



技术资料

MNS3.0[®] 低压开关柜 船舶及平台系统

用电力与效率
创造美好世界™



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ABB简介

ABB 集团

ABB是全球电力和自动化技术领域的领导企业，致力于为工业、能源、电力、交通和建筑行业客户提供解决方案，帮助客户提高生产效率和能源效率，同时降低对环境的不良影响。ABB集团的业务遍布全球100多个国家，拥有14.5万名员工，2012年销售收入约为390亿美元。

ABB集团是全球500强企业之一，总部位于瑞士苏黎世，在苏黎世、斯德哥尔摩和纽约证券交易所上市交易。ABB由两家拥有100多年历史的国际性企业—瑞典的阿西亚公司（ASEA）和瑞士的布朗勃法瑞公司（BBC Brown Boveri）在1988年合并而成。

ABB（中国）有限公司

ABB与中国的关系可以追溯到上个世纪初的1907年。当时ABB向中国提供了第一台蒸汽锅炉。1974年ABB在香港设立中国业务部，1979年在北京设立办事处。1992年，ABB在厦门投资建立了第一家合资企业。1994年ABB将中国总部迁至北京，并于1995年正式注册了投资性控股公司——ABB（中国）有限公司。

经过多年的快速发展，ABB迄今在中国已拥有36家企业、在90个城市设有销售与服务分公司及办事处，拥有研发、生产、工程、销售与服务全方位业务，员工人数约1.9万名。2012年ABB在中国的销售收入超过52亿美元，保持ABB集团全球第二大市场的地位。





办公大楼
ABB Building



厦门ABB低压电器设备有限公司

厦门ABB低压电器设备有限公司是ABB集团在中国设立的唯一MNS®低压开关柜及Emax空气断路器生产基地。公司成立于1994年8月，位于厦门火炬高科技产业开发区，拥有各种专家及工程技术人员，他们正以高效率的工作为客户提供满意的产品和服务。历经十多年的发展，公司已经成为了全球最大的低压电器设备制造商之一。

雄厚的技术力量是我们在激烈的市场竞争中保持优势的关键因素，为了保证相同的质量标准，我们在设计、生产和质量控制过程中与国外ABB密切保持同步，并在厦门设立研发中心作为全球研发机构的分支，使本地研发能力不断加强，从而更好地服务于中国市场并支持全球的技术创新。

运用高度计算机化的企业资源计划管理系统，我们有效地计划、监控生产过程和产品质量。作为对社会和客户富有责任感的公司，我们还获得了独有的全面管理体系认证，它涵盖了质量管理 (ISO 9001)，环境保护 (ISO 14001) 和员工的职业健康安全管理体系 (OHSAS 18001)。在全体员工的共同努力下，公司稳健发展，不断获得各种殊荣，包括“中国质量诚信企业”、“全国实施卓越绩效模式先进企业”、“福建省政府质量奖”、“福建省百家重点企业”、“福建省省级企业技术中心”、“厦门市政府质量奖”、“厦门市十佳工业企业”、“厦门市技术进步先进工业企业”、“厦门市守合同重信用企业”等等，并连续多年入选“中国电气工业100强”。

MNS3.0低压开关柜 各种应用屏

应急配电盘 >>



PMS柜 ^

专门为船舶与海上平台项目开发的PMS柜，结构紧凑，接线方便，美观大方。

马达起动屏 >>

按ABB标准起动柜方案配置，抽屉间隔采用了德国进口多功能板，更加安全可靠，美观大方。

背靠背柜型 ^

适用于配电室空间有限的紧凑型方案，双面均可布置回路，中间为共用母排区。



《《 发电机屏

功能强大，通常由ABB Emax系列开关结合各类保护元件、仪表及指示元件组合而成。

《《 同步屏

可以配备发电柜同步控制设备及能量管理系统，同时还可提供监测和手动控制所需的必要仪表和控制开关，保护继电器和控制器安装在柜内。

《《 配电盘馈线柜

根据负荷大小选择Emax柜或MCCB集中分布柜，结构紧凑、布置均匀、同时兼顾客户接线方便。

MNS3.0低压开关柜

产品概述



适用范围

厦门ABB低压电器设备有限公司是ABB集团在中国设立的唯一生产MNS®低压开关柜的生产基地，公司从德国ABB Schaltanlaagenteknik GmbH引进具有世界最先进技术水平的MNS 3.0组合式低压开关柜系统，适用于所有发电、配电和电力使用的场所，包括船舶、石油钻井平台。

MNS 系统特点

MNS组合式低压开关柜系统，在世界市场上经过多年使用，证实了它的价值。整个系统充分考虑了将来的发展空间，可避免因技术发展而被淘汰的风险。

MNS系统采用的柜架结构具有高度灵活性，结构一旦组装完毕就不再需要维修。柜体内可安装不同的标准元件，以满足各种使用要求。由于整个系统包括电气结构均采用了组合式设计，这种优化的结构设计满足了各种元件的要求并能符合不同工作环境，达到相应的防护等级。

MNS系统的设计和所采用的材料均能最大程度的防止故障电弧的发生，一旦发生故障电弧，能在短时间内熄灭。它符合IEC298附件AA的要求，并通过权威试验机构的故障电弧测试，同时也通过了型式试验。在试验中，故障电弧产生后不影响相邻的抽出式组件，电弧熄灭，抽屉组件经清理后，仍具有操作功能；带有机械联锁的组件在柜中的位置没有变动，甚至在隔离位置上，柜体表面也没有故障的痕迹。

MNS系统中所选用的塑胶材料不含CFC或卤素，它具有阻燃和自熄灭的特性。

新颖的MNS系统与传统产品相比，具有更多的优越性：

结构紧凑，节省柜体的体积；柜体能背靠背排列；配电回路布置经济；全部选用标准元件，方便工程设计人员设计；模块化设计；全系列标准化；柜体可按工作和环境的不同要求设计出相应的防护等级；在一个柜体中可自由安装不同型式的功能组件，如：插入式组件和抽出式组件；具备防电弧设计；按要求柜体可满足抗地震、抗震荡和抗冲击的要求；设备更新改进方便；母线及框架结构免维修；设备运行连续性和可靠性高；操作人员人身安全有保障。



技术标准

MNS系统是通过验证试验的成套低压开关柜，它符合：IEC 61439-1/-2; EN 61439-1/-2 IEC60439-1, EN60439-1, VDE0660第500部分，BS5486第一部分，UTE63-412和GB7251.1-2005等标准。系统的安装和连接是按IEC364和DIN VDE0105标准执行。

工作和环境条件

MNS低压开关柜是适用于户内安装的电气设备，其他工作条件下的开关柜防护等级可至IP54。

环境温度

短时最高温度	+50℃
24小时最高平均温度	+45℃
最低温度	-5℃

对于测量、计量仪表和保护继电器等的工作条件，应遵照制造厂家的规定。

环境条件

正常工作时气候环境按IEC60439-1, EN60439, VDE0660第500部分的规定。周围环境相对湿度在40℃时为50%。

开关柜户内安装地点的条件应符合相应标准的要求。在会产生凝露的场合，开关柜中将采用通风或加热等措施来防止凝露。

MNS3.0低压开关柜

产品概述

技术数据

标准			GB7251, 1-2005	
		通过型式试验(TTA)的成套开关设备*	IEC 60439-1, EN 60439-1	
		通过验证试验的成套开关设备**	IEC 61439-1/-2, EN 61439-1/-2	
			DIN VDE0660, 第500部分 BS5486, UTE63-412	
试验报告		ASTA英国(按 IEC 61641 及抗故障电弧试验IEC 60298, 附录AA) DRL德国宇航研究所, 核电站震动安全测试振动和冲击试验符合 德意志劳埃德 汉堡		
电气数据	额定电压	额定绝缘电压Ui	1000 V 3~, 1500 V- **	
		额定电压Ue	690 V 3~, 750 V-**	
		额定脉冲耐压Uimp	6 / 8 / 12 kV **	
		过电压等级	II / III / IV **	
		污染等级	3	
		额定频率	至60 Hz	
	额定电流	主母线:		
		额定电流Ie	至6300 A	
		额定峰值耐受电流Ipk	至250 kA	
		额定短时耐受电流Icw	至100 kA	
		配电母线:		
		额定电流Ie	至2000 A	
	抗故障电弧	额定峰值耐受电流Ipk	至176 kA	
		额定短时耐受电流Icw	至100 kA	
		额定工作电压	至690 V	
		预期短路电流	至100 kA	
内部分隔形式	持续时间	300 ms		
	判定准则 (IEC 61641)	1至7		
	判定准则	至Form4		
结构特性	尺寸	柜体和支件构件	DIN 41488	
		推荐高度	2200 mm	
		推荐宽度	400, 600, 800, 1000, 1200 mm	
		推荐深度	400, 600, 800, 1000, 1200 mm	
		模数	E = 25mm根据DIN43660	
		模数	E = 25mm根据DIN43660	
	防护等级	根据IEC 60529	外部IP 30到IP 54 内部IP 2X	
	钣金材料	框架, 包括内部分隔件	2.0 / 2.5 mm	
		内部覆盖层	最小 1.5/2.0 mm	
外部覆盖层		最小 1.5 mm		
表面保护/喷漆	框架, 包括内部分隔件	覆铝锌板		
	内部覆盖层	覆铝锌板		
	外部覆盖层	覆铝锌板和亮灰色电漆, RAL7035 (浅灰色)		
塑胶件材料	无卤素、自熄、无CFC、助燃	IEC 60707, DIN VDE 0304第3部分		
按客户要求特殊	母线系统	母线	热缩套管 镀银 镀锡	
订制部分	特殊资质	试验报告	见上述的试验报告	
	喷漆	外壳	按客户需求订制	

