

## Motor protection

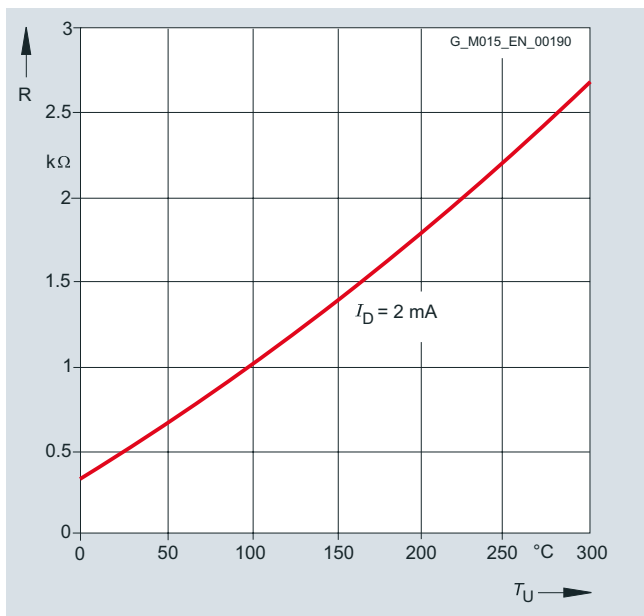
### KTY 84 temperature sensor

Order code

**A23:** 1 x KTY 84-130

**A25:** 2 x KTY 84-130

This sensor is a semi-conductor that changes its resistance depending on temperature in accordance with a defined curve.



KTY 84 temperature sensor

For 1LA8 motors, the PTC thermistors supplied as standard are omitted when ordering with order code **A23**.

For mains-fed operation, the temperature monitoring device 3RS10 that is part of the protection equipment can be ordered separately. For further details, see Catalog LV1.

### Motor protection for explosion-proof motors

The explosion-proof motors for Zones 2, 21 and 22 for converter-fed operation (ordered with order codes **M73**, **M38**, **M39**, **M75** or **M77**) already have PTC thermistors for tripping as standard. For converter-fed operation, thermistors can be additionally ordered for alarm (order code **A10**).

For the explosion-proof motor series of Zone 1 with type of protection "d", order codes **A15** and **A16** are available specially for converter-fed operation:

Order code **A15**: Motor protection with PTC thermistors for converter-fed operation with 3 or 4 embedded temperature sensors for tripping.

Order code **A16**: Motor protection with PTC thermistors for converter-fed operation with 6 or 8 embedded temperature sensors for alarm and tripping.

Order code **M77** (incl. order code **A15**): Design for Zones 1 and 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating.

## Rating plate data for motors operating with frequency converters for Zones 2, 21 and 22

"MICROMASTER DUTY S9" is stamped on the rating plate as standard, i.e. the rating data for the MICROMASTER converter series from Siemens are indicated. For other converter types (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or SIMATIC ET 200S FC), the converter type required must be specified in the order in plain text following the order code **Y68**. This is due to the different degree of utilization of the converter and the resulting derating of the motor.

### Bearing

For converter-fed operation with frame size 225 and above, it is recommended that an "Insulated bearing cartridge" – Order code **L27** is used.

### Ventilation/noise generation

The fan noise can increase at speeds that are higher than the rated speed of self-ventilated motors.

To increase motor utilization at low speeds, it is recommended that forced ventilated motors are used, in particular motor series 1LA5, 1LA7, 1LG4 and 1LG6 with order code **G17** or motor series 1PQ8.

### Insulation

For converter-fed operation with the outputs specified in the catalog, the motors are used according to temperature class 155 (F), i.e. in this case neither a service factor >1 nor an increased coolant temperature is possible, that is order codes **C11**, **C12** and **C13** cannot be ordered. Explosion-proof motors for Zones 2, 21 and 22 are utilised in accordance with temperature class 130 (B).

### Supply frequencies larger than 60 Hz

For converter-fed operation with frequencies greater than 60 Hz, special balancing is required for compliance with the specified limit values (plain text: Max. speed).

## ECOFAST motor connectors

In combination with the ECOFAST versions of the MICROMASTER 411 distributed drive solutions, the following motor connectors can be ordered separately:

- ECOFAST motor connector, standard (unshielded connection): Order code **G55**.
- ECOFAST motor connector, EMC (shielded connection): Order code **G56**.  
Shielded motor connection cables must be used for frequency converters and soft starters.

