SIMOTICS HV C

High Voltage Motors

1N.1

Preliminary Catalog D84.2• Version 1.05 • 10.1.2020

Compact motors

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Edition 01/2020

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SIMOTICS HV C Motors

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1.1 General

The **SIMOTICS HV C** series of motors is available in shaft heights up to 560mm and covers a power range extending up to 3.2 MW (6 kV, 50 Hz, 4-pole).

This motor series covers the entire high voltage motor market and all applications in safe area and explosion protected zones.

- Air-cooled. IP55, cooling IC411/IC416
- Water-cooled, IP55, cooling IC71W

The **SIMOTICS HV C** series has been developed for line (DOL) and converter operation. This means that in conjunction with medium-voltage SINAMICS GH150, GH180, GM150 and SM150 converters and successor products, drive systems are available in a power range up to 3.2 MW (@ 6 kV, 50 Hz, 4-pole).

The **SIMOTICS HV C** series is also suitable for operation at non-Siemens converters.

In the Appendix you will find electrical and mechanical selection tables with technical data regarding line and converter operation.

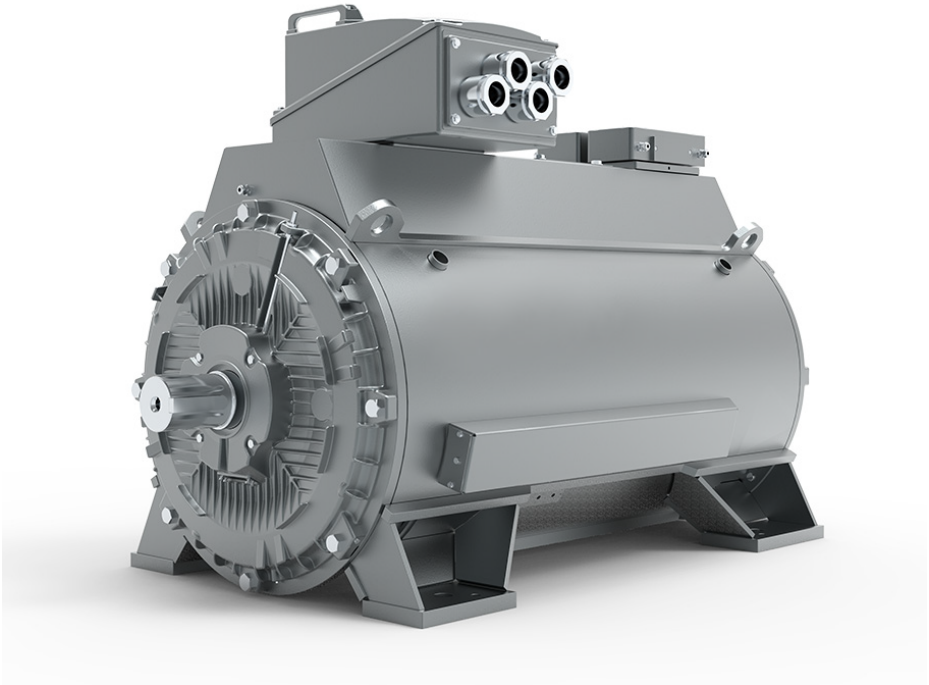

Fig 1-1 SIMOTICS HV C motor, shaft height 450, water-cooled

1.2 Regulations and standards

The motors are in compliance with the following standards and regulations:

- EN 60034-1 Rating and performance
- EN 60034-2-1 Tests for losses and efficiency
- EN 60034-2-2 Tests for large machines
- EN 60034-2-3 Tests for inverter driven machines
- EN 60034-5 Degree of protection
- EN 60034-6 Methods of cooling
- EN 60034-7 Types of construction and mounting
- EN 60034-8 Terminal markings
- EN 60034-9 Noise limits
- EN 60034-11 Thermal protection
- EN 60034-12 Starting performance
- EN 60034-14 Limits of vibration
- EN 60034-15 Impulse voltage withstand levels
- EN 60034-17 Cage induction motors when fed from inverters
- EN 60034-18 Insulation systems
- IEC 60072-2 Dimension and output series 355-1000
- EN 60079-0 Explosive atmospheres Part 0 – General requirements
- EN 60079-X Applicable parts (i.e. Part 1 – Gas – Flameproof enclosure d"…)

Equivalent IEC standards are also applicable.

Power stages in compliance with NEMA and CSA are available on request.
Versions according to API are possible, including special API tests and factory hold points.
The motor dimensions are metric, which means that they can be used in a wide range of applications.

1.3 MLFB coding system for SIMOTICS HV C motors

Overview

Table 1-1 MLFB coding system

1-3	**Primary and main group, Ex-protection**							
	1NA	Safe area						
	1NB	II 2G Ex db IIB (flameproof)						
	1NC	II 2G Ex db IIC (flameproof)						
	1NN	II 3G Ex ec IIC (increased safety Zone 2) - *formerly known as Ex nA (non-sparking)* II 3D Ex tc IIIB T125 Dc (dust explosion Zone 22 – *if combined with MLFB 13 = 7*						
4	**Motor series**							
	1	Simotics HV C – 1st generation						
5+6	**Shaft height**							
			45	450 mm				
	35	355 mm	**50**	500 mm				
	40	400 mm	**56**	560 mm				
7	**Code number for relative length of laminated core**							
	0	Shortest	**4**	Mid-size	**8**	Longest	**9**	Special length
8	**Pole number**							
	2	2 poles						
	4	4 poles						
	6	6 poles						
	8	8 poles						
	3	10 poles – *on request*						
	5	12 poles– *on request*						
	7	14 poles– *on request*						
	0	16 poles– *on request*						
	1	18 poles– *on request*						
	9	other numbers of poles - *on request*						

9	**Cooling method**	
	A	Surface cooled, with outer fan (IC411)
	B	Surface cooled, with forced ventilation (IC416)
	W	Water jacket cooled (IC71W)
10	**Operation**	
	A	Direct on line operation, high voltage
	B	Direct on line operation, low voltage
	C	Converter operation, low voltage, SINAMICS G150
	D	Converter operation, low voltage, SINAMICS S120
	E	Converter operation, low voltage, SINAMICS S150
	F	Converter operation, low voltage, SINAMICS G180
	R	Converter operation, high voltage, SINAMICS GM150
	S	Converter operation, high voltage, SINAMICS SM150
	T	Converter operation, high voltage, SINAMICS GH180
	U	Converter operation, high voltage, SINAMICS GH150
	Z	Other converters
		Other LV converter (**Z-K1Y**)
		Other HV converter (**Z-K2Y**)
11	**Rated voltage/frequency**	
		Low voltage operation, (MLFB digit 10 = B/C/D/E/F)
	0	690V, 50Hz
	1	690V, 60Hz
	4	400V
	5	500V
	7	660V
	9	**+L6Y + additional text data**: other voltages

