Catalogue LV 63 • 2004/2005

sidac

SIDAC-D reactors
and SIDAC-F filters

SIEMENS

Related catalogues

Low-Voltage LV 10
Controlgear for Industry
Order No.:
E86060-K1002-A101-A4-7600

Sensor Technology LV 20
BERO - Sensors for Automation
Order No.:
E86060-K1803-A101-A3-7600

Power Distribution LV 30
Products and Systems for Power Distribution
Order No.:
E86060-K1801-A101-A4-7600

SIDAC LV 63
SIDAC-D reactors and SIDAC-F filters
Order No.:
E86060-K2803-A101-A1-7600

Industrial Communication IK PI
Industrial Communication for Automation and Drives
Order No.:
E86060-K6710-A101-B3-7600

Automation and Drives CA 01
The Offline Mall for A&D
Order No.:
E86060-D4001-A110-C3-7600

A&D Mall

Internet:
http://www.siemens.de/automation/mall

Contents

Contactors and contactor assemblies · Semiconductor controlgear, soft starters, controllers · Circuit-breakers · Overload relays · Load feeders · Switch disconnectors and fuses · SIMIREL time, monitoring, coupling relays and converters · Control and signaling devices · BETA electrical installation technology: Selected products · SIGUARD safety systems · SIDAC-T transformers · SIDAC-S power supplies · ALPHA FIX terminal blocks

IQ-Sense · Sonar BERO · Opto BERO · Inductive BERO · Capacitive BERO · Accessories

BETA protect installation equipment · Communication-capable circuit-breakers · Compact circuit-breakers (MCCB) · Open-type circuit-breakers (ACB) · SENTRIC switch disconnectors and fuse switch disconnectors · Switchgear, distribution systems and cabinets

Commutation reactors for converters · Mains reactors for frequency converters · Iron-core output reactors · Ferrite output reactors · Iron-core smoothing reactors · Smoothing air-core reactors · Filter reactors · Application-specific reactors · Radio interference suppression filters · dv/dt filters · Sinewave filters

Industrial mobile communication · Industrial Ethernet to IEEE 802.3 · PROFIBUS to IEC 61158/EN 50170 · ET 200 distributed I/O · AS-Interface · Remote operation with SINAUT ST7 · Routers · ECOFAST system

All the products from Automation and Drives including the products from the catalogues listed above.

All the products from Automation and Drives including the products from the catalogues listed above.

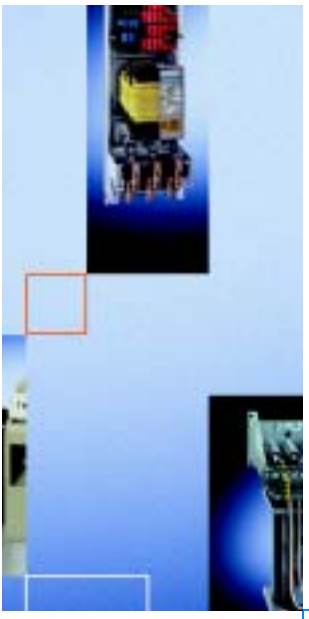
Registered trademarks

Further information about low-voltage controlgear is available on the Internet at:

http://www.siemens.com/lowvoltage

SIDAC-D reactors and SIDAC-F filters

Catalogue LV 63 · 2004/2005



The products included in this catalogue are also included in the mall and the CD-ROM catalogue CA 01
Order No.:
E86060-D4001-A110-C3-7600

Contact your local Siemens representative for further information

The products and systems listed in this catalogue are distributed/manufactured using a certified quality management system which complies with DIN EN ISO 9001 (Certificate Register No. 12 100 16950). The certificates are recognized in all IQ Net countries.

SIEMENS

SIDAC-D

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Explanations

Delivery Times (DT)

- ► Preferred type
- A 2 working days
- B 1 week
- C 3 weeks
- D 6 weeks
- X On request

Preferred types are device types that are immediately available ex warehouse, i.e. are dispatched within 24 hours.

Normal order quantities of products are generally delivered within the specified delivery times on receipt of your order at our office.

However, actual delivery times may vary under special circumstances.

The delivery times apply ex ramp at Siemens AG (products that are ready to dispatch). The transit times depend on the destination and type of shipping. Standard delivery time within Germany is 1 day.

The delivery classes specified here are valid as of: 01/2004. However, we continuously strive to optimise our services. You will find up-to-the minute information on our delivery services at www.siemens.de/automation/mall.

Price unit (PU)

The price unit stipulates the number of units (UT), sets (ST) or metres (M) are received for the specified price and weight.

Packaging size (PS)

The packaging size specifies the number of, e.g. items (UT), sets (ST) or metres (M) contained in the outer packaging.

It is only possible to order the quantity contained in a packaging size or a multiple thereof!

For information on multi-unit and recyclable packing see Appendix.

Price group (PG)

Each product is assigned to a price group.

Weight

The specified weight in kg refers to the price unit (PU) .

Dimensions

All dimensions are in mm.

Technical data

General technical data can be found in the catalogue PD60 "Technische Informationen" (only available in German).

Standards

DIN EN 61558 (IEC 61558), DIN VDE 0532

The German standard DIN EN 61558 with VDE classification VDE 0570 represents the German version of the international standard

IEC 61558 (Safety of power transformers, power supply units and similar), and since 01 August 2003 partially supersedes the old standard VDE 0550 and fully supersedes VDE 0551. These amendments saw a considerable tightening of the production and test conditions for reactors.

Changes brought about by amendments to the standard

Reactors for general use are now made with increased creepages and clearances, and higher test voltages.

Furthermore, all reactors must include references to the protective elements that protect them against short-circuits and overloads.

Designation of the rated current according to EN 61558: I_{Ln}

and specification of the maximum permissible continuous thermal current I_{thmax}

These amendments to the standard, and the accompanying changes to the product, have made it necessary to add a suffix to the order no. Please refer to the conversion list "Old Order No. - New Order No." in the Appendix for the new number.

Introduction

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1/2	Welcome to Automation and Drives
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1/6	Totally Integrated Power – One-stop power distribution and management
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1/12	SIDAC-D reactors
1/17	SIDAC-F filters

Welcome to Automation and Drives

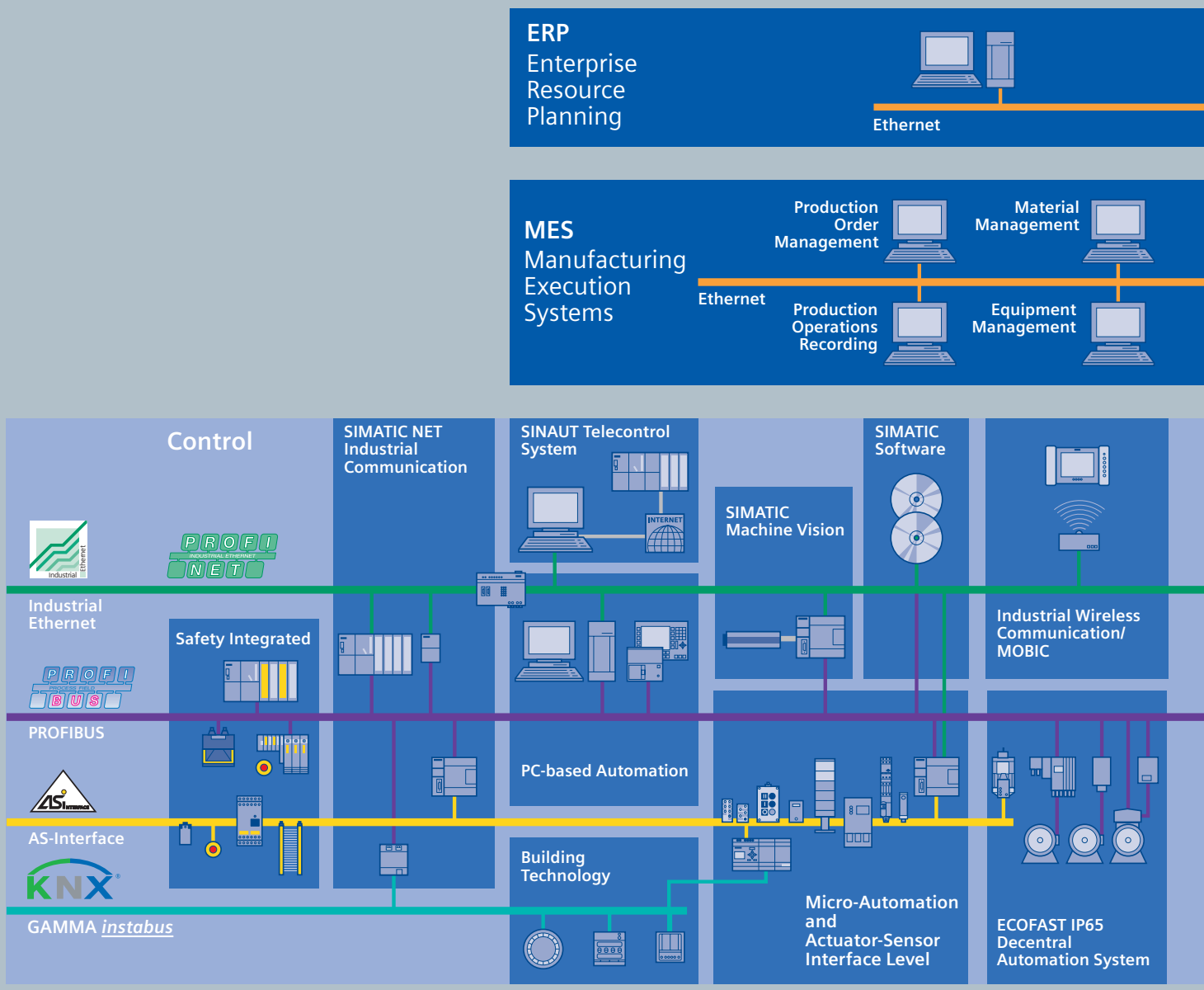
We would like to welcome you to Automation and Drives and our comprehensive range of products, systems, solutions and services for production and process automation and building technology worldwide.

With Totally Integrated Automation and Totally Integrated Power, we deliver solution platforms based on standards that offer you a considerable savings potential.

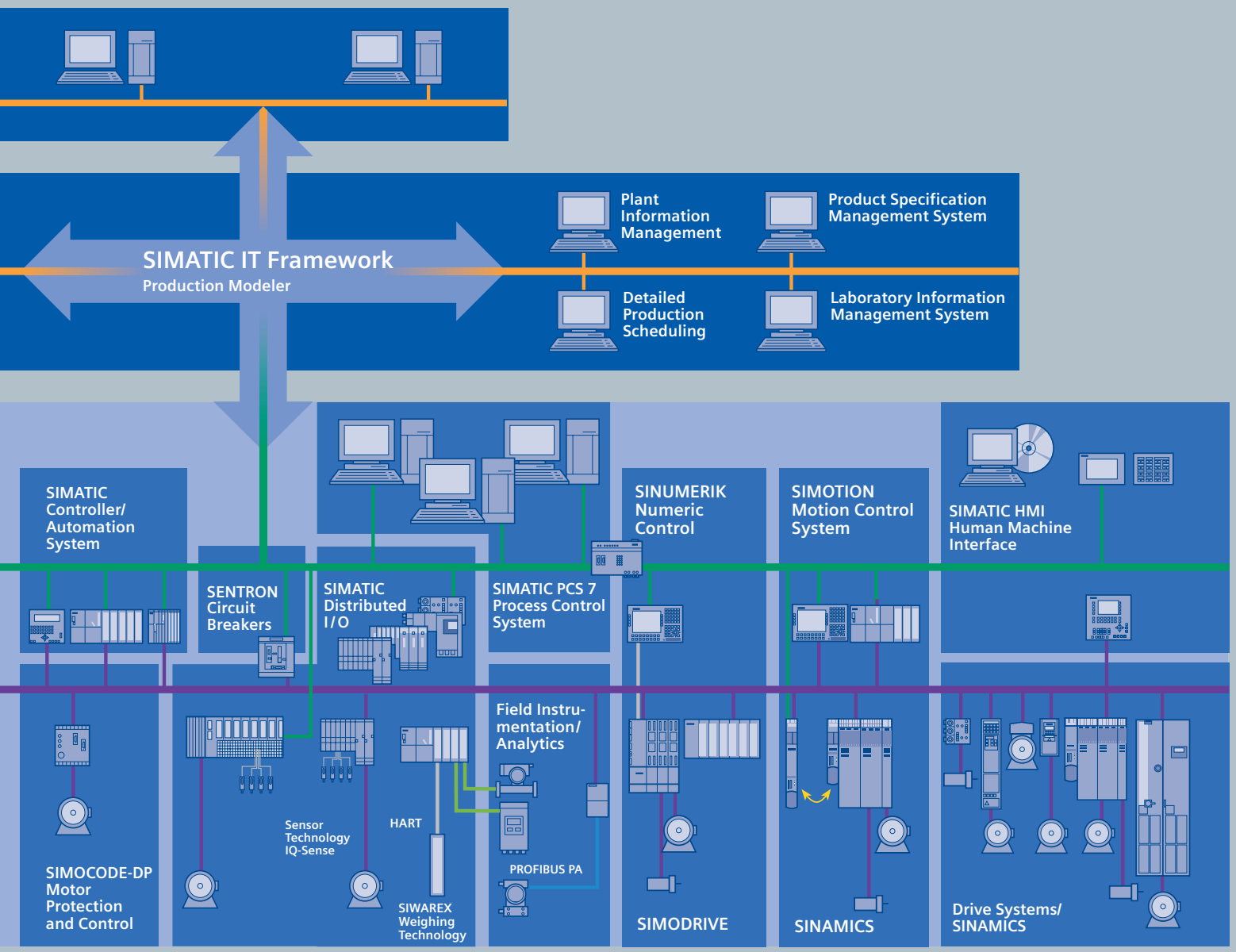
Discover the world of our technology now. If you need more detailed information, please contact one of your regional Siemens partners.
They will be glad to assist you.

Totally Integrated Automation – innovations for more productivity

With the launch of Totally Integrated Automation, we were the first ones on the market to consistently implement the trend from equipment to an integrated automation solution, and have continuously improved the system ever since.
Whether your industry is process- and production-oriented or a hybrid, Totally Integrated Automation is a unique "common solution" platform that covers all the sectors.
Totally Integrated Automation is an integrated platform for the entire production line - from receiving to technical processing



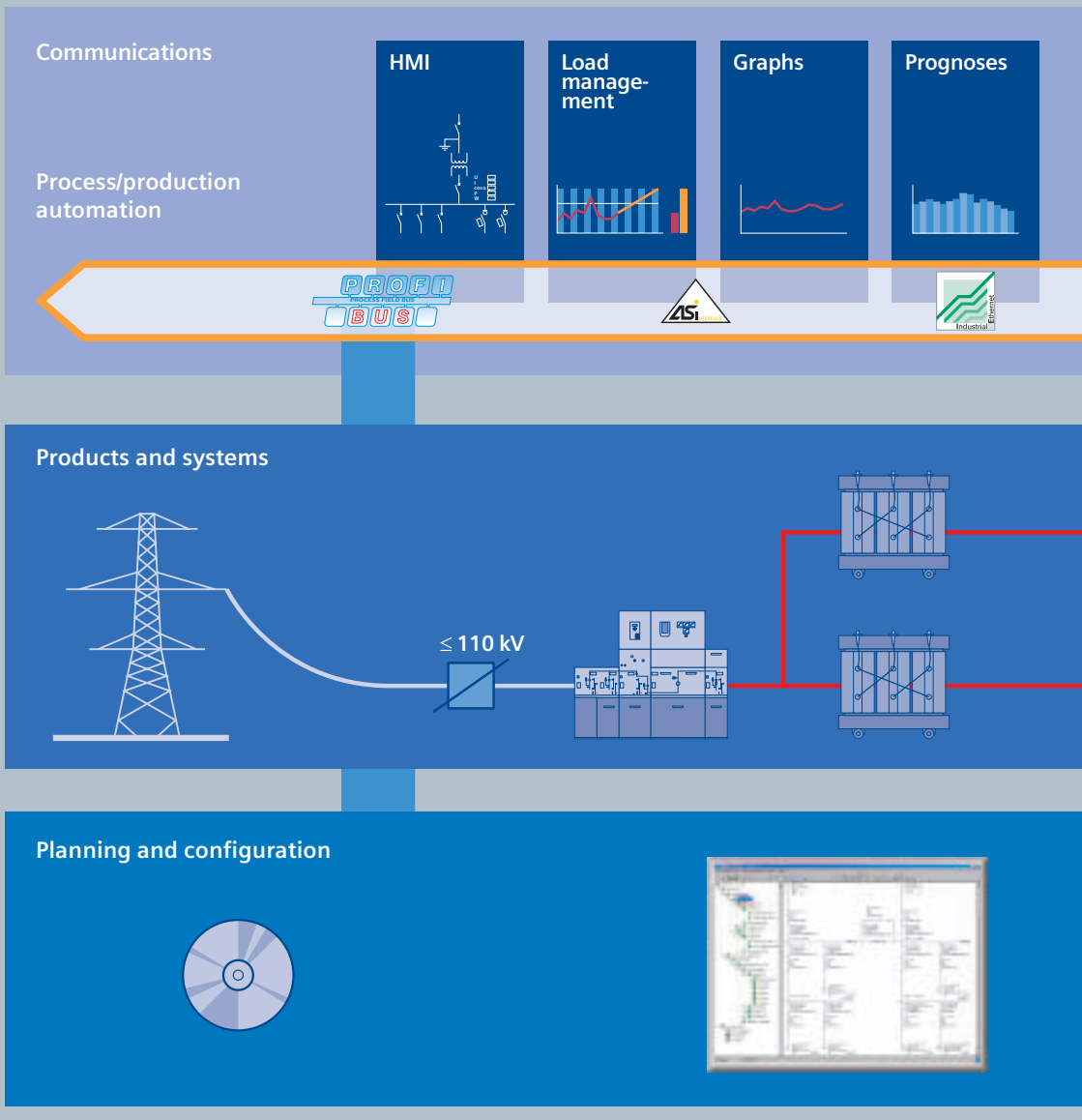
and production areas to shipping. Thanks to the system-oriented engineering environment, integrated, open communications as well as intelligent diagnostics options, your plant now benefits in every phase of the life cycle.
In fact, to this day we are the only company worldwide that can offer a control system based on an integrated platform for both the production and process industry.

