EECO

Ideas Powering Performance

MARINE SERVICES

SUPPLIER LISTINGS ALPHABETICALLY

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3M Purification
901D

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Brady Worldwide
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Controlled Power Company
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Crouse-Hinds Interconnect

D
Daniels Manufacturing Corp.
Dare Electronics
Davis Inotek Instruments
Delta
Delphi
Detornics Corporation
Dongan Electric Manufacturing
Dorn Equipment
DRI Relays
DUCT-O-Wire
Duraline
Dwyer Instruments
Dynalec
Dynasoound
Dytran Instruments

E
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Eiko America
Electroshield
Electroswitch
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ElectricEmerson Process
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Fiber Instrument Sales
Flow-Tech
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Fluke
Foranne Manufacturing

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Gem Sensors
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Germantown Tool & Machine
Glenair
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H
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Heyco
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Honeywell International
Hose-McCann
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Hubbell Industrial Controls
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Hydra-Electric

I
ICC Cable
IFM EFECTOR, INC
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Insulation Products Corp.
Integrated Motion
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Juniper Industries

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Kitco Fiber Optics
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Krohne Incorporated
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Kulka/Marathon

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Lemo

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Littlefuse
LopoLight
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Mensor Corp.
Mersen/Ferraz Shawmut
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Molex
Molex Industrial
MOXA

N
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Nidec-Avtron
NSI Industries

O
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Red Dot
Roanwell Corp.
Rockwell Automation
Rosemount
Roxtec
Russellstoll

S
Selecta Products
Sentinel Connectors
Shat-R-Shield
Siemens
Siemens Energy
Simpson Electric
Sola/Hevi-Duty
Spacecraft Components
SPC Technology
Sprecher & SchuhStaco
Switch

T
Tabet Manufacturing
Tescom
TELEDYNE D.G. O'BRIEN
Thermo CIDTEC
Thomas & Betts
Time Mark Corporation
Trans-Coil Inc.
Trident Systems
Trion
Tri-Star Connectors
Turck
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U
Universal Metal Hose
Universal Switching
U.S. Pioneer
U.S. Tsubaki

W
Weidmuller
Weshler Instruments
Westinghouse
Winchester/Kings Electronics
Wiremold
Wirlatone
Woodhead/Molex
World Magnetics

AUTOMATION SERVICES

We have the resources and the people to see your projects through every phase. This is where we truly put Dependable People, Real Solutions to the test. Whether you're improving the workflow of your facility or building a unique application, you can count on our specialists to guide you through every obstacle.

INVENTORY SERVICES

The Inventory Services Group has several programs that offer different levels of service. From basic routine deliveries and counts to completely automated and internet-based solutions, we can find a solution that works best for you.

GOVERNMENT SERVICES

Our knowledge of government procurement systems enables us to provide you the best service with a vast inventory of products courtesy of our strategic distribution network. We understand what it means to procure more for less, and we're prepared to ensure your needs are met.

LED SMART

EECO
Ideas Powering Performance

LCD
The L.C. Doane Company

LOPOLIGHT
PROFESSIONAL SERIES

NAVY PRODUCTS

SHIPBOARD & SHORE LIGHTING

E: Marine@eeco-net.com | P: 757.857.1100 EXT 2

MIL-DTL-16377/X

900 Series

Single Foundation | Overhead Lighting | Surface Mount | Flush Mount | 10W-30W | LED

PRODUCT SPECIFICATION

Overhead Lighting

900 Series

The 900 Series is a single foundation watertight LED luminaire designed for general purpose naval lighting in wet maritime environments. Available with a 5-hour EM (NEALS) battery system.

Mounting
Mounts to ceiling surface or flushed within them. Legacy dual foundation mounting available for M16377/8, M16377/11 and M16377/12.

Light Source
One LED array, powered by 120V 60Hz drivers, provides 10W-30W of solid state illumination.

901 series - 10W M16377/8 SYM 331.1 Lumen output

902 series - 20W M16377/11 SYM 77.4 Lumen output

903 series - 30W M16377/12 SYM 333.1 Lumen output

Lens
0.187 in. thick white diffusing lens.

Housing
Die cast aluminum.

Finish
Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance.

Weight
901-902 series
5 lbs. 14 oz.(standard model), 6 lbs. 4 oz. (EM model)
without cable

903 series
6 lbs. 7 oz. (standard model) 6 lbs. 13 oz. (EM model)
without cable

Cable
901 series
Supplied with 10 ft. of LSDHOF-3.

902-903 series
Supplied with 10 ft. of LSTHOF-3.
All EM models supplied with 10 ft. of LSFHOF-3 cable

Certifications
First Article Qualified.

Contact factory for additional options.

901-902 series

903 series

Ordering information: marine@eeco-net.com
800.486.1100 ext 2 or 757.857.1100 ext 2

EECO
Ideas Powering Performance

MADE IN USA

SERIES - one - two - three - four

Series	one	Mounting	two	LED Color Array	three	Switch option(s)
901	F	Flush mount	R	Red/White	S	One DPST switch
902			NV	Night Vision/White		
903						

four	Options
EM	NEALS emergency battery backup
LC	Less Cable

MIL-DTL-16377/X

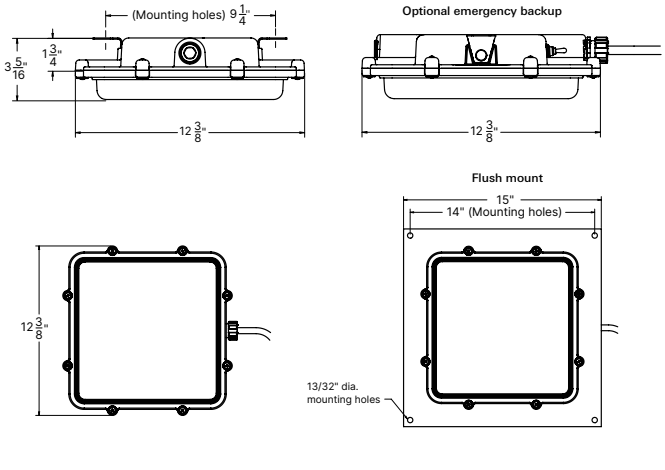
900-LED Series

Single Foundation Overhead Lighting Surface Mount Flush Mount 10W-30W LED

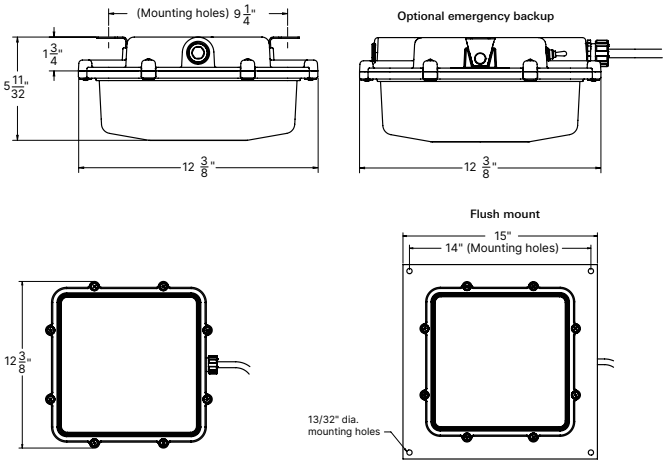
PRODUCT SPECIFICATION

Replacement Item	L.C. Doane Number
LED Array (White Only)	L-LW96
LED Array (White Only), EM	L-LW96-EM
LED Array (White-Red)	L-LW96-R24
LED Array (White-Red), EM	L-LW96-R24-EM
LED Array (White-Nvis Green)	L-LW96-NV15
LED Array (White-Nvis Green), EM	L-LW96-NV15-EM
Driver, Non-EM	P-900
Driver, EM	P-901
Window Assembly	B-3212
Shockmount Assembly	B-3210-A
Emergency Battery Pack	P-3083

901-902 variants



903 variant



EECO

Ideas Powering Performance

CERTIFICATE NUMBER	24-2507002-PDA
EFFECTIVE DATE	08-Feb-2024
EXPIRY DATE	07-Feb-2029
ABS TECHNICAL OFFICE	Houston ESD - Electrical

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

L.C. DOANE COMPANY

located at

110 POND MEADOW RD., , IVORYTON, CT, United States, 06442

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product:	**Lighting Fixtures, LED**
Model:	**900 Series**
Endorsements:	
Tier:	**2 - PDA Issued**

This Product Design Assessment (PDA) Certificate remains valid until 07/Feb/2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Soheni Haque

Soheni Haque,Engineer/Consultant

L.C. DOANE COMPANY
110 POND MEADOW RD.
IVORYTON CT
United States 06442
Telephone: 860-767-8295
Fax:
Email: sales@lcdoane.com
Web: www.lcdoane.com

Tier: 2 - PDA Issued

Product: **Lighting Fixtures, LED**
Model: **900 Series**
Endorsements:

Intended Service:
Marine Applications - Lighting Fixtures for Installations on Marine & Offshore Vessels.

Description:
900 Series Shipboard LED Lighting Luminaires: 901, 902, 903: may be followed by F, R, NV, S, EM.

Rating:
1. VAC: 120
2. HZ: 60
3. IP: 67
4. Ambient Temperature: -25 to 60 °C (-13 to 140 °F)
5. White Light Operation: 10 to 30 Watt, NVIS Light Operation: 8 Watt, Red Light Operation: 5 Watt
6. Housing Material: Aluminum

Service Restriction:
1. Unit Certification is not required for this product. If the manufacturer or purchaser's request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
2. Not suitable for Hazardous Area Locations.

Comments:
The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:
Drawing No. 110223, 900 Series Product Specification, Revision: -, Pages: 2
Drawing No. 900, LED LIGHT FIXTURE, #900 SERIES, Revision: 0, Pages: 4
Drawing No. 900-EM, LED LIGHT FIXTURE, #900 SERIES, Revision: 0, Pages: 4
Drawing No. 900-F, LED LIGHT FIXTURE, #900 SERIES, Revision: 0, Pages: 4
Test Report No. 9696A Rev 2, First Article Testing for 903-EM Light Fixture, Revision: 2, Pages: 91
Test Report No. 9825-A Rev 2, Electrical Testing for Type III, Class 2, General Illumination Light Fixture, Revision: 2, Pages: 65
Test Report No.230404-03, Lumen Maintenance Test Report, Revision: A, Pages: 37
Test Report No. 230404-01B, Emergency Light Fixture Battery & Charging System, Revision: B, Pages: 18

Terms of Validity:
This Product Design Assessment (PDA) Certificate remains valid until 07/Feb/2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

L.C. DOANE COMPANY
110 POND MEADOW RD.
IVORYTON CT
United States 06442
Telephone: 860-767-8295
Fax:
Email: sales@lcdoane.com
Web: www.lcdoane.com

Tier: 2 - PDA Issued

STANDARDS

ABS Rules:
2024 Rules for Conditions of Classification, Part 1, 1-1-4/7.7, 1-1-A3, 1-1-A4, which cover the following:
2024 Marine Vessel Rules: 4-8-3/1.3, 4-8-3/1.7, 4-8-3/1.11, 4-8-3/1.17, 4-8-3/Table 2

2024 Rules for Conditions of Classification, Part 1 - Offshore Units and Structures 1-1-4/9.7, 1-1-A2, 1-1-A3, which cover the following:
2024 Mobile Offshore Units Rules: 4-3-1/11, 4-3-1/15, 4-3-1/17, 4-3-3/Table 1

National:
N/A

International:
N/A

Government:
N/A

EUMED:
N/A

OTHERS:
N/A

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVE SE
WASHINGTON NAVY YARD DC 20376-0001

IN REPLY REFER TO
9330
Ser 05Z/094
February 9, 2024

Ryan Gallacher
Engineering Manager
L.C. Doane
110 Pond Meadow Road
Ivoryton, CT 06442

Dear Mr. Gallacher:

The purpose of this correspondence is to respond to L.C. Doane's submission of the 900 Series First Article Test Reports to Naval Surface Warfare Center Philadelphia Division (NSWCPD) for review. The luminaires were evaluated to the generic Type III performance requirements of MIL-DTL-16377K dated May 26, 2023. NSWCPD completed the review of the contents of your submittal and forwarded their recommendation for approval to the NAVSEA Electrical System Technical Warrant Holder.

NAVSEA Electrical System Technical Warrant Holder concurs with the findings presented by NSWCPD. L.C. Doanes's 900 Series light emitting diode (LED) luminaires listed in the table meet the requirements of MIL-DTL-16377K and are approved for use in U.S. Navy shipboard applications.

L.C. Doane Part Number	Description
901	Standard Mount, Diffuse Window Non-emergency
902	
903	
901-EM	Standard Mount, Diffuse Window Emergency
902-EM	
903-EM	
901-F	Flush Mount, Diffuse Window Non-emergency
902-F	
Note: The following MIL-DTL-16377 color outputs are approved in addition to the white light outputs. Red – R Night Vision Device Friendly – NV	

Technical questions regarding this letter should be directed to Mr. Christopher Nemarich, SEA 05Z33, at (202) 781-0413 or email: christopher.p.nemarich.civ@us.navy.mil, or Mr. Ben Hatch, NSWCPD (Code 447), at 215-897-8766, or email: benjamin.e.hatch.civ@us.navy.mil.

ABADILLA.CHRISTOPHER.W.1298393847

Digitally signed by ABADILLA.CHRISTOPHER.W.1298393847
Date: 2024.02.09 09:12:05 -05'00'

CHRISTOPHER ABADILLA
Technical Warrant Holder
Electrical System - Protection, Safety, Distribution and Instrumentation – Ships

Copy to:
NAVSURFWARCENDIV PHILADELPHIA PA (447)

MIL-DTL-16377

600A-SSL2 Series

Standard Mount **LED**

PRODUCT SPECIFICATION

Overhead Lighting

600A-SSL2 Series

The 600A-SSL2 series is a wet location high output LED light fixture for general lighting.

Light Source
White 4000K 85 CRI LED, 14,300 Lm
Option: Cyan LED (NVIS), 1,230 Lm

Input Voltage
115VAC 60Hz
133W white operation

Lens
1/8" diffusing acrylic or polycarbonate lens sealed to housing via silicone gasket.

Housing
Constructed of die formed, continuously welded marine grade aluminum.

Finish
Polyester powder-coated after phosphate pretreatment for superior adhesion and corrosion resistance.

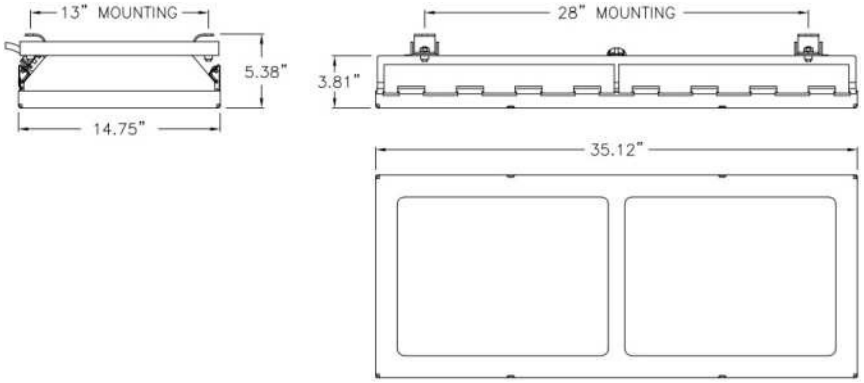
Hardware
Stainless steel fasteners

Cable
Cable supplied by request
Please contact L.C. Doane for cable options.

Dimensions
35-1/8" X 14-3/4" X 5-3/8".
13" X 28" mounting matches M16377/13 & /85
Weight (without cable): 24.4 lbs.

Certifications
First Article Qualified

Consult factory for specific requirements



MADE IN USA

L.C. Doane Part Number

600A-SSL2 - [ ] - [ ]
one two

one Leave blank for White LEDs only.
NV - With cyan (NVIS) LEDs
NV4 - With cyan (NVIS) LEDs + stepped dimming capable.

two **Option**
Contact L.C. Doane for Cable Options & Lengths

For more information or to order please contact:
marine@eeco-net.com
800.486.1100 ext 2 or 757.857.1100 ext 2

Modifications are available to meet custom requirements.
Specifications and dimensions are subject to change without notice.

LED SMART

Distributed by **Electrical Equipment Company (EECO)**

MARITIME LIGHTING PRODUCTS

SHIPBOARD LIGHTING

24” 10W T12 4100K NSN:6240-01-610-2124
PART: FLZT12G24
Designed for use in M16377 fluorescent fixtures. The LED tube works with or without the ballasts. This lamp is suitable for use in all M16337/8, /11, /12, ,/44*, /57, /72*, /73, /74, /75, /77, /80, /81 and /83 fixtures.

Replaces 6240-00-152-2996
*Starter removed , as per MIL-DTL-16377/86A(SH)

48” 20W T12 4100K NSN:6240-01-655-7354
PART: FLZT12G48
Designed for use in M16377/13 fixtures, and other 48” applications. For use in below deck, and exposed below deck applications. Only 20W of power, compared to the existing 56W fluorescent.

Replaces 6210-00-474-5653

48” 20W REPLACEMENT FOR T5 4100K
PART: FLZT5G48
Designed for use in M16377/13 modified fixtures that use T5 fluorescent tubes normally found in well deck, vehicle deck, mission bay or hangar bay. For use in below deck, and exposed below deck applications. This LED tube requires fixture modification to work without a ballast.

Replaces 6210-00-474-5653

18” 8W T12 4100K NSN:6240-01-655-5877
PART: FLZT12G18
Designed for use in M16377/5, /18 fixtures, and other 18” applications. This lamp is designed to operate with or without the ballast. Uses 50% less energy than fluorescent, only 8W compared to 15W.

Replaces 6240-00-583-3668

24” 10W T8 4100K NSN:6240-01-705-5319
PART: FLZT8G24
Designed for use in M16377 fluorescent fixtures. The LED tube works with or without the ballasts. This lamp is suitable for use in all M16337/77A, /78A, /79A, /80A, /81A, /82A, /83A, /84A, /85A fixtures primarily used on the Ford Class CVNs & Independence variant LCS.

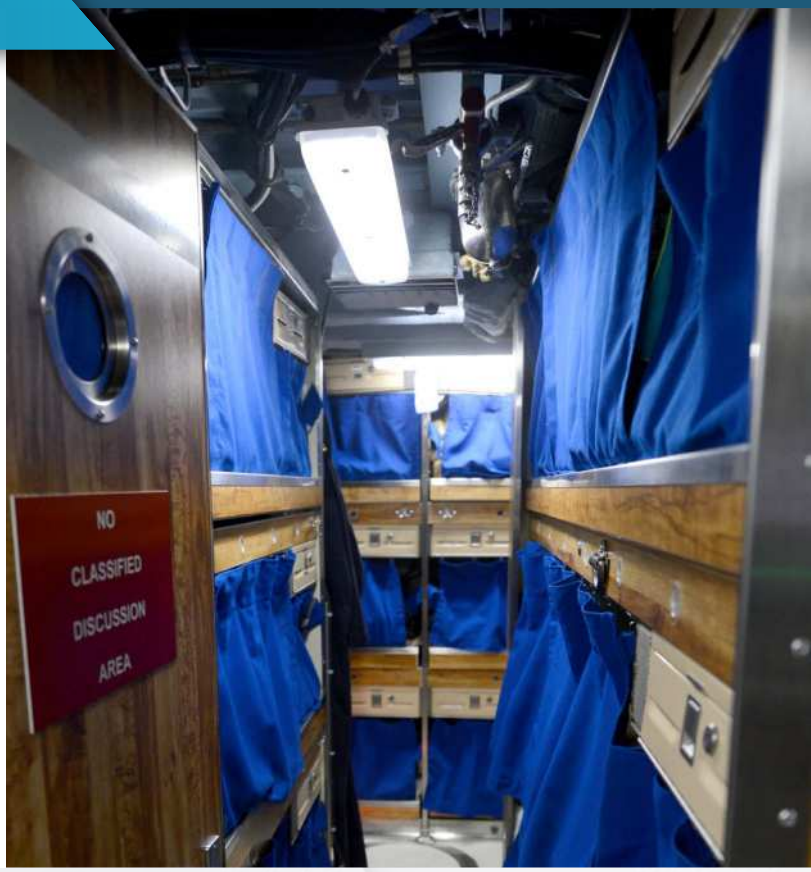
Replaces 6240-01-391-6027

12” 5W T5 4100K NSN: 6240-01-650-0055
PART: FLZT5G12
Designed for use in M16377/7B, /14B or other T5 lamp fixtures. This lamp is designed to operate with the ballast. Uses 35% less energy than fluorescent, only 5W compared to 8W

Replaces 6240-00-299-5546

LED SMART

GENERAL PURPOSE LIGHTING



24” 10W T12 4100K NSN: 6240-01-610-2124
PART: FLZ-T12-G-24-115-0-B-10-41-S

Designed for use in M16377 fluorescent fixtures. The LED tube works with or without the ballasts. This lamp is suitable for use in all M16337/8, /11, /12, ,/44*, /57, /72*, /73, /74, /75, /77, /80, /81 and /83 fixtures. Available in NVIS Red, NVIS Blue, NVIS Green A

*Starter removed , as per MIL-DTL-16377/86A(SH)

E: Marine@eeco-net.com | P: 757.857.1100 EXT 2

LED SMART

Ford Class CVNs
LCS (Independence Type), and Mirrors

18" 8W T12 4100K NSN: 6240-01-655-5877
PART: FLZ-T12-G-18-115-0-G-8-41-S

Designed for use in M16377/5, /18 fixtures, and other 18" applications. This lamp is designed to operate with or without the ballast. Uses 50% less energy than fluorescent, only 8W compared to 15W.

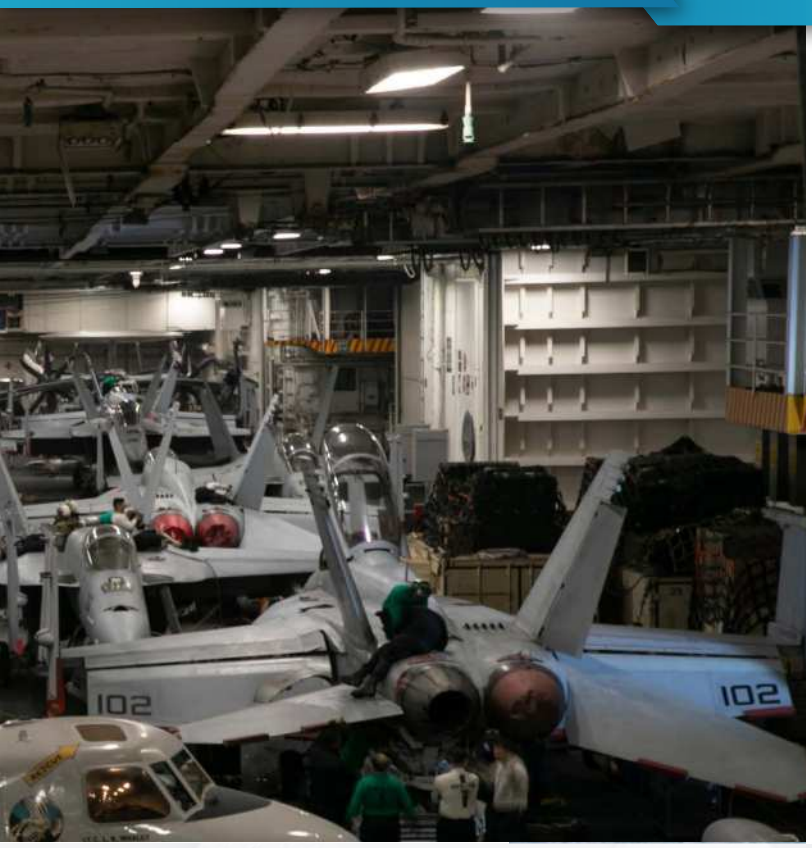
24" 10W T8 4100K NSN: 6240-01-705-5319
PART: FLZ-T8-G-24-115-0-G-10-41-S

Designed for use in M16377 T8 fluorescent fixtures. The LED tube works best without the ballast for energy consumption and decrease shipboard weight. This lamp is suitable for use on CVN 78 class and LCS Independence variant. Also available in Red, Blue LED colors.

E: Marine@eeco-net.com | P: 757.857.1100 EXT 2

LED SMART

Four foot fixture tubes for Hangar & Vehicle Bays, Well Decks, and General use lighting



APPROVED
NAVSEA
NAVAL SEA SYSTEMS COMMAND

48” 20W T12 4100K* NSN: 6240-01-655-7354
PART: FLZ-T12-R-48-115-0-G-20-41-M
Designed for use in M16377/13 fixtures, and other 48” applications.For use in below deck, and exposed below deck applications. Only 20W of power, compared to the existing 56W fluorescent, saves 30%energy. Also available in NVIS Red, NVIS Blue, NVIS Green A

Additional four foot options: FLZ-T12-48-G Maritime and FLZ 48 T5

The MILSPEC LED tube has been adapted to work with conventional fluorescent fixtures in interior lighting on LCS, Amphibs, MSC, USCG and commercial ships. The single ended powered LED tube works without a ballast. This lamp provides the low EMI/EMC and NAVSEA performance requirements for shipboard use. Also available in NVIS Red, NVIS Blue, NVIS Green A.

