MARINE DIVISION

Certificate number: 23445/A0 BV
File number: AP 4160
Product code: 4440I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

Fisher Rosemount Systems Inc.

Austin - UNITED STATES OF AMERICA

for the type of product

ALARM, MONITORING AND CONTROL SYSTEMS

Delta V Digital Automation System
(S-Series, Electronic Marshalling & WIOC)

Requirements:
BUREAU VERITAS Rules for the Classification of Steel Ships,
EN 60079-0:2009 and EN 60079-15:2005/2010.

This certificate is issued to attest that BUREAU VERITAS did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 25 Mar 2016

For BUREAU VERITAS,

At BV PORT EVERGLADES CENTRE, on 25 Mar 2011,

Flavio Rosas

BUREAU VERITAS SURVEYORS AT PARIS 1828 MIAMI CENTRE INTERNATIONAL REGISTER

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION:

The **Delta V Digital Automation System (S-Series, Electronic Marshalling & WIOC)** includes the following modules:

1.1 - KJ series:

Product type	Description	FW rev.	HW rev.
KJ1501X1-BK1	System Power Supply (24 VDC)	N/A	N/A
KJ2003X1-BK1	SD Plus Controller	12P5602	45.62
KJ2005X1-BK1	SX Controller	12P4376	47.2
KJ4005X1-BA1	Power / Controller Carrier	N/A	N/A
KJ4005X1-BB1	Left Extender	N/A	N/A
KJ4005X1-BC1	Right Extender	N/A	N/A
KJ4005X1-BD1	DeltaV SIS adapter	N/A	N/A
KJ4005X1-BE1	8-Wide I/O Carrier	N/A	N/A
KJ4005X1-BF1	Power Plug Terminal	N/A	N/A
KJ4005X1-BG1	Power Plug Buss	N/A	N/A
KJ3201X1-BK1	DI 8-Channel NAMUR	12P3969	41.3
KJ3202X1-BK1	DO 8-Channel 24 VDC High-Side	12P3969	41.3
KJ3206X1-BK1	DI 8-Channel 24 VDC Isolated	12P3815	42.4
KJ3207X1-BK1	DI 8-Channel 120VAC Isolated	12P3815	41.4
KJ3207X1-BL1	DI 8-Channel 120VAC Dry Contact	12P3815	41.4
KJ3208X1-BK1	DO 8-Channel 24 VDC Isolated	12P3815	43.5
KJ3209X1-BK1	DO 8-Channel 120/230 VAC Isolated	12P3815	41.4
KJ3210X1-BK1	DO 8-Channel 120/230 VAC High-Side	12P3815	41.4
KJ3221X1-BK1	AO 8-Channel 4-20 mA HART	12P3802	42.5
KJ3222X1-BK1	AI 8-Channel 4-20 mA HART	12P3802	42.5
KJ3203X1-BK1	DI 32-Channel 24VDC Dry Contact	12P4027	41.3
KJ3204X1-BK1	DO 32-Channel 24VDC High-Side	12P4027	41.3
KJ3223X1-BK1	AI 16-Channel 4-20 mA HART	12P4054	41.3
KJ3211X1-BK1	Sequence of Events	12P4290	41.3
KJ3212X1-BK1	Pulse Count Input	12P3246	41.3
KJ3224X1-BK1	Thermocouple / mV	12P4436	42.4
KJ3225X1-BK1	RTD / Resistance input	12P4436	42.4
KJ3231X1-BK1	Isolated Input	12P4055	42.4
KJ3241X1-BK1	Serial	12P4056	42.4
KJ3245X1-BK1	AS-Interface	12P4083	41.4
KJ3242X1-BK1	Fieldbus H1	12P4057	42.4
KJ3244X1-BK1	DeviceNet	12P4058	42.4
KJ3243X1-BK1	Profibus DP	12P3995	42.4
KJ4006X1-BA1	Fielbus H1 Terminal Block (Simplex)	N/A	N/A
KJ4006X1-BB1	8-Channel Terminal Block	N/A	N/A
KJ4006X1-BC1	Fused 8-Channel Terminal Block	N/A	N/A
KJ4006X1-BD1	Interface Terminal Block	N/A	N/A
KJ4006X1-BE1	Thermocouple Terminal Block	N/A	N/A
KJ4006X1-BF1	Discrete 32 Channel Terminal Block	N/A	N/A
KJ4006X1-BG1	AI 16-Channel Terminal Block	N/A	N/A
KJ4006X1-BH1	Isolated Input Terminal Block	N/A	N/A
KJ4006X1-BJ1	RTD / Resistance Term block	N/A	N/A
KJ4006X1-BK1	Redundant Interface Terminal Block	N/A	N/A
KJ4006X1-BL1	AI 8-Channel Terminal Block (2 or 4 wire)	N/A	N/A
KJ4006X1-BM1	16-Pin Mass Terminal Block	N/A	N/A
KJ4006X1-BN1	24-Pin Mass Terminal Block	N/A	N/A
KJ4006X1-BP1	40-Pin Mass Terminal Block	N/A	N/A
KJ4006X1-BQ1	Profibus DP Terminal Block	N/A	N/A
KJ4006X1-BR1	Redundant Profibus DP Terminal Block	N/A	N/A
KJ4006X1-BS1	Redundant AI 8-Channel Terminal Block (2 or 4 wire)	N/A	N/A
KJ4006X1-BT1	Redundant AO 8-Channel Terminal Block	N/A	N/A
KJ4006X1-BU1	Redundant Discrete 8-Channel Terminal Block	N/A	N/A
KJ4006X1-BV1	Redundant H1 Terminal Block	N/A	N/A
KJ4006X1-BW1	DeviceNet Terminal Block	N/A	N/A