* TTA定义: 成套开关设备, 在通过这些标准的型式组合开关柜的原始型号和系统基本一致。

** 验证试验: 若成套设备已按照IEC 60439-1标准做过了相关试验, 且试验结果符合IEC 61439-1/-2的要求, 则这些验证不需要重复。

*** 按不同电气元件情况而定。

框架

MNS系统框架的基本零件为带有25mm间隔模数孔的C形骨架(DIN43660)。框架结构的连接采用了新工艺的自攻螺钉和ESLOK螺丝，所有框架零件均为免维修型。

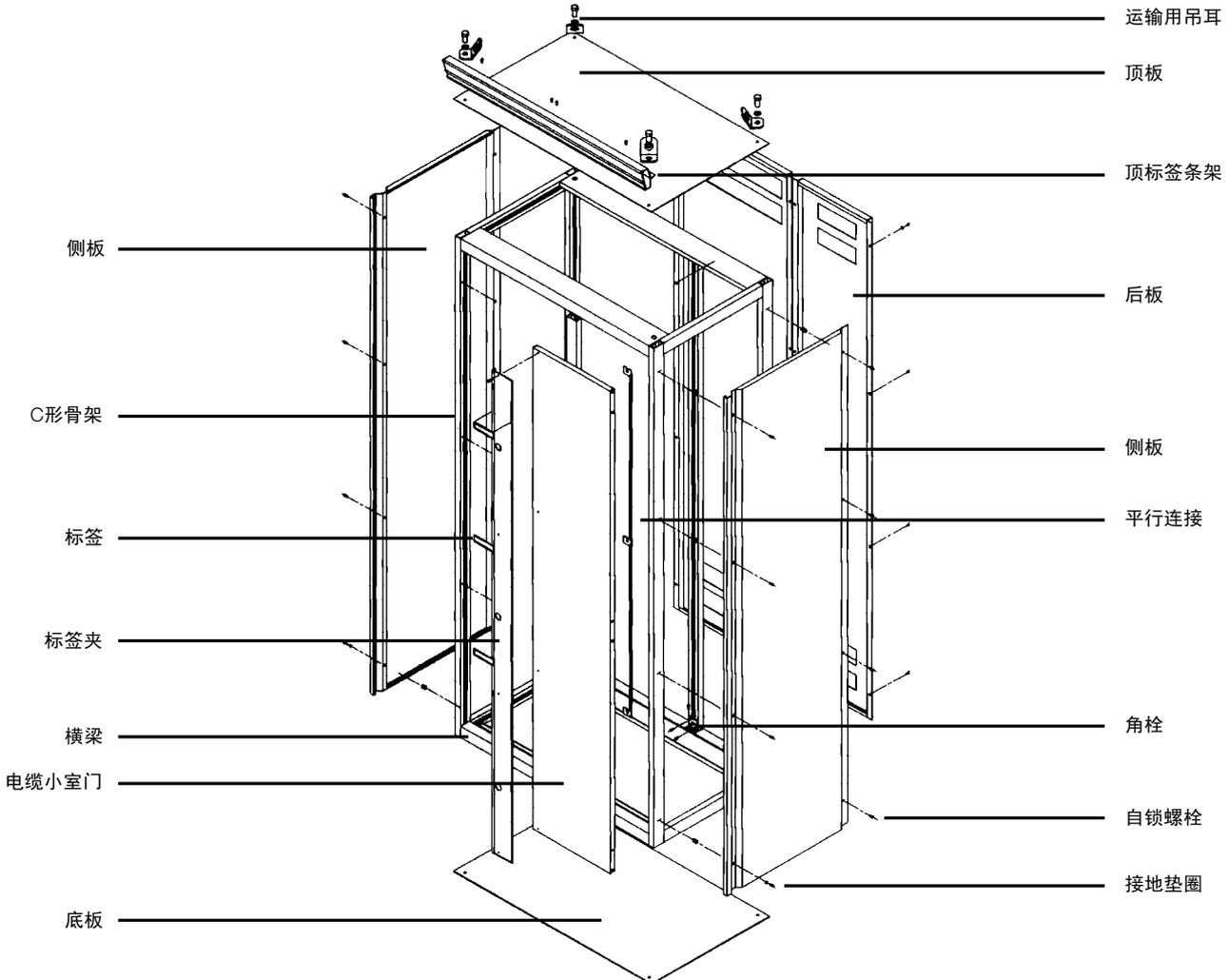
MNS系统的标准模数E=25mm，由于采用了标准模数孔系统，框架结构无需专用工具即能组装成各种型式的柜体，如：前操作式和背靠背式单台或多台组合的开关柜。

外壳

MNS系统按不同的使用要求，可设计出不同防护等级的外壳。后操作和联屏柜可选用正面防护等级为IP30的外壳，全封闭外壳防护等级为IP40-IP54(抽出式开关柜均为全封闭结构)。

铰链框架可作安装电子器件和仪表板用，也可作装置框架用。铰链框架的安装位置上可加带/不带观察孔的盖板。柜底部可提供底板，加装法兰板后可安装电缆槽。

门板和外壳可装配单个/多个通风口，顶板可为全通风型(适用于IP30和IP40)。



MNS3.0低压开关柜 结构设计

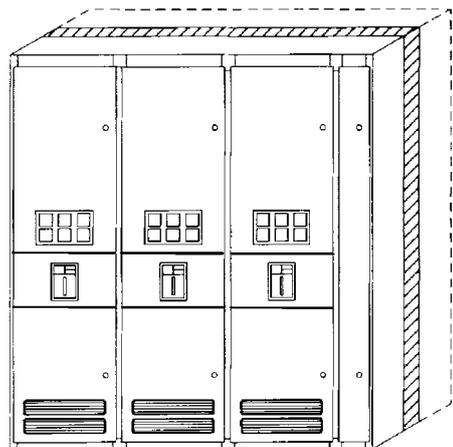


柜架结构

MNS系统的柜架结构可分为装置小室、母线小室和电缆小室，其尺寸(高×宽×深)为2200mm×400/600/800/1000/1200mm×600/800/1000mm。空气断路器为2000A以下的开关柜柜宽可为400mm。运输单元最长为2600mm。

进、出线柜、母联柜均安装有一个开关，这个开关可以是固定式隔离开关，也可以是固定式或抽出式塑壳断路器，或者是空气断路器。

在MNS系统中将同一功能组的零部件组装后，可构成一个简便的机械和电气功能组件，包括动力组件和控制组件。



带装有空气断路器的装置小室，母线小室、母线连接小室的开关柜

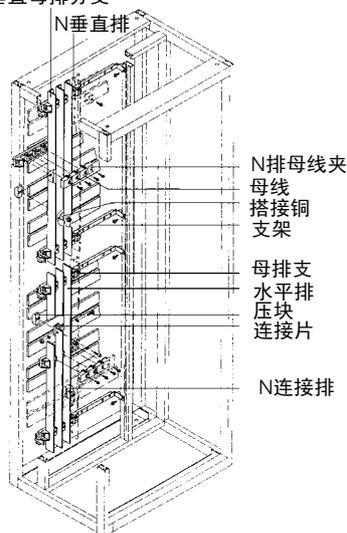
主母线

主母线布置在开关柜的背部（母线小室内），可分为上、下层。双层主母线系统分别布置在上、下两层，单层主母线系统布置在上层或下层。两层主母线的截面大小可以不相同。主母线单独、串联、并联均可。视母线电流大小，每相可由2条或4条主母线组成。双面操作的柜体采用共同母线的设计。联屏柜的母线按其运输单元作分隔。母线材料为铜(Cu)，截面面积为30×10mm，40×10mm，60×10mm三种规格，不同截面的母线也能相接。

配电母线

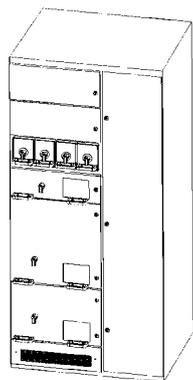
配电母线用于功能单元组件和母线之间的连接，垂直分布在母线小室内。一个开关柜中最多能安装两个3相或4相配电母线，可以全高度、半高度或中间分开呈两段布置。配电母线每相为单根直角型铜排，其截面为50×5mm或L形50×30×5mm。配电母线材料为铜。

垂直母排分支

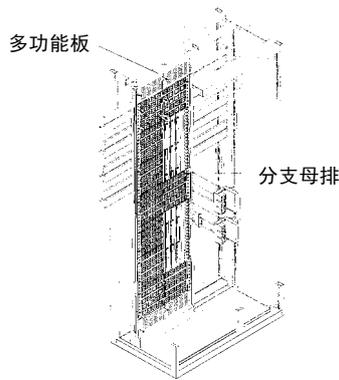


带母线、分支母线柜架

抽出式结构



抽出式开关柜带装置、电缆、母线小室



分支母线嵌入多功能分隔板中

抽出式结构

抽出式开关柜可分为装置小室、母线小室、电缆小室，其尺寸(高×宽×深)为2200mm×1000mm×600/800/1000/1200mm。抽出式组件由组件本身和组件安装小室两部分组成，动力单元和控制单元的组件为抽出式安装，标准规格为8E/4、8E/2、8E、12E、16E、20E、24E。4个8E/4或2个8E/2组件可以水平安装在600mm宽的装置小室内，组件高度为8E(200mm)。8E、12E、16E、20E、24E的单个组件就需要600mm宽的装置小室，组件的高度就是组件规格所指的尺寸。抽出式组件作抽出操作时，开关柜的主电源不必切断。在相邻组件不断电的情况下操作组件插入/抽出，不会发生触电的危险。