*ballast removed and single end power, as per MIL-DTL-16377/86A(SH)

E: Marine@eeco-net.com | P: 757.857.1100 EXT 2

LED SMART

BERTH LIGHTS

12” 5W T5 4100K NSN: 6240-01-650-0055
PART: FLZ-T5-G-12-115-0-G-5-41-S

APPROVED NAVSEA NAVAL SEA SYSTEMS COMMAND

Designed for use in M16377/7B, /14B or other T5 lamp fixtures. This lamp is designed to operate with the ballast. Uses 35% less energy than fluorescent, only 5W compared to 8W

LED SMART

VESSEL EXTERIOR

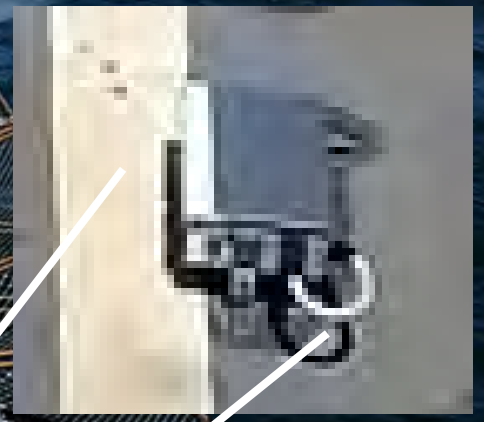
65W WATERLINE SECURITY LIGHT
PART: EXP-AL-115-65-40-60 or
LCS Independence variant uses EXP-AC-115-65-40-60 for the hull mount bracket
Explosion proof LED Waterline light fixture. Designed to mount to existing 2" diameter pole. Ultra high efficiency with up to 10,350 lumens, at 4100K. UL844 approved for shore use. IP66 rated. Replaces fixture M16377/61 with 60° beam angle.

Replaces Symbol 303.4

LED BULBS
PART: LB-A19-3-115-X-HT
Quickly replace the existing incandescent lamps. Available in standard 4100K White, NVIS Blue (B), NVIS Red (R), NVIS Yellow (Y), NVIS Green A (GA). 3W lamps replace a standard 50W or 60W light, for up to 90% energy savings. When ordering replace X with color option if ordering other than white LED: B,R,Y or GA

Are you tired of replacing those ancient PAR36 Lamps in your “Dust Pan” Fixtures?

Deck Flood -“Dust Pan”



LED Light Engine Module

For NAWC 619403 Deck Floodlight

PRODUCT SPECIFICATION

Operation:
LED Driver with PWM Dimming (28-9VAC) for Flight Deck operations.
Ambient temperature operating range -40°C to 50°C.
>50,000 hour continuous operation.

Mounting:
Mounts directly into a NAWC 619403 deck floodlight (See figure below).

Direct replacements for (DUAL) 100WATT, 28VAC, PAR36 LAMPS

Housing / Construction:
Constructed of lightweight aluminum, hard-coat anodized per MIL-A-8625, TYPE II, CLASS 2. Acrylic output window, hard-coated for optical clarity, scratch resistant, UV protection.

Connections:
Supplied with 8" power conductors and ring terminals.

NSN 5998-01-557-8090

MADE IN USA

NAWC 619403

BEFORE....619403 with Legacy PAR36 Lamps

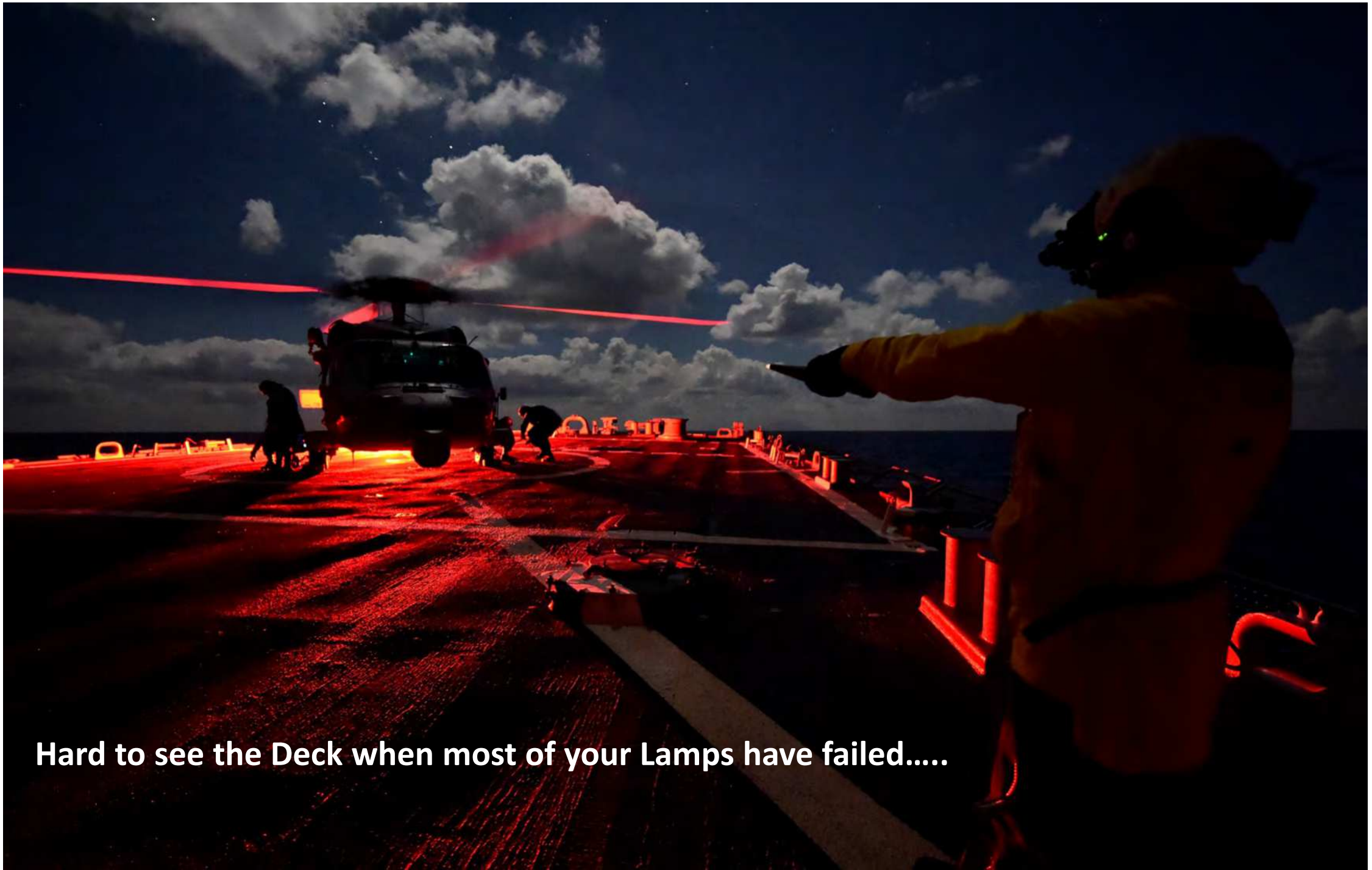
AFTER....619403 with LED Light Engine Module

Item Description	L.C. Doane Part #	For Light Fixture	NSN
40W DUAL PAR 36-LEM	L-25/120/DIM	NAWC 619403	5998-01-557-8090

Dual Lamp, 100Watt PAR36 Floodlamps & Holders

40Watt PAR36-LEM

(LEM replaces both Lamps & Holders)


Hard to see the Deck when most of your Lamps have failed…..

LED Lighting Replacement Modules: Flight Deck Lighting Fixtures USNS Mercy

626 Series

NAEC 506829

615 Series

NAEC 619403

LED Light Engine Module

For 626 & 628 SERIES FLOODLIGHTS

PRODUCT SPECIFICATION

Totally sealed LED Light Engine Modules (LEM).
*Fully Dimmable for Flight Deck Operations.

Mounting

Mounts directly into a 626 or 628 Series floodlight fixture.

Direct replacements for 300Watt Incandescent Lamps:

300WATT PAR56/4MFL (NSN 6240-00-145-1148)

300WATT PAR56/4WFL (NSN 6240-00-056-0737)

Housing / Construction

Constructed of lightweight aluminum, hard-coat anodized per MIL-A-8625, TYPE II, CLASS 2.
Acrylic output window, hard-coated for optical clarity, scratch resistant, UV protection.

Connections

Supplied with 6" power conductors, (2) reusable lever action splice connectors,
& (1) waterproof gel-box.

NSN 5330-01-688-1006

MADE IN USA

50W PAR 56-LEM / WFL

300Watt PAR56 Floodlamp

50Watt PAR56-LEM


615 Series
NAEC 619403

Great News!!! The PAR36 Light Engine Modules are here.

PRODUCT SPECIFICATION

LED Light Engine Module

For NAWC 619403 Deck Floodlight

Operation:
LED Driver with PWM Dimming (28-9VAC) for Flight Deck operations.
Ambient temperature operating range -40°C to 50°C.
>50,000 hour continuous operation.

Mounting:
Mounts directly into a NAWC 619403 deck floodlight (See figure below).

Direct replacements for (DUAL) 100WATT, 28VAC, PAR36 LAMPS

Housing / Construction:
Constructed of lightweight aluminum, hard-coat anodized per MIL-A-8625, TYPE II, CLASS 2. Acrylic output window, hard-coated for optical clarity, scratch resistant, UV protection.

Connections:
Supplied with 8" power conductors and ring terminals.

NSN 5998-01-557-8090

MADE IN USA

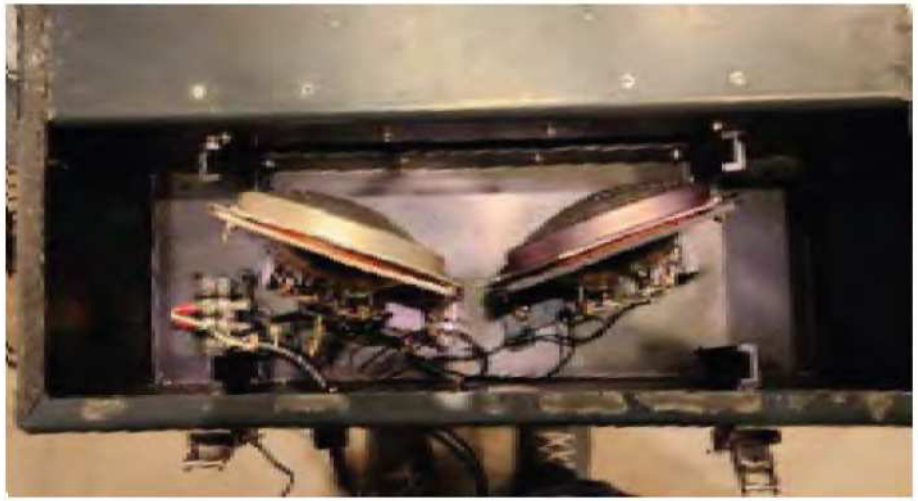
Purchase Today through Stock System! LC Doane Part #L-25/120/DIM NSN 5998-01-557-8090

Dual Lamp, 100Watt PAR36 Floodlamps & Holders

40Watt PAR36-LEM

(LEM replaces both Lamps & Holders)

BEFORE....619403 with Legacy PAR36 Lamps



AFTER....619403 with LED Light Engine Module

iGLO LED PORTABLE STRING LIGHT

ENVIRONMENTALLY FRIENDLY, ENERGY EFFICIENT

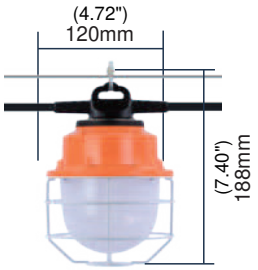
iGLOLED.NET

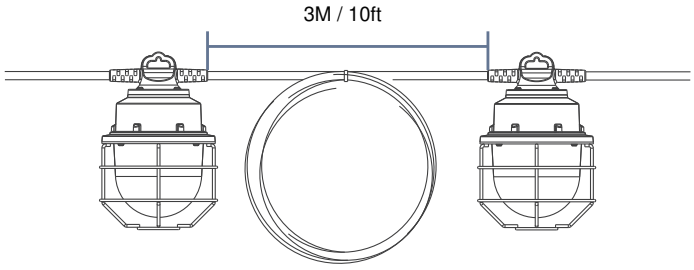
Product Description

LINKABLE WEATHERPROOF PORTABLE LIGHTING
51FT Heavy Duty Weatherproof Power cord with five 20W cage guarded industrial grade LED light bulb spaced 10 feet apart and waterproof plugs

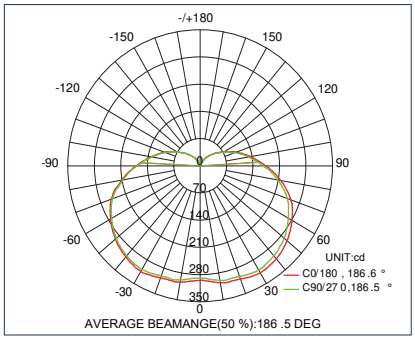
Applications

When it comes to lighting a large area, this product is the ideal solution for high impact lighting of mine-haul road intersections, road works, construction sites, events and general industrial and maintenance programs.





Specifications/Features



3 Year Warranty

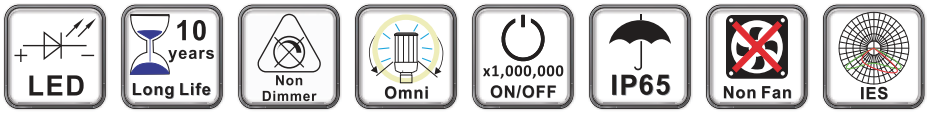
E

115LW/W

IP65 Outdoor Use

-20°F to 122°F (-29°C to +50°C)

- » Input Voltage: 100-277V ac / 50~60Hz
- » Wattage: 20W±5%
- » THD: <20%
- » Housing: Orange
- » Lamp cover: opal
- » Protective net cover
- » 115LM/W per LED fixture
- » Outdoor use/Weatherproof design: IP65
- » Reliable lifespan: >50,000 hours
- » 3 year limited warranty



UL Rubber Cord

Power Cord	Area	Overall Diameter	Insulation Thickness	Sheath Thickness
SOOW 14AWG*3C	2.08mm²	13.8±0.3mm	1.14mm	2.03mm

TECHNICAL SPECIFICATIONS

* Kelvin Temperatures may vary +/- 250K.

* Line length, Please inquire. Extending the power cord may increase the size of the package.

Model No.	Wattage (W)+/- 10%	AC Input	Lumens +/- 5%	CCT.	PF	Dimensions H*D (Single)	Total length	Fixtures
GL100W277VAC600143SO	20Wx5	100~277V ac 50/60Hz	2,300x5	2700-6500K	≥0.9	188.00*120.00(mm) 7.40"x4.72"	15.78M 51.77ft	5pcs

To order: marine@eeco-net.com
1-800-486-1100 EXT 2

EECO Ideas Powering Performance

3798 Village Ave
Norfolk, VA 23502

LOPOLIGHT

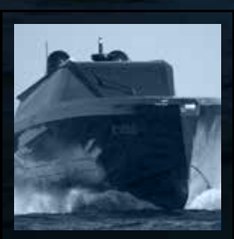
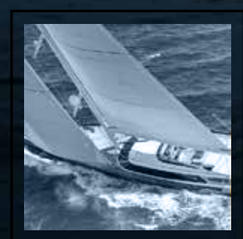
THE ULTIMATE NAVIGATION LIGHT SOLUTION

EECO
Ideas Powering Performance

TOP STORIES IN THIS ISSUE TO READ ABOUT:

APPROVALS AND CERTIFICATIONS • *PRO SERIES* • *ICE-CLASS* • *Ex SERIES* • *SUPER/LEISURE YACHTS* • *NLC* • *CONTROL HUB* • *REFIT*

NEW!
ATEX/IEC Ex
WHY EXPLOSION PROOF NAVIGATION LIGHTS?

ICE-CLASS NAVIGATION LIGHTS

- FULLY INTEGRATED DESIGN WITH STAND-BY DE-ICE FUNCTION

DE-ICING LED NAVIGATION LIGHTS - THAT YOU CAN DEPEND ON!

The ice-class functionality has been integrated from the early design phase; this gives a number of advantages that you can read about below. The ability to truly monitor the light, that the light can be thawed when in the 'off' position, only needing 1 cable for both light and heating and that we only use a fraction of the energy that our competition needs all comes together in a unique product. Did we say that there is no problem in mixing ice-class lights with regular Lopolight nav lights in a installation?

STAND-BY DE-ICE FUNCTION
Activate the stand-by de-ice function and keep all relevant Lopolight´s ready for use in an ice free condition. Even when light is switched off. This exclusive feature installs in the same 2-wire cabling that is powering the light.

FULLY INTEGRATED DESIGN
– plug & play, ABS, DNV & USGC approved

The Ice-class feature has no impact to the weight, size, mounting configuration, IP-rating, electrical connections or approvals of the standard Lopolight Navigation Lights.

All Lopolight ice class lights are available in a dimmable Navy/SAR version.

SEAMLESS INTEGRATION WITH LOPOLIGHT CONTROL & MONITORING SYSTEMS
The built-in logic- and power control allows full and detailed monitoring of the basic navigation light function, also when full de-icing is active. All functions controlled via 2-wire cabling! - all functions controlled via a correctly configured Lopolight NLC system.

NO ADDITIONAL CABLING REQUIRED
– less cost and easier to install or re-fit

Lopolight's low power consumption, combined with the efficient de-ice control, works seamlessly using simple 2-wire cabling. Even dimmable navy installations can be integrated in the same simple cable systems.

LOW POWER CONSUMPTION FOR HEATING
The low profile of the lights in combination with heat conducting aluminium, allows for efficient de-icing at low energy usage. Testing to -60°C /-76°F proves full de-icing ability, even under extreme arctic conditions.

LED Navigational Lighting System: US Navy Combatants

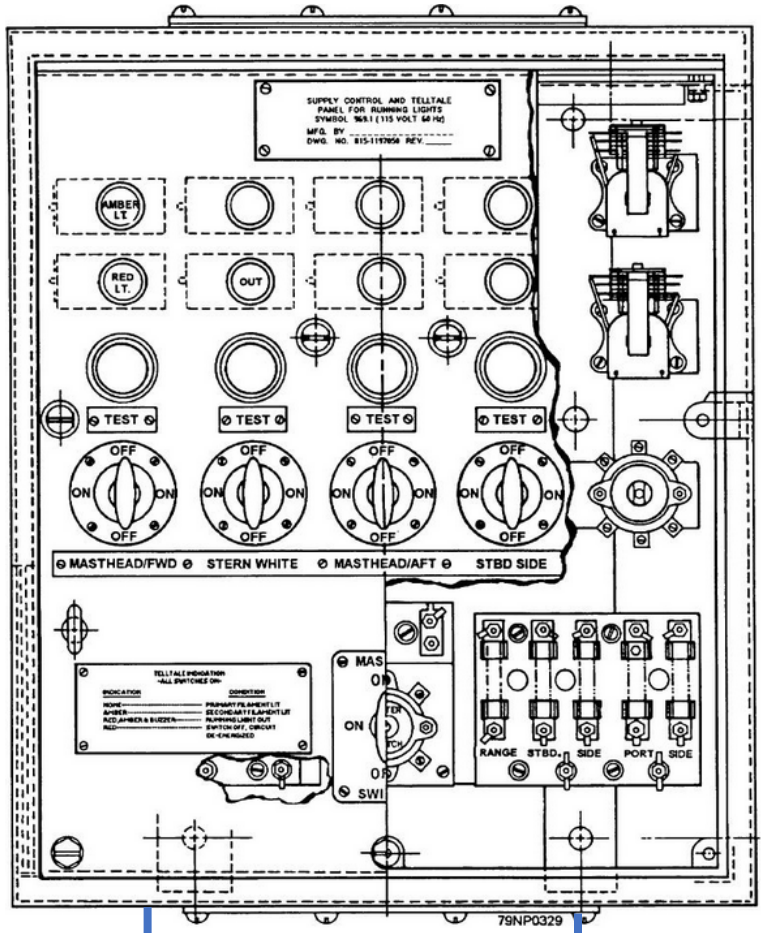
Converting from Legacy to LED on LCS Independence

NSN SOLUTIONS

EECO Ideas Powering Performance

TELLTALE CONTROL PANEL AND ASSOCIATED “LEGACY” RUNNING LIGHTS: GENERAL LAYOUT

Telltale Panel, Symbol 969.1

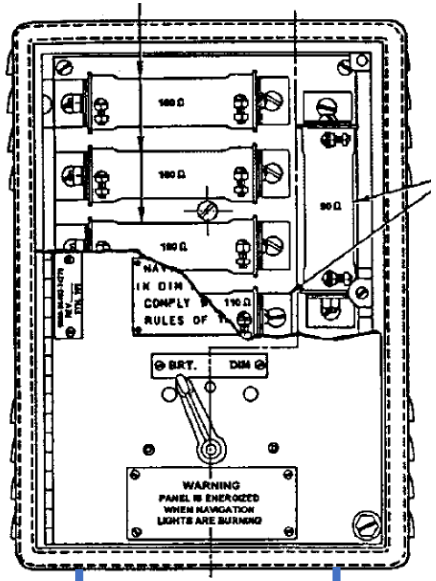


50lbs

120VAC, 60hz, Input

15lbs

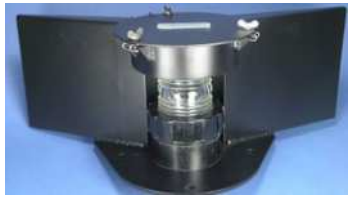
Dimmer Control Panel
Symbol 989



18lbs

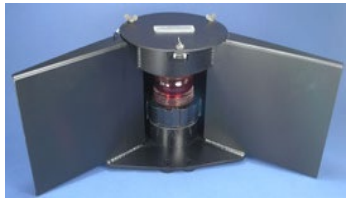
Masthead FWD, Symbol 172.2

18lbs



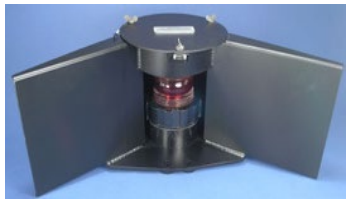
Masthead AFT, Symbol 172.2

18lbs



Sidelight, Port Symbol 182.2

18lbs



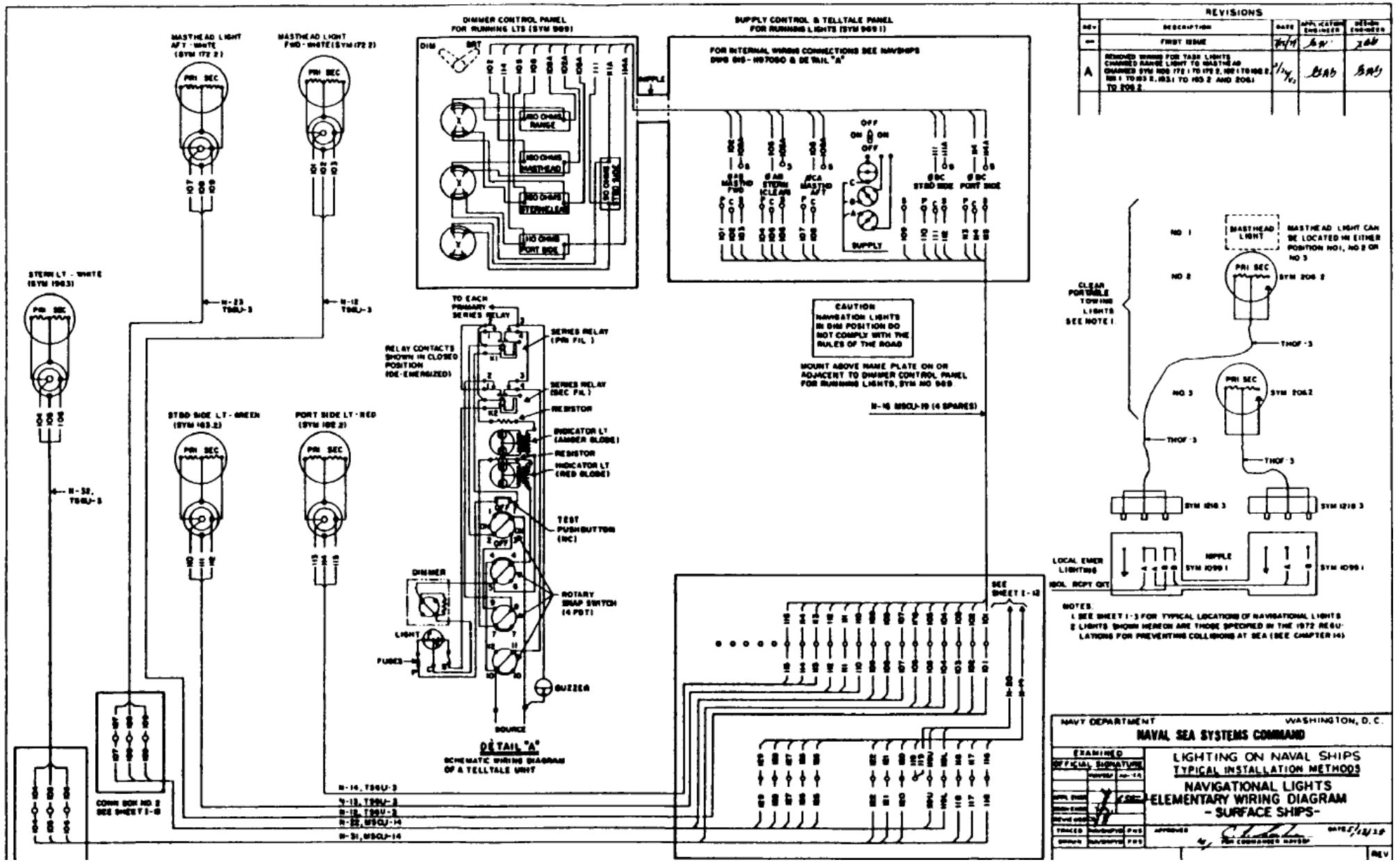
Sidelight, Starboard Symbol 183.2

18lbs

Stern WHT, Symbol 196.3

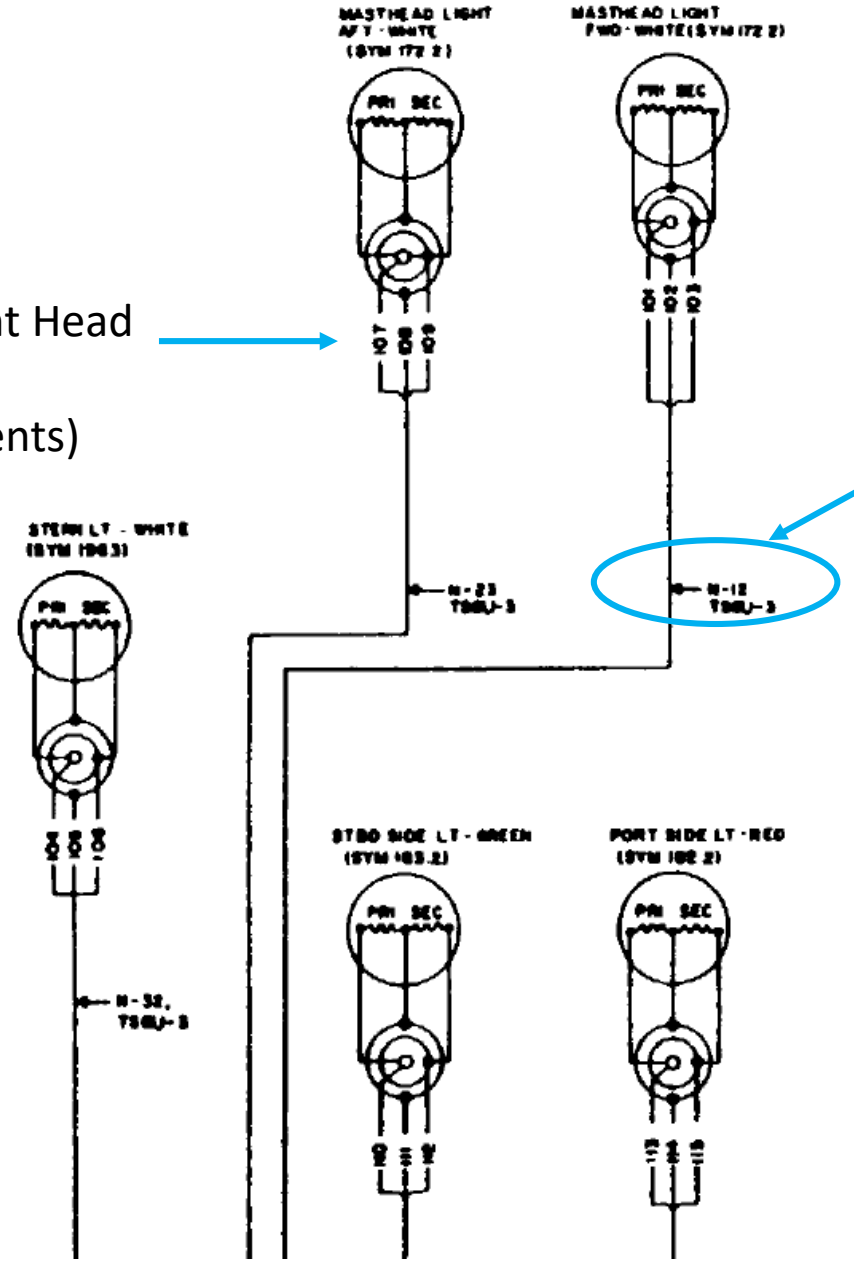
System Weight 155lbs

TELLTALE CONTROL PANEL AND ASSOCIATED “LEGACY” RUNNING LIGHTS: SCHEMATIC



LEGACY NAVIGATION LAMP & CABLING

3 Conductor Cable to each Light Head
2 Hots and Common
(Primary and Secondary Filaments)



Cable Designation:

