



FRICATIVE HINGE PORTLIGHTS

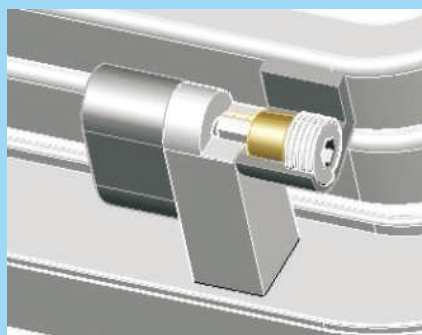
please note hinge in the order

FRICATIVE HINGE PATENT IN MANY COUNTRIES



If you order the portlight with fricative hinge,
No need to install a stay or port hook
to keep your portlight open

- New patented design: unique SS 316 fricative hinge.
- New portlight can be opened at any degree, including an impressive 180 degree, without a hatch arm or port hook for a clean and elegant look.
- Storm cover easily installed and removed. It also can be adjusted for gasket water tightness.



Fricative hinges can be applied to the following model and dimensions
Modern portlighty can be applied in the following model and dimension.

- Opening ports: LS,LSO,LSR,CLS,CLSO,CLSR
TLS,TLSO,TLSR,CTLS,CTLISO,CTLNR
LS-H,LSO-H,LSR-H,CLS-H,CLSO-H
CLSR-H,LO,CLO
- Dimension: Small portlight Model Number 0512-0818
Big portlight Model Number 1020-1228
Special dimension: If there is no portlight models size in the catalogue,
Please inform the Model No, the dimension and spigot.

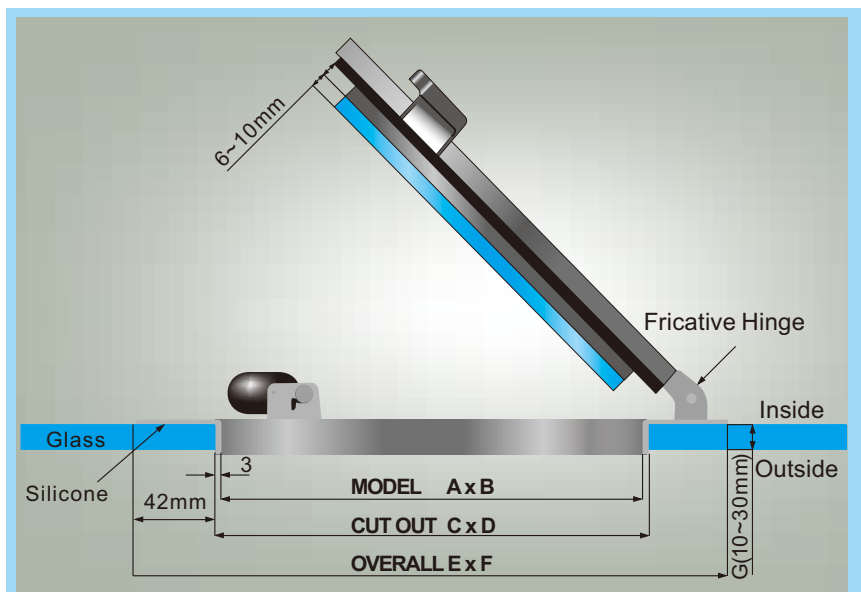
GLASS IN GLASS PORTLIGHT (CUSTOM MADE)



Man Ship has developed a new flush portlight which can be installed inset and flush within a glass window. Designed to give an elegant touch without any visible screws.

Features

- All Stainless steel 316 material with high quality mirror polish.
- With certificate of grant of Patent-Man ship Fricative Hinge.
- Glass portlight flush design which can be installed directly inset within a glass window.
- Wide range of size and shape available.
- Watertight function which passed the watertight test for 6 meter level.



RECTANGULAR OPENING PORTS



Rectangular opening ports



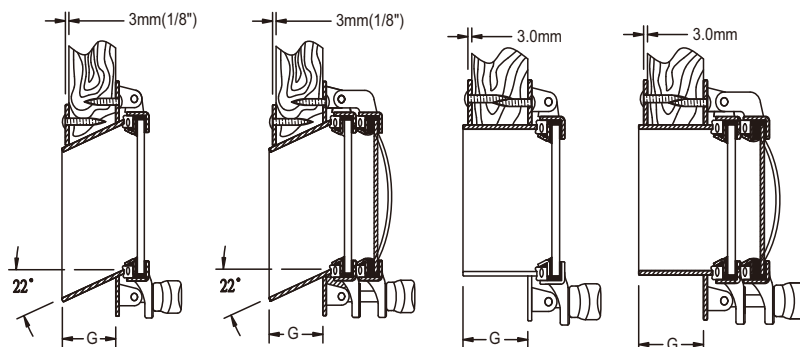
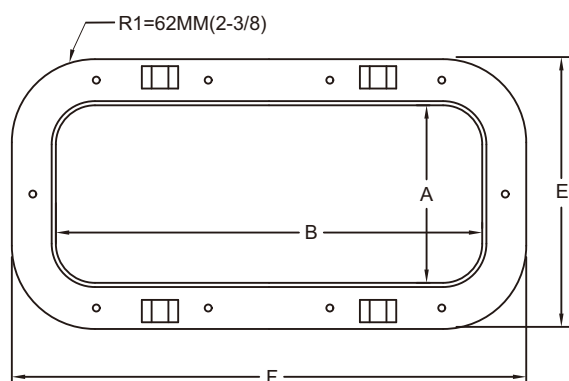
LS Rect. Portholes / boat outside view



Rect port with storm cover.

RECTANGULAR OPENING PORTS - ANGLED SPIGOT

MODEL No.		A x B		C x D		E x F		R	R1	GLASS THICKNESS					
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL									
LS-0512A		5X12	127X305	5 1⁄4	X 12 1⁄8	133x307	7 5⁄8	X 14 1⁄2	193x368	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-0714A		7X14	178X356	7 1⁄4	X 14 1⁄4	184x362	9 5⁄8	X 16 5⁄8	244x422	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-0716A	CLS-0716A	7X16	178X406	7 1⁄4	X 16 1⁄4	184x413	9 5⁄8	X 18 5⁄8	244x473	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-0718A	CLS-0718A	7X18	178X457	7 1⁄4	X 18 1⁄4	184x464	9 5⁄8	X 20 5⁄8	244x524	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-0816A	CLS-0816A	8X16	203X406	8 1⁄4	X 16 1⁄4	210x413	10 5⁄8	X 18 5⁄8	269x473	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-0818A	CLS-0818A	8X18	203X457	8 1⁄4	X 18 1⁄4	210x464	10 5⁄8	X 20 5⁄8	269x524	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LS-1020A	CLS-1020A	10X20	254X508	10 3⁄8	X 20 3⁄8	262x516	12 7⁄8	X 22 7⁄8	327x581	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LS-1024A	CLS-1024A	10X24	254X609	10 3⁄8	X 24 3⁄8	262x617	12 7⁄8	X 26 7⁄8	327x682	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LS-1224A	CLS-1224A	12X24	305X609	12 3⁄8	X 24 3⁄8	313x617	14 7⁄8	X 26 7⁄8	378x682	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LS-1228A	CLS-1228A	12X28	305X710	12 3⁄8	X 28 3⁄8	313x718	14 7⁄8	X 30 7⁄8	378x784	1 1⁄4	32	2 1⁄2	65	3⁄8	10



RECTANGULAR OPENING PORTS - STRAIGHT SPIGOT

MODEL No.		A x B		C x D		E x F		R	R1	GLASS THICKNESS		
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL						
LS-0512S		5X12	127X305	5 1⁄4	12 1⁄8	133x307	7 5⁄8	14 1⁄2	193x368	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0714S		7X14	178X356	7 1⁄4	14 1⁄4	184x362	9 5⁄8	16 5⁄8	244x422	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0716S	CLS-0716S	7X16	178X406	7 1⁄4	16 1⁄4	184x413	9 5⁄8	18 5⁄8	244x473	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0718S	CLS-0718S	7X18	178X457	7 1⁄4	18 1⁄4	184x464	9 5⁄8	20 5⁄8	244x524	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0816S	CLS-0816S	8X16	203X406	8 1⁄4	16 1⁄4	210x413	10 5⁄8	18 5⁄8	269x473	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0818S	CLS-0818S	8X18	203X457	8 1⁄4	18 1⁄4	210x464	10 5⁄8	20 5⁄8	269x524	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-1020S	CLS-1020S	10X20	254X508	10 3⁄8	20 3⁄8	262x516	12 7⁄8	22 7⁄8	327x581	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1024S	CLS-1024S	10X24	254X609	10 3⁄8	24 3⁄8	262x617	12 7⁄8	26 7⁄8	327x682	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1224S	CLS-1224S	12X24	305X609	12 3⁄8	24 3⁄8	313x617	14 7⁄8	26 7⁄8	378x682	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1228S	CLS-1228S	12X28	305X710	12 3⁄8	28 3⁄8	313x718	14 7⁄8	30 7⁄8	378x784	1 1⁄4 32	2 1⁄2 65	3⁄8 10

1. Standard angled spigot size "G" available 1 1/4 32mm · 1 1/2 38mm · 2 51mm · 2 1/2 63mm · 3 76mm · 3 1/2 89mm
2. Special spigot size "G" available from 1 25.4mm ~ 5 127mm
3. Custom sizes available if Radius (R & R1) are kept unchanged.
4. The spigot height are needed, while ordering.
5. CLS-0716~CLS-1228 are with elegant arc storm cover.