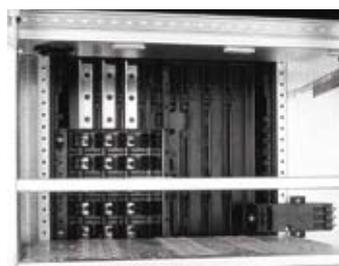
多功能分隔板

在抽出式或固定式、抽出式混合设计的开关柜中，配电母线(直角L型截面50×30×5mm)安装在绝缘多功能分隔板中，同整个母线系统一起，无需另加隔板即可达到抗电击防护等级(IP20)的要求。

多功能分隔板有抗故障电弧性能，也作为装置小室和母线小室之间的隔离。



8E/4和8E/2抽出式组件小室



8E和4E装置小室

8E/4、8E/2装置小室

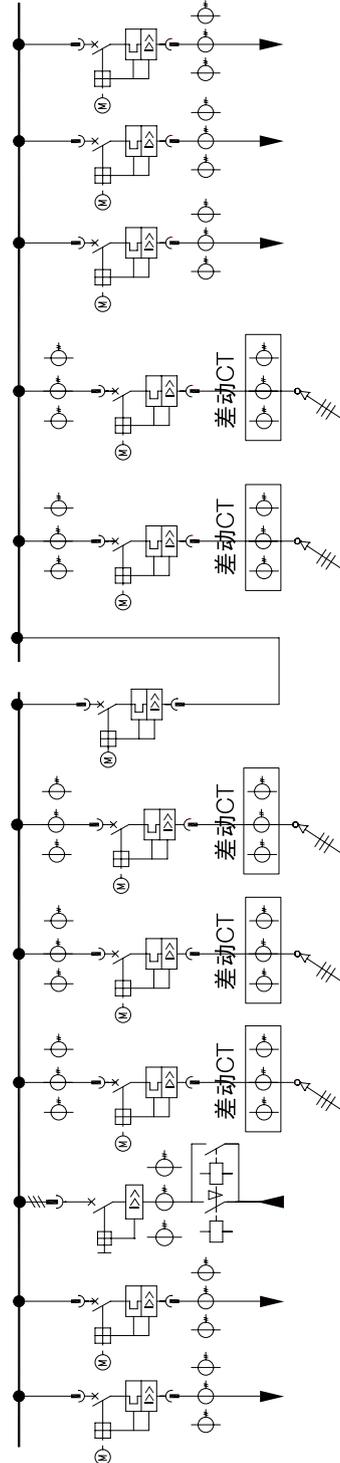
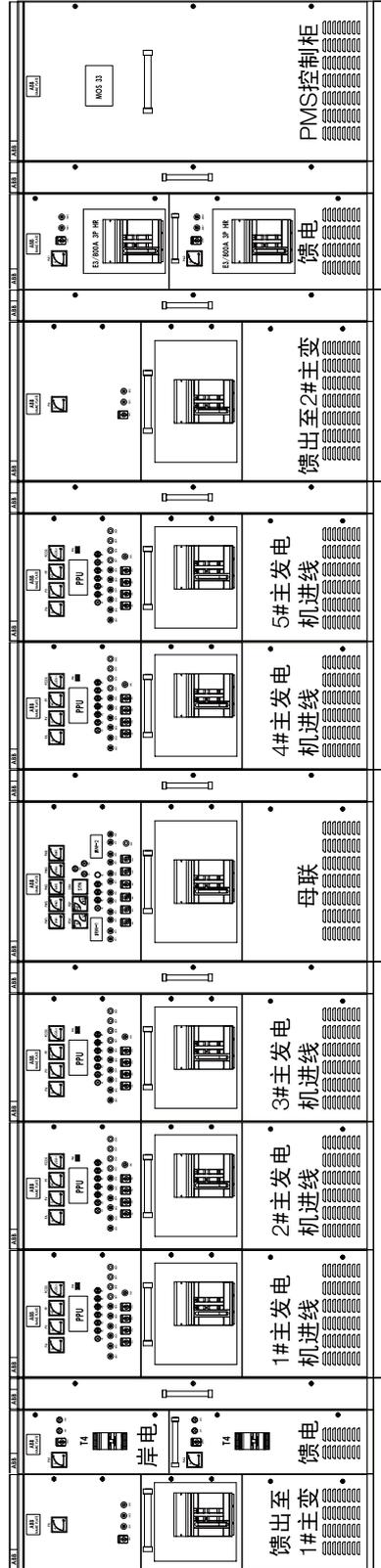
8E/4、8E/2装置小室包括底板、导轨、前档和插头转接组件。动力和控制回路与配电母线、组件与电缆小室之间的电气连接由插头转接件来完成。抽出式插头组件电流最大至125A，它可容纳四个8E/4(电流至45A)或两个8E/2(电流至63A)的插头，每个8E/4组件配备一个20芯的端子，每个8E/2组件配备一个或两个20芯的控制端子。进、出线缆的连接侧位于抽出式插头组件内，并有抗故障电弧保护功能。

8E...24E装置小室

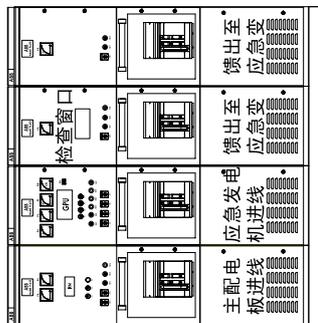
8E...24E装置小室包括底板、导轨、金属侧板(带控制出线端子)。抽出式组件的进线与多功能分隔板中的配电母线通过分列触头连接，出线电缆连接采用电缆接头(主回路)，控制电缆连接用由20芯或16芯控制接线接头组成的高度为8E的16芯或32芯控制接线端子(二次回路)来实现。主回路电缆接头安装在多功能分隔板上。

MNS3.0低压开关柜 抽出式结构

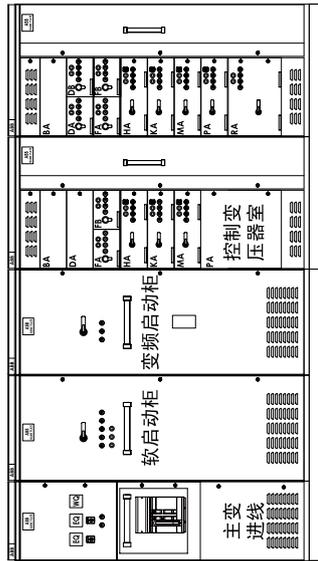
主配电板



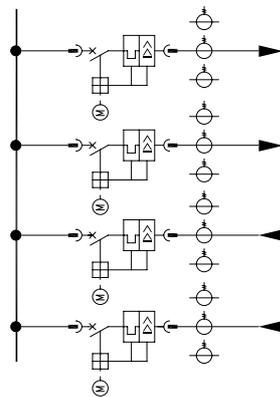
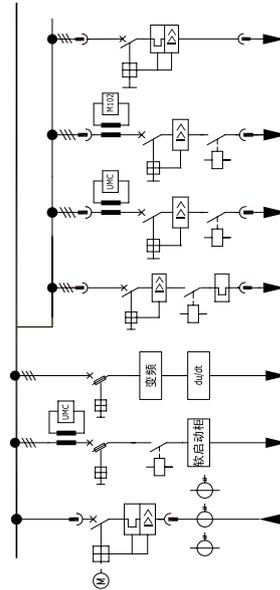
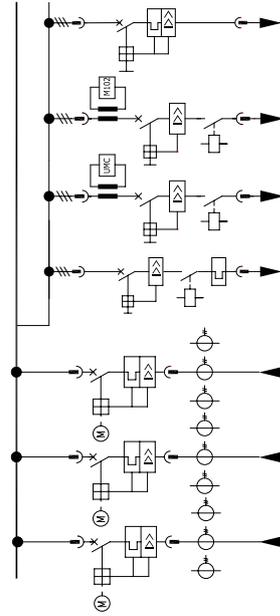
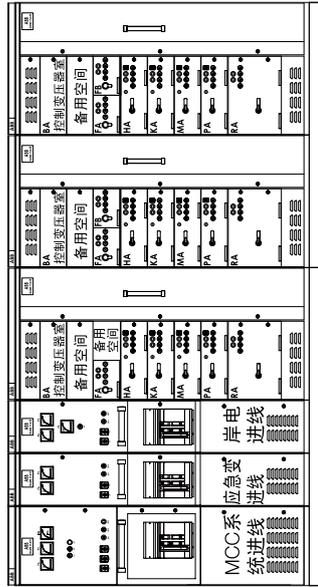
应急MCC柜



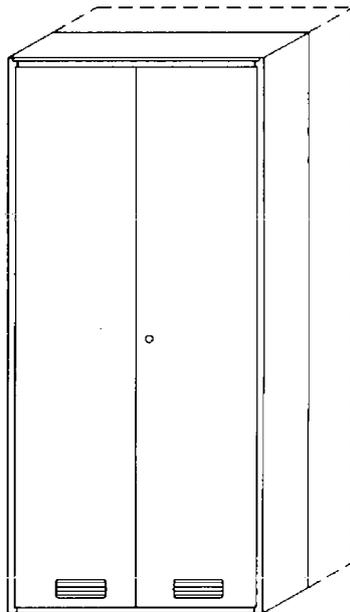
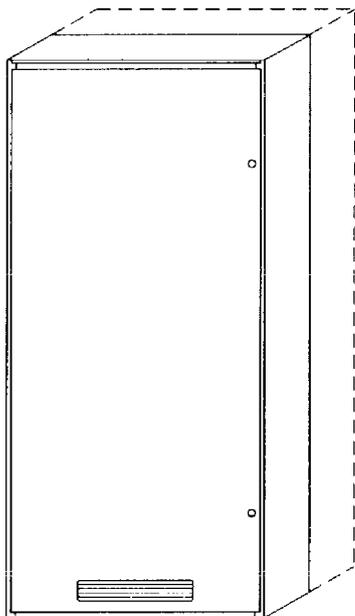
MCC柜