TSGU-3

MILITARY HANDBOOK

LIGHTING ON NAVAL SHIPS

Navigation Lamp:

50/50 T12

Dual Filament

LEGACY NAVIGATION LIGHTING SYSTEM: REPLACEMENT / CONVERSION ALLOWANCE

422-1.1.4 EFFECTS OF THE ACQUISITION REFORM PROGRAM. As a result of the Acquisition Reform Program, it is the Navy's intention to begin introducing commercial grade navigation and signal light products into the fleet. Lighting products conforming to Underwriters Laboratories standard UL 1104 and modified to meet certain unique Navy requirements will be used as interchangeable alternatives for the current Military Specification (MIL-Spec) navigation light fixtures. The twelve-inch signaling searchlights will be required to meet a new performance based MIL-Spec. Since the specification is performance based, requirements detailing the "how-to" are being removed. This means that twelve-inch searchlights may begin utilizing lamps other than the mercury-xenon or incandescent types. Information contained in this Chapter is intended to be general in nature so as to cover the salient features of the new commercial products as they are applied to the Navy.

S9086-N2-STM-010/CH-422R3

REVISION 3

NAVAL SHIPS' TECHNICAL MANUAL

CHAPTER 422

NAVIGATION AND SIGNAL LIGHTS

NOTE

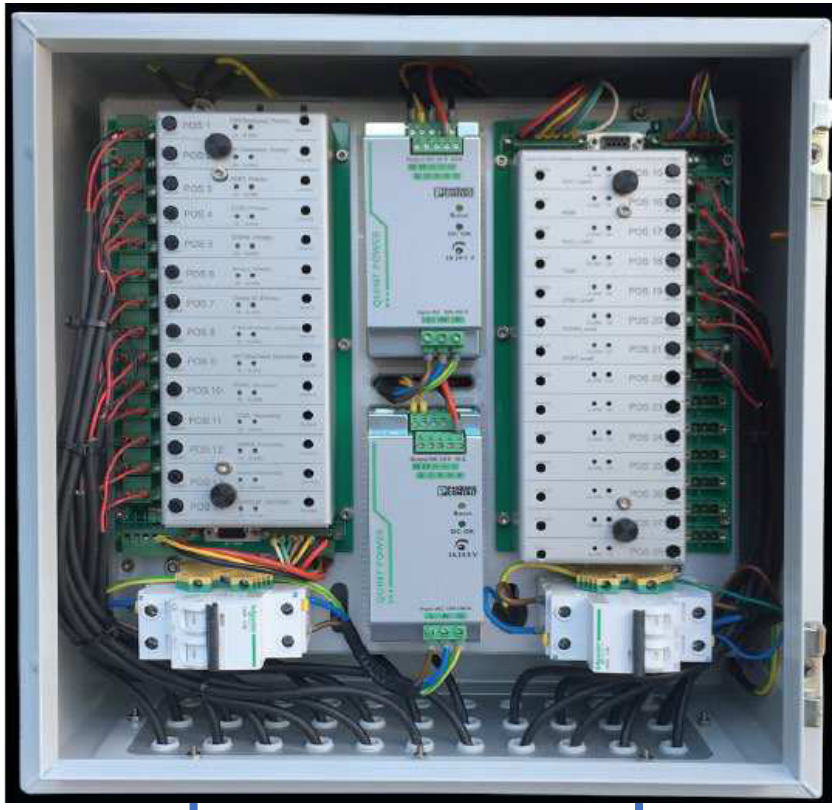
1. **Commercial products that may be procured as replacements for existing MIL-Spec products will not always be the same physical size nor have the same bolt pattern as the MIL-Spec units being replaced. The space available for these units must be considered prior to replacement. The commercial units must still comply with all spacing requirements as outlined in the COLREGS.**
2. **If any light, that is part of an array, is changed from a MIL-Spec fixture to a commercial unit, all other lights in that array must also be changed to commercial units to maintain proper spacing within the array.**

UL 1104

Standard for Marine Navigation Lights

TELLTALE CONTROL PANEL AND “LEGACY” RUNNING LIGHT REPLACEMENTS: GENERAL LAYOUT

NSNSOL-NLCP-RL



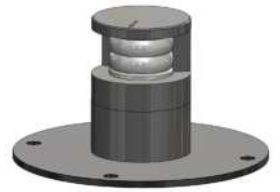
25lbs

No Dimmer Control Panel required. Dimming control incorporated in main control panel.

115VAC, 60hz Supply

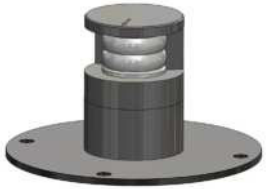
24VDC Output, <7Watts/ fixture

5lbs



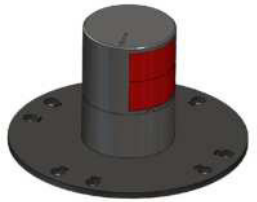
Masthead FWD, NSNSOL-MH

5lbs



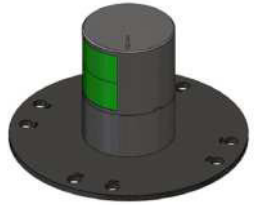
Masthead AFT, NSNSOL-MH

5lbs



Sidelight Port, NSNSOL-PSL

5lbs



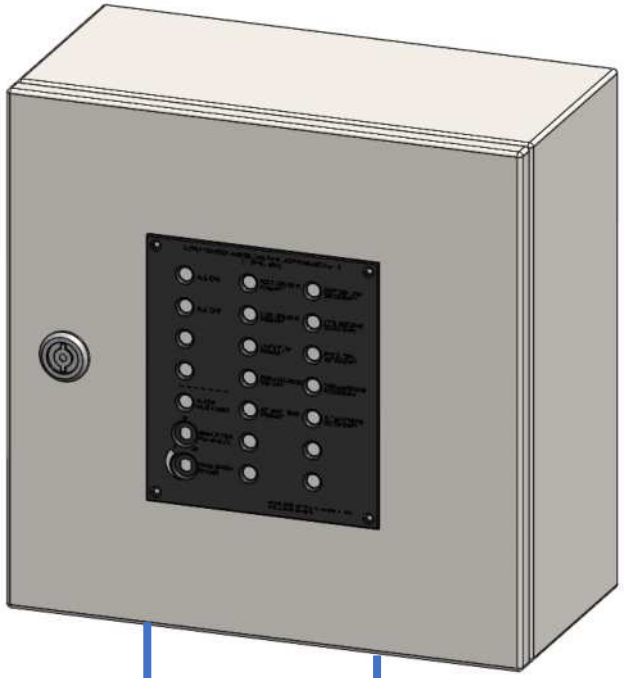
Sidelight, Starboard Symbol 183.2

5lbs

Stern WHT, NSNSOL-SLW

TELLTALE CONTROL PANEL AND “LEGACY” RUNNING LIGHT REPLACEMENTS: GENERAL LAYOUT

NSNSOL-NLCP-RL



25lbs

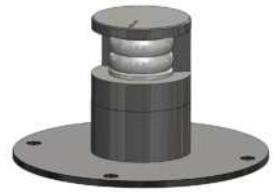
No Dimmer Control Panel required. Dimming control incorporated in main control panel.

115VAC, 60hz Supply

24VDC Output, <7Watts/ fixture

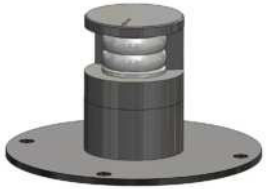
System Weight 50lbs

5lbs



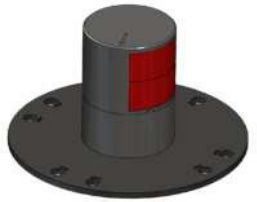
Masthead FWD, NSNSOL-MH

5lbs



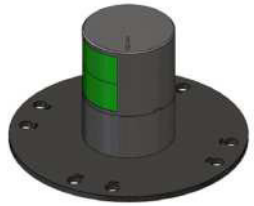
Masthead AFT, NSNSOL-MH

5lbs



Sidelight Port, NSNSOL-PSL

5lbs



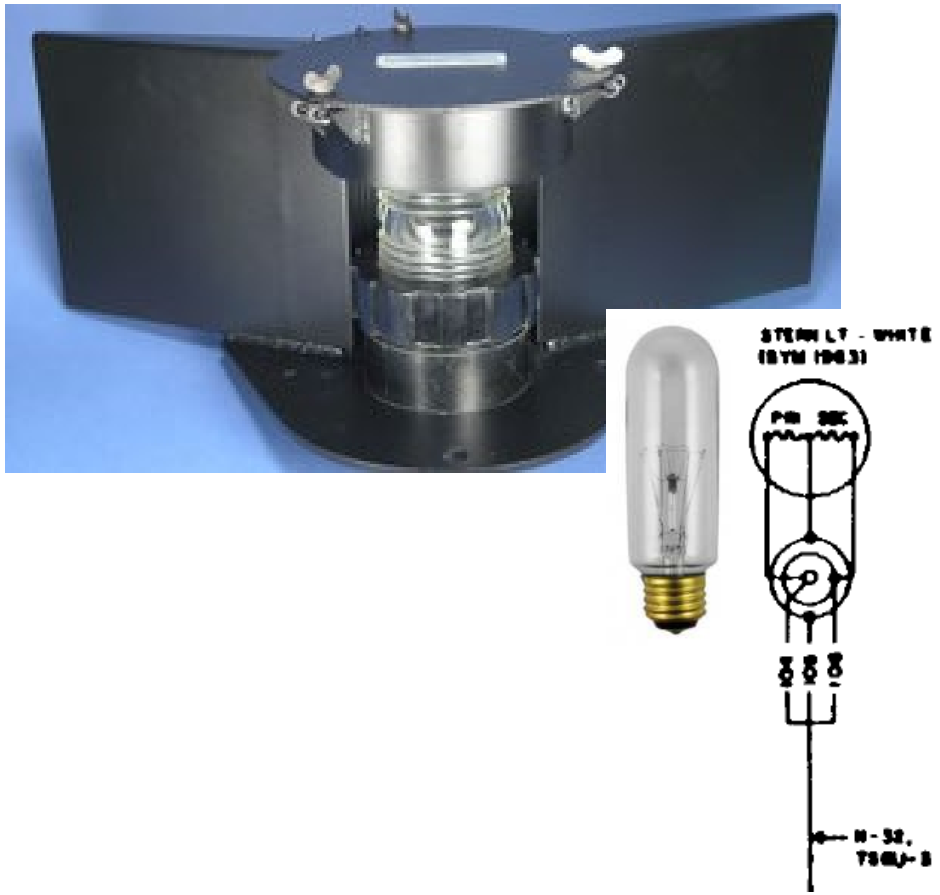
Sidelight, Starboard Symbol 183.2

5lbs

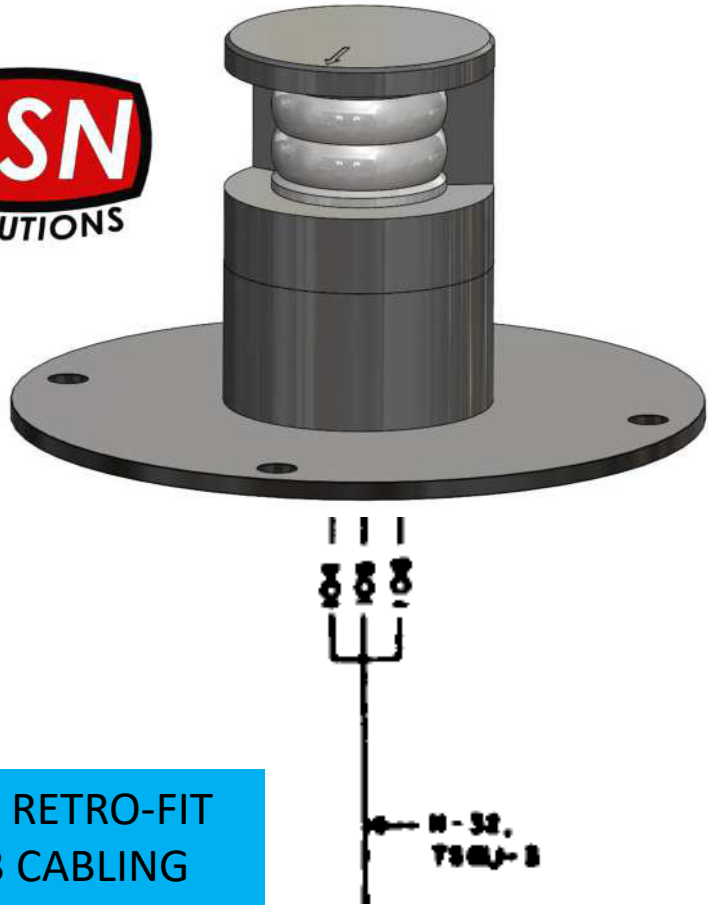
Stern WHT, NSNSOL-SLW

MASTHEAD LIGHT CONVERSION/COMPARISON

- 50Watts / filament
- 1,200hrs life / filament
- Fixture weight = 18lbs
- “Drip Proof” enclosure Only

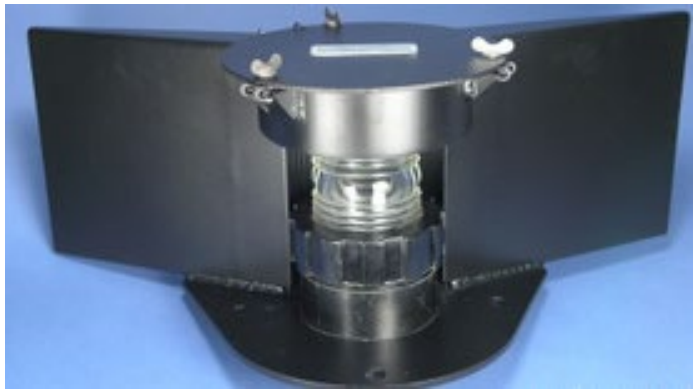


- 7Watts / Array
- 100,000hrs life / Array
- Fixture weight = 5lbs
- IP68 Rated (Completely Sealed)

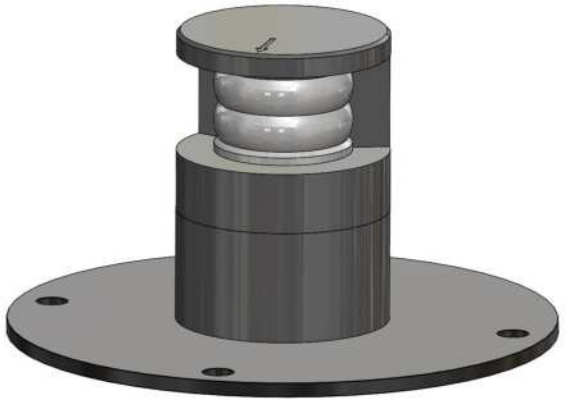


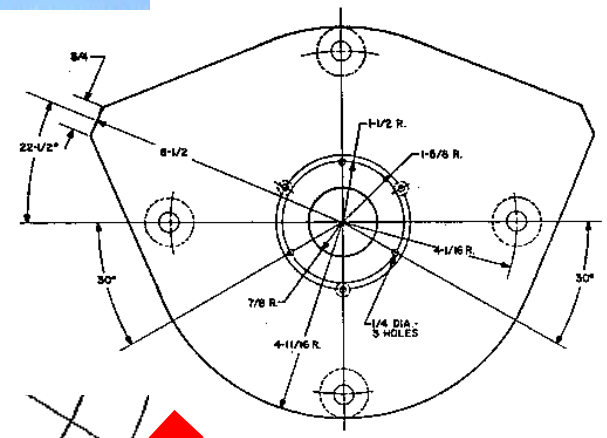
NSN SOLUTIONS FIXURES ARE RETRO-FIT USING THE EXISTING TSGU-3 CABLING

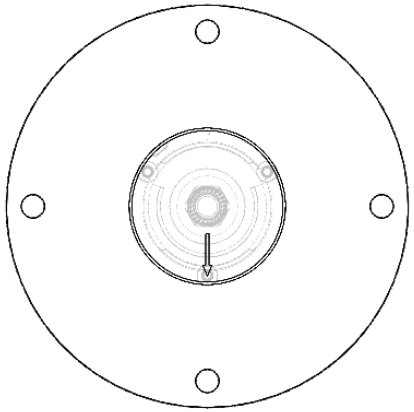
MASTHEAD LIGHT CONVERSION/COMPARISON



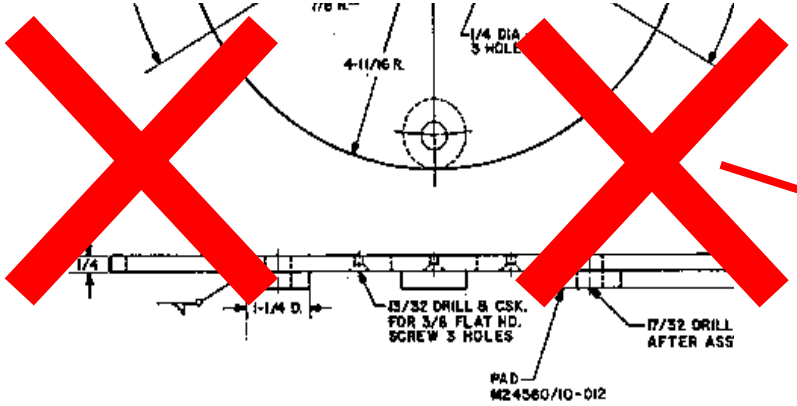
ALL NSN SOLUTIONS LED RUNNING LIGHTS HAVE IDENTICAL BOLT PATTERNS TO LEGACY SYM # COUNTERPARTS .



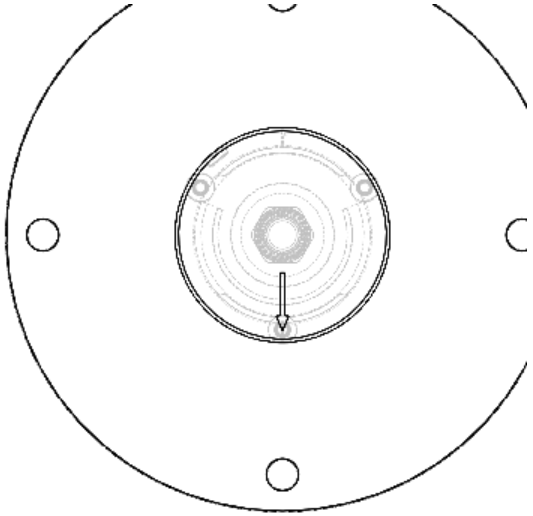




NSN SOLUTIONS



NO LIGHT SCREENS REQUIRED FOR NSN SOLUTIONS FIXTURES. ALL FIXTURE VARIANTS MEET UL1104 LIGHT OUTPUT SPECIFICATION PER DOD-HDBK-289(SH).



Marine & Offshore Applications

OPTIMIZE ELECTRICAL POWER CONNECTIONS WITH NVENT ERIFLEX

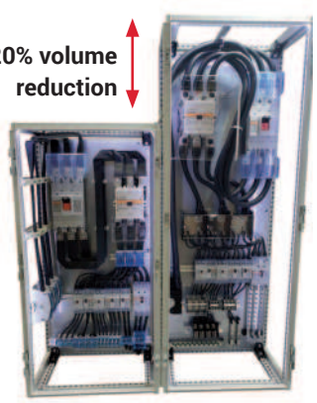
We deliver low voltage power distribution* solutions that reduce total installed cost and increase design flexibility by providing a comprehensive range of innovative and reliable products through global end user application expertise and intimacy.

* From 80 Amps to 6000 Amps

NVENT ERIFLEX SOLUTIONS PROVIDE:

SPACE SAVINGS

In the marine and offshore market, space is critical for electrical cabinets and connections. Thanks to the innovative technology from nVent ERIFLEX you can reduce your footprint of your electrical cabinet.



TIME SAVINGS

The design of an electrical panel is important. nVent ERIFLEX helps to simplify the connection with solutions that reduce labor time.

Our products are easy to shape and enable more efficient visual inspection.

RELIABILITY

To enhance safety and reliability in enclosed spaces, nVent ERIFLEX has developed a complete and reliable range that uses tinned plate material for better corrosion resistance.

Additionally, our unique products help provide better access and improved vibration resistance.