1.2 - KL series:

Product type	Description	FW rev.	HW rev.
KL2102X1-BA1	WIRELESS I/O CARD (WIOC)	12P5031	9.2
KL4102X1-BA1	2-WIDE WIRELESS I/O CARD (WIOC) CARRIER	N/A	N/A
KL4302X1-CA1	REDUNDANT WIRELESS I/O CARD (WIOC) TERMINAL BLOCK	N/A	N/A
KL4101X1-BA1	CHARM I/O CARD CARRIER	N/A	N/A
KL2101X1-BA1	CHARM I/O CARD	12P5622	8.6
KL1601X1-BA1	I/O PORT COPPER	N/A	N/A
KL3001X1-BA1	DISCRETE IN NAMUR CHARM	12P5572	1.02
KL3002X1-BA1	DISCRETE OUT 24VDC HIGH-SIDE CHARM	12P5574	1.03
KL3003X1-BA1	DISCRETE IN 24VDC DRY CONTACT CHARM	12P5573	1.02
KL3004X1-BA1	DISCRETE OUT 24VDC ISOLATED CHARM	12P5575	1.02
KL3021X1-BA1	ANALOG IN 4-20mA HART CHARM	12P5576	1.02
KL3022X1-BA1	ANALOG OUT 4-20mA HART CHARM	12P5577	1.02
KL3032X1-BA1	THERMOCOUPLE / mV INPUT CHARM	12P5579	1.01
KL3032X1-DA1	THERMOCOUPLE COLD JUNCTION COMPENSATION (CJC) SENSOR	N/A	N/A
KL3031X1-BA1	RTD / RESISTANCE INPUT CHARM	12P5578	1.01
KL4201X1-BA1	CHARM BASEPLATE, RIGHT-SIDE WIRING, (SCREW)	N/A	N/A
KL4502X1-BA1	CHARM TERMINAL, STANDARD (SCREW)	N/A	N/A
KL4502X1-DA1	CHARM ADDRESS TERMINAL (SCREW)	N/A	N/A
KL4501X1	CHARM ADDRESS PLUGS	N/A	N/A
KL4502X1-EA1/FA1	CHARM COLUMN TERMINATOR (SCREW)	N/A	N/A

2. DOCUMENTS AND DRAWINGS:

Emerson Process Management:

DeltaV Digital Automation System: CD-ROM dated Sep. 2010 containing Bills of Materials, Schematics, Assembly Drawings, Assembly Functional Description and Test Reports from Professional Testing Inc.

3. TEST REPORTS:

Professional Testing (EMI), Inc.

Electromagnetic Compatibility & Environmental Test Reports:

Group 1, Project Number: 10158-10/30 Rev. 6, dated September 21, 2010
Group 2, Project Number: 10225-10/30 Rev. 8, dated September 29, 2010
Group 3, Project Number: 10226-10/30 Rev. 5, dated September 14, 2010
Group 4, Project Number: 10227-10/30 Rev. 7, dated September 13, 2010
Group 5, Project Number: 10228-10/30 Rev. 3, dated September 22, 2010
Wireless I/O Card (WIOC), Project Number: 10741-10/30 Rev. 0, dated April 30, 2010
Smart Marshalling Products, Project Number: 10821-10/30 Rev. 3, dated August 26, 2010.