应急配电板



MNS3.0低压开关柜 各种用途柜型结构



标准柜型

MNS系统可提供标准型空柜，尺寸规格(高×宽×深)为2200mm×800/1000mm×/600/800/1000/1200/mm。

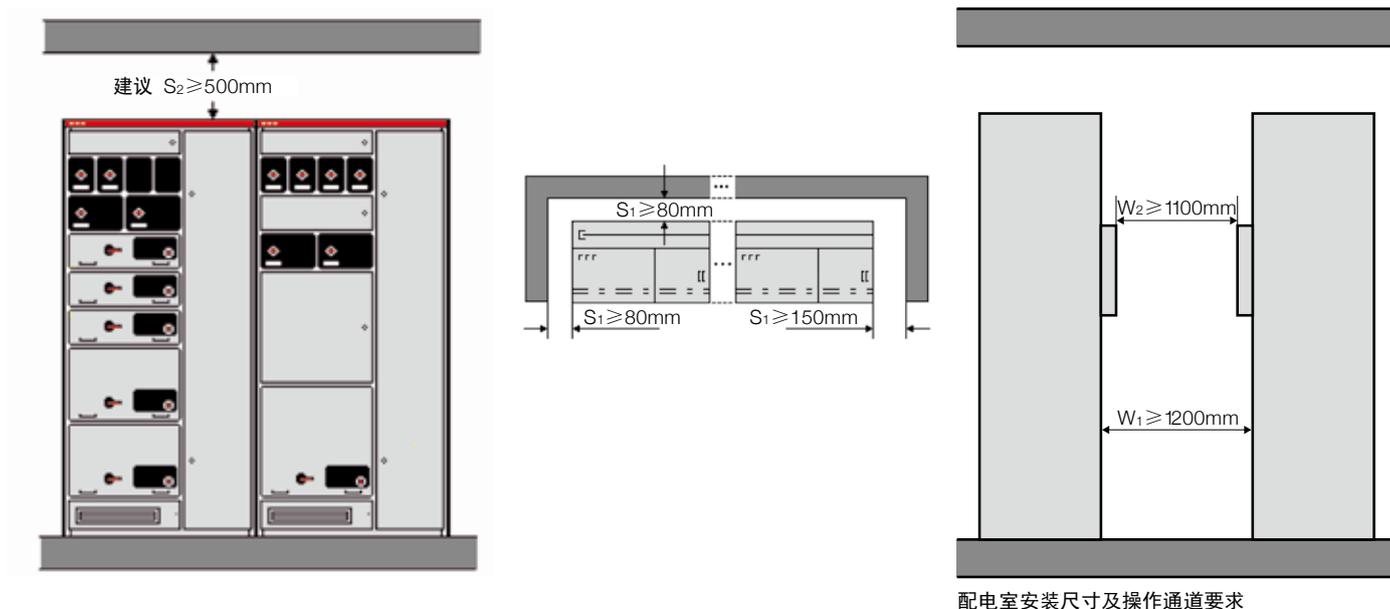
型号	柜宽 (mm)	柜深 (mm)
进线柜、联络柜	600,800,1000	600,800,1000,1200
出线柜	600*,800,1000	600,800,1000,1200
IP54柜体		
-进线柜	1000	600,800,1000,1200
-出线柜	1000	600,800,1000,1200
双面柜		
-控制柜	800,1000	800,1000
-出线柜	800,1000	800,1000
-转接柜	200,400	400,600,800,1000,1200

* 不带电缆小室

柜深的选择

各种柜体推荐选用标准柜深，并以进线柜为基准采用双面对齐。若仅为单面对齐，则柜体之间应加转接柜，以确保母线的连线。

操作与安装



运输与安装

开关柜在全部装配齐全并经检验合格后，方可装箱运输。装箱分单台、二台、三台和四台4种运输方式，运输单元最多为2600mm，应尽可能避免单独装箱，以减少主母线之间的连接点。

当产品运抵目的地后，首先应检查装箱是否完整。若开关柜不是立即使用，应存放在干燥、清洁处。

开关柜应按照柜架尺寸图安装。安装时应根据图纸做主母线连接，对母线表面做好清洁处理，然后用螺栓紧固，并进行电缆布线工作。开关柜并联安装时，应在并联孔部位用螺栓紧固。

配电室空间要求

安装尺寸

开关柜在配电室内必须竖直安装。若靠墙安装时，为满足散热要求，应保证：与墙壁距离最小为 $S_1 \geq 80\text{mm}$ 。

运行前检验

开关柜在安装或检修后，在投入运行前须进行下列检查和试验（检修后的检查可视其检修性质而定）。

- 检查开关柜内部电器设备和接线是否符合图纸要求，线端是否有编号，接线是否整齐牢固；
- 检查所安装的电器设备接触是否良好，是否符合本身技术要求；
- 检查机械连锁和电气连锁的可靠性；
- 检查抽出式组件动作是否灵活，接触是否良好；
- 检查并试验开关柜的接地装置是否牢靠，有无明显标志，并作耐压试验；
- 检查并试验所有表计及继电器动作是否正确。

产品的成套性

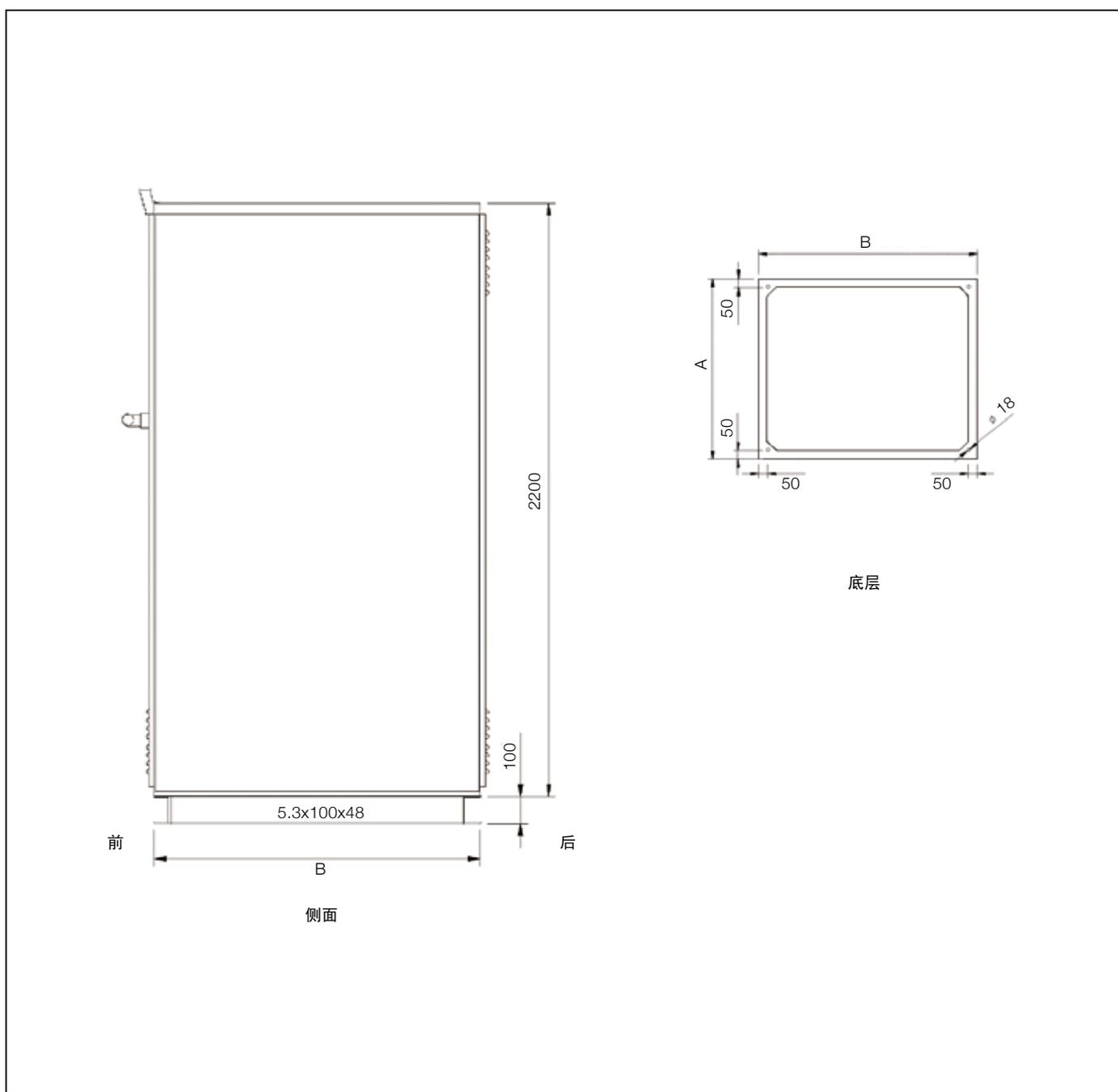
开关柜附有装箱单、产品合格证、产品使用说明书及必要的图纸，随机附件有门钥匙以及根据配套清单所提供的备品备件。

