/ lock cover with suitable compound

It is advisable to record that the above checks have been performed for future records.

Fitting Tools

Nominal thread size	Hook spanner DIN 1810B	Open-jaw wrench		Allen key	
					
	for fork, turnbuckle, coupler	for tension rod	for turnbuckle/coupler	for pin set screw*	
					
			Spanner flat	Countersunk screw DIN EN ISO 10642	Countersunk screw DIN EN ISO 10642
M	Size [mm]	SW [mm]	SW [mm]	M	SW [mm]
12	16-18	10	17	3	2
16	20-22	14	22	3	2
20	25-28	18	30	4	2,5
24	34-36	2 2	36	4	2,5
27	40-42	25	41	5	3
30	40-42	27	45	5	3
36	52-55	34	50	6	4
42	58-62	36	60	6	4
45	68-76	41	65	8	5
48	68-75	41	65	8	5
52	68-75	46	75	8	5
56	80-90	50	85	8	5
60	80-90	55	90	10	6
64	80-90	60	95	10	6
68	95-100	60	100	10	6
72	110-115	65	105	12	8
76	110-115	70	110	12	8
80	110-115	75	120	12	8
85	120-130	80	125	16	10
90	120-130	85	130	16	10
95	135-145	90	140	16	10
100	135-145	95	145	20	12
105	155-165	100	central hole supplied, dia Q in place of spanner flats	20	12
110	155-165	105		20	12
115	155-165	110		20	12
120	180-195	115		20	12
130	180-195	125		20	12
140	205-220	135		20	12
150	205-220	145		20	12
160	230-245	155		24	14

Alternative pin design*
M12 - M24: Collar pin with washer + screw or circlip + 2x circlip
Using circlips a special pincer acc. DIN / ISO 5254, site A1, is necessary
M12 - M60: Collar pin with washer + countersunk crew + 2x circlip

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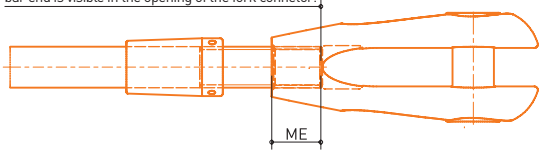
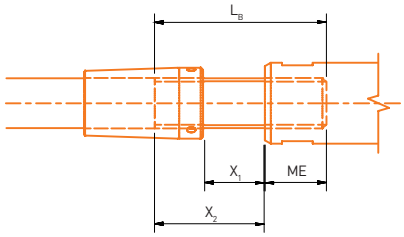
Table A Reference dimensions minimum engagement

tie bar to fork end

The fork connector is sufficiently engaged when the bar end is visible in the opening of the fork connetor!



tie bar to turnbuckle or coupler



Nominal thread size	Fork End (FE) Turnbuckle (TB) Coupler (CO) thread length	Minimum thread engagement	With Locking Thread Cover (TC)	Without Locking Thread Cover (TC)
	L_B [mm]	ME [mm]	X_1 [mm]	X_2 [mm]
12	38	15	14	21
16	49	20	19	27
20	61	24	24	34
24	73	29	29	41
27	79	33	31	43
30	89	36	35	49
36	106	44	42	58
42	122	51	49	67
45	129	54	52	70
48	144	58	56	81
52	150	63	57	81
56	159	68	58	86
60	164	72	59	86
64	175	77	61	92
68	180	82	61	92
72	185	87	61	92
76	190	92	61	92
80	200	96	61	97
85	205	102	61	97
90	215	108	64	100
95	220	114	64	100
100	230	120	64	100
105	235	126	64	100
110	240	132	64	100
115	245	138	64	100
120	250	144	64	100
130	265	156	64	100
140	275	168	64	100
150	290	180	64	100
160	300	192	64	100

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