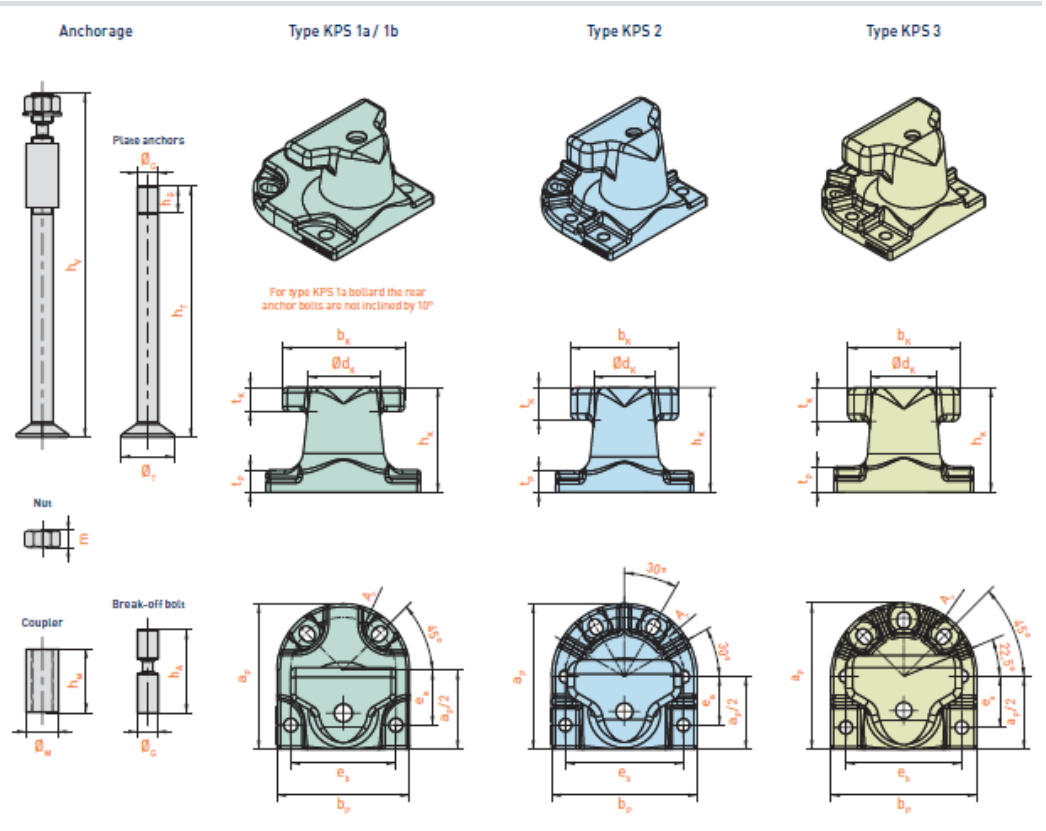
ASDO SEAPORT BOLLARDS – ASDO KPS 50 - 3000

Bollardhead		KPS 50 - 300	KPS 500 - 700	KPS 800 - 1000	KPS 1250 - 1500	KPS 2000	KPS 2500	KPS 3000
Mooring lineforce*	[kN]	50 - 300	500 - 700	800 - 1000	1250 - 1500	2000	2500	3000
Typ		KPS 1a	KPS 1a	KPS 1a	KPS 1b	KPS 2	KPS 2	KPS 3
a_P	[mm]	490	600	700	900	900	1050	1200
b_P	[mm]	490	600	700	820	900	1050	1200
h_K	[mm]	370	450	520	560	650	800	900
b_K	[mm]	400	490	580	650	760	820	960
t_K	[mm]	100	115	130	130	165	250	290
$Ød_K$	[mm]	250	290	380	380	420	465	580
t_P	[mm]	80	95	120	120	150	160	210
A_T	[mm]	200	250	290	325	365	425	475
e_a	[mm]	90	100	125	340	320	350	420
e_b	[mm]	400	500	580	650	750	850	950
Castmaterial:		EN-GJS-500 & G20Mn5+QT						
Anchorage		**KPS 50 - 300**	**KPS 500 - 700**	**KPS 800 - 1000**	**KPS 1250 - 1500**	**KPS 2000**	**KPS 2500**	**KPS 3000**
$N_G / Ø_G$		M27	M36	M56	M72	M72	M76	M90
m	[mm]	22	29	45	58	58	61	72
h_A	[mm]	120	160	220	255	255	290	355
h_M	[mm]	90	120	170	220	220	240	270
$Ø_M$	[mm]	40	60	90	105	105	115	140
h_T	[mm]	440	520	690	805	805	890	1065
h_G	[mm]	40	50	70	90	90	100	110
$Ø_T$	[mm]	85	110	170	210	210	230	270
h_V	[mm]	580	650	930	1100	1120	1340	1460
Steelgrade:		ASDO-500						