EC-Type Examination Certificates:

Nemko:

Nemko 10ATEX3225U dated 2011-01-07 **Ex nA nL IIC T4 Gc / Ex nA nC IIC T4 Gc** (see certificate for covered products)
Nemko 11ATEX3029U dated 2011-01-07: **Ex nA IIC T4 Gc** (see certificate for covered products)

4. APPLICATION / LIMITATION :

4.1 - BUREAU VERITAS Rules for the Classification of Steel Ships.
4.2 - Approval valid for ships intended to be granted with the following additional class notations: **AUT-UMS, AUT-CCS, AUT-PORT and AUT-IMS.**
4.3 - BUREAU VERITAS Environmental Category, **EC Code: 31/41.**
4.4 - The equipment, once installed in metallic enclosure and with EMI Filter (CORCOM 6VS1-F7247 or equivalent) on DC lines, fulfils the EMC requirements for installation on the Bridge and Deck Zone.
4.5 - Each application and configuration is to be submitted to the Society's examination prior to fitting on board.
4.6 - Operation voltage of the System Power Supply (Dual DC/DC) modules will be 24 VDC only.
4.7 - The equipment, once installed on board ship, is to be tested in accordance with the above referred Regulations under the supervision of a Society's Surveyor.
4.8 - Only Hardware and Software successfully tested together in compliance with the regulations as referred to in page one, according to the declaration of the manufacturer are covered by this certificate.
4.9 - The machinery protection based on data processing techniques is to be duplicated by another and different system.
4.10 - Correct configuration and setup for each delivery to be tested during commissioning after installation.

5. PRODUCTION SURVEY REQUIREMENTS :

5.1 - The **DeltaV Digital Automation Systems** are to be manufactured, examined and tested by **Fisher Rosemount Systems, Inc.** in accordance with the type described in this certificate and Bureau Veritas Rules for the Classification of Steel Ships.

5.2 - Arrangements shall be made for a Society's Surveyor to attend the relevant tests and examinations at manufacturer's works or to perform the relevant audits when an alternative survey scheme (BV Mode I) has been agreed. Relevant Bureau Veritas certificate will be issued after satisfactory completion of the procedure.

6. MARKING OF PRODUCT:

6.1 - Maker's name or trade mark.

6.2 - Catalogue Number and Serial Number.

6.3 - Equipment type number or model identification under which it was type-tested.

6.4 - The title and version of each software element included in the installed software system shall be either marked or presented on a display of the equipment.

6.5 - Ex marking, as relevant.

7. OTHERS:

7.1 - This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that:

Fisher Rosemount Systems, Inc.
12301 Research Boulevard
Research Park Plaza, Bldg III
Austin, TX 78759
UNITED STATES OF AMERICA

will accept full responsibility for informing shipbuilders, shipowners or their sub-contractors of the proper methods of use and general maintenance of the units and the conditions of this approval.

***** END OF CERTIFICATE *****

DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **A-12620**

This is to certify that the
Programmable Electronic System

with type designation(s)
DeltaV Automation System

Manufactured by
Fisher Rosemount Systems, Inc.
AUSTIN TX, United States

is found to comply with
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application
Location classes:

Temperature	**A/D: see application limitations**
Humidity	**A/B: see application limitations**
Vibration	**A**
EMC	**A/B: see application limitations**
Enclosure	**Required protection according to the Rules shall be provided upon installation on board**

Høvik, 2012-02-06
for **Det Norske Veritas AS**

Odd Magne Nesvåg
Head of Section

DNV local office:
Houston

This Certificate is valid until
2015-06-30

Aleksandra Górowska
Surveyor

Product description

DeltaV is a digital process automation system that can be used to manage and control a variety of plant processes. A DeltaV system consists of a variety of hardware equipment designed and produced by Emerson Process management and a specific set of off the shelf equipment used within the automation system.