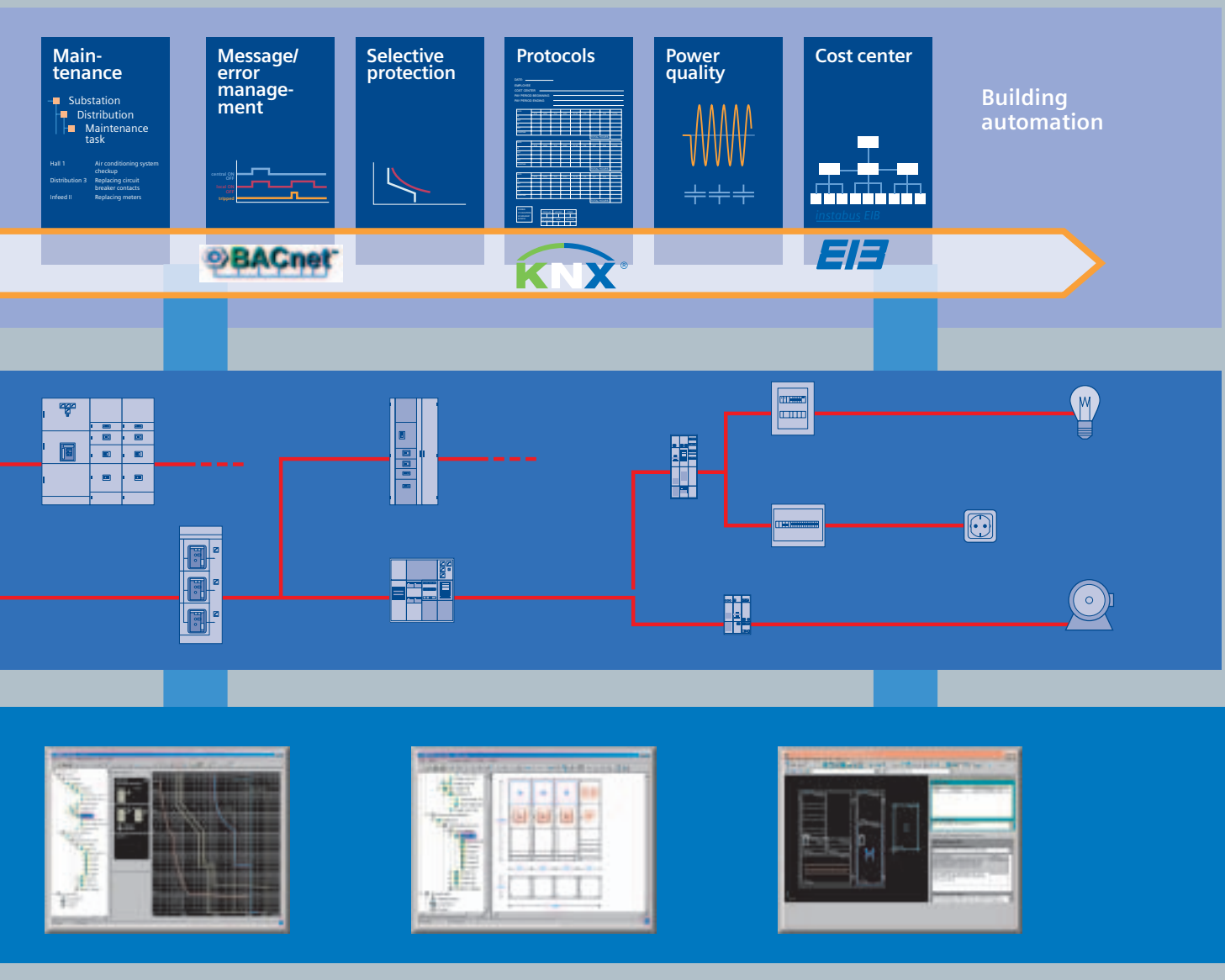


Totally Integrated Power – energy distribution and management from one source

Totally Integrated Power™ by Siemens offers integrated solutions for energy distribution in functional and industrial buildings covering everything from medium-high voltage to power outlets.

Totally Integrated Power™ is based on integration in planning and configuration as well as coordinated products and systems. In addition, it features communications and software modules for connecting power distribution systems to industrial automation and building automation, thereby offering a substantial savings potential.




Main-
tenance
Substation
Distribution
Maintenance
task
Hall 1
Air conditioning system
checkup
Distribution 3
Replacing circuit
breaker contacts
Infeed II
Replacing meters
Message/
error
manage-
ment
Selective
protection
Protocols
Power
quality
Cost center
Building
automation
instabus EIB
BACnet
KNX
EIB

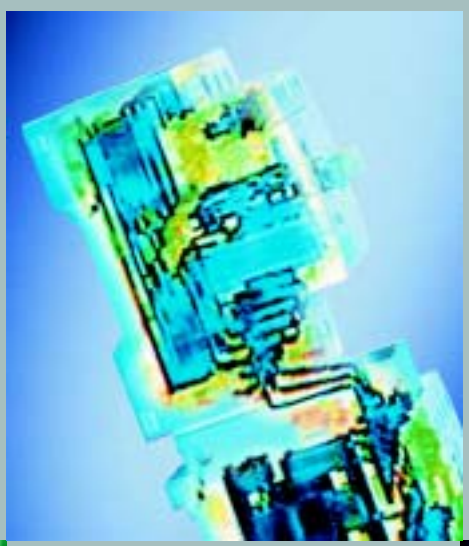
Low-voltage switchgear and controlgear – The basis for progressive solutions

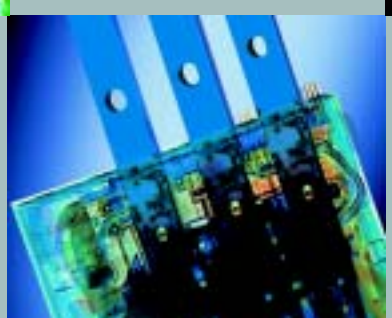
Everyday life would be unimaginable without electric power. Competence and innovations in switching and electrical installation technology are prerequisites so that power can be used without danger and user-friendly in industrial facilities and buildings. We have been providing you with these prerequisites for more than 110 years and are permanently developing new features – innovations which permit you to use power more safely and economically.

Low-voltage controlgear, switchgear and systems from Siemens offer a comprehensive and innovative range of products covering switching devices for load feeders or the distribution of power, control and signaling devices as well as complete cabinet systems. Multi-functional, uniform concepts such as Totally Integrated Power, Safety Integrated or ECOFAST additionally permit our product portfolio to be combined into optimized systems.

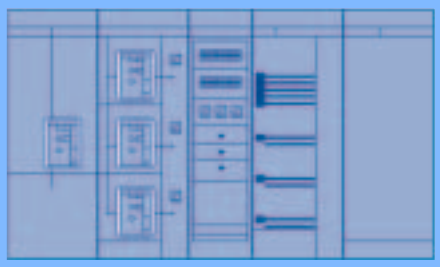
All in all, we can provide you with innovative components for switching and electrical installation technology which utilize state-of-the-art features such as integration and communication as the basis for advanced and uniform solutions which provide you with many benefits:

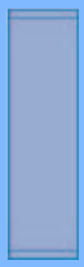
See what's behind.





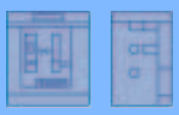
Distribution

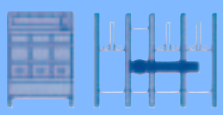

SIVACON low-voltage switchgear


SICUBE


Distribution cabinets/systems

Protection


SENTRON circuit-breakers


SENTRIC switch disconnectors


SENTRIC in-line switch disconnectors


SENTRIC main/ EMERGENCY-STOP switches

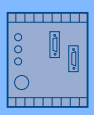

LV HRC fuses


SITOR fuses

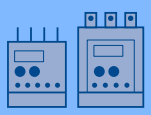

BETA protect


SIDAC transformers, power supplies

Protection


SIMOCODE DP


SIRIUS circuit-breakers


SIRIUS overload relays

Switching

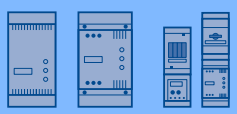

SIRIUS contactors


SIRIUS SC semiconductor switching device


LOGO! logic modules


SITOP power supplies

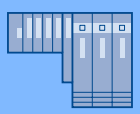
Starting

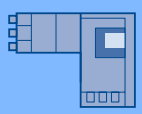

SIRIUS soft starters

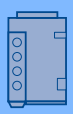
SIRIUS load feeders

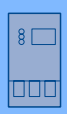
Communication-capable starting and switching

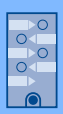

Communication-capable load feeders

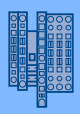

ET 200 S motor starters


ET 200 X motor starters

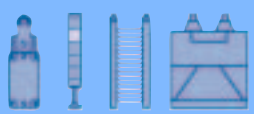

ECOFAST motor starters


AS-Interface compact starters

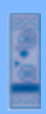

AS-Interface


ALPHA FIX terminal blocks

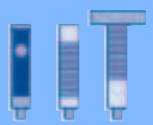
Monitoring


SIGUARD safety systems


SIGNUM control and signaling devices


SIMIREL relays


BETA control


BERO sensors


IQ-Sense

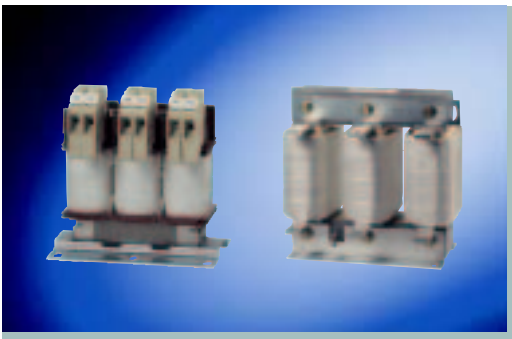
1000 V to 1 V

The first choice in drive and converter technology
SIDAC-D reactors and SIDAC-F filters

These days, modern machines and industrial processes are inconceivable without variable-speed drives. However, machines and industrial plants with a high degree of automation are particularly susceptible to radio interference voltages and deviations in the system voltage due to sinusoidal curves, generated (for example) by high-speed semiconductors in converters. Compliance with current standards and regulations ensure:

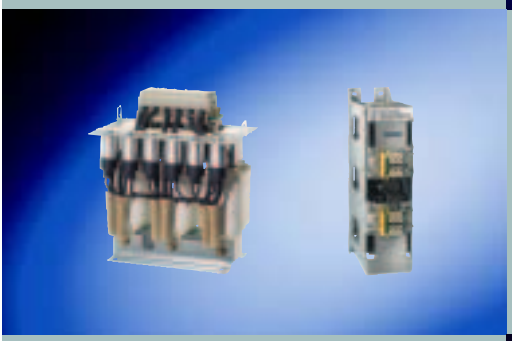
SIDAC-D reactors and SIDAC-F filters
When it comes to smoothing currents, for example in drive systems, or when interference signals need to be suppressed, the rugged and reliable components of the SIDAC-D reactor and SIDAC-F filter series are always first choice. Used worldwide, they provide solutions for tasks in both drive and traffic engineering, as well as control cabinet and plant engineering. High quality products and the certificates required for international application guarantee maximum customer satisfaction in all industrial sectors. SIDAC components that are cost-effective and technically optimised ensure the consistent configuration of drive systems and control cabinets in the field of Low-Voltage, Controls and Distribution.

- Comprehensive standard stock range
- Short delivery times
- Small, compact and light design of all devices
- User-friendly and space-saving supporting solutions
- For assistance in assigning reactors and filters to Siemens drives, please refer to the relevant drive system catalogues
- CE marking
- The majority are UL-approved, reactors , filters



SIDAC-D reactors
Commutation reactors for converters
Mains reactors for frequency converters
Smoothing reactors for DC drives
Filter reactors for p.f. correction equipment
Output reactors for frequency converters
Models available:
Single or three-phase reactors
Air-core reactors, iron-core reactors, ferrite reactors and sintered metal reactors

Rated voltages
690 V AC 4EP/4EM
1,000 V AC 4EU
3.6 kV max. for customised applications
Performance range:
0.1 to 2,000 kVA
3 A to 1,640 A
Reactors in Iso class H not fully utilised, i.e. can handle a continuous overload of 6%
High linearity of inductance



SIDAC-F filters
Radio interference suppression filter
Combination filters
dv/dt filters
Sinewave filters
Versions for use on the line and motor-side of frequency converters

Input voltage ranges
Single-phase 200 - 230 V
Three-phase 380 - 690 V
Can be used for drive outputs of
2.2 to 800 kW
Currents
4 A to 860 A

SIDAC-D reactors

SIDAC reactors – key components in drive systems

Along with transformers, reactors are classic components of electrical engineering and are indispensable in modern heavy current engineering and power electronics.

For the suppression of conducted interferences in AC or three-phase systems and the smoothing of currents in DC circuits:

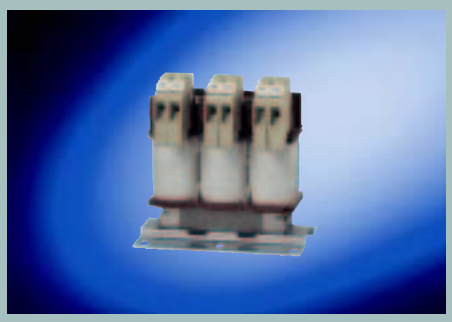
SIDAC-D AC and DC reactors from Siemens are the specialists. As motor and commutation reactors in drive systems for locomotives and railcars and water-cooled valve reactors for HVDC systems in power distribution.

A reactor is a device that comprises one or more windings with a frequency-dependent resistance that operates in accordance with the principle of self-induction. A magnetising current generates a magnetic field that either passes through a magnetically reactive core or through air.

Reactors are used to reduce current peaks or current harmonics. They are mainly used in AC and DC drive systems, in the fields of power supply and transmission and in plant and equipment technology.

A distinction is made between reactors according to their application and design.

Commutation reactors



4EM, 4EP and 4EU commutation reactors (line reactors, mains reactors) for converters are installed in the line-side supply cable. Alternating current flows through them.

Commutation reactors are used to limit line-side voltage drops during commutation (commutation is the current transition from one phase to another) of the converter (DIN VDE 0160 and EN 50178). The reactor also limits the rate of voltage rise dv/dt at the thyristors used by limiting the rate of current rise di/dt.

Features

- 4EU series up to approx. 50 kVA, Iso class H not fully utilised, i.e. can handle a continuous overload of 6%
- Small and light design
- c UL us approval
- Up to 50 A using SIGUT connection method
- Comprehensive standard stock range

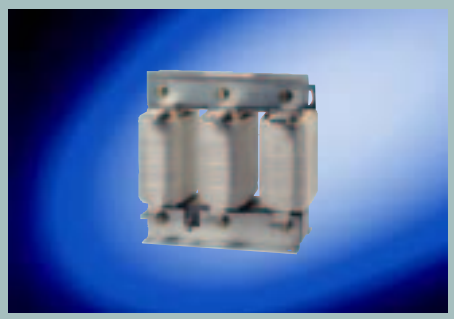
Three-phase mains reactors

Three-phase mains reactors for 4EP and 4EU frequency converters are used in the line-side supply cable. Alternating currents flow through them with the line frequency as the fundamental component.

The reactors limit the circuit feedback that occurs in the form of harmonics. They also reduce the alternating currents and their frequencies caused by the switching of the input rectifier in the DC link capacitors. Compared to commutation reactors, mains reactors are designed to handle significantly higher harmonic loads. Mains reactors are also characterised by a much higher linearity in the inductance curve (L=f(I)).

Features

- 4EU series up to approx. 50 kVA, not fully utilised, i.e. can handle a continuous overload of 6%
- Small and light design
- c UL us approval
- Up to 50 A using SIGUT connection method
- Comprehensive standard stock range
- High linearity in the inductance curve



Output reactors (iron-core)

Output reactors are installed at the output of frequency converters and motor currents flow through them. They compensate capacitive charge-reversal currents in long cables and, in the case of long motor cables, limit the dv/dt at the motor terminals. This enables the use of longer motor supply cables.

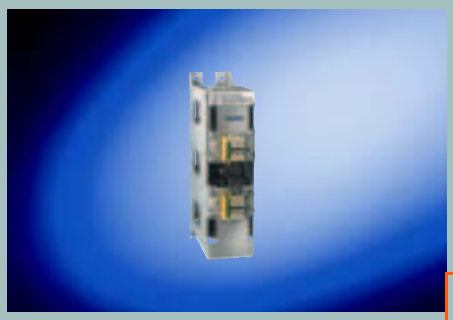
The standard catalogue types can be used for converter output frequencies of up to 300 Hz and clock frequencies of up to 3 kHz.

Features

- Reduction in voltage gradient dv/dt at the motor supply terminals
- Longer motor supply cables can be used
- Reduction in current peaks from the capacitive charge-reversal currents and therefore optimum utilisation of the converter capacity
- Higher operational reliability
- Compact design

Output reactors (ferrite)

Due to the special material characteristics, the standard catalogue ferrite reactor types can be operated at higher converter output frequencies of up to 600 Hz. Can be used with clock frequencies of up to 16 kHz.



Features

- Expanded field of application: f_{max}=600 Hz and clock frequencies of up to max. 16 kHz
- Reduction in voltage gradient dv/dt at the motor supply terminals
- Longer motor supply cables can be used
- Reduction in current peaks from the capacitive charge-reversal currents and therefore optimum utilisation of the converter capacity
- Higher operational reliability
- Compact design

Filter reactors

4EP and 4EU filter reactors for p.f. compensation are connected to the series resonant circuit using capacitors. These series resonant circuits are used to compensate inductive reactive power.

The series resonant circuit is set to a specific resonant frequency to achieve targeted compensation of currents with a harmonic content by connecting the filter reactor with capacitors to form a series resonant circuit.

Features

- High linearity in the inductance curve
- Inductive rating for I_{eff}, can handle permanent thermal overload of 1.05 x I_{eff}
- Standard design with temperature switch
- cULus approval
- Up to 4EP44: angle bracket acc. to EN 60852, allows the use of screwdrivers
- Long service life due to high-quality materials

Smoothing reactors for DC drives

Smoothing reactors are used on the DC side of converter sets. Direct current flows through them.

Smoothing reactors are used to limit the alternating current superimposed on the direct current to a pre-defined value.

Smoothing reactors are used as; series reactors in converter-fed DC motors, for smoothing the DC link current in indirect current and voltage converters, for the DC side decoupling of converter sections for converter connections with higher pulsating circuit feedback, for reducing the ripple limit, for limiting the circulating currents in circuits carrying circulating currents and for limiting the current increase rate by using high-speed DC circuit breakers for the selective disconnection of fault currents.

Depending on the inductance curve required, smoothing reactors are constructed as 4EM and 4ET iron-core reactors or 4PK air-core reactors.

Features

- 4ET series → Iso class H not fully utilised, i.e. can handle a continuous overload of 6%
- Small and light design
- c UL us approval
- Up to 50 A using SIGUT connection method
- Supports cage clamp connection method
- Comprehensive standard range
- Short delivery times

Smoothing air-core reactors

4PK smoothing air-core reactors (natural air cooling, energy content E from 380 Ws - 1.9 kWs) are used in the DC circuit of converter units. They are primarily used to limit the current rise in the event of faults, especially in the case of through-conductions.

They cause the high-speed DC switches in the electric circuit to interrupt the rising fault current early enough to prevent the fuses in the thyristor branches from responding.

Features

- Constant inductance regardless of load
- High short-circuit strength
- Low weight thanks to aluminum windings
- Up to 2 reactors can be piggy-backed

Sintered metal reactors

Sintered metal reactors for three-phase incoming feeders comprise three mutually independent single-phase reactors. They are installed in the main supply line of converters and alternating currents with line frequency and the harmonics generated by the converter flow through them.

