

This information is from:

http://www.der-moba.de/old/Inhalt/Artikelverzeichnis/FAQ_HOAC.html which was originally written in the german language. This has been translated by Dion Stevenson of www.toottoot.co.nz.

I acknowledge the work carried out by the german writers and thank them for their service to Marklin followers world wide.


Measurement Parameters:

- Analogue Motor :: 16Vac at 50Hz
- Analogue with Electronic Control :: 16V * crest factor of 0.9 = 14.4V, 14.4V-3.5V (voltage drop caused by transistors) = 10.9V at 100Hz
- Digital :: Motor voltages calculate to be:
 - :: Transformer voltage = 16V * crest factor of 1.4.
 - :: Central Controller (6021) = 22.4V - 4.2V voltage drop caused by the transistors in the central processing unit provides 18.2V to the track
 - :: Track voltage is affected by the decoder used:
 - :: ::Delta Decoder :: 18.2V * crest factor or 1 (square-wave impulses) – 3.5V voltage drop caused by transistors decoder =14.7V, 75Hz with no regulation
 - :: :: 6090(x) Decoders ::18.2V*Form factor of 1 – 4.2V voltage drop caused by transistors on decoder = 14V, 250Hz with regulation (approximate value for 60901-decoder)
- P1 represents the maximum current draw of the motor (important for the output stages of controlling electronics)
- P2 represents the maximum usable current draw of the motor with field coils???

Note: the following table is based on own measurements and computations!
 Engine-specific losses remain unconsidered.

All information is provided without any guarantee!

What is form factor? :: It is the ratio of RMS (Root Mean Square) of an AC signal to a DC voltage. This ultimately provides a method of calculating an AC voltage to provide same effective power across a known resistive load if DC was used.


MotorType	Number	Analog P ₁ (P ₂)	Electronics P ₁ (P ₂)	Digital P ₁ (P ₂)	Picture	Remarks and examples (NO GUARANTEE!)
Series Motors (Field Coil), Digital with Regulation						
SFCM	200680	22.3W (5.6W)	9.0W (2.3W)	14.5W* (3.6W#)		8 Teeth on the axis 3000 (till 1995), 3001, 3003, 3005, 3031, 3034 (till 1975), 3064, 3074, 3095 ... Field Magent Type 200620, 214010, 214070, 214860, 215330, 401300, 405490

LSFCM	(RE800-11U2)	?	?	?	?	Only in RE 800
LFCM1	202930	29.4W (7.6W)	11.4W (2.8W)	23.1W* (5.8W#)		7 Teeth on the axis 3004, 3007, 3008, 3009, 3011, 3012, 3013, 3014, 3021, ... Field Magent Type 202870, 211440, 217100, 222180, 222200, 250120
LFCM2	205800	26.6W (6.7W)	9.9W (2.5W)	20.4W* (5.1W#)		7 Teeth on the axis G800, GN800, 3009, 3027, 3045, 3046, 3047, 3108 Field Magent Type 202870, 211440, 217100, 222180, 222200, 250120
LFCM3	217450	31.7W (7.9W)	12.0W (3.0W)	25.0W* (6.3W#)		8 Teeth on the axis 3022, 3041, 3043, 3050, 3051, 3052, 3053, 3089, 3094, ... Field Magent Type 202870, 211440, 217100, 222180, 222200, 250120
LFCM4	(TT800-11U3)	29.4W (7.6W)	11.4W (2.8W)	23.1W* (5.8W#)		7 Teeth on the axis only in 3006/TT800 Feldmagnet Type 202870
SLFCM	207070	61.0W (15.2W)	26.5W* (6.4W#)	50.1W* (12.5W#)		10 Teeth on the axis DL800, DT800, ST800, 3010, 3015, 3017, 3025, 30159, 36159 Field Magent Type 207010, 208810

DCM1	231440	13.6W (3.4W)	5.4W (1.4W)	10.8W (2.7W)		7 Teeth on the axis 3000 (since 1996), 3033, 3034 (since 1976), 3084, 3085, 3102, 3489, ... Field Magent Type 231390, 237550, 237560
DCM2	245480	20.6W (5.2W)	8.2W (2.1W)	16.3W* (4.1W#)		7 Teeth on the axis 34155, 34156, 34157, 34158, 34159, 34611, 34612, ... Field Magent Type 231390, 237550, 237560
FDCM	610030	27.9W (7.0W)	11.9W (3.0W)	22.7W* (5.7W#)		7 Teeth on the axis 3502, 3504, 3553, 3557, ... Feldmagnet Type 231390
Rotors used with Permanent Magnets, Digital with regulation						
SFCM	200680	§	18.6W* (4.6W#)	14.8W* (3.7W#)		8 Teeth on the axis 8303, 8398, ... Permanentmagnet 220450
LFCM1	202930	§	19.2W* (4.8W#)	17.2W* (4.3W#)		7 Teeth on the axis 8373, ... Permanentmagnet 220560

LFCM2	205800	§	16.7W* (4.2W#)	11.5W* (2.9W#)		7 Teeth on the axis 8345, 8346, 8347 Permanentmagnet 220560
LFCM3	217450	§	25.0W* (6.3W#)	24.2W* (6.1W#)		8 Teeth on the axis 3722, 8322, 8389, 8394, ... Permanentmagnet 220560
DCM1	231440	§	7.7W (1.9W)	6.9W (1.7W)		7 Teeth on the axis 8342, 8317, 8313, 8306, ... Permanentmagnet 235690
DCM2	245480	§	15.7W* (3.9W#)	13.8W* (3.5W#)		7 Teeth on the axis 8360, ... Permanentmagnet 235690
FDCM	610030	§	34.7W* (8.7W#)	38.2W* (9.6W#)		7 Teeth on the axis Permanent magnet 235690

DDCM1	386820	§	0.8W& (0.2W&)	6.9W (1.7W)		7 Teeth on the axis 3701, 3702, 3704, 3710, ... Permanent magnet 389000, 449390
DDCM2	210888	§	0.8W& (0.2W&)	6.9W (1.7W)		8 Teeth on the axis fünfpoliger DC- Motor, 60903/4-Ersatz für SFCM/LFCM3 Permanent magnet 210882
DDCM3	214118	§	0.8W& (0.2W&)	6.9W (1.7W)		8 Teeth on the axis Five Pole DC-Motor, 60904 replacement for LFCM1,2,4 Permanentmagnet 210882
DDCM4	306602	§	0.8W&? (0.2W&?)	6.9W? (1.7W?)		8 Teeth on the axis Five Pole DC-Motor, DDCM with ball bearing for VT11.5 Permanent magnet 306605
FH1319-12S	602620	§	6.5W (1.6W)	6.1W@ (1.5W@)		Bell Motor 3311, 3411, 3511, 3513, 3514, 3611, 3613, 3614, 3711, 34112, 37112, ...

Brushless Synchronus Motor (Permanent Magnet)						
Sinus-Motor		§	5W	8W?		brushless synchronous motor
(?????)			(3W?)	(5W?)		39103, 39370, ...
§ Engine without electronics in the adaptive command system not operable						
& Engine is operated also in the analog enterprise with regulation, data for 6090 electronic						
* Use with standard Decoder not possible						
# Use with standard Decoder not possible						
@ Electronics without regulation in the digital environment						