Description	Product Type	Temperature class	Humidity class	EMC class
System Power Supply (Dual DC/DC)	KJ1501X1-BC2	A	A	A
Astec system DC Power supply (Dual DC/DC)	KJ1501X1-BC3	A	B	B
Fiber switch	KJ1710X1-BA1	D	A	B
4 Port Fiber switch	KJ1740X1-BA1	A	B	B
MD Controller	KJ2003X1-BA2	A	A	A
MD Controller plus	KJ2003X1-BB1	D	A	B
Remote Interface unit	KJ2004X1-BA1	D	A	B
Safety logic solver	KJ2201X1-BA1	A	A	B
SISNET Repeater	KJ2221X1-BA1	A	A	A
SISNET Repeater carrier	KJ2221X1-EA1	A	A	B
SISNET repeater distance extender	KJ2222X1-BA1	A	B	B
Auxillary Relay, energize to actuate	KJ2231X1-BA1	D	B	B
Auxillary Relay, deenergize to actuate	KJ2231X1-BB1	D	A	B
Auxillary relay, diode	KJ2231X1-BC1	D	A	B
Safety relay module	KJ2231X1-EA1	D	B	B
Voltage monitor accessory	KJ2231X1-EB1	D	B	B
End of line	KJ2231X1-EC1	D	B	B
RC compensator	KJ2231X1-ED1	D	B	B
SIS current limiter	KJ2231X1-EE1	D	B	B
AS-Interface card	KJ3005X1-BA1	A	A	A
Multifunction card	KJ3006X1-BA1	A	A	A
Sequence of Events card	KJ3008X1-BA1	A	A	A
Series 2 DI, 8-Channel, 24 VDC, Dry Contact	KJ3201X1-BA1	A	A	A
Redundant Discrete terminal block	KJ3201X1-EA1	A	A	A
Series 2 DO, 24 VDC, High-Side card, 8-channel	KJ3202X1-BA1	A	A	A
Series 2 DI, 32-Channel, 24 VDC	KJ3203X1-BA1	A	A	A
Series 2 DO, 32-Channel, 24 VDC	KJ3204X1-BA1	A	A	A
Series 2 DI card 24VDC ISO	KJ3206X1-BA1	D	B	B
Series 2 DI card 120V ISO	KJ3207X1-BA1	D	B	B
Series 2 DI card 120V dry contact	KJ3207X1-BB1	D	B	B
Series 2 DO card 24VDC ISO	KJ3208X1-BA1	D	B	B
Series 2 DO card 120/230V ISO	KJ3209X1-BA1	D	B	B
Series 2 DO card 120/230V HS	KJ3210X1-BA1	D	B	B
Series 2 SOE	KJ3211X1-BA1	A	B	B
Series 2 AO, 8-Channel, 4-20 mA, HART	KJ3221X1-BA1	A	A	A
Redundant Analog Output terminal block	KJ3221X1-EA1	A	A	A
Series 2 AI, 8-Channel, 4-20 mA, HART	KJ3222X1-BA1	A	A	A
Redundant Analog Input terminal block	KJ3222X1-EA1	A	A	A
Series 2 AI, 16-Channel, 4-20 mA HART	KJ3223X1-BA1	A	A	A
Series 2 AI, 16-Channel, terminal block	KJ3223X1-EA1	A	A	A
Isolated Analog input card.	KJ3231X1-BA1	A	A	A
Isolated Analog terminal block	KJ3231X1-EA1	A	A	A
Series 2 Serial Card, 2 Ports, RS232/RS485 H	KJ3241X1-BA1	A	A	A
Redundant Interface terminal block	KJ3241X1-EA1	A	A	A
Series 2 H1 terminal block	KJ3242X1-GA1	A	A	A
Series 2 H1 card	KJ3242X1-BA1	A	A	A
Series 2 Profibus-DP	KJ3243X1-BA1	A	A	A
Profibus DP series 2 redundant	KJ3243X1-BB1	A	B	B
Series 2 Device Net	KJ3244X1-BA1	A	A	A
2-Wide Power/Controller Carrier	KJ4001X1-BA2	A	A	A

