

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Programmable Controller

with type designation(s)
Inline Series

Issued to

Phoenix Contact GmbH & Co. KG
Blomberg, Germany

is found to comply with
DNV GL rules for classification – Ships

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

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

*** Location classes for temperature, vibration and EMC are specified in the product tables on page 2, 3 and 4**

This Certificate is valid until **2021-02-24**.

Issued at **Hamburg** on **2016-02-25**

DNV GL local station: **Magdeburg**

Approval Engineer: **Heinz Scheffler**

for **DNV GL**

Duy Nam Le
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

Table 1

Phoenix Contact INTERBUS Inline I/O Terminals and Ethernet/Inline bus terminal comprising the following modules:

Order No.	Type	Description	Temp. class	Vibr. class	EMC class*
2861027	IB IL 24 PWR IN/M	Inline Power Terminal	D	B	A/B
2726311	IB IL 24 PWR IN	Inline Power Terminal without Fuse	D	B	A/B
2742104	IBS IL 24 BK-DSUB	Inline Bus terminal	D	B	A
2727941	IBS IL 24 RB-T	Inline Branch Terminal	D	B	A/B
2727349	IB IL RS 232	Inline Terminal Serial Data Transmission	B	B	A/B
2836793	IB IL RS 485/422	Inline Terminal Serial Data Transmission	B	B	A/B
2831057	FL IL 24 BK	Ethernet / Inline Bus Terminal	B	B	A
2726201	IB IL 24 DI 2	Inline Terminal 2 Digital Inputs	B	B	A/B
2726214	IB IL 24 DI 4	Inline Terminal 4 Digital Inputs	D	B	A/B
2726227	IB IL 24 DI 8	Inline Terminal 8 Digital Inputs	D	B	A/B
2726230	IB IL 24 DI 16	Inline Terminal 16 Digital Inputs	D	B	A/B
2860785	IB IL 24 DI 32/HD	Inline Terminal 32 Digital Inputs	D	B	A
2726256	IB IL 24 DO 4	Inline Terminal 4 Digital Outputs	D	B	A/B
2726269	IB IL 24 DO 8	Inline Terminal 8 Digital Outputs	D	B	A/B
2726272	IB IL 24 DO 16	Inline Terminal 16 Digital Outputs	D	B	A/B
2860934	IB IL 24 DO 32/HD	Inline Terminal 32 Digital Outputs	D	B	A
2727831	IB IL AI 8/SF	Inline Terminal 8 Analog Inputs	D	B	A/B
2862806	IB IL AO 2/SF	Inline Terminal 2 Analog Outputs	D	B	A/B
2727763	IB IL TEMP 2 UTH	Inline Terminal 2 Analog Inputs for Measuring Temperature	D	B	A/B
2726308	IB IL TEMP 2 RTD	Inline Terminal 2 Analog Inputs for Temperature Shunts	D	B	A/B
2863009	IB IL TEMP 4/8 RTD	Inline Terminal 8 Analog Inputs for Temperature Shunts	D	B	A/B
2985327	ILC 370 ETH 2TX-IB/M	Ethernet / Inline Controller	D	B	A/B
2985576	ILC 370 PN 2TX-IB/M	PROFINET IO / Inline Controller	D	B	A/B
2861331	IB IL 24 PWR IN-PAC	Inline Power Terminal without Fuse	D	B	A/B
2861593	IBS IL 24 BK-DSUB-PAC	Inline Bus terminal	D	B	A
2861441	IBS IL 24 RB-T-PAC	Inline Branch Terminal	D	B	A/B
2861933	IB IL RS 485/422-PAC	Inline Terminal Serial Data Transmission	B	B	A/B
2862314	FL IL 24 BK-PAC	Ethernet / Inline Bus Terminal	B	B	A
2878816	FL IL 24 BK-PN-PAC	PROFINET IO / Inline Bus Coupler	B	B	A
2861221	IB IL 24 DI 2-PAC	Inline Terminal 2 Digital Inputs	B	B	A/B
2861234	IB IL 24 DI 4-PAC	Inline Terminal 4 Digital Inputs	D	B	A/B
2861247	IB IL 24 DI 8-PAC	Inline Terminal 8 Digital Inputs	D	B	A/B
2861250	IB IL 24 DI 16-PAC	Inline Terminal 16 Digital Inputs	D	B	A/B
2862958	IB IL 24 DI 16-PAC/SN	Inline Terminal 16 Digital Inputs	D	B	A/B
2862835	IB IL 24 DI 32/HD-PAC	Inline Terminal 32 Digital Inputs	D	B	A