IN/MM

OVAL OPENING PORTHOLES



Oval opening portholes.



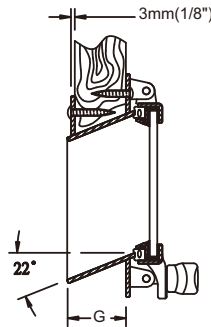
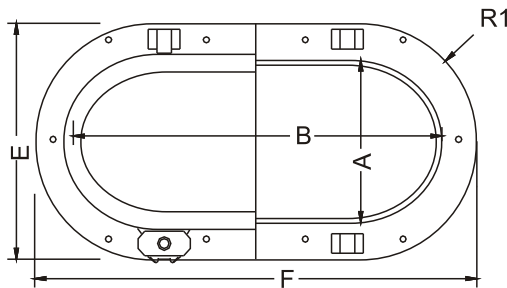
LSO Oval portholes / boat outside view



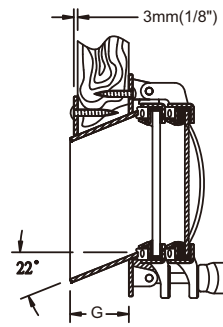
Oval opening portlight with storm cover.

OVAL OPENING PORTS - ANGLED SPIGOT

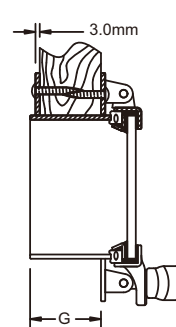
MODEL No.		A x B		C x D		E x F		R	R1	GLASS THICKNESS					
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL									
LSO-0512A		5X12	127X305	5 1⁄4	X 12 1⁄8	133x307	7 5⁄8	X 14 1⁄2	193x368	2 5⁄8	67	3 7⁄8	98	5⁄16	8
LSO-0714A		7X14	178X356	7 1⁄4	X 14 1⁄4	184x362	9 5⁄8	X 16 5⁄8	244x422	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0716A	CLSO-0716A	7X16	178X406	7 1⁄4	X 16 1⁄4	184x413	9 5⁄8	X 18 5⁄8	244x473	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0718A	CLSO-0718A	7X18	178X457	7 1⁄4	X 18 1⁄4	184x464	9 5⁄8	X 20 5⁄8	244x524	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0816A	CLSO-0816A	8X16	203X406	8 1⁄4	X 16 1⁄4	210x413	10 5⁄8	X 18 5⁄8	269x473	4 1⁄8	104	5 3⁄8	137	5⁄16	8
LSO-0818A	CLSO-0818A	8X18	203X457	8 1⁄4	X 18 1⁄4	210x464	10 5⁄8	X 20 5⁄8	269x524	4 1⁄8	104	5 3⁄8	137	5⁄16	8
LSO-1020A	CLSO-1020A	10X20	254X508	10 3⁄8	X 20 3⁄8	262x516	12 7⁄8	X 22 7⁄8	327x581	5 1⁄8	131	6 3⁄8	164	3⁄8	10
LSO-1024A	CLSO-1024A	10X24	254X609	10 3⁄8	X 24 3⁄8	262x617	12 7⁄8	X 26 7⁄8	327x682	5 1⁄8	131	6 3⁄8	164	3⁄8	10
LSO-1224A	CLSO-1224A	12X24	305X609	12 3⁄8	X 24 3⁄8	313x617	14 7⁄8	X 26 7⁄8	378x682	6 1⁄8	157	7 3⁄8	190	3⁄8	10
LSO-1228A	CLSO-1228A	12X28	305X710	12 3⁄8	X 28 3⁄8	313x718	14 7⁄8	X 30 7⁄8	378x784	6 1⁄8	157	7 3⁄8	190	3⁄8	10



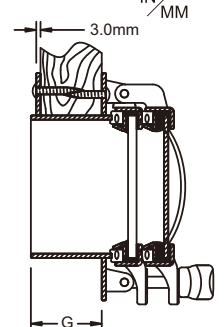
LSO-XXXXA



CLSO-XXXXA



LSO-XXXXS



CLSO-XXXXS

OVAL OPENING PORTS - STRAIGHT SPIGOT

MODEL No.		A x B		C x D		E x F		R	R1	GLASS THICKNESS					
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL									
LSO-0512S		5X12	127X305	5 1⁄4	X 12 1⁄8	133x307	7 5⁄8	X 14 1⁄2	193x368	2 5⁄8	67	3 7⁄8	98	5⁄16	8
LSO-0714S		7 X14	178X356	7 1⁄4	X 14 1⁄4	184x362	9 5⁄8	X 16 5⁄8	244x422	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0716S	CLSO-0716S	7X16	178X406	7 1⁄4	X 16 1⁄4	184x413	9 5⁄8	X 18 5⁄8	244x473	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0718S	CLSO-0718S	7X18	178X457	7 1⁄4	X 18 1⁄4	184x464	9 5⁄8	X 20 5⁄8	244x524	3 5⁄8	92	4 7⁄8	124	5⁄16	8
LSO-0816S	CLSO-0816S	8X16	203X406	8 1⁄4	X 16 1⁄4	210x413	10 5⁄8	X 18 5⁄8	269x473	4 1⁄8	104	5 3⁄8	137	5⁄16	8
LSO-0818S	CLSO-0818S	8X18	203X457	8 1⁄4	X 18 1⁄4	210x464	10 5⁄8	X 20 5⁄8	269x524	4 1⁄8	104	5 3⁄8	137	5⁄16	8
LSO-1020S	CLSO-1020S	10X20	254X508	10 3⁄8	X 20 3⁄8	262x516	12 7⁄8	X 22 7⁄8	327x581	5 1⁄8	131	6 3⁄8	164	3⁄8	10
LSO-1024S	CLSO-1024S	10X24	254X609	10 3⁄8	X 24 3⁄8	262x617	12 7⁄8	X 26 7⁄8	327x682	5 1⁄8	131	6 3⁄8	164	3⁄8	10
LSO-1224S	CLSO-1224S	12X24	305X609	12 3⁄8	X 24 3⁄8	313x617	14 7⁄8	X 26 7⁄8	378x682	6 1⁄8	157	7 3⁄8	190	3⁄8	10
LSO-1228S	CLSO-1228S	12X28	305X710	12 3⁄8	X 28 3⁄8	313x718	14 7⁄8	X 30 7⁄8	378x784	6 1⁄8	157	7 3⁄8	190	3⁄8	10

1. Standard angled spigot size "G" available 1 1/4" 32mm · 1 1/2" 38mm · 2" 51mm · 2 1/2" 63mm · 3" 76mm · 3 1/2" 89mm
2. Special spigot size "G" available from 1" 25.4mm ~ 5" 127mm
3. Custom sizes available if Radius (R & R1) are kept unchanged.
4. The spigot height are needed, while ordering.
5. CLS-0716~CLS-1228 are with elegant arc storm cover.

ROUND OPENING PORTHOLES



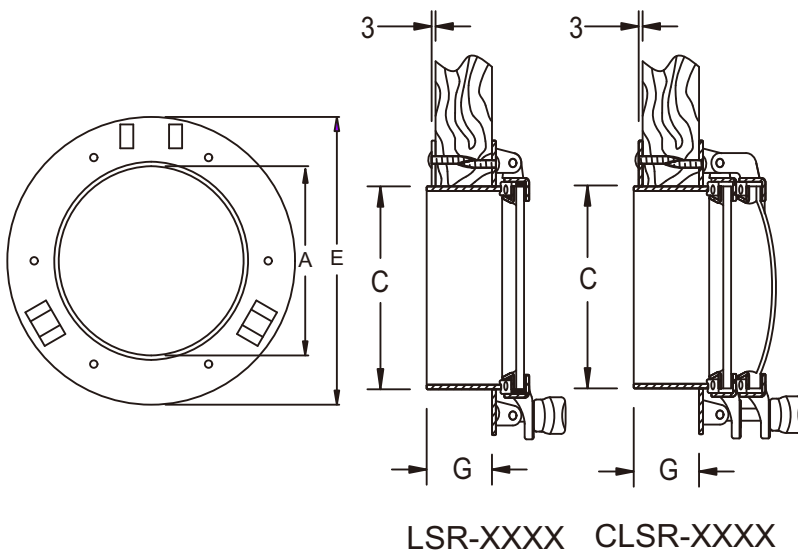
Round opening ports



LSR Round Portholes / boat outside view



Round ports with storm cover



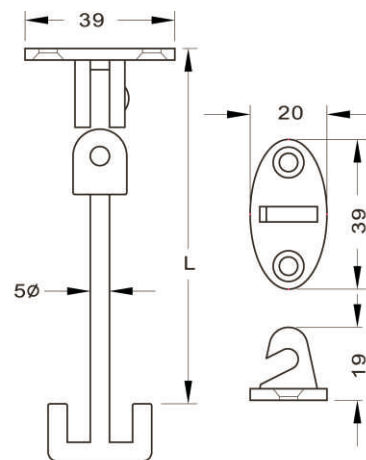
ROUND OPENING PORTHOLES

MODEL No.	A		C		E		GLASS THICKNESS	
	W/O COVER	W/COVER	MODEL	CUT OUT SIZE	OVERALL			
LSR-0700	7	178	7 1/4	184	9 5/8	244	5/16	8
LSR-0800	8	203	8 1/4	210	10 5/8	269	5/16	8
LSR-1000	CLSR-1000	10	254	10 3/8	262	12 7/8	327	3/8 10
LSR-1200	CLSR-1200	12	305	12 3/8	311	14 7/8	378	3/8 10
LSR-1400	CLSR-1400	14	356	14 3/8	365	16 7/8	431	3/8 10

IN/MM

1. Standard spigot size
"G" available 1 1/4" · 1 1/2" · 2" · 2 1/2" · 3" · 3 1/2"
2. Special spigot size "G" available from 1" ~ 5"
3. The spigot height are needed, while ordering.
4. CLSR-0700~CLSR-1400 are with elegant arc storm cover.

PORT HOOK

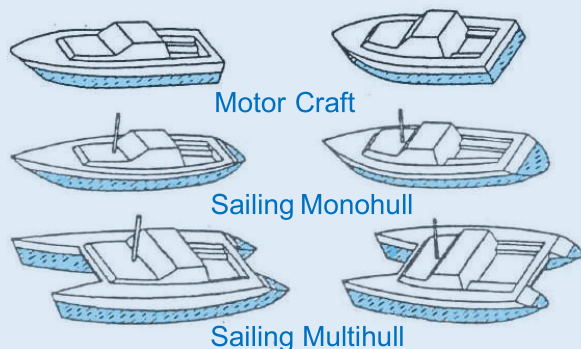


Standard size (L): 3", 4", 5", 6" & custom size available.

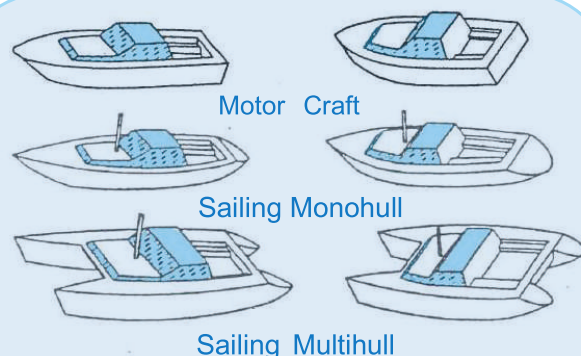
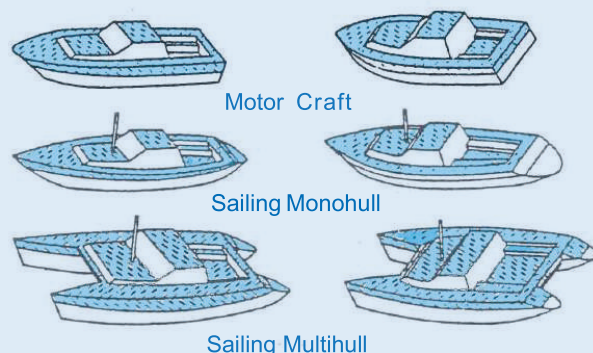
HATCH & PORTLIGHT CE REGULATIONS

CE AREAS

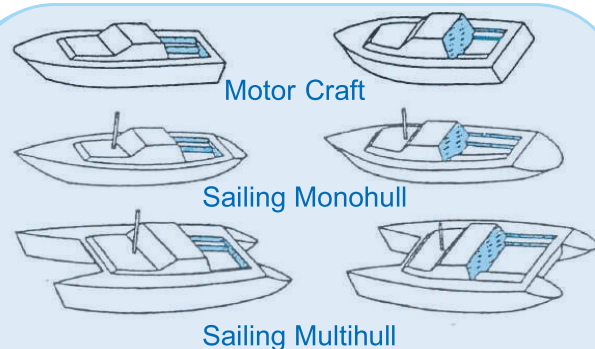
CE Areas1 Part of the hull sides situated above the waterline.



CE Areas2 Any Area other than Area 1 where persons are liable to walk or step.



CE Areas3 Any Area other than Area 1 or 2. For example superstructures.



CE Areas4 Parts of Area 3 protected from the impact of sea or assault waves. For example cockpit sides and rear faces of superstructures.

CE APPROVAL

- The CE Regulations apply to craft up to 24m in length that are sold in the European Union. Although the regulations may not apply to your boat, they are a useful guide for small craft throughout the world.
- Manship warranty portlights and hatches are installed in CE areas 1.2.3.4, Can't be installed in unexpected places, otherwise the warranty is invalid.
- Manship hatches and portlights are both apply to Design Category A (Ocean Sailing) or Design Category B (Offshore Sailing). It's manufactured according to CE regulations and passed DNV CE certification, The regulations divide up the hull and deck into four specific "Areas".
 - A. Hatches and portlights which is suitable for fitting to an area "1" that the product is suitable for installation in any area.
 - B. The product that is approved for area 2 may also fitted to area 3, and 4, not area 1
- All sailboats, machine ships, ocean sailing boats (Category A) and offshore sailing boats (Category B). No glass or tempered glass should be used for portlights installed in areas 1, 2 (unless it is bulletproof glass) It must be equipped with a standard metal explosion-proof cover before it can be used in areas 1, 2
- Hatch material in CE has special regulations, do not use glass or tempered glass (unless it is bulletproof glass)

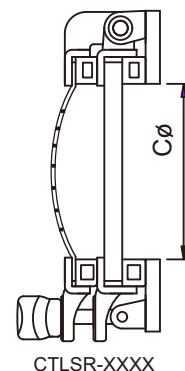
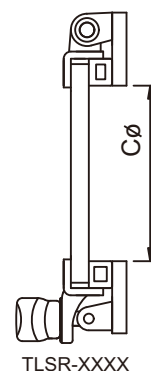
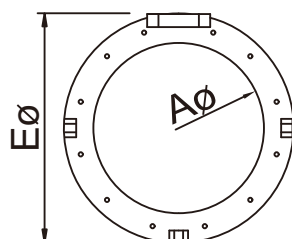
HEAVY DUTY PORTS

Suitable for steel boat and Aluminum boat.

- CE Approved. According to ISO / DIS 12216

TLS, TLSO, TLSR type are applied to Area III, IV. Designs for craft type "any".

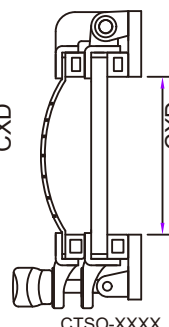
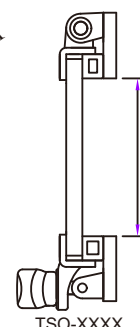
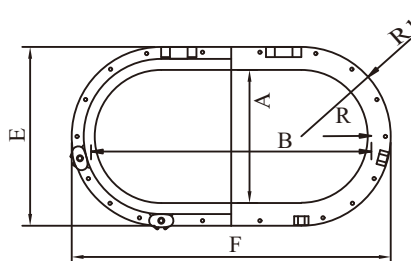
CTLS, CTLSO, CTLSR type are applied to Area I, II, III, IV. Designs for craft type "any".



TLSR-XXXX

CTLSR-XXXX

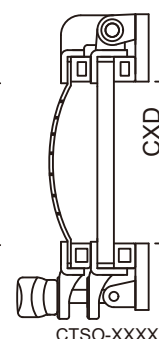
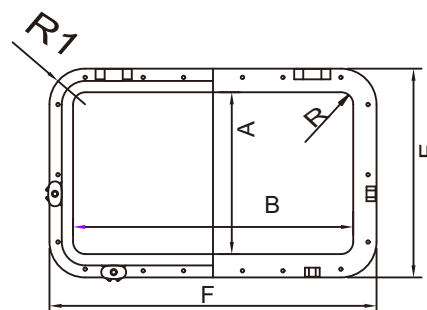
MODEL No.		A x B MODEL	C x D CUT OUT SIZE		E x F OVERALL		GLASS THICKNESS
W/O COVER	W/COVER						
TLSR-1000	CTLSR-1000	10 254	10 254	10 254	13 5/16 338	13 5/16 338	3/8 10
TLSR-1200	CTLSR-1200	12 305	12 305	12 305	15 5/16 389	15 5/16 389	3/8 10
TLSR-1400	CTLSR-1400	14 356	14 356	14 356	17 5/16 440	17 5/16 440	3/8 10



TSO-XXXX

CTSO-XXXX

MODEL No.		A x B MODEL	C x D CUT OUT SIZE		E x F OVERALL		R	R1	GLASS THICKNESS
W/O COVER	W/COVER								
TLSO-1020	CTLSO-1020	10X20 254X508	10X20 254X508	10X20 254X508	13 5/16 X 23 5/16 338x592	13 5/16 X 23 5/16 338x592	5 127	6 5/8 169	3/8 10
TLSO-1024	CTLSO-1024	10X24 254X609	10X24 254X609	10X24 254X609	13 5/16 X 27 5/16 338x694	13 5/16 X 27 5/16 338x694	5 127	6 5/8 169	3/8 10
TLSO-1224	CTLSO-1224	12X24 305X609	12X24 305X609	12X24 305X609	15 5/16 X 27 5/16 389x694	15 5/16 X 27 5/16 389x694	6 152	7 5/8 194	3/8 10
TLSO-1228	CTLSO-1228	12X28 305X710	12X28 305X710	12X28 305X710	15 5/16 X 31 5/16 389x795	15 5/16 X 31 5/16 389x795	6 152	7 5/8 194	3/8 10



TSO-XXXX

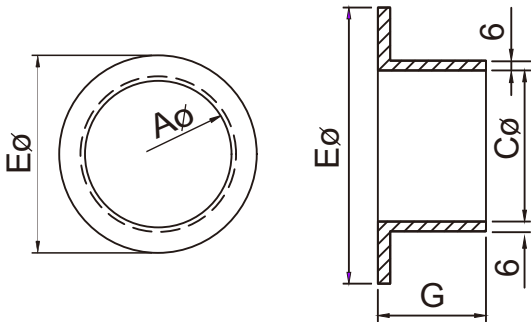
CTSO-XXXX

MODEL No.		A x B MODEL	C x D CUT OUT SIZE		E x F OVERALL		R	R1	GLASS THICKNESS
W/O COVER	W/COVER								
TLS-1020	CTLS-1020	10X20 254X508	10X20 254X508	10X20 254X508	13 5/16 X 23 5/16 338x592	13 5/16 X 23 5/16 338x592	2" 50	3 5/8 92	3/8 10
TLS-1024	CTLS-1024	10X24 254X609	10X24 254X609	10X24 254X609	13 5/16 X 27 5/16 338x694	13 5/16 X 27 5/16 338x694	2" 50	3 5/8 92	3/8 10
TLS-1224	CTLS-1224	12X24 305X609	12X24 305X609	12X24 305X609	15 5/16 X 27 5/16 389x694	15 5/16 X 27 5/16 389x694	2" 50	3 5/8 92	3/8 10
TLS-1228	CTLS-1228	12X28 305X710	12X28 305X710	12X28 305X710	15 5/16 X 31 5/16 389x795	15 5/16 X 31 5/16 389x795	2" 50	3 5/8 92	3/8 10

IN/MM

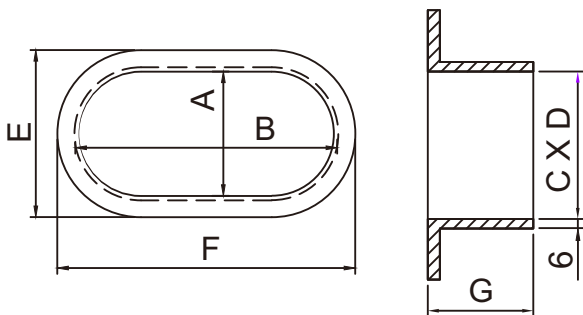
HEAVY DUTY PORTS (G)

1. Install with heavy duty ports spigot and weld on the hull spigot (G). Stainless Steel (316) and Aluminum (5052) are available.
2. Standard angled spigot size "G" available 1-1/4" (32mm), 1-1/2" (38mm), 2" (51mm), 2-1/2" (63mm), 3" (76mm), 3-1/2" (89mm).
3. Special spigot size "G" available from 1" (25.4mm)~6" (152mm).
4. Custom sizes available if Radius (R&R1) are kept unchanged.
5. The spigot height are needed, while ordering.



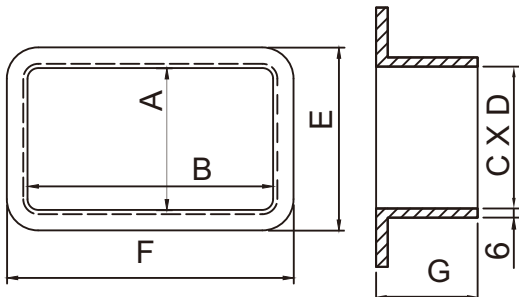
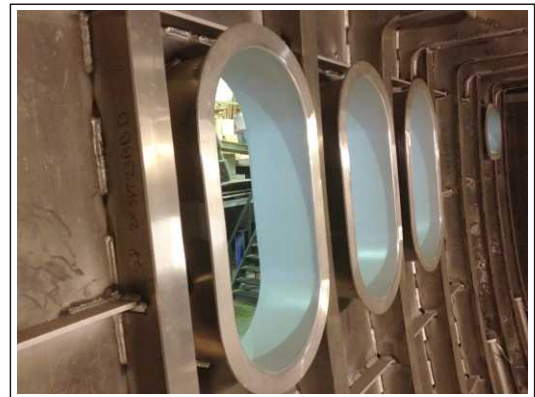
MODEL NO .		MODEL		OVER ALL	
TLSR-1000G	CTLSR-1000G	10	254	13-5/16	338
TLSR-1200G	CTLSR-1200G	12	305	15-5/16	389
TLSR-1400G	CTLSR-1400G	14	356	17-5/16	440

IN/MM

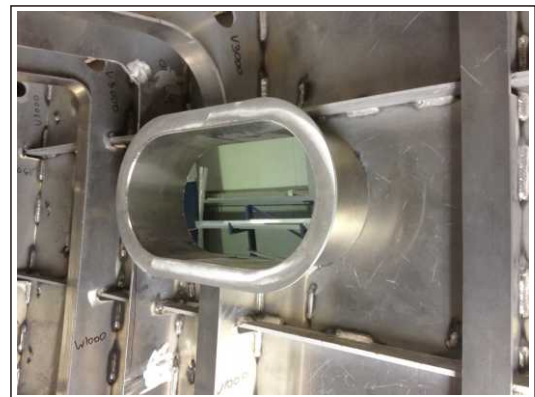


MODEL NO .		A x B MODEL		E x F OVER ALL	
TLISO-1020G	CTLSO-1020G	10X20	254X508	13-5/16X23-5/16	338X592
TLISO-1024G	CTLSO-1024G	10X24	254X609	13-5/16X27-5/16	338X694
TLISO-1224G	CTLSO-1224G	12X24	305X609	15-5/16X27-5/16	389X694
TLISO-1228G	CTLSO-1228G	12X28	305X710	15-5/16X31-5/16	389X795

IN/MM



MODEL NO .		A x B MODEL		E x F OVER ALL	
TLS-1020G	CTLS-1020G	10X20	254X508	13-5/16X23-5/16	338X592
TLS-1024G	CTLS-1024G	10X24	254X609	13-5/16X27-5/16	338X694
TLS-1224G	CTLS-1224G	12X24	305X609	15-5/16X27-5/16	389X694
TLS-1228G	CTLS-1228G	12X28	305X710	15-5/16X31-5/16	389X795



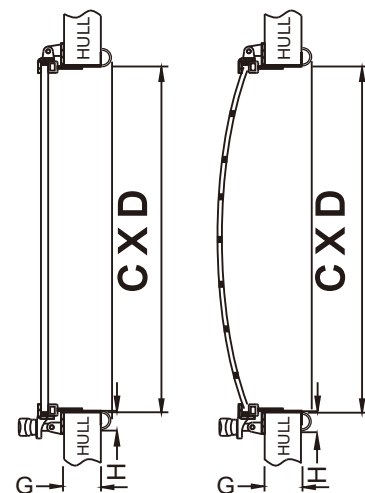
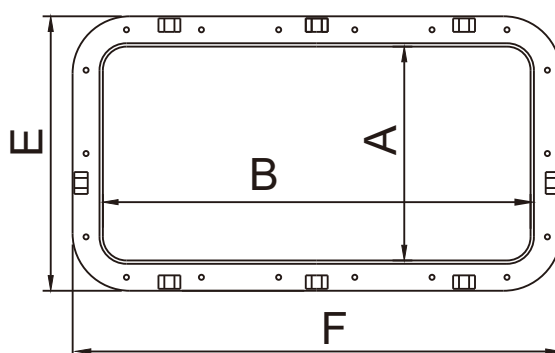
OPENING PORTS (H-TRIM)

H-Trim: 316 stainless steel material, the appearance is elegant, not the same as traditional frames.

LS-H



LS-H · CLS-H OPENING PORTHOLE



LS-H, CLS-H

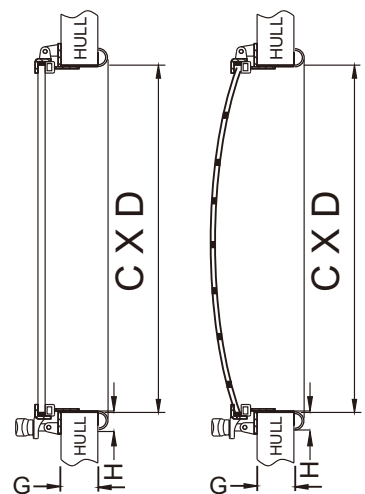
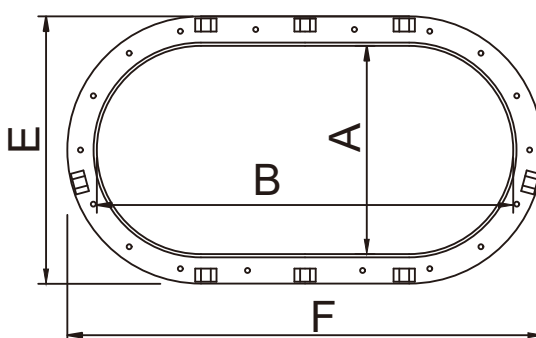
MODEL No.		A x B		C x D		E x F		H	R	R1	GLASS THICKNESS		
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL							
LS-0512H		5X12	127X305	5 1⁄2	X 12 3⁄8	139X313	7 5⁄8	X 14 1⁄2	193x368	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0714H		7X14	178X356	7 1⁄2	X 14 1⁄2	190X368	9 5⁄8	X 16 5⁄8	244x422	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0716H	CLS-0716H	7X16	178X406	7 1⁄2	X 16 1⁄2	190X419	9 5⁄8	X 18 5⁄8	244x473	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0718H	CLS-0718H	7X18	178X457	7 1⁄2	X 18 1⁄2	190X470	9 5⁄8	X 20 5⁄8	244x524	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0816H	CLS-0816H	8X16	203X406	8 1⁄2	X 16 1⁄2	216X419	10 5⁄8	X 18 5⁄8	269x473	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-0818H	CLS-0818H	8X18	203X457	8 1⁄2	X 18 1⁄2	216X470	10 5⁄8	X 20 5⁄8	269x524	5⁄8 15	1 1⁄4 32	2 3⁄8 62	1⁄4 6
LS-1020H	CLS-1020H	10X20	254X508	10 5⁄8	X 20 5⁄8	268X522	12 7⁄8	X 22 7⁄8	327x581	3⁄4 20	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1024H	CLS-1024H	10X24	254X609	10 5⁄8	X 24 5⁄8	268X623	12 7⁄8	X 26 7⁄8	327x682	3⁄4 20	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1224H	CLS-1224H	12X24	305X609	12 5⁄8	X 24 5⁄8	319X623	14 7⁄8	X 26 7⁄8	378x682	3⁄4 20	1 1⁄4 32	2 1⁄2 65	3⁄8 10
LS-1228H	CLS-1228H	12X28	305X710	12 5⁄8	X 28 5⁄8	319X724	14 7⁄8	X 30 7⁄8	378x784	3⁄4 20	1 1⁄4 32	2 1⁄2 65	3⁄8 10
													IN / MM

IN/MM

CLSO-H



LSO-H · CLSO-H OPENING PORTHOLE



LSO-H, CLSO-H

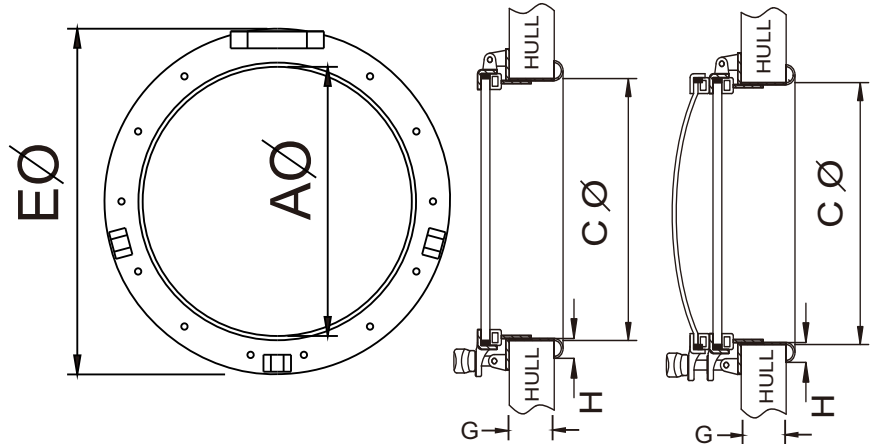
MODEL No.		A x B		C x D		E x F		H	R	R1	GLASS THICKNESS						
W/O COVER	W/COVER	MODEL		CUT OUT SIZE		OVERALL											
LSO-0512H		5X12	127X305	5 1⁄2	X 12 3⁄8	139X313	7 5⁄8	X 14 1⁄2	193x368	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-0714H		7X14	178X356	7 1⁄2	X 14 1⁄2	190X368	9 5⁄8	X 16 5⁄8	244x422	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-0716H	CLSO-0716H	7X16	178X406	7 1⁄2	X 16 1⁄2	190X419	9 5⁄8	X 18 5⁄8	244x473	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-0718H	CLSO-0718H	7X18	178X457	7 1⁄2	X 18 1⁄2	190X470	9 5⁄8	X 20 5⁄8	244x524	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-0816H	CLSO-0816H	8X16	203X406	8 1⁄2	X 16 1⁄2	216X419	10 5⁄8	X 18 5⁄8	269x473	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-0818H	CLSO-0818H	8X18	203X457	8 1⁄2	X 18 1⁄2	216X470	10 5⁄8	X 20 5⁄8	269x524	5⁄8	15	1 1⁄4	32	2 3⁄8	62	1⁄4	6
LSO-1020H	CLSO-1020H	10X20	254X508	10 5⁄8	X 20 5⁄8	268X522	12 7⁄8	X 22 7⁄8	327x581	3⁄4	20	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LSO-1024H	CLSO-1024H	10X24	254X609	10 5⁄8	X 24 5⁄8	268X623	12 7⁄8	X 26 7⁄8	327x682	3⁄4	20	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LSO-1224H	CLSO-1224H	12X24	305X609	12 5⁄8	X 24 5⁄8	319X623	14 7⁄8	X 26 7⁄8	378x682	3⁄4	20	1 1⁄4	32	2 1⁄2	65	3⁄8	10
LSO-1228H	CLSO-1228H	12X28	305X710	12 5⁄8	X 28 5⁄8	319X724	14 7⁄8	X 30 7⁄8	378x784	3⁄4	20	1 1⁄4	32	2 1⁄2	65	3⁄8	10
																	IN / MM

IN/MM

CLSR-H



LSR-H · CLSR-H OPENING PORTHOLE



LSR-H, CLSR-H

MODEL No.		A		C		E		H		GLASS THICKNESS	
W/O COVER	W/COVER	MODEL	CUT OUT SIZE	MODEL	CUT OUT SIZE	OVERALL					
LSR-1000H	CLSR-1000H	10	254	10 1/2	267	12 7/8	327	3/4	20	3/8	10
LSR-1200H	CLSR-1200H	12	305	12 1/2	318	14 7/8	378	3/4	20	3/8	10
LSR-1400H	CLSR-1400H	14	356	14 1/2	368	16 7/8	429	3/4	20	3/8	10

IN/MM

1. Standard angled spigot size "G" available 1 1/4" 32mm · 1 1/2" 38mm · 2" 51mm · 2 1/2" 63mm · 3" 76mm · 3 1/2" 89mm
2. Special spigot size "G" available from 1" 25.4mm ~ 5" 127mm
3. Custom sizes available if Radius (R & R1) are kept unchanged.
4. The spigot height are needed, while ordering.

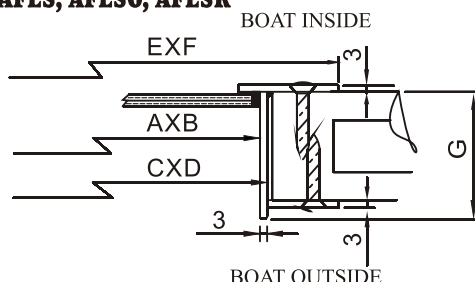


FIXED PORTS

AFLS



AFLS, AFLSO, AFLSR



BFLS



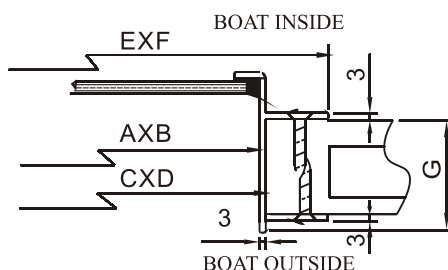
MODEL No.		A x B MODEL		C x D CUT OUT SIZE		E x F OVERALL		R	R1	GLASS THICKNESS
AFLS-0512	BFLS-0512	5X12	127X305	5 1/4 X 12 1/8	133x307	7 5/8 X 14 1/2	193x368	1 1/4 32	2 3/8 62	1/4 6
AFLS-0714	BFLS-0714	7X14	178X356	7 1/4 X 14 1/4	184x362	9 5/8 X 16 5/8	244x424	1 1/4 32	2 3/8 62	1/4 6
AFLS-0716	BFLS-0716	7X16	178X406	7 1/4 X 16 1/4	184x413	9 5/8 X 18 5/8	244x473	1 1/4 32	2 3/8 62	1/4 6
AFLS-0718	BFLS-0718	7X18	178X457	7 1/4 X 18 1/4	184x464	9 5/8 X 20 5/8	244x524	1 1/4 32	2 3/8 62	1/4 6
AFLS-0816	BFLS-0816	8X16	203X406	8 1/4 X 16 1/4	210x413	10 5/8 X 18 5/8	269x473	1 1/4 32	2 3/8 62	1/4 6
AFLS-0818	BFLS-0818	8X18	203X457	8 1/4 X 18 1/4	210x464	10 5/8 X 20 5/8	269x524	1 1/4 32	2 3/8 62	1/4 6
AFLS-1020	BFLS-1020	10X20	254X508	10 5/16 X 20 5/16	262x516	12 7/8 X 22 7/8	327x581	1 1/4 32	2 1/2 65	3/8 10
AFLS-1024	BFLS-1024	10X24	254X609	10 5/16 X 24 5/16	262x617	12 7/8 X 26 7/8	327x682	1 1/4 32	2 1/2 65	3/8 10
AFLS-1224	BFLS-1224	12X24	305X609	12 5/16 X 24 5/16	313x617	14 7/8 X 26 7/8	378x682	1 1/4 32	2 1/2 65	3/8 10
AFLS-1228	BFLS-1228	12X28	305X710	12 5/16 X 28 5/16	313x718	14 7/8 X 30 7/8	378x783	1 1/4 32	2 1/2 65	3/8 10

IN/MM

AFLSO



BFLS, BFLSO, BFLSR



BFLSO



MODEL No.		A x B MODEL		C x D CUT OUT SIZE		E x F OVERALL		R	R1	GLASS THICKNESS
AFLSO-0512	BFLSO-0512	5X12	127X305	5 1/4 X 12 1/8	133x307	7 5/8 X 14 1/2	193x368	2 5/8 67	3 7/8 98	1/4 6
AFLSO-0714	BFLSO-0714	7X14	178X356	7 1/4 X 14 1/4	184x362	9 5/8 X 16 5/8	244x424	3 5/8 92	4 7/8 124	1/4 6
AFLSO-0716	BFLSO-0716	7X16	178X406	7 1/4 X 16 1/4	184x413	9 5/8 X 18 5/8	244x473	3 5/8 92	4 7/8 124	1/4 6
AFLSO-0718	BFLSO-0718	7X18	178X457	7 1/4 X 18 1/4	184x464	9 5/8 X 20 5/8	244x524	3 5/8 92	4 7/8 124	1/4 6
AFLSO-0816	BFLSO-0816	8X16	203X406	8 1/4 X 16 1/4	210x413	10 5/8 X 18 5/8	269x473	4 1/8 104	5 3/8 137	1/4 6
AFLSO-0818	BFLSO-0818	8X18	203X457	8 1/4 X 18 1/4	210x464	10 5/8 X 20 5/8	269x524	4 1/8 104	5 3/8 137	1/4 6
AFLSO-1020	BFLSO-1020	10X20	254X508	10 5/16 X 20 5/16	262x516	12 7/8 X 22 7/8	327x581	5 1/8 131	6 3/8 164	3/8 10
AFLSO-1024	BFLSO-1024	10X24	254X609	10 5/16 X 24 5/16	262x617	12 7/8 X 26 7/8	327x682	5 1/8 131	6 3/8 164	3/8 10
AFLSO-1224	BFLSO-1224	12X24	305X609	12 5/16 X 24 5/16	313x617	14 7/8 X 26 7/8	378x682	6 1/8 157	7 3/8 190	3/8 10
AFLSO-1228	BFLSO-1228	12X28	305X710	12 5/16 X 28 5/16	313x718	14 7/8 X 30 7/8	378x783	6 1/8 157	7 3/8 190	3/8 10

IN/MM

AFLSR



MODEL No.		A		C		E		GLASS	
		MODEL		CUT	OUT SIZE	OVERALL		THICKNESS	
AFLSR-0500	BFLSR-0500	5	127	5	1¼ 133	7	5⅞ 193	1¼	6
AFLSR-0600	BFLSR-0600	6	152	6	1¼ 158	8	5⅞ 218	1¼	6
AFLSR-0700	BFLSR-0700	7	178	7	1¼ 184	9	5⅞ 244	1¼	6
AFLSR-0800	BFLSR-0800	8	203	8	1¼ 210	10	5⅞ 269	1¼	6
AFLSR-1000	BFLSR-1000	10	254	10	5⁄16 262	12	7⁄8 327	3⁄8	10
AFLSR-1200	BFLSR-1200	12	305	12	5⁄16 313	14	7⁄8 378	3⁄8	10
AFLSR-1400	BFLSR-1400	14	356	14	5⁄16 364	16	7⁄8 428	3⁄8	10

IN/MM

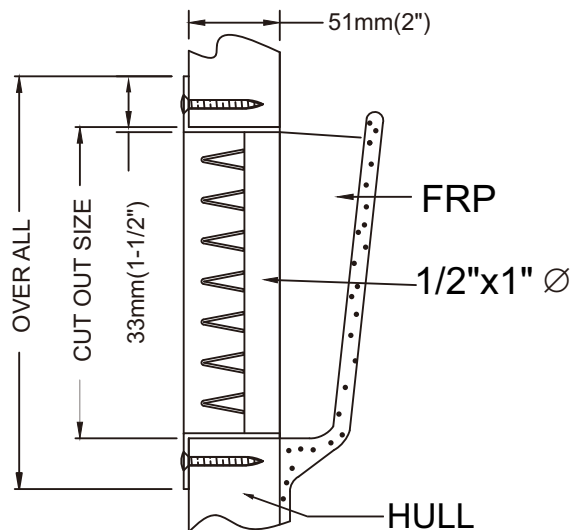
BFLSR



VENTILATOR

- 316 stainless steel machined rolled frames. Hand polishing to protect against corrosion.
- Powder coating either off white or black available.
- All cut out sizes C X D are same as Rectangular / Round / Oval / Elliptical port's, pls refer it to LS / LR / LO / LE type.

(LS) RECTANGULAR VENTILATOR



(LS-H) RECTANGULAR VENTILATOR



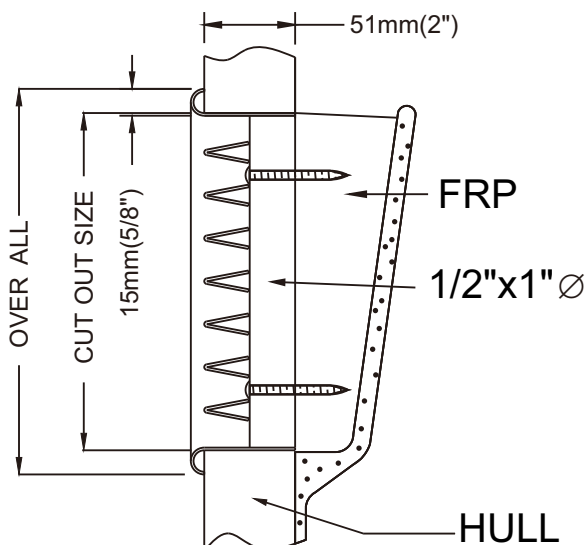
(LO) OVAL VENTILATOR



(LE) ELLIPTICAL VENTILATOR



(LR) ROUND VENTILATOR

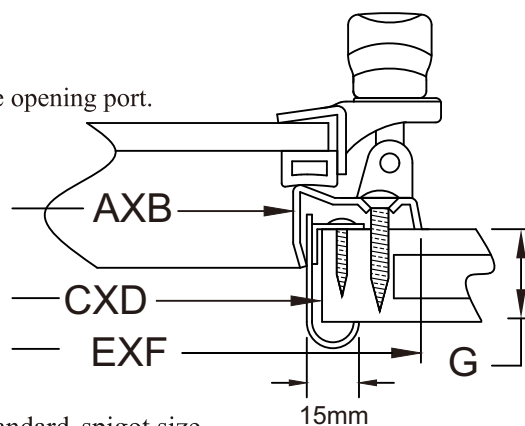


ELLIPTICAL, OVAL AND ROUND OPENING PORTS (H-TRIM)

- **CE Approved. According to ISO / DIS 12216**

LE, LO & LR type are supplied to Area III, IV. Designs for craft type "any".

- 316 stainless steel machined rolled ports. 316 stainless steel machine stamped frames. Hand Polished and electro polished to provide long lasting protection against corrosion.
- Weather resistant thermo-plastic Sanplane gasket.
- High Strength tempered glass.
- Optional fiberglass screens with rubber gaskets to ensure a tight fit on the opening port.



1. Standard spigot size
"G" available $1\frac{1}{4}$ " 32mm · $1\frac{1}{2}$ " 38mm · 2" 51mm · $2\frac{1}{2}$ " 63mm · 3" 76mm · $3\frac{1}{2}$ " 89mm
2. Special spigot size "G" available from 1" 25mm ~ 5" 125mm
3. The spigot height are needed, while ordering.

MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
LE-0718	7 X 17 $\frac{3}{4}$ 178X451	7 $\frac{3}{8}$ X 18 187X458	9 $\frac{5}{8}$ X 20 $\frac{3}{8}$ 244X518	$\frac{5}{16}$ 8 IN/MM



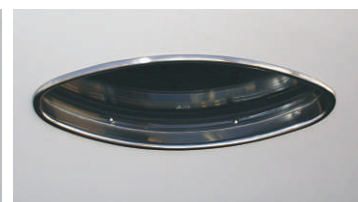
MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
LO-0512	5 X 12 127X305	5 $\frac{5}{8}$ X 12 $\frac{5}{8}$ 143X321	7 $\frac{7}{8}$ X 14 $\frac{7}{8}$ 200X378	$\frac{5}{16}$ 8
LO-0614	6 X 14 153X356	6 $\frac{5}{8}$ X 14 $\frac{5}{8}$ 168X371	8 $\frac{7}{8}$ X 16 $\frac{7}{8}$ 225X429	$\frac{5}{16}$ 8
LO-0714	7 X 14 178X356	7 $\frac{5}{8}$ X 14 $\frac{5}{8}$ 194X371	9 $\frac{7}{8}$ X 16 $\frac{7}{8}$ 251X429	$\frac{5}{16}$ 8
LO-0716	7 X 16 178X406	7 $\frac{5}{8}$ X 16 $\frac{5}{8}$ 194X422	9 $\frac{7}{8}$ X 18 $\frac{7}{8}$ 251X479	$\frac{5}{16}$ 8
LO-0718	7 X 18 178X457	7 $\frac{5}{8}$ X 18 $\frac{5}{8}$ 194X473	9 $\frac{7}{8}$ X 20 $\frac{7}{8}$ 251X530	$\frac{5}{16}$ 8
LO-0816	8 X 16 203X406	8 $\frac{5}{8}$ X 16 $\frac{5}{8}$ 219X422	10 $\frac{7}{8}$ X 18 $\frac{7}{8}$ 276X479	$\frac{5}{16}$ 8
LO-0818	8 X 18 203X457	8 $\frac{5}{8}$ X 18 $\frac{5}{8}$ 219X473mm	10 $\frac{7}{8}$ X 20 $\frac{7}{8}$ 276X530	$\frac{5}{16}$ 8 IN/MM



MODEL No.	A MODEL	C CUT OUT	F OVERALL	GLASS THICKNESS
LR-0500	5 127mm	5 $\frac{5}{8}$ 143	7 $\frac{7}{8}$ 200	$\frac{5}{16}$ 8
LR-0600	6 153mm	6 $\frac{5}{8}$ 168	8 $\frac{7}{8}$ 225	$\frac{5}{16}$ 8
LR-0700	7 178mm	7 $\frac{5}{8}$ 194	9 $\frac{7}{8}$ 251	$\frac{5}{16}$ 8
LR-0800	8 203mm	8 $\frac{5}{8}$ 219	10 $\frac{7}{8}$ 276	$\frac{5}{16}$ 8 IN/MM



LO Oval portholes



LE Elliptical portholes
boat outside view

OPENING PORTS (H-TRIM) WITH STORM COVERS

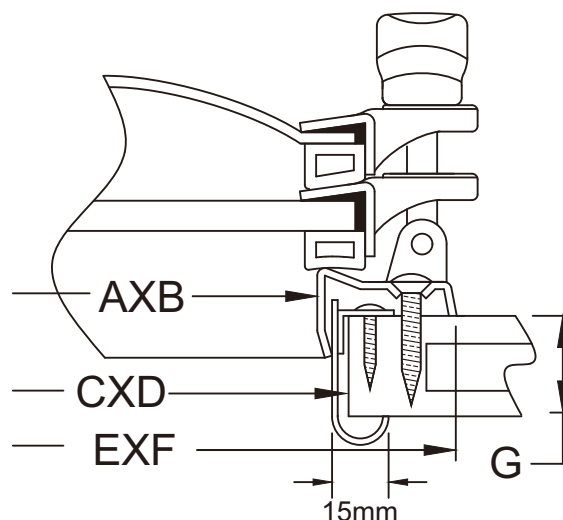
- **CE Approved. According to ISO / DIS 12216**
CLE, CLR & CLO type are applied to Area I, II, III, IV. Designs for craft type "any".
- Each cover is machine stamped 316 stainless steel. Hand Polished and electro polished to provide long lasting protection against corrosion.
- All other features are the same as our **RECTANGULAR OPENING PORTS**.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
CLE-0718	7 X 17 ³ / ₄ 178x451	7 ³ / ₈ X 18 187x458	9 ⁵ / ₈ X 20 ³ / ₈ 244x518	⁵ / ₁₆ 8

IN/MM

- Fixed or removable storm cover available.



1. Standard spigot size

"G" available 1 ¹/₄ 32mm · 1 ¹/₂ 38mm · 2 51mm · 2 ¹/₂ 63mm · 3 76mm · 3 ¹/₂ 89mm

2. Special spigot size "G" available from 1 ¹/₂ 25mm ~ 5 ¹/₂ 125mm

3. The spigot height are needed, while ordering.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
CLO-0716	7 X 16 178x406	7 ⁵ / ₈ X 16 ⁵ / ₈ 194x422	9 ⁷ / ₈ X 18 ⁷ / ₈ 251x479	⁵ / ₁₆ 8
CLO-0718	7 X 18 178x457	7 ⁵ / ₈ X 18 ⁵ / ₈ 194x473	9 ⁷ / ₈ X 20 ⁷ / ₈ 251x530	⁵ / ₁₆ 8
CLO-0816	8 X 16 203x406	8 ⁵ / ₈ X 16 ⁵ / ₈ 219x422	10 ⁷ / ₈ X 18 ⁷ / ₈ 276x479	⁵ / ₁₆ 8
CLO-0818	8 X 18 203x457	8 ⁵ / ₈ X 18 ⁵ / ₈ 219x473	10 ⁷ / ₈ X 20 ⁷ / ₈ 276x530	⁵ / ₁₆ 8

IN/MM



MODEL No.	A MODEL	C CUT OUT	F OVERALL	GLASS THICKNESS
CLR-0800	8 203	8 ⁵ / ₈ 219	10 ⁷ / ₈ 276	⁵ / ₁₆ 8

IN/MM

ECONOMY OPENING PORTS (H-TRIM)

• CE Approved. According to ISO / DIS 12216

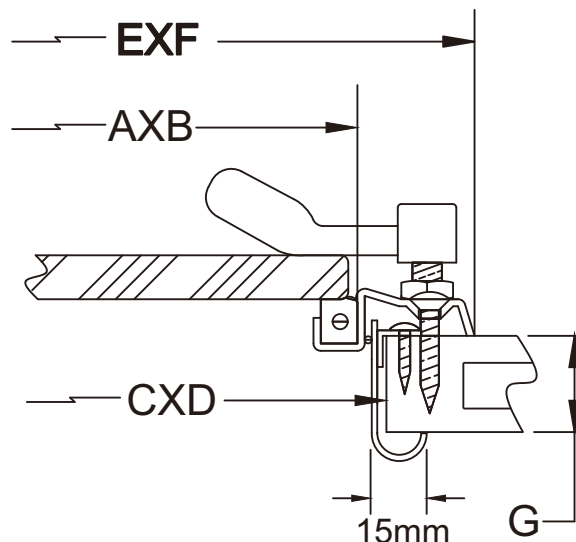
EE, EO & ER type are applied to Area III, IV. Designs for craft type "any".

- 316 stainless steel machine stamped frames, ports and hinges. Hand Polished and electro polished to provide long lasting protection against corrosion.
- Wing type nylon closures.
- Weather resistant thermo-plastic Sanplane gasket.
- Clear or Tanned Acrylic.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	ACRYLIC THICKNESS
EE-0718	7 X 17 ³ / ₄ 178x459	7 ³ / ₈ X 18 188x458	9 ⁵ / ₈ X 20 ³ / ₈ 244x518	1 ¹ / ₂ 12

IN/MM



1. Standard spigot size

"G" available 1¹/₄" 32mm · 1¹/₂" 38mm · 2" 51mm · 2¹/₂" 63mm · 3" 76mm · 3¹/₂" 89mm

2. Special spigot size "G" available from 1¹/₂mm ~ 5¹/₂mm

3. The spigot height are needed, while ordering.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	ACRYLIC THICKNESS
EO-0512	5 X 12 127x305	5 ³ / ₈ X 12 ³ / ₈ 137x315	7 ⁷ / ₈ X 14 ⁷ / ₈ 200x378	1 ¹ / ₂ 12
EO-0614	6 X 14 153x356	6 ³ / ₈ X 14 ³ / ₈ 162x365	8 ⁷ / ₈ X 16 ⁷ / ₈ 225x429	1 ¹ / ₂ 12
EO-0714	7 X 14 178x356	7 ³ / ₈ X 14 ³ / ₈ 188x365	9 ⁷ / ₈ X 16 ⁷ / ₈ 251x429	1 ¹ / ₂ 12
EO-0716	7 X 16 178x406	7 ³ / ₈ X 16 ³ / ₈ 188x416	9 ⁷ / ₈ X 18 ⁷ / ₈ 251x479	1 ¹ / ₂ 12
EO-0718	7 X 18 178x457	7 ³ / ₈ X 18 ³ / ₈ 188x467	9 ⁷ / ₈ X 20 ⁷ / ₈ 251x530	1 ¹ / ₂ 12
EO-0816	8 X 16 203x406	8 ³ / ₈ X 16 ³ / ₈ 213x416	10 ⁷ / ₈ X 18 ⁷ / ₈ 276x479	1 ¹ / ₂ 12
EO-0818	8 X 18 203x457	8 ³ / ₈ X 18 ³ / ₈ 213x467	10 ⁷ / ₈ X 20 ⁷ / ₈ 276x530	1 ¹ / ₂ 12

IN/MM

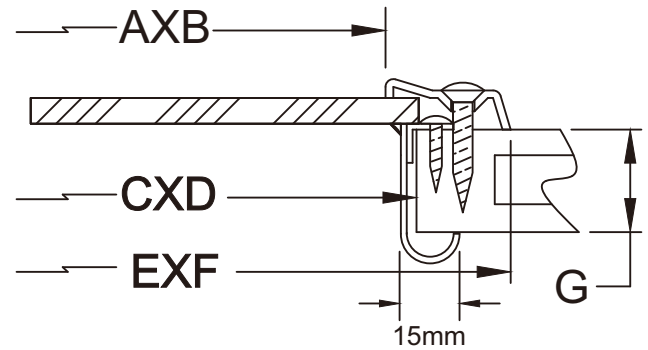


MODEL No.	A MODEL	C CUT OUT	F OVERALL	ACRYLIC THICKNESS
ER-0500	5 127	5 ³ / ₈ 137	7 ⁷ / ₈ 200	1 ¹ / ₂ 12
ER-0600	6 153	6 ³ / ₈ 162	8 ⁷ / ₈ 225	1 ¹ / ₂ 12
ER-0700	7 178	7 ³ / ₈ 188	9 ⁷ / ₈ 251	1 ¹ / ₂ 12
ER-0800	8 203	8 ³ / ₈ 213	10 ⁷ / ₈ 276	1 ¹ / ₂ 12

IN/MM

FIXED TYPE PORTHOLES (H-TRIM)

- 316 machined stamped stainless steel frames and trim rings. Hand Polished and electro polished to provide long lasting protection against corrosion.
- High Strength tempered glass.
- Additional fixed or removable storm cover available.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
FE-0718	7 X 17 ³ / ₄ 178X451	7 ³ / ₈ X 18 188X458	9 ⁵ / ₈ X 20 ³ / ₈ 244X518	¹ / ₄ 6

IN/MM

1. Standard spigot size

"G" available 1 ¹/₄" _{32mm} · 1 ¹/₂" _{38mm} · 2" _{51mm} · 2 ¹/₂" _{63mm} · 3" _{76mm} · 3 ¹/₂" _{89mm}

2. Special spigot size "G" available from 1" _{25mm} ~ 5" _{125mm}

3. The spigot height are needed, while ordering.



MODEL No.	A x B MODEL	C x D CUT OUT	E x F OVERALL	GLASS THICKNESS
FO-0512	5 X 12 127X305	5 ³ / ₈ X 12 ³ / ₈ 137X315	7 ⁷ / ₈ X 14 ⁷ / ₈ 200X378	¹ / ₄ 6
FO-0614	6 X 14 153X356	6 ³ / ₈ X 14 ³ / ₈ 162X365	8 ⁷ / ₈ X 16 ⁷ / ₈ 225X429	¹ / ₄ 6
FO-0714	7 X 14 178X356	7 ³ / ₈ X 14 ³ / ₈ 188X365	9 ⁷ / ₈ X 16 ⁷ / ₈ 251X429	¹ / ₄ 6
FO-0716	7 X 16 178X406	7 ³ / ₈ X 16 ³ / ₈ 188X416	9 ⁷ / ₈ X 18 ⁷ / ₈ 251X479	¹ / ₄ 6
FO-0718	7 X 18 178X457	7 ³ / ₈ X 18 ³ / ₈ 188X467	9 ⁷ / ₈ X 20 ⁷ / ₈ 251X530	¹ / ₄ 6
FO-0816	8 X 16 203X406	8 ³ / ₈ X 16 ³ / ₈ 213X416	10 ⁷ / ₈ X 18 ⁷ / ₈ 276X479	¹ / ₄ 6
FO-0818	8 X 18 203X457	8 ³ / ₈ X 18 ³ / ₈ 213X467	10 ⁷ / ₈ X 20 ⁷ / ₈ 276X530	¹ / ₄ 6

IN/MM

MODEL No.	A MODEL	C CUT OUT	F OVERALL	GLASS THICKNESS
FR-0500	5 127	5 ³ / ₈ 137	7 ⁷ / ₈ 200	¹ / ₄ 6
FR-0600	6 153	6 ³ / ₈ 162	8 ⁷ / ₈ 225	¹ / ₄ 6
FR-0700	7 178	7 ³ / ₈ 188	9 ⁷ / ₈ 251	¹ / ₄ 6
FR-0800	8 203	8 ³ / ₈ 213	10 ⁷ / ₈ 276	¹ / ₄ 6

IN/MM