Description	Product Type	Temperature class	Humidity class	EMC class
2-Wide pwr/controller w/redundant support	KJ4001X1-BA3	A	B	B
8-Wide I/O interface carrier	KJ4001X1-BB1	A	B	B
8-Wide I/O Interface Carrier / Shield Bar	KJ4001X1-BE1	A	B	A
2-Wide power carrier	KJ4001X1-BH1	A	A	B
I/O terminal block	KJ4001X1-CA1	A	A	A
Fused I/O terminal block	KJ4001X1-CB1	A	A	A
4-Wire terminal block	KJ4001X1-CC1	A	A	A
10-Pin Mass termination block	KJ4001X1-CD1	A	A	A
16-Pin Mass termination block	KJ4001X1-CE1	A	A	A
24-Pin Mass termination block	KJ4001X1-CF1	A	A	A
Thermocouple, mV terminal block	KJ4001X1-CG1	A	A	A
RTD, ohms terminal block	KJ4001X1-CH1	A	A	A
32-Channel terminal block	KJ4001X1-CJ1	A	A	A
Horizontal LocalBus Cable Extender	KJ4001X1-HA1	A	A	A
Right LocalBus Extender Cable Assembly	KJ4001X1-HB1	A	A	A
Left LocalBus Extender Cable Assembly	KJ4001X1-HC1	A	A	A
4-Wide remote I/O carrier	KJ4001X1-LA1	A	B	B
Dual right extender	KJ4001X1-NA1	A	B	B
Dual left extender	KJ4001X1-NB1	A	B	B
Left 8-Wide Vertical Carrier	KJ4002X1-BA1	A	A	A
Right 8-Wide Vertical Carrier	KJ4002X1-BB1	A	A	A
Top 4-Wide Vertical Carrier	KJ4002X1-BC2	A	A	A
Bottom 4-Wide Vertical Carrier	KJ4002X1-BD2	A	A	A
Top Extender Cable Assembly	KJ4002X1-BE1	A	A	A
Bottom Extender Cable Assembly	KJ4002X1-BF2	A	A	A
SIS vertical left 8-wide carrier	KJ4003X1-BA1	D	B	B
SIS vertical right 8-wide carrier	KJ4003X1-BB1	D	B	B
SIS vertical controller carrier	KJ4003X1-BC1	D	B	B
Vertical SIS net repeater	KJ4003X1-BD1	D	B	B
SIS vertical right cable ext	KJ4003X1-BE1	D	B	B
SIS vertical left cable ext	KJ4003X1-BF1	D	B	B
Vertical power carrier	KJ4003X1-BG1	D	B	B
Fieldbus H1 carrier w/enclosure	KJ6001X1-BA1	A	B	B
Fieldbus H1 carrier(redesigned) w/enclosure	KJ6001X1-BA2	A	B	B
Fieldbus H1 carrier	KJ6001X1-CA1	A	B	B
Fieldbus H1 carrier (redesigned)	KJ6001X1-CA2	A	B	B
Zone 1 Carrier	KJ7001X1-BA1	D	A	B
Zone 1 Power supply	KJ7011X1-BA1	D	A	B
Zone 1 CPU	KJ7012X1-BA1	D	A	B
Zone 1 DIO Card	KJ7101X1-BA1	D	A	B
Zone 1 AIO Card	KJ7102X1-BA1	D	A	B
DeltaV MX Controller	KJ2005X1-BA1	D	B	A
Series 2 AS-Interface Card	KJ3245X1-BA1	A	B	A
Series 2 Multifunction Card	KJ3212X1-BA1	D	B	A
Series 2 Thermocouple/MV Input Card	KJ3224X1-BA1	D	B	A
Series 2 Thermocouple Terminal Block	KJ3224X1-EA1	D	B	A
Series 2 RTD/OHM Input Card	KJ3225X1-BA1	D	B	A
Simplex Fieldbus H1 Terminal Block	KJ3242X1-EA1	A	A	A
Redundant Fieldbus H1 Terminal Block	KJ3242X1-FA1	A	A	A
Profibus DP Redundant Terminal Block	KJ3243X1-EA1	A	A	A
SLS Terminal Block	KJ2201X1-HA1	A	A	A
SLS Redundant Terminal Block	KJ2201X1-JA1	A	A	A

New products included during extention Q2/2011:

