



Instruction sheet 773 2104

Squirrel Cage Motor

Asynchronous motor, Induktion motor

1	Aluminium base with glides
2	Type of construction B3
3	Connection box
4	Front panel with 4 mm safety plugs
5	Coupling
6	Fan

Safety instructions



The machines must not be put into operation if

- the machines show any visible damage.
- the casing cover or parts of it are missing.
- the machines has been dropped.
- the cables are damaged..
- shaft ends or other rotating parts can be touches.

The machines must not be used

- in damp or wet locations..
- in locations containing flammable gases, vapours or dust..
- in explosion-risk locations.
- outdoors.

Avoid

- impacts.
- touching the machine and its operating elements with wet hands..
- the ingress of liquids.
- overloads and short circuits.
- heat concentration due to covered ventilation slots, ventilation holes and signal lamps fire hazard!
- opening the machine when it is connected to power.
- contacting live parts.

Make sure that

- a residual current device has been connected in series.
- the machine is only cleaned when it is off-circuit.
- only original spare parts are used if repair work has to be carried out.

Only use

- plug-in connections with protection against electric shock.
- undamaged experimental cables.
- shock-proof equipment.

Electrical work and repairs must only be carried out by our service team or by an authorised electrical expert

Changes to the circuit or of any other kind are not permitted

The ELWE equipment, systems and installations correspond to the harmonised or national standards EN-61010-1, EN-60204, DIN 57789 Part 100, EN-292, EN-982, EN-983 and the relevant product standards, depending on their functional use.

The protection requirements specified by the law of electromagnetic compatibility (EMC) are fulfilled by the requirements of the harmonised standards EN-61326-1, EN-50081, EN-50082 and EN-55011.

The operator of the experimental set-ups is responsible for observing the protection requirements specified by the EMC law. The experiments must only be conducted by skilled teachers and trainers.

1 Description

Features of the electrical machines of the 0.3 kW class

- The machines are of solid, industrial B3 construction.
- All machines comply with the updated international standards, e.g. DIN VDE 0530IEC EN 60034.
- All machines guarantee maximum possible safety, e.g. by the construction of most machines in accordance with IP21 protection and isolation class B. The temperature sensors embedded in the stator windings enable circuit designs for protection against thermal overload.
- The machines are connected to each other via a machine bench and mechanically fixed to it. The machine bench consists of the same stable aluminium profile as the machines.
- All machines are mounted on solid continuous cast aluminum profiles. This allows them to be connected quickly and safely and to be handled, transported and stored without any problems.
- All machines are designed with one shaft end and coupling. Consequently, even complex machine sets can be built up individually and without problems. All connections and connecting cables remain at the top of the connection box.
- Rotating shaft ends are covered by an attachable protective yoke. The brake or servo machine will not operate if the protective yoke is not plugged on.
- Type plate is located on the connection box. On multi-function machines, there is a nameplate for each function. As the machines have the characteristic curve shape of their type, the knowledge gained in experiments can therefore also be transferred to machines with very high power ratings.
- The modular system setup guarantees a selection according to the respective didactic objectives. Later extension possibilities in accordance with technical progress are ensured by the consistent product maintenance of LD.
- Existing machines from other systems, also from other manufacturers, can be adapted at low cost to LD's modern continuous cast aluminium profiles and fitted with new couplings.

Front view of the connection panel of the 7732104 squirrel-cage motor

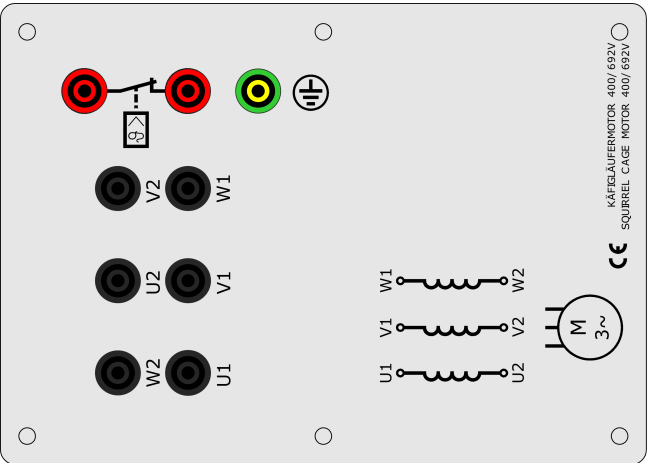


Fig. 1: Front view of the connection panel of the 7732104 squirrel-cage motor.

Rating plate

LD DIDACTIC GmbH											
Typ:		7732104		1							
2		Y 400		V		3a		0,76 / 1,32		3b	
4a		0,25		4b		kW		cos φ		5	
6a		1350		6b		U/min		7		50	
8											
Is.Kl. B		IP		20		12		12345678		VDE 0530	

Fig. 2: Rating plate from 7732104

1	Type: catalogue number and function for machines with more than one rating plate
2	Circuit / Rated voltage
3a	Rated current as motor in star connection Y
3b	Nennstrom als Motor in Dreieckschaltung Δ
4a	Rated power as motor (mechanical power)
4b	Rated power as generator (electrical power)
5	Rated power factor
6a	Rated speed as motor
6b	Rated speed as generator
7	Rated frequency
8	Rated exciter voltage
9	Rated exciter current
10	Insulation class
11	IP-Class
12	Continuous production number

Data not mentioned on the type plate.