Sintered metal reactors can be used as individual components in the input or output circuit of frequency converters. Sintered metal reactors are always used where, as well as a commutation reactor, interference suppression is required from the low to high frequency range.

The special material characteristics enable excellent interference suppression of frequencies up to 150 kHz. The closed design of the pot-type cores reduces radiation-linked interferences to a minimum, thus enabling non-critical installation of reactors in close proximity to electronic devices.

Applications are found in the area of controlled rectifier/regenerative units that operate in high-frequency systems. They also enable cost-effective interference suppression in converter connections for uninterruptible power supplies.

Features

- Excellent RF characteristics for higher saturation induction
- High initial inductance
- Excellent EMC behavior
- Compliance with interference level A when using the reactor
- Compliance with interference level B when using both capacitive network and reactor
- Low-cost combination of interference suppression reactor and commutation reactor.

Railway reactors

These include reactors for use in electrical railcars. All these reactors are used in trams, subway trains and modern high-speed railcars. The components have been designed and manufactured for the harsh environmental conditions that occur in railway operation. This includes increased requirements in terms of resistance to extreme climates, humidity and pollutants in the atmosphere. All reactors comply with the mechanical requirements demanded of them with regard to the permanent vibrations during railway operation.

Application

For many decades, Siemens reactors have been used in railway networks around the world. The know how gained in this field is constantly available to our customers for the development of new products.

Application examples:

- On-board power supply network containers with transformer, reactor and selector switch are used in the supply of the on-board power for different infeed conditions.
- Acceptor circuit reactors are used to smooth the DC link voltage and reduce the harmonics in the DC link.
- Chopper reactors limit the current gradient of the pulsed chopper current and the short-circuit currents.
- Rod core reactors as a component of the line filter for overvoltage protection and to limit the mains or DC link harmonic currents

Selection aid
Which problem needs solving?

Reactors **SIDAC – D** AC drive systems	Output reactors	Commutation/ line reactors	Output reactor with integrated radio interference suppression filter	Commutation reactor with integrated radio interference suppression filter	DC-link reactors	Sintered metal reactors
Reduction of load current peaks, output/input circuit	++	++	++	++	- -	++
Reduction of voltage gradient dv/dt at the motor terminals	+	- -	+	- -	- -	- -
Reduction of EMC problems between outer conductors (output/input)	- -	+	++	++	- -	++
Reduction of EMC problems between outer conductors and ground (output/input)	- -	+	++	++	- -	+
Use of unshielded motor cable also possible	+	- -	+	- -	- -	- -
Reduction of commutation notches and limiting of the rate of current rise in the input circuit	- -	++	- -	++	+	++
Reduction of commutation reactive power	- -	++	- -	++	+	++
Attenuation of radio interference voltages and reduction of high frequency circuit feedback	+	+	++	++	- -	++
Reduction of mains-borne electromagnetic emission and its influence	+	+	++	++	- -	+

Customised designs

For specification sheets for customised reactors and filters, see Chapter 13.

Accessories

For terminal covers to protect against accidental contact with free bar connections (DIN VDE 0106-100) see Chapter 14 "Accessories".

Connection terminals

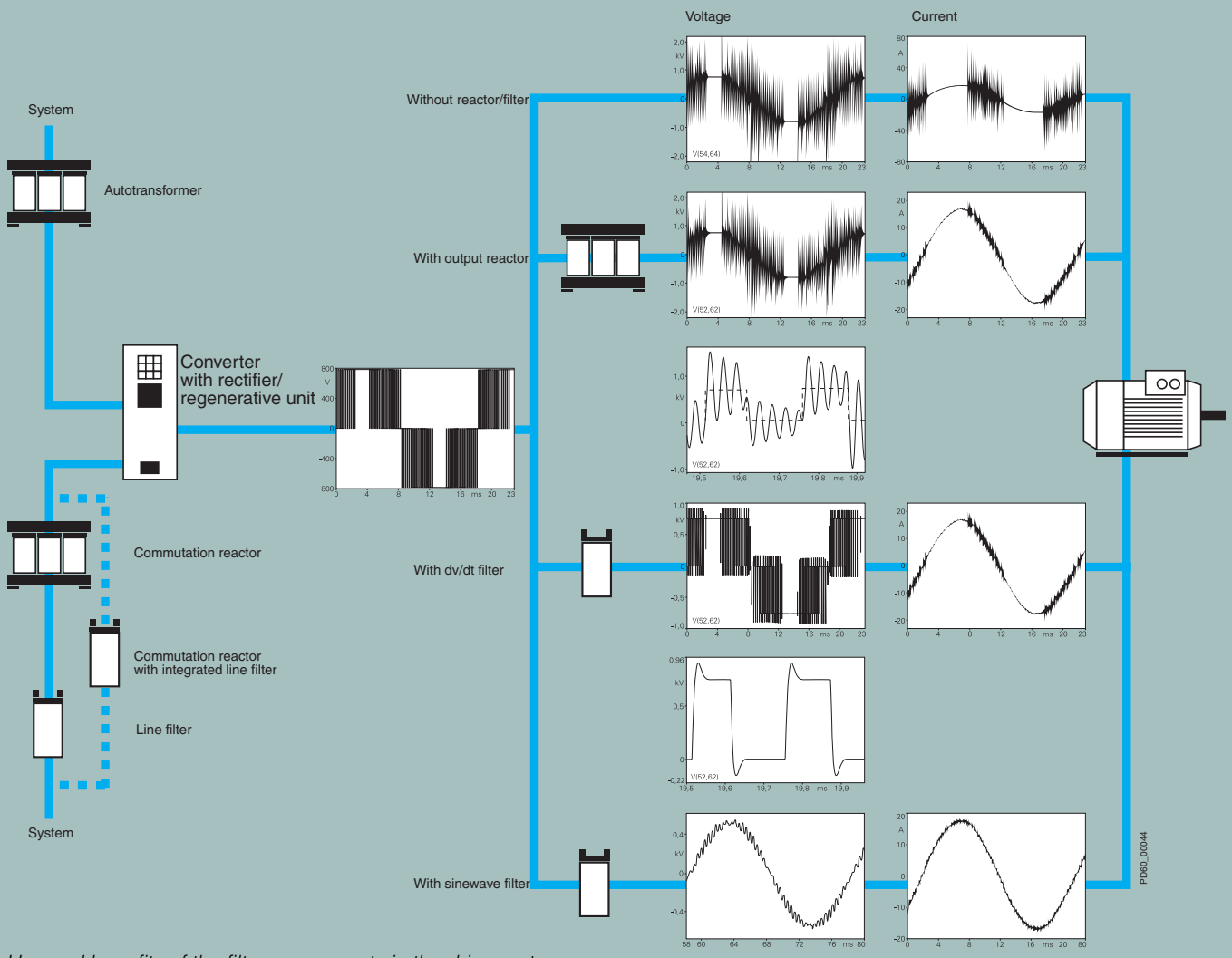
Connection terminals are mounted for rated currents up to 50 A (in the case of 4EM iron-core smoothing reactors; up to 40 A). They offer finger-touch protection according to DIN VDE 0106-100. The cable cross-sections that can be connected are specified in Chapter 15 "Configuration notes" in the dimensioned drawings.

Flat terminations are installed for reactors with rated currents > 50 A. For dimensions of the flat terminations, please refer to the dimensioned drawings in Chapter 15 "Configuration notes".

Dimensioned drawings/technical data

Dimensions and dimensioned drawings of the reactors can be found in Chapter 15 "Configuration notes". General technical data are describe in the catalogue PD 60 "Technische Informationen". Special data for the reactors are entered in the "Selection and ordering data" section. The permissible mounting position for each reactor type is specified in the dimensioned drawings.

SIDAC-F filters



Use and benefits of the filter components in the drive system

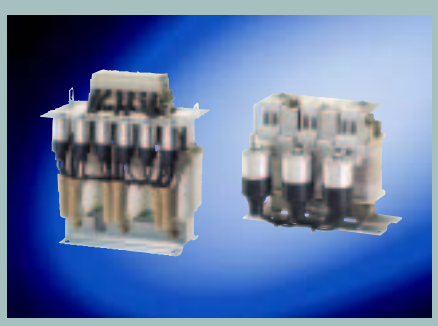
SIDAC filters – key components in drive systems

**dv/dt filters,
voltage limiting filters**

dv/dt filters comprise a limiter circuit and a reactor. The filters are used at the output of frequency converters, whereby the motor currents flow through the reactor.

By connecting the filter at the output of the frequency converter, transient voltage peaks are reduced and the voltage gradients in the motor winding are reduced to non-critical values of less than 500 V/µs.

When long motor cables are used, the dv/dt filter also reduces the capacitive load current peaks that result from the capacitance per unit length of the motor cable.



Sinewave filters

The sinewave filter is used at the output of frequency converters whereby motor currents flow through the reactor. The frequency converter output variables are filtered in such a way that it produces an almost sinusoidal motor voltage and an absolutely sinusoidal motor current.

Stray losses in the motor are reduced and the motor runs significantly quieter. With long motor cables, the sinewave filter also reduces the load current peaks caused by the cable capacity.

EX(d) motors can be converter-fed if a sinewave filter is used. Operation with an unshielded motor cable is almost completely unrestricted.

Radio interference suppression filters, combination filters (radio interference suppression filter + output/input reactor) as a supporting solution

Radio interference suppression filters for frequency converters are fitted in the line-side supply leads in order to attenuate mains-borne radio interference voltages. If special demands are made on the dv/dt values at the motor supply terminals, an output reactor can also be fitted to the housing.

Using a radio interference suppression filter ensures compliance with interference suppression level A or B to EN 50081 (depending on customer requirements). It is also possible to use significantly longer motor supply cables in compliance with the limit values of EN 50081. By using a combination filter comprising radio interference suppression filter and output reactor, it is also possible to increase the length of the even further motor cable while still maintaining the required level of radio interference suppression.

Combining the radio interference suppression filter with an input reactor allows the circuit feedback to be reduced still further, thus enhancing the interference immunity of the frequency converter.

Selection aid

Which problem needs solving?
With the comprehensive range of SIDAC-F filter components, a solution can always be found!

Filters SIDAC-F	dv/dt filters	Sine-wave filters	Sine-wave radiated noise filters	Radio interference suppression filter	Output reactor with integrated radio interference suppression filter	Commutation reactor with integrated radio interference suppression filter
Reduction of load current peak output/input circuit	++	++	++	+	++	++
Reduction of voltage gradient dv/dt at the motor terminals	++	++	++	- -	+	- -
Limiting of overvoltage due to line reflection	++	++	++	- -	- -	- -
Generation of sinusoidal motor terminal voltage and currents	- -	++	++	- -	- -	- -
Reduction of stray losses in the motor	- -	++	++	- -	- -	- -
Reduction of motor noise	- -	++	++	- -	- -	- -
Reduction of EMC problems between outer conductors (output/input)	- -	++	++	++	++	++
Reduction of EMC problems between outer conductors and ground (output/input)	- -	- -	++	++	++	++
Use of unshielded motor cable also possible	+	+	++	- -	+	- -
Reduction of commutation notches and limiting of the rate of current rise in the input circuit	- -	- -	- -	+	- -	++
Reduction of commutation reactive power	- -	- -	- -	- -	- -	++
Attenuation of radio interference voltages and reduction of high frequency circuit feedback	+	+	+	++	++	++
Reduction of mains-borne electromagnetic emission and its influence	++	++	++	++	++	++

SIDAC-D
Commutation reactors for converters

2

Single-phase reactors
2/2 Application
2/2 Technical data
2/3 Selection and ordering data

Three-phase reactors
2/5 Application
2/5 Technical data
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2

Single-phase reactors

Application

Fig. 2/1 Single-phase commutation reactor for converters

Single-phase 4EM commutation reactors for converters are used with two-pulse bridge converters as line reactors in the line-side supply cable. Alternating current flows through them.

They are used to limit line-side voltage drops during commutation of the converter. The reactor also limits the rate of voltage rise dv/dt at the thyristors used by limiting the rate of current rise di/dt.

There are different reactor series.

- u_D ~ 2% with the following supply voltage: 230 V AC
- u_D ~ 4% with the following supply voltage: 230 V AC, 400 V

The data is valid for mains frequency f= 50 Hz

Technical data

Recommended supply voltage U_N **Rated alternating current I_{Ln}** **Maximum continuous thermal current I_{thmax}** **Peak current I_{Lmax}** **Permissible continuous direct current with downstream two-pulse bridge converters (I_{dn}= I_{thmax} · 1.0)** **Inductance per phase** **Core losses P_{Fe} at f = 50 Hz** **Winding losses P_W**	See table "Selection and ordering data"
Degree of protection	IP00 according to DIN VDE 0470-1/EN 60529
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	690 V AC at U_N ≤ 500 V for 4EM with terminals 600 V AC at U_N ≤ 500 V for 4EM according to UL
Permissible ambient temperature during operation	Type 4EM: from –25 °C to +70 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Temperature classes	Type 4EM: temperature class B
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} at site altitudes >1000 m above sea level	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards/approvals	The reactors comply with EN 61558 The reactors are UL Recognised under Guide No. XQNX2 and File No. E103902 as well as cUL approved under Guide No. XQNX8 File No. E103902 (applies to reactors with U_N ≤ 600 V according to UL)
Storage temperature	from –25 °C to +80 °C
Permissible humidity rating	Relative humidity at +40 °C occasionally up to 100% annual mean, up to 80% occasional condensation permissible

Selection and ordering data

CE c UL us [1])

Overview

$I_{thmax} = I_{Lmax}$

Max. continuous thermal current	Rated current	Max. continuous direct current [2])	Reference voltage drop of reactor u_D for I_{thmax} and U_N		
I_{thmax}	I_{Ln}	I_{dn}	Order No.	Order No.	Order No.
A	A	A	**u_D = 2% 230 V AC**	**u_D = 4% 230 V AC**	**u_D = 4% 400 V AC**
5	4.5	6.1	–	4EM46 05-4CB00	–
6.3	5.67	7.7	–	4EM46 05-6CB00	–
8	7.2	9.8	–	4EM47 00-0CB00	4EM48 07-1CB00
10	9.0	12.2	4EM46 05-8CB00	4EM48 00-3CB00	4EM49 11-7CB00
11.2	10.1	13.7	4EM46 00-8CB00	4EM48 07-4CB00	4EM49 11-8CB00
12.5	11.3	15.3	4EM46 06-0CB00	4EM48 07-5CB00	4EM49 12-0CB00
14	12.6	17.1	4EM47 04-2CB00	4EM48 07-6CB00	4EM49 12-1CB00
15	13.5	18.3	–	4EM49 00-5CB00	4EM50 00-2CB00
16	14.4	19.5	4EM47 00-5CB00	–	–
18	16.2	22	4EM47 04-3CB00	4EM49 12-2CB00	4EM50 05-6CB00
20	18.0	24.4	4EM47 00-8CB00	4EM49 12-3CB00	4EM50 05-7CB00
22	19.8	26.8	4EM48 01-8CB00	–	–
22.4	20.2	27.3	–	4EM49 12-4CB00	4EM50 05-8CB00
24	19.8	29.3	–	–	4EM51 00-2CB00
25	22.5	31	4EM48 07-8CB00	4EM49 12-5CB00	–
26	23.4	32	–	4EM50 00-3CB00	–
28	25.2	34	4EM48 08-0CB00	–	4EM61 00-2CB00
31.5	28.4	39	4EM48 00-8CB00	4EM50 06-0CB00	4EM61 00-3CB00
33	29.7	40	4EM49 03-2CB00	4EM50 03-2CB00	–
35.5	32.0	43	4EM49 12-6CB00	4EM50 06-1CB00	4EM52 12-8CB00
40	36.0	49	4EM49 12-7CB00	4EM51 07-7CB00	4EM52 00-1CB00
45	40.5	55	4EM49 12-8CB00	4EM51 11-1CB00	4EM62 00-3CB00
50	45.0	61	4EM50 01-1CB00	4EM61 00-4CB00	4EM53 16-6CB00

1) All reactors with $U_N \leq 600$ V according to UL

2) Reactors with higher rated currents on request for downstream two-pulse bridge converters