Description	Product Type	Temperature class	Humidity class	EMC class
System Power Supply (24 VDC)	KJ1501X1-BK1	D	B	A
SX Controller	KJ2005X1-BK1	D	B	A
MQ Controller	KJ2005X1-MQ1	D	B	A
SQ Controller	KJ2005X1-SQ1	D	B	A
Power / Controller Carrier	KJ4005X1-BA1	D	B	A
8-Wide I/O Carrier	KJ4005X1-BE1	D	B	A
Power Plug Terminal	KJ4005X1-BF1	D	B	A
DI 8-Channel 120VAC Isolated	KJ3207X1-BK1	D	B	A
DI 8-Channel 120VAC Dry Contact	KJ3207X1-BL1	D	B	A
DO 8-Channel 120/230 VAC Isolated	KJ3209X1-BK1	D	B	A
DO 8-Channel 120/230 VAC High-Side	KJ3210X1-BK1	D	B	A
8-Channel Terminal Block	KJ4006X1-BB1	D	B	A
SD Plus Controller	KJ2003X1-BK1	D	B	A
AS-Interface	KJ3245X1-BK1	D	B	A
Fieldbus H1	KJ3242X1-BK1	D	B	A
DeviceNet	KJ3244X1-BK1	D	B	A
Profibus DP	KJ3243X1-BK1	D	B	A
H1 Terminal Block	KJ4006X1-BA1	D	B	A
Interface Terminal Block	KJ4006X1-BD1	D	B	A
Profibus DP Terminal Block	KJ4006X1-BQ1	D	B	A
Redundant Profibus DP Terminal Block	KJ4006X1-BR1	D	B	A
Redundant H1 Terminal Block	KJ4006X1-BV1	D	B	A
DeviceNet Terminal Block	KJ4006X1-BW1	D	B	A
Sequence of Events Card	KJ3211X1-BK1	D	B	A
Pulse Count Input Card	KJ3212X1-BK1	D	B	A
Thermocouple / mV	KJ3224X1-BK1	D	B	A
RTD / Resistance input	KJ3225X1-BK1	D	B	A
Isolated Input Card	KJ3231X1-BK1	D	B	A
Redundant Serial Interface Card	KJ3241X1-BK1	D	B	A
Thermocouple Terminal Block	KJ4006X1-BE1	D	B	A
Discrete 32 Channel Terminal Block	KJ4006X1-BF1	D	B	A
Isolated Input Terminal Block	KJ4006X1-BH1	D	B	A
RTD / Resistance Term block	KJ4006X1-BJ1	D	B	A
Redundant Interface Terminal Block	KJ4006X1-BK1	D	B	A
Left Extender Card	KJ4005X1-BB1	D	B	A
Right Extender	KJ4005X1-BC1	D	B	A
DeltaV SIS adapter	KJ4005X1-BD1	D	B	A
AO 8-Channel 4-20 mA HART	KJ3221X1-BK1	D	B	A
AI 8-Channel 4-20 mA HART	KJ3222X1-BK1	D	B	A
AI 8-Channel Terminal Block (2 or 4 wire)	KJ4006X1-BL1	D	B	A
Redundant AI 8-Channel Terminal Block (2 or 4 wire)	KJ4006X1-BS1	D	B	A
Redundant AO 8-Channel Terminal Block	KJ4006X1-BT1	D	B	A
DI 8-Channel NAMUR	KJ3201X1-BK1	D	B	A
DO 8-Channel 24 VDC High-Side	KJ3202X1-BK1	D	B	A
DI 8-Channel 24 VDC Isolated	KJ3206X1-BK1	D	B	A
DO 8-Channel 24 VDC Isolated	KJ3208X1-BK1	D	B	A
DI 32-Channel 24VDC Dry Contact	KJ3203X1-BK1	D	B	A
DO 32-Channel 24VDC High-Side	KJ3204X1-BK1	D	B	A
Fused 8-Channel Terminal Block	KJ4006X1-BC1	D	B	A
16-Pin Mass Terminal Block	KJ4006X1-BM1	D	B	A
24-Pin Mass Terminal Block	KJ4006X1-BN1	D	B	A
40-Pin Mass Terminal Block	KJ4006X1-BP1	D	B	A
Redundant Discrete 8-Channel Terminal Block	KJ4006X1-BU1	D	B	A
IOP: Ethernet Switch Fiber	KL1602X1-BA1	D	B	B