Maximum admissible mains voltage on motor connector: ≤500 V

### Ordering example:

Selection criteria	Requirement	Structure of the Order No.
Motor type	Standard motor with high efficiency (EFF1), IP55 degree of protection, aluminum housing	<b>1LA9 000-00000</b>
No. of poles/speed	4-pole/1500 rpm	
Rated output	1.1 kW	
Special voltage and frequency	Star/delta starting for a mains voltage 400 VΔ, 50 Hz <sup>1)</sup>	
Type of construction	IM B3	
ECOFAST connector	Shielded connection	<b>1LA9 090-4KA90 – Z L1U + G56</b>

## Converter mounting

Motor series 1LA7 with standard insulation up to 500 V in parts “Standard motors up to frame size 315 L” and “Fan motors” can be prepared for mounting an MMI (MICROMASTER Integrated). Order code **H15** is required for this purpose.

## Earth brushes for converter-fed operation

Earth brushes are available for converter-fed operation for 1LG4 and 1LG6 motors with order code **M44**. Please contact your local Siemens office for advice.

## Motor series with special insulation up to 690 V

**For motor series 1LA7/5 and 1LG6 with special insulation up to 690 V, the following special versions are generally not possible:**

Description	Order code
With PTC thermistors for alarm for converter-fed operation in Zones 2, 21 and 22	<b>A10</b>
Temperature detectors for tripping	<b>A31</b>
Installation of 3PT100 resistance thermometers	<b>A60</b>
Installation of 6PT100 resistance thermometers in stator winding	<b>A61</b>
Temperature class 155 (F), used acc. to 155 (F), with service factor (SF)	<b>C11</b>
Temperature class 155 (F), used acc. to 155 (F), with increased output	<b>C12</b>
Temperature class 155 (F), used acc. to 155 (F), with increased coolant temperature	<b>C13</b>
Temperature class 180 (H) at rated output and max. CT 60 °C	<b>C18</b>
Increased air humidity/temperature with 30 to 60 g water per m <sup>3</sup> of air	<b>C19</b>
Increased air humidity/temperature with 60 to 100 g water per m <sup>3</sup> of air	<b>C26</b>
Stamping of Ex nA II on VIK rating plate	<b>C27</b>
Coolant temperature –40 °C to +40 °C for EX motor	<b>D19</b>
Design according to UL with “Recognition Mark”	<b>D31</b>
Canadian regulations (CSA)	<b>D40</b>
ECOFAST motor connector Han-Drive 10e for 230 VΔ/400 VY	<b>G55</b>
ECOFAST motor connector EMC Han-Drive 10e for 230 VΔ/400 VY	<b>G56</b>
Prepared for mounting the MICROMASTER Integrated frequency converter	<b>H15</b>
Mounting of explosion-proof rotary pulse encoder for use in Zones 2, 21, 22	<b>H86</b>
VIK design (comprises Zone 2 for mains-fed operation, without Ex nA II marking on rating plate)	<b>K30</b>
Anti-condensation heater, Ex. 115 V	<b>M14</b>
Anti-condensation heater, Ex. 230 V	<b>M15</b>
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for mains-fed operation	<b>M34</b>
Design for Zone 22 for non-conducting dust (IP55) for mains-fed operation	<b>M35</b>
Design for Zone 21, as well as Zone 22 for conducting dust (IP65) for converter-fed operation, derating	<b>M38</b>
Design for Zone 22 for non-conducting dust (IP55) for converter-fed operation, derating	<b>M39</b>
Design for Zone 2 for mains-fed operation Ex nA II T3 acc. to IEC/EN 60079-15	<b>M72</b>
Design for Zone 2 for converter-fed operation, derating acc. to IEC/EN 60079-15	<b>M73</b>
Design for Zones 2 and 22, for non-conducting dust (IP55), for mains-fed operation	<b>M74</b>
Design for Zones 2 and 22, for non-conducting dust (IP55), for converter-fed operation, derating	<b>M75</b>
Mounting of explosion-proof separately driven fan Ex nA for use in Zone 2	<b>M95</b>
Mounting of explosion-proof separately driven fan II 2D for use in Zone 21	<b>M96</b>
Mounting of explosion-proof separately driven fan II 3D for use in Zone 22	<b>M97</b>
Temperature class 155 (F), used acc. to 155 (F), other requirements	<b>Y52</b>
Alternative converter (SIMOVERT MASTERDRIVES, SINAMICS G110, SINAMICS S120 or ET 200S FC)	<b>Y68</b>

<sup>1)</sup> Note: Voltage code **9** with order code **L1U** must be selected due to the 400 V voltage. With voltage code 6 (= 400 VΔ/690 VY, 50 Hz), temporary voltage peaks of 690 V can arise which can cause faults on the ECOFAST connectors.