

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Personal Computer

with type designation(s)

SIMATIC Microbox IPC427B, IPC427C, IPC427D, HMI IPC477C, IPC627C, IPC627D, IPC647C, IPC647D, HMI IPC677C, IPC227D, IPC277D, IPC827D, IPC477D, IPC227E, IPC277E, IPC277E, IPC427E, IPC477E, IPC477E PRO

Issued to

**Siemens AG SIMATIC Type Test Karlsruhe
Karlsruhe, Germany**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

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

Temperature D / B*

Humidity B

Vibration A

EMC A / B*

Enclosure Required protection according to DNVGL Rules shall be provided upon installation on board

*** see Application/Limitation**

This Certificate is valid until **2020-06-08**.

Issued at **Hamburg** on **2017-12-18**

for **DNV GL**

DNV GL local station: **Augsburg**

Approval Engineer: **Heinz Scheffler**

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Joannis Papanuskas
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.

Job Id: **262.1-020880-2**
Certificate No: **TAA00000DV**
Revision No: **3**

Type designation:

SIMATIC Microbox PC427B / 427B RTX 6ES7 675-1Cwx0-0yz0 and 6ES7 647-7Awx0-0yz0
w= A,B,D,E,F,J,K
x= 1,2,3,4
y= A,C, D, X,M,N,P,Q,R,F,G,H
z= A, B*, C*, D, E, F, G, H, X,A
* only 427B RTX

SIMATIC IPC427C Bundle 6ES7 675-1Dwx.-yzq0
w= A,B,E,F,G,J,K,L
x= 2,3,4
y= 0,2,3,6,7,8
z= A,D,E,F

SIMATIC IPC427C 6ES7 647-7Bwxy-zqr0
w=A,B,D,E,F,G,J,K,L
x=1,2,3,4
y=0,1
z=0,1,2,3,4,5
q=X,D,M,N,P,Q,E,R
r=X, A, B, C, D, M, N

SIMATIC HMI IPC477C 6AV7 884-w t xyz-qrs0
w= 0,1,2,3,5
t: A, Y
x=A,B,D,E,F,G,H,J
y=1,2,3
z=0,2,3,4, 5,6,7,8
q=1,2,3,4, 5,6,7,8
r and s: not relevant

w,x,y,z,q,t – possible variants for Processor, Drive and Operating System refer to Siemens configuration Version V45 dated 30.07.2009 and I IA AS FA HMI-PRM 3 ipc-configurator SIMATIC Microbox PC427B PCS7 AS RTX: 6ES7 654-0UC11-0XX0 (identical with Hardware 6ES7647-7AK30-0QA0) for SIMATIC PCS7

SIMATIC IPC 427C PCS7 OS Client SSD / AS RTX 6ES7 650-0RG..-0YX1 and 6ES7 654-0UE2.-0XX0
SIMATIC IPC 427E PCS7 OS Client SSD 6ES7 650-0VG..-0YX1
SIMATIC IPC 477E PCS7 OS Client SSD 6ES7 650-0VG..-1YX1

HMI IPC 627C 6ES7 647-6C...-J (V, L or X)..
J: Solid State Disk
V: Compact Flash Drive No. 2
X: without drives

HMI IPC 677C 6AV7 89a.-b...4 (5, 6 or 8)-0...
a: 0,1,2,3,4
b: 0,1,2,3,7,8
4: Solid State Disk
5: Compact Flash Drive No. 2
8: without drive

IPC 647C 6AG4 112-1....-....

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IPC647C AKER

6BK1 800-6AK00-0AA0

IPC 227D

6ES7 647-8A.(0,2,3,4,5,6,7,8).-....

0: without drive
2: 160 GB SSD
3: 50 GB SSD
4: 80 GB SSD
5: 2 GB CF; 6: 4 GB CF; 7: 8 GB CF; 8: 16 GB CF

IPC 277D

6AV7 881-aA.00-(0,1,2,3,4,6,7,8)..0

a: 1,2,3
0: without drive
1: 2 GB CF
2: 4 GB CF
3: 8 GB CF
4: 16 GB CF
6: 160 GB SSD
7: 50 GB SSD
8: 80 GB SSD

SIMATIC IPC 427D

6AG4 140-wDxyz-qrs0 (or 8); 6ES7 650-0UGz-0YX1

w: 0,1,2,3,4,5,6,7,8
x: A,B,C,D,G,H,J,K,L,M,N,P
y: 0,1,2,3,4,5
z: not relevant
q: 0,1,2,3,4
r: A,B,C,D,E,G,H,P
s: not relevant

SIMATIC IPC627D

6AG4 131-2wxyz-qrst

w= A,B,C,D,E,F,G,H,J
x= M,Q
y= 1,2,3,4,5,6
z= 0,1,2
q= 0,1,2,3
r= not relevant
s= A,B,C,X,Y
t= 0,1,2,3,4,5,6

SIMATIC IPC827D

6AG4 132-2wxyz-qrst

w= A,B,C,D,E,F,G,H,J
x= M,Q
y= 1,2,3,4,5,6
z= 0
q= 0,1,2,3
r= not relevant
s= A,B,C,X,Y
t= 0,1,2,3,4,5,6

SIMATIC IPC647D

6AG4 112-2wxyz-qrst

w= D,E,F,G,H,J,K,L,M

x= S,T,W

y= 1,2,3,4,5,6,7,8

z= 0,1,2,6,7,8

q= 0,1,2,3,4,5

r= not relevant

s= A,B,C,X,Y

t= 0,1,2,3,4,5,6

Exception: Z= 0,6 (2-slot bus-device) not be combined with q= 4,5 (graphics adapter).

SIMATIC IPC647D PCS7

6ES7 660-5wxyz-qrst

w= A,B,C,W,D,E,F,X,G,H,J,Y

x= P,Q,R,S,T,U,V,W

y= 0,1,2,3,4,5,6,7

z= 1,8

q= 0,1,8

r= A,D,X

s= A,B,C,G,H,J

t= 0,1,2,3,4,5,6

SIMATIC IPC227E

6ES7 647-8Bwxy-zqr2

w= A, B

X= 1, 2, 3, 4, 5, 6

Y= 1, 2, 3, 4

z= 0, 1, 2, 3, 4, 5, 6

q= A, B, C, K, L, M

r= not relevant

SIMATIC IPC277E

6AV7 882-0wxy0-qrs0

w= A, B, C, H, F, G, J, K, R, S, T, L, W, X, M, N

x= A, B

Y= 1,2,3,4,5,6

q= 0,1,2,3,4,5,6,7

r= A,B,C,K,L,M

s= not relevant

SIMATIC IPC477D

6AV7 240-wxyzq-rstu

w=0,1,3,4,5,6,7,8

x= M,N,P

y= A,B,C,D,J,K,L,M

z= 0,3

q= 0,3,4,5,6,7

r= 0,1,2,3,4

s= A,B,C,D,E,H,N,P

t= not relevant

u= 0,8

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SIMATIC IPC427E

6AG4 141-wxyzq-rstu

w = 0,1,3,5,7
x = C,G
y = A,B,C,D,E,F,G,H,J,K
z = 0,1,2,3,4,5
q = not relevant
r = 0,1,2,3,4,5
s = A,E,F,G
t = not relevant
u = 0,8

SIMATIC IPC477E

6AV7241-wxyzq-rstu

w = 0,1,3,5,7
x = J,K,L,R,S,W,X,Y
y = A,B,C,D,E,F,G,H,J,K
z = 0,1,2,3,4,5,6
q = not relevant
r = 0,1,2,3,4,5
s = A,E,F,G
t = not relevant
u = 0,8

SIMATIC IPC477E PRO

6AG7251-wxyzq-rstu

w = 1,3,5,7
x = B,C,D,E,F,G,H,J,K,L,M,N,P,Q,R,S,T,U
y = A,B,C,D,E,F,G,H,J,K
z = 0,3,5,6
q = not relevant
r = 0,1,2,3,4,5
s = A,E,F,G
t = not relevant
u = 0,8

w,x,y,z,q,j,v,a,b, r, s, t – possible variants for Processor, Drive and Operating System,
refer to Siemens configuration I IA AS FA HMI-PRM 3 ipc-configurator

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNVGL, 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 GL 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.

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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 GL for evaluation and approval. Major changes in the software are to be approved before being installed in the computer

Application/Limitation

Temperatur B:

- IPC647C/647D

EMC B:

- IPC427C/477C/647D IPC277E, IPC427E, IPC477E, IPC477E PRO complies with EMC B class location when filter (type Epcos B84113C or equivalent) with ratings I=3A, C=2*0,47µF + 2*4700pF, L=4*4,7mH is used.
- IPC427D, IPC227D, IPC277D, IPC627C, IPC647C, IPC677C and IPC477D comply with EMC B class location when filter Corcom xFC10 (or equivalent) is used.
- IPC627D/827D complies with EMC B class location without filter.

Type Approval documentation

Specification for Type Tests and Test Report of Marine Electrical Equipment /
Specification and Test Report A&D AS RD ST Type Test

- Protocol No.: A&d AS RD ST Type Test – 07/07, dated 23.07.2007 (PC427B)
- Protocol No.: I IA AS RD ST Type Test – 07/09, dated 22.10.2009 (IPC427C/477C)
- Protocol No.: I IA AS RD ST Type Test – 07/2010, dated 02.12.2010 (IPC627C/677C)
- Protocol No.: I IA AS RD ST Type Test – 2011-01, dated 28.06.2011 (IPC647C)
- Protocol No.: I IA AS RD ST Type Test – 04/2011, dated 16.12.2011 (IPC227D/277D)
- Protocol No.: I IA AS RD ST Type Test – 2012-04, dated 18.02.2013 (IPC647C AKER)
- Protocol No.: I IA AS RD ST Type Test – 2013-01, dated 26.07.2013 (IPC 427D (Box-PC))
- Protocol No.: 15-E006314-BM-A01, dated 19.12.2014 (IPC627D/827D)
- Protocol No.: 15-E006314-BM-B01, dated 19.12.2014 (IPC647D/647D PCS7)
- Protocol No.: SIMATIC Type Test - 2015-06, dated: 20.11.2015
- I IA AS RD ST Type Test - 2010.07, dated 02.12.2010
- I IA AS RD ST Type Test - 2013-01, dated 26.07.2013
- Type Test-2015-05, dated 17-08-2015; Test Software Version FW 03 dated 05.04

List of Test Reports: 18-E007434-BM-B02 (SIMATIC IPC277E, IPC427E, IPC477E, IPC477E PRO, PCS7)

Manuals and Operating Instructions:

- Operation Manual A5E00913637-01 dated 04/2007
- Siemens SIMATIC Industrial PC IPC627C, doc. No.: A5E02669068-01 dated 05/2010
- Siemens SIMATIC Industrial PC HMI IPC677C, doc. No.: A5E02722710-01 dated 05/2010
- Siemens SIMATIC Industrial PC IPC647C, doc. No.: A5E02669337-03 dated 07/2011
- Siemens SIMATIC Operating Instructions for IPC227D, doc. No.: A5E03409478-01 dated 07/2011
- Siemens SIMATIC Operating Instructions for IPC277D, doc. No.: A5E03409486-01 dated 07/2011
- Siemens SIMATIC Operating Instructions for IPC427D, doc. No.: A5E31347215-AA dated 01/2013
- Siemens SIMATIC Industrial PC IPC647D, doc. No.: A5E32996306-AA dated 01/2014
- Siemens SIMATIC Industrial PC IPC627D/827D, doc. No.: A5E32990859-AB dated 09/2014
- Siemens SIMATIC Operating Instructions IPC227E, doc. No.: A5E35782395-AA dated 06/2015
- Siemens SIMATIC Operating Instructions IPC277E, doc. No.: A5E35783335-AA dated 06/2015
- Siemens SIMATIC Operating Instructions IPC477D, doc. No.: A5E31347228-AD dated 07/2015

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Configuration:

- Siemens configuration Version V45 dated 30.07.2009 and specification dated 22.07.2009
- Siemens configuration I IA AS FA HMI-PRM 3 ipc-configurator:
 - Version 16.1 dated 17.04.2014,
 - Version 17.3 dated 30.01.2015 and specifications
- Configurator Version 14.6 dated 2012
- Siemens configuration IPC227D and 277D: 2x7D V3-11-2013 1204

Configuration_Options_for shipbuilding_use_IPC2x7E

Installation of the units described in manufacturer's instructions.

List of documents/manual: 18-E007434-BM-C02 (SIMATIC IPC277E, IPC427E, IPC477E, IPC477E PRO, PCS7)

Tests carried out

Applicable tests according to Class Guidance DNVGL-CG-0339, November 2016.

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 after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE