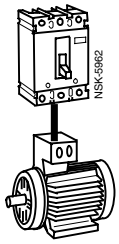
Appendix

20

Glossary

Requirements for circuit-breakers for motor protection



- Inrush immunity:
  - Response threshold of the short-circuit release up to 11 x I_n or
  - Inrush current buffering due to tripping delay (approx. 10 ms to 20 ms)
- Temperature compensation
- Phase-failure sensitivity
- Adjustable trip class for matching the start-up response of the motor
- Thermal memory
  (repeated attempts at starting heat the motor)
- Overload release according to IEC 60947-4-1:
  - **Must not trip** at **1.05 times** load **within two** hours
  - **Must trip** at **1.2 times** load **within two** hours (at 1.15 times load with 2-phase loads).

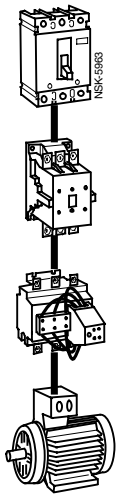
Circuit-breakers for motor protection

Switching

- Motor operating currents
- Short-circuit currents that flow in this load feeder.

When circuit-breakers are used with an adjustable time lag class, they can be matched to almost any motor starting current.

Circuit-breakers for starter combinations



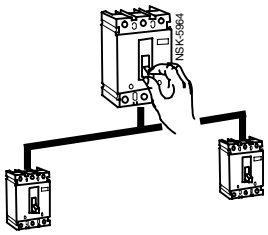
These circuit-breakers are only designed for short-circuit-protection of series-connected equipment and loads, they do not feature overload releases. The short-circuit release is adjustable.

In this case, overload protection must be implemented elsewhere. This can be a simple bi-metal relay or a convenient electronic motor control unit (SIMOCODE) between the load contactor and the load. In the event of a fault, it is then extremely easy to distinguish between an overload (checkback signal of the bi-metal relay) or short-circuit (acknowledgement signal from the circuit-breaker).

If a circuit-breaker with overload protection is chosen instead, the acknowledgement signals from the devices cannot always be clearly distinguished.

For information on the correct assignment of contactors, overload relays and circuit-breakers, please refer to the manual "Fuseless assembly of load feeders",
Order No. E20002-A580-P302-V2 or the relevant tables in the Technical Information LV 1 T.

Non-automatic circuit-breakers



This type of circuit-breaker is used in applications in which different load circuits must be decoupled or connected together. They do not feature overload releases. The short-circuit release is not adjustable.

Current-limiting circuit-breakers


NSE0_01270

This symbol shows the form of the short-circuit current after the circuit-breaker. Because the let-through current of the circuit-breaker is lower than the maximum value of the short-circuit current (dotted line) they are known as current-limiting circuit-breakers.

The load on the series-connected devices, cables and wires is therefore significantly reduced (see the current limiting characteristic).

Requirements for circuit-breakers for system protection


NSE0_00695

- Compliance with IEC 60947-1 and IEC 60947-2 standards:
  - **Must not trip** at **1.05 time** load **within two** hours
  - **Must trip** at **1.3 time** load **within two** hours.
- Usual adjustment range:
  - It is usually not necessary to adjust the overload release;
  - Response threshold of the short-circuit release 1.25 to 10 x I_n or
- A selectivity analysis is necessary.

Circuit-breaker for system protection with permanently set values

They have a permanently set overload release and a permanently set short-circuit release.

Current-limiting.

Example:
Circuit-breaker in outgoing feeder to subdistribution boards or switchboards.

Circuit-breakers for system protection with some permanently set values


NSE0_00015

They have a permanently set overload release and an adjustable short-circuit release.

Current-limiting.

Example:
Circuit-breaker in outgoing feeder to subdistribution boards or switchboards with special requirements for short-circuit releases.

Circuit-breakers for system protection with adjustable values


NSE0_00704

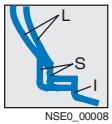
They have an adjustable overload release and an adjustable short-circuit release.

Current-limiting.

Example:
For direct protection of non-motor loads.

