#### **UL 260**

Stabitlity calculation according to ISO 12217-3-2017 Small craft Stability and buoyancy assessment

#### By Xiamen DAWN DESIGN

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604B-588 Yuntong Center, No.95 Xiangyunyilu road, Xiamen area of

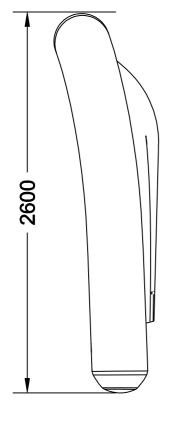
China(Fujian) Pilot Free Trade Zone

Owner: 王弘涛

DND		ITEM	PROJECT:	UL	260	
	DAWN YACHT DESIGN 直恩建筑设计有限	2公司	UL 260	Cat.	ca	t. C
	Signature			REV.	PAPER	SCALE
Design by Checked by	John Com		Stability	R2	A4	
Technic by	1		calculations	sheet	1	of 8
Approved by	DATE	2018.05				

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  - 3.1 Maximum power and buoyancy
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# **SPECIFICATION**

 Loa
 2600mm

 Beam
 1520mm

 Inside Length
 1822mm

 Inside Width
 756mm

 Weight
 31Kg

 Max Pax
 3

 Max Load
 340Kg

 Max HP
 6

 Shaft
 Short

 Tube
 38cm

 Airtight Chambers
 3



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DAWN YACHT DESIGN	Signature	S.C/L			
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	Drawing Title	Project N	Project Name: UL260	L260
		Drawing	Drawing NOu 26-01-0	01-0
	General Arrangement		PAPER	SCAL
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UL260 Weight							
Weight of the boat	31	kg					
Weight of the motor	40.9	kg					
test load	150.75	kg	3 passengers				
TOTAL test mass:	222.65	kg					

The total test load  $m_{\mathrm{t}}$ , in kilograms, shall be calculated using the following formula:

$$m_t = (0.67 \times n \times 75) + (0.67 \times 37.5)$$
 for a child, if applicable

n is the maximum permissible number of adults determined by the manufacturer (see 6.1), i.e. 75 kg for each permissible adult and 37,5 kg for a child, if applicable.

# **Maximum power**

This is applicable to Type II boats only.

— For boats without a transom:  $P_{\text{max}} = 0.8F(d)$ 

For boats with a transom:  $P_{\text{max}} = 1,2F(d)$ 

where

 $P_{
m max}$  is the maximum motor power rating, in kilowatts, determined in accordance with ISO 8665;

F(d) is the dimensional factor =  $l \times b$ 

where

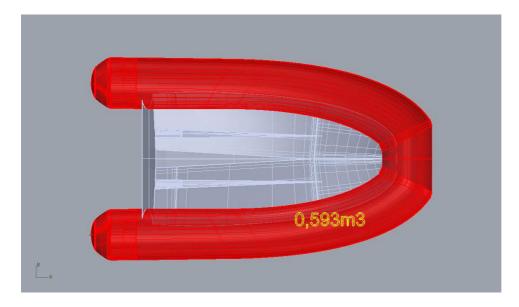
i is the overall length of the boat, in metres, from the bow to the extremity of the rear float (excluding handholds or other fittings);

b is the overall beam of the boat, in metres (excluding handholds or other fittings).

	l(m)	b(m)	Pmax Kw	Pmax HP
UL 260	2.6	1.530	4.77	6.40

# **UL260 Buoyancy**

Inflatable Buoyancy tube: 0.593 m<sup>3</sup>



### **Maximum Load**

— For Types I and III:  $m = (0.5 \times V \times 1000) - M$ 

— For Types II and IV:  $m = (0.75 \times V \times 1000) - M$ 

#### where

m is the maximum load capacity, in kilograms (total mass on board including persons, equipment, outboard motor(s) and fuel);

V is the volume, in cubic metres, of the buoyancy of the boat;

M is the total mass, in kilograms, of the boat as supplied by the manufacturer (inclusive of all permanently installed equipment supplied with the boat: hull, fittings and similar items but without outboard motor(s) and fuel). Permanently installed engine(s) and drive systems shall also be included.

Buoyancy volume (m3)	M (kg)	m (kg)	Max load reccomended by manufacturer:
$m^3$	kg	kg	kg
0.593	31	413.75	340

## Maximum number of passengers

$$n = \frac{l_1}{0.38} - 1$$

where  $l_i$  is the inboard length, in metres.

Under no circumstances shall the value, n, expressed in body mass, exceed the maximum load capacity (see 6.4).

The value n shall always be rounded down to the nearest integer but, if the first decimal place is greater than 5, a child may be added, or if greater than 7, an adult may be added.

For calculations, the body mass of a child is defined as 37,5 kg and the body mass of an adult as 75 kg.

The data displayed on the builder's plate(s), see clause 8 e), shall include at least one adult and not more than one child.

