



## 6.12 Torque limit curves for DRS, DRE, DRP motors operated on an inverter

### Thermally approved torque

Note thermally approved torque in project planning for operation of DR asynchronous AC motors with inverter. The following factors determine the thermally permitted torque:

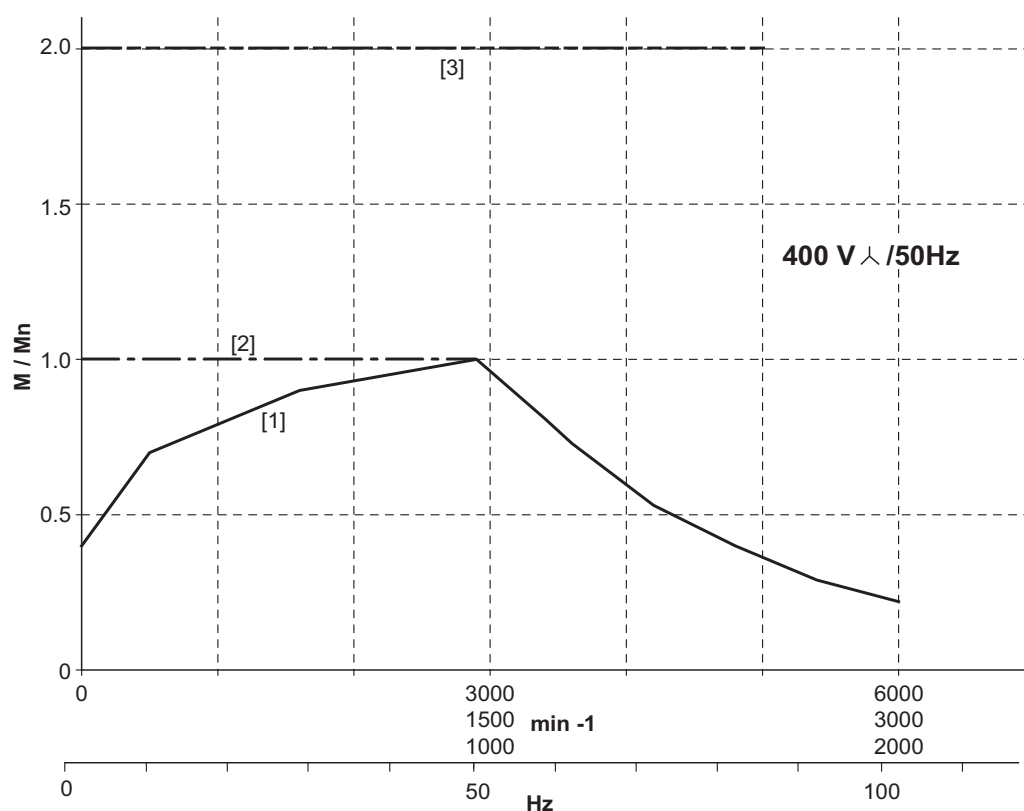
- Duty cycle
- Type of cooling: Self-ventilation or forced cooling
- Base frequency:  $f_{base} = 50 \text{ Hz}$  (400 V  $\Delta$ ) or  $f_{base} = 87 \text{ Hz}$  (230 V  $\Delta$ )

Use the torque limit curves to determine the thermally permitted torque. The projected, effective torque has to be less than the limit curve value. The following illustration shows the limit curves of 4-pole asynchronous DR AC motors with  $f_{base} = 50 \text{ Hz}$  and  $f_{base} = 87 \text{ Hz}$ . The following peripheral conditions apply to the shown limit curves:

- Duty type S1
- Supply voltage of the inverter  $V_{line} = 3 \times \text{AC } 400 \text{ V}$
- Motor in thermal class 155 (F)

$f_{base} = 50 \text{ Hz}$  (400 V  $\Delta$  / 50 Hz)

The following diagram shows the limit curves for operation at  $f_{base} = 50 \text{ Hz}$ . The curves are different for those motors with self-ventilation and those with forced cooling (= optional forced cooling fan).



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- [1] S1 operation with self-ventilation (= without forced cooling fan)
- [2] S1 operation with forced cooling (= with forced cooling fan)
- [3] Mechanical limitations for gearmotors

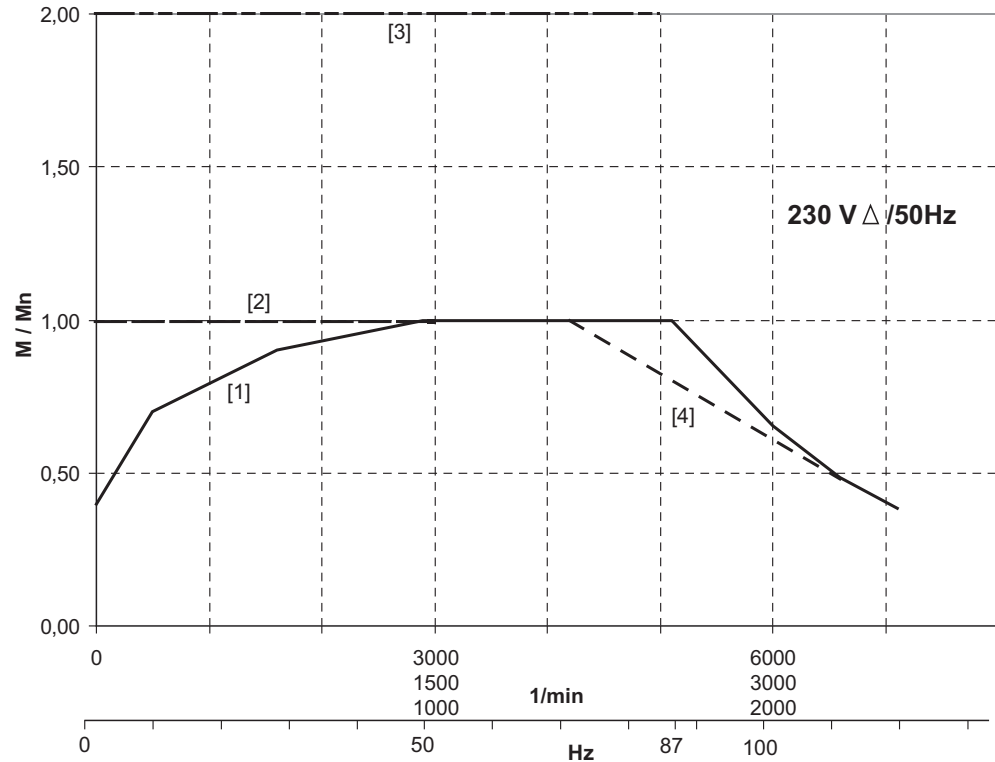


## Project Planning

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$$f_{base} = 87 \text{ Hz (230 V } \Delta / 50 \text{ Hz)}$$

The following diagram shows the limit curves for operation at  $f_{base} = 87 \text{ Hz}$ . The curves are different for those motors with self-ventilation and those with forced cooling (= optional forced cooling fan).



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- [1] S1 operation with self-ventilation (= without forced cooling fan)
- [2] S1 operation with forced cooling (= with forced cooling fan)
- [3] Mechanical limitation for gearmotors
- [4] Limitation for shaft heights 280 – 315