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Order No.	Type	Description	Temp. class	Vibr. class	EMC class*
2861276	IB IL 24 DO 4-PAC	Inline Terminal 4 Digital Outputs	D	B	A/B
2861289	IB IL 24 DO 8-PAC	Inline Terminal 8 Digital Outputs	D	B	A
2861292	IB IL 24 DO 16-PAC	Inline Terminal 16 Digital Outputs	D	B	A/B
2862961	IB IL 24 DO 16-PAC/SN	Inline Terminal 16 Digital Outputs	D	B	A/B
2862822	IB IL 24 DO 32/HD-PAC	Inline Terminal 32 Digital Outputs	D	B	A
2861412	IB IL AI 8/SF-PAC	Inline Terminal 8 Analog Inputs	D	B	A/B
2863083	IB IL AO 2/SF-PAC	Inline Terminal 2 Analog Outputs	D	B	A/B
2861386	IB IL TEMP 2 UTH-PAC	Inline Terminal 2 Analog Inputs for Measuring Temperature	D	B	A/B
2861328	IB IL TEMP 2 RTD-PAC	Inline Terminal 2 Analog Inputs for Temperature Shunts	D	B	A/B
2863915	IB IL TEMP 4/8 RTD-PAC	Inline Terminal 8 Analog Inputs for Temperature Shunts	D	B	A/B

Option -PAC = complete article including connectors and labelling field

Option /SN = standard numbering of the connectors

* EMC Class: Filter is required for both EMC Class A and EMC Class B. See Application/Limitation below.

Table 2:

Phoenix Contact INTERBUS Inline I/O Terminals and Ethernet/Inline bus terminal comprising the following modules:

Order No.	Type	Description	Temp. class	Vibr. class	EMC class
2863478	IB IL AI 4/EF	Inline Terminal With Four Differential Analog Input Channels	D	A	A
2726230	IB IL 24 DI 16	Inline Terminal With 16 Digital Inputs	D	A	A/B*
2726285	IB IL AI 2/SF	Inline Terminal With 2 Analog Input Channels	D	A	A/B*
2740106	IB IL 24 DO 2	Inline Terminal With Two Digital Outputs	D	A	A/B*
2726272	IB IL 24 DO 16	Inline Terminal With 16 Digital Outputs	D	A	A/B*
2985330	ILC 150 ETH	Ethernet / Inline Controller	D	A	A/B*
2985819	ILC 350 ETH/M	Ethernet / Inline Controller	D	A	A
2878447	IB IL AI 4/EF-PAC	Inline Terminal With Four Differential Analog Input Channels	D	A	A
2861250	IB IL 24 DI 16-PAC	Inline Terminal With 16 Digital Inputs	D	A	A/B*
2861302	IB IL AI 2/SF-PAC	Inline Terminal With 2 Analog Input Channels	D	A	A/B*
2861470	IB IL 24 DO 2-PAC	Inline Terminal With Two Digital Outputs	D	A	A/B*
2861292	IB IL 24 DO 16-PAC	Inline Terminal With 16 Digital Outputs	D	A	A/B*

Option -PAC = complete article including connectors and labelling field

* EMC Class: Filter is required for EMC Class B. See Application/Limitation below.

Table 3:

Phoenix Contact Inline Modules and Bus Coupler comprising the following:

Mat.No (Rev.No) Article	Designation Article	Description	EMC class
2703994	IL PN BK DI8 DO4 2TX-PAC	Inline Bus Coupler	A/B*
2863070	IL IB BK(-PAC)	Inline Bus Coupler	A
2863025	IL IB BK	Inline Bus Coupler	A
2861674	IB IL 24 PWR IN/R(-PAC)	Inline Power Terminal for Supplying the Communications Power	A/B*
2742764	IB IL 24 PWR IN/R	Inline Power Terminal for Supplying the Communications Power	A/B*
2861878	IB IL 24/230 DOR4/W(-PAC)	Inline Terminal with 4 digital relay outputs with PAC option	A/B*
2836421	IB IL 24/230 DOR4/W	Inline Terminal with 4 digital relay outputs	A/B*
2861645	IB IL DOR LV-SET(-PAC)	Terminals for separating a relay terminal with PAC option	B
2742641	IB IL DOR LV-SET	Terminals for separating a relay terminal	B
2861881	IB IL 24/230 DOR1/W(-PAC)	Inline Terminal with 1 digital relay output with PAC option	A
2836434	IB IL 24/230 DOR1/W	Inline Terminal with 1 digital relay output	A
2861373	IB IL 24 SEG/F(-PAC)	Segment Terminal with fuse and PAC option	A/B*
2727747	IB IL 24 SEG/F	Segment Terminal with fuse	A/B*
2862136	IB IL 24 PWR IN/2-F(-PAC)	Supply Terminal with fuse and PAC option	A/B*
2860015	IB IL 24 PWR IN/2-F	Supply Terminal with fuse	A/B*
2861218	IBS IL 24 BK-LK(-PAC)	Bus Terminal Block Optic Fibers	B

Option -PAC = complete article including connectors and labelling field

* EMC Class: Filter is required for EMC Class B. See Application/Limitation below.

Application/Limitation

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. Reference is made to DNV Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Product certificate

If specified in the Rules, ref. Pt.4 Ch.9 Sec.1, the control and monitoring system in which the above listed hardware is used shall be delivered with a product certificate. For each such delivery the certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. The test shall be done according to an approved test program. After the certification the clause for application software control will be put into force.

The equipment exceeds the radiated emission limit of 24 dBµV/m in the VHF maritime mobile band. The limit is exceeded by a frequency stable, narrow band frequency between 159.900 MHz - 160.100 MHz. For this specific frequency range, DNV accepts radiated emission values below 54 dBµV/m. Type Approval is granted based on the fact that this frequency band does not conflict with any transmitting frequencies currently recommended by ITU-R Radio Regulations Appendix 18 (WRC-07).

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.

Table1:

EMC Class A, for all devices requires the Phoenix Contact power line filter NEF 1 6 to be applied to the DC power supply inputs as specified by the manufacturer.

EMC Class B, for all devices identified with EMC Class A/B, requires the Phoenix Contact power line filter ME MAX NEF/QUINT20A to be applied to the DC power supply inputs as required by the manufacturer. FL IL 24 BK, IB IL RS 232 and IB IL RS 485/422 are to be installed inside an EMC shielded enclosure as specified by manufacturer.

Table2:

EMC Class B, for all devices identified with EMC Class A/B, requires the Phoenix Contact power line filter ME MAX NEF/QUINT20A to be applied to the DC power supply inputs as required by the manufacturer.

Table3:

EMC Class B for IL PN BK D18 D04 2TX-PAC requires the Phoenix Contact power line filter NEF1-3 or ME-MAX-NEF/QUINT20A to be applied to the DC power supply inputs as specified by the manufacturer. EMC Class B, for devices marked with **, requires the Phoenix Contact power line filter ME-MAX-NEF/QUINT20A to be applied to the DC power supply inputs as specified by the manufacturer.

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2015.

Marking of product

The products to be marked with:

- model name
- manufacturer name
- serial number

Periodical assessment

The scope of the periodical assessment 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 assessment 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

Periodical assessment is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE