



2020
ORC Club
Certificate

Rating Office
Hellenic Sailing Federation
Offshore Committee
Επιτροπή
Ανοικτής Θαλάσσης
Ελληνικής
Ιστιοπλοϊκής Ομοσπονδίας

Certificate
Number **01239**
Issued On **04/04/2020**
ORC Ref **03420000H7S**
VPP Ver. **2020 1.01**
Valid until **28/02/2021**

Crew Weight

Default	884kg
Maximum	800kg
Minimum*	600kg

**when applied by the NoR and SI*
Non Manual Pwr **No**

Special Scoring

ToD	ToT
Non Spin GPH 642.1	0.9344
Non Spin OSN 622.0	0.9646

Sails Limitations

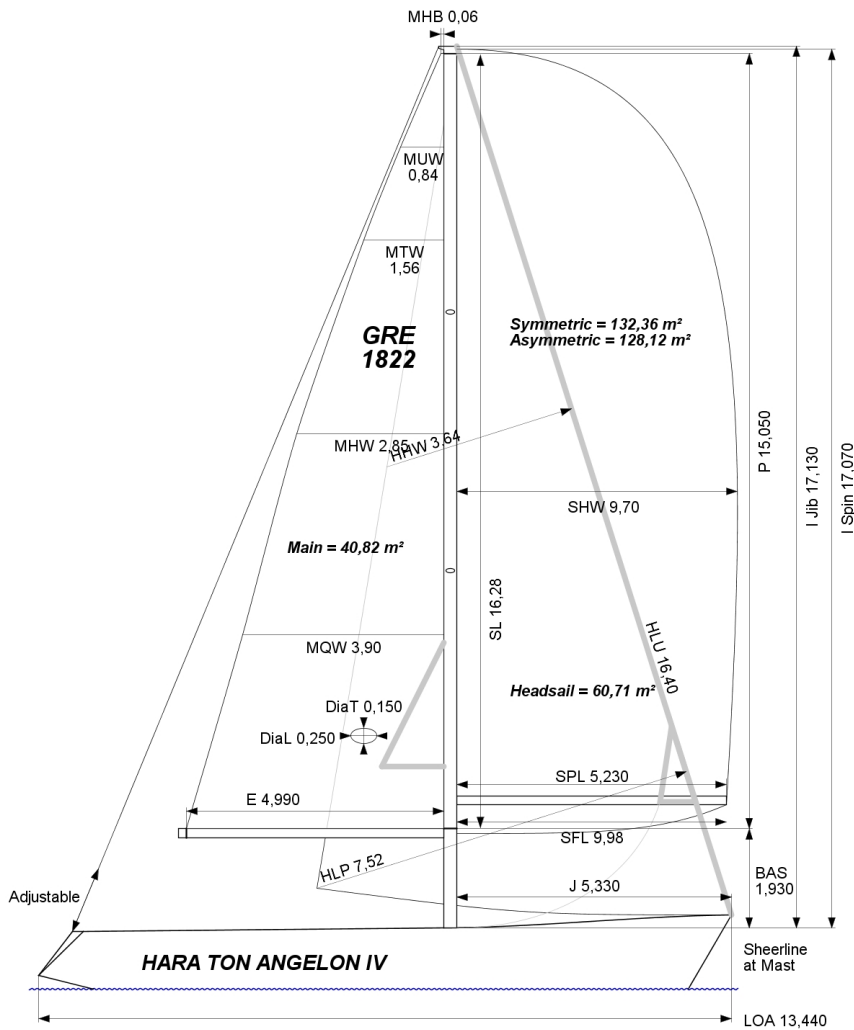
Headsails **1** Spinnakers **4**

Spinnaker configuration
Symmetric: **Yes** **132.36**
Asymmetric: **Yes** **128.12**
Flying H/S: **No**
Spin. Pole: **Yes**

Class Division Length
CDL = **10.390**

Stability (Estimated)
Limit Positive Stab.: **110.1°**
Stability Index: **115.8**

Owner



BOAT
Name HARA TON ANGELON IV
Sail Nr GRE-1822

GPH
610.0

HULL
Data File GR1822 LOA 13.440m
Offset File ELAN45.OFF MB 4.156m
Displacement 10,710kg Draft 2.087m

CLASS
Class ELAN 45
Designer HUMPHREYS
Builder ELAN YACHTS
Series 01/2001
Age Date
Age Allowance 0.487%

IMS Division Cruiser/Racer Dynamic All. 0.344%
Plan Review Construction Solid
Fiber Rigging No Aramid Core No
Crew Arm Ex Carbon Rudder No
Light Stanchions No

IMSL 11.803m VCGD 0.046m Sink 28.31kg/mm
RL 8.976m VCGM 0.113m WS 38.24m²
LSM0 11.914m Displacement/Length ratio 6.3331

COMMENTS
Weighted by measurer.

Water Ballast 0 Trim Tab No
BLR Index 0.0000

PROPELLER
Installation Strut PRD 0.500
Type Feathering 3 blades PBW 0.165
PIPA 0.0039

CENTERBOARD
N/A

SCORING OPTIONS						
	COASTAL / LONG DISTANCE			WINDWARD / LEEWARD		
Time on Distance	591.2			662.9		
Time on Time	1.0149			1.0182		
Triple Number	Low	Medium	High	Low	Medium	High
Time on Distance	716.9	535.9	469.9	934.1	670.0	565.8
Time on Time	0.9415	1.2595	1.4365	0.7226	1.0075	1.1930

BOAT	
Name HARA TON	Sail Nr GRE-1822
File GR1822	Data in meters/kilograms

RIG	
Forestay Tension Aft	Spreaders 2
Inner Stay None Fitted	Runners/Checkstays 0
Carbon Mast No	Jib Furler Yes
Fiber Rigging No	Main Furler Yes
Non-Circular Rigging No	
Articulated Bowsprit No	
P 15.050	E 4.990 MDT1 0.150 MW
IG 17.130	J 5.330 MDL1 0.250 GO
ISP 17.070	SFJ 0.000 MDT2 BD
BAS 1.930	SPL 5.230 MDL2 MWT
FSD -3.000	TPS 0.000 TL -3.000 MCG

INCLINING TEST AND FREEBOARDS	
Inclining Test Club Estimated VCG	
Flotation date 12/03/2020	SG
FFM 1.416	SFFP 0.965
FAM 1.121	SAFP 12.568
LCF from stem on CL / on sheer	7.293 / 7.559
Maximum beam station from stem	8.182
RM Measured	252.6kg-m
RM Default	249.1kg-m
Limit of positive stability / Stab.Index	110.1° / 115.8
Freeboard at mast at 5.330	1.183



ORC
Offshore Racing Congress
World leader in rating technology

2020
Measurements
Datasheet

MIZZEN RIG AND SAILS	
N/A	

PROPELLER	
Installation Strut	PRD 0.500
Type Feathering 3 blades	PBW 0.165
Twin Screw No	PIPA 0.0039
ST1 0.042	ST3 0.180 ST5 0.300
ST2 0.180	ST4 0.112 EDL 2.540

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COMMENTS	
Weighted by measurer.	

MOVABLE BALLAST	
N/A	

CENTERBOARD	
N/A	

SAILS INVENTORY																
MAINSAIL (3)																
Id	MHB	MUW	MTW	MHW	MQW	Area	Measurer	Meas.Date	Manufacture	Material	Comment					
3	0.06	0.84	1.56	2.85	3.90	40.83		18/03/2019	BANKS	Dacron						
2	0.04	0.78	1.50	2.77	3.87	40.11		13/03/2018	BANKS	Dacron						
HEADSAILS (2)																
Id	HHB	HUW	HTW	HHW	HQW	HLP	HLU	Ovrlp	Area	Btn	Flying	Measurer	Meas.Date	Manufacture	Material	Comment
2	0.04	0.93	1.82	3.64	5.54	7.52	16.40	141%	60.71		No		11/02/2020	BANKS	Polyest	
1	0.07	0.77	1.52	3.05	4.70	6.40	16.40	120%	51.35		No		18/03/2019	BANKS	Dacron	
SYMMETRIC SPINNAKERS (1)																
Id	SLU	SLE	SL	SHW	SFL	Area	Measurer	Meas.Date	Manufacture	Material	Comment					
1	16.28	16.28	16.28	9.70	9.98	132.36		12/09/2017		Unknown						
ASYMMETRIC SPINNAKERS (1)																
Id	SLU	SLE	SL	SHW	SFL	Area	Kind	Measurer	Meas.Date	Manufacture	Material	Comment				
1	17.00	16.00	16.50	9.31	9.35	128.13	asym		18/03/2019	BANKS	Nylon					

MEASUREMENT INVENTORY					
Measurer					
Date 12/03/2020					
Comment					
Internal Ballast total = 0.0					
Id	Item	Weight	Distance	VCG Description	
Id	Item	Weight	Description		

MEASUREMENT INVENTORY								
Id	Item	Tank Use	Tank Type	Capcty	Dist.	VCG	Condtn	Description
1	Tank	fuel			10.00		400.0	
Id	Item	Weight	Distance	VCG	Description			

2020

ORC Club Certificate Appendix

BOAT			
Name	HARA TON ANGELON IV	Certificate Number	01239
Sail Nr	GRE-1822	Issued On	04/04/2020

TIME ALLOWANCES							
Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat VMG	1078.4	885.0	772.6	704.8	674.2	659.8	652.6
52°	692.3	578.4	511.1	477.5	463.4	457.6	453.8
60°	646.4	545.9	489.1	463.2	450.7	444.7	440.2
75°	612.7	520.8	473.9	452.4	439.4	429.9	419.4
90°	619.6	523.0	471.2	447.1	435.8	423.8	403.5
110°	632.6	518.1	462.5	438.2	420.9	405.7	388.5
120°	651.5	532.7	469.6	441.8	422.4	404.1	373.9
135°	722.9	582.3	499.7	457.7	435.6	417.0	379.9
150°	859.6	676.1	569.2	499.3	459.8	438.5	403.5
Run VMG	992.6	780.7	657.3	573.8	519.3	477.4	432.2
Selected Courses							
Windward / Leeward	1035.5	832.9	714.9	639.3	596.8	568.6	542.4
Circular Random	854.9	684.2	590.9	535.9	501.9	480.1	454.9
Coastal / Long Distance	1031.2	780.2	639.3	552.9	509.7	478.8	433.1
Non Spinnaker	912.4	725.0	621.3	559.2	520.3	495.1	465.2

Velocity Prediction in Knots for True Wind Speeds							
Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat Angles	44.3°	43.5°	42.4°	42.0°	40.9°	40.1°	39.9°
Beat VMG	3.34	4.07	4.66	5.11	5.34	5.46	5.52
52°	5.20	6.22	7.04	7.54	7.77	7.87	7.93
60°	5.57	6.59	7.36	7.77	7.99	8.10	8.18
75°	5.88	6.91	7.60	7.96	8.19	8.37	8.58
90°	5.81	6.88	7.64	8.05	8.26	8.49	8.92
110°	5.69	6.95	7.78	8.22	8.55	8.87	9.27
120°	5.53	6.76	7.67	8.15	8.52	8.91	9.63
135°	4.98	6.18	7.20	7.87	8.26	8.63	9.48
150°	4.19	5.32	6.32	7.21	7.83	8.21	8.92
Run VMG	3.63	4.61	5.48	6.27	6.93	7.54	8.33
Gybe Angles	145.0°	149.0°	150.0°	153.0°	160.0°	180.0°	180.0°