2

Single-phase reactors

$I_{thmax} = I_{Lmax}$

	Maximum continuous thermal current	Rated current [1]	Maximum continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
1 AC 230 V 50 Hz, u_D ~ 4.4 V 2% reference voltage drop for I_{thmax} and U_N												
	10	9	12.2	1.4	6.1	8.3	T	C	**4EM46 05-8CB00**	–	0.050	0.470
	11.2	10.1	13.7	1.25	8.9	7.1	T	B	**4EM46 00-8CB00**	–	0.080	0.500
	12.5	11.3	15.3	1.12	6	6.9	T	C	**4EM46 06-0CB00**	–	0.090	0.510
	14	12.6	17.1	1	8.7	8.2	T	▶	**4EM47 04-2CB00**	–	0.090	0.600
	16	14.4	19.5	0.875	11	8.2	T	▶	**4EM47 00-5CB00**	–	0.120	0.680
	18	16.2	22	0.778	8.1	8.9	T	C	**4EM47 04-3CB00**	–	0.170	0.700
	20	18	24.4	0.637	11	8.6	T	B	**4EM47 00-8CB00**	–	0.160	0.700
	22	19.8	26.8	0.622	11.3	10.6	T	C	**4EM48 01-8CB00**	–	0.110	1.030
	25	22.5	31	0.56	7.9	12.9	T	C	**4EM48 07-8CB00**	–	0.120	1.040
	28	25.2	34	0.5	7.9	12.9	T	C	**4EM48 08-0CB00**	–	0.150	1.080
	31.5	28.4	38	0.404	11.3	11.4	T	B	**4EM48 00-8CB00**	–	0.180	1.110
	33	29.7	40	0.424	20.4	12.1	T	B	**4EM49 03-2CB00**	–	0.150	1.840
	35.5	32	43	0.395	14	14.6	T	C	**4EM49 12-6CB00**	–	0.160	1.800
	40	36	49	0.35	14.4	14.6	T	C	**4EM49 12-7CB00**	–	0.180	1.900
	45	40.5	55	0.311	14.4	14.6	T	C	**4EM49 12-8CB00**	–	0.210	1.900
	50	45	61	0.28	27.9	13.2	T	B	**4EM50 01-1CB00**	–	0.240	2.600
1 AC 230 V 50 Hz, u_D ~ 8.8 V 4% reference voltage drop for I_{thmax} and U_N												
	5	4.5	6.1	5.6	6.1	6.5	T	▶	**4EM46 05-4CB00**	–	0.050	0.470
	6.3	5.7	7.7	4.45	6.1	8.3	T	▶	**4EM46 05-6CB00**	–	0.080	0.500
	8	7.2	9.8	3.5	11	7.2	T	▶	**4EM47 00-0CB00**	–	0.140	0.700
	10	9	12.2	2.8	6.1	6.4	T	C	**4EM48 00-3CB00**	–	0.130	1.100
	11.2	10	13.7	2.5	7.6	12	T	▶	**4EM48 07-4CB00**	–	0.090	1.000
	12.5	11.3	15.3	2.24	7.6	13	T	C	**4EM48 07-5CB00**	–	0.130	1.100
	14	12.6	17.1	2	7.8	12.9	T	▶	**4EM48 07-6CB00**	–	0.160	1.100
	15	13.5	18.3	1.87	20.4	12.1	T	▶	**4EM49 00-5CB00**	–	0.130	1.800
	18	16.2	22	1.56	14.4	14	T	C	**4EM49 12-2CB00**	–	0.130	1.800
	20	18	24.4	1.4	14.4	14.6	T	C	**4EM49 12-3CB00**	–	0.190	1.900
	22.4	20.2	27.3	1.24	14.4	11.1	T	C	**4EM49 12-4CB00**	–	0.270	2.000
	25	22.5	31	1.12	14.4	11.1	T	B	**4EM49 12-5CB00**	–	0.270	2.000
	26	23.4	32	1.08	27.9	14.4	T	▶	**4EM50 00-3CB00**	–	0.190	2.500
	31.5	28.4	38	0.889	19.7	18	T	C	**4EM50 06-0CB00**	–	0.270	2.600
	33	29.7	40	0.772	27.9	13.6	T	C	**4EM50 03-2CB00**	–	0.360	2.700
	35.5	32	43	0.789	19.7	18	T	B	**4EM50 06-1CB00**	–	0.410	2.700
	40	36	49	0.7	26	18	T	B	**4EM51 07-7CB00**	–	0.470	3.500
	45	40.5	55	0.622	26	18	T	C	**4EM51 11-1CB00**	–	0.530	3.600
	50	45	61	0.56	32	18	T	C	**4EM61 00-4CB00**	–	0.520	4.300
1 AC 400 V 50 Hz, u_D ~ 15.2 V 4% reference voltage drop for I_{thmax} and U_N												
	8	7.2	9.8	6.05	7.8	9.9	T	▶	**4EM48 07-1CB00**	–	0.150	1.100
	10	9	12.2	4.84	14.4	10.7	T	▶	**4EM49 11-7CB00**	–	0.100	1.800
	11.2	10.1	13.7	4.32	14.4	14.6	T	C	**4EM49 11-8CB00**	–	0.140	1.800
	12.5	11.3	15.3	3.87	14.4	14.6	T	▶	**4EM49 12-0CB00**	–	0.180	1.900
	14	12.6	17.1	3.46	14.4	14.6	T	▶	**4EM49 12-1CB00**	–	0.230	1.900
	15	13.5	18.3	3.23	27.9	13.4	T	▶	**4EM50 00-2CB00**	–	0.340	2.700
	18	16.2	22	2.69	19.7	18	T	▶	**4EM50 05-6CB00**	–	0.300	2.600
	20	18	24.4	2.42	19.7	18	T	C	**4EM50 05-7CB00**	–	0.380	2.700
	22.4	20.2	27.3	2.15	19.7	18	T	▶	**4EM50 05-8CB00**	–	0.500	2.800
	24	21.6	29.3	2.02	33.7	19.8	T	▶	**4EM51 00-2CB00**	–	0.430	3.500
	28	25.2	34	1.73	31.8	12.6	T	C	**4EM61 00-2CB00**	–	0.480	4.200
	31.5	28.4	38	1.54	32	22	T	▶	**4EM61 00-3CB00**	–	0.750	4.500
	35.5	32	43	1.36	36	22	T	C	**4EM52 12-8CB00**	–	0.730	5.000
	40	36	49	1.21	33.7	19.8	T	▶	**4EM52 00-1CB00**	–	0.870	5.100
	45	40.5	55	1.08	47.4	20.1	T	C	**4EM62 00-3CB00**	–	1.030	6.900
	50	45	61	0.968	52	28	T	C	**4EM53 16-6CB00**	–	1.280	7.400

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream two-pulse bridge converters

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

Application

Fig. 2/2 Three-phase commutation reactors for converters

Commutation reactors for converters are used for two-pulse bridge converters in the line-side supply cable. They are used to limit line-side voltage drops during commutation of the converter. The reactor also limits the rate of voltage rise dv/dt at the thyristors used by limiting the rate of current rise di/dt.

Commutation reactors can also be used for decoupling converter sets operating in parallel.

There are different reactor series.

- $I_{thmax} = 0.8 \cdot I_{Lmax}$ ("80% reactors") with $u_D \sim 4\%$ for the following supply voltages:
  3 AC 400 V, 3 AC 500 V, 3 AC 690 V, 3 AC 750 V
- $I_{thmax} = I_{Lmax}$ ("100% reactors") with $u_D \sim 2\%$ for the following supply voltages:
  3 AC 400 V, 3 AC 690 V, 3 AC 830 V
  and with $u_D \sim 4\%$ for the following supply voltages:
  3 AC 400 V, 3 AC 500 V, 3 AC 690 V, 3 AC 750 V

The data is valid for line frequency f = 50 Hz.

Technical data

Recommended supply voltage U_N **Rated alternating current I_{Ln}** **Maximum continuous thermal current I_{thmax}** **Peak current I_{Lmax}** **Maximum continuous direct current with downstream six-pulse bridge converter ($I_{dn} = I_{thmax} \cdot 1.225$)** **Inductance per phase** **Core losses P_{Fe} at f = 50 Hz** **Winding losses P_W**	See table "Selection and ordering data"
Degree of protection	IP00 according to DIN VDE 0470-1/EN 60529
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	690 V AC at $U_N \leq$ 500 V for 4EP with terminals 1000 V AC at $U_N \leq$ 830 V for 4EP, 4EU24 to 4EU43 with flat terminations
Permissible ambient temperature during operation	Type 4EP: from –25 °C to +70 °C Type 4EU: from –25 °C to +80 °C
Deviation of permissible alternating current from rated alternating current I_{Ln} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Temperature classes	Type 4EP: temperature class B Type 4EU: temperature class H (utilisation according to F for applications according to EN) Type 4EU: temperature class H (for applications according to UL)
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} at site altitudes >1000 m above sea level	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Operation with varying load	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Operation at 60 Hz	I_{Ln} (60 Hz) = 0.9 · I_{Ln} (50 Hz)
Standards/approvals	The reactors comply with EN 61558 (type 4EU45 to 4EU51: DIN VDE 0532) The reactors are UL Recognised under Guide No. XQNX2 and File No. E103902 as well as cUL approved under Guide No. XQNX8 File No. E103902 (applies to reactors with $U_N \leq$ 600 V according to UL)
Storage temperature	from –25 °C to +80 °C
Permissible humidity rating	Relative humidity at +40 °C occasionally up to 100% annual mean, up to 80% occasional condensation permissible

2

Three-phase reactors

Selection and ordering data

CE c UL us [1])

Overview

$I_{thmax} = I_{Lmax}$

	Max. continuous thermal current [3])	Rated current	Max. continuous direct current [2])	Reference voltage drop of reactor u_D = 2% for I_{thmax} and U_N		
	I_{thmax}	I_{Ln}	I_{dn}	Order No.	Order No.	Order No.
	A	A	A			
				3 AC 400 V 50 Hz	**3 AC 690 V 50 Hz**	**3 AC 830 V 50 Hz**
	25	23	31	**4EP36 00-2DS00**	–	–
	28	25	34	**4EP36 00-3DS00**	–	–
	31.5	28	38	**4EP36 00-4DS00**	–	–
	35.5	32	43	**4EP36 00-5DS00**	–	–
	40	36	49	**4EP36 00-6DS00**	–	–
	45	41	55	**4EP37 00-4DS00**	–	–
	50	45	61	**4EP37 00-5DS00**	–	–
	56	50	68	**4EP37 00-6DS00**	–	–
	63	57	77	**4EP37 00-7DS00**	–	–
	71	64	87	**4EP38 00-8DS00**	–	–
	80	72	98	**4EP38 01-0DS00**	–	–
	91	82	111	**4EP38 01-1DS00**	–	–
	100	90	122	**4EP39 01-0DS00**	–	–
	1230	1107	1501	–	**4EU43 21-0BC00-0A**	**4EU43 21-0BE00-0A**
	1560	1404	1903	–	–	**4EU45 21-0AN00** [3])
	1640	1476	2001	–	**4EU43 21-0BD00-0A**	–

1) All reactors with $U_N \leq 600$ V according to UL

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Reactors according to VDE 0532: I_{thmax} = rated current

$I_{thmax} = I_{Lmax}$

CE c UL us [1])

	Max. continuous thermal current [4])	Rated current	Max. continuous direct current [3])	Reference voltage drop of reactor u_D = 4% for I_{thmax} and U_N			
	I_{thmax} A	I_{Ln} A	I_{dn} A	Order No.	Order No.	Order No.	Order No.
				3 AC 400 V 50 Hz	**3 AC 500 V 50 Hz**	**3 AC 690 V 50 Hz**	**3 AC 750 V 50 Hz**
	16	14	20	**4EP36 00-7DS00**	**4EP36 01-2DS00**	–	–
	18	16	22	**4EP36 00-8DS00**	**4EP37 01-2DS00**	–	–
	20	18	24	**4EP36 01-0DS00**	**4EP37 01-3DS00**	–	–
	22.4	20	27	**4EP37 00-8DS00**	**4EP37 01-4DS00**	–	–
	25	23	31	**4EP37 01-0DS00**	**4EP37 00-1DS00**	–	–
	28	25	34	**4EP37 01-1DS00**	**4EP38 01-4DS00**	–	–
	31.5	28	38	**4EP37 00-0DS00**	**4EP38 00-1DS00**	–	–
	35.5	32	43	**4EP38 01-2DS00**	–	–	–
	40	36	49	**4EP38 00-0DS00**	**4EP39 00-1DS00**	–	–
	45	41	55	**4EP38 01-3DS00**	**4EP39 01-3DS00**	–	–
	50	45	61	**4EP39 00-0DS00**	**4EP40 00-2DS00**	–	–
	56	50	68	**4EP39 01-2DS00**	**4EP40 02-0DS00**	–	–
	63	57	77	**4EP40 00-0DS00**	**4EP40 02-1DS00**	–	–
	71	64	87	**4EP40 01-8DS00**	**4EP40 02-2DS00**	–	–
	80	72	98	**4EP40 00-1DS00**	**4EU24 22-2AA00-0AA0**	–	–
	91	82	111	**4EP40 02-3DS00**	**4EU24 22-3AA00-0AA0**	–	–
	100	90	122	**4EU24 22-0AA00-0AA0**	**4EU25 22-3AA00-0AA0**	–	–
	112	101	137	**4EU24 22-1AA00-0AA0**	**4EU25 22-4AA00-0AA0**	–	–
	125	113	153	**4EU25 22-0AA00-0AA0**	**4EU25 22-5AA00-0AA0**	–	–
	140	126	171	**4EU25 22-1AA00-0AA0**	**4EU25 22-6AA00-0AA0**	–	–
	160	144	195	**4EU25 22-2AA00-0AA0**	**4EU27 22-5AA00-0AA0**	–	–
	180	162	220	**4EU27 22-0AA00-0AA0**	**4EU27 22-6AA00-0AA0**	–	–
	200	180	244	**4EU27 22-1AA00-0AA0**	**4EU27 22-7AA00-0AA0**	**4EU30 22-7AA00-0AA0**	**4EU30 22-5CA00-0AA0**
	224	202	273	**4EU27 22-2AA00-0AA0**	**4EU27 22-8AA00-0AA0**	**4EU30 22-8AA00-0AA0**	**4EU30 22-6CA00-0AA0**
	250	225	305	**4EU27 22-3AA00-0AA0**	**4EU30 22-4AA00-0AA0**	**4EU30 22-0BA00-0AA0**	**4EU36 22-5BA00-0AA0**
	280	252	342	**4EU27 22-4AA00-0AA0**	**4EU30 22-5AA00-0AA0**	**4EU36 22-1BA00-0AA0**	**4EU36 22-6BA00-0AA0**
	315	284	384	**4EU30 22-0AA00-0AA0**	**4EU30 22-6AA00-0AA0**	**4EU36 22-2BA00-0AA0**	**4EU36 22-7BA00-0AA0**
	355	320	433	**4EU30 22-1AA00-0AA0**	**4EU36 22-5AA00-0AA0**	**4EU36 22-3BA00-0AA0**	**4EU36 22-8BA00-0AA0**
	400	360	488	**4EU30 22-2AA00-0AA0**	**4EU36 22-6AA00-0AA0**	**4EU36 22-4BA00-0AA0**	**4EU39 21-8AA00-0A**
	450	405	549	**4EU30 22-3AA00-0AA0**	**4EU36 22-7AA00-0AA0**	**4EU39 21-5AA00-0A**	**4EU39 21-0BA00-0A**
	500	450	610	**4EU36 22-0AA00-0AA0**	**4EU36 22-8AA00-0AA0**	**4EU39 21-6AA00-0A**	**4EU39 21-1BA00-0A**
	560	504	683	**4EU36 22-1AA00-0AA0**	**4EU36 22-0BA00-0AA0**	**4EU39 21-7AA00-0A**	**4EU43 21-2BA00-0A**
	630	567	769	**4EU36 22-2AA00-0AA0**	**4EU39 21-2AA00-0A**	**4EU43 21-8AA00-0A**	**4EU43 21-3BA00-0A**
	710	639	866	**4EU36 22-3AA00-1BA0**	**4EU39 21-3AA00-0A**	**4EU43 21-0BA00-0A**	**4EU43 21-4BA00-0A**
	800	720	976	**4EU36 22-4AA00-1BA0**	**4EU39 21-4AA00-0A**	**4EU43 21-1BA00-0A**	**4EU45 21-2AA00 [4])**
	910	819	1110	**4EU39 21-0AA00-0A**	**4EU43 21-4AA00-0A**	**4EU45 21-0AA00 [4])**	**4EU45 21-3AA00 [4])**
	1000	900	1220	**4EU39 21-1AA00-0A**	**4EU43 21-5AA00-0A**	**4EU45 21-1AA00 [4])**	**4EU45 21-4AA00 [4])**
	1230	1107	1501	–	–	**4EU47 21-0AX00 [4])**	–
	1300	1170	1586	**4EU43 21-0BB00-0A**	**4EU45 21-0AM00 [4]) [2])**	–	–
	1640	1476	2001	**4EU45 21-0AL00 [4])**	**4EU50 21-0AA00 [4]) [2])**	**4EU51 21-0AA00 [4])**	–

1) All reactors with $U_N \leq 600$ V according to UL

2) Reference voltage drop of reactor $u_D \sim 4\%$ for I_{Ln} and U_N = 575 V

3) Reactors with higher rated currents on request for downstream six-pulse bridge converter

4) Reactors according to VDE 0532: I_{thmax} = rated current

2

Three-phase reactors

$I_{thmax} = 0.8 \cdot I_{Lmax}$

CE c UL us [1])

Max. continuous thermal current [5])	Rated current	Peak current [4])	Max. continuous direct current [3])	Reference voltage drop of reactor u_D = 4% for I_{thmax} and U_N			
I_{thmax} A	I_{Ln} A	I_{Lmax} A	I_{dn} A	Order No.	Order No.	Order No.	Order No.
				3 AC 400 V 50 Hz	**3 AC 500 V 50 Hz**	**3 AC 690 V 50 Hz**	**3 AC 750 V 50 Hz**
16	14	20	20	**4EP36 01-3DS00**	**4EP36 01-8DS00**	–	–
18	16	23	22	**4EP36 01-4DS00**	**4EP36 02-0DS00**	–	–
20	18	25	24	**4EP36 01-5DS00**	**4EP37 02-0DS00**	–	–
22.4	20	28	27	–	**4EP37 02-1DS00**	–	–
25	23	31.3	31	**4EP37 01-5DS00**	**4EP37 02-2DS00**	–	–
28	25	35	34	**4EP37 01-6DS00**	**4EP38 01-7DS00**	–	–
31.5	28	39	38	**4EP37 01-7DS00**	**4EP38 01-8DS00**	–	–
35.5	32	44	43	**4EP37 01-8DS00**	**4EP38 02-0DS00**	–	–
40	36	50	49	**4EP38 00-2DS00**	**4EP38 00-4DS00**	–	–
45	41	56	55	**4EP38 01-6DS00**	**4EP39 01-5DS00**	–	–
50	45	63	61	**4EP38 00-3DS00**	**4EP39 00-3DS00**	–	–
56	50	70	68	**4EP39 01-4DS00**	**4EP40 03-1DS00**	–	–
63	57	79	77	**4EP39 00-2DS00**	**4EP40 00-4DS00**	–	–
71	64	89	87	**4EP40 02-7DS00**	**4EP40 03-2DS00**	–	–
80	72	100	98	**4EP40 00-3DS00**	**4EU24 22-8AA00-0AA0**	–	–
91	82	114	111	**4EP40 02-8DS00**	**4EU24 22-0BA00-0AA0**	–	–
100	90	125	122	**4EP40 03-0DS00**	**4EU25 22-6BA00-0AA0**	–	–
112	101	140	137	**4EU24 22-6AA00-0AA0**	**4EU25 22-7BA00-0AA0**	–	–
125	113	156	153	**4EU24 22-7AA00-0AA0**	**4EU25 22-8BA00-0AA0**	–	–
140	126	175	171	**4EU25 22-2BA00-0AA0**	**4EU25 22-0CA00-0AA0**	–	–
160	144	200	195	**4EU25 22-3BA00-0AA0**	**4EU27 22-0CA00-0AA0**	–	–
180	162	225	220	**4EU25 22-4BA00-0AA0**	**4EU27 22-1CA00-0AA0**	–	–
200	180	250	244	**4EU25 22-5BA00-0AA0**	**4EU27 22-2CA00-0AA0**	**4EU27 22-0DA00-1BA0**	–
224	202	280	273	**4EU27 22-5BA00-0AA0**	**4EU27 22-3CA00-0AA0**	**4EU30 22-8BA00-0AA0**	–
250	225	313	305	**4EU27 22-6BA00-0AA0**	**4EU27 22-4CA00-0AA0**	**4EU30 22-0CA00-0AA0**	**4EU30 22-2CA00-0AA0**
280	252	350	342	**4EU27 22-7BA00-0AA0**	**4EU30 22-5BA00-0AA0**	**4EU30 22-1CA00-0AA0**	**4EU36 22-5DA00-0AA0**
315	284	394	384	**4EU27 22-8BA00-0AA0**	**4EU30 22-6BA00-0AA0**	**4EU36 22-0DA00-0AA0**	**4EU36 22-6DA00-0AA0**
355	320	444	433	**4EU30 22-1BA00-0AA0**	**4EU30 22-7BA00-0AA0**	**4EU36 22-1DA00-0AA0**	**4EU36 22-7DA00-0AA0**
400	360	500	488	**4EU30 22-2BA00-0AA0**	**4EU36 22-4CA00-0AA0**	**4EU36 22-2DA00-0AA0**	**4EU36 22-8DA00-1BA0**
450	405	563	549	**4EU30 22-3BA00-0AA0**	**4EU36 22-5CA00-0AA0**	**4EU36 22-3DA00-0AA0**	**4EU36 22-0EA00-1BA0**
500	450	625	610	**4EU30 22-4BA00-0AA0**	**4EU36 22-6CA00-0AA0**	**4EU36 22-4DA00-0AA0**	**4EU39 21-1CA00-0A**
560	504	700	683	**4EU36 22-0CA00-0AA0**	**4EU36 22-7CA00-0AA0**	**4EU39 21-8BA00-0A**	**4EU39 21-2CA00-0A**
630	567	788	769	**4EU36 22-1CA00-0AA0**	**4EU36 22-8CA00-1BA0**	**4EU39 21-0CA00-0A**	**4EU43 21-4DA00-0A**
710	639	888	866	**4EU36 22-2CA00-1BA0**	**4EU39 21-6BA00-0A**	**4EU43 21-0DA00-0A**	**4EU43 21-5DA00-0A**
800	720	1000	976	**4EU36 22-3CA00-1BA0**	**4EU39 21-7BA00-0A**	**4EU43 21-1DA00-0A**	**4EU43 21-6DA00-0A**
910	819	1138	1110	**4EU39 21-2BA00-0A**	**4EU43 21-4CA00-0A**	**4EU43 21-2DA00-0A**	**4EU45 21-4BA00**
980	882	1225	1196	–	–	**4EU43 21-0AY00-0A**	–
1000	900	1250	1220	**4EU39 21-3BA00-0A**	**4EU43 21-5CA00-0A**	**4EU43 21-3DA00-0A**	**4EU45 21-5BA00** [5])
1040	936	1300	1269	**4EU39 21-0AL00-0A**	**4EU43 21-0AX00-0A** [2])	–	–
1310	1179	1638	1598	**4EU43 21-0AW00-0A**	**4EU45 21-0AK00** [5]) [2])	**4EU45 21-0AP00** [5])	–

