Certificate No:
TAA000035F

TYPE APPROVAL CERTIFICATE

This is to certify:

That the EPL / ShaPoLi arrangement

with type designation(s)
KM EPL / KM ShaPoLi

Issued to
Kongsberg Maritime AS
Kongsberg, **Norway**

is found to comply with
DNV rules for classification – Ships
Resolution MEPC.335(76)

Application :

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

Issued at **Høvik** on **2022-09-02**
This Certificate is valid until **2024-09-01**.
DNV local station: **Sandefjord**

Approval Engineer: **Thorbjørn Hansen**

for **DNV**

Jan Tore Grimsrud
Head of Section

Product description

This Type Approval Certificate covers KM EPL / KM ShaPoLi implemented in KM's AutoChief C20/600 based on specifications in MEPC.335(76).
KM EPL / KM ShaPoLi is SW functionality that may be implemented in new and/or existing HW modules.
Activation of EPL/ShaPoLi override and indication of "power limit exceeded" is through dedicated HMI. Records of specified parameters may be provided through KM, alternatively through separate system/recorder.

Functionality specified by MEPC.335(76) concerning EPL/ShaPoLi are listed in Table 1. Those that are covered by the subject Type Approval Certificate are identified in column no. 3. When used onboard DNV classed vessels, the vessel-specific configuration shall be reflected in Annex 1 (confidential).

Table 1: EPL & ShaPoLi functionality specified in MEPC.335(76)

No	Function	Covered by this TAC	SW no covered by this TAC	Ref to DNV TAC
1	**Power Limitation**			
1a	EPL – Power limitation	Yes	Ref. Table 2	TAA0000017
1b	ShaPoLi – Power limitation	Yes Note 1	Ref. Table 2	TAA0000017
2	**Override**			
2a	Override Power Limitation Note 2	Yes	Ref. Table 2	TAA0000017
3	**Alarm**			
3a	System failures alarmed Note 3	Yes	Ref. Table 2	TAA0000017
4	**Indication (on the bridge)**			
4a	Activation of un-limiting mode Note 2	Yes	Ref. Table 2	TAA0000017
4b	Power limit exceeded (visual and audible) Note 2	Yes	Ref. Table 2	TAA0000017
4c	Indication of shaft speed, -torque and -power Note 4,5	Yes	Ref. Table 2	TAA0000017
5	**Recording**			
5a	Shaft speed, torque and power recorded in un-limiting mode Note 4,5	Yes Note 6	-	TAA0000017
5b	Power limit exceeded	Yes Note 6	-	TAA0000017
5c	Activation of override	Yes Note 6	-	TAA0000017
6	**Tamper proofing**			

6a	The following measures are taken to arrange the EPL/ShaPoLi functionality tamper proof:
	• Lid protected switch for "override". Activation initiates audible and visible indication on bridge.
	• All parameter- and alarm settings are password protected.
	• Event history log (ShaPoLi) covering:
	  ○ Parameter change
	  ○ Use and recording of unlimiting mode
	  ○ Activation of unlimited mode
	• Override and power exceeded stored in Alarm history of Governor system, alarm history cannot be changed or deleted by user.
		Yes	-	TAA0000017

Note 1	Torque meter for use in ShaPoLi-configuration is not covered by the subject TAC. Dedicated I/O's prepared to interface signals from such, SW arranged to limit the power accordingly.			
Note 2	Separate Power Limitation panel "PL" for installation on the bridge available (covered by this TAC), covering: • Lid protected switch for activating override • Separate indicator for "Override active" • Separate indicator (audible and visual) for "Power limit exceeded" Back-up mean for override provided through KM ACP (ACP for C20, CP12 for AC600. Ref. TAA0000017).			
Note 3	System failures alarmed through existing C20/600 HW (ACP for C20, CP12 for AC600. Ref. TAA0000017).			
Note 4	Applicable for ShaPoLi only.			
Note 5	Torque meter not covered by the subject TA certificate.			
Note 6	Covered in AC600 only. Separate recorder required for AC C20.			

Table 2: The following DPU SW no's (-and above / later) are covered by this TAC:

8.16.91	6.07.E2	6.04.57	6.01.49
814.156	6.06.39	6.03.32	

Table 3: Signals prepared for interface to torque meter, recorder, and PL-panel.

Parameter	Signal type / signal range
Measured torque for external recorder (ShaPoLi)	AO / 4-20 mA
Measured power for external recorder (ShaPoLi)	AO / 4-20 mA
Measured RPM for external recorder (ShaPoLi)	AO / 4-20 mA
Measured torque from external torque meter (ShaPoLi)	AI / 4-20 mA
Measured power from external torque meter (ShaPoLi)	AI / 4-20 mA
Measured RPM from external torque meter (ShaPoLi)	AI / 4-20 mA
Override, input from push button	DI / potential-free contact
Override, output for lamp driver (Indication / PL panel)	DO / potential-free contact
Override, output for external recorder	DO / potential-free contact
Power exceeded output, lamp driver (Indication / PL panel)	DO / potential-free contact
Power exceeded output, for external recorder	DO / potential-free contact
All above signals can also be on a serial line to external recording system	Modbus RTU/TCP

Approval conditions

The Type Approval covers hardware and software as listed under product description.

Whenever any of the functions listed in Table 1 are implemented on a DNV classed vessel, a signed copy of Annex 1 in this TAC shall be filled in and submitted to DNV.

A signed copy of the vessel specific test record (KM document no. 488029 Rev. C / “HAT & SAT, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation”) shall be available onboard.

When the type approved software is revised (affecting all future deliveries) DNV is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Application/Limitation

KM EPL / KM ShaPoLi functionality as covered by the subject TA certificate may be implemented in AutoChief C20/600 systems on DNV classed vessels subject to EEXI power limitation.

Type Approval documentation

Tests carried out

Function test as per KM document no. 495512 Rev. C / “Factory Acceptance Test FAT, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation”.

Marking of product

Components are marked with product name and product number as listed in TAA0000017.
PL panel intended for bridge installation marked “Power Limitation”.
Basic software version as pr. Table 2 is displayed in the system graphical user interface.

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

Annex 1: Vessel specific configuration

Annex 2: Overall description of EPL/ShaPoLi functionality and variants