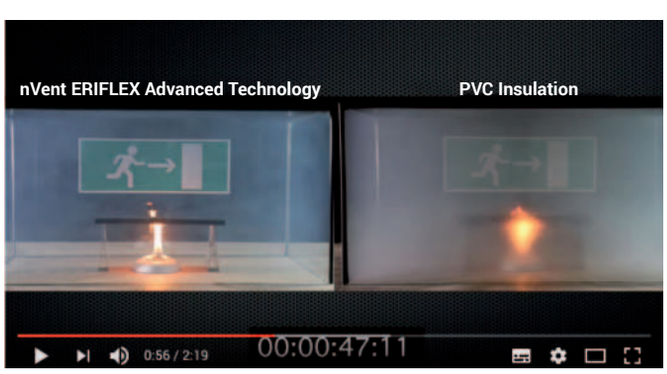
Cabinet with cables

nVent ERIFLEX Flexibar Advanced

SAFER SOLUTIONS

Catering to the unique needs of the marine and offshore market, the latest generation of nVent ERIFLEX insulation material combines the following features:

- Low smoke, halogen-free, flame retardant
- High temperature resistant
- Tin-plated



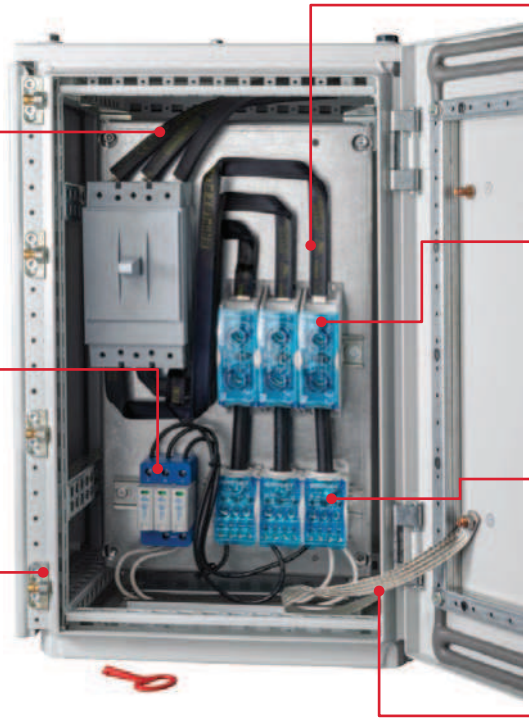
nVent Integrated Solutions for Electrical Panels

ERICO ERIFLEX HOFFMAN

nVent ERIFLEX IBSB Advanced
- Insulated Braided Conductor

nVent ERICO DT Series
- Power Surge Protection

nVent HOFFMAN
- Outdoor Mounted Enclosure



nVent ERIFLEX Flexibar Advanced
- Flexible Busbar

nVent ERIFLEX Power Blocks
- Low Voltage Splice Blocks

nVent ERIFLEX Distribution Blocks
- Low Voltage Power Distribution

nVent ERIFLEX MBJ Braid
- Metallic Grounding Braid

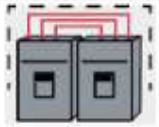
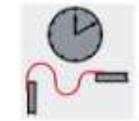
ACHIEVE MORE COMPACT, EFFICIENT ELECTRICAL PANELS

- nVent provides a range of solutions for electrical panels that allow for greater design flexibility, including more ways to compress an electrical panel and overcome spatial limitations.
- nVent products are highly compatible within a panel making it easier to configure and scale, both key advantages for electrical systems across many renewable applications.
- Designed with installers in mind, nVent solutions feature efficiencies that can significantly lower the overall cost of implementation, one of the few areas that OEMs have an opportunity to lower costs.

nVent Electrical Panel Solutions

- nVent HOFFMAN Enclosure Solutions
- nVent ERIFLEX Low Voltage Power Connection and Distribution Solutions
- nVent ERIFLEX Surge Protection Devices

nVent ERIFLEX Strength for Marine & Offshore market

Why choosing nVent ERIFLEX for Marine & Offshore applications	
Products Tested & Certified by international standards	
Products certified by Marine Classification societies	
Space saving solutions	
Safety solution : Advanced Technology (Low smoke, Halogen free, Flame retardant & Hight Temperature)	
Vibration resistance solutions	
Reliability & reduced maintenance and assembly	
Corrosion resistance with dedicated material (Tinned Copper or Stainless steel)	

Why nVent ERIFLEX

nVent ERIFLEX Product Offering

- Flexible Conductors

- Distribution and Power Blocks

- Busbar and supports

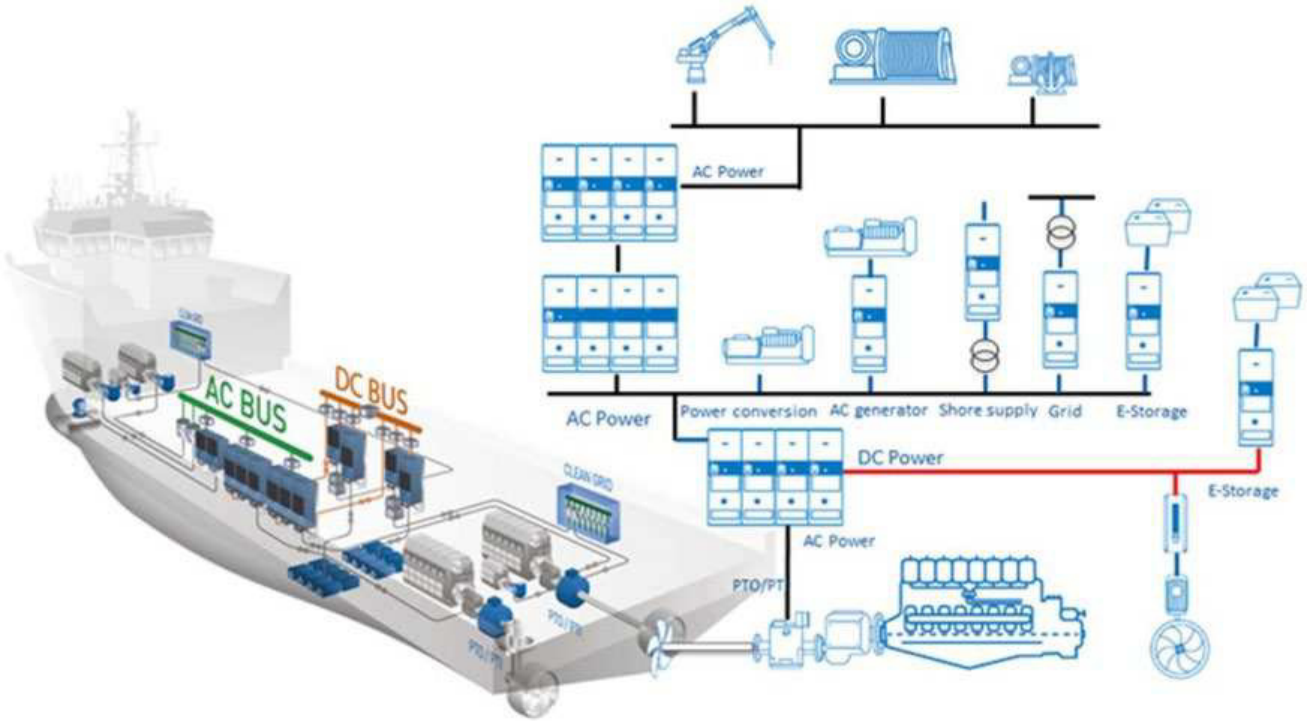
- Ground braids and bulk braid

- Insulators and Earthing busbar

- Cabling Sleeves

Where can we provide support

- Much more than just Marine Switchboards:
- Switchboards/Panel Boards/Control Boards
- HVAC
- Power Quality
  - Marine UPS but also various types of power quality panels such as voltage rectifiers
- Gensets
- Shore-to-Ship Power (SSP) aka Cold Ironing
- Electrification
  - Long term trend of fully electrified ships
  - DC Charging solutions/Energy storage

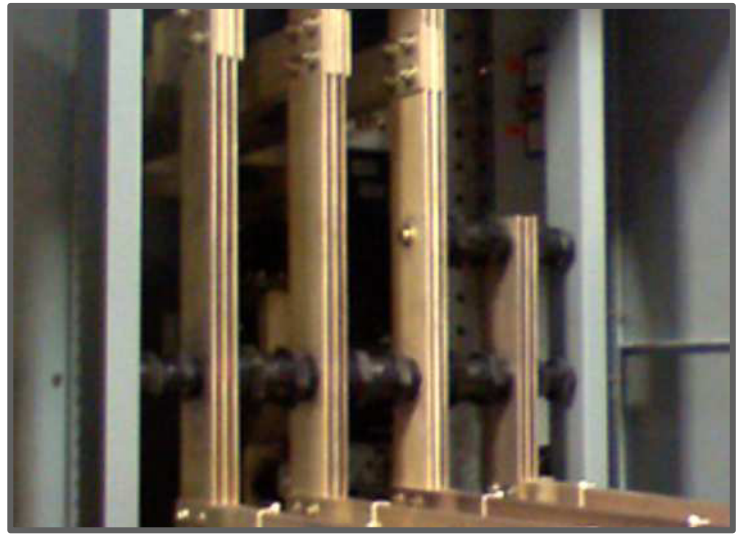


nVent ERIFLEX applications

Challenges in the design and assembly of low-voltage electrical systems

1. **Need a compact footprint**

2. **Lack of space to run cables or busbar and supports**



3. **Assembly time (particularly for multiple cable per phase systems) and high repeatability**

Highlights about the nVent ERIFLEX Advanced Flat Conductors

- **nVent ERIFLEX Flexibar Advanced – Insulated Flexible Busbar**

  - From 125 to 6000 A

  - Available in standard 2 or 3 meters
  - Other length on request

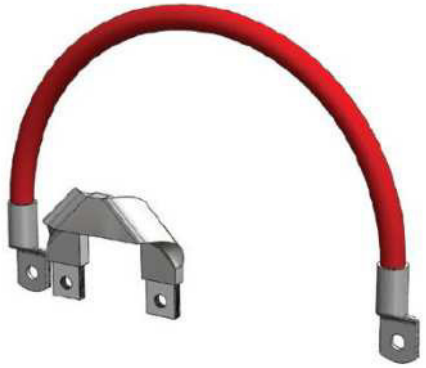
- **nVent ERIFLEX IBSB Advanced –** *Insulated Braided Conductor*

  - From 80 to 1250 A

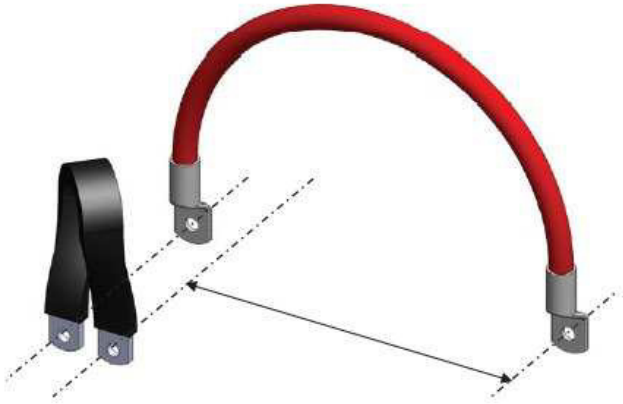
  - From 230 mm to 1030 mm
  - Other length on request

Highlights about the nVent ERIFLEX Advanced Flat Conductors

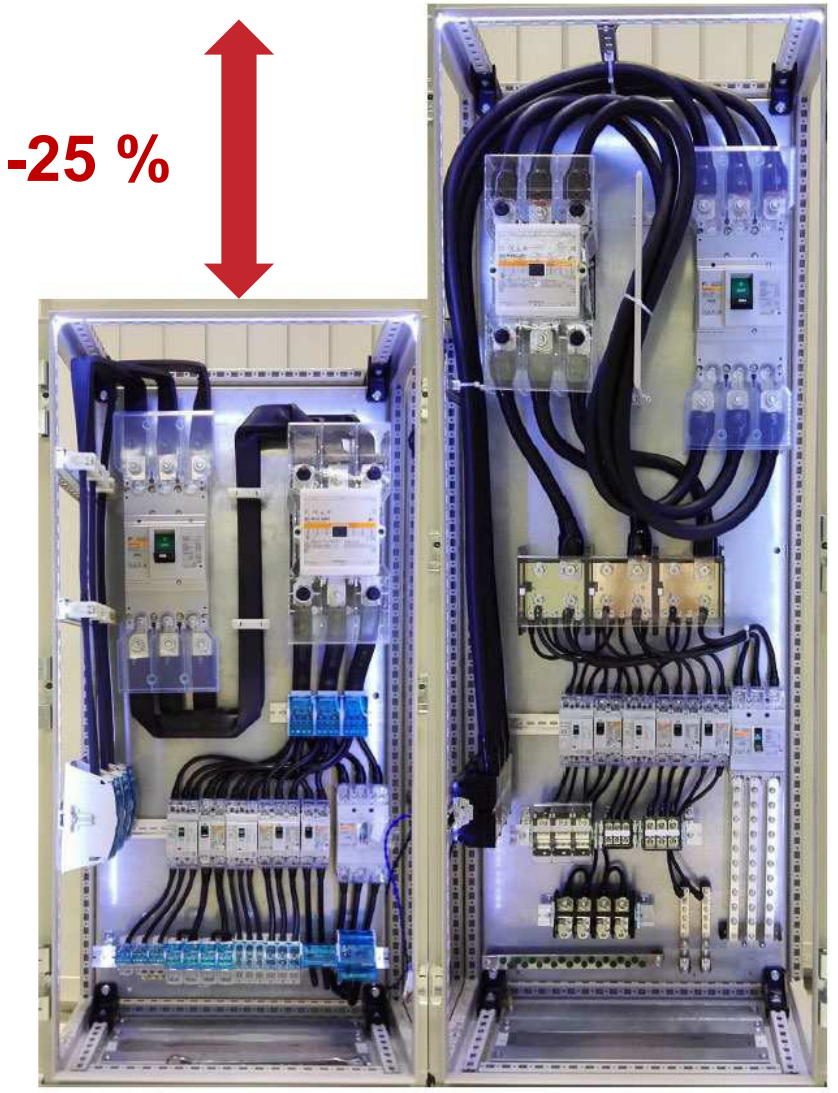
- Reduced cross-section leads to **space** and **weight savings**
- Field maintenance simplified



Flexibar Adv.



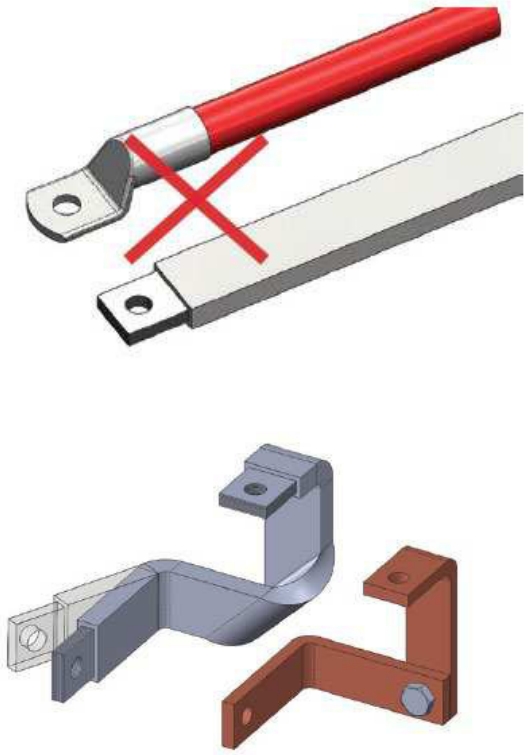
IBSB Adv.



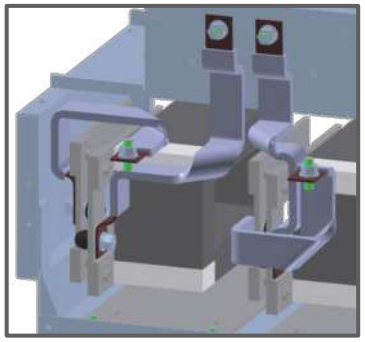
nVent ERIFLEX Advanced Conductors feature a **reinforced insulation** as defined in IEC 61439-1 or UL 60950

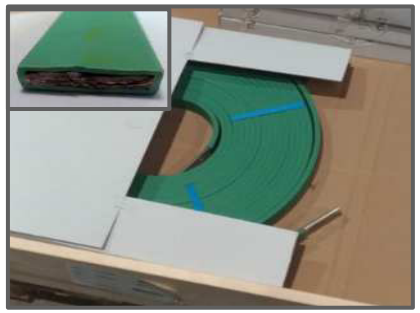
Highlights about the nVent ERIFLEX Advanced Flat Conductors

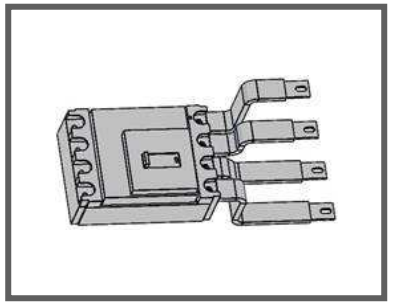
- Reduced assembly time and cost
- Higher throughput
- Number of hot spots reduced leading to greater reliability

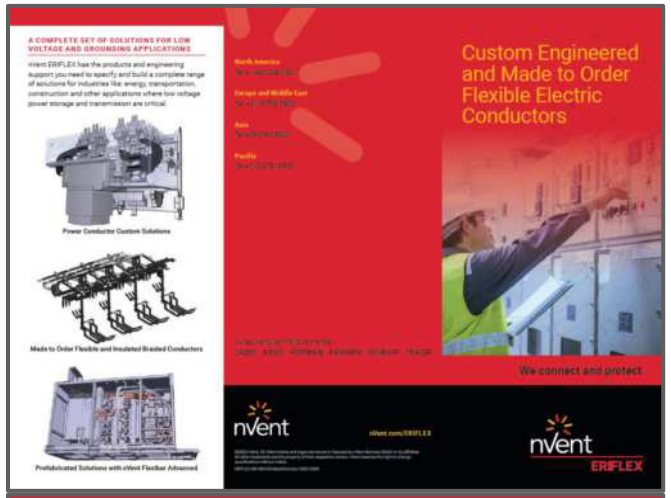


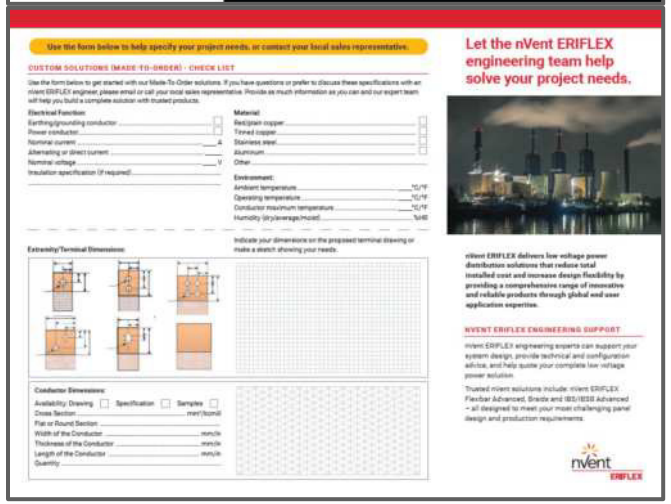
Engineering & Made-to-Order Capabilities











nVent ERIFLEX Engineering Support

- Provides technical and configuration advice
- Helps quote your complete low voltage power solution
- Trusted solutions include: nVent ERIFLEX Flexibar Advanced, Braids & IBS/IBSB Advanced
- All designed to meet your most challenging panel design and production requirements

nVent ERIFLEX Software Support

- Assisted product selection
- IEC Power losses (heat dissipation)
- https://eriflex-configurator.nvent.com/eriflex/

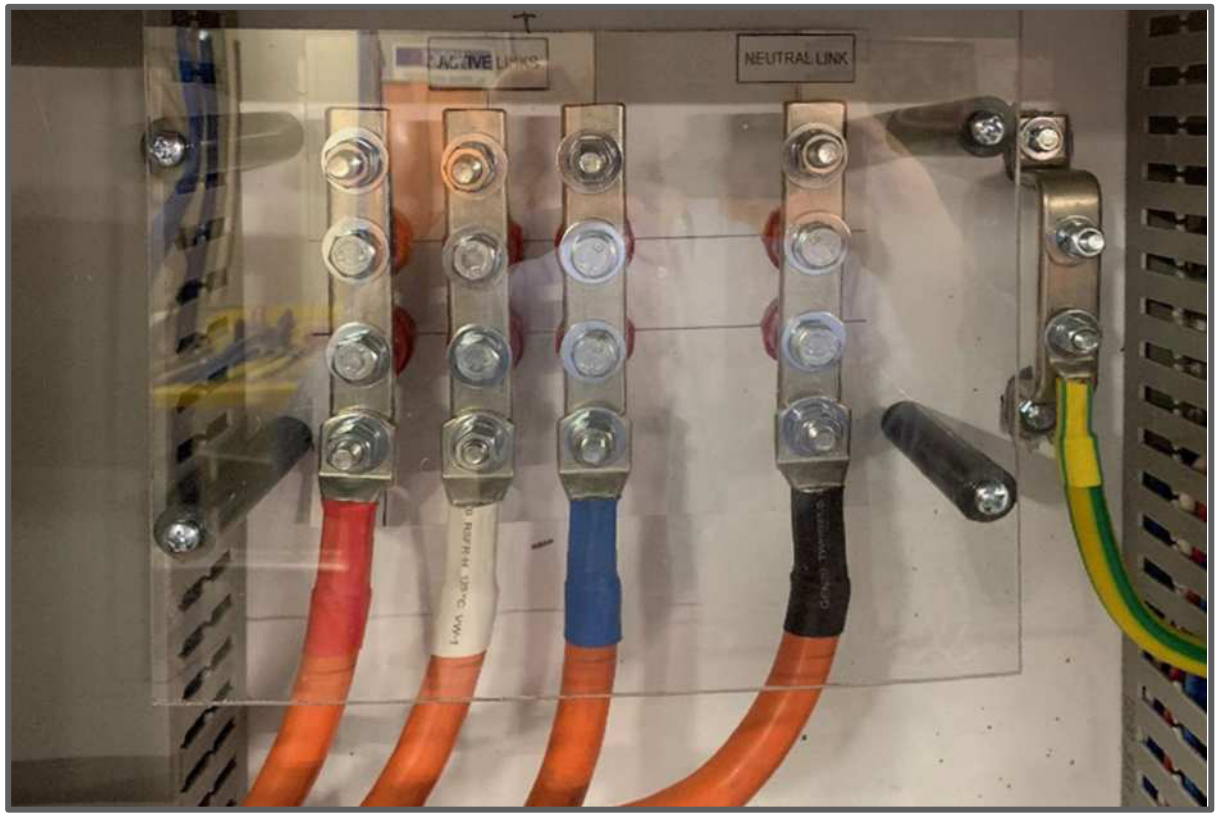
We deliver customized Ready-To-Use solutions for repetitive applications

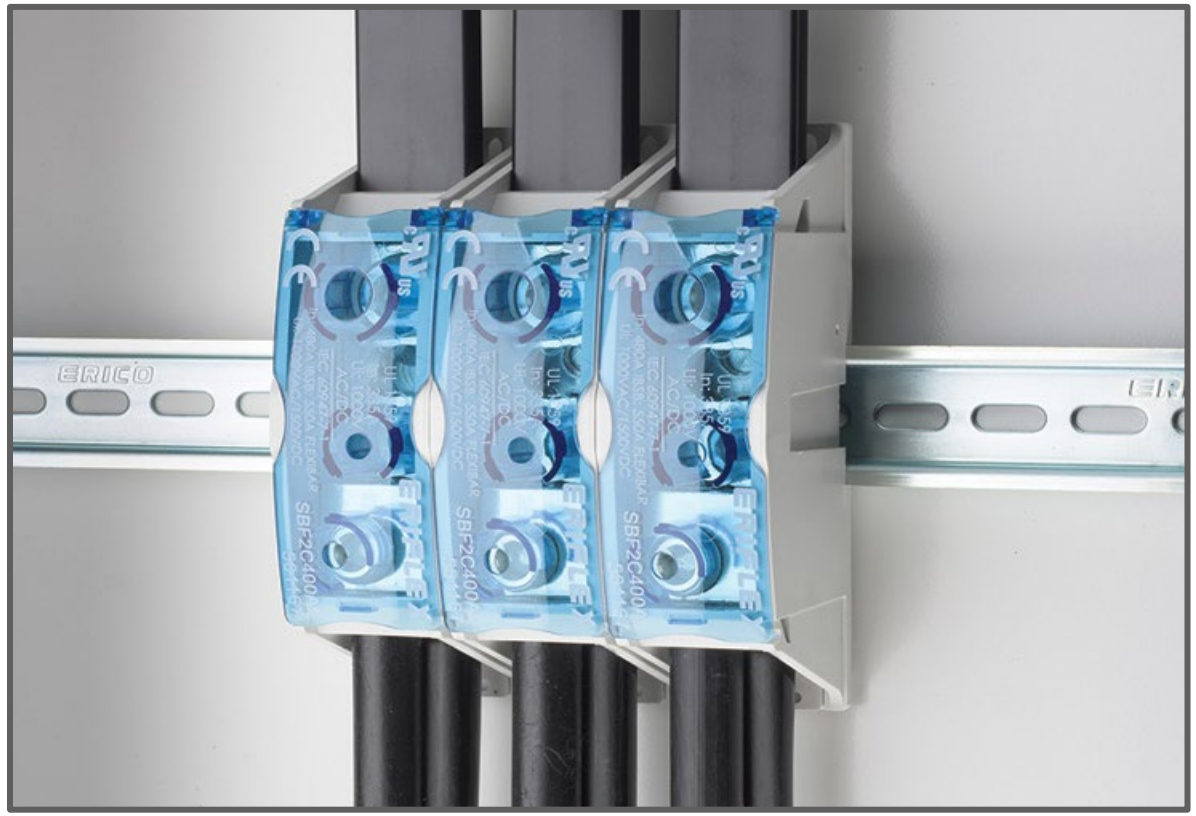
Other nVent ERIFLEX Products - Highlights

EECO
Ideas Powering Performance

Highlights about the nVent ERIFLEX Distribution Solutions

- **Old way vs. New Way**





Highlights about the nVent ERIFLEX Distribution Solutions

- **nVent ERIFLEX UD Distribution Blocks**

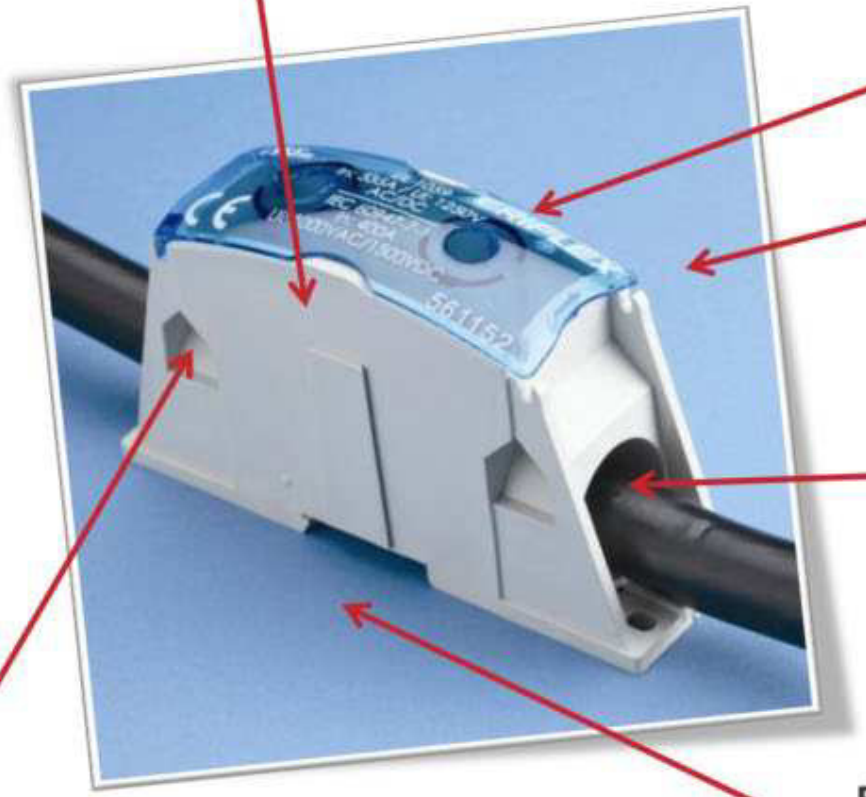
From 80 to 950 A (UL)
Up to 12 output cables

- **nVent ERIFLEX SB Power Blocks**

From 100 to 1680A (UL)
Up to 4 input cables

Features and Benefits

Modular snap-together blocks for building multi-pole power blocks



IP 20
Finger Safe

Short Circuit Current Rated
- SCCR up to 100 kA (UL)
- Ipk up to 105 kA (IEC)

Compactness

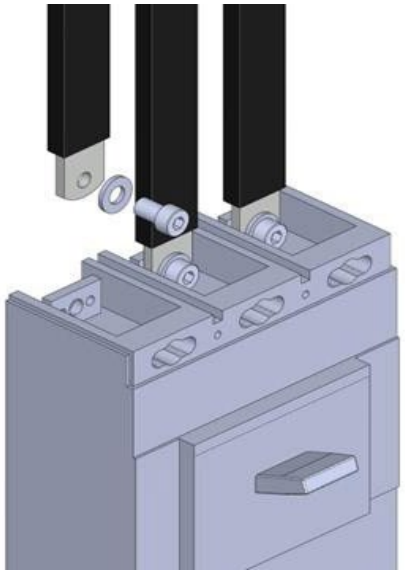
>95% fill ratio

UL94V-0 Flammability Rating
Halogen- free
RoHS Compliant

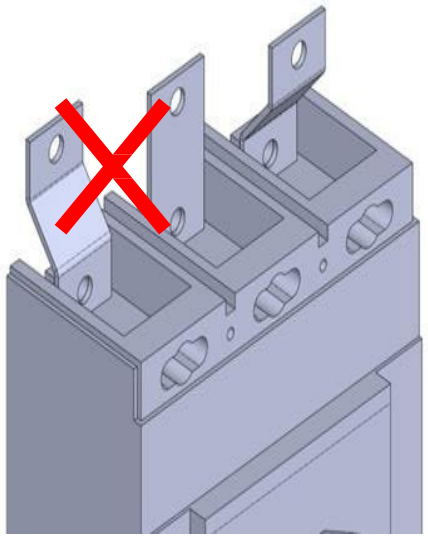
Easy and strong fixing
DIN rail (2-position clip) or
panel mount with screws

Ideal Circuit Breaker Connection

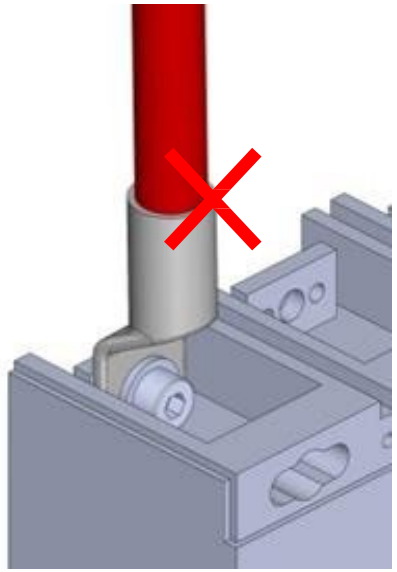
- nVent ERIFLEX IBS & IBSB Advanced forms **direct connection** from front access terminals of the breakers *without any additional accessories*
- *Simple, Quick, Ready to use*



Direct connection with IBS & IBSB ADVANCED

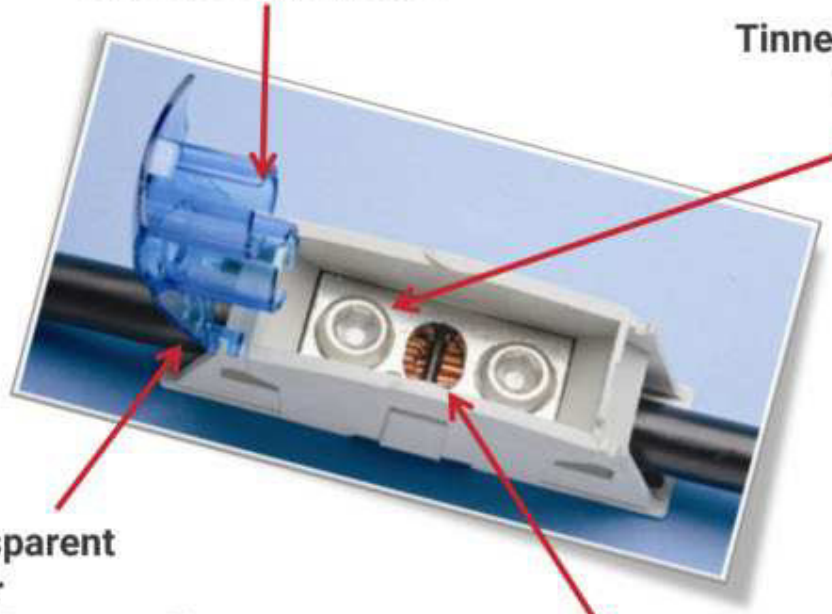


No spreader, no extender needed



No lug, no tools needed

Features and Benefits



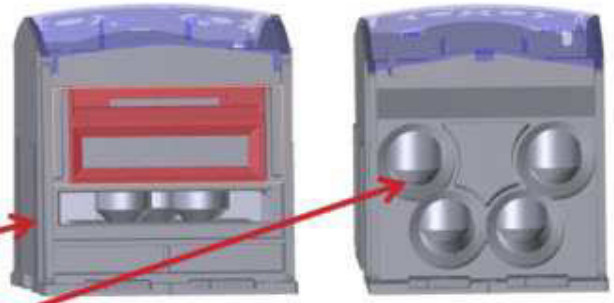
Screw retention cover

Tinned Cu Blocks - Tinned Al Blocks
For Cu and/or Al Conductors

Transparent Cover
Hinged or removable

Visual inspection of Conductors & Connection

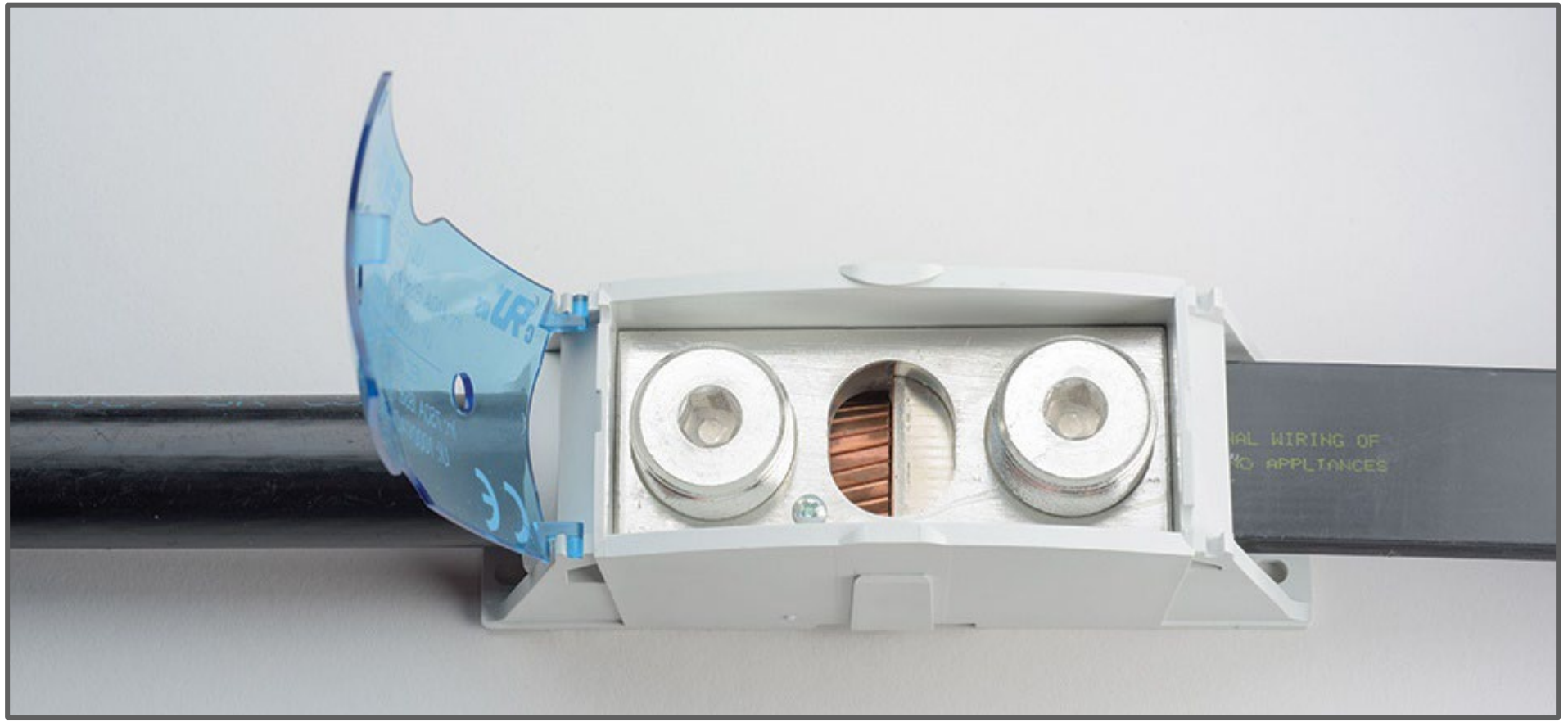
Voltage detection & measurement



Unique!
IP20 Flexibar multi-size entry and up to 4 Cables entry

Features and Benefits

- **Compatibility with Advanced Flat Conductors**
- **Both Distribution and Power blocks**



IBSB Advanced – Circuit Breaker Connection

Circuit Breaker Current Rating	125/160 A		250 A		300 A	350 A	400 A	500 A	630 A
Insulated Braided conductor type	**IBSB ADV 25x**	**IBS ADV 25x**	**IBSB ADV 50x**	**IBS ADV 50x**	**IBSB ADV 70x**	**IBSB ADV 100x**	**IBSB ADV 120x**	**IBSB ADV 185x**	**IBSB ADV 240x**
Schneider Electric Compact (IEC)	NSA NG 125	NSX 100 NSX 160	NSX 250	NSX 250	NSX 400	NSX 400	NSX 400	NSX 630	NSX 630
Square D PowerPact (UL)	H-Frame	J-Frame	J-Frame	J-Frame	L-Frame	L-Frame	L-Frame	–	–
ABB Tmax (IEC)	T1 T2 XT1 XT2	–	T3 XT3 XT4	T3 XT3 XT4	T4	T4	T5	T5	T5
ABB Tmax (UL)	T1 T2 XT1 XT2	T3	T4 XT3 XT4	T4 XT3 XT4	T5	T5	T5	–	–
GE Record Plus (IEC/UL)	FD 160	FE 160	FE 250	FE 250	FG 400	FG 400	FG 400	FG 630	FG 630
Siemens Sentron (IEC/UL)	VL160X 3VL1 VL160 3VL2	–	VL250 3VL3	VL250 3VL3	VL400 3VL4	VL400 3VL4	VL400 3VL4	–	–
Moeller xEnergy (IEC)	NZM1		NZM2	NZM2	NZM3	NZM3	NZM3	NZM3	NZM3
Cutler Hammer Series G (UL)	EG Frame	JG Frame	JG Frame	JG Frame	LG Frame	LG Frame	LG Frame	LG Frame	LG Frame
Legrand (IEC)	DPX 160 DPX3 160	–	DPX 250 DPX3 250	DPX 250 DPX3 250	DPX 630	DPX 630	DPX 630	DPX 630	DPX 630
Hager (IEC)	h3 160	–	h3 250	h3 250	h3 630	h3 630	–	–	–
Rockwell/Allen Bradley (UL)	G-Frame H-Frame	–	I-Frame J-Frame	I-Frame J-Frame	I-Frame J-Frame	–	K-Frame	K-Frame	–
Mitsubishi Electric (IEC)	–	NF125 NF160 DSN125 DSN160	NF250 DSN250	NF250 DSN250	–	NF400 DSN400	–	–	–
OEZ (IEC)	BC160N	–	BD250N BD250S	BD250N BD250S	BH630B BH630S	BH630B BH630S	BH630B BH630S	BH630B BH630S	BH630B BH630S

Highlights about the nVent ERIFLEX Low Voltage Insulators

- **Full range of low-voltage stand-off with a total of 29 sizes available**
- **Great stability of electrical and mechanical parameters**
- **Very high resistance to leakage current.**

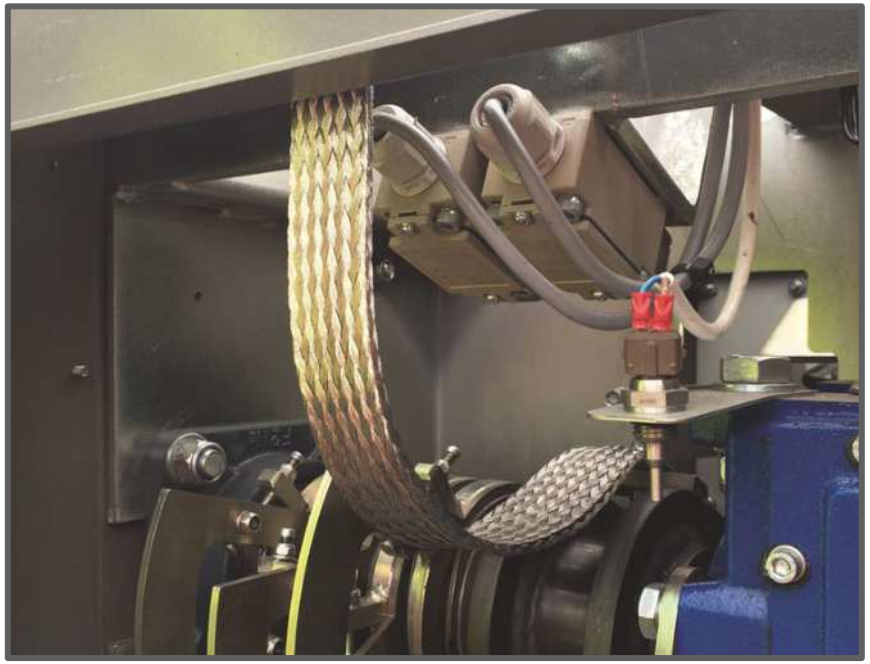
Working temperature : from - 40°C to 130°C

UL 94-V0 for self-extinguishing

Highlights about the nVent ERIFLEX Grounding and Support Solutions

- **Too often overlooked, no electrical system is safe and reliable without a high-quality, durable grounding and bonding system**
- **Need to provide an “escape path” for fault currents**
- **Prefabricated tinned copper (MBJ) and stainless steel (CPI) straps leading to labor savings**
- **Ideal for outdoor applications**

Prefabricated terminations provide consistent quality



nVent ERIFLEX Flexibar Advanced

A COMPLETE RANGE OF INSULATED FLEXIBLE BUSBAR

Enhanced Flexibility

nVent's exclusive manufacturing process offers superior flexibility:

- Copper laminates are free to slide within the insulation
- High insulation quality
- Wide variety of bending, twisting & folding possibilities

INNOVATIVE PATENT INSULATION

Flexibar has added grooves on the inner surface of the insulation sleeve to improve sliding between the central conductor and the insulation material. The grooves help to reduce the contact surface between the central conductor and the insulation material. This results enhances the flexibility of the flexible busbar.

Result: <20% of the inner surface is in contact with the central conductor.

This nVent ERIFLEX patent idea makes Flexibar more flexible than ever and allows users to optimize the design of their electrical power connection.

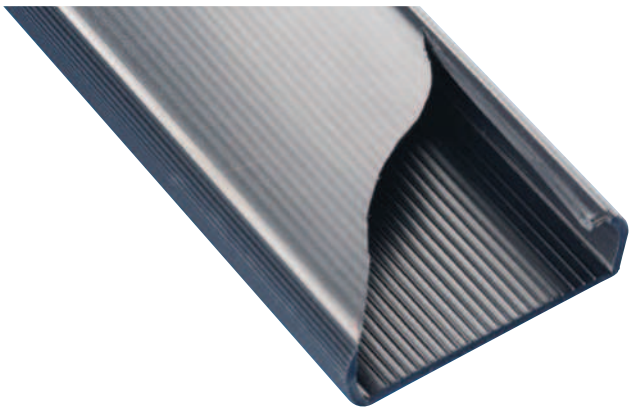
* This patent is applicable for the cross section indication by "*" on the part number.

The reference conductor

- nVent Flexibar is composed by with multiple layers of thin electrolytic tinned copper
- Flexibar connections are made by punching directly through the laminates. There are no lugs to purchase, which eliminates faulty connection problems and makes installation easier and faster
- The insulation is a high-resistance, self-extinguishing TPE
- Traceability code and designation Part Number on product
- Easily formed, Flexibar improves assembly flexibility and aesthetics of panels
- Optimal alternative to large cable & rigid busbar
- Quality: 100% production dielectric tested
- Full range from 24 mm^2 up to 1200 mm^2

FEATURES

- Self-extinguishable/flame retardant
- High mechanical resistance
- High elongation value
- Withstands high currents
- 99.9% pure copper
- High conductivity



CONNECTION TYPES

- Between main power and distribution equipment (contactors, circuit-breakers)
- Between transformer and busduct
- Between busduct and electrical cabinet

SPACE/WEIGHT SAVINGS

- Less installation space compared to cable
- Reduces the length, number of conductors and weight
- Insulation allows for closer spacing than traditional busbar designs

COST SAVINGS

- Eliminates cost and installation of lugs
- Reduces inventory costs

IMPROVES RELIABILITY

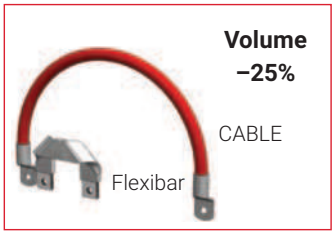
- nVent ERIFLEX Flexibar is directly connected thus eliminating the cable lug connection
- Excellent resistance to vibration
- No crimping

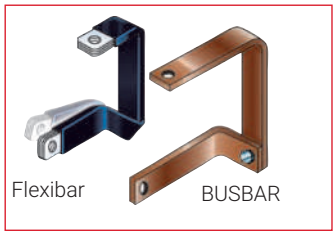
AESTHETICS

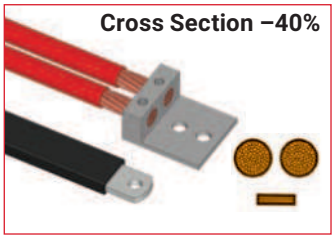
- Optimal flexibilty for easy access

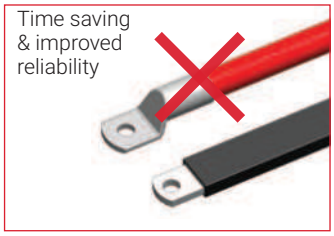
EASY INSTALLATION

- Thanks to its design Flexibar can be easily bent and shaped for all sizes









Skin Effect on A.C. Application

COPPER CABLE — **FLEXIBAR**

OR →

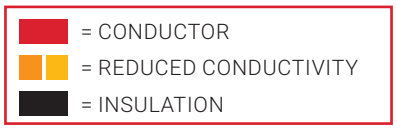
150 AMPS
1/0
53.5 sq. mm
(.373 In)

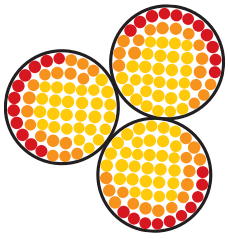
158 AMPS
3 x 9 x 0.8 mm
21.6 sq. mm
60% smaller

OR →

380 AMPS
500 MCM
253 sq. mm
(.813 In)

379 AMPS
3 x 24 x 1 mm
72 sq. mm
71% smaller





OR →

1140 AMPS
(3) 500 MCM
759 sq. mm
(.813 In)

1211 AMPS
4 x 80 x 1 mm
320 sq. mm
58% smaller

Representative to scale

Flexibar ampacity and cable ampacity are based on (NEC Table 310-16. 75° column) conductor temprature rise of 45°C

nVent ERIFLEX Flexibar Advanced

UNIQUE - SAFER - FLEXIBLE

Flexibar Advanced
Unique – Safer – Flexible

- Conductor is electrolytic tinned copper (Cu-ETP)
- Insulation is a high-resistance TEP Low Smoke. Halogen Free and Flame Retardant (LSHFFR). compound:
  - Typical elongation: 500%
  - Working temperature: –50°C to +115°C
  - Typical thickness: 1.8 mm
  - Self-extinguishing: UL 94 V0 and IEC 60695-2-11 (Glow Wire Test 960°C)
  - Dielectric strength: 20kV/mm
  - Nominal voltage: 1000 V AC/1500 V DC (IEC – UL - CSA)
  - Dielectric strength: 20kV/mm

Flexibar Advanced has a unique insulation on the market that combines **low smoke, halogen-free and flame retardant** features that improve both the reliability of your electrical installation and safety for equipment and people.

WHY IS FLEXIBAR ADVANCED A SAFER INSULATION?

Low smoke features:

- Generates less corrosive smoke as per IEC 61034-2, ISO 5659-2 and UL 2885
- Improves visibility for people to be able to easily locate the emergency exit and also allows rescue workers to better assess an emergency situation

Halogen-free features:

- Reduction in the quantity of toxic smoke
- Minimum of toxicity with no halogens (according to UL 2885, IEC 60754-1 and IEC 62821-1)
- Use in enclosed spaces for specific applications such as submarines, switchboards, and other enclosed environments that require a low emissions solution

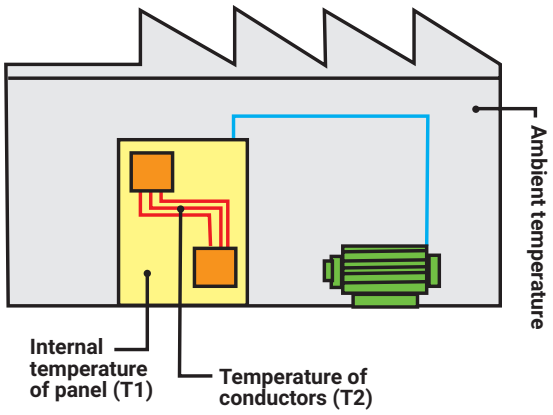
Flame-retardant and self-extinguishing features:

- Compliant with the UL 94-V0 and Glow wire test at 960°C (IEC 60695-2) testing standard
- Reduces the risk of the spread of fire
- Less damage to your electrical installation

nVent ERIFLEX Flexibar Advanced

UNIQUE - SAFER - FLEXIBLE

Selection of Flexibar Advanced according to the internal temperature of the panel



TEMPERATURE RISE OF CONDUCTOR = T2 - T1 = ΔT (K)

Ex: For a current of 630A, with: T1 = 40°C and T2 = 90°C

1) ΔT = 90 - 40 = 50K

2) In the 50°K column, find the closest current value to 630A. nVent ERIFLEX Flexibar Advanced 5x32x1 - 534026 - 160 mm2 - 671A.

3) Select nVent ERIFLEX Flexibar Advanced according to the terminal width of the equipment being connected.

K = Kelvin degree (temperature calculated, but not measurable)

Flexibar Advanced IN PARALLEL

When using 2 or 3 Flexibar Advanced on edge in parallel for the same phase, use the coefficient:

Ex: 5 x 32 x 1: ΔT° = 50 K: 671A

2 bars in parallel: 671 A x 1.72 = 1154 A

3 bars in parallel: 671A x 2.25 = 1509 A

Certification & Approvals

- International Commission Electrotechnique (IEC) - Meets all requirements of IEC 61439.1
- UL 67 Recognized component in the Panelboard and Switchboard accessories – component category (UL file E125470) for US
- UL 758 Recognized component in the "Appliance wiring material - component" category style 11681
- CSA 90005
- CE Conformity
- RoHS compliant
- Class II Conductors (IEC 61439-1. Chapter 8.4.4 - Protection by total insulation)
- Low Smoke IEC 61034-2, ISO 5659-2 and UL 2885
- Halogen-free UL 2885, IEC 60754-1 and IEC 62821-1
- Flame retardant UL94-V0
- Glow wire test at 960°C (IEC 60695-2)
- EN 45545 obtaining an HL2 classification for chapters R22 and R23
- EN 50264-3-1 (Railway application) : 6kV AC/DC)
- Bureau Veritas Marine and Offshore Division - for the Classification of Steel Ships and according IEC 60092 (Electrical installations on ships)
- American Bureau of Shipping (ABS) - Marine & Offshore Applications
- UV rating according to UL 2556 and UL 854

Made to Order Solutions (MTO)

Let the nVent ERIFLEX engineering team help solve your project needs.

nVent ERIFLEX delivers low voltage power distribution solutions that reduce total installed cost and increase design flexibility by providing a comprehensive range of innovative and reliable products through global end user application expertise.

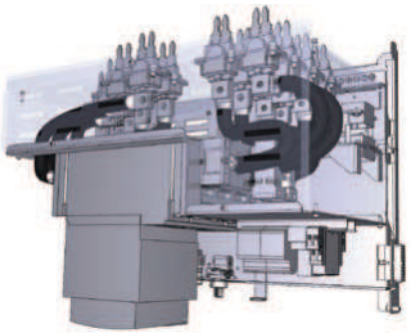
NVENT ERIFLEX ENGINEERING SUPPORT

nVent ERIFLEX engineering experts can support your system design, provide technical and configuration advice, and help quote your complete low voltage power solution.

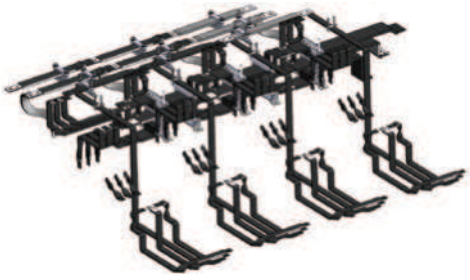
Trusted nVent solutions include: nVent ERIFLEX Flexibar Advanced, Braids and IBS/IBSB Advanced – all designed to meet your most challenging panel design and production requirements.

A COMPLETE SET OF SOLUTIONS FOR LOW VOLTAGE AND GROUNDING APPLICATIONS

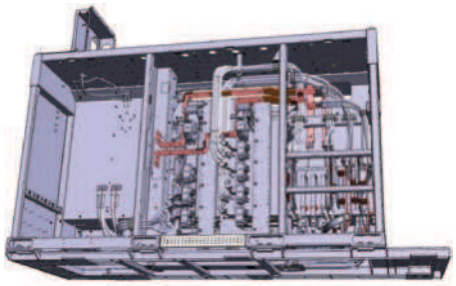
nVent ERIFLEX has the products and engineering support you need to specify and build a complete range of solutions for industries like: energy, transportation, construction and other applications where low voltage power storage and transmission are critical.



Power Conductor Custom Solutions



Made to Order Flexible and Insulated Braided Conductors



Prefabricated Solutions with nVent Flexibar Advanced

Made to Order Solutions (MTO)

Use the form below to help specify your project needs, or contact your local sales representative.

CUSTOM SOLUTIONS (MADE-TO-ORDER) - CHECK LIST

Use the form below to get started with our Made-To-Order solutions. If you have questions or prefer to discuss these specifications with an nVent ERIFLEX engineer, please email or call your local sales representative. Provide as much information as you can and our expert team will help you build a complete solution with trusted products.

Electrical Function:

Earthing/grounding conductor ☐
Power conductor ☐
Nominal current ____ A
Alternating or direct current ____
Nominal voltage ____ V
Insulation specification (if required) .....

Material:

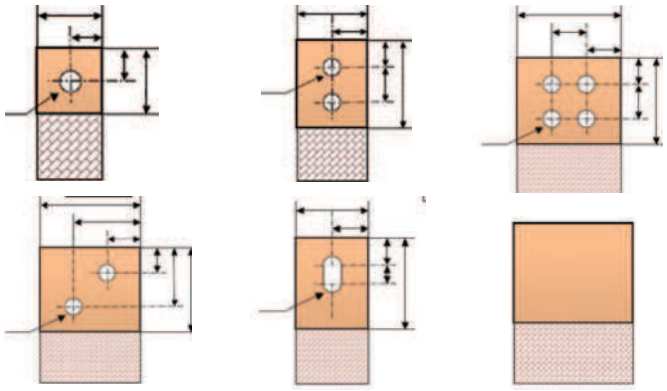
Red/plain copper ☐
Tinned copper ☐
Stainless steel ☐
Aluminum ☐
Other .....

Environment:

Ambient temperature °C/°F
Operating temperature °C/°F
Conductor maximum temperature °C/°F
Humidity (dry/average/moist) %HR

Extremity/Terminal Dimensions:

Indicate your dimensions on the proposed terminal drawing or make a sketch showing your needs.



Conductor Dimensions:

Availability: Drawing ☐ Specification ☐ Samples ☐
Cross Section _____ mm2/kcmill
Flat or Round Section _____
Width of the Conductor _____ mm/in
Thickness of the Conductor _____ mm/in
Length of the Conductor _____ mm/in
Quantity _____

nVent ERIFLEX Advanced Technology insulation is a high-resistance low smoke, halogen-free and flame retardant Thermoplastic (LSHFFR), with 115°C high working temperature.

IBS & IBSB Advanced does not generate corrosive gases and produces a relatively low smoke opacity in accordance with IEC 61034-2 and UL 2885. The **low smoke** features improves visibility conditions for people to be able to easily locate the emergency exit and also allows rescue workers to better assess an emergency situation. IBS & IBSB Advanced means greater safety for individuals, less damage for your electrical equipment and less environmental impact.

The **halogen-free** feature enables a reduction in the quantity of toxic smoke. IBS & IBSB Advanced contain no halogens, according to IEC 60754-1 and UL 2885, minimizing toxicity and making it the ideal product for use in enclosed spaces such as data centers, rail and spaces where people are present such as hospitals and schools. This feature also facilitates the use of IBS & IBSB Advanced in specific applications such as submarines, switchboards and other enclosed environments that require a low emissions solution.

In addition to the above features, IBS & IBSB Advanced are compliant with the UL 94-V0 testing standard and Glow wire test 960°C. The **flame retardant** portion of the test illustrates self-extinguishing capabilities. This feature is also shown by the Limiting Oxygen Index (LOI) at 30%. In the case of a fire, IBS & IBSB Advanced generates a limited quantity of smoke that is less damaging to your electrical equipment.

Main Technical Specifications

Flat IBS and IBSB Advanced	
Material	Electrolytic copper Cu-ETP 99,9% purity Thermoplastic Elastomer
Wire Diameter	0,15 mm
Finish	Tinned
Maximum resistivity at 20°C	0.017241 ohms.mm² / m
Dielectric Strength	20 kV/mm
Flammability Rating	UL® 94V-0 IEC® 60695-2-12 (Glow Wire Test 960°C)
Halogen Free Rating	UL® 2885 IEC® 60754-1 IEC® 62821-2
Low Smoke Rating	UL® 2885 IEC® 61034-2 ISO 5659-2
Typical Insulation Elongation	> 500%
Typical Insulation Thickness	1.8 mm (0,070 inches)
Nominal Voltage	UL/IEC: 1,000 VAC; 1,500 VDC
Working Temperature	–50 to 115°C (–58 to 239°F)
Certification Details	UL® 67 UL® 758 CSA 90005
Complies With	IEC® 60695-2-12 (Glow Wire Test 960°C) IEC® 61439.1 IEC® 61439.1 Class II UV rating according to UL 2556 and UL 854 CE RoHS EN 45545 : HL2 classification Marine & Offshore application certified by: DNV-GL, Bureau Veritas, ABS

How to select nVent ERIFLEX IBS & IBSB Advanced

When sizing a conductor, the air temperature around the conductor is a very important parameter, mainly affected by factors such as convection type, protection level of enclosure or the temperature rise. Based on IEC 61439 standards, the ambient air temperature does not exceed +40°C and its average over a period of 24h does not exceed +35°C.

For IBS & IBSB Advanced, we provided an ampacity table under different temperature rise, a lower temperature rise maybe used when the ambient temperature is higher than usual.

For IBS & IBSB Advanced, we recommend the maximum temperature rise does not exceed 50°C for a normal application. Generally, 50°C is chosen as the default temperature rise considering the ambient temperature inside the panel is below 40°C. But when the connected section is an electrical component which may dissipate heat (for example circuit breaker) or the ventilation inside the enclosure is not efficient, it may be necessary to choose lower temperature rise.

TEMPERATURE RISE OF THE CONDUCTOR.

Temperature rise of the conductor (ΔT) = Temperature of the conductor – Internal temperature of the panel

• Temperature rise of conductor = T2 – T1 = ΔT (C°)

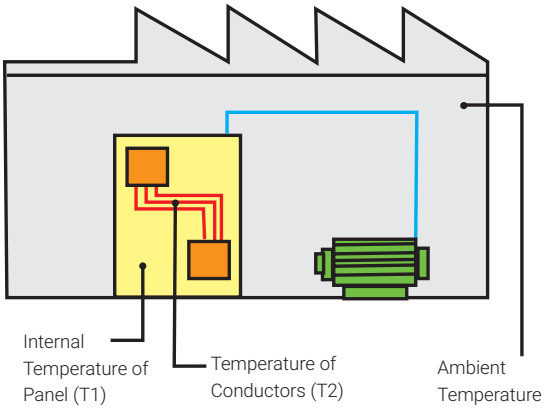
Example:

For a requested current of 630A, with: T1 = 40°C and T2 = 90°C

• ΔT = 90 – 40 = 50°C

• in the ΔT 50°C column, find the closest current value to 630A

Result: IBSB Advanced 240 mm² – 718A (IEC & UL)



Insulated Braided conductor type	Cross Section mm² (kcmil)	Maximum Ampacity Ratings							Current Coefficient	
		ΔT 30° C (A)	ΔT 40° C (A)	ΔT 45° C (A)	ΔT 50° C (A)	ΔT 55° C (A)	ΔT 60° C (A)	ΔT 70° C (A)		
IBSB ADV 25	25 (49.34)	116	134	142	150	157	164	177	1.6	2
IBS ADV 25	25 (49.34)	137	158	167	177	185	193	209	1.6	2
IBS ADV 50 IBSB ADV 50	50 (98.68)	213	246	260	274	288	301	325	1.6	2
IBSB ADV 70	70 (138.15)	226	261	277	291	306	319	345	1.6	2
IBSB ADV 100	100 (197.35)	298	344	365	385	404	422	456	1.6	2
IBSB ADV 120	120 (236.82)	363	419	444	468	491	513	554	1.6	2
IBSB ADV 185	185 (365.1)	416	480	509	537	563	588	635	1.6	2
IBSB ADV 240	240 (473.65)	556	642	681	718	753	786	849	1.6	2

Admissible currents: This table indicates the temperature rise produced by chosen current in the given section. This calculation does not take into account the heat dissipation from the switch gear.

IBS & IBSB ADVANCED IN PARALLEL

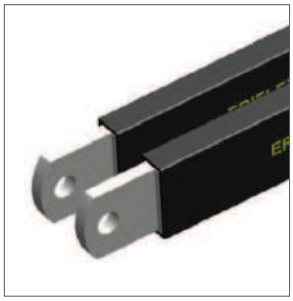
When using 2 or 3 IBS & IBSB Advanced in parallel for the same phase, use the current coefficient showed on the above IEC & UL ampacities table.

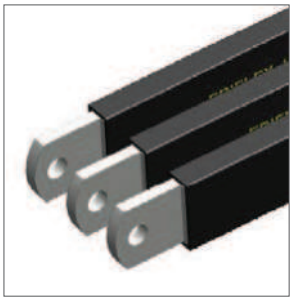
Example:

IBSB Advanced 240 mm² – ΔT = 50°C: 718 A (IEC & UL)

• 2 Braids in parallel: 718 A x 1,6 = 1149 A

• 3 Braids in parallel: 718 A x 2 = 1436 A





Round Insulated Braided Conductor IBS Advanced

IBS 120
IBS 185
IBS 240

INSULATION

- Dielectric Strength: 20 kV/mm
- Insulation Elongation: 500 %
- Insulation Thickness: 1.8 mm
- Max Working Voltage, IEC/UL 758: 1,000 VAC; 1,500 VDC
- Max Working Voltage, UL 67: 600 VAC/DC
- Working Temperature: –50 to 115°C
- Certification Details: UL® 67; UL® 758
- Complies With: IEC® 60695-2-11 (Glow Wire Test 960°C); IEC® 61439.1; IEC® 61439.1 Class II
- UV rating according to UL 2556 and UL 854

BRAID

- Tinned electrolytic copper for better corrosion protection
- Wire diameter: 0.15 mm for maximum flexibility

CERTIFICATION & APPROVAL

- Flammability Rating: UL® 94V-0
- Halogen Free Rating: UL® 2885; IEC® 60754-1; IEC® 62821-1
- Low Smoke Rating: IEC® 61034-2; ISO 5659-2; UL® 2885
- IEC 61439.1
- cRUus per UL67 & CAN/CSA C22.2 No. 29
- CE conformity
- RoHS compliant
- RU per UL758
- American Bureau of Shipping (ABS) Bureau Veritas : Marine & Offshore application.
- CSA C22.2 No 210 for appliance wiring material products
- Conforms to NF EN 45545 obtaining an HL2 classification for chapters R22 and R23

DIELECTRIC TEST

- 3500 VAC, 1 minute according to the IEC 61439 standard (rated insulation voltage Ui 1000 VAC)
- 6000 VAC, 1 minute with 6 mA creepage current set up

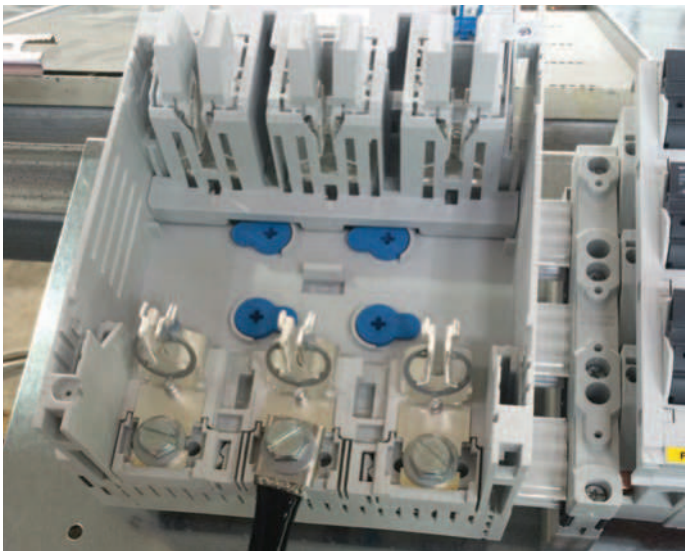
Features

- Resistant to vibration, improving reliability and performance
- Insulated by high-resistance, halogen free, flame retardant and low smoke material
- Tinned copper provides superior corrosion resistance
- Improves assembly flexibility and aesthetics
- Quick and easy installation
- No additional cutting, stripping, crimping and punching needed

Technical data

- Intensity = 100A up to 1000A
- Excellent electrical contact
- Good tensile strength

Advanced Insulated Braided IBSHY Conductor for Compact Circuit Breakers

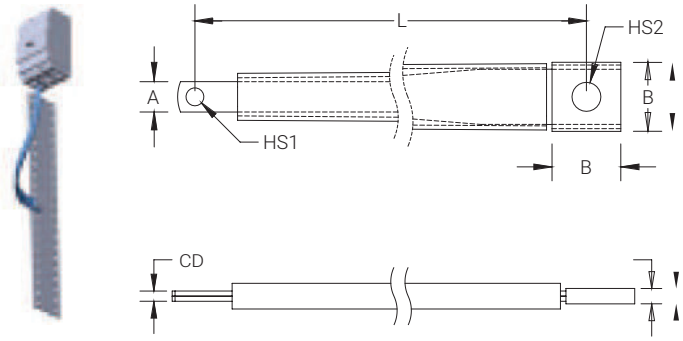


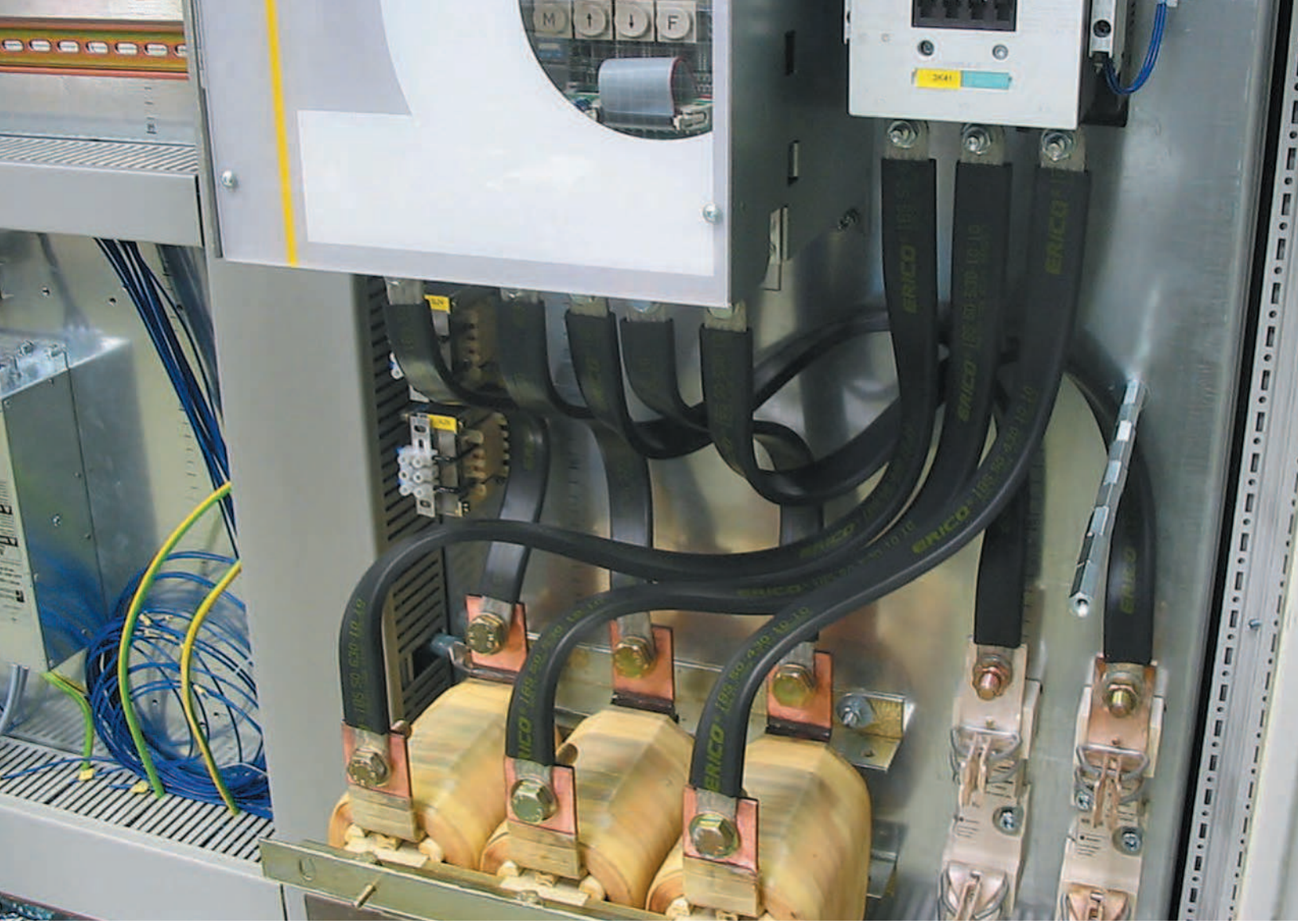
Features

- Suitable for all main 125/160 A electrical devices and specifically molded case circuit breakers
- Resistant to vibration, improving reliability and performance
- Improves assembly flexibility and aesthetics
- Quick and easy installation
- No additional cutting, stripping, crimping and punching needed
- Small wire diameter provides maximum flexibility
- Halogen-free solution for applications requiring a low smoke solution
- DNV-GL certified busbar systems for electrical installation for ship and marine application
- Conforms to NF EN 45545 obtaining an HL2 classification for chapters R22 and R23
- High working temperature
- RoHS compliant

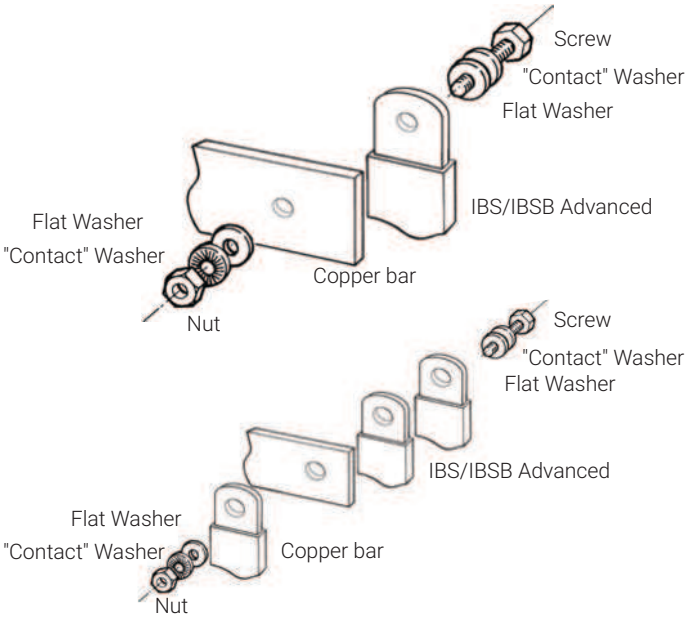
IBSHY INSULATED BAIDED CONDUCTOR SPECIFICATIONS

- Typical Application Current Rating: 160 A
- Finish: Tinned
- Material: Copper; Glass Fibre Reinforced Silicon
- Flammability Rating: UL 1441 VW-1
- Max Working Voltage: IEC (Ui): 1 000 VAC; 1 500 VDC
- Operating Temperature: from –60 to 250°C
- Wire Diameter: 0.15 mm
- IEC 61439-1 compliant



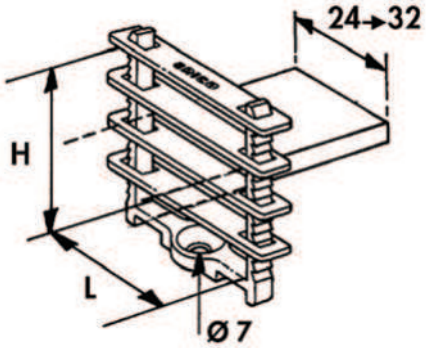


Assembly Instructions



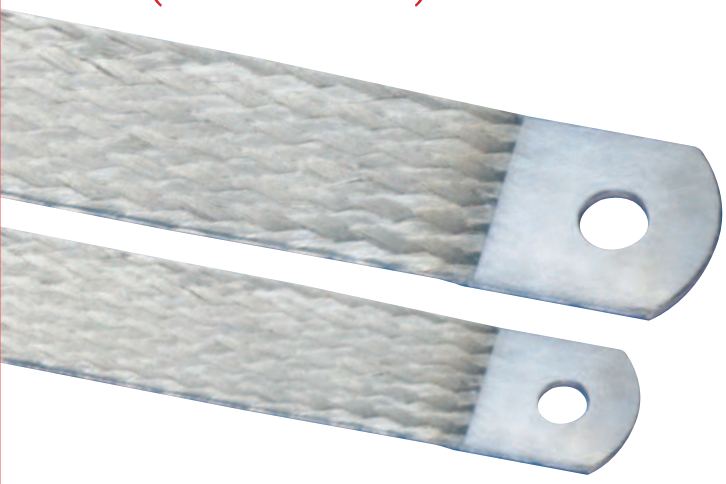
Space between 2 or 3 insulated braided conductors in parallel, for cooling.

A minimum air gap is required. Use FS type spacer clamp.



Designation	Part No.	For insulated braided conductor type
FS 24	553550	IBS Advanced 25 / 50 IBSB Advanced 25 / 50 / 70 / 100
FS 32	553560	IBSB Advanced 120 / 185 / 240

Grounding and Bonding Tinned Copper Braids (MBJ & BJ)



Innovative, state-of-the-art manufacturing process

nVent ERIFLEX manufacturing directly the palms of the MBJ tinned-plated braids. This manufacturing process provides an effective electrical contact, due to the integral palms, without the addition of tin or crimped lugs.

This process welds the flexible braid and brings back a solid tinned or red copper block as a palm. Unlike the traditional press-welded palms process. nVent ERIFLEX's process is suitable for red copper, but also for tin plated copper. The electrical contact between each wire is optimized.

This nVent ERIFLEX process also helps eliminate moisture issues in the palms. By using crimped lugs in a severe environment, moisture can enter in the lug (often by capillarity) and create corrosion between each wire. After several years, the electrical contact between each wire can deteriorate and alter the electrical conductivity of the equipment. The corrosion in the palm is impossible to remove without changing the element.

This process produces RoHS products; no additional substances are added to the tinned-plated wires during the manufacturing process.

BJ

Round braids with crimped lugs

Part No.	Description	Section mm	L mm	Ø D mm	Intensity A		Kg
556900	BJ 6-150 S	6	150	6.5	45	10	0.010
556910	BJ 6-200 S	6	200	6.5	45	10	0.015
556920	BJ 10-300 S	10	300	6.5	75	10	0.033

Tinned Copper Earth/Ground Braids Technical Features

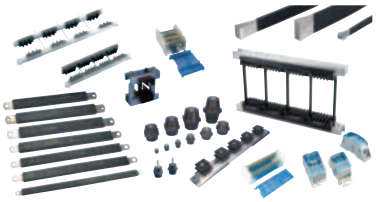
With integral palm

- A complete range of earth/ground flexible connections from 6 to 100 mm^2 section and from 100 to 500 mm length
- Strong resistance to vibration and fatigue
- Reliable: No extra contact due to the lugs crimped at the ends of the cable
- Weight savings: A flat braid weighs less than a cable (with insulation) and lugs and offers better copper usage (skin effect)
- Integral palm, without tin or crimped lugs for superior electrical contact and tensile strength resistance
- Quick and easy to install: Ready to use, No cutting, stripping, crimping or punching. Less labor time for installation
- Material savings: no lugs or terminals
- Recommended by the EMC/EMI directives and less impedance than cables

PRODUCTS FOR RENEWABLE ENERGY APPLICATIONS

nVent ERIFLEX Flexible Conductors

nVent ERIFLEX delivers low voltage power distribution solutions that reduce total installed cost and increase design flexibility by providing a comprehensive range of innovative and reliable products through global end user application expertise. These products are low-smoke, halogen-free and flame retardant all while maintaining the level of flexibility and reliability that our partners have come to expect from nVent ERIFLEX Flexibar.



nVent ERIFLEX Power Distribution

nVent ERIFLEX offers a wide selection of compact halogen free single pole, two pole, and four pole distribution blocks and a complete range of assembly support products for easy fastening to DIN rails or steel sheet. The blocks offer easy assembly with visual inspection to allow for confirmation of connections to a wide range of conductors.

nVent ERICO Surge Protective Devices

DT1, EDT2, PVT

Surge protection for power distribution, discrete signals (inputs and outputs) and communication (data and RF) equipment.

nVent HOFFMAN Enclosures

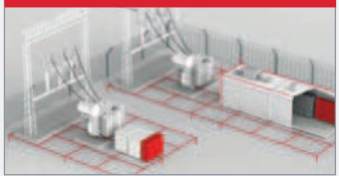
VJ enclosures are maintenance free and designed for use in highly corrosive environments. Made from hot compression molded halogen free, self-extinguishing fiberglass reinforced polyester (FRP) makes them lightweight and easy to install. Enclosures can be modified to meet customer specifications.

ELECTRICAL PANEL SOLUTIONS IDEAL FOR RENEWABLE ENERGY APPLICATIONS

nVent electrical panel solutions help overcome challenges and lower the cost of implementation across a range of renewable energy applications:

Solar: Combiner Boxes, Inverters

Battery Energy Storage Systems



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Electrical Equipment Company (EECO) is a US small business that has nearly 100 years of experience in weathering economic booms and busts, war, and peace by serving clients with real and relevant solutions.

Our team looks to provide qualified shipboard cable that offers a strong value proposition in cost and delivery for your production schedule.

EECO provides diverse solutions for shipbuilders, and repair facilities.

- Shipboard cable
- Sacrificial Anodes for cathodic protection
- Shipboard lighting
- Electrical products for building and maintaining ships
- Innovative products that provide space and electrical load management

EECO

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ICC CABLE CORP.

SETTING THE GLOBAL STANDARD FOR WORLD CLASS WIRE & CABLE

ICC CABLE IS A CABLE AND ACCESSORIES DISTRIBUTOR WITH OVER 30 YEARS OF EXPERIENCE IN THE MARINE AND OFFSHORE INDUSTRY IN THE UNITED STATES.

WE TAKE GREAT PRIDE IN OUR RELATIONS WITH OUR CUSTOMERS. WE CONTINUOUSLY STRIVE TO EXCEED OUR OWN HIGH STANDARDS OF PRODUCT QUALITY AND DELIVER CUSTOMER SATISFACTION.

ICC CABLE CORP.

» LEADING SUPPLIER AND MANUFACTURER OF WORLD CLASS WIRE & CABLE

» CABLES, ELECTRICAL COMPONENTS & ACCESSORIES MEET ALL U.S. AND CANADIAN STANDARDS AS WELL AS INTERNATIONAL STANDARDS AND ARE FULLLY BACKED BY REGULATORY BODY APPROVALS

IEEE 1580 TYPE P, TYPE LSXTPO (LSZH)

» TYPE “P”

UNARMORED, BRONZE ARMORED, ARMORED & SHEATEHED, FLAME RETARDANT MUD-RESISTANT CABLE, FIRE-RESISTANT CABLE OPTIONS AVAILABLE

» TYPE “E” MV CABLE

5KV, 8KV, 15KV

» LOW-SMOKE HALOGEN-FREE TYPE “LSX/TPO”

FR (60331 FIRE-RESISTANT) CABLE OPTIONS AVAILABLE

» VFD POWER CABLE

APPLICATION STANDARDS

- IEEE 1580 (2010), IEEE 45 (2004)
- UL 1309 (2011)
- IEEE 1202, IEC 60332-3 CAT. A
- IEC 60331 (FIRE-RESISTANT TYPE ONLY)
- CSA A 22.2 NO. 0.3 (AT -40°C/-35°C)

LSZH MARINE SHIPBOARD CABLE

MATERIAL/CONTRUCTION	*INSULATION*	*INNER COVERING (INNER SHEATH)*	*ARMORING*	*OUTER SHEATH*
XLPE	**T**			
MGT + XLPE	**B**			
HALOGEN FREE COMPOUND W/TAPE		**F**		
NO ARMORING			**X**	
COPPER WIRE BRAID			**O**	
GALVANIZED STEEL WIRE BRAID			**C**	
SHF1 (HALOGEN FREE THERMOPLASTIC COMPOUND)		**I**		**I**

EXAMPLE

0.6/1KV T F O I

- **I** — OUTER SHEATH
- **O** — ARMORING
- **F** — BEDDING
- **T** — INSULATION
- **0.6/1KV** — VOLTAGE RATING

LSZH FLAME-RETARDANT UNARMORED CABLE

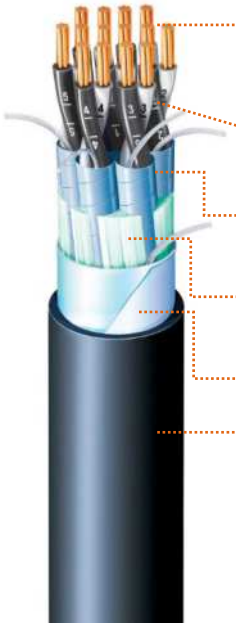
"TI" POWER AND CONTROL CABLE

- POWER AND CONTROL CABLE
- 0.6/1KV, 90DEG.C, IEEE 45
- LOW SMOKE HALOGEN-FREE
- FLAME RETARDANT (IEC 60332-1, 60332-3 CAT. A)
- UNARMORED

CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)
INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)
INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL
SHEATH
BLACK POLYOLEFIN SHF1

"TI(IC)" INSTRUMENTATION CABLE

- INSTRUMENTATION CABLE
- 250V, 90DEG.C, IEEE 45
- LOW SMOKE HALOGEN-FREE
- FLAME RETARDANT (IEC 60332-1, 60332-3 CAT. A)
- AL/PS FOIL TAPE INDIVIDUAL & OVERALL SHIELDED
- UNARMORED

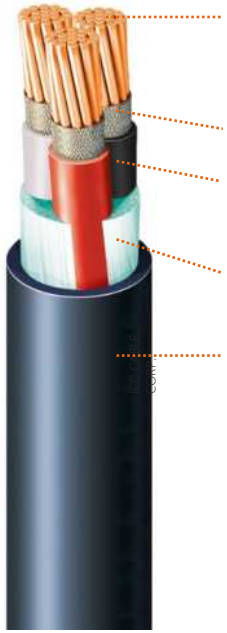


CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)
INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)
INDIVIDUAL SCREEN
AL/PS TAPE W/TINNED CU DRAIN WIRE
INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL
OVERALL SCREEN
AL/PS TAPE W/TINNED CU DRAIN WIRE
SHEATH
BLACK POLYOLEFIN SHF1

LSZH 60331 FIRE-RESISTANT UNARMORED CABLE

"BI" POWER AND CONTROL CABLE

- POWER AND CONTROL CABLE
- 0.6/1KV, 90DEG.C, IEEE 45
- LOW SMOKE HALOGEN-FREE
- FIRE RESISTANT (IEC 60331-1, 2, 21)
- FLAME RETARDANT (IEC 60332-1, 60332-3 CAT. A)
- UNARMORED



CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)

FIRE RESISTANT MICA/GLASS TAPE LAYER

INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)

INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL

SHEATH
BLACK POLYOLEFIN SHF1

"BI(IC)" INSTRUMENTATION CABLE

- INSTRUMENTATION CABLE
- 250V, 90DEG.C, IEEE 45
- LOW SMOKE HALOGEN-FREE
- FIRE RESISTANT (IEC 60331-1, 2, 21)
- FLAME RETARDANT (IEC 60332-1, 60332-3 CAT. A)
- AL/PS FOIL TAPE INDIVIDUAL & OVERALL SHIELDED
- UNARMORED

CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)

FIRE RESISTANT MICA/GLASS TAPE LAYER

INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)

INDIVIDUAL SCREEN
AL/PS TAPE W/TINNED CU DRAIN WIRE

INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL

OVERALL SCREEN
AL/PS TAPE W/TINNED CU DRAIN WIRE

SHEATH
BLACK POLYOLEFIN SHF1

LSZH FLAME-RETARDANT BRAID SHIELDED CABLE

"TFOI" POWER AND CONTROL CABLE

- POWER AND CONTROL CABLE
- 0.6/1KV, 90DEG.C
- LOW SMOKE HALOGEN-FREE
- FLAME RETARDANT (IEC 60332)
- COPPER WIRE BRAID SHIELDED

CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)

INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)

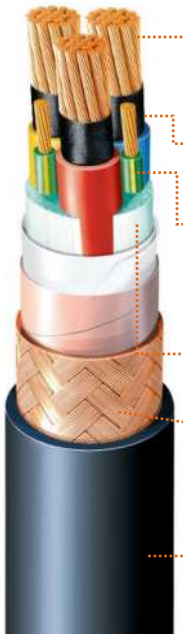
INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL

SHIELD
BARE COPPER WIRE BRAID (MIN. 90%)

SHEATH
BLACK POLYOLEFIN SHF1

"FX-TFOI (VFD)" VFD POWER CABLE

- POWER VFD CABLE
- 0.6/1KV (1.8/3KV), 90DEG.C
- LOW SMOKE HALOGEN-FREE
- FLAME RETARDANT (IEC 60332)
- CLASS 5 FLEXIBLE COPPER WIRE CONDUCTOR ("FX-)
- CU/PS FOIL TAPE (100%) AND BARE COPPER WIRE BRAID (MIN. 90%) OVERALL SHIELDED



CONDUCTOR
CLASS 5 FLEXIBLE BARE ANNEALED CU WIRE
(TINNED COPPER WIRE OPTION AVAILABLE)

INSULATION
CROSS-LINKED POLYETHYLENE (XLPE)

GROUND CONDUCTOR
STRANDED BARE ANNEALED COPPER WIRE
(YELLOW/GREEN

INNER COVERING/BEDDING
NON-HYGROSCOPIC MATERIAL

SHIELD
CU/PS FOIL TAPE (100%)
BARE COPPER WIRE BRAID (MIN. 90%)

SHEATH
BLACK POLYOLEFIN SHF1

LSZH FIRE-RESISTANT ARMORED & SHEATHED CABLE

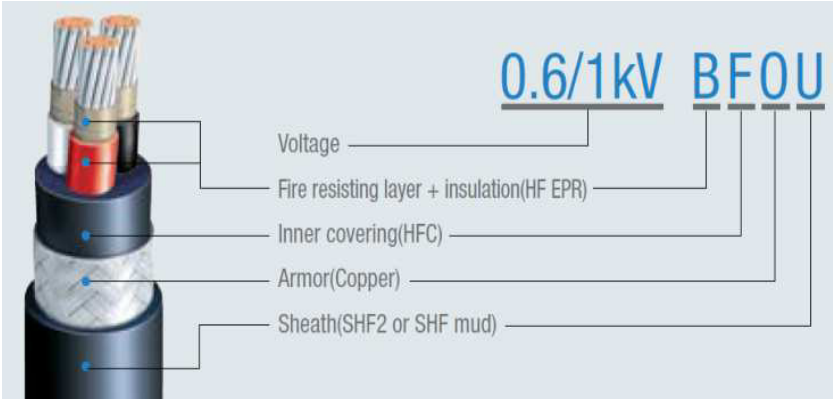
» EPR/SHF2, LSZH, FLAME-RETARDANT/FIRE-RESISTANT CABLE, MUD-RESISTANT CABLE, UNARMORED, ARMORED & SHEATHED

» MV & HV CABLE: 3.6/6KV, 6/10KV, 8.7/15KV

» VFD POWER CABLE

APPLICATION STANDARDS

- NEK TS 606 (2009)
- IEC 60092-350, 353, 354, 376, IEEE 45
- IEC 60092-351, 359
- IEC 60332-3 CAT. A & IEC 60332-1
- IEC 60331 (FIRE-RESISTANT TYPE ONLY)
- IEC 60754-1, 2, IEC 61034-1, 2
- ASTM D 2863, UL 1581
- CSA C 22.2 No. 0.3 (at -40°C/-35°C)
- ARTIC APPLICATION AVAILABLE:
  CSA C 22.2 No. 0.3 COLD/IMPACT AT -65°C

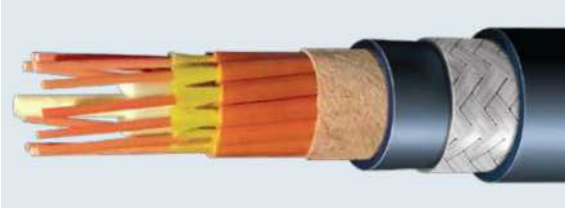


MARINE LSZH FIBER OPTIC CABLE

» LSZH, FLAME RETARDANT/FIRE RESISTANT, TIGHT-BUFFER, LOOSE-TUBE

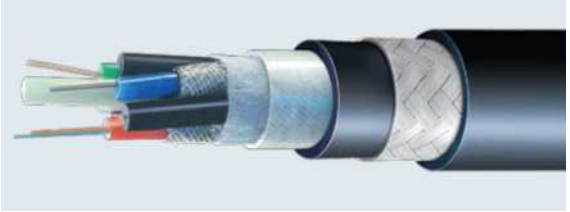
» MARINE VESSELS, OFFSHORE PLATFORMS, OIL-RIG, FPSOs, DRILL-SHIPS

AICI



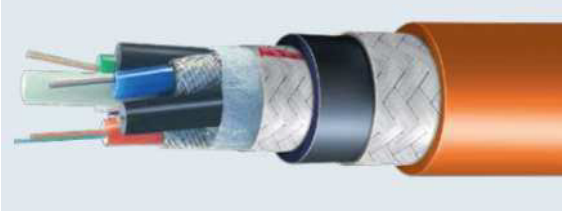
- LOW-SMOKE HALOGEN-FREE
- FLAME RETARDANT, BREAKOUT TPE CABLE
- ARMORED, TIGHT-BUFFER
- NEK606, IEC 60092-353, IEEE 45

QFCI



- LOW-SMOKE HALOGEN-FREE
- FLAME RETARDANT, FIRE RESISTANT CABLE
- ARMORED, LOOSE-TUBE WITH MICA
- NEK606, IEC 60092-353, IEEE 45

QFCU



- LOW-SMOKE HALOGEN-FREE, MUD-RESISTANT
- FLAME RETARDANT, FIRE RESISTANT CABLE
- ARMORED, LOOSE-TUBE WITH MICA
- NEK606, IEC 60092-353, IEEE 45

MARINE GRADE LSZH LAN CABLE

CAT 6 U/FTP 250MHz

- SOLID BARE COPPER CONDUCTOR
- PO INSULATION
- AL/PS FOIL INDIVIDUAL SHIELDED
- FLAME RETARDANT-LSZH JACKET
- ABS, DNV-GL APPROVED

CAT6A S/FTP 500MHz

- STRANDED BARE COPPER CONDUCTOR
- PO INSULATION
- AL/PS FOIL INDIVIDUAL SHIELDED
- TINNED COPPER OVERALL BRAID SHIELD W/DRAIN WIRE
- FLAME RETARDANT-LSZH JACKET
- ABS, DNV-GL APPROVED

CAT 7 S/FTP 600MHz

- STRANDED BARE COPPER CONDUCTOR
- FIRE RESISTANT TAPE, PO INSULATION
- AL/PS FOIL INDIVIDUAL SHIELDED
- TINNED COPPER OVERALL BRAID SHIELD W/DRAIN WIRE
- FLAME RETARDANT-LSZH JACKET
- ABS, DNV-GL APPROVED

CATA 7 S/FTP A&S 1000MHz

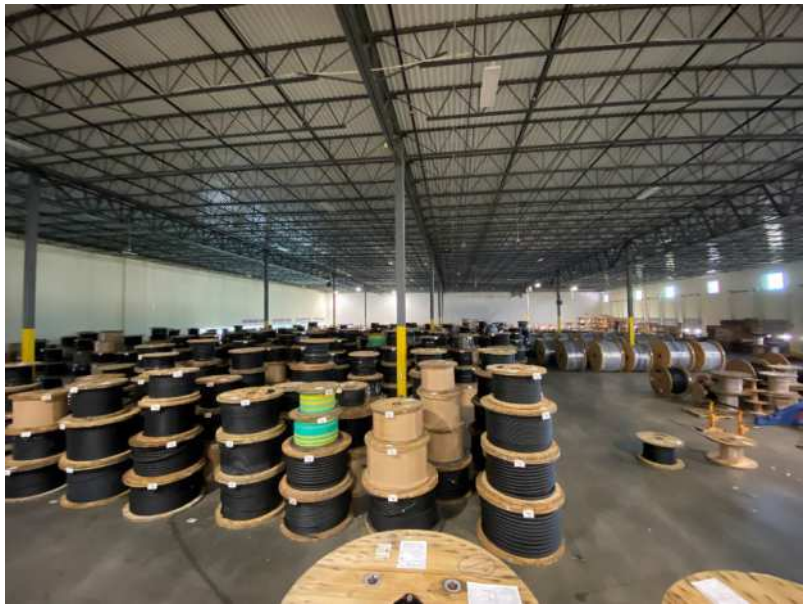
- STRANDED BARE COPPER CONDUCTOR
- FIRE RESISTANT TAPE, PO INSULATION
- AL/PS FOIL INDIVIDUAL SHIELDED
- TINNED COPPER OVERALL BRAID SHIELD W/DRAIN WIRE
- FLAME RETARDANT-LSZH JACKET
- TINNED COPPER WIRE BRAID AND SHF1 OUTHER SHEATHED
- ABS, DNV-GL APPROVED

CABLE INVENTORY

» EXTENSIVE INVENTORY OF MARINE CABLES AND ACCESSORIES

» LARGEST TYPE P CABLE INVENTORY IN NORTH AMERICA

» CABLE DISTRIBUTION WAREHOUSES IN HOUSTON, TX & GULFPORT, MS



BAC®

BAC CORROSION CONTROL A/S

Cathodic protection

EECO

Ideas Powering Performance

BAC CORROSION CONTROL A/S

EECO Ideas Powering Performance

MILITARY ANODES US STANDARD

BAC®

BAC CORROSION CONTROL A/S

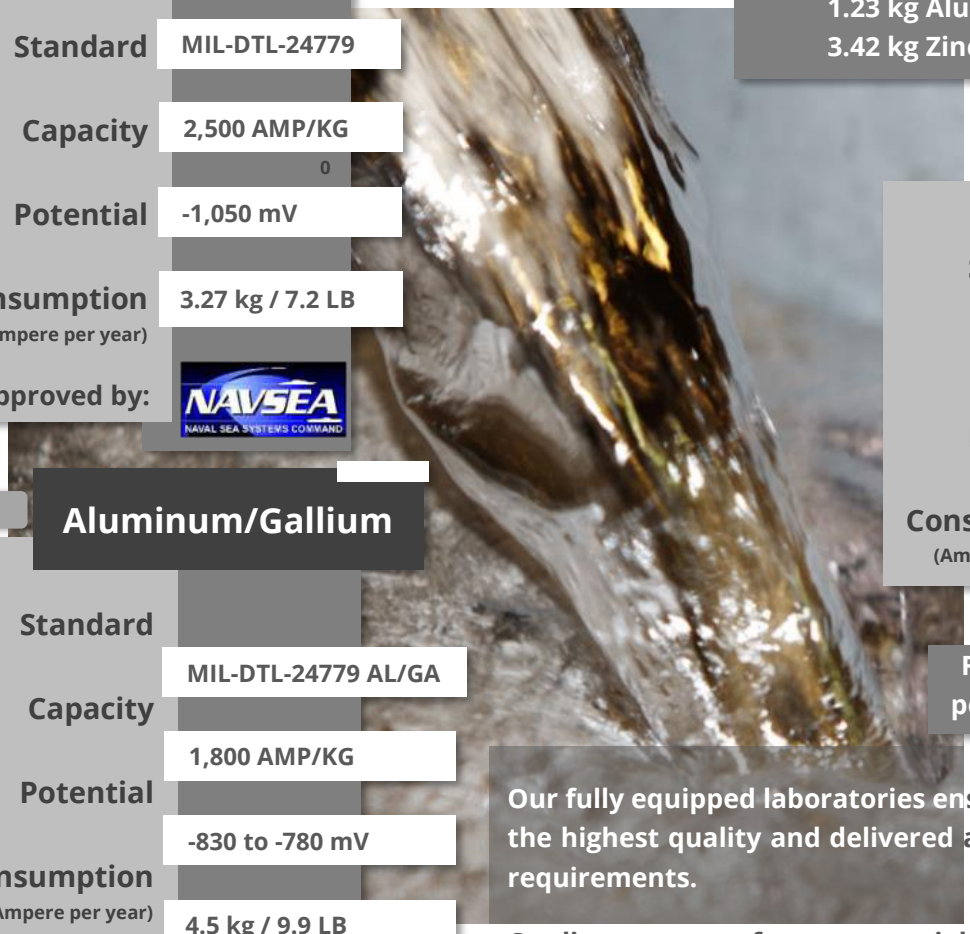
Europe's **leading** **supplier** and **manufacturer** of sacrificial anodes for Cathodic Protection

Continuous **quality** control and **analysis** of the product

Aluminum

Standard	MIL-DTL-24779
Capacity	2,500 AMP/KG
Potential	-1,050 mV
Consumption (Ampere per year)	3.27 kg / 7.2 LB
Approved by:	NAVSEA NAVAL SEA SYSTEMS COMMAND

1 kg of Aluminum corresponds to:
1.23 kg Aluminum/Gallium
3.42 kg Zinc



Zinc

Standard	MIL-DTL-18001
Capacity	780 AMP/KG
Potential	-1,000 mV
Consumption (Ampere per year)	11.2 kg / 24.7 LB

Reference requirement per m^2 bare steel 100 mA

Aluminum/Gallium

Standard	MIL-DTL-24779 AL/GA
Capacity	1,800 AMP/KG
Potential	-830 to -780 mV
Consumption (Ampere per year)	4.5 kg / 9.9 LB
Approved by:	NAVSEA NAVAL SEA SYSTEMS COMMAND

Different kinds of steel demand different kinds of protection!

Our fully equipped laboratories ensure that all products are of the highest quality and delivered according to the customers' requirements.

Quality assurance for raw materials, specific standard alloys as well as for all final manufactured products, is backed by full spectrograph analysis of chemical composition and electro-chemical performance, thus following industry recognized specifications along with the customers' unique specifications.

ISO and DNV certified, we guarantee production and delivery of the highest consistent quality.

EECO
Ideas Powering Performance

MILITARY ANODES US STANDARD

AVAILABLE

Hull Slab (1.25" Thick – Steel Double Strap)

	NSN	Weight	Size
AHS-10	5342-01-541-4321	9.1 LB	12.0" x 6.0" x 1.25"
LHS-10	5342-01-586-4258		
ZHS-23	5342-00-277-7559	21.5 LB	

Hull Slab (1.25" Thick – Steel Core)

	NSN	Weight	Size
AHC-10	5342-01-590-7164	8.1 LB	12.0" x 6.0" x 1.25"
LHC-10	5342-01-586-4415		
ZHC-23	5342-00-813-6058	20.4 LB	

Submarine Slab (1.25" Thick – Steel Strap)

	NSN	Weight	Size
ASS-5	5342-01-541-4371	4.7 LB	12.0" x 3.0" x 1.25"
LSS-5	5342-01-586-5211		
ZSS-12	5342-00-290-8243	11 LB	

Submarine Slab (2.5" Thick – Steel Strap)

	NSN	Weight	Size
ASS-10	5342-01-494-0109	8.5 LB	12.0" x 3.0" x 2.5"
LSS-10	5342-01-586-4915		
ZSS-24	5342-01-356-6383	21.5 LB	

Fairwater Slab (Ø 2" – Pipe Core)

	NSN	Weight	Size
AEP-B		0.46 LB	Ø 2" x 1.5"
LEP-B	5342-01-619-3356		
ZEP-B	5342-00-527-2368	0.6 LB	Ø 2" x 1.0"

Fairwater Slab (Ø 4" – Pipe Core)

	NSN	Weight	Size
AEP-B		1.79 LB	Ø 4" x 1.5"
LEP-B	5342-01-619-3465		
ZEP-B	5342-00-582-2011	2.9 LB	Ø 4" x 1.0"

Fairwater Slab (Ø 6" – Pipe Core)

	NSN	Weight	Size
AEP-B	5342-01-522-5658	2.5 LB	Ø 6" x 1.0"
LEP-B	5342-01-586-4744		
ZEP-B	5342-00-702-1371	6.7 LB	

Fairwater Slab (Ø 9" – Double Pipe Core)

	NSN	Weight	Size
AEP-B		5.7 LB	Ø 9" x 1.0"
LEP-B	5342-01-586-4770		
ZEP-B	5342-00-702-1372	15.2 LB	

Hull Slab (2.5" Thick – Steel Double Strap)

	NSN	Weight	Size
AHS-20	5342-01-508-7350	17.2 LB	12.0" x 6.0" x 2.5"
LHS-20	5342-01-586-5920		
ZHS-42	5342-00-134-8131	41 LB	

Hull Slab (2.5" Thick – Steel Core)

	NSN	Weight	Size
AHC-20	5342-01-573-2831	15.6 LB	12.0" x 6.0" x 2.5"
LHC-20	5342-01-586-4470		
ZHC-42	5342-00-486-0957	39 LB	

Submarine Slab (1.75" Thick – Steel Strap)

	NSN	Weight	Size
LSS-7	5342-01-586-5291	6.2 LB	12.0" x 3.0" x 1.75"

Submarine Slab (3.25" Thick – Steel Strap)

	NSN	Weight	Size
LSS-12	5342-01-586-5306	10.6 LB	12.0" x 3.0" x 3.25"

Fairwater Slab (Ø 3" – Pipe Core)

	NSN	Weight	Size
AEP-B	5342-01-683-6261	1.0 LB	Ø 3" x 1.5"
LEP-B	5342-01-619-3452		
ZEP-B	5342-00-582-2012	1.6 LB	Ø 3" x 1.0"

Fairwater Slab (Ø 5" – Pipe Core)

	NSN	Weight	Size
AEP-B		2.8 LB	Ø 5" x 1.5"
LEP-B	5342-01-619-3478		
ZEP-B	5342-00-527-2366	4.6 LB	Ø 5" x 1.0"

Fairwater Slab (Ø 6" – Pipe Core)

	NSN	Weight	Size
AEP-B		6.3 LB	Ø 6" x 2.5"
LEP-B	5342-01-586-4778		

Fairwater Slab (Ø 11" – Double Pipe Core)

	NSN	Weight	Size
AEP-B		8.6 LB	Ø 11" x 1.0"
LEP-B	5342-01-586-5931		
ZEP-B	5342-00-702-1664	24.0 LB	

BAC CORROSION CONTROL A/S

BAC Corrosion Control A/S

Faeroevej 7-9
DK-4681 Herfoelge
Denmark

Phone: +45 70 26 89 00
E-mail: info@bacbera.dk

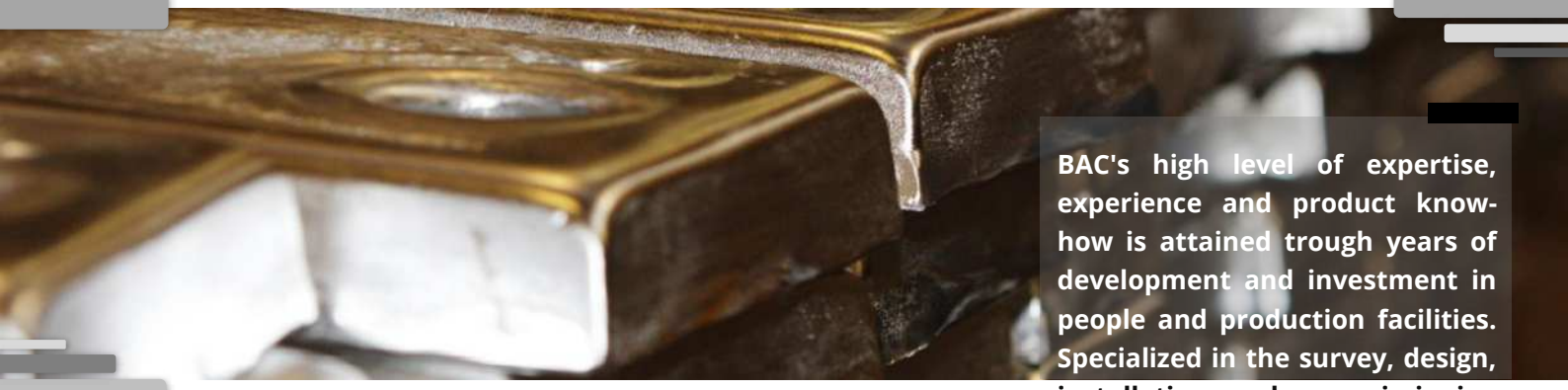
Europe's **leading supplier** and **manufacturer** of sacrificial anodes for Cathodic Protection

BAC Corrosion Control A/S is a global supplier and manufacturer of Galvanic Anodes for Cathodic Protection. With over 65 years of experience our professional team of experts can protect your investment like no other on the market.

We offer a unique expertise in Cathodic Protection, state-of-the-art production facilities and machinery, vigorous quality control and documentation, industry standard ISO and DNV certificates, and remarkably effective delivery times.

BAC is a qualified and approved manufacturer for the NAVSEA since 2009.

In-house product R&D and production ensure we are not reliant on subcontractors. Customers can be assured of reliable delivery times and products of consistent quality.



BAC's high level of expertise, experience and product know-how is attained trough years of development and investment in people and production facilities. Specialized in the survey, design, installation and commissioning of anti-corrosion control systems, BAC's experienced support staff can resolve most corrosion challenges.

In addition to marine protection solutions, we provide anti-corrosion systems and components globally for the Off-Shore Renewable Energies (wind turbines) and Oil & Gas Industries (pipelines and platforms), for harbors and similar installations as well as for other industrial installations.

EECO Ideas Powering Performance

Electrical Equipment Company

3798 Village Avenue
Norfolk, VA 23502
USA

Phone: +1 757 857 1100 ext 2
E-mail: marine@eeco-net.com

EECO Ideas Powering Performance

BAC®
CORROSION CONTROL A/S

EECO Ideas Powering Performance
800.993.3326 | eecoonline.com
3798 Village Avenue, Norfolk, VA 23502
(757) 857-1100 Fax (757) 857-1617

Shaft Grounding

The BAC shaft grounding system is as standard supplied in several versions

General

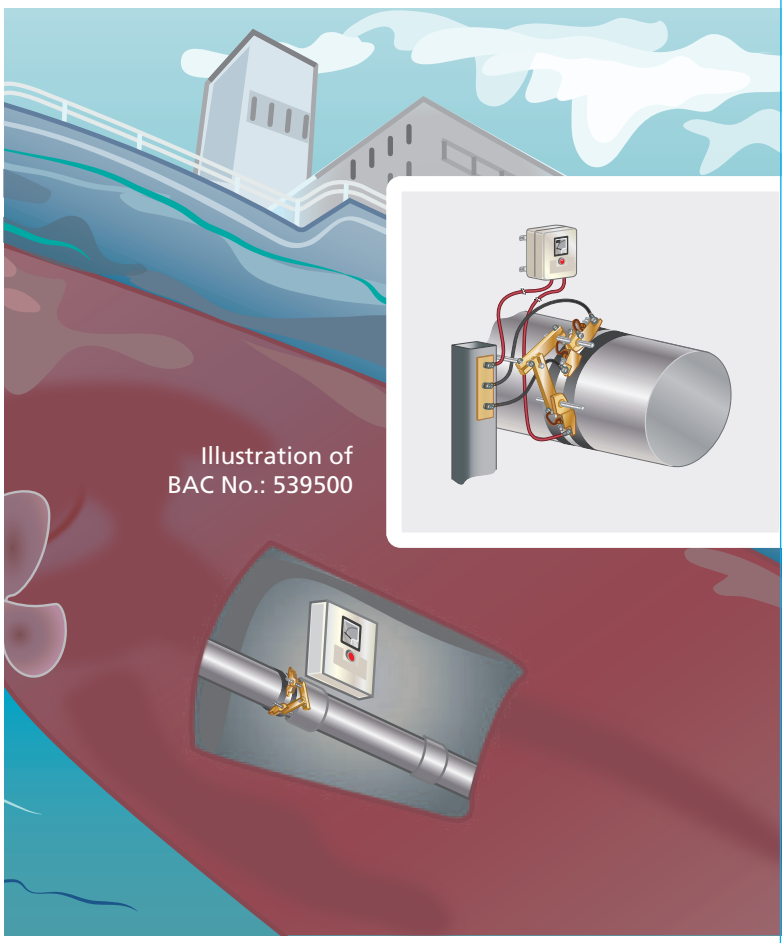
When a propeller shaft is rotating, it will be electrically insulated from the Ship's hull by the lubricating oil film in the bearings which creates a high resistance. The dissimilar materials used for the propeller and hull normally bronze and steel, will form a galvanic couple where the hull is the most active part.

This means that the differences in electric potential creates an electric current which has a tendency to discharge across the lubricating oil film as an electric arc which results in spark erosion and subsequent bearing break down.

To prevent this from taking place it will be beneficial to install a shaft grounding system as being part of the ships cathodic protection system.

In general a difference in electric potential between the Ship's hull and the Shaft system of less than 50mV will minimize the risk of arcing.

The BAC Corrosion Control A/S shaft grounding system comprises high quality silver band slip rings and high quality silver carbon brushes which reduce the electric resistance between the propeller shaft and the ship's hull to a value less of 0.001 Ohms. This system is well proven and easy to install on both new and existing shaft systems.



An extended version of the standard system where the monitoring cabinet is fitted with an amplifier, thus enabling the solution to send an alarm signal direct to the ships computer (or eg. a bell /horn) via a 4-20 mA signal.

EECO Ideas Powering Performance

BAC®
CORROSION CONTROL A/S

EECO Ideas Powering Performance
800.993.3326 | eecoonline.com
3798 Village Avenue, Norfolk, VA 23502
(757) 857-1100 Fax (757) 857-1617

Antifouling

The BAC antifouling system

Antifouling

Bio fouling in seawater pipe systems system is expensive and time consuming to rectify.

The problem arises when barnacles, mussels and others lower forms of marine life, enter into the pipe systems and heat exchangers etc. and settles and grow and multiply and creates blockage of the cooling water flow.

BAC solves the problem with our Anti Fouling system normally consisting of Cu & Al anodes.

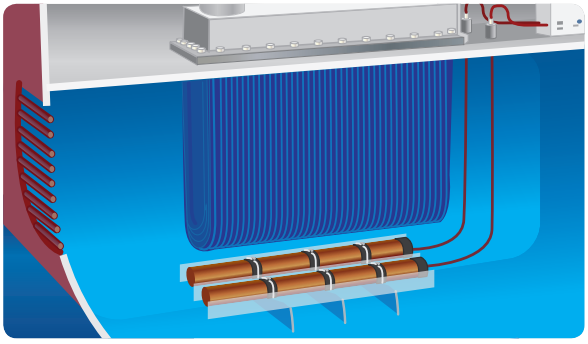
The anodes are feed with DC current from a control panel.

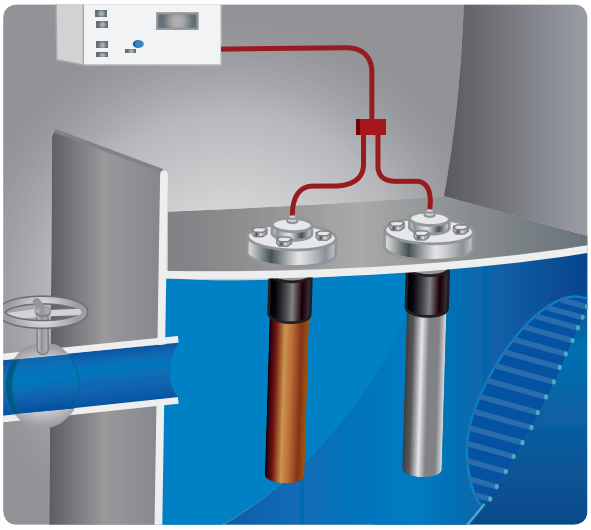
The anodes are usually mounted in the sea chest, thus in direct contact with the flow of seawater. The Cu ions produced are transported through the pipe systems and connected equipment beyond.

The small concentrations of Cu ions – app. 2 parts pr. billion – are sufficient to prevent marine life from settling and multiplying.

The Al ions produced spread throughout the system and produce an anti-corrosive layer on the internal surfaces of pipes.

Like this the BAC Anti Fouling system gives complete and continuous protection to pipe work and vital fire fighting, refrigeration, air conditioning and other cooling water systems.





EECO
Ideas Powering Performance

Martyr

The world's premium marine anode

Al premium

SALT AND BRACKISH WATER

Zn traditional

SALT WATER ONLY

MADE IN USA

COMMERCIAL ANODES

WHY MARTYR™ COMMERCIAL ANODES?

Martyr™ commercial anodes are gravity cast and manufactured to strict quality standards through an ISO 9001 Quality Management System. Each alloy is engineered to meet or exceed the most stringent commercial and military specifications, including the latest US Military Alloy Specifications **MIL-DTL-18001(L) for Zinc (Traditional)** and **MIL-DTL 24779C(SH) for Aluminum (Premium.)** We one of the few manufacturers in the USA that are 100% compliant to this new spec.

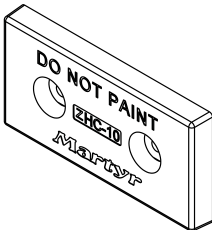
The techinique of providing cathodic protection for ships, piers, and other sctructures is a refined science. Martyr™ commercial anodes are highly active and provide longterm galvanic performance characteristics, even consumtion, and longer active life. We are a US and Canadian Military and Government Approved Vendor. Work order and designation "L" stamped on each anode. Copies of Material Certificate of Compliance are available upon request.

WHY ALUMINUM?

Martyr™ **Premium** Aluminum Alloy Anodes:

- Perform at least 5% better than **Traditional** zinc anodes in saltwater;
- Protect 50% longer than **Traditional** zinc anodes;
- Are enviro-friendly — contain 0% Cadmium, a toxic material found in **Traditional** zinc anodes;
- Weigh 50% less than **Traditional** zinc anodes;
- Meet the US Military Spec Mil-DTL-24779C(SH);
- Are the only anodes proven to be effective in Salt & Brackish water;
- Result in considerable cost savings compared with **Traditional** zinc anodes on commercial products.

	Part ID	Alloy	Dimensions	Mounting	Insert Type	Insert Material	NSN
●	**CMZHC23TBG**	Zn	12" X 6" X 1.25"	Bolt-on	Small CB	Galvanized	5342-00-812-6058
●	**CMZHC23TBS**	Zn	12" X 6" X 1.25"	Bolt-on	Small CB	Steel	5342-00-812-6058
●	**CMZHC23TBA**	Zn	12" X 6" X 1.25"	Bolt-on	Small CB	Aluminum	5342-00-812-6058
●	**CMZHC23SBG**	Zn	12" X 6" X 1.25"	Bolt-on	Large CB	Galvanized	5342-00-812-6058
●	**CMZHC23SBS**	Zn	12" X 6" X 1.25"	Bolt-on	Large CB	Steel	5342-00-812-6058
●	**CMZHC23SBA**	Zn	12" X 6" X 1.25"	Bolt-on	Large CB	Aluminum	5342-00-812-6058
◆	**CMAHC10TBG**	Al	12" X 6" X 1.25"	Bolt-on	Small CB	Galvanized	5342-01-590-7164
◆	**CMAHC10TBS**	Al	12" X 6" X 1.25"	Bolt-on	Small CB	Steel	5342-01-590-7164
◆	**CMAHC10TBA**	Al	12" X 6" X 1.25"	Bolt-on	Small CB	Aluminum	5342-01-590-7164
◆	**CMAHC10SBG**	Al	12" X 6" X 1.25"	Bolt-on	Large CB	Galvanized	5342-01-590-7164
◆	**CMAHC10SBS**	Al	12" X 6" X 1.25"	Bolt-on	Large CB	Steel	5342-01-590-7164
◆	**CMAHC10SBA**	Al	12" X 6" X 1.25"	Bolt-on	Large CB	Aluminum	5342-01-590-7164

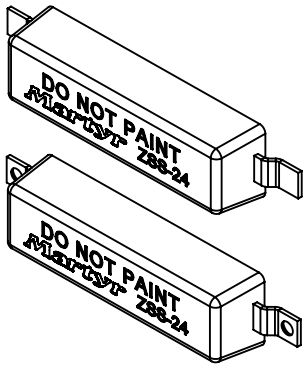


CB = Counterbore

	Part ID	Alloy	Dimensions	Mounting	Insert Material	NSN
●	CMZSS12G	Zn	12" X 3" X 1.25"	Weld-on	Galvanized	5342-00-290-8243
●	CMZSS12S	Zn	12" X 3" X 1.25"	Weld-on	Steel	5342-00-290-8243
●	CMZSS12A	Zn	12" X 3" X 1.25"	Weld-on	Aluminum	5342-00-290-8243
●	CMZSS12BG*	Zn	12" X 3" X 1.25"	Bolt-on	Galvanized	5342-00-290-8243
●	CMZSS12BS*	Zn	12" X 3" X 1.25"	Bolt-on	Steel	5342-00-290-8243
●	CMZSS12BA*	Zn	12" X 3" X 1.25"	Bolt-on	Aluminum	5342-00-290-8243
◆	CMASS5G	Al	12" X 3.5" X 1.25"	Weld-on	Galvanized	5342-01-541-4371
◆	CMASS5S	Al	12" X 3.5" X 1.25"	Weld-on	Steel	5342-01-541-4371
◆	CMASS5A	Al	12" X 3.5" X 1.25"	Weld-on	Aluminum	5342-01-541-4371
◆	CMASS5BG*	Al	12" X 3.5" X 1.25"	Bolt-on	Galvanized	5342-01-541-4371
◆	CMASS5BS*	Al	12" X 3.5" X 1.25"	Bolt-on	Steel	5342-01-541-4371
◆	CMASS5BA*	Al	12" X 3.5" X 1.25"	Bolt-on	Aluminum	5342-01-541-4371

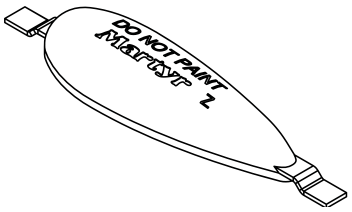
*Bolt holes are available upon request

	Part ID	Alloy	Dimensions	Mounting	Insert Material	NSN
●	CMZSS24A	Zn	12"X3.5"X2.5"	Weld-on	Aluminum	5342-01-357-4579
●	CMZSS24BG*	Zn	12"X3.5"X2.5"	Bolt-on	Galvanized	5342-01-357-4579
●	CMZSS24BS*	Zn	12"X3.5"X2.5"	Bolt-on	Steel	5342-01-357-4579
●	CMZSS24G	Zn	12"X3.5"X2.5"	Weld-on	Galvanized	5342-01-357-4579
●	CMZSS24S	Zn	12"X3.5"X2.5"	Weld-on	Steel	5342-01-357-4579
◆	CMASS10A	Al	12"X3.5"X2.5"	Weld-on	Aluminum	5342-01-494-0109
◆	CMASS10BG*	Al	12"X3.5"X2.5"	Bolt-on	Galvanized	5342-01-494-0109
◆	CMASS10BS*	Al	12"X3.5"X2.5"	Bolt-on	Steel	5342-01-494-0109
◆	CMASS10G	Al	12"X3.5"X2.5"	Weld-on	Galvanized	5342-01-494-0109
◆	CMASS10S	Al	12"X3.5"X2.5"	Weld-on	Steel	5342-01-494-0109



*Bolt holes are available upon request

	Part ID	Alloy	Dimensions	Mounting	Insert Material	NSN
●	CMMZTSG	Zn	9" X 3" X 1.5"	Weld-on	Galvanized	5342-01-294-2332
●	CMMZTSS	Zn	9" X 3" X 1.5"	Weld-on	Steel	5342-01-294-2332
●	CMMZTSA	Zn	9" X 3" X 1.5"	Weld-on	Aluminum	5342-01-294-2332
●	CMMZTSBG*	Zn	9" X 3" X 1.5"	Bolt-on	Galvanized	5342-01-294-2332
●	CMMZTSBS*	Zn	9" X 3" X 1.5"	Bolt-on	Steel	5342-01-294-2332
●	CMMZTSBA*	Zn	9" X 3" X 1.5"	Bolt-on	Aluminum	5342-01-294-2332
◆	CMATSG	Al	9" X 3" X 1.5"	Weld-on	Galvanized	5342-01-565-3485
◆	CMATSS	Al	9" X 3" X 1.5"	Weld-on	Steel	5342-01-565-3485
◆	CMATSA	Al	9" X 3" X 1.5"	Weld-on	Aluminum	5342-01-565-3485
◆	CMATSBG*	Al	9" X 3" X 1.5"	Bolt-on	Galvanized	5342-01-565-3485
◆	CMATSBS*	Al	9" X 3" X 1.5"	Bolt-on	Steel	5342-01-565-3485
◆	CMATSBA*	Al	9" X 3" X 1.5"	Bolt-on	Aluminum	5342-01-565-3485



*Bolt holes are available upon request

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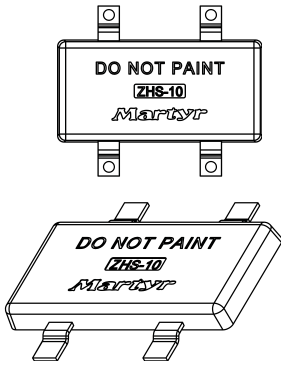
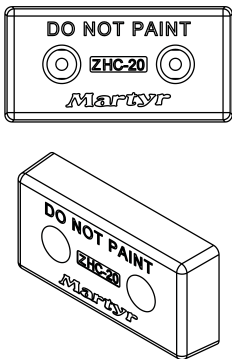
	Part ID	Alloy	Dimensions	Mounting	Insert Material	NSN
●	CMZHS23G	Zn	12" X 6" X 1.25"	Weld-on	Galvanized	5342-00-277-7559
●	CMZHS23S	Zn	12" X 6" X 1.25"	Weld-on	Steel	5342-00-277-7559
●	CMZHS23A	Zn	12" X 6" X 1.25"	Weld-on	Aluminum	5342-00-277-7559
●	CMZHS23BG*	Zn	12" X 6" X 1.25"	Bolt-on	Galvanized	5342-00-277-7559
●	CMZHS23BS*	Zn	12" X 6" X 1.25"	Bolt-on	Steel	5342-00-277-7559
●	CMZHS23BA*	Zn	12" X 6" X 1.25"	Bolt-on	Aluminum	5342-00-277-7559
◆	CMAHS10G	Al	12" X 6" X 1.25"	Weld-on	Galvanized	5342-01-541-4321
◆	CMAHS10S	Al	12" X 6" X 1.25"	Weld-on	Steel	5342-01-541-4321
◆	CMAHS10A	Al	12" X 6" X 1.25"	Weld-on	Aluminum	5342-01-541-4321
◆	CMAHS10BG*	Al	12" X 6" X 1.25"	Bolt-on	Galvanized	5342-01-541-4321
◆	CMAHS10BS*	Al	12" X 6" X 1.25"	Bolt-on	Steel	5342-01-541-4321
◆	CMAHS10BA*	Al	12" X 6" X 1.25"	Bolt-on	Aluminum	5342-01-541-4321



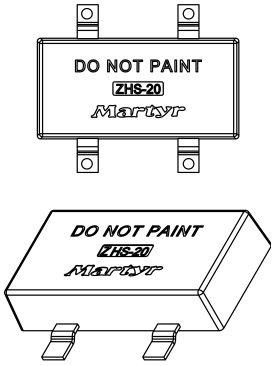
*Bolt holes are available upon request

	Part ID	Alloy	Dimensions	Mounting	Insert Type	Insert Material	NSN
●	CMZHC42TBG	Zn	12" X 6" X 2.5"	Bolt-on	Small CB	Galvanized	5342-00-486-0957
●	CMZHC42TBS	Zn	12" X 6" X 2.5"	Bolt-on	Small CB	Steel	5342-00-486-0957
●	CMZHC42TBA	Zn	12" X 6" X 2.5"	Bolt-on	Small CB	Aluminum	5342-00-486-0957
●	CMZHC42SBG	Zn	12" X 6" X 2.5"	Bolt-on	Large CB	Galvanized	5342-00-486-0957
●	CMZHC42SBS	Zn	12" X 6" X 2.5"	Bolt-on	Large CB	Steel	5342-00-486-0957
●	CMZHC42SBA	Zn	12" X 6" X 2.5"	Bolt-on	Large CB	Aluminum	5342-00-486-0957
◆	CMAHC20TBG	Al	12" X 6" X 2.5"	Bolt-on	Small CB	Galvanized	5342-01-573-2831
◆	CMAHC20TBS	Al	12" X 6" X 2.5"	Bolt-on	Small CB	Steel	5342-01-573-2831
◆	CMAHC20TBA	Al	12" X 6" X 2.5"	Bolt-on	Small CB	Aluminum	5342-01-573-2831
◆	CMAHC20SBG	Al	12" X 6" X 2.5"	Bolt-on	Large CB	Galvanized	5342-01-573-2831
◆	CMAHC20SBS	Al	12" X 6" X 2.5"	Bolt-on	Large CB	Steel	5342-01-573-2831
◆	CMAHC20SBA	Al	12" X 6" X 2.5"	Bolt-on	Large CB	Aluminum	5342-01-573-2831



CB = Counterbore

	Part ID	Alloy	Dimensions	Mounting	Insert Material	NSN
●	CMZHS42G	Zn	12" X 6" X 2.5"	Weld-on	Galvanized	5342-00-134-8131
●	CMZHS42S	Zn	12" X 6" X 2.5"	Weld-on	Steel	5342-00-134-8131
●	CMZHS42A	Zn	12" X 6" X 2.5"	Weld-on	Aluminum	5342-00-134-8131
●	CMZHS42BG*	Zn	12" X 6" X 2.5"	Bolt-on	Galvanized	5342-00-134-8131
●	CMZHS42BS*	Zn	12" X 6" X 2.5"	Bolt-on	Steel	5342-00-134-8131
●	CMZHS42BA*	Zn	12" X 6" X 2.5"	Bolt-on	Aluminum	5342-00-134-8131
◆	CMAHS20G	Al	12" X 6" X 2.5"	Weld-on	Galvanized	5342-01-508-7350
◆	CMAHS20S	Al	12" X 6" X 2.5"	Weld-on	Steel	5342-01-508-7350
◆	CMAHS20A	Al	12" X 6" X 2.5"	Weld-on	Aluminum	5342-01-508-7350
◆	CMAHS20BG*	Al	12" X 6" X 2.5"	Bolt-on	Galvanized	5342-01-508-7350
◆	CMAHS20BS*	Al	12" X 6" X 2.5"	Bolt-on	Steel	5342-01-508-7350
◆	CMAHS20BA*	Al	12" X 6" X 2.5"	Bolt-on	Aluminum	5342-01-508-7350



CB = Counterbore

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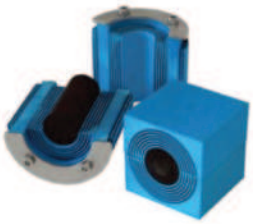

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