

IMS RATING CERTIFICATE No. 35p1  
Based on: CLUB VCG (Metric)

IMS AMENDED TO JANUARY 2007  
Offshore Racing Congress  
Chelmsford, England  
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IMS AMENDED TO JANUARY 2007 VPP: 29/AUG/07 15:50:42  
Cert No 35p1 8 HA320-1.DAT 29/AUG/07 15:48:12  
OFF Meas'd: 00/00/00 HA320.OFF 29/AUG/07 14:20:24

NOT VALID AFTER 12/07

---GPH---  
! 678.3 !

--- YACHT DESCRIPTION ----- RATING OFFICE: -----  
Name: HA 320 Issued: TESTCALCULATION  
Sail No: HANSE320 29/AUG/07 NOT PERMITTED FOR RACIN  
Class: HANSE 320 105% Measured:  
LOA: 9.550m Beam(MB) 3.301m 17/MAY/99  
Designer: judel/vrolijk  
Builder: YZ GREIFSWALD Revalidation Authority: D.S.V.  
Rig: FRACTIONAL SLOOP 106% Jib Measurer:  
Keel/CB: FIXED KEEL  
PropInst: STRUT DRIVE FOLDING "I CERTIFY THAT I UNDERSTAND MY  
FwdAccom: YES Spin: SYMMETRIC RESPONSIBILITIES UNDER THE IMS."  
HullCnst: HVYCORE RudCnst: STNDRD!  
Forestay: ADJST AFT BoomMtl: HEAVY! OWNER:.....  
Spreadrs: 2 Sets InrFsty: NONE!  
Runners: NONE Jumpers: NONE!  
Dates: AGE:0/2007

COMMENTS-----!  
105% JIB, SPINNAKER ONLY  
DESIGNER LINES

----- LIMITS AND REGULATIONS -----  
Limit of Positive Stability: MEETS REQ Measurement Inventory: 17/MAY/99  
Minimum Displacem't 2519kg: MEETS REQ Accom Lgth: RACE= 9.6 C/R= 9.6  
Maximum Crew Weight: 400 kg Accom Certificate: C/R DA= 0.86%  
Stability Index: 115.7 Plan Approval: NONE FILED  
C/R HeavyItems Pitch Adjustm't 0.00000 Anchor(s) Weight: 0 Dist: 0.00  
Applied Age Allowance: 0.00%

NOTE TO OWNER: The range available to revise crew weight is 388- 716 kg.  
----- TIME ALLOWANCES IN SEC/MI BY TRUE WIND VELOCITY & ANGLE -----  
(NOT WIND-AVERAGED)

Wind Velocity:	6kt	8kt	10kt	12kt	14kt	16kt	20kt	CHECKSUM
BEAT ANGLES:	44.6	43.4	42.7	40.9	39.8	39.1	38.9	( 289.4)
BEAT VMG:	1215.1	985.2	863.8	808.5	777.2	757.9	742.7	(6150.4)
52 :	777.9	637.1	574.3	543.6	528.4	519.0	511.0	(4091.3)
R 60 :	723.9	600.9	549.2	519.0	505.3	498.3	491.7	(3888.3)
E 75 :	682.3	566.0	518.6	500.3	485.1	474.6	465.6	(3692.5)
A 90 :	632.8	543.2	502.1	482.6	473.0	465.9	446.6	(3546.2)
C 110 :	656.3	557.3	510.0	484.2	463.7	444.4	423.2	(3539.1)
H 120 :	700.2	578.6	523.6	492.0	470.7	448.9	411.7	(3625.7)
135 :	804.8	640.1	559.7	515.0	488.6	468.4	427.4	(3904.0)
150 :	960.5	748.7	624.8	557.9	516.3	490.5	451.0	(4349.7)
RUN VMG:	1109.1	864.5	720.9	628.3	569.4	528.3	480.7	(4901.2)
GYBE ANGLES:	143.7	148.3	151.9	163.1	169.7	172.6	176.2	(1125.5)