*Direction of mooring line pull as EAU 2012



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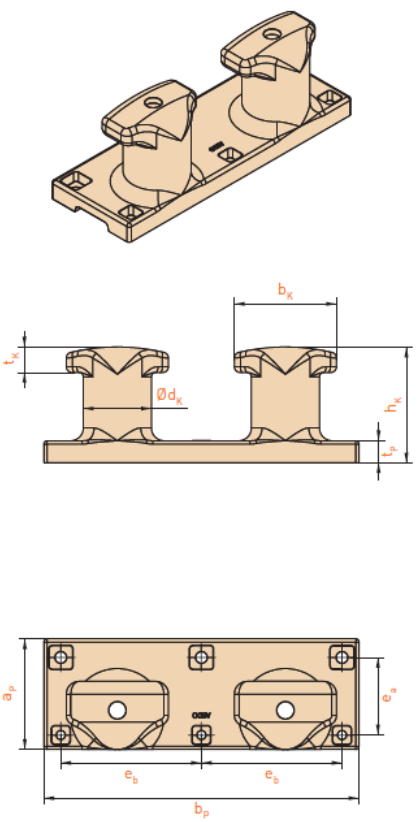
ASDO DOUBLE BOLLARDS HPA & MIG 500 - 3000

Bollardhead Mooring lineforce* [kN]		HPA 500 - 3000 500 - 3000	MIG 500 - 2000 500 - 2000	MIG 3000 3000
Typ		HPA	MIG2000	MIG3000
a_P	[mm]	650	650	650
b_P	[mm]	1850	1850	1850
e_a	[mm]	455	440	440
e_b	[mm]	825	815	815
h_K	[mm]	550	540	775
b_K	[mm]	600	600	600
t_K	[mm]	120	120	120
t_P	[mm]	130	135	135
$Ød_K$	[mm]	400	400	400

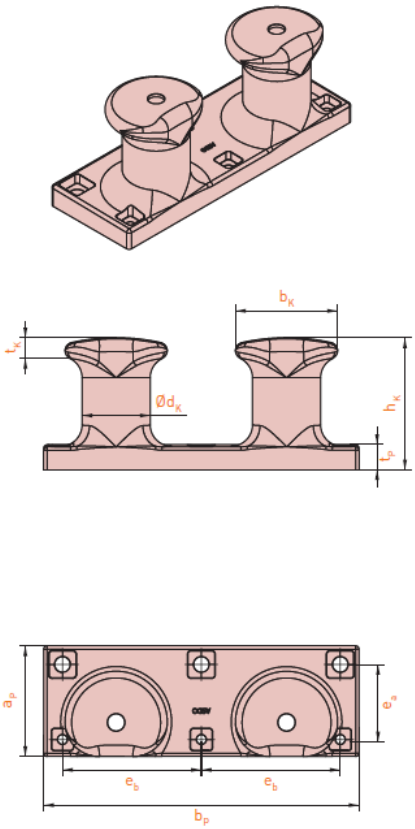
Castmaterial:		EN-GJS-500		EN-GJL-250		EN-GJS-500	
Anchorage		**HPA 500 - 3000**		**MIG 500 - 2000**		**MIG 3000**	
N_G/ $Ø_G$	[mm]	M48	M64	M48	M64	M52	M85
m	[mm]	38	51	38	51	42	68
h_A	[mm]	195	240	195	240	195	320
h_M	[mm]	145	210	145	210	150	260
$Ø_M$	[mm]	70	100	70	100	80	125
h_T	[mm]	605	760	605	760	605	980
h_G	[mm]	55	90	55	90	60	110
$Ø_T$	[mm]	145	195	145	195	160	260
h_V	[mm]	820	1040	820	1040	820	1340
Steelgrade:				ASDO-500			

*Direction of mooring line pull as EAU 2012

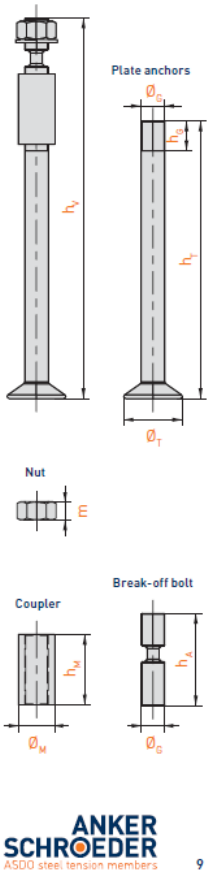
Type HPA



Type MIG



Anchorage



ANKER SCHROEDER
ASDO steel tension members

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ASDO BOLLARD RANGE

In the past bollards were typically cast in grey iron material such as EN-GJL-250, today more ductile materials such as spheroidal graphite (SG) iron or steel are preferred. Anker Schroeder uses the ductile and strength benefits of these materials to optimise the design of the ASDO cast bollard range. Bollards cast from steel also have the additional benefit that welding techniques can be used to either enhance the design or provide a reliable repair method. Using the improved material properties such as notch impact strength and stress/strain behaviour of steel and SG Iron ASDO bollard systems can be rated higher than traditional grey cast iron bollards of similar dimensions.

