



中国船级社
CHINA CLASSIFICATION SOCIETY

证书格式号/Form: T01.01-
HQ000435

型式认可证书
CERTIFICATE OF TYPE APPROVAL

证书编号/Certificate No. HB13T00022_01

兹证明本证书所述制造厂生产的下列产品能够满足下面列明认可标准的要求。

This is to certify that the following products produced by the manufacturer stated in the certificate can meet the requirements of the approval standards listed below.

认可产品/ Product Approved

电力半导体变频器

Power Semiconductor Frequency Convertor

逆变器

Converter

制造厂/ Manufacturer

Danfoss Drives A/S

Danfoss Drives A/S

Ulsnaes 1, DK-6300 Graasten, Denmark

Ulsnaes 1, DK-6300 Graasten, Denmark

认可标准/ Approval Standard

1. 中国船级社《钢质海船入级规范》(2012)及其修改通报第4篇 第3章
CCS "Rules for the Classification of Sea-going Steel Ships" (2012) and its Amendments, Part 4, Chapter 3

证书有效期至/ This Certificate is valid until 2017年6月25日 / Jun. 25, 2017

发证机构 中国船级社汉堡分社
Issued by CCS Hamburg Branch

签发日期 2013年12月28日
Date Dec. 28, 2013

本证书根据中国船级社《钢质海船入级规范》及有关规定签发。关于证书的有关规定见本证书背面的说明。当本证书包括多项纸张时，则所有证书页为一个整体，必须同时使用。每一页证书均须由本社盖章方为有效。证书复印件无效。任何单位和个人均不应摘录或节选本证书的部分内容。本认可证书不代表本社对个体产品质量的检验。有关各方对所持证书的真实性有疑问时，可以向本社检验机构咨询。
This Certificate is issued pursuant to the Rules for Classification of Sea-going Steel Ships and related procedures of the Society. Refer to the back of the certificate for detailed requirements of the certificate. When the certificate consists of more than one page, all pages of the certificate are taken as a whole and are used simultaneously. No certificate page is valid without bearing the stamp of the Society and no copied form of the certificate is regarded as valid. Any part of the certificate is not to be extracted or abridged by any unit or individual in any form. This approval certificate does not constitute the inspection of the Society about the quality of the unit/batch product. Related parties who are doubted about the authenticity of the certificate may inquire of the Society or its offices.



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HB48730233
No. 13164802

产品明细/ Product Description

逆变器/Converter
产品型号/Type

: Frequency converter VLT® HVAC
Drive FC102 series

批准的图纸和设计计算书/ Approved Drawings and Design Calculations

图纸批准号/ Drawings Approval No. : HB06T00002, HB07T00025

产品认可试验报告/ Approval Test Report

试验报告编号/Test Report No.	:	P420-316
试验报告日期/Test Report Date	:	2008-01-02
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-341
试验报告日期/Test Report Date	:	2007-07-25
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-395
试验报告日期/Test Report Date	:	2008-07-09
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-423
试验报告日期/Test Report Date	:	2007-07-20
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-366
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-367
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-539
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-540
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-541
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-585
试验报告日期/Test Report Date	:	2008-01-10
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	A402498
试验报告日期/Test Report Date	:	2007-10-10
试验单位/ Laboratory	:	DELTA Danish Electronics, Light and Acoustics
试验单位地址/ Test Address	:	Erhvervsvej 2A, DK-8653 Them, Denmark
试验报告编号/Test Report No.	:	P420-544
试验报告日期/Test Report Date	:	2007-12-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-545
试验报告日期/Test Report Date	:	2007-12-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1, DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-546
试验报告日期/Test Report Date	:	2008-01-03



试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-547
试验报告日期/Test Report Date	:	2008-01-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-549
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-550
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-552
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-553
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-554
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-561
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-563
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-575
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-576
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-577
试验报告日期/Test Report Date	:	2007-11-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-543
试验报告日期/Test Report Date	:	2008-08-18
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P420-622
试验报告日期/Test Report Date	:	2008-08-11
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-144
试验报告日期/Test Report Date	:	2008-12-30
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-155
试验报告日期/Test Report Date	:	2008-12-30
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-163
试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-164