1) All reactors with $U_N \leq 600$ V according to UL

2) Reference voltage drop of reactor $u_D \sim 4\%$ for I_{Ln} and U_N = 575 V

3) Reactors with higher rated currents on request for downstream six-pulse bridge converter

4) Load with I_{max} permissible, occasional or periodic, if the effective current does not exceed the value I_{thmax}

5) Reactors according to VDE 0532: I_{thmax} = rated current

$I_{thmax} = I_{Lmax}$

CE cULus

	Maximum continuous thermal current	Rated current [1]	Maximum continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 400 V 50 Hz, u_D ~ 4.4 V 2% reference voltage drop for I_{thmax} and U_N												
	25	23	31	0.56	8.3	39	T	C	**4EP36 00-2DS00**	–	0.360	2.200
	28	25	34	0.5	8.7	39	T	C	**4EP36 00-3DS00**	–	0.300	2.200
	31.5	28	38	0.445	8.8	39	T	C	**4EP36 00-4DS00**	–	0.410	2.300
	35.5	32	43	0.395	9	39	T	C	**4EP36 00-5DS00**	–	0.600	2.500
	40	36	49	0.35	9.3	39	T	C	**4EP36 00-6DS00**	–	0.700	2.600
	45	41	55	0.311	12	49	T	C	**4EP37 00-4DS00**	–	0.620	3.100
	50	45	61	0.28	12	50	T	▶	**4EP37 00-5DS00**	–	0.900	3.400
	56	50	68	0.25	12	50	T	C	**4EP37 00-6DS00**	–	1.110	3.600
	63	57	77	0.222	13	50	T	▶	**4EP37 00-7DS00**	–	1.110	3.600
	71	64	87	0.197	18.5	59	F	C	**4EP38 00-8DS00**	–	0.850	4.700
	80	72	98	0.175	17.8	53	F	C	**4EP38 01-0DS00**	–	1.220	5.100
	91	82	111	0.154	18	53	F	C	**4EP38 01-1DS00**	–	1.690	5.600
	100	90	122	0.14	22	71	F	C	**4EP39 01-0DS00**	–	1.490	6.100

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

2

Three-phase reactors

$I_{thmax} = I_{Lmax}$

Max. continuous thermal current	Rated current [1]	Max. continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 400 V 50 Hz, u_D ~ 8.8 V 4% reference voltage drop for I_{thmax} and U_N											
16	14	20	1.75	8.8	39	T	C	**4EP36 00-7DS00**	–	0.450	2.300
18	16	22	1.56	9.1	39	T	C	**4EP36 00-8DS00**	–	0.590	2.500
20	18	24	1.4	9.3	39	T	C	**4EP36 01-0DS00**	–	0.610	2.500
22.4	20	27	1.24	12	49	T	C	**4EP37 00-8DS00**	–	0.700	3.200
25	23	31	1.12	10	52	T	C	**4EP37 01-0DS00**	–	0.870	3.400
28	25	34	1	12	49	T	C	**4EP37 01-1DS00**	–	1.020	3.500
31.5	28	38	0.889	11.8	53	T	▶	**4EP37 00-0DS00**	–	1.290	3.800
35.5	32	43	0.789	18	53	T	C	**4EP38 01-2DS00**	–	0.880	4.800
40	36	49	0.7	19	53	T	▶	**4EP38 00-0DS00**	–	1.130	5.100
45	41	55	0.622	19.5	53	T	C	**4EP38 01-3DS00**	–	1.620	5.600
50	45	61	0.56	21	65	T	C	**4EP39 00-0DS00**	–	1.770	6.100
56	50	68	0.5	21.6	67	F	C	**4EP39 01-2DS00**	–	2.290	6.600
63	57	77	0.445	33	71	F	C	**4EP40 00-0DS00**	–	1.280	8.400
71	64	87	0.395	32.1	75	F	C	**4EP40 01-8DS00**	–	1.760	8.900
80	72	98	0.35	33	71	F	▶	**4EP40 00-1DS00**	–	2.510	9.700
91	82	111	0.308	35.8	73	F	C	**4EP40 02-3DS00**	–	2.680	9.800
100	90	122	0.28	39	120	F	▶	**4EU24 22-0AA00-0AA0**	1.700	–	10.800
112	101	137	0.25	38	120	F	▶	**4EU24 22-1AA00-0AA0**	2.100	–	11.200
125	113	153	0.224	64	131	F	C	**4EU25 22-0AA00-0AA0**	1.200	–	15.900
140	126	171	0.2	64	131	F	C	**4EU25 22-1AA00-0AA0**	1.700	–	16.400
160	144	195	0.175	64	131	F	▶	**4EU25 22-2AA00-0AA0**	2.200	–	16.900
180	162	220	0.156	85	167	F	C	**4EU27 22-0AA00-0AA0**	1.500	–	24.100
200	180	244	0.14	85	167	F	C	**4EU27 22-1AA00-0AA0**	1.900	–	24.600
224	202	273	0.124	90	176	F	C	**4EU27 22-2AA00-0AA0**	2.700	–	25.400
250	225	305	0.112	90	167	F	C	**4EU27 22-3AA00-0AA0**	3.400	–	26.200
280	252	342	0.1	88	167	F	C	**4EU27 22-4AA00-0AA0**	4.500	–	27.400
315	284	384	0.0869	143	220	F	C	**4EU30 22-0AA00-0AA0**	2.500	–	33.700
355	320	433	0.0771	143	220	F	C	**4EU30 22-1AA00-0AA0**	2.900	–	34.200
400	360	488	0.0684	143	220	F	C	**4EU30 22-2AA00-0AA0**	4.900	–	36.400
450	405	549	0.0608	143	220	F	C	**4EU30 22-3AA00-0AA0**	6.400	–	38.100
500	450	610	0.0535	170	280	F	C	**4EU36 22-0AA00-0AA0**	3.700	–	48.700
560	504	683	0.0477	187	280	F	C	**4EU36 22-1AA00-0AA0**	4.900	–	50.000
630	567	769	0.0424	187	280	F	C	**4EU36 22-2AA00-0AA0**	6.500	–	52.000
710	639	866	0.0377	195	280	F	C	**4EU36 22-3AA00-1BA0**	–	15.850	61.800
800	720	976	0.0334	187	280	F	C	**4EU36 22-4AA00-1BA0**	–	21.230	68.000
910	819	1110	0.0297	277	358	F	C	**4EU39 21-0AA00-0A**	–	14.310	74.500
1000	900	1220	0.0271	277	360	F	C	**4EU39 21-1AA00-0A**	–	18.820	79.300
1300	1170	1586	0.0225	270	670	F	C	**4EU43 21-0BB00-0A**	–	23.130	110.000
1640 [4]	1640	2001	0.0179	435	700	F	D	**4EU45 21-0AL00**	–	30.000	146.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

4) Reactors according to VDE 0532: I_{thmax} = rated current

$I_{thmax} = I_{Lmax}$

	Max. continuous thermal current	Rated current [1]	Max. continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 500 V 50 Hz, u_D ~ 11.5 V 4% reference voltage drop for I_{thmax} and U_N												
	16	14	20	2.29	9.3	39	T	C	**4EP36 01-2DS00**	–	0.750	2.700
	18	16	22	2.03	12	55	T	C	**4EP37 01-2DS00**	–	0.720	3.200
	20	18	24	1.83	12	50	T	C	**4EP37 01-3DS00**	–	0.920	3.400
	22.4	20	27	1.63	11	49	T	C	**4EP37 01-4DS00**	–	1.530	4.100
	25	23	31	1.46	13	55	T	C	**4EP37 00-1DS00**	–	1.300	3.800
	28	25	34	1.31	14	53	T	C	**4EP38 01-4DS00**	–	1.020	5.000
	31.5	28	38	1.16	22	59	T	C	**4EP38 00-1DS00**	–	1.120	5.100
	35.5	32	43	1.03	20	59	T	C	**4EP38 01-5DS00**	–	1.550	5.500
	40	36	49	0.915	22	70	T	C	**4EP39 00-1DS00**	–	1.630	5.900
	45	41	55	0.81	22	70	T	C	**4EP39 01-3DS00**	–	2.550	6.900
	50	45	61	0.732	33	80	T	C	**4EP40 00-2DS00**	–	1.380	8.500
	56	50	68	0.654	36	73	T	C	**4EP40 02-0DS00**	–	1.800	8.900
	63	57	77	0.581	35	80	T	►	**4EP40 02-1DS00**	–	2.240	9.400
	71	64	87	0.516	34	80	T	C	**4EP40 02-2DS00**	–	3.750	11.000
	80	72	98	0.458	41	120	F	C	**4EU24 22-2AA00-0AA0**	1.900	–	11.000
	91	82	111	0.402	41	120	F	C	**4EU24 22-3AA00-0AA0**	2.400	–	11.500
	100	90	122	0.366	68	131	F	C	**4EU25 22-3AA00-0AA0**	1.400	–	16.000
	112	101	137	0.327	68	131	F	C	**4EU25 22-4AA00-0AA0**	1.700	–	16.300
	125	113	153	0.293	68	131	F	C	**4EU25 22-5AA00-0AA0**	2.300	–	17.000
	140	126	171	0.261	68	131	F	C	**4EU25 22-6AA00-0AA0**	2.900	–	17.800
	160	144	195	0.229	85	167	F	C	**4EU27 22-5AA00-0AA0**	2.200	–	24.900
	180	162	220	0.2	85	174	F	C	**4EU27 22-6AA00-0AA0**	3.500	–	26.300
	200	180	244	0.183	105	160	F	C	**4EU27 22-7AA00-0AA0**	3.500	–	26.300
	224	202	273	0.163	95	167	F	C	**4EU27 22-8AA00-0AA0**	4.400	–	27.400
	250	225	305	0.146	148	220	F	C	**4EU30 22-4AA00-0AA0**	2.800	–	34.000
	280	252	342	0.131	143	210	F	C	**4EU30 22-5AA00-0AA0**	4.000	–	35.400
	315	284	384	0.116	144	220	F	C	**4EU30 22-6AA00-0AA0**	5.400	–	36.900
	355	320	433	0.103	190	280	F	C	**4EU36 22-5AA00-0AA0**	3.900	–	48.900
	400	360	488	0.0915	212	280	F	C	**4EU36 22-6AA00-0AA0**	4.900	–	50.100
	450	405	549	0.0813	220	300	F	C	**4EU36 22-7AA00-0AA0**	8.800	–	51.000
	500	450	610	0.0732	200	280	F	C	**4EU36 22-8AA00-0AA0**	9.200	–	54.900
	560	504	683	0.0654	187	280	F	C	**4EU36 22-0BA00-0AA0**	10.900	–	56.800
	630	567	769	0.0556	220	380	F	C	**4EU39 21-2AA00-0A**	–	10.860	70.600
	710	639	866	0.0493	231	380	F	C	**4EU39 21-3AA00-0A**	–	20.540	81.200
	800	720	976	0.0438	261	370	F	C	**4EU39 21-4AA00-0A**	–	18.310	78.000
	910	819	1110	0.0392	365	459	F	C	**4EU43 21-4AA00-0A**	–	14.920	107.000
	1000	900	1220	0.0357	365	480	F	C	**4EU43 21-5AA00-0A**	–	18.300	110.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

2

Three-phase reactors

$I_{thmax} = I_{Lmax}$

CE c UL us [4])

	Max. continuous thermal current	Rated current [1])	Max. continuous direct current [2])	Inductance	Core losses	Winding losses	Connections [3]) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 575 V 50 Hz, u_D ~ 13.0 V 4% reference voltage drop for I_{thmax} and U_N												
	1300 [5])	1300	1586	0.0316	404	700	F	D	**4EU45 21-0AM00**	–	33.000	152.000
	1640 [5])	1640	2001	0.0258	402	1300	F	D	**4EU50 21-0AA00**	–	52.800	190.000
3 AC 690 V 50 Hz, u_D ~ 7.8 V 2% reference voltage drop for I_{thmax} and U_N												
	1230	1107	1501	0.0202	350	660	F	C	**4EU43 21-0BC00-0A**	–	14.300	99.000
	1640	1476	2001	0.0151	325	670	F	C	**4EU43 21-0BD00-0A**	–	20.670	108.000
3 AC 690 V 50 Hz, u_D ~ 15.0 V 4% reference voltage drop for I_{thmax} and U_N												
	200	180	250	0.242	132	210	F	C	**4EU30 22-7AA00-0AA0**	4.000	–	35.400
	224	201.6	280	0.215	160	220	F	C	**4EU30 22-8AA00-0AA0**	6.200	–	35.000
	250	225	313	0.194	148	210	F	C	**4EU30 22-0BA00-0AA0**	6.300	–	38.000
	280	252	350	0.173	220	300	F	C	**4EU36 22-1BA00-0AA0**	5.900	–	48.000
	315	283.5	394	0.154	220	300	F	C	**4EU36 22-2BA00-0AA0**	6.900	–	49.000
	355	319.5	444	0.136	210	280	F	C	**4EU36 22-3BA00-0AA0**	7.000	–	52.500
	400	360	500	0.121	200	280	F	C	**4EU36 22-4BA00-0AA0**	10.200	–	56.000
	450	405	563	0.105	277	378	F	C	**4EU39 21-5AA00-0A**	–	10.410	70.000
	500	450	625	0.0942	223	378	F	C	**4EU39 21-6AA00-0A**	–	13.230	73.300
	560	504	700	0.0841	220	375	F	C	**4EU39 21-7AA00-0A**	–	17.380	78.000
	630	567	788	0.0768	325	480	F	C	**4EU43 21-8AA00-0A**	–	15.000	106.000
	710	639	888	0.0681	331	480	F	C	**4EU43 21-0BA00-0A**	–	21.490	113.000
	800	720	1000	0.0605	300	480	F	C	**4EU43 21-1BA00-0A**	–	27.980	123.000
	910 [5])	910	1138	0.0532	356	500	F	D	**4EU45 21-0AA00**	–	31.160	148.000
	1000 [5])	1000	1250	0.0484	350	500	F	X	**4EU45 21-1AA00**	–	34.600	156.000
	1230 [5])	1230	1538	0.0411	450	733	F	D	**4EU47 21-0AX00**	–	28.820	185.000
	1640 [5])	1640	2050	0.031	520	1300	F	D	**4EU51 21-0AA00**	–	56.100	210.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

4) All reactors with $U_N \leq 600$ V according to UL

5) Reactors according to VDE 0532: I_{thmax} = rated current

$I_{thmax} = I_{Lmax}$

CE c UL us [4])

	Max. continuous thermal current	Rated current [1])	Max. continuous direct current [2])	Inductance	Core losses	Winding losses	Connections [3]) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 750 V 50 Hz, u_D ~ 17.3 V 4% reference voltage drop for I_{thmax} and U_N												
	200	180	244	0.275	160	220	F	C	**4EU30 22-5CA00-0AA0**	6.200	–	35.000
	224	202	273	0.245	160	220	F	C	**4EU30 22-6CA00-0AA0**	8.100	–	37.000
	250	225	305	0.22	220	300	F	C	**4EU36 22-5BA00-0AA0**	5.900	–	48.000
	280	252	342	0.197	210	300	F	C	**4EU36 22-6BA00-0AA0**	7.400	–	50.000
	315	283	384	0.175	210	301	F	C	**4EU36 22-7BA00-0AA0**	9.100	–	51.000
	355	319	433	0.155	210	300	F	C	**4EU36 22-8BA00-0AA0**	13.200	–	55.000
	400	360	488	0.138	288	394	F	C	**4EU39 21-8AA00-0A**	–	11.020	70.800
	450	405	549	0.122	288	394	F	C	**4EU39 21-0BA00-0A**	–	14.540	73.800
	500	450	610	0.11	277	360	F	C	**4EU39 21-1BA00-0A**	–	25.060	86.200
	560	504	683	0.0983	313	474	F	C	**4EU43 21-2BA00-0A**	–	16.150	108.000
	630	567	769	0.087	315	460	F	C	**4EU43 21-3BA00-0A**	–	22.470	115.000
	710	639	866	0.0776	283	488	F	C	**4EU43 21-4BA00-0A**	–	28.630	122.000
	800 [5])	800	976	0.0688	404	500	F	D	**4EU45 21-2AA00**	–	24.500	142.000
	910 [5])	910	1110	0.0605	404	500	F	D	**4EU45 21-3AA00**	–	32.000	149.000
	1000 [5])	1000	1220	0.0551	404	500	F	D	**4EU45 21-4AA00**	–	40.000	157.000
3 AC 830 V 50 Hz, u_D ~ 9.6 V 2% reference voltage drop for I_{thmax} and U_N												
	1230	1107	1501	0.0248	325	670	F	C	**4EU43 21-0BE00-0A**	–	23.140	110.000
	1560 [5])	1560	1903	0.0196	404	700	F	D	**4EU45 21-0AN00**	–	25.300	142.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