Comparison of cast material for bollards

		EN-GJL-250 / DIN EN 1561	EN-GJS-500 / DIN EN 1563	G20Mn5+QT / DIN EN 10340
$R_{p0,1}$/ $R_{p0,2}$/ R_e	[MPa]	165 - 235	320*1	320*1
R_m	[MPa]	250 - 350	500*1	500*1
A	[%]	0,8 - 0,3	10 - 14	20
K_V	[J/-40°]	-	10*2	27
Ductile behavior		--	+	++
Material price		++	++	+
Charpy impact strength		--	+	++
Corrosion resistance		++	++	+ + (Painted!)

*1) Mechanical properties are guaranteed minimum. Therefore do not require reducing due to section thickness according to material standards. *2) Special cast specification: K_v at RT.

Standard steel grades for bollard anchor bolts

		ASDO-355 / DIN EN 10025	ASDO-500 / DIN EN 10025
R_e	[MPa]	355*1	500*1
R_m	[MPa]	510*1	700*1
A	[%]	17	17
K_V	[J/-20°]	27	20

*1) Mechanical properties are guaranteed minimum. Therefore do not require reducing due to section thickness according to material standards.

Certification to DIN EN 1090 - Execution Class 4


TÜV NORD

ZERTIFIKAT

Steel grades used for ASDO anchor bolts ensure a high degree of ductility and predictable structural behaviour and our standard range is detailed herein. Higher grades of steel for anchor bolts can be used such as ASDO 640, please contact our technical department for more information. Pre-tensioning of the anchorage bolt is possible by debonding the bolt shaft from the concrete. This ensures that line loads are transferred directly to the concrete anchorage point.

Anker Schroeder is certified and independently audited to DIN EN 1090 & ISO 9001. All bollard systems using material conforming to harmonised Eurocodes are supplied with the 'CE' mark (a legal requirement within the European Union).

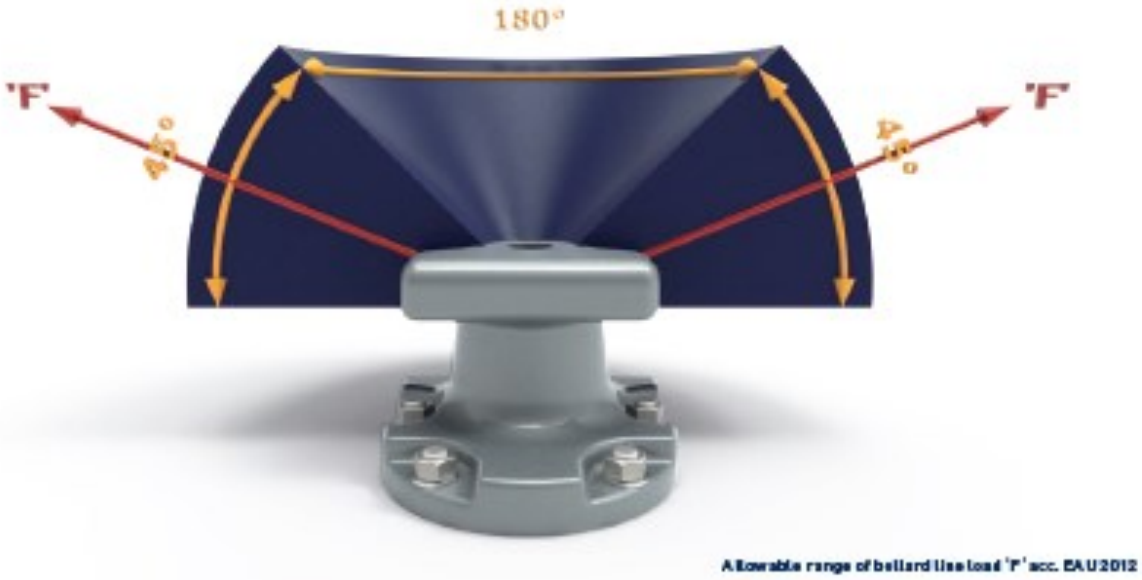
All components are delivered with an 3.1 inspection certificate according to EN 10204. On request at time of order 3.2 inspection certification is also available.

Fiche Technique

Table E 12-1. (EAU 2012) Determination of bollard loads for seagoing vessels	
Water displacement [t]	Bollard line load 'F' [kN]
up to 10,000	300
up to 20,000	600
up to 50,000	800
up to 100,000	1,000
up to 200,000	2,000
up to 250,000	2,500
> 250,500	> 2,500

Pour toute étude technique ou commerciale, nous contacter :

contact@adc-maritime.fr



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