

January 22, 2022

DC Motor Component for NavCad® 2021

New electric drive motor feature for Propulsion simulation

Development for HydroComp NavCad 2021 offers new features across the range of applications. One specific highlight is NavCad's new DC motor feature.

New DC electric motor Drive option

A major update for NavCad is the new support for electric motors as the prime mover of NavCad's *Drive* component. The first electric motor type to be released is for DC motors, with particular development for easy user definition of standard motor curve formats.

This includes the popular "constant torque" and "constant torque-constant power" styles of permanent magnet synchronous motors (PMSM) found in UVs and other submersibles. Custom data entry is also supported for specific manufacturer-supplied power curves.

A new proprietary model for partial load efficiency and current draw was developed to provide engineers and designers with a critical missing piece when conducting trade-off studies, evaluation and validation of trial data, or calculations of operational battery budget. Full propulsion system DC motor metrics can then be predicted, including current draw, mechanical-to-electrical efficiency, and electrical input power.

AC motor support is in development and scheduled for release in early 2022.

Electric motor data

Properties	
Description:	Example DC motor
Type:	DC motor
AC phase:	
Data source:	Generic DC [Q]
Units	
Torque:	[0.0] N-m
Mech power:	[0.0] kW
Elec power:	[0.0] kW
Voltage:	[0] V
Current:	[0.0] A
Mechanical output	
Show as:	Torque
Rating	
Voltage:	353 V
Max torque:	213.0 N-m
at RPM of:	2500
Max no load RPM:	5000
Parasitic load:	0.0 kW
Electrical input	
Current draw:	Estimated
Max motor effy:	0.90

CONTINUOUS MAX POWER CURVE						
	RPM	TORQUE	PMECH	CURRENT	EFFMTR	PELEC
1	5000	0.5	0.3	4.9	0.162	1.7
2	4375	53.3	24.4	78.3	0.883	27.6
3	3750	106.5	41.8	132.3	0.895	46.7
4	3125	159.8	52.3	164.7	0.899	58.1
5	2500	213.0	55.8	175.5	0.90	62.0
6	1875	213.0	41.8	132.3	0.895	46.7
7	1250	213.0	27.9	89.1	0.886	31.5
8	625	213.0	13.9	45.9	0.86	16.2
9	125	213.0	2.8	11.5	0.687	4.1
10						

DEFINED LOAD CURVE						
	RPM	TORQUE	PMECH	CURRENT	EFFMTR	PELEC
1	2500	213.0	55.8	175.5	0.90	62.0
2	2000	136.3	28.6	91.2	0.887	32.2
3	1500	76.7	12.0	40.0	0.852	14.1
4	1000	34.1	3.6	13.9	0.729	4.9
5	500	8.5	0.4	5.0	0.251	1.8
6						
7						
8						
9						
10						

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About HydroComp NavCad

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About HydroComp

Since 1984, HydroComp has been a leader in providing hydrodynamic software and services for resistance and propulsion prediction, propeller sizing and design, and forensic performance analysis. Through its unique array of software packages and services, HydroComp now serves over 1200 naval architectural design firms, shipyards, yacht owners, ship operators, propeller designers, universities and militaries around the globe.

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