NOTE: To convert any time allowance above to speed in knots: Kt = 3600/TA

----- TIME ALLOWANCES FOR SELECTED COURSES (AFTER WIND-AVERAGING) -----

Wnd/Lwd VMG	1182.3	939.0	805.1	728.2	681.3	650.5	618.4	(5604.8)
CircularRandom	945.8	758.3	657.1	598.3	562.3	538.9	510.0	(4570.7)
Ocean for PCS	1066.4	831.9	698.8	615.9	560.9	522.1	469.2	(4765.2)
Non-Spinnaker	1040.2	823.6	704.4	633.6	589.6	561.1	527.2	(4879.7)

----- SIMPLIFIED SCORING OPTIONS -----

Time-on-Distance (sec/mi)	Time-on-Time TMF	Performance Line PLT PLD
! OFFSHORE 678.3 (=GPH)	0.8846 (=600/GPH)	0.678 53.9 (Ocean)
! INSHORE 764.3 (=ILC)	0.8832 (=675/ILC)	0.872 264.1 (Olympic)
! Performance Line Corrected Time = (PLT x Elapsed Time)-(PLD x Distance) !		
! TRI-NUMBER TMFS BY WIND RANGE !		
! WINDWARD Low Medium High	! CIRCULAR	Low Medium High
! /LEEWARD 0.6469 0.9012 1.0566	! RANDOM	0.8549 1.1306 1.2780

-----CENTERBOARD AND DRAFT-----  
ECM 0.000 CBRC 0.000 CBMC 0.000 CBTC 0.000  
WCBA 0.0 CBDA 0.000 KCDA 0.000 ECE 0.000  
WCBB 0.0 CBDB 0.000 ENDPLATE ADJ (KEDA) 0.000  
-----PROPELLER AND INSTALLATION-----  
PRD 0.320 ST1 0.041 ST4 0.103 ST5 0.260 EDL 1.000

PIPA 0.0032 ST4MAX 0.103  
-----FLOTATION DATA-----  
FFPS 1.295 AFPS 1.050 SFFP 0.094 SAFFP 9.075  
FFM 1.275 FAM 1.015 FFPV 0.000 AFPV 0.000  
FF 1.279 FA 1.018 RMst 97.8 SG 1.015

-----STABILITY DATA-----  
No inclining test was performed. Club righting moment is based on class standard vertical center of gravity of 0.150 to the offset file datum.  
SMB 6.641  
RM2 100.6 RM20 89.2 RM40 69.2 RM60 48.3  
RM90 20.1 WBV 0.0 CREW ARM (CRA) 1.634  
CALCULATED LIMIT OF POSITIVE STABILITY: 113.7 DEGREES  
RATIO STABILITY CURVE AREAS, POSITIVE/NEGATIVE 2.120

-----HYDROSTATICS-----MEASUREMENT TRIM--SAILING TRIM--  
KEEL DRAFT (DHK0) 1.776 (DHKA) 1.808  
2ND MOMENT LENGTH (LSM0) 8.956 (LSM1) 9.181  
DISPLACEMENT (WEIGHT) (DSPM) 5154 (DSPS) 5748  
WETTED SURFACE (WSM) 23.65 (WSS) 24.68  
VCG FROM OFFSETS DATUM (For CLUB RM) (VCGD) 0.150  
VCG FROM MEASUREMENT TRIM WATERLINE (VCGM) 0.125  
INTEGRATED BEAM ATTENUATED WITH DEPTH (B) 2.888  
MAXIMUM SECTION AREA (AMS1) 1.177  
BEAM/DEPTH RATIO (BTR) 4.623  
EFFECTIVE DRAFT (D) 1.617  
2 DEG HEEL (LSM2) 9.186 25 DEG HEEL (LSM3) 9.550  
SUNK (LSM4) 10.317 AVG LENGTH (L) 9.162  
TRIM: 1mm/8.097m-Kg SINK: 1mm/17.373kg

-----SAIL AREAS-----  
MAIN+FORE+MIZ'N: 53.64 MAIN: 29.55 MIZ'N: 0.00  
GENOA: 26.95 SYM: 81.31 ASYM: 0.00

-----FORETRIANGLE-----MAIN & SPARS-----  
J 3.870 FSP 0.064  
IG 12.450 LPG 4.07 HB 0.150 TH NO  
MW 0.215 LP 4.13 MGT 0.00 TL 0.800  
GO 0.215 JL 0.00 MGU 0.00 MDT1 0.095  
ISP 12.450 JGT 0.00 MGM 0.00 MDL1 0.160  
IM 12.450 JGU 0.00 MGL 0.00 MDT2 0.095  
HBI 1.080 JGM 0.00 MSW 0.0 MDL2 0.130  
SFJ 0.000 JGL 0.00 P 11.700 MWT 105.0  
SPL 3.880 TPS 0.000 E 4.100 MCG 4.200  
SL 0.00 ASL EC 4.100 BD 0.150  
SMW 0.00 AMG BAS 1.600 CPW 2.320  
SF ASF SPS 0.000 BAL 0.150

-----MIZZEN-----  
IY 0.000 PY 0.000 HBY 0.000 TLY 0.000  
EB 0.000 EY 0.000 MGTY 0.000 MDT1Y 0.000  
YSD 0.00 ECY 0.000 MGUY 0.000 MDL1Y 0.000  
YSF 0.00 BASY 0.000 MGYM 0.000 MDT2Y 0.000  
YSMG 0.00 BAILY 0.000 MGLY 0.000 MDL2Y 0.000  
HBIY 0.000 BDY 0.000

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IMS AMENDED TO JANUARY 2007 VPP: 29/AUG/07 15:50:44  
Cert No 35p1 8 HA320-2.DAT 29/AUG/07 15:47:48  
OFF Meas'd: 00/00/00 HA320.OFF 29/AUG/07 14:20:24

NOT VALID AFTER 12/07

---GPH---  
! 681.9 !  
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Builder: YZ GREIFSWALD Revalidation Authority: D.S.V.  
Rig: FRACTIONAL SLOOP 96% Jib Measurer:  
Keel/CB: FIXED KEEL  
PropInst: STRUT DRIVE FOLDING "I CERTIFY THAT I UNDERSTAND MY  
FwdAccom: YES Spin: ASYM-CL RESPONSIBILITIES UNDER THE IMS."  
HullCnst: HVYCORE RudCnst: STNDRD!  
Forestay: ADJST AFT BoomMtl: HEAVY! OWNER:.....  
Spreadrs: 2 Sets InrFsty: NONE!  
Runners: NONE Jumpers: NONE!  
Dates: AGE:0/2007!  
COMMENTS-----!  
ST-JIB GENNAKER ONLY  
DESIGNER LINES

----- LIMITS AND REGULATIONS -----  
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Minimum Displacem't 2519kg: MEETS REQ Accom Lgth: RACE= 9.6 C/R= 9.6  
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Stability Index: 115.7 Plan Approval: NONE FILED  
C/R HeavyItems Pitch Adjustm't 0.00000 Anchor(s) Weight: 0 Dist: 0.00  
Applied Age Allowance: 0.00%

NOTE TO OWNER: The range available to revise crew weight is 388- 716 kg.  
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(NOT WIND-AVERAGED)

Wind Velocity:	6kt	8kt	10kt	12kt	14kt	16kt	20kt	CHECKSUM
BEAT ANGLES:	44.4	43.1	42.6	40.8	39.6	38.9	38.5	( 287.9)
BEAT VMG:	1233.9	996.0	868.0	805.8	773.1	752.6	733.7	(6163.1)
52 :	791.3	646.1	578.4	543.7	526.5	516.6	507.2	(4109.8)
R 60 :	737.3	608.5	553.9	521.0	503.9	496.5	488.8	(3909.9)
E 75 :	673.8	559.3	513.4	496.1	487.1	474.6	462.5	(3666.8)
A 90 :	622.7	538.1	498.9	479.7	469.2	461.4	447.9	(3517.9)
C 110 :	648.2	554.0	508.1	482.9	462.2	442.3	417.5	(3515.2)
H 120 :	694.3	576.1	522.4	491.7	470.7	449.2	411.3	(3615.7)
135 :	805.3	642.2	562.4	518.4	491.9	473.0	434.0	(3927.2)
150 :	972.7	765.9	642.5	569.6	526.2	497.6	460.0	(4434.5)
RUN VMG:	1123.2	884.4	741.9	645.8	580.5	536.9	485.7	(4998.4)
GYBE ANGLES:	140.4	143.7	149.0	162.4	173.3	176.1	178.4	(1123.3)