MNS3.0低压开关柜 操作与安装

安装基础图

A:柜宽
B:柜深

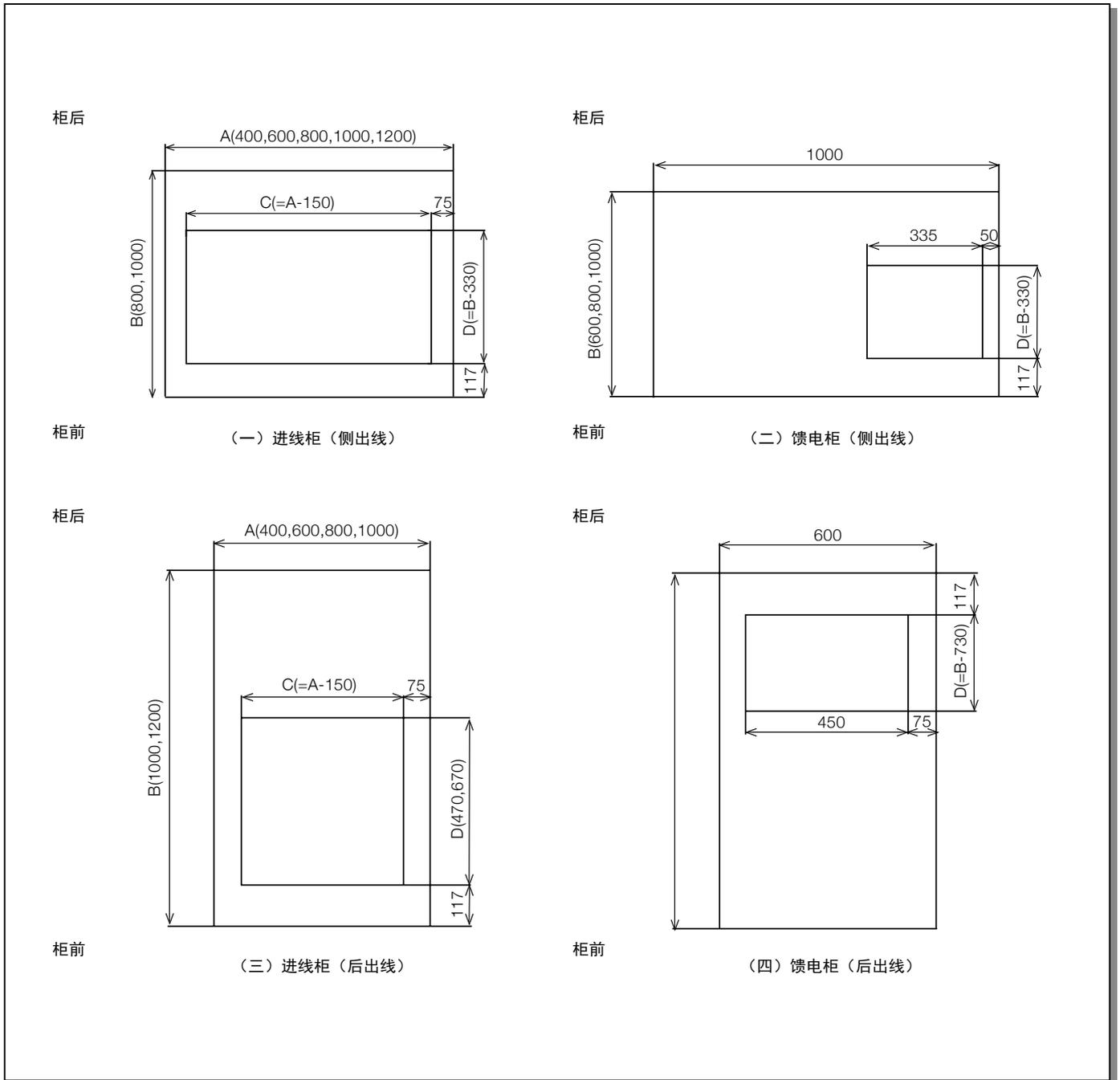
注：（以下尺寸均为mm）上进线依实际情况定



底柜开孔图

A:柜宽
 B:柜深
 C=A-150
 D=B-330

注：（以下尺寸均为mm）上进线依实际情况定



MNS3.0低压开关柜 在中国的应用范例



海洋钻井平台

22艘船

船东：CNOOC

船厂：海洋石油工程股份有限公司

制造商：厦门ABB低压电器设备有限公司

供货范围：低压电气包

交货期：2003-2004年

项目意义：厦门ABB低压电器设备有限公司是中国最早独立承接海洋工程项目设计、建造、调试、服务的公司。



海洋石油981深水半潜式钻井平台

1艘船

船东：CNOOC

船厂：上海外高桥造船有限公司

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2012-2013年



自升式钻井平台

2艘船 936&937

船东：中海油田服务股份有限公司
 船厂：招商局重工（深圳）有限公司、
 大连船舶重工集团海洋工程有限公司
 制造商：厦门ABB低压电器设备有限公司
 供货范围：MNS3.0低压开关柜
 交货期：2009年

2艘船

船东：Bestford
 船厂：招商局重工（深圳）有限公司
 制造商：厦门ABB低压电器设备有限公司
 供货范围：MNS3.0低压开关柜
 交货期：2013年

1艘船

船东：BK Marine
 船厂：招商局重工（深圳）有限公司
 制造商：厦门ABB低压电器设备有限公司
 供货范围：MNS3.0低压开关柜
 交货期：2014年

其它海上平台应用实例

业主

陕西宝鸡石油机械厂
 泰科热控(上海)贸易有限公司
 中国石油集团海洋工程公司

 中国石油集团海洋工程公司
 科麦奇中国石油有限公司
 国民油井电器控制(上海)有限公司
 丹文能源中国有限公司
 国民油井电器控制(上海)有限公司

项目名称

韩国海洋钻井平台
 Tyco EDC SPD DPB platform
 CPOE Rig 33
 CPOE Rig 5/6/7/8/9/10
 Baoji Drilling Platform I/II
 KMG CED 11-6平台
 OSL Rig3/4
 Devon Panyu 4-2/5-1
 National Oilwell

交货期

2011年
 2010年
 2008年
 2007年
 2007年
 2006年
 2006年
 2005年
 2004年

MNS3.0低压开关柜 在中国的应用范例



平台供应船

18艘船

船东: Surf Groupe, France

船厂: 浙江船厂

制造商: 挪威ABB

供货范围: 2* 低压主配电盘MCCs
(440V/220V)

2* 低压应急配电盘

(440V/220V)

交货期: 2004-2008年

20艘船

船东: Bourbon

船厂: 上海太平洋船务有限公司

制造商: 厦门ABB低压电器设备有限公司

供货范围: 低压主配电盘MCCs (440V/220V)

低压应急配电盘

控制箱

交货期: 2012-2013年

2艘船

船厂: Shinan Heavy Industries

制造商: 厦门ABB低压电器设备有限公司

供货范围: 低压主配电盘 (690V)

交货期: 2012年



AHTS

4艘船

船东: 俄罗斯海运公司

船厂: 浙江造船厂

制造商: 厦门ABB低压电器设备有限公司

供货范围: MNS3.0低压开关柜

交货期: 2014年



SWATH 2500 小水线面双体船

1艘船

船东：中国科学院

船厂：渤海重工船厂

制造商：厦门ABB低压电器设备有限公司

供货范围：低压主配电盘（690V）

交货日期：2008年



化学品船

1艘船

船东：Donso Tanker, Sweden

船厂：上海爱德华船厂

制造商：芬兰ABB

供货范围：1* 低压主配电盘（690V）

交货期：2006年

MNS3.0低压开关柜 在中国的应用范例



海监船

2艘船（1期）

船东：国家海洋局

船厂：江南船厂

制造商：芬兰ABB

供货范围：1* 低压主配电盘（690V）

交货期：2004年

10艘船（2期）

船东：国家海洋局

船厂：武昌船厂

制造商：芬兰ABB

供货范围：1* 低压主配电盘（690V）

交货期：2009年

渔政船

1艘船

船东：中国农业部渔政局

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2013-2014年

井口液回收船

2艘船

船东：中国船舶重工集团公司第七一一研究所

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2014年

浮式储油卸油装置

1个平台

船东：DANA

船厂：南通COSCO船厂

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2014年

自升式生活平台

2艘船

船厂：大连船舶重工集团海洋工程有限公司

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2014年

浮船坞

1艘船

船东：上海振华港口机械(集团)股份有限公司

船厂：道达海洋重工股份有限公司

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2013年

敞口集装箱船

2艘船

船东：中国船舶重工集团公司第七一一研究所

制造商：厦门ABB低压电器设备有限公司

供货范围：MNS3.0低压开关柜

交货期：2014年

MNS3.0低压开关柜 在中国的应用范例

挖泥船

2艘船

船东：天津航道局

船厂：青岛前进船厂

制造商：厦门ABB低压电器设备有限公司

供货范围：低压主配电盘、应急配电盘（690V/440V）

交货期：2008年

1艘船

船东：上海航道局

船厂：广州文冲船厂

制造商：厦门ABB低压电器设备有限公司

供货范围：马达控制柜

交货日期：2008年

供给船

1艘船

船东：Clearwater Seafoods

船厂：高雄庆富造船有限公司

制造商：厦门ABB低压电器设备有限公司

供货范围：低压主配电盘、应急配电盘（690V/440V/230V）

交货期：2006年

散装货轮

3艘船

船东：Fairstar

船厂：GSI

制造商：厦门ABB低压电器设备有限公司

供货范围：低压主配电盘(440V/220V)、低压应急配电盘

交货期：2011年

1艘船

船东：MV“TRANSIT”

船厂：南通中远船厂

制造商：厦门ABB低压电器设备有限公司

供货范围：低压主配电盘、应急配电盘（440V/220V）

交货期：2005年

MNS3.0低压开关柜 船级社认证

美国船级社 American Bureau of Shipping

船级证书-1



Electronically published by ABS Shanghai.
Reference 406472, dated 28-NOV-2008.



