AMKASYN

VARIABLE SPEED DRIVES

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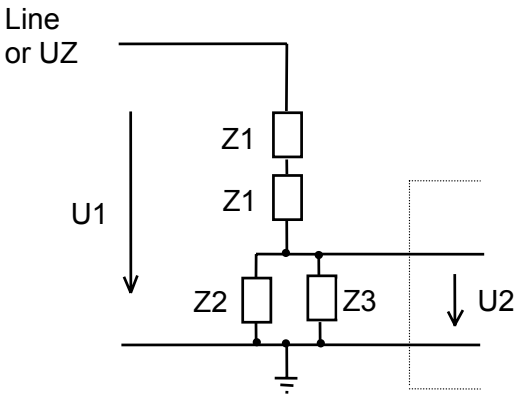
Insulation resistance and high-voltage test for units of the AZ, AW and KU series

1. Insulation resistance

The AZ / AW modules and the single KU units are equipped with a non-floating circuit for acquiring and monitoring the line or DC bus voltage. This is designed as protective impedance according to prEN 50178 (VDE 0160) Oct. 96 Chapter 5.2.8 (see also VDE 0160 May 88 Chapter 5.5.2).



Example: AZ10 Line acquisition
U1 = Line - PE voltage
= 230VAC
Z1 = 200kΩ
Z2//Z3 = 20kΩ // 13.79kΩ
= 8.16kΩ

Condition: U2 ≤ 25 VAC
is fulfilled

The built-in protective impedances reduce the measurable insulation resistance of the units.
The power supply modules AN10F ... AN60F contain discharge resistors parallel to X and Y capacitors. With the power terminals short-circuited among one another, a measurable insulation resistance to PE according to the table below results.
The insulation resistance test serves for detecting insulation faults in the cabling.
In the insulation resistance test of the electrical equipment of machines according to EN 60204-1 (VDE 0113) 1992, AMKASYN and KU units must therefore be separated during the test both on the input side (power supply) and output side (motor).
The insulation resistance can be checked by short-circuiting all power supply side terminals - UZP, UZN, RBP, RBN, L1, L2, L3, L1.1, L2.1, L3.1, L1.2, L2.2, L3.2, U, V, W - with one another and then measuring the resistance to PE.

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Type	Insulation resistance
AN 10F...60F	580 kΩ
AZ 10...60	50 kΩ
AW	200 kΩ
AZ 5	270 kΩ
AW (new) 1)	680 kΩ
KU 6 .. 14	500 kΩ
KU 0.6 .. 1.5	680 kΩ

1) AW (new) : AW 1.3/2.6 ; AW 2.5/5 ; AW 4.5/9

2. High-voltage test

In the high-voltage test for the insulation of AMKASYN units according to EN 60204 (VDE 0113) 1992, the following must be observed (cf. also prEN50178 (VDE 0160) Oct. 96):

- All terminals on the power side - UZP,UZN, RBP, RBN, L1, L2, L3, L1.1, L2.1, L3.1, L1.2, L2.2, L3.2, U, V, W - must be short-circuited with one another in the test for protection of voltage-sensitive components and semi-conductors.
- The units contain fault protection capacitors and must therefore be tested with direct voltage.
- Because of the protective impedances in the unit, a current according to the following table flows during the test: Test voltage: 1000VAC * $\sqrt{2}$ = 1414 VDC Duration: 1 sec.
- AZ 10 ... AZ 60 and AW can be tested only with a test voltage of maximum 900 VDC because of the low protective impedance.

Type	Test current	Test voltage
AN 10F...AN 60F	3 mA	1414 VDC
AZ 10...AZ 60	18 mA	900 VDC
AW	5 mA	900 VDC
AZ 5	6 mA	1414 VDC
AW (new) 1)	2 mA	1414 VDC
KU 6.. 14	3 mA	1414 VDC
KU 0.6...1.5	2 mA	1414 VDC

1) AW (new) : AW 1.3/2.6 ; AW 2.5/5 ; AW 4.5/9

Higher test voltages and prolonging the test duration can lead to damage of the unit (e.g. overload of the protective impedance). Under these conditions, the units must be disconnected during the test.