试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	A505861-1
试验报告日期/Test Report Date	:	2009-01-16
试验单位/ Laboratory	:	DELTA Danish Electronics,Light and Acoustics
试验单位地址/ Test Address	:	Venlighedsvej 4, DK-2970 Horsholm, Denmark
试验报告编号/Test Report No.	:	P429-150
试验报告日期/Test Report Date	:	2009-02-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-151
试验报告日期/Test Report Date	:	2009-02-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-154
试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-159
试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-161
试验报告日期/Test Report Date	:	2009-02-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-162
试验报告日期/Test Report Date	:	2009-02-03
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-165
试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-231
试验报告日期/Test Report Date	:	2009-01-07
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-58
试验报告日期/Test Report Date	:	2008-12-19.
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-81
试验报告日期/Test Report Date	:	2008-06-02
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-98
试验报告日期/Test Report Date	:	2008-12-19
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark
试验报告编号/Test Report No.	:	P429-120
试验报告日期/Test Report Date	:	2008-03-26
试验单位/ Laboratory	:	Danfoss Drive A/S
试验单位地址/ Test Address	:	Ulsnaes 1,DK-6300 Graasten, Denmark

产品适用范围/ Application of the Product

船用/Marine Application

认可保持条件/ Maintenance Requirements of Approval

1. 型式认可后, 如果产品及其重要零部件的设计、所用材料或制造方法有所改变, 且影响到产品的主要特性、特征; 或产品的性能指标有所更改, 且超过认可的范围, 则有关图纸和文件应经检验机构审批。并在检验机构认为必要时, 经本社检验人员见证有关试验和进行检查, 其结果应能证实仍符合认可条件。
After type approval, if there are changes to the design, materials used or manufacturing method of the product and important components and such changes affect major characteristics and properties of the product, or property indexes of the product are changed and exceed the scope of approval, related drawings and documents are to be examined and approved by the concerned survey office. Where deemed



necessary by the survey office, the surveyor to the Society will go to witness relevant tests and conduct inspection and the results should be able to demonstrate compliance with the approval conditions.

2. 工厂的专业质量管理体系应保持有效运行, 并且与认可时一致。如果质量管理体系发生改变, 应经原体系认证机构审核并报本社批准。

The professional quality management system of the factory shall be ensure effective operation, and shall be the same as the situation of approval. If there are any changes to the quality management system, auditing of the original certification organization for quality management system and the society's approval shall be obtained.

3. 认可证书有效期内, 如果出现可能导致本社取消认可的情况, 工厂应及时采取有效的纠正措施。

Within the validity of the approval certificate, if cases occur that may cause the Society to withdraw the approval, the manufacturer should take corrective actions in a prompt and effective manner.

4. 在认可证书有效期内, 本社检验人员可在未经事先通知的情况下对工厂的产品制造过程进行审核, 以验证产品的生产是否符合业经本社批准的图纸和文件。工厂应予以配合。

Within the validity of the approval certificate, the surveyor to the Society may pay unannounced audit to the manufacturing process of the product in order to confirm whether it is in compliance with the drawings and documents approved by the Society. The factory should provide an active cooperation and necessary for the surveyor.

认可后的产品检验方式/ Method of Product Inspection after Approval

按照规范逐件检验的产品/The product inspected one by one in term of the rules:

认可后的产品检验应由本社验船师根据本社规范规定逐件按批准的产品检验计划进行检验, 经检验合格后由本社颁发产品证书。

After approval, product inspection should be carried out one by one by the Surveyor of the Society in accordance with the approved product inspection scheme, and the Product Certificate will be issued by the Society upon satisfactory inspection.

对于原材料和零部件的检验要求/ Inspection Requirements for Materials and Components

产品如下原材料和零部件的制造厂清单, 经本社批准方可变更/The list of manufacturer for the following materials and components of the product should not be changed without the Society's approval:
The details please refer to manufacturer submitted list No.UL file E 134261 Vol.1 Sec.14.

责任声明/Statement of Responsibility

本社的认可不影响、替代与本社授权或检验无关的各方对上述工厂的认可和发证, 并且不对与本社授权或检验无关的各方负责, 不承担其未经应允而承认、接受本社认可所导致的法律和经济责任。

The approval of the Society does not affect and replace any approval and certification of the manufacturer by any parties that bear no relation with this Society's authorization or survey and therefore takes no responsibility for these parties. The Society does not undertake any legal and economic liabilities arising from accepting this Society's certificate without prior permission from this Society.

其他/Others

1. 本证书由原型式认可证书(No. HB07T00025)换新并替代原证书。

This certificate is renewed from and supersedes the previous Type Approval Certificate (No. HB07T00025).

2. 本社已审核了产品厂无石棉声明, 但本社的审核不免除产品厂按照合同关系向订货方保证产品无石棉的责任。

The declaration of asbestos-free submitted by manufacturer has been reviewed by the Society. However, liability of the manufacturer to guarantee the products are asbestos-free to purchaser under contract will not be exempted.