11	Rated voltage/frequency (continuation)	
		High voltage, direct-on-line, (MLFB digit 10 = A)
	0	3.3kV, 50Hz
	1	6.6kV, 60Hz
	2	13.2kV, 60Hz
	3	4.16kV, 60Hz
	4	4kV, 60Hz
	5	2.3kV, 60Hz
	6	6kV, 50Hz
	7	6.6kV, 50Hz
	8	10kV, 50Hz
	9	**+L6B**: >3.3 – 6.6kV, 50Hz
	9	**+L6C**: 9 – 11kV, 50Hz
	9	**+L6E**: >3.3 – 6.6kV, 60Hz
	9	**+L6F**: 9 – 11kV, 60Hz
	9	**+L6K**: 11kV, 50Hz
	9	**+L6Q**: 6.3kV, 60Hz
	9	**+L6T**: 3kV, 50Hz
	9	**+L6Y + additional text data:** other voltages
		Medium voltage converter operation, (MLFB digit 10 = R/S/T/U)
	0	7.2kV, 50Hz
	1	11kV, 50Hz
	2	2.3kV, 50Hz
	3	4.16kV, 60Hz
	4	4.16kV, 50Hz
	5	3.3kV, 50Hz
	6	6kV, 50Hz
	7	6.6kV, 50Hz
	8	6.6kV, 60Hz
	9	**+L6C**: 10kV, 50Hz
	9	**+L6E**: 6kV, 60Hz
	9	**+L6Y + additional text data:** other voltages

12	**Type of construction**	
	0	IM B3 (IM 1001)
	1	IM B5 with additional fixing point (IM 3001) - *on request*
	4	IM V1, with protective hood (IM 3011) – *standard design for IIC411 motors*
	6	IM B35 (IM 2001) - *on request*
	8	IM V1, without protective hood (IM 3011) – *standard design for IC71W motors*
	9	other type of construction - *on request*
13	**Temperature class (for explosion protection)**	
	0	without temperature class
	3	Temperature class T3 (max. surface temperature 200°C/392°F)
	4	Temperature class T4 (max. surface temperature 135°C/275°F)
	7	Surface temperature T=125°C for Ex t motors
14	**Rotor design**	
	A	Standard rotor: Aluminum
	B	Special rotor Aluminum – *on request*
	C	Standard rotor with E-Cu
	D	Special rotor with E-Cu – *on request*
	E	Standard rotor with Si- Cu – *on request*
	F	Special rotor with Si- Cu – *on request*
	G	Special rotor with other materials
15	**Housing and bearing design**	
	A	Cast iron housing, antifriction bearings
	C	Cast iron housing, sleeve bearings
	G	Welded steel housing, antifriction bearings
	J	Welded steel housing, sleeve bearings
16	**Category**	
	0	Standard series

Example of MLFB

Table 1-2 Example of MLFB

MLFB Position	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**-**	**8**	**9**	**10**	**11**	**12**	**-**	**13**	**14**	**15**	**16**	**-**	**Z**
Safe area	**1**	**N**	**A**																	
SIMOTICS HV C	1	N	A	**1**																
Shaft height 500mm	1	N	A	1	**5**	**0**														
Output identifier	1	N	A	1	5	0	**6**													
4 poles	1	N	A	1	5	0	6	-	**4**											
Cooling IC71W	1	N	A	1	5	0	6	-	4	**W**										
SINAMICS GH150	1	N	A	1	5	0	6	-	4	W	**U**									
6kV, 50Hz	1	N	A	1	5	0	6	-	4	W	U	**6**								
IM B3	1	N	A	1	5	0	6	-	4	W	U	6	**0**							
Without temperature class	1	N	A	1	5	0	6	-	4	W	U	6	0	-	**0**					
Standard rotor Aluminum	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	**A**				
Cast iron frame, antifriction bearings.	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	A	**A**			
Standard series	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	A	A	**0**		
Final MLFB	**1**	**N**	**A**	**1**	**5**	**0**	**6**	**-**	**4**	**N**	**U**	**6**	**0**	**-**	**0**	**A**	**A**	**0**	**-**	**Z***

* Additional information as text and/or selection code is required.

1.4 Motor dimensions

Note

Use the “DT configurator” tool to get a motor drawing and/or a 3D STP model.
Quickest way to get a drawing: by using “Direct article number input” on the front page

Please note, that it is not possible to display all special accessories in standard dimension drawings and tables.
Therefore no special terminal boxes, sensors, sleeve bearing monitoring and oil supply equipment etc. are displayed.

Note

If the motor dimensions cannot be found in DT configurator, please contact headquarters for a customized drawing.

Tables for mechanical data: see document "SIMOTICS HV C - Electrical and

Mechanical Data"

1.5 Electrical data

Tables for electrical data: see document "SIMOTICS HV C - Electrical and Mechanical Data"

1.6 Noise data

Noise values

Even the basic version of SIMOTICS HV C motors has low noise levels. This is achieved through the following measures:

- Low noise motor design
- Optimized ventilation
- Fans with flow optimized aerodynamic design
- Noise-optimized design of the steel fan cover
- Number of stator and rotor slots carefully selected for low magnetic noise excitation
- Magnetic slot seals

Table 1-3 Noise levels – SIMOTICS HV C motors 1NA1 IC411

SIMOTICS HV C motors 1NA1 in standard design IC411
L_{pA} sound pressure level at 50/60Hz, at no load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
450	84	80	85	81	81	77	76	72
500	85	81	86	82	81	77	77	73
560	87	83	88	84	83	79	79	75

SIMOTICS HV C motors 1NA1 in standard design IC411
L_{pA} sound pressure level at 50/60Hz, at load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
450	86	82	86	82	83	82	78	77
500	87	83	87	83	83	82	79	78
560	89	85	89	85	85	84	81	80

Lower noise levels on request!

Table 1-4 Noise levels – SIMOTICS HV C motors IC71W

SIMOTICS HV C motors 1NA1 in IC71W design
L_{pA} sound pressure level at 50/60Hz, at no load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
450	-	-	67	66	68	67	71	70
500	-	-	68	67	68	67	72	71
560	-	-	70	69	70	69	74	73

SIMOTICS HV C motors 1NA1 in IC71W design
L_{pA} sound pressure level at 50/60Hz, at load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
450	-	-	77	76	78	77	81	80
500	-	-	78	77	78	77	82	81
560	-	-	80	79	80	79	84	83

Lower noise levels on request!

Table 1-5 Noise levels – SIMOTICS HV C motors 1NB1/1NC1 IC411

SIMOTICS HV C motors 1NB1/1NC1 in standard design
L_{pA} sound pressure level at 50/60Hz, at no load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
355		79		78		76		
400	85	79	83	79	77	73	73	69
450	84	80	85	81	81	77	76	72
500	85	81	86	82	81	77	77	73
560	87	83	88	84	83	79	79	75

SIMOTICS HV C motors 1NB1/1NC1 in standard design
L_{pA} sound pressure level at 50/60Hz, at load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
355		79		79		77		
400	83	79	84	80	79	78	75	74
450	86	82	86	82	83	82	78	77
500	87	83	87	83	83	82	79	78
560	89	85	89	85	85	84	81	80

Lower noise levels on request!

1.7 Options, order codes

Motors can be supplied with additional equipment and/or as special versions. You must then add a "Z" to the order number

Order codes for the order number (MLFB)

Order codes have been defined for frequently requested "special versions/options". The use of order codes simplifies and speeds up the ordering process.