NOTE: To convert any time allowance above to speed in knots: Kt = 3600/TA

----- TIME ALLOWANCES FOR SELECTED COURSES (AFTER WIND-AVERAGING) -----

Wnd/Lwd VMG	1199.4	954.2	817.2	735.7	685.1	652.1	616.0	(5659.7)
CircularRandom	952.6	763.2	660.7	600.6	563.5	539.2	509.2	(4589.0)
Ocean for PCS	1075.1	837.6	702.4	618.0	562.0	522.8	470.5	(4788.4)
Non-Spinnaker	1051.7	828.3	704.6	631.2	586.0	557.8	527.6	(4887.2)

----- SIMPLIFIED SCORING OPTIONS -----

Time-on-Distance (sec/mi)	Time-on-Time TMF	Performance Line PLT PLD
! OFFSHORE 681.9 (=GPH)	0.8799 (=600/GPH)	0.667 48.8 (Ocean)
! INSHORE 768.2 (=ILC)	0.8787 (=675/ILC)	0.837 241.0 (Olympic)
! Performance Line Corrected Time = (PLT x Elapsed Time)-(PLD x Distance) !		
! TRI-NUMBER TMF'S BY WIND RANGE !		
! WINDWARD Low Medium High	! CIRCULAR	Low Medium High
! /LEEWARD 0.6372 0.8907 1.0554	! RANDOM	0.8480 1.1250 1.2782

-----CENTERBOARD AND DRAFT-----  
ECM 0.000 CBRC 0.000 CBMC 0.000 CBTC 0.000  
WCBA 0.0 CBDA 0.000 KCDA 0.000 ECE 0.000  
WCBW 0.0 CBDB 0.000 ENDPATE ADJ (KEDA) 0.000  
-----PROPELLER AND INSTALLATION-----  
PRD 0.320 ST1 0.041 ST4 0.103 ST5 0.260 EDL 1.000

PIPA 0.0032 ST4MAX 0.103  
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FFM 1.275 FAM 1.015 FFPV 0.000 AFPV 0.000  
FF 1.279 FA 1.018 RMst 97.8 SG 1.015

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BEAM/DEPTH RATIO (BTR) 4.623  
EFFECTIVE DRAFT (D) 1.617  
2 DEG HEEL (LSM2) 9.186 25 DEG HEEL (LSM3) 9.550  
SUNK (LSM4) 10.317 AVG LENGTH (L) 9.162  
TRIM: 1mm/8.097m-Kg SINK: 1mm/17.373kg

-----SAIL AREAS-----  
MAIN+FORE+MIZ'N: 53.64 MAIN: 29.55 MIZ'N: 0.00  
GENOA: 23.19 SYM: ASYM: 71.66

-----FORETRIANGLE-----MAIN & SPARS-----  
J 3.870 FSP 0.064  
IG 12.450 LPG 3.68 HB 0.150 TH NO  
MW 0.215 LP 3.74 MGT 0.00 TL 0.000  
GO 0.215 JL 12.30 MGU 0.00 MDT1 0.095  
ISP 12.450 JGT 0.00 MGM 0.00 MDL1 0.000  
IM 12.450 JGU 0.00 MGL 0.00 MDT2 0.000  
HBI 1.080 JGM 0.00 MSW 0.0 MDL2 0.000  
SFJ 0.000 JGL 0.00 P 11.700 MWT 105.0  
SPL 0.000 TPS 4.300 E 4.100 MCG 4.200  
SL 0.00 ASL EC 4.100 BD 0.150  
SMW 0.00 AMG BAS 1.600 CPW 2.320  
SF ASF SPS 0.000 BAL 0.150

-----MIZZEN-----  
IY 0.000 PY 0.000 HBY 0.000 TLY 0.000  
EB 0.000 EY 0.000 MGTY 0.000 MDT1Y 0.000  
YSD 0.00 ECY 0.000 MGUY 0.000 MDL1Y 0.000  
YSF 0.00 BASY 0.000 MGMY 0.000 MDT2Y 0.000  
YSMG 0.00 BAILY 0.000 MGLY 0.000 MDL2Y 0.000  
HBIY 0.000 BDY 0.000