ABB Xiamen Low Voltage Equipment Co., Ltd.
No.12-26, 3rd Chuang Xin Road
Xiamen High Technology Development Zone, 361006
P. R. China

Attn.: Ms. Dou Juan-Juan

Re: "HAI YANG SHI YOU 936" for COSL
MSC-CJ46-X100-D Self-Elevating Drilling Unit
65.25m x 62.00m x 8.00m
China Merchants Heavy Industry (Shenzhen) Hull CMH1-028
690V Emergency Switchboard, 480V Emergency MCC
(Partial Revised Drawings as Listed Below)

Refer To: HLLI
File Ref: T-8-2
Task No.: 406472
VID.: YY188387
28 November 2008



Electronically published by ABS Shanghai.
Reference 406472, dated 28-NOV-2008.

Page 2
Task No.: 406472
28 November 2008

If we may be of further assistance, please do not hesitate to contact Mr. Li Hualin at +86-21-6103-0526. In case of inquiry by a telephone or reply by a document, please inform or refer to Task No. & the date of this letter.

Very truly yours,
AMERICAN BUREAU OF SHIPPING
K. M. WONG
Vice President of Engineering

By: 
Takashi Matsumoto
Manager of Engineering Service - Machinery

cc: ABS Shanghai Opts +Pr
Drawing List

Engineering Office:	Shanghai Engineering Services	
Submitter:	ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD	
Drawing No	Revision No	Drawing Title
3BCN54H5029-330	0	690V/480V Switchboard Function Description
ITNC911106M6203V32	0	Booklet of M101-P& M102-P Parameter Description
---	0	480V Emergency Switchboard (Partial Revised)
MNS01015781P005AP006	0	480V Drilling & Ventilation MCC (Partial Revised)
---	0	Relay Coordination Study

Madam:

We have your email dated 28 November 2008, resubmitting one soft copy of the partial revised drawings as listed therein on the above subject and with regard thereto have to advise that we would have no objections to the changes made to the plans since the last submittal.

At owner's specific request, the drawings have also been reviewed for issuance of Statement of Fact for compliance with the applicable sections of IMO Resolution A649 (16) "Code for the Construction and Equipment of Mobile Offshore Drilling Units" (1989). The arrangements and details as indicated are satisfactory subject to the work being carried out to the satisfaction of the attending Surveyor.

With reference to your reply dated 27 November 2008, in response to the comments made in our letter of 21 November 2008 (Task No.: 396395) on the above subject, we advised as follows:

- Items E-054 to E-059 of our letter:
Since our comment is satisfactorily resolved by your reply and partial revised drawings, we would have no further objection in this regard provided the work is carried out to the Surveyor's satisfaction.
- Item E-061 of our letter:
With reference to your reply and partial revised plan, we note that a frequency meter is provided for shore connection at the emergency switchboard. In this regard please be advised that an indicator light is also to be provided at the emergency switchboard to show energized status of the shore connection cable. This is to be verified by the attending Surveyors and this comment has changed to open surveyor accordingly.
- Item E-068 of our letter:
With reference to your reply, we understand that the undervoltage release (capable of restarting automatically when power is restored after a power failure) can be set in the M102-P unit. This is to be verified by the attending Surveyors and this comment has changed to open surveyor accordingly.
- All other comments are to be satisfactorily dealt with by the attending Surveyors.

17th Floor No. 300 North Cheng De Road, Lucky Target Square, Shanghai, 200003, CN
POST CODE: 200003 TEL: (86-21) 61030600 FAX: (86-21) 61605391

17th Floor No. 300 North Cheng De Road, Lucky Target Square, Shanghai, 200003, CN
POST CODE: 200003 TEL: (86-21) 61030600 FAX: (86-21) 61605391



AMERICAN BUREAU OF SHIPPING

Customer Name: ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD. Purchase Order No.:
 Attending Office: Fujian Report Number: FU1894333
 First Visit Date: 04-Dec-2008 Last Visit Date: 05-Dec-2008

Certification Of: Main Switchboard Quantity: One(1)
 Manufacturer: ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD. Model No.:

Survey Location: Xiamen
 Equipment Data:
 Manufacturer Number(S. No.): See Observation Below
 Destination Vessel (Name): HAI YANG SHI YOU 936
 Destination Vessel (Class Number): YY18E887
 Builder/Shipyard: CHINA MERCHANTS HEAVY INDUSTRY (SHENZHEN) CO LTD
 Builder ID / Hull No.: CMH-028
 Design State: Design Approved
 ABS Reviewing Organization: Shanghai Engineering Services
 Drawing Number: 3BCN548529-330

This is to Certify that the undersigned surveyor(s) to this Bureau did, at the request of the customer, carry out the following survey and report as follows:

Inspections
 Traceability of materials used on this project has been verified.
 The principal data has been verified in accordance with the applicable Rules/specifications and approved plans, and confirmed to be within acceptable tolerances.
 Examination during manufacturer assembly has been carried out to verify all critical phases of welding, fitting, machining, and non-destructive examination as required by the applicable Rules and/or requirements.
 All testing (pressure/load/operational/etc.) has been carried out as applicable and verified in accordance with the applicable Rules/specifications.
 Testing machines are maintained in a satisfactory condition and records of their check or calibration dates confirmed.
 All parts of the machinery/equipment satisfactorily complied with the approved drawings. Amendments, if any, verified to be rectified and considered satisfactory.
 For non-ABS Grades, tests and examinations as required by the specifications as listed in this report were carried out and found satisfactory.
 Manufacturer test records and/or mill certificates were confirmed to comply with specification.
 Final markings for identification confirmed.

Observations
 ONE (1) SET OF MAIN SWITCHBOARD (850/480V) INCLUDING DRILLING AND VENTILATION GROUP PANELS WAS ASSEMBLED, SHOP TESTED AS NOTED BELOW AND CONSIDERED SATISFACTORY.
 SERIAL NO. PM1578-01-01-S-J4101-P01-P16, PM1578-01-01-S-J4111-P01-P18, PM1578-01-01-S-J4112-P01-P20, PM1578-01-01-S-J4114-P01-P07, PM1578-01-01-S-J4115-P01-P05.



NOTE: This report certifies that the subject equipment described herein complies with one or more of the Rules, guidelines, standards of the American Bureau of Shipping and is issued solely for the use of the Shipper. It is intended to serve as a reference document. This Report is a confidential document and its disclosure, without the prior written consent of the American Bureau of Shipping, is prohibited. The validity, applicability and interpretation of this report is governed by the applicable Rules and specifications of the American Bureau of Shipping. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report.

Customer Name: ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD. Purchase Order No.:
 Attending Office: Fujian Report Number: FU1894333
 First Visit Date: 04-Dec-2008 Last Visit Date: 05-Dec-2008

Status	Submitter	Comment	Action Type	Surveyor
Closed	ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD.	-Certification - Switchboard	WCN	675768
Closed In Report		This comment is to be satisfactorily dealt with by the attending Surveyors		
Observation		Confirmed, the preferential trip is arranged.		
E-007 Submittal #				
Status	Submitter	Comment	Action Type	Surveyor
Closed	ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD.	-Certification - Switchboard	WCN	675768
Closed In Report		This comment is to be satisfactorily dealt with by the attending Surveyors		
Observation		Confirmed, the motor running protection is set to 100% rated current.		

Surveyor(s) to The American Bureau of Shipping
 Attending Surveyors:
 ZH JIN Electronically Signed on 09-Jan-2009
 HO, Frank-Chu (Peter) Electronically Signed on 09-Jan-2009



NOTE: This report certifies that the subject equipment described herein complies with one or more of the Rules, guidelines, standards of the American Bureau of Shipping and is issued solely for the use of the Shipper. It is intended to serve as a reference document. This Report is a confidential document and its disclosure, without the prior written consent of the American Bureau of Shipping, is prohibited. The validity, applicability and interpretation of this report is governed by the applicable Rules and specifications of the American Bureau of Shipping. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report. The American Bureau of Shipping and its representatives shall not be held responsible for any consequences arising from the use of this report.

MNS3.0低压开关柜 船级社认证

DNV船级社 DNV Classification Society

船级证书






DET NORSKE VERITAS
CERTIFICATE OF CONFORMITY
(Cert. No. : SHA / 500091 / 2003-08)

COPY

Manufacturer : ABB XIAMEN LOW VOLTAGE EQUIPMENT CO., LTD.
Manufacture Location : No. 12-20, 3rd Chuang Xin Road, Xiamen High Technology Development Zone, Xiamen SEZ, Fujian 361006, P. R. China
Intended for : Platform WHPB - BZ25-1 Offshore Oil Field in Bohai Bay, CNOOC
Equipment Description : Normal 400V Switchgear & MCC
Equipment Tag No. : WHPB-NLP-01
Equipment Type : MNS
Equipment S/N : PM00676-1~17 (WHPB)
DNV Project No. : 50009102

This is to certify that the design, supply and fabrication of the above mentioned one (1) set of Normal 400V Switchgear & MCC had been reviewed, inspected and found to comply with the DNV understanding of implementation and interpretation of

- The " Safety Rules for Offshore Fixed Platforms" (1 December 2000) by State Economic & Trade Commission of the People's Republic of China

Main Technical Data : Dimension (Width×Depth×Height) : 11000×1200×2200mm
 Power System : 400V, 3PH, 3W, 50HZ
 Main Busbar Rated Current : 4000A
 Rated Short Circuit Breaking Current : 70KA RMS, 1S
 Enclosure Protection Degree : IP 23

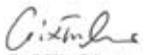
Year of Fabrication : November 2003

Reference Document : Specification SPC-BZ25-1-EL-0001 Rev. 1, SPC-BZ25-1-EL-0005 Rev. 0
 CNOOC.'s Data Sheet DDS-WHP-EL-0003 Rev.0
 CNOOC.'s Drawing No. DWG-WHPB-EL-0103-01~07 Rev. 1
 Manufacturer's Drawing No. MNSE200676P01 Rev.1, MNSE100676P01 Rev.1
 Manufacturer's Drawing No. MNSE300676P01~ MNSE300676P10
 Manufacturer's type tests report (No. 98153, AT00031, AT02455, AT00366)
 Manufacturer's Equipment Testing Repots (Serial No. PM00676-1~17[WHPB])

Following inspection/test was carried out and witnessed:

- Visual inspection
- Functional testing by sampling
- High voltage testing
- Insulation resistance testing

For **DET NORSKE VERITAS A/S**
 Shanghai, 31 December 2003



CAI Xiu Liang
Engineer



It is agreed that each of the parties herein, the licensee, holder, officer, director, employee and agent shall have no liability for any loss, damage or expense properly incurred directly or indirectly by their respective negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or willful misconduct by any such person with the exception of gross negligence or willful misconduct by the governing bodies or senior executive officers of the licensee holder. This applies regardless of whether the loss, damage or expense has affected persons who obtain the license holder for a contract or a third party who has either an actual or deemed knowledge of the licensee holder. If any person uses the services of the licensee holder or its subsidiaries or relies on any decision made or information given by or on behalf of them and is subsequently affected by loss, damage or expense proved to be due to their negligence, omission or default, then the licensee holder will not be liable for compensation to such person or their representatives in respect of the loss. In the event the licensee holder or its subsidiaries may be held liable in accordance with the sections above, the amount of compensation shall not exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. Under no circumstances shall the licensee or its subsidiaries be held liable in accordance with the sections above, the amount of compensation shall not exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. In the event that any provision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not be affected.

劳埃德船级社 Lloyd's Register

船级证书

		<p style="text-align: center; color: red; font-weight: bold;">CERTIFIED COPY</p>	<p>Certificate no.: GZU 0520646/2 Page 1 of 1</p>
<p>Project: NANTONG COSCO SHIPYARD, M/V "TRANSIT", LR 7910151. CONVERSION FROM OBD TO SELF UNLOADING ORE CARRIER</p>		<p>Client: ABB Xiamen Low Voltage Equipment Co., Ltd</p>	
<p>Client's Order Number: *</p>		<p>Office: Shanghai</p>	
<p>Inspection Dates: First: 27 May 2005</p>		<p>Date: 17 June 2005</p> <p>Order Status: Complete</p> <p>Final: 27 May 2007</p>	
<p>This certificate is issued to ABB Xiamen Low Voltage Equipment Co., Ltd. to certify that the undersigned surveyor to this society attended their works on the above date to inspect and witness tests on the under mentioned electrical equipment assembled at their works, intended for the above named ship.</p>			
<p>One (1) set of main switchboard, suitable for 3-phase, 60Hz, 440vac and 220vac, controlling 2x1448 kW generators. Manufacturer's Serial No. PM00948-1/2/3/4/5/6/7/8 (MSB-B).</p>			
<p>PLANS: The equipment had been built in accordance with the approved plans. The design appraisal document SPA/ECE/45314 date 14 March 2005 refers.</p>			
<p>VISUAL INSPECTION: The main switchboard was examined in finished condition and arranged in accordance with approved plans. The materials used and workmanship were found satisfactory.</p>			
<p>TESTS WITNESSED: The following tests were witnessed, the result found satisfactory:</p>			
<ol style="list-style-type: none"> 1. Function tests as defined on "MNS Inspection & Testing Report". 2. Function test of protection equipment as defined in the "Emax Final Inspection and testing Record--Moving Part". 3. Dielectric strength test. 4. Insulation Resistance measurement before and after dielectric strength test. 			
<p>OUTSTANDING: The main switchboard remains to be installed on board the vessel, wired and tested to the attending surveyor's satisfaction.</p>			
<p>IDENTIFICATION: A copper plate was fixed inside the switchboard and stamped with "LR" & "GZU 0520646/2".</p>			
			
<p>Jindong Zhang & Huosong Xia Surveyor to Lloyd's Register Asia</p>			
<p>A member of the Lloyd's Register Group</p>			
<p>Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the "Lloyd's Register Group". The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.</p>			
<p>Form 1123/Local (2005.02)</p>			

MNS3.0 低压开关柜 船级社认证

BV船级社 BV Classification Society

船级证书-1

 <p style="text-align: right;">Page 1 / 1</p> <p style="text-align: center;">Certificate number: 00441GGZ12</p> <p style="text-align: center;">CERTIFICATE FOR SWITCHBOARD AND COMPONENTS</p> <p>Manufacturer : ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN) Shipyards : ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN) BV Register N° : 21169M Hull N° : ZJ4001 Requirements : Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)</p> <p>Product description : 440V Main Switchboard Design review : Reference(s) : 21169M:PM002370-01 (Rev.0) Quantity : 1 set</p> <p>Drawing number : PM002370-01 Rev.0 Specification : AQ440V3 phase/60Hz/136KVA(2230A) x 4 S/N of Units : 18 units / PM002370-01-V1-440MSB+01-18</p> <p>Enclosures / Remarks : Manufacturer's test report with total 25 pages is attached (original certificate only)</p> <p>This certificate is issued by Bureau Veritas as per the above Classification Rules and in compliance with the applicable technical requirements therein.</p> <p>Marking : R/ 00441GGZ12 Last survey : 06 Jul 2012 Surveyor : Jacky Tang</p> <p style="text-align: right;">Issuance date : 07 Aug 2012 Office : BV GUANGZHOU</p> <p style="text-align: right;"><i>Jacky Tang</i></p> 	<p style="text-align: right;">Page 1 / 1</p> <p style="text-align: center;">Certificate number: 00442GGZ12A</p> <p style="text-align: center;">CERTIFICATE FOR SWITCHBOARD AND COMPONENTS</p> <p>Manufacturer : ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN) Shipyards : ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN) BV Register N° : 21169M Hull N° : ZJ4001 Requirements : Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)</p> <p>Product description : 220V Main Switchboard Design review : Reference(s) : 21169M:PM002370-01 (Rev.0) Quantity : 1 set</p> <p>Type of product : MNS 3.0 Drawing number & revision : PM002370-01 Rev.0 Specification : 220V/3 phase/60Hz S/N : 1 set / PM002370-01-V1-220MSB S/N of Units included : 3 units / PM002370-01-V1-220MSB+01-03</p> <p>Enclosures / Remarks : Manufacturer's test report with total 25 pages is attached (original certificate only)</p> <p>This certificate is issued by Bureau Veritas as per the above Classification Rules and in compliance with the applicable technical requirements therein.</p> <p>Marking : R/ 00442GGZ12 Last survey : 06 Jul 2012 Surveyor : Jacky Tang</p> <p style="text-align: right;">Issuance date : 07 Aug 2012 Office : BV GUANGZHOU</p> <p style="text-align: right;"><i>Jacky Tang</i></p> 
<p>This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine Division available on the internet site www.veristar.com. Any person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgment, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.</p> <p>The Electronic Version is available at: http://www.veristarpm.com/veristambj/sp/certificate.jsp?id=ihunc6fy BV Mod. Ad.E 677a February 2009</p> <p style="text-align: right;">This certificate consists of 1 page(s)</p>	<p>This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine Division available on the internet site www.veristar.com. Any person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgment, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.</p> <p>The Electronic Version is available at: http://www.veristarpm.com/veristambj/sp/certificate.jsp?id=rwofmqbz BV Mod. Ad.E 677a February 2009</p> <p style="text-align: right;">This certificate consists of 1 page(s)</p>



Certificate number: 00443GGZ12

www.veristar.com

CERTIFICATE FOR SWITCHBOARD AND COMPONENTS

Manufacturer : ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN)
Shipyard : ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN)
BV Register N° : 21169M Hull N° : ZJ4001
Requirements : Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)
Product description : 440V Emergency Switchboard
Design review : Reference(s) : 21169M:PM002370-01 (Rev.0)
Quantity : 1 set
Drawing number : PM002370-01 Rev.0
Specification : AC440V/3 phase/50Hz/250Kw(410A) x 1
SIN : 1 set / PM002370-01-V1-440ESB
SIN of Units included : 3 units / PM002370-01-V1-440ESB+01-03

Enclosures / Remarks : Manufacturer's test report with total 25 pages is attached (original certificate only)

This certificate is issued by Bureau Veritas as per the above Classification Rules and in compliance with the applicable technical requirements therein.