Note

Always use the order code for the required design.

Recommended accessories

The following is advised as standard accessories with each motor (not included):

- Six PT 100 in the stator winding (option A65) as 4-wire circuit from a separate auxiliary terminal box (option M50)
- SPM nipple for antifriction bearing design motors at DE and NDE (option G50)
- 2x2 PT100 in each bearing shell (option A42) as 4-wire circuit from terminal box for motors with sleeve bearing design
- Anti-condensation heating in a separate auxiliary terminal box (option M52), standard voltage range 220 up to 240 V (option M13)

Note

Please check “Industry Online Support” for available detailed option descriptions

Please contact your SIEMENS sales representative, if your requirement is not listed!

The following tables give an overview about the available options for SIMOTICS HV C motors

Symbols used in order code tables

□	Standard design
○	Alternative design, no additional price
●	Additional text needed for clarification
✓	Available with additional price
o.r.	Available on request
-	Not available

1.7.1 Winding & rotor design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Winding & rotor design				
Retrofit (description of the special design separately)	B15	o.r.	o.r.	o.r.
Non-standard winding	C20	✓	✓	✓
Site altitude max.1500m above sea level (observe derating)	D06	✓	✓	✓
Site altitude max.2000m above sea level (observe derating)	D07	✓	✓	✓
Site altitude max.2500m above sea level (observe derating)	D08	✓	✓	✓
Site altitude max.3000m above sea level (observe derating)	D09	✓	✓	✓
Cooling air temperature max. 45°C (observe derating)	D11	✓	✓	✓
Cooling air temperature max. 50°C (observe derating)	D12	✓	✓	✓
Cooling air temperature max. 55°C (observe derating)	D13	✓	✓	✓
Cooling air temperature max. 60°C (observe derating)	D14	✓		✓
Cooling water temperature 30°C (observe derating)	D15	✓		
Cooling water temperature 35°C (observe derating)	D16	✓		
Cooling water temperature 40°C (observe derating)	D17	✓		

1.7.2 International certificates

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
International certificates				
Electric design according to NEMA MG1-12	D30		o.r.	o.r.
Ex certificate for China	D32			✓
Certificate EAC for Eurasian Customs Union	D35	✓	✓	✓
IEC Ex Certificate	D37	✓	✓	✓
Ex-Certification for India (PESO - CCOE)	D38		o.r.	✓
Certificate for import into Eurasian customs union (EAC)	D47	✓	✓	-
POVERKA Certificate for Russia	D48	✓	✓	✓
API 541 Standard, 4th Edition	D52		o.r.	✓
API 541 Standard, 5th Edition	D69	o.r.	o.r.	✓
Design for Zone 21/22 (conductive dust) for DOL operation; IP65	M34		-	✓
Design for Zone 22 (nonconductive dust) for DOL operation	M35		✓	✓
Design for Zone 21/22 (conductive dust) for VFD operation; IP65	M38		-	✓
Design for Zone 22 (nonconductive dust) for VFD operation	M39		-	✓

1.7.3 Frame fittings/adaptions & fixing elements

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Frame design & fixing elements				
Reverse lock for direction of rotation right, seen from DE (left locked)	G48			o.r.
Reverse lock for direction of rotation left, seen from DE (right locked)	G49			o.r.
Machine mounting: bolts, shims and tapered pins for mounting on steel foundation	L31	✓	✓	✓
Motor mounting materials for mounting on a concrete foundation or concrete base: Threaded bolts, armature plates, sole plates, shims, leveling plates and taper dowels	L32	✓	✓	✓
Anchor bolts, sole plates and stainless steel shims for fixing on concrete base	L33	✓	✓	✓
Brackets for lifting and shifting	P42			o.r.
Stainless steel (V2A) external bolts	P45	✓	✓	
Stainless steel (V4A/AISI316) external bolts	P48			✓
Internal fastening devices secured acc. API 541-2.4.1.1.D	Q51			✓
Shims of stainless steel material (V4A/AISI316) - 4mm/motor foot not laminated	Q92			✓
Machined surface on motor feet with dowel pin holes	Q94			✓
Slotted feet holes	Q95			✓
Base frame for height adaptation of max. 2 shaft heights difference	Q96	o.r.	o.r.	✓
Shims of brass material - 4mm/motor foot - not laminated!	V31			✓
Sun protection shield - fixing parts of mild steel, cover of stainless steel unpainted for horizontal motors	V99			-
Additional measures for 2 up to 4 years storage	W50			✓

1.7.4 Special measures for low temperature design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Special measures for low temperature design				
Operation at ambient temperatures down to -50°C and transport down to -50°C	D02	o.r.	o.r.	✓*
Operation at ambient temperatures down to -40°C and transport down to -40°C	D03	o.r.	o.r.	✓*
Operation at ambient temperatures down to -30°C and transport down to -40°C	D04	o.r.	o.r.	✓*
Low temperature sleeve bearings for forced oil lubrication	Q27			✓
Oil sump heater for sleeve bearings	T15	o.r.	o.r.	✓

**available only for steel housing design (MLFB digit 15=G/J) and for shaft height 355*

1.7.5 Degree of protection

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Degree of protection				
Enclosure IP65	K50	✓	✓	✓
Enclosure IP56	K51	✓		✓
Enclosure IP56 (non-heavy sea)	K52		✓	
Enclosure IP66	L94	✓	✓	o.r.
Terminal boxes in IP65	Q71			✓

1.7.6 Cooling design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Cooling design				
Leakage water detection for water cooler	H08	✓	-	-
Cooling tubes of stainless steel material V4A (1.4571/AISI 316Ti)	Q17	-	✓	✓
Cooling tubes of stainless steel material V2A (1.4301/AISI 304)	V97	-	✓	□

1.7.7 Sleeve bearing options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Sleeve bearing options				
DIN flange type for forced oil lubrication for oil inlet with flowmeter, manometer and throttle valve (incl. counter flange)	H09	✓	✓	✓
ANSI flange type for forced oil lubrication for oil inlet with flowmeter, manometer and throttle valve (incl. counter flange)	H10	✓	✓	✓
DIN flange type for forced oil lubrication for oil outlet with inspection glass (incl. counter flange)	H11	✓	✓	✓
ANSI flange type for forced oil lubrication for oil outlet with inspection glass (incl. counter flange)	H12	✓	✓	✓
DIN-flanges (incl. counter flange) for oil connection (forced oil lubrication)	H43	✓	✓	✓
ANSI-flanges (incl. counter flange) for oil connection (forced oil lubrication)	H44	✓	✓	✓
Support ring for coupling guard	L15	✓	✓	✓
Drive end bearing insulation (insulation bridged)	L18	✓	✓	✓
Non drive end bearing insulation	L27	✓	✓	✓
Forced-circulation oil lubrication (with oil cooling) instead of oil-ring lubrication	L60	✓	✓	✓
Oil-ring lubrication, but prepared for future conversion to forced-circulation oil lubrication	L66	✓	✓	✓
Bearing provisioned for oil pressure relief (hydrostatic)	P07			o.r.
Stainless steel oil collection piping acc. ANSI/ASME design	P44	✓	✓	✓
Oil-flowmeter with contacts (two-way contact) and leads in auxiliary terminal box	P66	o.r.	o.r.	✓
DE+NDE bearing insulation (DE linked to earth)	Q08			✓
Provision for oil change during operation for sleeve bearings without forced lubrication	Q50			✓
Bearing ventilation for lower bearing temperature for sleeve bearing design	V26			✓
Constant oiler DE and NDE (200ml)	V71			✓