中国船级社汉堡分社

CCS Hamburg Branch

*****本证书正文完/ End of Text*****

注: 本证书含有附页, 共3页

Note: The certificate is attached with 3 additional page(s)



产品明细

Particulars

Frequency Converter VLT® HVAC Drive FC102 Series

200~240VAC, 50/60Hz						
Power rating [kW]	Enclosure type				RFI filter	
	IP20 (*1)	IP21 (*2)	IP55 (*3)	IP66 (*4)	Type (*6)	
1,1	A2	A2 (*5)	A4+A5	A4+A5	H5**	H5
1,5						
2,2						
3,0	A3	A3 (*5)	A5	A5	H5**	H5
3,7						
4,0	N/A					
5,5	B3	B1	B1	B1	H5**	H6
7,5						
11						
15	B4	B2	B2	B2	H5**	H6
18,5						
22	C3	C1	C1	C1	H5**	H6
30						
37	C4	C2	C2	C2	H5**	H6
45						
55						
75	N/A					
90	N/A					

380~480/500VAC, 50/60Hz						
Power rating [kW]	Enclosure type				RFI filter	
	IP20 (*1)	IP21 (*2)	IP55 (*3)	IP66 (*4)	Type (*6)	
1,1	A2	A2 (*5)	A4+A5	A4+A5	H5**	H6
1,5						
2,2						
3,0						
3,7	N/A					
4,0	A2	A2 (*5)	A4+A5	A4+A5	H5**	H6
5,5	A3	A3 (*5)	A5	A5		
7,5						
11	B3	B1	B1	B1	H5**	H6
15						
18,5						
22	B4	B2	B2	B2	H5**	H6
30						
37						
	C3	C1	C1	C1	H5**	H6



45	C3	C1	C1	C1	H5**	H6
55						
75	C4	C2	C2	C2		
90			N/A			

525~690VAC, 50/60Hz							
Power rating [kW]	Enclosure type				RFI filter		
	IP20 (*1)	IP21 (*2)	IP55 (*3)	IP66 (*4)	Type (*6)		
1,1	N/A	N/A				H5**	H6
1,5		N/A					
2,2*		B2	B2	B2	B2	H5**	H6
3,0*		N/A				H5**	H6
3,7*		N/A					
4,0*		B2	B2	B2	B2	H5**	H6
5,5*							
7,5*							
11							
15							
18,5							
22							
30							
37		C2	C2	C2	C2	H5**	H6
45							
55							
75							
90		N/A				H5**	H6

(*1) IP20/Panel mount. All IP20 versions can be upgraded to IP21 with optional kit

(*2) IP21/NEMA Type 1

(*3) IP55/NEMA Type 12

(*4) IP66/NEMA Type 4X

(*5) IP20/Panel with IP21 upgrades kit

(*6) H6 RFI complies with all IACS E10 requirements.

H5 RFI complies with IACS E10 requirements except radiated and conducted emissions.

* For future product line expansion

****Limitations:** Converters with conducted and radiated emission above the IACS E10 required limits can be installed in "special distribution zone" and "general power distribution zone", in accordance with IEC60553 provided measures are taken to attenuate these effects on the distribution system, so safe operation is assured. Planned EMC measures shall be submitted for approval prior installation onboard.

Selection types for Type Codes for FC 102

----- (character 24 - 39 software + options)
 1 4 7 10 11

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Basic string definitions:**Product Group (character 1-3)**

FC- : Adjustable Frequency Converters

VLT series (character 4-6)

102 : VLT HVAC Drive – Advanced version

Power size (character 7-10)

P1K1 : 1.1 kW / 1.5 HP

P90K : 90 KW / 125 HP

Voltage: (character 11-12)

T2 : Three phase 200-240 VAC

T4 : Three phase 380-480 VAC

T5 : Three phase 380-500 VAC

T7 : Three Phase 525-690 VAC

Enclosure (character 13-15)

E20 : IP20 / Chassis

E21 : IP21 / Type 1

E55 : IP55/ Type 12

E66 : IP66 / Type 4X

Hardware (character 16-23)*Hardware, RFI filter (character 16-17)*

H5 : RFI for Maritime use. H5 RFI complies with IACS E10 requirements except radiated and conducted emissions

H6 : RFI for Maritime use. H6 RFI complies with all IACS E10 requirements

*Hardware, Brake & Stop (character 18)**Hardware, Display (character 19)**Hardware, Coating (character 20)**Hardware, Mains options (character 21)**Hardware, adaptation A (character 22)**Hardware, adaptation B (character 23)***Software (character 24-28)****Options – A (character 29-30)****Options – B (character 31-32)****Options – C (character 33-37)****Options – D (character 38-39)**