

TYPE APPROVAL CERTIFICATE

Certificate no.:
TAA000035F
Revision No:
2

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), as amended by Resolutions MEPC.375(80) and MEPC.390(81)

Application:

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

Issued at **Høvik** on **2026-07-10**

This Certificate is valid until **2028-08-31**.

DNV local unit: **Sandefjord**

Approval Engineer: **Andrzej Rosinski**



for **DNV**

This document has been digitally signed and will
therefore not have handwritten signature

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

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.

The following documents, holding vessel specific information shall be available onboard and be presented to the DNV surveyor upon request:

- Annex 1 in this TA certificate.
- 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").

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

Title	Document		DNV document no
	No	Rev.	
Function Description, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation	488026	C	5
Power Limitation, System implementation, Function diagram	110-0008544	B	17
Operator Manual, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation	491199	B	8
Power limitation panel, Outline drawing	110-0000686	A	9
HAT & SAT, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation	488029	C	13
Factory Acceptance Test FAT, EPL Engine Power Limitation, ShaPoLi Shaft Power Limitation	495512	D	14
Type Approval Renewal Assessment Report dated 2026-04-30	-	-	24

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

Whenever any of the functions listed in table 1 shall be implemented on a DNV classed vessel, this Annex shall be filled in with project specific information and presented to the DNV surveyor upon request. The default choice / configuration is for some items indicated with **bold** letter inside the parenthesis. Any deviation from these are subject to case by case approval.

No	Item	Actual configuration			
0	Vessels AutoChief system (C20 / C600 ) .....	.....			
1	Propeller arrangement: FPP ^{Note 1, Note 5}				
1.1	Single or <u>D</u> ual ME (S / D / n/a ) .....	.....			
2	Propeller arrangement: CPP ^{Note 1, Note 6}				
2.1	Single or Dual ME (S / D / n/a ) .....	.....			
3	Power limiting method ^{Note 2}				
3.1	EPL - fixed max fuel (Y / n/a ) .....	.....			
3.1.1	Fixed max fuel used together with mechanical limitation (Y / N / n/a ) .....	.....			
3.2	EPL - dynamic fuel limitation based on estimated power (Y / n/a ) .....	.....			
3.3	EPL - limiting RPM based on estimated power, 3 rd part governor (Y / n/a) ^{Note 5} .....	.....			
3.4	ShaPoLi - limiting fuel based on measured power (Y / n/a ) .....	.....			
3.5	ShaPoLi - limiting RPM based on measured power, 3 rd part governor (Y / n/a) ^{Note 5} .....	.....			
3.6	ShaPoLi - limiting CPP based on measured power (Y / n/a) ^{Note 6} .....	.....			
3.7	ShaPoLi - limiting CPP based on measured power, 3 rd part governor (Y / n/a) ^{Note 6} .....	.....			
	Software & EEXI power limit				
4.1	KM SW version no for EPL / ShaPoLi .....	.....			
4.2	The EEXI limits for below vessels are set according to information in their technical files (Y / N ) .....	.....			
5	Override				
5.1	Switch for override on the bridge is supplied by KM (Y / N ) .....	.....			
5.1	Backup override arranged in control panel / ACP on bridge and in ECR (Y / N ) .....	.....			
6	Alarm				
6.1	Loop failure in override switch is detected and alarmed by KM (Y / N ) .....	.....			
6.2	Failure in EPL/ShaPoLi functionality is detected and alarmed by KM (Y / N ) .....	.....			
7	Indication				
7.1	Panel for indication of override and EEXI power exceeded is supplied by KM (Y / N ) .....	.....			
8	Recording				
8.1	EPL/ShaPoLi installed in AC 600, recording in existing HW for AC 600 or K-Chief 600 (Y / n/a) ^{Note 3} ..	.....			
8.2	EPL/ShaPoLi installed in AC C20, recorder in K-Chief (Y / n/a) ^{Note 3} .....	.....			
8.3	Signals provided by KM for external recorder, serial or hardwired I/O's (Y / n/a) ^{Note 3} .....	.....			
9	New HW provided by KM				
9.1	Torquemeter supplied by KM (TAC no / No / N/A) .....	.....			
9.2	New HW provided by KM (Y / N) ^{Note 4} .....	.....			
10	EPL/ShaPoLi onboard test				
10.1	After implementation, tests as pr. document no 488029 Rev. C is performed onboard (Y / N ) .....	.....			
^{Note 1}	Only one of the propeller arrangements (FPP or CPP) shall be selected. When one is selected the other shall be set to N/A.				
^{Note 2}	Only one of the power limiting methods (3.1 – 3.7) shall be selected. When one is selected the other shall be set to N/A.				
^{Note 3}	8.1, 8.2 or 8.3 shall be ("Y")				
^{Note 4}	"Y" indicates new HW in addition to the PL panel and I/O module. Elaborate in "comments" below.				
^{Note 5}	3.3 and 3.5 applies to FPP only.				
^{Note 6}	3.6 and 3.7 applies to CPP only.				
The above IDENTICAL configuration applies to the following vessels:					
IMO No	Flag Adm.	IMO No	Flag Adm.	IMO No	Flag Adm.
Comments:					
_____ Manufacturer's signature, date & stamp					

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

The below table is to provide supplementary information on the different EPL/ShaPoLi solutions listed in Annex 1 and the two different power limiting methods listed in Table 1 (1a and 1b).

No.	Variants	Description / limitations
1a.1	EPL - Fixed max fuel. Max fuel limit set in EPL-function. Ref " Solution 1 ", KM document ID 110-0008544 Rev B	- Max fuel limit is set to a fixed value. - Max actuator stroke during limited operation is set to a fixed value based on the EEXI calculations and the vessels propeller curve. - Actual engine power is continuously estimated based on measured RPM and fuel index. - Suitable as a stand-alone EPL solution but may also be used in combination with mechanical limitation of the fuel rack. In such case its function is to prevent mechanical damage, not to limit the power.
1a.2	EPL - Dynamic max fuel. Fuel limit calculated in EPL-function based on RPM. Ref " Solution 2 ", KM document ID 110-0008544 Rev B	- Max power limit is set to a fixed value. - Max fuel limit is a dynamic value, continuously calculated based on RPM and fuel index. - Fuel injection is limited when the power exceeds the pre-set power limit.
1b.1	ShaPoLi - Limiting fuel based on external measurement. Max fuel calculated in EPL-function. Ref " Solution 3.1 ", KM document ID 110-0008544 Rev B	- Dedicated torque-meter interfaced to DPU_EPL. - Fuel command limited when the measured power exceeds the EEXI power limit. - Recording of shaft-power may be thorough KM's IAS or by third-party vendor.
1a.3	EPL - Limiting RPM based on estimated power. EPL-function calculates power and controls RPM accordingly. Ref " Solution 3.2i ", KM document ID 110-0008544 Rev B	- Governor / actuator is not KM supply. - EPL-limiter is integrated in KM RCS. - Max power limit is set to a fixed value. - SP to external governor is a dynamic value, continuously calculated based on RPM and estimated power. - SP to external governor is limited when the power exceeds the pre-set power limit.
1a.4	ShaPoLi - Limiting RPM based on external measurement. EPL-function controls RPM command accordingly. Ref " Solution 3.2e ", KM document ID 110-0008544 Rev B	- Dedicated torque-meter interfaced to DPU_EPL. - Governor / actuator is not KM supply. - EPL-limiter is integrated in KM RCS. - SP to external governor is a dynamic value, continuously calculated based on RPM and estimated power. - SP to external governor is limited when the power exceeds the pre-set power limit.
1b.2	ShaPoLi - Limiting CPP based on external measurement. KM governor. Ref " Solution 3.3 ", KM document ID 110-0008544 Rev B Solution 3.3 duplicated in document	- Telegraph commands to DGU and DPU_CPP / combinator. - Dedicated torque-meter interfaced to DPU_EPL. - Power limit calculated based on measured power and EPL power to a pitch limit in the pitch load controller as a "overload" to reduce pitch when EEXI power is reached. - Recording of shaft-power may be through KM's IAS or by third-party vendor.
1b.3	ShaPoLi - Limiting CPP based on external measurement. 3 rd part governor. Ref " Solution 3.3 ", KM document ID 110-0008544 Rev B	- Telegraph commands to DGU and DPU_CPP / combinator. - Dedicated torque-meter interfaced to DPU_EPL. - Power limit calculated based on measured power and EPL power to a pitch limit in the pitch load controller as a "overload" to reduce pitch when EEXI power is reached. - Recording of shaft-power may be through KM's IAS or by third-party vendor.
3	Override	Panel with key-switch for activation and indication of "override" and with indicator for "power limit exceeded" may be supplied by KM, alternatively by a third-party vendor.
4	Alarm	System alarms related to EPL/ShaPoLi are initiated in AC and in KM IAS (if provided).
5	Indication	- Panel with key-switch for activation and indication of "override" and with indicator for "power limit exceeded" may be supplied by KM, alternatively by a third-party vendor. - Additionally may the following be provided through KM IAS in case of ShaPoLi solution: - Torque - Shaft power - RPM

6	Recording	- The below signals may be recorded in a KM IAS (if installed), alternatively may the signals be provided for external / 3rd party recording: - Torque - Power - RPM - Override - Power exceeded
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