Description	Product Type	Temperature class	Humidity class	EMC class
Wireless I/O Card (WIOC)	KL2102X1-BA1	D	B	A
2-Wide Wireless I/O Card (WIOC) Carrier	KL4102X1-BA1	D	B	A
Redundant Wireless I/O Card (WIOC) Terminal Block	KL4302X1-CA1	D	B	A
CHARM I/O Card Carrier	KL4101X1-BA1	D	B	A
CHARM I/O Card	KL2101X1-BA1	D	B	A
I/O Port Copper	KL1601X1-BA1	D	B	A
Discrete IN NAMUR CHARM	KL3001X1-BA1	D	B	A
Discrete OUT 24VDC High-Side CHARM	KL3002X1-BA1	D	B	A
Discrete IN 24VDC Dry Contact CHARM	KL3003X1-BA1	D	B	A
Discrete OUT 24VDC Isolated CHARM	KL3004X1-BA1	D	B	A
Discrete IN 24VDC Isolated CHARM	KL3005X1-BA1	D	B	B
Discrete OUT 100 mA Energy Limited CHARM	KL3006X1-BA1	D	B	B
24VDC Power CHARM	KL3007X1-BA1	D	B	B
Discrete IN 120 VAC Isolated CHARM	KL3011X1-BA1	D	B	B
Discrete IN 230 VAC Isolated CHARM	KL3012X1-BA1	D	B	B
Discrete OUT VAC Isolated CHARM	KL3013X1-BA1	D	B	B
Analog IN 4-20mA HART CHARM	KL3021X1-BA1	D	B	A
Analog OUT 4-20mA HART CHARM	KL3022X1-BA1	D	B	A
Analog IN 0-10 V Isolated CHARM	KL3023X1-BA1	D	B	B
Thermocouple / mV INPUT CHARM	KL3032X1-BA1	D	B	A
Thermocouple Cold Junction Compensation (CJC) Sensor	KL3032X1-DA1	D	B	A
RTD / Resistance INPUT CHARM	KL3031X1-BA1	D	B	A
CHARM Baseplate, Right-Side Wiring, (Screw)	KL4201X1-BA1	D	B	A
CHARM Terminal, Standard (Screw)	KL4502X1-BA1	D	B	A
CHARM Address Terminal (Screw)	KL4502X1-DA1	D	B	A
CHARM Address Plugs	KL4501X1	D	B	A
CJC CHARM Terminal Block Assy	KL4502X1-NA1	D	B	A
CHARM Column Terminator (Screw)	KL4502X1-EA1/FA1	D	B	A
CHARM Terminal Relay	KL4502X1-LA1	D	B	B
CHARM Terminal Fused	KL4502X1-MA1	D	B	B
CHARM Baseplate Extender with cable connectors, Btm.	KL4503X1-BA1	D	B	B
CHARM Baseplate Extender with cable connectors, Top	KL4503X1-CA1	D	B	B
Power Plug Buss	KJ4005X1-BG1	D	B	A
AI 16-Channel 4-20 mA HART	KJ3223X1-BK1	D	B	A
AI 16-Channel Terminal Block	KJ4006X1-BG1	D	B	A

Place of manufacture

Benchmark Electronics Public Company Ltd., Thailand

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case, by inclusion into an instrument list. Reference is made to DNV Rules for Ships / Pt.4 Ch.9 Control & Monitoring Systems.

The following project specific documentation of the actual application is to be submitted for approval in each case. (Depending on the actual configuration and the class notation of the specific vessel, additional documents may be required):

- Reference to this TA-Certificate
- System block diagram (covering overall- and detailed information)
- Power supply arrangement drawing (may be a part of the system block diagram)
- Instrument- and equipment list
- Detailed test program for certification
- Functional description
- Documented compliance with DNV's environmental requirements in Pt.4 Ch.9 Sec.5 for integrated components which not are covered by this TA-certificate (e.g. power supply, work-station, switch/hub etc).

Product certificate
Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system according to an approved test program before the system is shipped to the yard. After the certification the clause for application software control will be put into force.

Clause for application software control
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the computer.

Ex-certification is not covered by this certificate. Application in hazardous area to be approved in each case according to the Rules and Ex-Certification/ Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

Application/Limitation

The DeltaV hardware shall be installed in a cabinet of type Stahl Series 8125/8126. Other cabinet types, providing a shielding of minimum 15dB reduction (between 156MHz and 165 MHz), may alternatively be considered. In such cases, the cabinets field reduction capabilities shall be documented and accepted prior to installation onboard.
This do not apply to Smart Marshalling Products (CIOC/WIOC/Carriers/IOP's/CHARMs).

Smart Marshalling Products: Corcom 6VS1/F7247 Line Filter (or equivalent) shall be applied to 24VDC power supply input to satisfy class requirements for Conducted Emission:
KL4101X1-BA1, KL2101X1-BA1, KL1601X1-BA1, KL3001X1-BA1, KL3002X1-BA1, KL3003X1-BA1, KL3004X1-BA1, KL3021X1-BA1, KL3022X1-BA1, KL3032X1-BA1, KL3032X1-DA1, KL3031X1-BA1, KL4201X1-BA1, KL4502X1-BA1, KL4502X1-DA1, KL4501X1, KL4502X1-EA1/FA1

EMC power line filter such as Tyco S series or equivalent shall be installed on all DC input leads at the Delta V system's enclosure. The filter shall be grounded at the enclosure.

The following components shall be installed inside an IP66/NEMA 4 enclosure:
KJ7001X1-BA1, KJ7011X1-BA1, KJ7012X1-BA1, KJ7101X1-BA1, KJ7102X1-BA1

KL2102X1-BA1, KL4102X1-BA1 and KL4302X1-CA1 are components used in wireless applications. Use of these components in wireless applications is subject to case-by-case considerations.

Analog I/O cables shall be shielded and grounded at the DeltaV end as specified by manufacturer and DeltaV system requirements.

Installations on open deck are to be maintained in a non-condensing humidity environment as leakage current detection circuits shuts the equipment down in the precense of condensing humidity.

Type Approval documentation

Document title	Document no.	Date/Revision
Professional Testing, EMC test report	04146-10	September 2003
Professional Testing, EMC test report	00433	March 2000
Professional Testing, EMC test report	01327-10	April 2001
Professional Testing, EMC test report	01329-10	April 2001
Professional Testing, EMC test report	01331-10	February 2001
Professional Testing, EMC test report	00460-10	April 2001
Professional Testing, EMC test report	00461	May 2000
Professional Testing, EMC test report	03013-10	March 2003
Professional Testing, EMC test report	01311-10	February 2001
Professional Testing, EMC test report	03084-10	October 2002
Professional Testing, EMC test report	03217-10	December 2002
Proffesional Tesing, vibration and power supply	04280-10 / 04280-30	December 2003
Proffesional Tesing, vibration and power supply	04288-10 / 04288-30	January 2004
Professional Testing, EMC & environmental test report	04280-10 / 04280-30	October 2004/Rev1
Professional Testing, EMC & ENV test report	04288-10 / 04288-30	October 2004/Rev1
Installing your DeltaV system, Ver. 7	D800001X122	June 2004
Extension of certificate, April 2006		
Environmental & vibration tests report EMC test report	05382-30 05382-10a	March 2005 November 2005

Environmental & vibration tests report	05153-30	October 2004
EMC test report	05153-10	October 15, 2004
Environmental & vibration tests report	05115-30a	November 2004
Environmental test report	06167-30	October 2005
EMC test report	05134-10	October 2004
Environmental & vibration tests report	05115-30	November 2004
EMC test report	05115-10	October 15,2004
Environmental & vibration tests report	06105-30a	November 2005
Extension of certificate, October 2008		
Environmental test report	06408-30	2008-08-18/Rev. 3
EMC test report	06408-10	2008-08-18/Rev. 5
Environmental test report	06291-30	2008-08-07/Rev. 1
EMC test report	06291-10	2008-09-08/Rev. 3
Environmental test report	06452-30	2008-08-05/Rev. 2
EMC test report	06452-10	2008-08-19/Rev. 3
EMC and environmental test report	07173-10	2008-07-02/Rev.1
EMC test report	07435-10	2008-08-07/Rev. 2
EMC and environmental test report	07238-10/30	2008-08-19/Rev. 7
EMC and environmental test report	07361-10/30	2008-07-17/Rev. 2
Extension of certificate, February 2009		
EMC and environmental test report	08466-10/30	2008-12-05/Rev. 1
EMC and environmental test report	08186-10/30	2008-12-08/Rev. 1
EMC and environmental test report	08460-10/30	2008-12-11/Rev. 1
EMC test report	05398-10	2005-05-16/Rev. 1
Extension of certificate, Q2 / 2011	10158-10/30	September 21, 2010
	10225-10/30	September 29, 2010
	10226-10/30	September 14, 2010
	10227-10/30	September 13, 2010
	10228-10/30	September 22, 2010
	10821-10/30	August 28, 2010
	11151-10/30	October 10, 2010
Extension of certificate, Q1 / 2012		
EMC & Environmental Test Report	11642-10/30	August 23, 2011
KJ2005X1-SQ1 DeltaV SQ Controller Radiated Emissions Test Report	--	September 7, 2011
EMC & Environmental Test Report	12149-10/30	August 25, 2011
DNV Bangkok Certificate retention survey report for A-11136, dated 2010-05-25.		

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

Certificate retention survey

The scope of the retention/renewal survey is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the survey are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Retention survey is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE