SELECTION DIAGRAMS

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The operational characteristics of the HEINZMANN disc motors are best illustrated through motor diagrams. They enable the ideal motor variant to be selected to suit a particular application. The procedure for this is described below.

HEINZMANN offers a wide range of disc motor variants. You can access the full range of selection diagrams from our home page:
www.heinzmann-electric-motors.com.

HOW TO USE THE SELECTION DIAGRAMS

Each selection diagram consists of 2 sub diagrams.

The upper diagram in each case shows these characteristics:

- Speed - Torque (blue wide)
- Current - Torque (red narrow)

The lower diagram in each case shows these characteristics:

- Output - Torque (turquoise wide)
- Efficiency - Torque (orange narrow)

The characteristics are shown for several voltages.

For overview purposes, the characteristics for the current and efficiency show only the lowest and the highest practical voltage (in this example, 36 V and 72 V). Characteristic values for voltages in between (in this instance, 48 V and 60 V) must be estimated.

The area highlighted in white on the diagram represents the safe operating range for the S1 operation of an uncooled motor mounted to a sufficiently sized cooling area. The wide red line represents the limit for a power loss that is just on the borderline (in this example 75 W).

The section highlighted in light grey in the diagram represents the range for which additional cooling measures are required to operate motors. Without them this operating range must be avoided. Depending on the type of motor and the winding design, there is a borderline for the maximum permissible speed (ngr). The relevant value is also specified in case it does not coincide with the borderline for power loss.

The diagrams are valid without exception for the operating temperature status, based on:

- Armature temperature ~125 °C
- Magnet temperature ~105 °C
- Ambient temperature 25 °C

Application example:

Given:	Voltage	U = 48 V
	Torque	M = 115 Ncm
Required:	Speed n	
	Current I	
	Output P	
	Efficiency η	

Readings in upper diagram:

- Starting from M = 115 Ncm, go vertically (1) go to the speed characteristic for U = 48 V. Intersecting point A is on the borderline, i.e. still in the permitted area.
- From A, go left horizontally (2) to the left to the speed scale and then read off the relevant speed (here: ~2800 rpm).
- Continue from A vertically into the range between the two current characteristics (between 36 V and 72 V) and estimate point B.
- From B, go right horizontally (3) to the right to the current scale and then read off the relevant amperage (here: ~8.7 A).

Readings in lower diagram:

- Starting from M = 115 Ncm, go vertically (4) go to the output characteristic for U = 48 V. Intersecting point C is also on the borderline, i.e. still in the permitted area.
- From C, go left horizontally (5) to the left to the output scale and then read off the relevant output (here: ~340 W).
- Continue from C vertically into the range between the two efficiency characteristics and estimate point D.
- From D, go right horizontally (6) to the right to the efficiency scale and then read off the relevant efficiency (here ~81 %).

Unknown values can be determined for other given variables in the same manner.

Additional example:

Appointed:	Speed n = 2000 rpm Torque M = 120 Ncm = 1.2 Nm (i.e. P = 0.104 • M • n = 250 W)
Required:	The relevant required operating voltage
Result:	U ≈ 36 V