- Efficiency 0.633
- Moment of inertia 0.00088 kgm² ±10 %.

All nominal data of a machine are based on the following nominal data.

- Ambient temperature 40 °C
- Installation altitude 1000 m
- Winding temperature 95 °C

The winding temperature often cannot be reached because the ambient temperature of 40 °C and the installation altitude with its low air pressure are not available in the laboratory. At an ambient temperature of 20...25 °C, a winding temperature of approx. 70 °C can be reached.

1.1 Induction Motor

- Nominal power 0.25 kW
- Nominal voltage 400 /230 V Y/Δ
- Nominal current 0.76 / 1.32 A
- Nominal frequency 50 Hz
- Nominal powerfactor 0.79
- Design: 4-pol
- Nominal speed 1350 min⁻¹

The squirrel cage motor connection in the star for clockwise rotation

Connection in delta is only possible with a mains voltage of 133 V / 230 V.

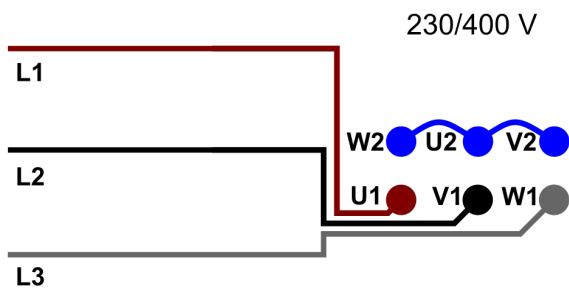


Fig. 3: The squirrel cage motor connection in the star for clockwise rotation

The squirrel cage motor connection in the star for counterclockwise rotation

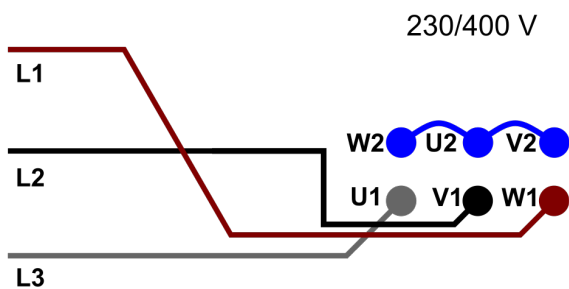


Fig. 4: The squirrel cage motor connection in the star for counterclockwise rotation

The squirrel cage motor connection in the delta for clockwise rotation

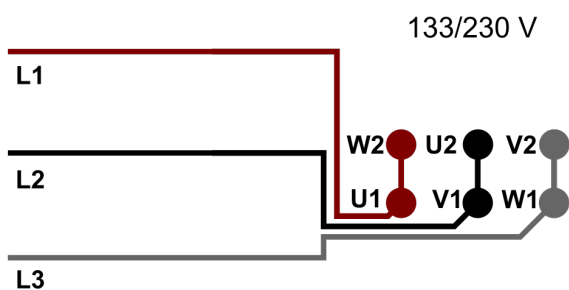


Fig. 5: The squirrel cage motor connection in the delta for clockwise rotation

The squirrel-cage motor connection in the delta for counterclockwise rotation

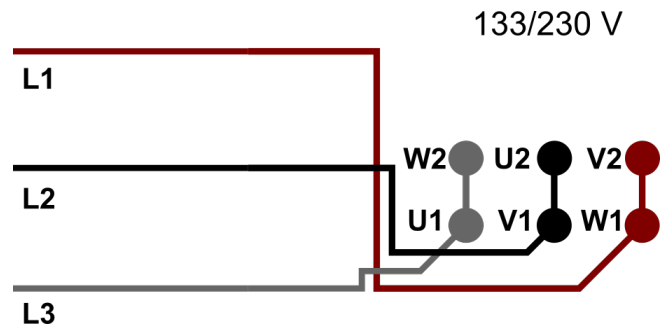


Fig. 6: The squirrel-cage motor connection in the delta for counterclockwise rotation

1.2 Winding resistances

Winding resistances are strongly dependent on temperature. This can only be measured if they have not been loaded for a long time. Then they should assume room temperature. Machines are calculated for an ambient temperature of 40 °C. At nominal operation, the windings should reach a temperature of 90 °C. These temperatures cannot be reached at room temperatures of about 20 °C.

Stator winding

	R_{U1U2} / Ω	R_{V1V2} / Ω	R_{W1W2} / Ω
Resistance at 22 °C	42.48	42.63	42.61
Resistance at 70 °C	50.10	50.28	50.25
Resistance at 90 °C	53.41	53.60	53.58

2 Disposal



Electrical and electronic products must not be disposed of with household waste. Dispose of the product in accordance with the applicable legal regulations.