4) All reactors with $U_N \leq 600$ V according to UL

5) Reactors according to VDE 0532: I_{thmax} = rated current

2

Three-phase reactors

$I_{thmax} = 0.8 \cdot I_{Lmax}$

Max. continuous thermal current	Rated current [1]	Peak current [4]	Max. continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
I_{thmax} A	I_{Ln} A	I_{Lmax} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 400 V 50 Hz, u_D ~ 8.8 V 4% reference voltage drop for I_{thmax} and U_N												
16	14	20	20	1.4	6.7	39	T	▶	**4EP36 01-3DS00**	–	0.470	2.400
18	16	23	22	1.24	7	39	T	C	**4EP36 01-4DS00**	–	0.480	2.400
20	18	25	24	1.12	7	39	T	▶	**4EP36 01-5DS00**	–	0.610	2.500
25	23	31	31	0.889	9	53	T	B	**4EP37 01-5DS00**	–	0.740	3.200
28	25	35	34	0.789	9	53	T	▶	**4EP37 01-6DS00**	–	0.970	3.500
31.5	28	39	38	0.7	9	55	T	C	**4EP37 01-7DS00**	–	1.240	3.800
35.5	32	44	43	0.622	9	55	T	▶	**4EP37 01-8DS00**	–	1.710	4.200
40	36	50	49	0.56	14.5	60	T	▶	**4EP38 00-2DS00**	–	0.710	4.700
45	41	56	55	0.5	16.5	58	T	C	**4EP38 01-6DS00**	–	1.330	5.300
50	45	63	61	0.445	14.5	55	T	▶	**4EP38 00-3DS00**	–	1.400	5.400
56	50	70	68	0.395	15.7	70	F	▶	**4EP39 01-4DS00**	–	2.070	6.500
63	57	79	77	0.35	19.1	70	F	▶	**4EP39 00-2DS00**	–	2.190	6.800
71	64	89	87	0.308	24.9	80	F	C	**4EP40 02-7DS00**	–	1.700	8.800
80	72	100	98	0.28	26.2	80	F	▶	**4EP40 00-3DS00**	–	1.910	9.000
91	82	114	111	0.25	24	80	F	▶	**4EP40 02-8DS00**	–	2.150	9.600
100	90	125	122	0.224	30	80	F	▶	**4EP40 03-0DS00**	–	2.950	10.400
112	101	140	137	0.193	28	122	F	C	**4EU24 22-6AA00-0AA0**	2.100	–	11.200
125	113	156	153	0.169	30	122	F	▶	**4EU24 22-7AA00-0AA0**	2.600	–	11.700
140	126	175	171	0.149	55	135	F	▶	**4EU25 22-2BA00-0AA0**	1.100	–	15.700
160	144	200	195	0.134	52	135	F	▶	**4EU25 22-3BA00-0AA0**	1.500	–	17.200
180	162	225	220	0.119	52	135	F	▶	**4EU25 22-4BA00-0AA0**	2.200	–	16.900
200	180	250	244	0.107	52	135	F	▶	**4EU25 22-5BA00-0AA0**	2.800	–	17.700
224	202	280	273	0.0955	75	174	F	C	**4EU27 22-5BA00-0AA0**	1.900	–	24.500
250	225	313	305	0.0849	75	174	F	▶	**4EU27 22-6BA00-0AA0**	2.300	–	25.000
280	252	350	342	0.0753	74	174	F	▶	**4EU27 22-7BA00-0AA0**	2.900	–	25.700
315	284	394	384	0.0668	75	174	F	▶	**4EU27 22-8BA00-0AA0**	4.100	–	27.000
355	320	444	433	0.0622	102	220	F	C	**4EU30 22-1BA00-0AA0**	1.100	–	34.500
400	360	500	488	0.056	102	220	F	▶	**4EU30 22-2BA00-0AA0**	4.100	–	35.500
450	405	563	549	0.05	92	220	F	C	**4EU30 22-3BA00-0AA0**	6.400	–	38.100
500	450	625	610	0.0445	92	220	F	▶	**4EU30 22-4BA00-0AA0**	7.000	–	38.700
560	504	700	683	0.0377	140	293	F	▶	**4EU36 22-0CA00-0AA0**	4.700	–	49.800
630	567	788	769	0.0334	140	293	F	▶	**4EU36 22-1CA00-0AA0**	6.200	–	51.600
710	639	888	866	0.0294	150	293	F	C	**4EU36 22-2CA00-1BA0**	–	14.100	60.000
800	720	1000	976	0.0267	140	293	F	▶	**4EU36 22-3CA00-1BA0**	–	20.350	66.700
910	819	1138	1110	0.025	220	380	F	C	**4EU39 21-2BA00-0A**	–	14.540	74.700
1000	900	1250	1220	0.0224	216	380	F	C	**4EU39 21-3BA00-0A**	–	18.380	78.800
1040	936	1300	1269	0.0225	210	535	F	C	**4EU39 21-0AL00-0A**	–	13.030	72.900
1310	1179	1638	1598	0.0179	325	680	F	C	**4EU43 21-0AW00-0A**	–	23.090	110.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

4) Load with I_{Lmax} permissible, occasional or periodic, if the effective current does not exceed the value I_{thmax}.

$I_{thmax} = 0.8 \cdot I_{Lmax}$

CE c UL us

	Max. continuous thermal current	Rated current [1]	Peak current [4]	Max. continuous direct current [2]	Inductance	Core losses	Winding losses	Connections [3] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	I_{Lmax}	I_{dn}	L_x	P_{FE}	P_W						
	A	A	A	A	mH	W	W				kg	kg	kg
3 AC 500 V 50 Hz, u_D ~ 11.5 V 4% reference voltage drop for I_{thmax} and U_N													
	16	14	20	20	1.83	8	37	T	▶	**4EP36 01-8DS00**	–	0.730	2.700
	18	16	23	22	1.63	7	37	T	C	**4EP36 02-0DS00**	–	0.900	2.800
	20	18	25	24	1.46	9	55	T	C	**4EP37 02-0DS00**	–	0.750	3.200
	22.4	20	28	27	1.31	9	52.6	T	C	**4EP37 02-1DS00**	–	0.980	3.500
	25	23	31	31	1.16	8	47	T	C	**4EP37 02-2DS00**	–	1.580	4.100
	28	25	35	34	1.03	14	52.8	T	C	**4EP38 01-7DS00**	–	0.870	4.800
	31.5	28	39	38	0.915	14	59	T	C	**4EP38 01-8DS00**	–	1.240	5.200
	35.5	32	44	43	0.813	15	69	T	C	**4EP38 02-0DS00**	–	1.640	5.600
	40	36	50	49	0.732	15	60	T	C	**4EP38 00-4DS00**	–	1.520	5.500
	45	41	56	55	0.654	17	70	T	C	**4EP39 01-5DS00**	–	2.480	6.900
	50	45	63	61	0.566	17	65	T	▶	**4EP39 00-3DS00**	–	2.260	6.600
	56	50	71	68	0.516	25	80	F	C	**4EP40 03-1DS00**	–	1.790	9.000
	63	57	79	77	0.458	25	80	F	C	**4EP40 00-4DS00**	–	2.290	9.400
	71	64	89	87	0.402	26	80	F	C	**4EP40 03-2DS00**	–	2.870	10.100
	80	72	100	98	0.36	42	120	F	C	**4EU24 22-8AA00-0AA0**	1.800	–	10.900
	91	82	114	111	0.327	32	122	F	C	**4EU24 22-0BA00-0AA0**	2.300	–	11.400
	100	90	125	122	0.293	52	135	F	C	**4EU25 22-6BA00-0AA0**	1.400	–	16.000
	112	101	140	137	0.261	52	135	F	C	**4EU25 22-7BA00-0AA0**	1.700	–	16.300
	125	113	156	153	0.229	52	135	F	C	**4EU25 22-8BA00-0AA0**	1.800	–	16.500
	140	126	175	171	0.203	52	135	F	C	**4EU25 22-0CA00-0AA0**	2.400	–	17.100
	160	144	200	195	0.175	74	174	F	▶	**4EU27 22-0CA00-0AA0**	1.400	–	24.000
	180	162	225	220	0.156	76	174	F	C	**4EU27 22-1CA00-0AA0**	1.900	–	24.600
	200	180	250	244	0.14	78	174	F	C	**4EU27 22-2CA00-0AA0**	2.500	–	25.200
	224	202	280	273	0.125	80	174	F	C	**4EU27 22-3CA00-0AA0**	3.300	–	26.100
	250	225	313	305	0.111	80	174	F	C	**4EU27 22-4CA00-0AA0**	4.200	–	27.100
	280	252	350	342	0.0986	110	220	F	C	**4EU30 22-5BA00-0AA0**	2.900	–	34.200
	315	284	394	384	0.0875	110	220	F	▶	**4EU30 22-6BA00-0AA0**	3.800	–	35.100
	355	320	444	433	0.0778	117	220	F	C	**4EU30 22-7BA00-0AA0**	4.600	–	36.100
	400	360	500	488	0.07	182	293	F	▶	**4EU36 22-4CA00-0AA0**	3.300	–	48.300
	450	405	563	549	0.0625	171	293	F	C	**4EU36 22-5CA00-0AA0**	4.200	–	49.000
	500	450	625	610	0.0556	160	293	F	▶	**4EU36 22-6CA00-0AA0**	5.700	–	51.000
	560	504	700	683	0.0493	160	293	F	C	**4EU36 22-7CA00-0AA0**	7.700	–	53.200
	630	567	788	769	0.0438	190	280	F	C	**4EU36 22-8CA00-1BA0**	–	19.420	65.700
	710	639	888	866	0.0392	210	378	F	C	**4EU39 21-6BA00-0A**	–	12.830	72.800
	800	720	1000	976	0.0357	230	375	F	C	**4EU39 21-7BA00-0A**	–	18.460	78.900
	910	819	1138	1110	0.0327	300	480	F	C	**4EU43 21-4CA00-0A**	–	14.230	106.000
	1000	900	1250	1220	0.0293	274	480	F	C	**4EU43 21-5CA00-0A**	–	16.740	108.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

4) Load with I_{Lmax} permissible, occasional or periodic, if the effective current does not exceed the value I_{thmax}.

2

Three-phase reactors

$I_{thmax} = 0.8 \cdot I_{Lmax}$

CE c UL us 4)

	Max. continuous thermal current	Rated current 1)	Peak current 5)	Max. continuous direct current 2)	Inductance	Core losses	Winding losses	Connections 3) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight approx.
	I_{thmax} A	I_{Ln} A	I_{Lmax} A	I_{dn} A	L_x mH	P_{FE} W	P_W W				kg	kg	kg
3 AC 575 V 50 Hz, u_D ~ 12.6 V 4% reference voltage drop for I_{thmax} and U_N													
	1040	936	1300	1270	0.0309	325	681	F	C	**4EU43 21-0AX00-0A**	–	14.010	101.000
	1310 6)	1310	1638	1600	0.0245	404	700	F	D	**4EU45 21-0AK00**	–	18.700	135.000
3 AC 690 V 50 Hz, u_D ~ 15.0 V 4% reference voltage drop for I_{thmax} and U_N													
	200	180	250	244	0.194	90	190	F	C	**4EU27 22-0DA00-1BA0**	–	11.340	34.700
	224	202	280	273	0.165	110	220	F	C	**4EU30 22-8BA00-0AA0**	4.900	–	36.400
	250	225	313	305	0.147	130	240	F	C	**4EU30 22-0CA00-0AA0**	5.300	–	35.000
	280	252	350	342	0.13	102	220	F	C	**4EU30 22-1CA00-0AA0**	7.000	–	38.700
	315	284	394	384	0.115	180	320	F	C	**4EU36 22-0DA00-0AA0**	5.900	–	48.000
	355	320	444	433	0.103	180	320	F	C	**4EU36 22-1DA00-0AA0**	7.200	–	49.000
	400	360	500	488	0.0923	171	293	F	C	**4EU36 22-2DA00-0AA0**	7.000	–	52.000
	450	405	563	549	0.0824	180	320	F	C	**4EU36 22-3DA00-0AA0**	12.100	–	54.000
	500	450	625	610	0.0733	180	390	F	C	**4EU36 22-4DA00-0AA0**	9.500	–	52.000
	560	504	700	683	0.0681	220	375	F	C	**4EU39 21-8BA00-0A**	–	13.850	77.600
	630	567	788	769	0.0605	176	388	F	C	**4EU39 21-0CA00-0A**	–	21.130	81.900
	710	639	888	866	0.0532	330	470	F	C	**4EU43 21-0DA00-0A**	–	12.820	104.000
	800	720	1000	976	0.0484	300	460	F	C	**4EU43 21-1DA00-0A**	–	15.970	103.000
	910	819	1138	1110	0.0432	280	448	F	C	**4EU43 21-2DA00-0A**	–	27.720	115.000
	980	882	1225	1196	0.0411	325	680	F	C	**4EU43 21-0AY00-0A**	–	23.110	110.000
	1000	900	1250	1220	0.0387	318	473	F	C	**4EU43 21-3DA00-0A**	–	29.330	124.000
	1310 6)	1310	1638	1598	0.0309	400	700	F	D	**4EU45 21-0AP00**	–	33.000	152.000
3 AC 750 V 50 Hz, u_D ~ 17.3 V 4% reference voltage drop for I_{thmax} and U_N													
	250	225	313	305	0.175	130	240	F	C	**4EU30 22-2CA00-0AA0**	6.600		36.000
	280	252	350	342	0.155	180	320	F	C	**4EU36 22-5DA00-0AA0**	6.800		49.000
	315	284	394	384	0.138	180	320	F	C	**4EU36 22-6DA00-0AA0**	9.000		51.000
	355	320	444	433	0.122	180	320	F	C	**4EU36 22-7DA00-0AA0**	9.200		51.000
	400	360	500	488	0.11	180	320	F	C	**4EU36 22-8DA00-1BA0**	–	19.200	62.000
	450	405	563	549	0.0983	170	293	F	C	**4EU36 22-0EA00-1BA0**	–	22.260	68.700
	500	450	625	610	0.0874	218	380	F	C	**4EU39 21-1CA00-0A**	–	18.180	78.900
	560	504	700	683	0.0776	240	380	F	C	**4EU39 21-2CA00-0A**	–	17.640	78.100
	630	567	788	769	0.0688	300	480	F	C	**4EU43 21-4DA00-0A**	–	15.070	106.000
	710	639	888	866	0.0605	321	472	F	C	**4EU43 21-5DA00-0A**	–	19.460	111.000
	800	720	1000	976	0.0551	285	480	F	C	**4EU43 21-6DA00-0A**	–	26.250	118.000
	910 6)	910	1138	1110	0.0469	404	520	F	D	**4EU45 21-4BA00**	–	20.000	137.000
	1000 6)	1000	1250	1220	0.042	404	488	F	D	**4EU45 21-5BA00**	–	21.850	141.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) I_{Ln} (60 Hz) = 0.9 x I_{Ln} (50 Hz), for further details, see catalogue PD 60, "Technische Informationen", Chapter "Drosseln"

2) Reactors with higher rated currents on request for downstream six-pulse bridge converter

3) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

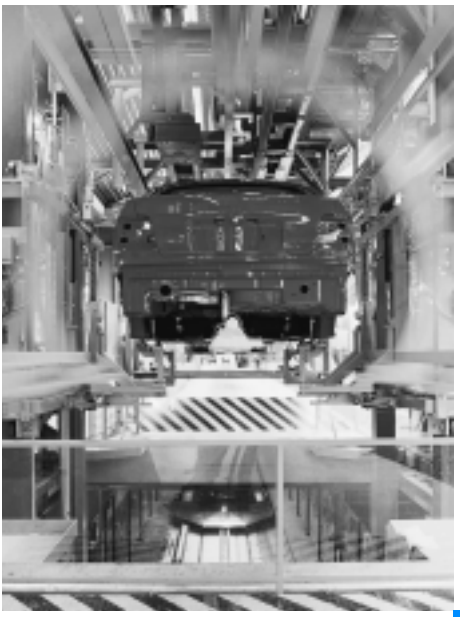
4) All reactors with $U_N \leq 600$ V according to UL

5) Load with I_{Lmax} permissible, occasional or periodic, if the effective current does not exceed the value I_{thmax}.

6) Reactors according to VDE 0532: I_{thmax} = rated current

SIDAC-D
Mains reactors
for frequency converters

3



Three-phase reactors

3/2 Application

3/2 Technical data

3/3 Selection and ordering data

Three-phase reactors

Application

Fig. 3/1 Mains reactors for frequency converters

Three-phase mains reactors for frequency converters are used in the line-side supply cable. Alternating currents flow through them with the mains frequency as the fundamental component.

The reactors limit the circuit feedback that occurs in the form of harmonics. They also reduce the alternating currents and their frequencies caused by the switching of the input rectifier in the DC link capacitors.

Two reactor series are available:

- Reactors with a reference voltage drop u_D of ~ 2% for the operation of converters without power recovery.
- Reactors with a reference voltage drop u_D of ~ 4% for operation with converters in combination with autotransformers with power recovery.

Technical data

Recommended supply voltage U_N **Rated alternating current I_{Ln}** **Maximum continuous thermal current I_{thmax}** **Voltage drop Δu per phase** **Inductance per phase** **Core losses P_{Fe}** **Winding losses P_W** **Weight**	See table "Selection and ordering data"	
Degree of protection	IP00 according to DIN VDE 0470-1/EN 60529	
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110	
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	According to DIN VDE	
	4EP with terminals:	690 V AC
	4EP with flat termination and 4EU24 to 4EU43 (EN 61558):	1000 V AC
	4EU45 to 4EU52 (DIN VDE 0532): with $U_N \leq 500$ V for 4EP and 4EU:	1100 V AC 600 V AC to c UL us
Permissible ambient temperature during operation	from –25 °C to +70 °C (4EP) from –25 °C to +80 °C (4EU)	
Deviation of the permissible alternating current from rated alternating current I_{Ln} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"	
Temperature classes	Type 4EP: temperature class B Type 4EU: temperature class H (utilisation according to F for applications according to EN) Type 4EU: temperature class H (for applications according to c UL us)	
Site altitude	≤ 1000 m above sea level	
Deviation of the permissible alternating current from rated alternating current I_{Ln} at site altitudes >1000 m above sea level	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"	
Operation with varying load	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"	
Standards	The reactors comply with EN 61558 (type 4EU45 to 4EU52: DIN VDE 0532) The reactors are UL Recognised under Guide No. XQNX2 and File No. E103902 as well as cUL approved under Guide No. XQNX8 File No. E103902 (applies to reactors with $U_N \leq 600$ V according to UL)	
Storage temperature	from –25 °C to +80 °C	
Permissible humidity rating	Relative humidity at +40 °C occasionally to 100% annual mean, 80% occasional condensation permissible	

Selection and ordering data

CE c UL us [1])