1.7.8 Antifriction bearing options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Antifriction bearing options				
SPM bearing monitoring: measuring nipple system 32 - thread M8, DE+NDE	G50	✓	✓	✓
Shock pulse measurement (SPM), fixed sensor and distribution box	H05	✓	✓	-
Shock pulse measuring (SPM), alarm box complete, no Ex-protection	H07	✓	✓	-
Bearing for increased lateral forces (roller bearing DE)	K20	o.r.	o.r.	o.r.
Support ring for coupling guard	L15	✓	✓	✓
Drive end bearing insulation (insulation bridged)	L18	✓	✓	✓*
Non drive end bearing insulation	L27	✓	✓	✓
DE+NDE bearing insulation (DE linked to earth)	Q08			✓*
Bearing ventilation for lower bearing temperature - for antifriction bearing design grease lubricated	V17			✓
Axial thrust bearing	V20			o.r.
Grease extractors for bearing DE and NDE – *stainless steel design V4A*	V21			✓
Automatic grease lubricator DE and NDE - suitable for ambient temperatures from -20°C up to +50°C	V22			✓
Enlarged grease chamber DE and NDE	V25	o.r.	o.r.	✓
Preparation for SPM bearing monitoring, only thread M8 for adapter	W84			✓

**not available for shaft height 355*

1.7.9 Shaft/rotor design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Shaft/rotor design				
Second shaft end up to 50% rated torque	K16	✓	✓	✓
Fitting of coupling half (customer supplied, ready machined and balanced)	L17	✓	✓	✓
Balancing with full key	L68	✓	✓	✓
Half key balancing	L69	□	□	□
Shaft material of alloy steel	L72	o.r.	o.r.	✓
Second standard shaft extension for up to 100% rated torque, for horizontal motors	Q21			o.r.
Tapered shaft end with shaft nut	T36	✓	✓	o.r.
Non-standard cylindrical shaft end (diameter identical or smaller as standard)	Y55	✓	✓	✓
Oil press-fit for cylindrical shaft extension instead of feather key connection	Y85	✓	✓	✓

1.7.10 Vibration values/monitoring

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Vibration values/monitoring				
Shaft vibration monitoring for sleeve bearings, Bently Nevada Proxpac	A02	✓	✓	✓
Prepared for shaft vibration monitoring with sleeve bearings in X-Y-direction	A39	✓	✓	✓
Vibration severity grade A - IEC 60034-14	K01	□	□	□
Vibration severity grade B (IEC 60034-14) - *for converter driven motors at minimum and rated frequency only!*	L81	✓	✓	✓
CMS2000 Condition Monitoring System (for Motors with antifriction bearings)	M49	o.r.	o.r.	✓
One keyphasor installed and wired to aux. terminal box	P61			✓
Provision for housing vibration probe, one flat surface with thread M8x1 on DE and NDE	P63	✓	✓	✓
Shaft vibration monitoring (2x2 in X-Y) for sleeve bearings with proximitors installed in stainless steel auxiliary terminal box	Q02	o.r.	o.r.	✓
Run out and shaft vibration according PGI-Norm - max. 15µm/50,8µm	Q03			✓
Run out and shaft vibration acc. to Shell DEP - max. 12,5µm/50µm	Q04			✓
Sleeve bearings provisioned for one keyphasor	Q06			✓
1 Sensor for enclosure vibration monitoring (vibration speed), without terminal box	V15			✓
1 Sensor for enclosure vibration monitoring (vibration acceleration), without terminal box	V16			✓
Run out and shaft vibration acc. to IEC 60034-14 grade A	V66			✓
Run out and shaft vibration acc. to IEC 60034-14 grade B	V67			✓
Run out and shaft vibration acc. API541 - max. 11,4µm/38µm	V68			✓

1.7.11 Noise & ventilation design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Noise & ventilation design				
External metal fan, 2 directions of rotation	K35			✓
Clockwise rotation viewed to DE	K97	□	□	□
Anti-clockwise rotation viewed to DE	K98	○	○	○
Operation for both rotations	K99	✓	o.r.	o.r.
Noise reduction: silencer for air inlet	L20		✓	✓
External metal fan, 1 direction of rotation	L23		✓	✓
Stainless steel grid for air inlet silencer	L25		✓	✓
Outer fan of stainless steel	V94			-
Outer fan unit in non-sparking design	W66			✓
Zinc-coated fan cowl	W69			✓
Abnormal voltage for forced ventilation motor	Y81	-	✓	-

1.7.12 Speed monitoring and shaft grounding

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Speed monitoring and shaft grounding				
Speed monitoring by inductive proximity switches, without evaluation unit	A03	✓	✓	✓
Mounting of Kübler Sendix 5834FS2 1024 (SIL-2) rotary pulse encoder	G21		✓	-
Mounting of Kübler Sendix 5834FS2 1024 (SIL-3) rotary pulse encoder	G22		✓	-
Mounting of HOG10 M DN 1024 I SR 16H7 KLK, SIL-2 rotary pulse encoder	G23		✓	-
Mounting of HOG10 M DN 1024 I SR 16H7 KLK, SIL-3 rotary pulse encoder	G24		✓	-
Mounting of HOG10S100S-B76.626.01024.1, SIL-2 rotary pulse encoder	G25		✓	-
Mounting of HOG10S100S-B76.626.01024.1, SIL-3 rotary pulse encoder	G26		✓	-
Mounting of LL FSI 862-184560-1024, SIL-2 rotary pulse encoder	G27		✓	-
Mounting of LL FSI 862-184560-1024, SIL-3 rotary pulse encoder	G28		✓	-
Rotary pulse encoder LL 861 900 220 (Leine+Linde)	H70	✓	✓	-
Rotary pulse encoder HOG 10 D1024 I (16 mm)	H73	✓	✓	-
Rotary pulse encoder HOG 10 D1024 I with integrated shaft earthing	H76	✓	✓	-
Rotary pulse encoder HOG 11 DN 1024 I (16 mm) with integrated shaft grounding and special anti-corrosion protection	H89	✓	✓	-
Mechanical protection for pulse encoder	M68	✓	✓	-
Shaft earthing device	V36			✓*
Speed encoder Ex design (SIEMENS preferred brand)	V72	-		✓

**not available for shaft height 355*

1.7.13 Winding temperature monitoring

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	Ex db IC411
Winding temperature monitoring				
Motor protection with 2x 3PTC thermistors for pre-warning / switching-off	A12	✓	✓	✓
Motor protection with 2x 3PTC thermistors for pre-warning/switching-off as sole protection with converter (TMS)	A16			✓
Motor protection with 2x 3PTC thermistors for pre-warning/switching-off with surge arrestors	A17			o.r.
1 temperature sensor PT1000	A35	✓	✓	✓
2 temperature sensor PT1000	A36	✓	✓	✓
6 temperature sensor PT1000	A37	✓		✓
6 embedded resistance thermometers PT 100 without lightning arresters for 4-wire connection from terminals	A65	✓	✓	✓
6 embedded resistance thermometers PT 100 with lightning arresters for 4-wire connection from terminals	A66	✓	✓	✓
6 embedded resistance thermometers PT 100 in shielded design without lightning arresters for 4-wire connection from terminals – *Ex ib design*	A67	✓	✓	✓
6 Ex ib-slot resistance thermometers PT 100 in shielded design, with surge arrestors for 4-wire connection ex terminal	Q40	-		✓
Upgrade 6 winding resistance thermometer PT 100 to 4-wire type ex sensor instead ex terminal	Q43			✓
PT100 winding in tolerance class A	V78			✓

1.7.14 Bearing temperature monitoring

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Bearing temperature monitoring				
2 resistance thermometers PT 100 for 4-wire connection from terminals for antifriction bearings	A40	✓	✓	-
2 resistance thermometers PT 100 for 4-wire connection from terminals for sleeve bearings	A41	✓	✓	-
2 double resistance thermometers PT 100 for 4-wire connection from terminals, antifriction bearings	A42	✓	✓	✓
2 double resistance thermometers PT 100 for 4-wire connection from terminals, sleeve bearings	A43	✓	✓	✓
Upgrade bearing resistance thermometers PT100 to 4-wire type ex sensor instead of ex terminal	Q44			✓
One bimetal-thermometer, diameter 100mm, for bearing DE- and NDE	V70			✓
Bearing- or coolant-PT100 in tolerance class A	V76			✓
2 bearing double resistance thermometers PT100 in Ex ib-design	V80	-		✓

1.7.15 Temperature gauges and transmitters

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Temperature gauges and transmitters				
Two capillary dial-type thermometers without contacts	A70	✓	✓	✓
Two capillary dial-type thermometers with 2 NO contacts	A71	✓	✓	-
3 pieces SITRANS transmitters for temperature monitoring of stator winding	T27	✓	✓	✓
2 pieces SITRANS transmitters for temperature monitoring of bearings	T28	✓	✓	✓
One Transmitter 4-20mA with digital display with Ex db or Ex ib-approval	V88	-		-

1.7.16 Heaters

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	Ex db IC411
Heaters				
Anti-condensation heater 400 V	L08	✓	✓	-
Anti-condensation heater 500 V	L09	✓	✓	-
Anti-condensation heater 110-120 V (min 100 V, max. 132V)	M12	✓	✓	✓
Anti-condensation heater 220-240 V (min 200 V, max. 264V)	M13	✓	✓	✓
Anti-condensation heater Ex eb IIC T3, 110-120 V (min 100 V, max. 132V)	M14	✓	✓	-
Anti-condensation heater Ex eb IIC T3, 220-240 V (min 200 V, max. 264V)	M15	✓	✓	-
Heater in main terminal box	P84	o.r.	o.r.	✓
Anti-condensation heater with other rated voltages for Ex-motors, voltage to be defined	Q48	-		✓

1.7.17 Auxiliary terminal boxes

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	Ex db IC411
Auxiliary terminal boxes				
Auxiliary terminal box cast iron safe area design	M50	✓	✓	-
Auxiliary terminal box stainless steel	M51	✓	✓	✓
Auxiliary terminal box cast iron, for space heater	M52	✓	✓	✓
Auxiliary terminal box in cast iron design (safe, Ex eb, Ex ib-design) with removable gland plate "undrilled"	Q75	-		✓
Auxiliary terminal box in cast iron design (safe, Ex eb, Ex ib-design) with removable gland plate "metric thread drilled and with metal plug"	Q76	-		✓
Breather IP66 Ex eb, for auxiliary terminal box	Q77	-		✓
Auxiliary terminal box in cast iron Ex db-design	V43	-		✓
Auxiliary terminal box in cast iron Ex eb-design	W72	-		✓

1.7.18 Main terminal box & options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Main terminal box & options				
Terminal box on right hand side (view onto DE)	K09	✓	✓	✓
Terminal box on left hand side (view onto DE)	K10	✓	✓	✓
Terminal box on top, cables from right hand side (view onto DE)	K11	□	□	□
Terminal box on top, cables from left hand side (view onto DE)	K12	✓	✓	✓
Turn of the terminal box 90° cables from DE	K83	✓	✓	✓
Turn of the terminal box 90° cables from NDE	K84	✓	✓	✓
Turn of the terminal box 180° cables from above – *only possible in case of K09/K10*	K85	✓	✓	✓
Undrilled cable gland plate at main terminal box	L01	✓	✓	✓
Terminal box enlarged (11kV design)	L59	✓	✓	-
Second main terminal box	L67	✓	✓	✓
Main terminal box on NDE	N85	✓	✓	-
Main terminal box in Ex db-design 3 synthetic terminals max. 11kV	Q31	-		✓
Main terminal box in Ex eb-design 6 synthetic terminals for parallel connection	Q32	-		✓
Main terminal box suitable for installation of 3 current transformers differential type	Q33	-		✓
Breather IP66 Ex eb, for main terminal box	Q78			✓
Main terminal box phase separated Ex eb-design max. 11kV - 3 synthetic terminals	V23	-		✓
Main terminal box phase separated Ex eb-design max. 11kV - 6 synthetic terminals for increased short circuit	V24	-		✓
Main terminal box in Ex db-design - 6 terminals for integrated star point	V44	-		✓
Euromold main terminal box with connector 3 terminals	V48	-		✓
Euromold main terminal box with connector 6 terminals	V49	-		✓
Main terminal box phase separated Ex eb-design max. 6.6kV, 3 synthetic terminals	V50	-		✓
Main terminal box phase separated Ex eb-design max. 6.6kV, 6 synthetic terminals	V51	-		✓
Main terminal box phase segregated Ex eb-design max. 6.6kV, 3 synthetic terminals	V52	-		✓
Raychem heat shrink caps for terminals in main terminal box (phase insulation)	V53			✓
Special large Ex db main terminal box (max. 13.8kV, gas group IIB + H2) including lightning arrestors and surge capacitors	V63	-		✓
Separate Ex db terminal box (max. 6.6kV) including lightning arrestors und surge capacitors	V64	-		✓

1.7.19 Neutral point terminal box & options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db IC411
Neutral point terminal box & options				
Neutral-point terminal box – standard, max. 6.6kV	L55	✓	✓	✓
Neutral-point terminal box – standard, max. 11kV	L56	✓	✓	✓
Neutral-point terminal box, max. 6.6kV, 6 terminals	L57	✓	✓	-
Neutral-point terminal box, max. 6.6kV, for installing current transformer (without current transformer)	L58	✓	✓	-
Neutral-point terminal box Ex eb phase separated - 3 synthetic terminals - 11kV	Q38	-		✓
Neutral-point terminal box Ex eb phase separated - 6 synthetic terminals - 11kV	Q72	-		✓
Breather IP66 Ex eb, for neutral-point terminal box	Q79			✓
Neutral-point terminal box Ex db up to 6.6kV - 3 synthetic terminals	V38	-		✓
Neutral-point terminal box Ex db up to 11kV - 3 synthetic terminals	V39	-		✓
Neutral-point terminal box Ex db - provisioned for 3 window type current transformers	V40	-		✓
Neutral-point terminal box Ex eb phase segregated - 3 synthetic terminals max. 6,6kV	V41	-		✓
Neutral-point terminal box Ex eb phase segregated - 6 synthetic terminals max. 6.6kV	V42	-		✓