Glossary

Circuit-breakers for system protection with adjustable values and short-time delayed release



NSE0_00008

The meaning of the symbols are as follows:

- L: Inverse-time delayed overload release or thermal overload release.
  - If the actual current rises above the value of set operational current (I_r), the circuit-breaker will trip within a certain time.
  - The time of the tripping operation is dependent on the current level.
  - The higher the current, the shorter the tripping delay.
- S: Short-time delayed short-circuit release.
  - The level of short-circuit current (I_{sd}) can be adjusted flexibly.
  - The short-circuit current that flows through the circuit-breaker excites the tripping mechanism (electromagnetic or solid-state).
  - The tripping operation is delayed for the set time (t_{sd}).
  - This means that time-selective grading can be implemented for the circuit-breakers.
- I: Instantaneous short-circuit release.
  - The short-circuit current that flows through the circuit-breaker excites the tripping mechanism (electromagnetic or solid-state).
  - The tripping operation is not delayed.

The value for the I-release (I_i) should be larger than the value for the S-release. In the case of the S-release, if the time (t_{sd}) is set to zero, the S-release responds in the same manner as the I-release, i.e. the tripping operation can be instantaneous, if required.

Example: Circuit-breaker in power distribution with total selectivity.

Circuit-breakers for motor protection with permanently set time lag class


NSE0_01243

They have an adjustable overload release, a permanently set short-circuit release and a permanently set time lag class.

Current-limiting.

Example:
For protecting motors in this starting class.

Circuit-breakers for motor protection with adjustable time lag class


NSE0_00706

They have an adjustable overload release, a permanently set short-circuit release and an adjustable time lag class.

Current-limiting.

With phase-failure sensitivity.

Example:
For the protection of motors of differing starting classes (one standard circuit-breaker for all motors), or for AC loads in hazardous areas (phase-failure sensitivity).

Circuit-breakers for starter combinations


NSE0_00707

They have an adjustable short-circuit release but no overload release.

Current-limiting.

Example:
In applications where a bi-metal relay is connected in series and a separate indication is required for short-circuits (from starter switch) and overloads (from bi-metal relay).

Non-automatic circuit-breakers, current-limiting


NSE0_00708

MCCB:
They have a permanently set short-circuit release but no overload release (VL160X to VL1600).

The let-through current is limited.

Example:
For disconnecting different load circuits.

Non-automatic circuit-breakers


NSE0_00017

ACB:
They have neither electronic trip units nor short-circuit releases (3W.).

Non current-limiting.

Example:
For disconnecting different load circuits.

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Training by the market leader in automation, plant installation and support permits you to make your decisions with certainty and full command. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.

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All training facilities at a glance: search in the worldwide range of courses at leisure, call up all course dates online, utilize the daily updated display of vacant course spaces - and register directly.

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"... the good course documents, competence and flexibility convinced me."
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"... represents effective training, constructive dialogs, and solutions which provide great help."
[Günter Niedermaier, electrical design manager at AMT, Aalen]

Contact

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or let us advise you personally. You can request our latest training catalog from:

Course office, Infoline Germany:
Tel.: +49 (0)1805 / 23 56 11 (0.12 €/Min)
Fax: +49 (0)1805 / 23 56 12

Further documentation

Overview

You will find all the latest information material, such as brochures, catalogs, manuals and operating instructions on low-voltage, controls and distribution on the Internet at:

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We regard product support as just as important as the products and systems themselves. Visit our Support site on the Internet for a comprehensive range of material on SIRIUS, SENTRON and SIVACON, such as

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Standards and approvals

Overview

Verification certificates and characteristic curves

To find the latest overview of the certificates available for our low-voltage controls and distribution products, as well as other technical documentation, please visit our Internet site at:

http://www.siemens.com/lowvoltage/support

Product support: Approvals / Certificates

Product support: Characteristic curves

Quality management

The quality management system of our A&D division complies with the international standard EN ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS and TÜV Management Service GmbH in accordance with ISO 9001. The certificates are recognized in all IQ Net countries.

DQS Registered Certificate Nos.:

Siemens AG
Automation and Drives

- Industrial Automation Systems
  Reg. No.: 001323 QM
- Industrial Communication SIMATIC NET
  Reg. No.: 002613 QM.

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Siemens AG
Automation and Drives

- Low-Voltage Controls
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Certificates

An overview of the certificates available for SIMATIC NET products (CE, UL, CSA, FM, shipping authorizations) can be found on the Internet at:

http://www.siemens.com/simatic-net

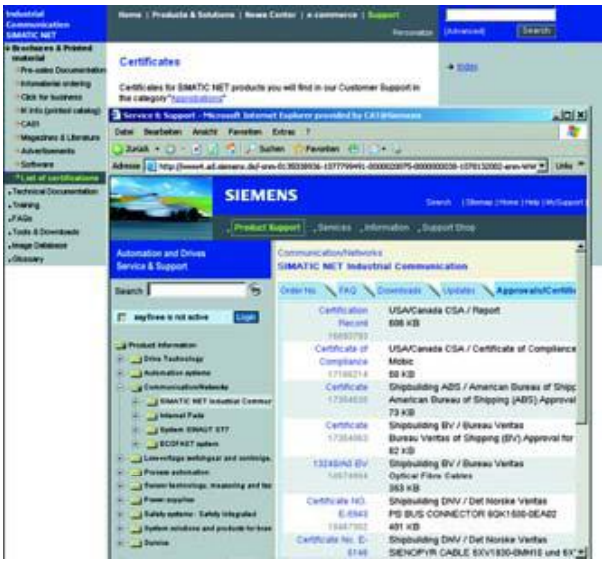
Other certificates for SIMATIC products can be found on the Internet at:

http://www.siemens.com/simatic

These lists are continuously revised and updated and data for products not yet included in the overview are continuously collected and prepared for subsequent editions.

You can find certificates, approvals, verification certificates and characteristic curves at:

Support\Infomaterial\Certificates



or by going directly to the Link Box:

Siemens contacts

Siemens contacts worldwide

At:

http://www.siemens.com/automation/partner

you can find details of Siemens contact partners worldwide responsible for particular technologies.

You can obtain in most cases a contact partner for

- Technical Support,
- Spare parts/repairs,
- Service,
- Training,
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- Product or
- Sector.

By further specifying the remaining criteria you will find exactly the right contact partner with his/her respective expertise.

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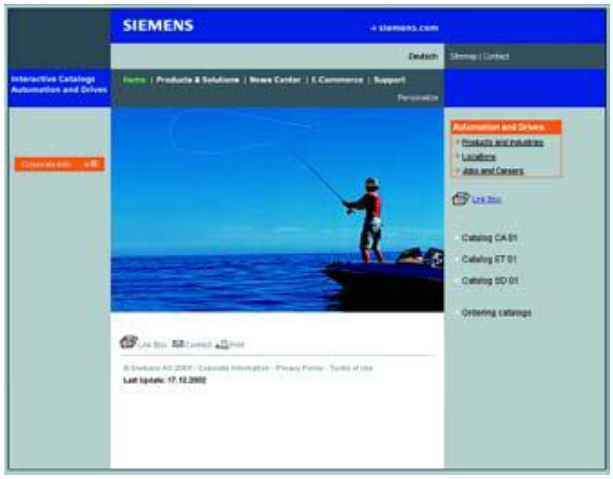
Under the address

http://www.siemens.com/automation

you will find everything you need to know about products, systems and services.

Product selection using the interactive catalog



Detailed information together with convenient interactive functions:
The interactive catalog CA 01 covers more than 80,000 products and thus provides a full summary of the Siemens Automation and Drives product base.

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All information is linked into a user interface which is easy to work with and intuitive.

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2) For country-specific telephone numbers go to our Internet site at:
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Overview

Software types

Software requiring a license is categorized into types.
The following software types have been defined:

- Engineering software
- Runtime software

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This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.
Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

Runtime software

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- Floating license
- Single license
- Rental license
- Trial license

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The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed.
The concurrent user is the person using the program. Use begins when the software is started. A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only one installation of the software.
The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.
One single license is required for each type of use defined.

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A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes.
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Software is constantly being updated.
The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software.

The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

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An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.
The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.
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ServicePacks are used to debug existing products.
ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Automation & Drives supplies software products with and without license keys.
The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).
The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Detailed explanations concerning license conditions can be found in the “Terms and Conditions of Siemens AG” or under
http://www.siemens.com/automation/mall
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Appendix

Subject index

Subject index

Subject index

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In addition to the prices of products which include silver, plump, aluminum and/or copper, surcharges may be calculated if the respective limits of the notes are exceeded. The respective note (e.g. source: German newspaper "Handesblatt" in category "deutsche Edelmetalle" and "Metallverarbeiter") for silver ("verarbeitetes Silber"), plump ("Blei in Kabeln"), aluminum ("Aluminium in Kabeln") and copper ("Elektrolytkupfer", "DEL-Notiz") respectively, of the day the order or rather the on call order is received, is decisive for the calculation of the surcharges.

Surcharges of copper shall be calculated for Drives at a note ("DEL-Notiz") above EUR 225,00 / 100 Kg and for chokes / transformers above EUR 150,00 / 100 kg.

Surcharges shall be charged based on the quantities of the materials which are contained in the relevant products.

Prices are subject to change without prior notice. We will debit the prices valid at the time of delivery.

The dimensions are in mm. Illustrations are not binding.

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  (for customers based in the Federal Republic of Germany)
- 6ZB5310-0KS53-0BA0
  (for customers based outside of the Federal Republic of Germany)

or download them from the Internet
http://www.siemens.com/automation/mall
(Germany: A&D Mall Online-Help System)

Export regulations

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AL	Number of the German Export List. Products marked other than "N" require an export license. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "AL not equal to N" are subject to a European or German export authorization when being exported out of the EU.
ECCN	Export Control Classification Number. Products marked other than "N" are subject to a reexport license to specific countries. In the case of software products, the export designations of the relevant data medium must also be generally adhered to. Goods labeled with an "ECCN not equal to N" are subject to a US re-export authorization.

Even without a label or with an "AL: N" or "ECCN: N", authorization may be required due to the final destination and purpose for which the goods are to be used.

The deciding factors are the AL or ECCN export authorization indicated on order confirmations, delivery notes and invoices.

Errors excepted and subject to change without prior notice.

A&D/VuL/De 17.03.05

Appendix

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Siemens AG
Automation and Drives
Low-Voltage Controls and Distribution
Postfach 48 48
90327 NÜRNBERG
GERMANY

Order No.
E86060-T1002-A101-A5-7600
KG 0306 20.0 E/O 1128 En/ 603011
Printed in Germany

Catalogs of the
Automation and Drives Group (A&D)

Further information can be obtained from our branch offices listed in the appendix or at www.siemens.com/automation/partner

	Catalog
Automation and Drives	
Interactive catalog on CD-ROM and on DVD	
• The Offline Mall of Automation and Drives	CA 01
Automation Systems for Machine Tools	
SINUMERIK & SIMODRIVE	NC 60
SINUMERIK & SINAMICS	NC 61
Drive Systems	
Variable-Speed Drives	
SINAMICS G130 Drive Converter Chassis Units, SINAMICS G150 Drive Converter Cabinet Units	D 11
SINAMICS G110 Inverter Chassis Units	D 11.1
SINAMICS GM150/SINAMICS SM150 Medium-Voltage Converter 0.6 MVA to 28 MVA	D 12
SINAMICS S120 Vector Control Drive System	D 21.1
SINAMICS S120 Servo Control Drive System	D 21.2
SINAMICS S150 Drive Converter Cabinet Units	D 21.3
Asynchronous Motors Standardline	D 86.1
DC Motors	DA 12
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2
SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units	DA 22
SIMOVERT PM Modular Converter Systems	DA 45
SIEMOSYN Motors	DA 48
MICROMASTER 410/420/430/440 Inverters	DA 51.2
MICROMASTER 411/COMBIMASTER 411	DA 51.3
SIMOVERT MASTERDRIVES Vector Control	DA 65.10
SIMOVERT MASTERDRIVES Motion Control	DA 65.11
Synchronous and asynchronous servomotors for SIMOVERT MASTERDRIVES	DA 65.3
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Squirrel-Cage Motors, Totally Enclosed, Fan-Cooled	M 11
Automation Systems for Machine Tools SIMODRIVE	NC 60
• Main Spindle/Feed Motors	
• Converter Systems SIMODRIVE 611/POSMO	
Automation Systems for Machine Tools SINAMICS	NC 61
• Main Spindle/Feed Motors	
• Drive System SINAMICS S120	
Drive and Control Components for Hoisting Equipment	HE 1
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ALPHA Small Distribution Boards and Distribution Boards	ET A1
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