	<b>l</b> <sub>i</sub>	n	N. persons
UL 260	1.82	3.789	3

# **Hydrostatics Report**

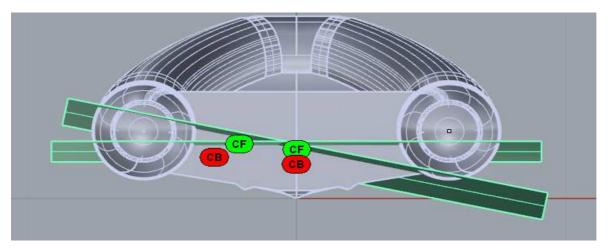
Length Overall, LOA	2.60	m
L <sub>H</sub> =	2.60	m
Beam Overall, Boa	1.51	m
Waterline Length, Lwl	2.15	m
Waterline Beam, Bwl	1.50	m
Navigational Draft, T	0.17	m
Displacement Weight	222.65	kgf
Volume	0.22	m³
LCG	0.47	m
TCG	0.00	m
VCG	0.40	m
Fluid Density	1025.00	kg/m³
LCB	0.46	m
TCB	0.00	m
VCB	0.13	m
Wetted Surface Area	2.63	m²
Waterplane Area, Awp	2.25	m²
LCF	0.53	m
TCF	0.25	m
Weight To Immerse	23.04	kgf/cm
I(transverse)	0.39	m^4
I(longitudinal)	0.56	m^4
BMt	1.79	m
BMI	2.58	m
GMt	1.53	m
GMI	2.31	m
Mt	1.73	m
MI	2.52	m
Heel Angle	0.00	deg
Trim Angle	-1.49	deg
Cb	0.39	
Cwp	0.70	
Cvp	0.56	
Cws	3.86	

## Offset load test simulation

1.Test condition	1						
	weight(kg)	x (mm)	y(mm)	z(mm)	Mx	My	Mz
boat	71.9	470	0	206	33793	0	14811.4
load	150.75	470	375	490	70852.5	56531.3	73867.5
	222.65	470.0	253.9	398.3	104646	56531.3	88678.9
1.General							

Length Overall, LOA  L <sub>H</sub> =  2.600  Beam Overall, Boa  1.520  Waterline Length, Lwl  Waterline Beam, Bwl  Navigational Draft, T  Displacement Weight  Volume  1.22.652  Volume  0.217  TCG  0.470  TCG  0.254  WCG  0.398  Fluid Density  1025.000  kg/m³  LCB  TCB  0.303  WCB  0.161  Wetted Surface Area  Waterplane Area, Awp  1.828  LCF  0.595  TCF  0.213  Weight To Immerse  I(transverse)  I(transverse)  I(longitudinal)  BMI  0.909  BMI  2.136  M  GMt  0.667  GMI  1.894  Mt  0.836  MI  2.062  M  Heel Angle  -11.717  deg  Trim Angle  -1.973  deg			
Beam Overall, Boa         1.520         m           Waterline Length, Lwl         2.107         m           Waterline Beam, Bwl         1.517         m           Navigational Draft, T         0.713         m           Displacement Weight         222.652         kgf           Volume         0.217         m³           LCG         0.470         m           TCG         0.254         m           VCG         0.398         m           Fluid Density         1025.000         kg/m³           LCB         0.462         m           TCB         0.303         m           VCB         0.161         m           Wetted Surface Area         2.318         m²           Waterplane Area, Awp         1.828         m²           LCF         0.595         m           TCF         0.213         m           Weight To Immerse         18.752         kgf/cm           I(longitudinal)         0.464         m^4           BMt         0.909         m           BMI         2.136         m           GMI         1.894         m           Mt         0.836	Length Overall, LOA	2.600	m
Waterline Length, Lwl Waterline Beam, Bwl Navigational Draft, T Displacement Weight Volume UCG VCG UCG VCG VCG UCG UCCG VCG UCCG UC	L <sub>H</sub> =	2.600	m
Waterline Beam, Bwl Navigational Draft, T Displacement Weight Volume	Beam Overall, Boa	1.520	m
Navigational Draft, T         0.713         m           Displacement Weight         222.652         kgf           Volume         0.217         m³           LCG         0.470         m           TCG         0.254         m           VCG         0.398         m           Fluid Density         1025.000         kg/m³           LCB         0.462         m           TCB         0.303         m           VCB         0.161         m           Wetted Surface Area         2.318         m²           LCF         0.595         m           TCF         0.213         m           Weight To Immerse         18.752         kgf/cm           I(transverse)         0.197         m^4           I(longitudinal)         0.464         m^4           BMI         0.909         m           BMI         0.136         m           GMI         1.894         m           Mt         0.836         m           MI         2.062         m           Heel Angle         -11.717         deg	Waterline Length, Lwl	2.107	m
Displacement Weight	Waterline Beam, Bwl	1.517	m
Volume         0.217         m³           LCG         0.470         m           TCG         0.254         m           VCG         0.398         m           Fluid Density         1025.000         kg/m³           LCB         0.462         m           TCB         0.303         m           VCB         0.161         m           Wetted Surface Area         2.318         m²           LCF         0.595         m           TCF         0.213         m           Weight To Immerse         18.752         kgf/cm           I(transverse)         0.197         m^4           I(longitudinal)         0.464         m^4           BMt         0.909         m           BMI         2.136         m           GMt         0.667         m           GMI         1.894         m           Mt         0.836         m           MI         2.062         m           Heel Angle         -11.717         deg	Navigational Draft, T	0.713	m
LCG 0.470 m TCG 0.254 m VCG 0.398 m Fluid Density 1025.000 kg/m³ LCB 0.462 m TCB 0.303 m VCB 0.161 m Wetted Surface Area 2.318 m² UCF 0.595 m TCF 0.213 m Weight To Immerse 18.752 kgf/cm I(transverse) 0.197 m^4 I(longitudinal) 0.464 m^4 BMt 0.909 m BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	Displacement Weight	222.652	kgf
TCG 0.254 m VCG 0.398 m Fluid Density 1025.000 kg/m³ LCB 0.462 m TCB 0.303 m VCB 0.161 m Wetted Surface Area 2.318 m² Waterplane Area, Awp 1.828 m² LCF 0.595 m TCF 0.213 m Weight To Immerse 18.752 kgf/cm I(transverse) 0.197 m^4 I(longitudinal) 0.464 m^4 BMt 0.909 m BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	Volume	0.217	m³
VCG 0.398 m Fluid Density 1025.000 kg/m³ LCB 0.462 m TCB 0.303 m VCB 0.161 m Wetted Surface Area 2.318 m² Waterplane Area, Awp 1.828 m² LCF 0.595 m TCF 0.213 m Weight To Immerse 18.752 kgf/cm I(transverse) 0.197 m^4 I(longitudinal) 0.464 m^4 BMt 0.909 m BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	LCG	0.470	m
Fluid Density	TCG	0.254	m
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VCB         0.161         m           Wetted Surface Area         2.318         m²           Waterplane Area, Awp         1.828         m²           LCF         0.595         m           TCF         0.213         m           Weight To Immerse         18.752         kgf/cm           I(transverse)         0.197         m^4           I(longitudinal)         0.464         m^4           BMI         0.909         m           BMI         2.136         m           GMt         0.667         m           GMI         1.894         m           Mt         0.836         m           MI         2.062         m           Heel Angle         -11.717         deg		0.462	m
Wetted Surface Area       2.318       m²         Waterplane Area, Awp       1.828       m²         LCF       0.595       m         TCF       0.213       m         Weight To Immerse       18.752       kgf/cm         I(transverse)       0.197       m^4         I(longitudinal)       0.464       m^4         BMt       0.909       m         BMI       2.136       m         GMt       0.667       m         GMI       1.894       m         Mt       0.836       m         MI       2.062       m         Heel Angle       -11.717       deg	TCB	0.303	m
Waterplane Area, Awp LCF 0.595 m TCF 0.213 m Weight To Immerse 18.752 kgf/cm I(transverse) 0.197 m^4 I(longitudinal) 0.464 m^4 BMt 0.909 m BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	VCB	0.161	m
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TCF 0.213 m  Weight To Immerse 18.752 kgf/cm  I(transverse) 0.197 m^4  I(longitudinal) 0.464 m^4  BMt 0.909 m  BMI 2.136 m  GMt 0.667 m  GMI 1.894 m  Mt 0.836 m  MI 2.062 m  Heel Angle -11.717 deg		1.828	m²
Weight To Immerse       18.752       kgf/cm         I(transverse)       0.197       m^4         I(longitudinal)       0.464       m^4         BMt       0.909       m         BMI       2.136       m         GMt       0.667       m         GMI       1.894       m         Mt       0.836       m         MI       2.062       m         Heel Angle       -11.717       deg			m
I(transverse) 0.197 m^4 I(longitudinal) 0.464 m^4 BMt 0.909 m BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg			
I(longitudinal) 0.464 m^4  BMt 0.909 m  BMI 2.136 m  GMt 0.667 m  GMI 1.894 m  Mt 0.836 m  MI 2.062 m  Heel Angle -11.717 deg	•		kgf/cm
BMt 0.909 m  BMI 2.136 m  GMt 0.667 m  GMI 1.894 m  Mt 0.836 m  MI 2.062 m  Heel Angle -11.717 deg	` ,	0.197	m^4
BMI 2.136 m GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	` • •		m^4
GMt 0.667 m GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg			m
GMI 1.894 m Mt 0.836 m MI 2.062 m Heel Angle -11.717 deg	=		m
Mt 0.836 m Ml 2.062 m Heel Angle -11.717 deg			m
MI 2.062 m Heel Angle -11.717 deg			m
Heel Angle -11.717 deg			m
3 - 3 -	••••		
Trim Angle -1.973 deg	•		•
	Trim Angle	-1.973	deg

#### 2.Test



Water does not enter into the boat.