1.7.20 Fittings for main and neutral point terminal boxes

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Fittings for main and neutral point terminal boxes				
Cable entry frame MCT	M59	✓	✓	✓
3 pieces of current transformers type 4MA72	T26	✓	✓	-
3 current transformers "window self-balance type" in Ex db terminal box with attached main terminal box	V27	-		✓
3 units ring core current transformer - *for use in neutral point terminal box V40*	V57			✓
Partial discharge monitoring - inductive; without evaluation unit and commissioning	V59			✓
Partial discharge monitoring - capacitive; without evaluation unit and commissioning – *IRIS couplers*	V60	o.r.	o.r.	✓

1.7.21 Name plates

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Name plates				
Second rating plate separately	K31			✓
Engraved tag plate fixed on terminal box	V96			✓
Second rating plate installed in terminal box	W47			✓
Warning plates in other languages than German or English; other plates according SN66020	W49			✓
Additional plate for customer data	Y82	•	•	•

1.7.22 Painting systems

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Painting systems				
Outdoor use with high salinity or areas with almost continuous condensation (corrosive category C5-M/C5-I)	E81	o.r.	o.r.	✓
Outdoor use with moderate salinity (corrosive category C4)	E82	o.r.	o.r.	✓
Outdoor use with low salinity (corrosive category C3)	E83	o.r.	o.r.	✓
Special paint finish, standard paint RAL 7030	K26	✓	✓	-
Special paint finish according to corrosivity category C3, 180 µm	K73	✓	✓	
Special paint finish according to corrosivity category C4, 240 µm	K74	✓	✓	
Special paint finish according to corrosivity category C5-I (300µm)	K75	✓	✓	
Special paint finish according to corrosivity category C5-M (320µm)	K76	✓	✓	
Indoor use in sulfurous atmosphere	M06	o.r.	o.r.	✓
2 metal test sheets (100x150mm) with paint layer for special paint inspection	V08	o.r.		✓
Coating system N08 - 110µm (C3-medium)	V09	o.r.		□
Coating system N14A - 170µm (chemical industry + on-shore, C5-industrial climate)	V10	o.r.		✓
Coating system Z21/J08 - 210µm (offshore, C5M-M)	V11	o.r.		✓
Special offshore painting S16 related to NORSOK M501 (C5M-high) with comments and deviations	V12	o.r.		✓
Coating system Z21/J08 - 300µm (offshore, C5M-high)	V19	o.r.		✓
Paint colors according Munsell or British Standard	Y50			•
RAL colors different from catalog	Y51			•
Standard coating in RAL1004/1018/2000/2004/5009/5010/5012/5015/6003/6011/7000/7011/7031/7038/9002	Y53	•	•	•
Special coating in RAL1004/1018/2000/2004/5009/5010/5012/5015/6003/6011/7000/7011/7031/7038/9002 - *special coat system not included!*	Y54	•	•	•

1.7.23 Warranty

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db IC411
Warranty				
Extension of the liability for defects to a total of 24 months (2 years) from date of delivery	Q80	✓	✓	✓
Extension of the liability for defects to a total of 30 months (2.5 years) from date of delivery	Q81	✓	✓	✓
Extension of the liability for defects to a total of 36 months (3 years) from date of delivery	Q82	✓	✓	✓
Extension of the liability for defects to a total of 42 months (3.5 years) from date of delivery	Q83	✓	✓	✓
Extension of the liability for defects to a total of 48 months (4 years) from date of delivery	Q84	✓	✓	✓
Extension of the liability for defects to a total of 60 months (5 years) from date of delivery	Q85	✓	✓	✓

1.8 Marine applications

General

SIMOTICS HV C motors for marine applications have been designed for below-deck operation on ships.
If the motors are intended for on deck operation or for offshore applications, then these must be explicitly ordered using an additional order code.
The reason for this is that in these cases special measures are required.

The thermal utilization of the motors is adapted to the generally higher ambient temperatures onboard ships.
If the application demands compliance with additional regulations, such as explosion protection, the appropriate motor series must be chosen.

The motors onboard ships are subdivided into three importance categories by the marine classification societies in collaboration with customers, depending on the field of application:

- Essential Service for Propulsion or also Primary Essential Service
- Essential Service or also Secondary Essential Service or Important Service
- Non-Essential Service or Non-Important Service

As the assignment of a drive to one of the importance categories has a direct impact on the scope of the marine options, this must be known when ordering the motor.

Table 1-6 Services of the motor manufacturer, associated with the categories

	Essential Service for Propulsion	Essential Service	Non-Essential Service
Typical applications	Propeller drive, thruster (if used as main drive/declared as propulsion)	Thrusters, lateral thrust units, anchor winches, bilge and ballast pumps, fire-fighting pumps	Pumps for service water
Version	In accordance with the regulations of the classification society		In accordance with ambient conditions of the classification society
Acceptance test certificate	Acceptance test certificate 3.2 according to EN10204		Acceptance test certificate 3.1 according to EN 10204[1)]
Individual acceptance by classification society	Will be performed. Motor is assigned an individual certificate of the classification society.		Not necessary
Ordering several identical motors	Differentiation between the first motor and additional ones must be realized when ordering using an order code.		No distinction
Rating plate data	Information about ambient conditions of the classification society		
Stamp of the classification society	Stamp on the shaft[2)] and enclosure		No stamp

1) Certificate is not stipulated by the classification society but it is issued according to the internal quality standards within the scope of a routine test.
2) If the classification society supervises construction.

Table 1-7 Ship building societies

Society	Abbreviation	Location
American Bureau Of Shipping	ABS	USA
Bureau Veritas	BV	France
China Classification Society	CCS	China
DNV GL Maritime	DNV GL	Norway/Germany
Korean Register	KR	Korea
Lloyds Register	LR	UK
Nippon Kaiji Kyokai	NK	Japan
Russian Maritime Register of Shipping	RMRS	Russia
Registro Italiano Navale	RINA	Italy

Benefits

The marine motors offer the user a number of advantages and benefits:

- Cast iron and steel versions can be supplied for corrosive atmospheres especially for high humidity levels and salt laden air
- Increased corrosion protection using specially designed paint finishes is available
- Certified marine motors can be supplied for use in areas to be protected against explosion
- In depth know-how regarding customer requirements
- Worldwide service network with 24-hour service hotline for motors and converters

Application

Our marine motors are designed for use onboard ships (installed below deck or on deck)

Applications onboard ships as main and auxiliary drives below deck, e.g.:

- Fans (air conditioning, refrigeration plants)
- Pumps (for fire-extinguishing water, fuels, oils)
- Winches (anchor winches, warping winches, lifting gear)
- Compressors
- Bow thruster drives
- Main propulsion drives
- Ex motors for hazardous zones

If marine motors are to be used on deck in especially corrosive atmospheres or in offshore applications, then they must be additionally upgraded to meet these more stringent conditions.

Typical applications are:

- Coastal areas, e.g. oil rigs, drilling ships
- Dynamic positioning drives for platforms
- Pumps

Offshore versions must be specifically ordered, as they require special measures.

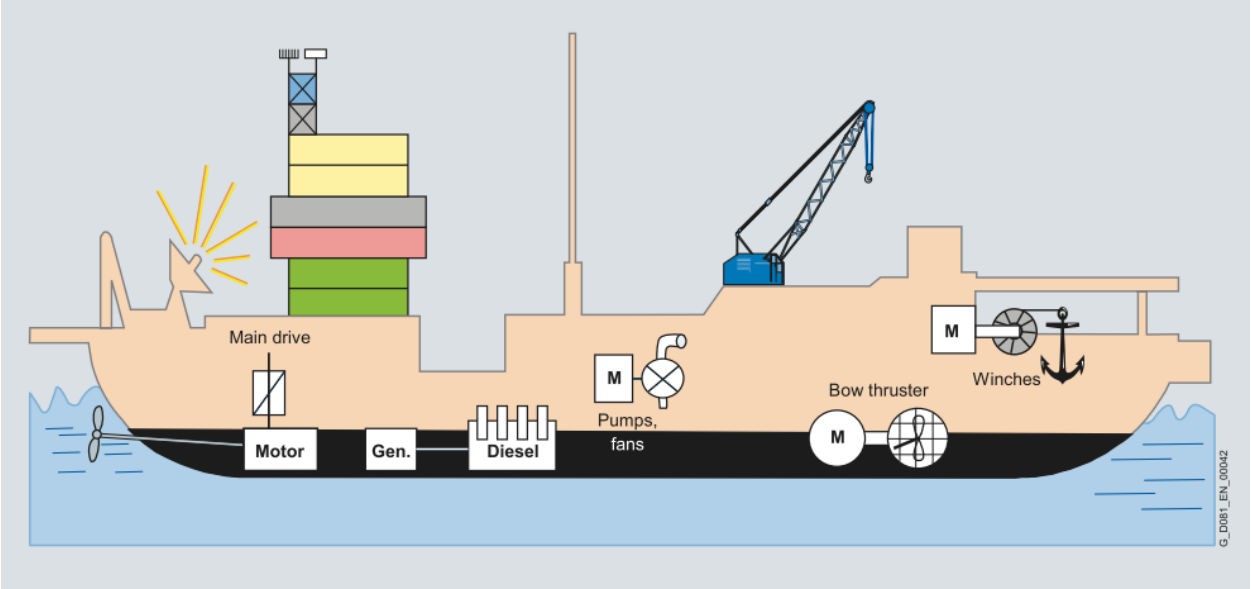

Fig 1-2 Typical areas of application

Technical Data

Table 1-8 Regulations of the individual classification societies for motors

Class. society	Coolant temperature KT		Admissible temperature rise limit according to the classification society Temperature class			Rated power limit individual accept. test	Construc-tion super-vision mandatory
	Water-cooling °C	Air-cooling °C	130 (B) K	155 (F), P_{rated} < 5MW K	155 (F), P_{rated} ≥ 5MW K	kW	
ABS	32	45	70	95	90	≥ 100	-
BV	32	45	75	100	95	≥ 100	≥ 500 kW
CCS	32	45	75	100	95	All	All
DNV GL	32	45	75	100	100	≥ 300	-
KR	32	45	75	100	95	≥ 7.5	-
LR	32	45	70	95	90	≥ 100	≥ 100 kW

SIMOTICS HV C motors for marine applications must be ordered with the classification-specific options.

This ensures that both, the mechanical design of the motor, and the tests are performed exactly in accordance with the instructions provided by the respective classification society.

There are four categories of classification-specific options:

1. **Design options** define the marine-compatible technical design in accordance with the definitions of the classification society
2. **Certification options** define the scope of the test certificates
3. **Test options define** the scope of the individual tests
4. **Additional options** for deviations and special conditions: specify the customer's request for participation in the tests at the factory, or define coolant temperatures that differ from the requirements of the classification society (additional plain text required)

The options of the importance categories listed above are combined with each other depending on the class of importance, classification society and other conditions.

If motors are to be designed according to the specifications of several classification societies, a special inquiry is necessary.

Motors for Non-Essential Services

The technical design is in accordance with the ambient operating conditions specified by the classification society. One of the marine design options X00, X01, X12[1)], X03, X04, X05, X06, X07, X08 or X09 must be specified depending on the classification society.

Acceptance inspections are not required.

There is no distinction between ordering an individual motor or several ones.

Table 1-9 Order codes for Non-Essential Service marine motors SIMOTICS HV C

Non-Essential Service	Options according to the classification society								
	ABS	BV	CCS	DNV GL	KR	LR	NK	RMRS	RINA
Technical version	X00	X01	1)	X03	X05	X06	X07	X08	X09

1) Non-Essential Service must be handled by CCS just like an essential service.

Motors for Essential Services

The technical design is in accordance with regulations of the classification society: Options X10 to X19.

An acceptance test certificate 3.2 according to EN 10204 and a product certificate of the classification society are provided with each motor.

Depending on the classification society, the test steps are defined by options X30 to X48 for the first motor (even numbers) and X31 to X49 for the additional motors (uneven numbers).

Options J70 to J88 or J71 to J89 define the expenditure for certifying the motor.

Table 1-10 Order codes for Essential Service marine motors SIMOTICS HV C

Essential Service	Options according to the classification society								
	ABS	BV	CCS	DNV GL	KR	LR	NK	RMRS	RINA
Technical version	X10	X11	X12	X13	X15	X16	X17	X18	X19
Certification									
• First motor	J70	J72	J74	J76	J80	J82	J84	J86	J88
• Additional motor	J71	J73	J75	J77	J81	J83	J85	J87	J89
Scope of the tests and presence of representatives of the classification society									
• First motor	X30	X32	X34	X36	X40	X42	X44	X46	X48
• Additional motor	X31	X33	X35	X37	X41	X43	X45	X47	X49
Tests in presence of representatives of the customer (in addition to the inspector of the classification society)	X99								
Conditions deviating from classification requirements must be fulfilled	E80								

Option E80 is used if a different coolant temperature KT is required.

The KT must also be specified in plain text, e.g. KT55.

Motors for Essential Services for Propulsion

The technical design is in accordance with regulations of the classification society:

Options X20 to X29. An acceptance test certificate 3.2 according to EN 10204 and a product certificate of the classification society are provided with each motor.

Depending on the classification society, the test steps are defined by options X60 to X78 for the first motor (even numbers) and X61 to X79 for the additional motors (uneven numbers). Options N40 to N52, or N41 to N59 define the expenditure for certifying the motor.

Table 1-11 Order codes for Essential Service for Propulsion marine motors SIMOTICS HV C

Essential Service for Propulsion	Options according to the classification society								
	ABS	**BV**	**CCS**	**DNV GL**	**KR**	**LR**	**NK**	**RM RS**	**RI NA**
Technical version	X20	X21	X22	X23	X25	X26	X27	X28	X29
Certification									
• First motor	N40	N42	N44	N46	N50	N52	N54	N56	N58
• Additional motor	N41	N43	N45	N47	N51	N53	N55	N57	N59
Scope of the tests and presence of representatives of the classification society									
• First motor	X60	X62	X64	X66	X70	X72	X74	X76	X78
• Additional motor	X61	X63	X65	X67	X71	X73	X75	X77	X79
Tests in presence of representatives of the customer (in addition to the inspector of the classification society)	X99								
Conditions deviating from classification requirements must be fulfilled	E80								

Option E80 is used if a different coolant temperature KT is required.

The KT must also be specified in plain text, e.g. KT55.

1.9 Test options

Tests and inspections for SIMOTICS HV C motors

Order code		
Unwitnessed	**Witnessed**	**Test description**
F00	**F01**	Routine test acc. IEC *(sine-wave voltage)*
	F03	Visual test and submission of test certificates
F04	**F05**	Heat run test *Depending on factory: horizontal testing of vertical motors possible*
F14	**F15**	Measurement of no-load characteristic and determination of core and friction losses
F16	**F17**	Measurement of locked-rotor characteristic and determination of losses
F18	**F19**	Measurement of load characteristic *Depending on factory: horizontal testing of vertical motors possible*
F22	**F23**	Dissipation factor test (tan delta) on 2 test coils *(test coils separate F90)*
F26	**F27**	Dissipation factor test (tan delta) on built-in stator winding in test field
F28	**F29**	No-load noise measurement, without noise analysis *Please use option F62/F63 for noise analysis*
F34	**F35**	Recording of current and torque curves during acceleration
F36	**F37**	Determination of moment of inertia by retardation method
F38	**F39**	Overspeed test
F42	**F43**	Conformance test (Wet Test) according to NEMA
F46	**F47**	Measurement of partial discharge
F52	**F53**	Measurement of starting torque and –current *Depending on factory: horizontal testing of vertical motors possible*
F54	**F55**	Measurement of polarization index
F58	**F59**	Vibration analysis
F60	**F61**	Impulse-voltage test or AC test on 2 single test coils *(select test coils extra with F90)*
F62	**F63**	Noise level analysis
	F67	Sleeve bearing inspection
F74	**F75**	Type test for converter fed motors
F82	**F83**	Type test with temperature rise test for horizontal motors acc. to IEC *(sine wave voltage)*
F90		2 Test coils for sample coil test *(test with extra price)*
F92	**F93**	Type test with temperature rise test for vertical motors acc. to IEC *(sine wave voltage)* *Depending on factory: horizontal testing of vertical motors possible*
	F97	Type test, motor acceptance with SINAMICS GM/SM or SINAMICS PERFECT HARMONY converter (max. 3 days! Service technician for converter setting not included!) *on request*

Note

Please see available test descriptions in “Industry Online Support” for more details on tests.

1.10 Documentation

General

The documentation for SIMOTICS HV C is based on the actual equipment, accessories and tests of the motor.
SIMOTICS HV C documentation is provided via the documentation download portal and is triggered at certain point in the order processing.

Pre-documentation DPRV

Pre-documentation package DPRV is provided via the documentation download portal in separate PDF files.

The following is included in the DPRV at least:

- Letter preliminary documentation
- Dimensional drawing (DXF, PDF, STEP)
- Preliminary dimensional drawing text, mechanical data and details
- Electrical data sheet
- For DOL motors: Current/torque curve
- Transient air gap torques
- Foundation loads
- Equivalent circuit diagram
- Thermal limit curve
- Shaft dimensional drawing (for 1NA. only)

Documentation DPOR

Documentation package DPOR is provided via the documentation download portal in separate PDF files.

The following is included in the DPOR at least:

- Letter final documentation
- Final Dimensional drawing (DXF, PDF, STEP)
- Final dimensional drawing text, mechanical data and details
  - Circuit diagrams
  - Terminal box drawings
  - Bearing and lubrication data
  - Setting values e.g. for PT100s
  - Lifting and transport recommendations
- Final electrical data sheet:
  - For DOL motors: Current/torque curve
  - Transient air gap torques
  - Foundation loads
  - Equivalent circuit diagram
  - Thermal limit curve
- Shaft dimensional drawing

Additional documents

See the table below for additional possible documents

Order code	Documentation description
B08	Pre-documentation DPRV subject to approval (hold point)
B16	Photos for approval before shipment
B17	Expediting during production
B21	Documentation on digital storage device
B22	Documentation as email
B23	Documentation on paper 1 set
B27	Run out protocol
B28	Protocol air gap calculation
B29	Protocol painting thickness measurement
B34	Document standard inspection and test plan
B35	Document balancing report
B36	Document test and inspection description
B37	Document load characteristics
B38	Document recommended spare parts
B41	Document instrumentation list
B43	Document production schedule: Generated once
B44	Document production schedule: Updated biweekly
B45	Document production schedule: Updated monthly
B48	Document order-specific inspection and test plan
D00	Documentation language German - standard [1]
D54	Documentation language Czech (operating & safety instructions) [2]
D55	Documentation language Polish (operating & safety instructions) [2]
D56	Documentation language Russian (operating & safety instructions, datasheet, drawing) [2]
D57	Documentation language Japanese (operating & safety instructions) [2]
D71	Documentation language Romanian (operating & safety instructions) [2]
D72	Documentation language Italian (operating & safety instructions) [2]
D73	Documentation language Finnish (operating & safety instructions) [2]
D74	Documentation language Dutch (operating & safety instructions) [2]
D75	Documentation language Turkish (operating & safety instructions) [2]
D76	Documentation language US-English - standard [1]
D77	Documentation language French (operating & safety instructions) [2]
D78	Documentation language Spanish (operating & safety instructions) [2]
D79	Documentation language Portuguese (operating & safety instructions) [2]
D81	Documentation language Norwegian (operating & safety instructions) [2]
D82	Documentation language Hungarian (operating & safety instructions) [2]
D83	Documentation language Swedish (operating & safety instructions) [2]
D84	Documentation language Chinese simplified (operating & safety instructions) [2]
D91	Documentation language Serbian (operating & safety instructions) [2]

[1] Complete documentation available

[2] Please contact headquarters about availability/delivery time of additional documents

Order code	Documentation description
U02	Customer data sheet
U03	Current-starting-time curve
U09	Woehler-Curve
U13	Calculation of the axial magnetic pull
U14	Lateral critical speed analysis
U16	Speed-starting-time-curve
U28	Drawing of thermal motor growth
U36	Painting description
U41	Certificate of conformity for mounting parts
U42	Certificate of conformity for terminal box
U44	Certificate of conformity of IP-protection
U45	Lifting-lug calculation
U54	Load characteristics *select applicable type test e.g. F82/F83/F92/F93/F95/F97/F99*
U59	Acceptance test certificate *select applicable witnessed test*
U60	Shaft material certificate 3.1
U62	Calibration certificates for all PT100s
U69	Manufacturing record book
U74	Material certificate for lamination 2.2
U75	Material certificate for copper 2.2
U82	Protection level certificate
U85	Layer thickness protocol 3.1 of each layer

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