Marking : BV 00443GGZ12
Last survey : 06 Jul 2012
Surveyor : Jacky Tang
Issuance date : 07 Aug 2012
Office : BV GUANGZHOU

Jacky Tang



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 BV Mod. Ad.E 677a February 2009 This certificate consists of 1 page(s)



MARINE DIVISION

Certificate number: 00444GGZ12

www.veristar.com

CERTIFICATE FOR SWITCHBOARD AND COMPONENTS

Manufacturer : ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN)
Shipyard : ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN)
BV Register N° : 21169M Hull N° : ZJ4001
Requirements : Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)
Product description : 220V Emergency Switchboard
Design review : Reference(s) : 21169M:PM002370-01 (Rev.0)
Quantity : 1 set
Type of product : MNS 3.0
Drawing number & revision : PM002370-01 Rev.0
Specification : 220V/3 phase/50Hz
SIN : 1 set / PM002370-01-V1-220ESB
SIN of Units included : 1 unit / PM002370-01-V1-220ESB+01

Enclosures / Remarks : Manufacturer's test report with total 25 pages is attached (original certificate only)

This certificate is issued by Bureau Veritas as per the above Classification Rules and in compliance with the applicable technical requirements therein.

Marking : BV 00444GGZ12
Last survey : 06 Jul 2012
Surveyor : Jacky Tang
Issuance date : 07 Aug 2012
Office : BV GUANGZHOU

Jacky Tang



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The Electronic Version is available at: <http://www.veristar.com/veristamb/jsp/certificate.jsp?id=2w6vxp2ay>
 BV Mod. Ad.E 677a February 2009 This certificate consists of 1 page(s)

MNS3.0 低压开关柜 船级社认证

BV 船级社 BV Classification Society

船级证书-5

	 MARINE DIVISION 	Certificate number: 00445GGZ12 www.veristar.com												
	CERTIFICATE FOR SWITCHBOARD AND COMPONENTS													
<table border="0"> <tr> <td>Manufacturer</td> <td>: ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN)</td> </tr> <tr> <td>Shipyard</td> <td>: ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN)</td> </tr> <tr> <td>BV Register N°</td> <td>: 21169M Hull N° : ZJ4001</td> </tr> <tr> <td>Requirements</td> <td>: Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)</td> </tr> </table>			Manufacturer	: ABB XIAMEN LOW VOLTAGE EQUIPMENT COMPANY LIMITED (Xiamen - CHN)	Shipyard	: ZHEJIANG SHIPBUILDING CO.,LTD (ZHEJIANG - CHN)	BV Register N°	: 21169M Hull N° : ZJ4001	Requirements	: Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)				
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BV Register N°	: 21169M Hull N° : ZJ4001													
Requirements	: Bureau Veritas Rules for the Classification of Steel Ships (Jul. 2010)													
<table border="0"> <tr> <td>Product description</td> <td>: Switchboard for MCC</td> </tr> <tr> <td>Design review</td> <td>: Reference(s) : 21169M: PM002370-01 (Rev.0)</td> </tr> <tr> <td>Quantity</td> <td>: 9 sets</td> </tr> </table>			Product description	: Switchboard for MCC	Design review	: Reference(s) : 21169M: PM002370-01 (Rev.0)	Quantity	: 9 sets						
Product description	: Switchboard for MCC													
Design review	: Reference(s) : 21169M: PM002370-01 (Rev.0)													
Quantity	: 9 sets													
<table border="0"> <tr> <td>Type of product</td> <td>: MNS 3.0</td> </tr> <tr> <td>Drawing number & revision</td> <td>: PM002370-01 Rev.0</td> </tr> <tr> <td>Specification</td> <td>: 440V/ 3 phase/60Hz</td> </tr> <tr> <td>S/N</td> <td>: PM002370-01-V1-MCC1+01-02 : PM002370-01-V1-MCC2+01-02 : PM002370-01-V1-MCC3+01 : PM002370-01-V1-MCC4+01 : PM002370-01-V1-MCC5+01-02 : PM002370-01-V1-MCC6+01 : PM002370-01-V1-MCC7+01 : PM002370-01-V1-MCC8+01 : PM002370-01-V1-MCC9+01</td> </tr> </table>			Type of product	: MNS 3.0	Drawing number & revision	: PM002370-01 Rev.0	Specification	: 440V/ 3 phase/60Hz	S/N	: PM002370-01-V1-MCC1+01-02 : PM002370-01-V1-MCC2+01-02 : PM002370-01-V1-MCC3+01 : PM002370-01-V1-MCC4+01 : PM002370-01-V1-MCC5+01-02 : PM002370-01-V1-MCC6+01 : PM002370-01-V1-MCC7+01 : PM002370-01-V1-MCC8+01 : PM002370-01-V1-MCC9+01				
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<table border="0"> <tr> <td>Marking</td> <td>: 8/ 00445GGZ12</td> <td>Issuance date</td> <td>: 07 Aug 2012</td> </tr> <tr> <td>Last survey</td> <td>: 06 Jul 2012</td> <td>Office</td> <td>: BV GUANGZHOU</td> </tr> <tr> <td>Surveyor</td> <td>: Jacky Tang</td> <td></td> <td></td> </tr> </table>			Marking	: 8/ 00445GGZ12	Issuance date	: 07 Aug 2012	Last survey	: 06 Jul 2012	Office	: BV GUANGZHOU	Surveyor	: Jacky Tang		
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<p><small>The Electronic Version is available at: http://www.veristarpm.com/veristamb/jsp/certificate.jsp?id=llccucxyzk BV Mod. Ad.E 677a February 2009 This certificate consists of 1 page(s)</small></p>														

船级证书-1



中国船级社
 CHINA CLASSIFICATION SOCIETY
产品证书
 CERTIFICATE OF PRODUCT

证书编号/Certificate No. X06P00030_01

兹证明 厦门低压电器设备有限公司 的申请，
 下列产品经本社签约船级社检验，符合本证书注明标准的要求。
This is to certify that, upon request of
AHD Xiamen Low Voltage Equipment Co.,LTD.
 the following products have been inspected by the undersigned surveyor to the Society and are found to comply with
 the requirements of the specified standards.

制造厂名 厦门低压电器设备有限公司
 Manufacturer AHD Xiamen Low Voltage Equipment Co.,LTD.
 订货方 AND Engineering (Shanghai) Ltd., CO.
 Purchaser AND Engineering (Shanghai) Ltd., CO.
 产品名称 低压电器
 Product: Electric Distribution Appliances
 认可证书号/Cert. No. of Approval: NL 图纸标准号/Approval No. of drawings/图号/DA0000-2
 用于 海上固定平台/land offshore platforms
 Intended for
 产品编号 PM80114S-02-P02-P14
 Serial No. CP02 Rg 8¹¹

产品检验标准 / Product Inspection Standard

1. 中国船级社批准提供
Drawings Approved by CCS
2. IEC60439-1 《低压成套开关设备和控制设备》第1部分
IEC60439-1 《Low-voltage Switchgear and Controlgear Assemblies》 Part 1
3. GB7251.1-2003 《低压成套开关设备和控制设备》第1部分
GB7251.1-2003 《Low-voltage Switchgear and Controlgear Assemblies》 Part 1
4. 中国船级社《钢质壳柜入级规范》(2006) 第4部分
Part 4 of CCS Rules(2006)

产品检验标志 / Marking

位置/Position: 在产品铭牌上 / On the nameplate of the product.

标志样式 / Type of Marking: CCS 钢印标志 / CCS steel stamp

发证日期 2008年4月16日
Date of issue Apr. 16, 2008

 验船师
 Surveyor 潘平强 Pan Pingqiang

本证书的有效性依赖于获证方遵守认证要求，并下开条款的符合性。本证书的有效性依赖于获证方遵守认证要求，并下开条款的符合性。本证书的有效性依赖于获证方遵守认证要求，并下开条款的符合性。本证书的有效性依赖于获证方遵守认证要求，并下开条款的符合性。

证书编号/Certificate No. X06P00030_01

产品说明/Product Description
 低压成套开关柜/Low-voltage Switchgear System

产品型号/Type	: KMS (低压成套开关设备)
额定电压/Rated Voltage	: 400 V
额定电流/Rated Current	: 3200 A
数量/Quantity	: 13 Pcs

其他 / Others

Test and Inspection:
 1. Visual inspection, simulated function test, high voltage and insulation tests were carried out and found in order; and
 2. The final function test should be carried out on board.

中国船级社厦门分社
 CCS Xiamen Branch



Nº 06737540

Nº 06853900

MNS3.0低压开关柜

ABB在中国的销售、生产和服务分布

● 船舶业务销售/服务分公司分布地

● 船舶业务生产企业分布地

北京

- ABB(中国)总部
- ABB(中国)工程有限公司
- 北京ABB低压电器有限公司
- 北京ABB电气传动系统有限公司

重庆

- 重庆ABB变压器有限公司
- 重庆ABB江津涡轮增压系统有限公司

西安

- 西安ABB大功率整流器有限公司
- 西安ABB电力电容器有限公司

新会

- ABB新会低压开关有限公司

合肥

- 合肥ABB变压器有限公司

南昌

- 南昌ABB泰豪发电机有限公司

上海

- 上海ABB变压器有限公司
- 上海ABB工程有限公司
- 上海ABB电机有限公司
- ABB高压电机有限公司
- 重庆ABB江津涡轮增压系统有限公司上海分公司

广州

- ABB(中国)工程与自动化服务中心
- 重庆ABB江津涡轮增压系统有限公司广州分公司

香港

- ABB涡轮增压系统(香港)有限公司

中山

- 中山ABB变压器有限公司

大连

- 重庆ABB江津涡轮增压系统有限公司大连分公司

天津

- 重庆ABB江津涡轮增压系统有限公司天津分公司

MNS3.0低压开关柜 全球化服务网络中心





- ▶ 赫尔辛基, 芬兰
- ▶ 奥斯陆, 挪威
- ▶ 鹿特丹, 荷兰
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