Overview

Max. continuous thermal current [2] I_{thmax} A	Rated current I_{Ln} A	Reference voltage drop of reactor u_D = 2% for I_{thmax} and U_N Order No. 3 AC 400 V 50 Hz 3 AC 480 V 60 Hz	Order No. 3 AC 500 V 50 Hz	Order No. 3 AC 690 V 50 Hz
1.5	1.4	4EP32 00-4US00	–	–
3	2.7	4EP32 00-5US00	–	–
5	4.5	–	4EP32 00-2US00	–
6.3	5.7	4EP32 00-1US00	4EP33 00-0US00	–
8	7.2	–	4EP34 00-3US00	–
9.1	8.2	4EP34 00-2US00	–	–
11.2	10.1	4EP34 00-1US00	–	–
12.5	11.3	–	4EP36 00-8US00	–
16	14.4	4EP35 00-0US00	4EP36 00-2US00	–
18	16.2	4EP36 00-4US00	–	–
22.4	20.2	–	4EP36 00-3US00	–
22.5	20.3	4EP36 01-0US00	–	–
28	25.2	4EP36 00-5US00	–	–
31.5	28.4	–	4EP37 00-6US00	–
35.5	32	4EP37 00-2US00	4EP37 00-1US00	–
40	36	4EP37 00-5US00	–	–
45	41	4EP38 01-1US00	4EP38 01-2US00	–
50	45	4EP38 00-2US00	4EP38 00-1US00	–
63	57	4EP38 00-7US00	4EP39 00-1US00	4EP40 00-3US00
71	64	–	4EP40 00-7US00	–
80	72	4EP39 00-2US00	4EP40 00-1US00	–
91	82	4EP40 01-3US00	–	4EU24 52-3UA00-0AA0
100	90	4EP40 00-2US00	–	4EU25 52-7UA00-0AA0
112	101	–	4EP40 00-8US00	–
125	113	4EP40 00-6US00	–	4EU25 52-3UA00-0AA0
140	126	–	4EU24 52-1UA00-0AA0	–
160	144	4EU24 52-2UA00-0AA0	4EU25 52-2UA00-0AA0	4EU25 52-0UB00-0AA0
180	162	–	–	4EU27 52-5UA00-0AA0
200	180	4EU25 52-4UA00-0AA0	4EU25 52-6UA00-0AA0	–
224	202	4EU25 52-8UA00-0AA0	–	4EU27 52-6UA00-0AA0
250	225	4EU25 52-5UA00-0AA0	4EU27 52-2UA00-0AA0	–
280	252	4EU27 52-0UB00-0AA0	–	–
315	284	4EU27 52-7UA00-0AA0	4EU27 52-3UA00-0AA0	4EU30 52-3UA00-0AA0
400	360	4EU27 52-8UA00-0AA0	4EU27 52-4UA00-1BA0	4EU30 52-4UA00-0AA0
450	405	–	4EU30 52-2UA00-0AA0	–
500	450	4EU30 52-4UB00-0AA0	–	4EU36 52-5UA00-0AA0
560	504	4EU30 52-5UA00-0AA0	4EU30 52-5UB00-0AA0	4EU36 52-4UC00-0AA0
630	567	4EU30 52-6UA00-1BA0	4EU36 52-2UA00-0AA0	4EU36 52-6UA00-0AA0
710	639	–	4EU36 52-3UA00-0AA0	4EU36 52-7UA00-1BA0
720	648	4EU36 52-8UA00-0AA0	–	–
910	819	4EU36 52-0UB00-1BA0	4EU36 52-4UA00-1BA0	4EU39 51-0UA00-0A
1000	900	–	4EU36 52-2UB00-1BA0	4EU39 51-4UA00-0A
1120	1008	4EU36 52-7UC00-1BA0	4EU39 51-5UB00-0A	4EU39 51-6UB00-0A
1250	1125	–	4EU39 51-7UB00-0A	4EU43 51-0UB00-0A
1400	1260	4EU39 51-8UB00-0A	–	4EU43 51-1UB00-0A
1600	1440	4EU39 51-0UC00-0A	4EU43 51-2UB00-0A	4EU45 51-4UA00 [2]

1) All reactors with $U_N \leq 600$ V according to UL
Reactors with higher rated currents on request

2) Reactors according to VDE 0532: I_{thmax} = rated current

Three-phase reactors

Overview

CE c UL us [1])

	Max. continuous thermal current [2])	Rated current	Reference voltage drop of reactor u_D = 4% for I_{thmax} and U_N		
	I_{thmax} A	I_{Ln} A	Order No.	Order No.	Order No.
			3 AC 400 V 50 Hz 3 AC 480 V 60 Hz	**3 AC 500 V 50 Hz**	**3 AC 690 V 50 Hz**
	18	16.2	**4EP37 00-7US00**	**–**	**–**
	22.4	20.2	**4EP38 01-0US00**	**4EP38 00-8US00**	**–**
	35.5	32	**4EP39 00-5US00**	**4EP40 01-0US00**	**–**
	45	41	**4EP40 01-1US00**	**4EP40 01-2US00**	**–**
	63	57	**–**	**4EU24 52-5UA00-0AA0**	**–**
	80	72	**4EU24 52-4UA00-0AA0**	**4EU25 52-1UB00-0AA0**	**–**
	91	82	**4EU25 52-2UB00-0AA0**	**–**	**–**
	100	90	**–**	**4EU25 52-3UB00-0AA0**	**–**
	125	113	**–**	**–**	**4EU27 52-4UB00-0AA0**
	140	126	**–**	**4EU27 52-3UB00-0AA0**	**–**
	160	144	**4EU27 52-1UB00-0AA0**	**4EU27 52-6UB00-0AA0**	**–**
	180	162	**–**	**–**	**4EU30 52-2UB00-0AA0**
	200	180	**4EU27 52-2UB00-0AA0**	**4EU30 52-0UB00-0AA0**	**–**
	224	202	**4EU27 52-5UB00-0AA0**	**–**	**4EU36 52-8UB00-0AA0**
	250	225	**–**	**4EU30 52-1UB00-0AA0**	**–**
	280	252	**4EU30 52-7UA00-0AA0**	**–**	**–**
	315	284	**4EU30 52-3UB00-0AA0**	**4EU36 52-5UB00-0AA0**	**4EU36 52-0UC00-0AA0**
	355	320	**4EU30 52-8UA00-0AA0**	**–**	**–**
	400	360	**4EU36 52-3UB00-0AA0**	**4EU36 52-6UB00-0AA0**	**4EU39 51-8UA00-0A**
	500	450	**4EU36 52-5UC00-0AA0**	**4EU36 52-7UB00-1BA0**	**4EU39 51-0UB00-0A**
	560	504	**4EU36 52-4UB00-0AA0**	**4EU39 51-3UB00-0A**	**4EU39 51-4UB00-0A**
	630	567	**4EU36 52-6UC00-1BA0**	**–**	**–**
	710	639	**4EU39 51-6UA00-0A**	**4EU39 51-7UA00-0A**	**4EU43 51-6UA00-0A**
	910	819	**4EU39 51-1UB00-0A**	**4EU43 51-5UA00-0A**	**4EU45 51-3UA00** [2])
	1120	1008	**4EU43 51-3UB00-0A**	**4EU45 51-5UA00** [2])	**4EU47 51-2UA00** [2])
	1250	1125	**–**	**4EU45 51-6UA00** [2])	**–**
	1500	1350	**4EU43 51-4UB00-0A**	**–**	**–**
	1600	1440	**4EU43 51-5UB00-0A**	**4EU47 51-3UA00** [2])	**4EU52 51-1UA00** [2])

1) All reactors with $U_N \leq 600$ V according to UL
Reactors with higher rated currents on request

2) Reactors according to VDE 0532: I_{thmax} = rated current

Three-phase reactors

	Max. continuous thermal current	Rated current	Inductance	Core losses [1]	Winding losses	Connections [2] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	L_x	P_{FE}	P_W						
	A	A	mH	W	W				kg	kg	kg
3 AC 400 V 50 Hz, u_D ~ 4.4 V 2% reference voltage drop for I_{thmax} and U_N											
3 AC 480 V 60 Hz, u_D ~ 5.3 V 2% reference voltage drop for I_{thmax} and U_N											
	1.5	1.4	9.4	4.5	16.7	T	▶	**4EP32 00-4US00**	–	0.050	0.600
	3	2.7	4.7	4.5	16.7	T	▶	**4EP32 00-5US00**	–	0.110	0.600
	6.3	5.7	2.24	5.6	17	T	▶	**4EP32 00-1US00**	–	0.220	0.700
	9.1	8.2	1.55	10	25	T	▶	**4EP34 00-2US00**	–	0.290	1.400
	11.2	10.1	1.26	11	23	T	▶	**4EP34 00-1US00**	–	0.370	1.500
	16	14.4	0.881	10	31	T	▶	**4EP35 00-0US00**	–	0.490	1.800
	18	16	0.783	15	37	T	▶	**4EP36 00-4US00**	–	0.600	2.500
	22.5	20	0.629	9	37	T	C	**4EP36 01-0US00**	–	0.620	2.500
	28	25	0.503	8	37	T	▶	**4EP36 00-5US00**	–	0.830	2.700
	35.5	32	0.397	10	50	T	▶	**4EP37 00-2US00**	–	0.860	3.300
	40	36	0.352	11	42	T	▶	**4EP37 00-5US00**	–	1.320	3.800
	45	41	0.313	12	57	T	C	**4EP38 01-1US00**	–	0.760	4.700
	50	45	0.282	19	54	F-Cu	▶	**4EP38 00-2US00**	–	0.910	5.000
	63	57	0.224	13	54	F-Cu	▶	**4EP38 00-7US00**	–	1.420	5.800
	80	72	0.176	18	65	F-Cu	▶	**4EP39 00-2US00**	–	2.090	7.400
	91	82	0.155	22	78	F-Cu	C	**4EP40 01-3US00**	–	1.340	7.600
	100	90	0.141	30	73	F-Cu	▶	**4EP40 00-2US00**	–	1.880	8.200
	125	113	0.113	24	77	F-Cu	▶	**4EP40 00-6US00**	–	2.960	9.600
	160	144	0.088	30	123	F-Al	▶	**4EU24 52-2UA00-0AA0**	2.000	–	11.100
	200	180	0.07	52	134	F-Al	▶	**4EU25 52-4UA00-0AA0**	1.600	–	16.300
	224	202	0.0629	52	134	F-Al	▶	**4EU25 52-8UA00-0AA0**	2.100	–	16.900
	250	225	0.0564	54	134	F-Al	▶	**4EU25 52-5UA00-0AA0**	2.600	–	17.400
	280	252	0.0503	67	172	F-Al	▶	**4EU27 52-0UB00-0AA0**	2.300	–	25.000
	315	284	0.0447	87	172	F-Al	▶	**4EU27 52-7UA00-0AA0**	1.900	–	24.500
	400	360	0.0352	87	172	F-Al	▶	**4EU27 52-8UA00-0AA0**	3.600	–	26.400
	500	450	0.0282	129	216	F-Al	C	**4EU30 52-4UB00-0AA0**	3.100	–	34.400
	560	504	0.0252	115	216	F-Al	▶	**4EU30 52-5UA00-0AA0**	4.200	–	35.600
	630	567	0.0224	110	216	F-Cu	▶	**4EU30 52-6UA00-1BA0**	–	9.800	41.200
	720	648	0.0196	135	300	F-Al	▶	**4EU36 52-8UA00-0AA0**	5.500	–	50.800
	910	819	0.0155	150	394	F-Cu	▶	**4EU36 52-0UB00-1BA0**	–	13.600	59.400
	1120	1008	0.0126	135	394	F-Cu	▶	**4EU36 52-7UC00-1BA0**	–	20.880	67.200
	1400	1260	0.0101	190	540	F-Cu	C	**4EU39 51-8UB00-0A**	–	34.020	95.700
	1600	1440	0.0088	212	540	F-Cu	▶	**4EU39 51-0UC00-0A**	–	24.640	85.600

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) At f = 60 Hz: $P_{Fe60} = P_{Fe50} \cdot 1{,}3$

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

Three-phase reactors

	Max. continuous thermal current	Rated current	Inductance	Core losses [1]	Winding losses	Connections [2] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	L_x	P_{FE}	P_W						
	A	A	mH	W	W				kg	kg	kg
3 AC 400 V 50 Hz, u_D ~ 8.8 V 4% reference voltage drop for I_{thmax} and U_N											
3 AC 480 V 60 Hz, u_D ~ 10.6 V 4% reference voltage drop for I_{thmax} and U_N											
	18	16	1.57	13	48	T	▶	**4EP37 00-7US00**	–	0.770	3.300
	22.4	20	1.26	23	73	T	▶	**4EP38 01-0US00**	–	0.690	4.600
	35.5	32	0.794	20	65	T	▶	**4EP39 00-5US00**	–	2.080	6.400
	45	41	0.625	29	70	T	C	**4EP40 01-1US00**	–	1.970	9.100
	80	72	0.352	37	123	F-Al	▶	**4EU24 52-4UA00-0AA0**	1.900	–	11.000
	91	82	0.31	55	134	F-Al	C	**4EU25 52-2UB00-0AA0**	1.500	–	16.100
	160	144	0.176	87	172	F-Al	▶	**4EU27 52-1UB00-0AA0**	2.200	–	24.900
	200	180	0.141	87	172	F-Al	▶	**4EU27 52-2UB00-0AA0**	3.400	–	26.200
	224	202	0.126	91	172	F-Al	C	**4EU27 52-5UB00-0AA0**	4.800	–	27.700
	280	252	0.101	104	216	F-Al	▶	**4EU30 52-7UA00-0AA0**	5.000	–	36.500
	315	284	0.0895	129	216	F-Al	C	**4EU30 52-3UB00-0AA0**	5.400	–	36.900
	355	320	0.0794	129	216	F-Al	▶	**4EU30 52-8UA00-0AA0**	6.800	–	38.500
	400	360	0.0704	170	394	F-Al	▶	**4EU36 52-3UB00-0AA0**	4.600	–	49.700
	500	450	0.0564	170	287	F-Al	C	**4EU36 52-5UC00-0AA0**	9.200	–	54.900
	560	504	0.0503	170	290	F-Al	C	**4EU36 52-4UB00-0AA0**	10.900	–	56.800
	630	567	0.0447	170	394	F-Cu	C	**4EU36 52-6UC00-1BA0**	–	22.370	68.900
	710	639	0.0397	190	540	F-Cu	C	**4EU39 51-6UA00-0A**	–	15.450	75.700
	910	819	0.031	190	540	F-Cu	C	**4EU39 51-1UB00-0A**	–	19.630	80.200
	1120	1008	0.0252	364	660	F-Cu	C	**4EU43 51-3UB00-0A**	–	18.240	110.000
	1500	1350	0.0188	260	660	F-Cu	X	**4EU43 51-4UB00-0A**	–	38.380	132.000
	1600	1440	0.0176	370	874	F-Cu	C	**4EU43 51-5UB00-0A**	–	43.010	137.000
3 AC 500 V 50 Hz, u_D ~ 5.7 V 2% reference voltage drop for I_{thmax} and U_N											
	5	4.5	3.68	6	12	T	▶	**4EP32 00-2US00**	–	0.230	0.700
	6.3	5.7	2.92	7	24	T	C	**4EP33 00-0US00**	–	0.320	1.000
	8	7.2	2.3	11	23	T	▶	**4EP34 00-3US00**	–	0.370	1.500
	12.5	11.3	1.47	17	50	T	▶	**4EP36 00-8US00**	–	0.450	2.400
	16	14.4	1.15	17	50	T	▶	**4EP36 00-2US00**	–	0.580	2.500
	22.4	20.2	0.82	4	50	T	▶	**4EP36 00-3US00**	–	0.710	2.600
	31.5	28.4	0.583	11	49	T	▶	**4EP37 00-6US00**	–	1.280	3.800
	35.5	32	0.518	10	50	T	▶	**4EP37 00-1US00**	–	1.510	4.000
	45	41	0.4	15	54	T	C	**4EP38 01-2US00**	–	1.090	5.100
	50	45	0.368	13	52	T	▶	**4EP38 00-1US00**	–	1.480	5.500
	63	57	0.292	14	69	F-Cu	▶	**4EP39 00-1US00**	–	1.960	7.300
	71	64	0.259	22	78	F-Cu	B	**4EP40 00-7US00**	–	1.350	7.700
	80	72	0.23	24	72	F-Cu	▶	**4EP40 00-1US00**	–	1.880	9.100
	112	101	0.164	22	78	F-Cu	▶	**4EP40 00-8US00**	–	3.610	10.000
	140	126	0.131	27	125	F-Al	▶	**4EU24 52-1UA00-0AA0**	2.400	–	11.500
	160	144	0.115	38	140	F-Al	▶	**4EU25 52-2UA00-0AA0**	1.700	–	16.400
	200	180	0.0919	41	140	F-Al	▶	**4EU25 52-6UA00-0AA0**	2.800	–	17.700
	250	225	0.0735	58	179	F-Al	▶	**4EU27 52-2UA00-0AA0**	2.300	–	25.000
	315	284	0.0583	58	179	F-Al	C	**4EU27 52-3UA00-0AA0**	4.100	–	27.000
	400	360	0.0459	58	179	F-Cu	▶	**4EU27 52-4UA00-1BA0**	–	13.830	37.400
	450	405	0.0408	102	220	F-Al	C	**4EU30 52-2UA00-0AA0**	3.900	–	35.300
	560	504	0.0328	110	230	F-Al	C	**4EU30 52-5UB00-0AA0**	6.300	–	36.000
	630	567	0.0292	150	310	F-Al	C	**4EU36 52-2UA00-0AA0**	6.800	–	49.000
	710	639	0.0259	110	300	F-Cu	C	**4EU36 52-3UA00-0AA0**	7.400	–	52.800
	910	819	0.0202	130	394	F-Cu	C	**4EU36 52-4UA00-1BA0**	–	22.150	68.700
	1000	900	0.0184	150	310	F-Cu	C	**4EU36 52-2UB00-1BA0**	–	27.500	70.000
	1120	1008	0.0164	160	385	F-Cu	C	**4EU39 51-5UB00-0A**	–	16.870	77.200
	1250	1125	0.0147	192	540	F-Cu	C	**4EU39 51-7UB00-0A**	–	21.990	82.700
	1600	1440	0.0115	260	660	F-Cu	C	**4EU43 51-2UB00-0A**	–	20.640	112.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) At f = 60 Hz: $P_{Fe60} = P_{Fe50} \cdot 1{,}3$

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

	Max. continuous thermal current	Rated current	Inductance	Core losses [1]	Winding losses	Connections [2] T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	L_x	P_{FE}	P_W						
	A	A	mH	W	W				kg	kg	kg
3 AC 500 V 50 Hz, u_D ~ 11.5 V 4% reference voltage drop for I_{thmax} and U_N											
	22.4	20.2	1.64	13	38	T	C	**4EP38 00-8US00**	–	1.560	5.600
	35.5	32	1.03	23	73	T	C	**4EP40 01-0US00**	–	1.550	8.700
	45	41	0.814	25	77	T	C	**4EP40 01-2US00**	–	2.580	9.800
	63	57	0.583	27	125	F-Al	C	**4EU24 52-5UA00-0AA0**	2.100	–	11.200
	80	72	0.459	42	139	F-Al	C	**4EU25 52-1UB00-0AA0**	1.400	–	16.100
	100	90	0.368	44	139	F-Al	C	**4EU25 52-3UB00-0AA0**	2.700	–	17.500
	140	126	0.263	68	179	F-Al	C	**4EU27 52-3UB00-0AA0**	2.500	–	25.200
	160	144	0.23	68	179	F-Al	C	**4EU27 52-6UB00-0AA0**	3.800	–	26.600
	200	180	0.184	87	220	F-Al	C	**4EU30 52-0UB00-0AA0**	3.500	–	34.900
	250	225	0.147	87	220	F-Al	C	**4EU30 52-1UB00-0AA0**	6.300	–	38.000
	315	284	0.117	135	300	F-Al	C	**4EU36 52-5UB00-0AA0**	5.100	–	50.300
	400	360	0.0919	135	300	F-Al	C	**4EU36 52-6UB00-0AA0**	10.200	–	56.000
	500	450	0.0735	146	300	F-Cu	C	**4EU36 52-7UB00-1BA0**	–	27.350	74.300
	560	504	0.0656	190	540	F-Cu	C	**4EU39 51-3UB00-0A**	–	18.250	78.700
	710	639	0.0518	192	540	F-Cu	C	**4EU39 51-7UA00-0A**	–	24.960	86.000
	910	819	0.0404	260	670	F-Cu	C	**4EU43 51-5UA00-0A**	–	27.570	120.000
	1120 [3]	1120	0.0328	400	700	F-Cu	D	**4EU45 51-5UA00**	–	23.800	141.000
	1250 [3]	1250	0.0294	369	711	F-Cu	X	**4EU45 51-6UA00**	–	37.800	155.000
	1600 [3]	1600	0.023	445	734	F-Cu	D	**4EU47 51-3UA00**	–	33.500	184.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) At f = 60 Hz: $P_{Fe60} = P_{Fe50} \cdot 1{,}3$

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

3) Reactors according to VDE 0532: I_{thmax} = rated current

Three-phase reactors

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	Max. continuous thermal current	Rated current	Inductance	Core losses 1)	Winding losses	Connections 2) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	L_x	P_{FE}	P_W						
	A	A	mH	W	W				kg	kg	kg
3 AC 690 V 50 Hz, u_D ~ 7.9 V 2% reference voltage drop for I_{thmax} and U_N											
	63	57	0.403	23	77	F-Cu	▶	**4EP40 00-3US00**	–	2.100	9.300
	91	82	0.279	28	125	F-Al	▶	**4EU24 52-3UA00-0AA0**	2.100	–	11.200
	100	90	0.254	43	140	F-Al	C	**4EU25 52-7UA00-0AA0**	1.200	–	15.900
	125	113	0.203	44	140	F-Al	▶	**4EU25 52-3UA00-0AA0**	2.100	–	16.800
	160	144	0.159	44	140	F-Al	▶	**4EU25 52-0UB00-0AA0**	3.000	–	17.800
	180	162	0.141	68	179	F-Al	C	**4EU27 52-5UA00-0AA0**	1.900	–	24.600
	224	202	0.113	68	179	F-Al	▶	**4EU27 52-6UA00-0AA0**	3.300	–	26.100
	315	284	0.0805	102	220	F-Al	C	**4EU30 52-3UA00-0AA0**	3.500	–	34.800
	400	360	0.0634	102	220	F-Al	C	**4EU30 52-4UA00-0AA0**	5.800	–	37.400
	500	450	0.0507	138	300	F-Al	C	**4EU36 52-5UA00-0AA0**	5.700	–	51.000
	560	504	0.0453	138	300	F-Al	C	**4EU36 52-4UC00-0AA0**	7.700	–	53.200
	630	567	0.0403	138	300	F-Al	C	**4EU36 52-6UA00-0AA0**	9.100	–	54.800
	710	639	0.0357	140	409	F-Cu	C	**4EU36 52-7UA00-1BA0**	–	18.840	65.100
	910	819	0.0279	190	384	F-Cu	C	**4EU39 51-0UA00-0A**	–	24.430	85.400
	1000	900	0.0254	190	380	F-Cu	C	**4EU39 51-4UA00-0A**	–	25.000	68.000
	1120	1008	0.0226	190	540	F-Cu	C	**4EU39 51-6UB00-0A**	–	33.220	94.900
	1250	1125	0.0203	250	690	F-Cu	X	**4EU43 51-0UB00-0A**	–	23.090	115.000
	1400	1260	0.0181	250	700	F-Cu	X	**4EU43 51-1UB00-0A**	–	28.060	121.000
	1600 4)	1600	0.0159	325	725	F-Cu	D	**4EU45 51-4UA00**	–	31.200	148.000
3 AC 690 V 50 Hz, u_D ~ 15.9 V 4% reference voltage drop for I_{thmax} and U_N											
	125	113	0.406	87	179	F-Al	C	**4EU27 52-4UB00-0AA0**	4.200	–	27.200
	180	162	0.282	110	230	F-Al	C	**4EU30 52-2UB00-0AA0**	5.900	–	35.000
	224	202	0.226	138	300	F-Al	C	**4EU36 52-8UB00-0AA0**	4.100	–	49.200
	315	284	0.161	150	420	F-Al	C	**4EU36 52-0UC00-0AA0**	8.700	–	51.000
	400	360	0.127	190	540	F-Cu	C	**4EU39 51-8UA00-0A**	–	12.770	72.700
	500	450	0.101	198	540	F-Cu	C	**4EU39 51-0UB00-0A**	–	22.100	82.800
	560	504	0.0906	200	540	F-Cu	C	**4EU39 51-4UB00-0A**	–	30.970	92.500
	710	639	0.0714	243	706	F-Cu	C	**4EU43 51-6UA00-0A**	–	33.080	126.000
	910 4)	910	0.0557	360	718	F-Cu	D	**4EU45 51-3UA00**	–	35.600	153.000
	1120 4)	1120	0.0453	370	760	F-Cu	D	**4EU47 51-2UA00**	–	41.600	195.000
	1250 4)	1250	0.0406	550	1100	F-Cu	D	**4EU50 51-1UA00**	–	48.500	185.000
	1600 4)	1600	0.0317	528	1340	F-Cu	D	**4EU52 51-1UA00**	–	65.000	200.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) At f = 60 Hz: $P_{Fe60} = P_{Fe50} \cdot 1{,}3$

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14

3) All reactors with $U_N \leq 600$ V according to UL

4) Reactors according to VDE 0532: I_{thmax} = rated current

SIDAC-D Iron-core output reactors

4

Three-phase reactors

4/2 Application

4/2 Technical data

4/3 Selection and ordering data

Three-phase reactors

Application

Fig. 4/1 4EU iron-core output reactors

Output reactors are used on the load side of frequency converters and motor currents flow through them.

Output reactors compensate capacitive charge-reversal currents with long cables and, in the case of long motor cables, limit the dv/dt at the motor terminals. This enables the use of longer motor supply cables:
- 200 m shielded motor supply cable
- 300 m unshielded motor supply cable.

Use of iron-core output reactors:

- Drives with standard and trans-standard asynchronous motors and a rated motor frequency (field weakening frequency) of up to 87 Hz and a maximum frequency of 200 Hz
- Drives with reluctance motors or permanently excited synchronous motors with a maximum frequency of 120 Hz.

Technical data

Recommended supply voltage	3 AC 400 V to 500 V
Rated alternating current	4.0 to 150 A
Test voltage	4 kV AC live parts against casing
Performance range of the drive	1.5 to 75 kW, higher outputs on request
Total power loss W	See table "Selection and ordering data"
Total weight kg	See table "Selection and ordering data"
Frequency	f_{max} = 200 Hz Clock frequency 4 kHz to 8 kHz
Degree of protection	IP00 safe to touch terminals or flat connector (BGV A2) see Chapter 14 Accessories
Safety class	I according to DIN VDE 0160-1/05.82 IEC 536/1976
Terminal	Screw terminal for 1.5 kW to 18.5 kW units, flat connector for 22 kW to 75 kW units
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	690 V AC for screw terminal units 1000 V AC for units with flat connector
Temperature classes	t_a 40 °C/F for 1.5 to 18.5 kW units t_a 40 °C/H for 22 to 75 kW units
Permissible ambient temperature during operation	0 °C to +40 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at coolant temperatures ≠ +40 °C)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	Reactors comply with EN 61558 UL508: for 1.5 to 18.5 kW units UL1561: for 22 to 75 kW units
Dimensions	On request
Storage temperature	from –25 °C to +55 °C
Transport temperature	from –25 °C to +70 °C
Permissible environmental conditions	humidity 5% to 95% occasional condensation allowed

Selection and ordering data

	Max. continuous thermal current 4 kHz [1]	Max. continuous thermal current 8 kHz	Rated current	Inductance	Core losses	Winding losses	Connections T=Terminal F=Flat termination	DT	Order No. [2]	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{thmax}	I_{Ln}	L_x	P_{FE}	P_W						
	A	A	A	mH	W	W				kg	kg	kg
3 AC 500 V 200 Hz maximum clock frequency 4 to 8 kHz												
	4	3.3	3.6	3.2	25	45	T	X	**4EP37 06-0ES01**	0	0.38	2.8
	6	5.3	5.4	2.5	25	45	T	X	**4EP37 06-0FS01**	0	1.1	3.6
	10	8.2	9	1	15	60	T	X	**4EP38 06-0BS01**	0	0.8	4.7
	17.5	15.2	15.8	0.9	15.9	28.9	T	X	**4EP38 06-0CS01**	0	1.8	5.8
	26	20	23.4	0.7	23.4	53.1	T	X	**4EP39 11-0AS01**	0	1.6	5.9
	38	30.4	34.2	0.42	32.5	58.2	T	X	**4EP40 10-0RS01**	0	1.5	8.6
	48	37	43.2	0.35	35.9	92.9	F	X	**4EU24 52-0ED00-4BA0**	0	2.1	10.7
	60	54	54	0.25	42.6	98	F	X	**4EU24 52-0EE00-4BA0**	0	2.5	11.2
	72	57.6	64.8	0.22	38.7	107.9	F	X	**4EU24 52-0EF00-4BA0**	0	3.3	12.0
	90	63	81	0.19	59	105.1	F	X	**4EU25 52-0EB00-4BA0**	0	3.5	17.5
	102	73	91.8	0.14	60.3	96.1	F	X	**4EU25 52-0EC00-4BA0**	0	3.2	17.3
	150	80	135	0.11	88.1	121.8	F	X	**4EU25 52-0ED00-4BA0**	0	6.9	21.0

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) In the range of operation between 4 kHz and 8 kHz the maximum continuous current follow a linear interpolation

2) Available 12/2004

Notes

SIDAC-D
Ferrite
output reactors

5

Three-phase reactors

5/2 Application

5/2 Technical data

5/3 Selection and ordering data

Three-phase reactors

Application

Fig. 5/1 Ferrite output reactor

Due to the special material characteristics, the ferrite reactors can be operated at higher converter output frequencies of up to 600 Hz. They can be used with clock frequencies of up to 16 kHz. Output filter reactors compensate capacitive charge-reversal currents for long cables and, in the case of longer motor cable lengths, limit the dv/dt at the motor terminals.

This enables the use of longer motor supply cables. For guidelines on the cable lengths that can be connected for operation with or without reactors, see catalogue PD 60 "Technische Informationen", Chapter "Drosseln".

Use of ferrite output reactors:

- Drives with asynchronous motors and a rated motor frequency (field weakening frequency) of 200 Hz and a maximum frequency of 300 Hz
- Drives with reluctance or permanently excited synchronous motors with a maximum frequency of 600 Hz.

Technical data

Recommended supply voltage **Rated alternating current** **Maximum converter output frequency** **Performance range of the drive kW** **Inductance per phase mH** **Total power loss W** **Total weight kg**	See table "Selection and ordering data"
Frequency	Maximum converter output frequency 600 Hz Clock frequency of converter ≤ 16 kHz, see derating
Degree of protection	IP00 according to DIN 40050
Terminal	Screw terminal
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 690 V AC version with flat terminations: 1000 V AC
Temperature classes	t_a 40 °C/B Natural air cooling (S) according to DIN 41751
Permissible ambient temperature during operation	from 0 °C to +40 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technical information", Chapter "Drosseln"
Standards	The reactors comply with VDE 0805
Dimensions	On request
Storage temperature	from –25 °C to +80 °C
Permissible humidity rating	Relative humidity at +40 °C occasionally to 100% annual mean, up to 80% occasional condensation permissible

Selection and ordering data

	Max. continuous thermal current 6 kHz [1]	Max. continuous thermal current 16 kHz	Rated current	Inductance	Total losses	Connections T=Terminal F=Flat termination	DT	Order No.	Total weight per PU approx.
	I_{thmax}	I_{thmax}	I_{Ln}	L_x	P_V				
	A	A	A	mH	W				kg
3 AC 500 V 600 Hz maximum clock frequency 6 to 16 kHz									
	6.1	3.05	6.1	3.47	96	T	X	**4EF13 04-4.A**	8.5
	10.2	5.1	10.2	1.24	96	T	X	**4EF13 04-5.A**	8.5
	17.5	8.75	17.5	0.48	96	T	X	**4EF13 04-6.A**	8.5
	25.5	12.75	25.5	0.33	100	T	X	**4EF13 01-2.A**	9.5
	34	17	34	0.25	115	T	X	**4EF13 01-3.A**	12.0
	47	23.5	47	0.18	170	T	X	**4EF13 01-4.A**	16.4
	72	36	72	0.06	135	T	X	**4EF13 01-5.A**	14.0
	92	46	92	0.05	170	T	X	**4EF13 01-6.A**	16.7
	146	73	146	0.03	300	T	X	**4EF13 01-7.A**	23.0
	186	93	186	0.02	300	T	X	**4EF13 01-8.A**	31.0

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) In the range of operation between 6 kHz and 16 kHz the maximum continuous current follow a linear interpolation.

The selection table provides an overview of our range of reactors.

If you are interested in any of our products or need further assistance, please copy the query page provided in chapter 13. Fill it out with the parameters of your specific requirement profile and fax it to the specified number. We will get back to you as soon as possible.

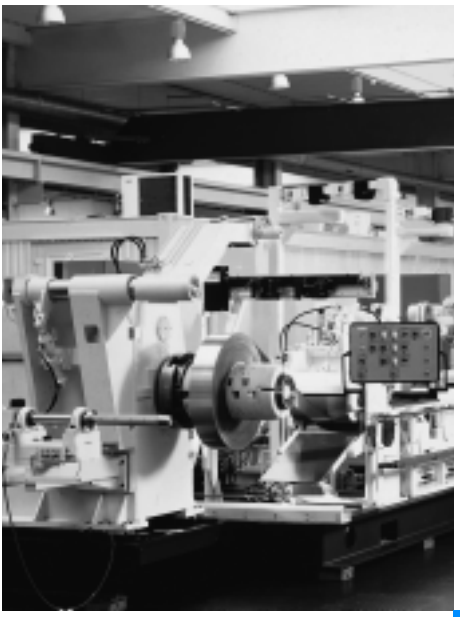
Note:

This query form is also available on our home page at http://www.siemens.de/sidac

Notes

SIDAC-D
Iron-core
smoothing reactors

6



Single-phase reactors

6/2 Application

6/2 Technical data

6/3 Selection and ordering data

Single-phase reactors

Application

Fig. 6/1 4ET/4EM iron-core smoothing reactors

Smoothing reactors are used on the DC side of converter sets. Direct current flows through them.

- Iron-core smoothing reactors as series inductance for DC motors (series reactors, 4EM, 4ET series)

  Their use is necessary to achieve problem-free commutation and reduce motor losses when the DC ripple is too high for DC motors due to the converter connection used. The reactors have an almost constant inductance L up to the rated direct current I_{dn}.

- Iron-core smoothing reactors with selectable inductance and current (4EM, 4ET series)

  These reactors enable individual adaptation to the smoothing requirements of the converter-fed consumers. A reactor is selected according to the required energy content E, which is determined from the required inductance (or inductance curve through the current) and the rated direct current I_{dn}. By dimensioning the reactors accordingly, it is possible to achieve a range of different inductance curves.

Technical data

	Iron-core smoothing reactors as series inductance for DC motors		Iron-core smoothing reactors with selectable inductance and current	
Maximum continuous thermal current I_{thmax} **Rated direct current I_{dn}** **Inductance for I_{thmax}** **Energy content E at I_{thmax}** **Connection of the winding with type 4ET**	See table "Selection and ordering data"		See table "Selection and ordering data"	
Permissible ripple of superimposed alternating current	≤ 30%		≤ 30%	
Core losses P_{Fe}/winding losses P_W/weight	See table "Selection and ordering data"		See table "Selection and ordering data"	
Degree of protection	IP00 according to DIN VDE 0470-1 / EN 60529			
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110			
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)		According to DIN VDE		according to cULus
	Type 4EM: Type 4ET with terminal: Type 4ET25 to 4ET45: Type 4ET47 to 4ET80:	690 V DC 800 V AC/DC 1000 V AC/DC 1150 V AC/DC		600 V DC, 600 V DC, 600 V DC, 600 V DC (to 4ET54)
Permissible ambient temperature during operation	Type 4EM: from –25 °C to +70 °C Type 4ET: from –25 °C to +80 °C			
Deviation of permissible direct current from rated direct current I_{dn} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"			
Temperature classes	Type 4EM: temperature class B Type 4ET: temperature class H (utilisation according to F for applications according to VDE) Type 4ET: temperature class H (for applications according to cULus)			
Site altitude	≤ 1000 m above sea level			
Deviation of permissible direct current from rated direct current I_{dn} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"			
Reduction of the rated voltage for insulation (at site altitudes > 2000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"			
Standards/approvals	The reactors comply with EN 61558 (Type 4ET47 to 4ET80: DIN VDE 0532). The reactors 4EM46 to 4ET54 are UL Recognised under Guide No. XQNX2 and File No. E103902 as well as cUL approved under Guide No. XQNX8 File No. E103902 (applies to reactors with U_N ≤ 600 V according to UL)			
Storage temperature	from –25 °C to +80 °C			
Permissible humidity rating	Relative humidity at +40 °C occasionally up to 100%, annual mean, up to 80% occasional condensation permissible			

Selection and ordering data

4EM iron-core smoothing reactors as series inductance for DC motors

Maximum continuous thermal current	Rated direct current	Inductance	Parallel or series connection of reactor windings	Energy content	Core losses	Winding losses	DT	Order No.	Cu weight per PU approx.	Total weight per PU approx.
I_{thmax} A	I_{Ln} A	L_x mH	P=Parallel S=Series	E Ws	P_{FE} W	P_W W			kg	kg
4EM iron-core smoothing reactors										
1.75	1.6	250	–	0.38	0.4	20	B	**4EM49 05-6CB00**	0.210	1.900
2.5	2.3	125	–	0.39	0.4	20	D	**4EM49 05-5CB00**	0.190	1.900
3.5	3.2	63	–	0.39	0.4	20	D	**4EM49 05-4CB00**	0.190	1.900
3.5	3.2	160	–	0.98	0.6	28	B	**4EM51 04-5CB00**	0.650	3.700
5	4.5	31.5	–	0.39	0.4	20	B	**4EM49 05-3CB00**	0.190	1.900
5	4.5	80	–	1	0.6	28	B	**4EM51 04-4CB00**	0.700	3.800
7	6.3	40	–	0.98	0.6	28	D	**4EM51 04-3CB00**	0.510	3.500
7	6.3	100	–	2.45	1.1	47	B	**4EM53 08-4CB00**	1.460	7.600
9.2	8.3	6.5	–	0.28	0.2	15	D	**4EM48 05-1CB00**	0.260	1.200
10	9	8	–	0.4	0.4	20	B	**4EM49 05-7CB00**	0.190	1.900
10	9	20	–	1	0.6	27	D	**4EM51 04-2CB00**	0.650	3.700
10	9	50	–	2.5	1.1	47	B	**4EM53 08-3CB00**	1.450	7.600
11	9.9	4.5	–	0.27	0.2	16	D	**4EM48 05-2CB00**	0.300	1.200
12	10.8	7.5	–	0.54	0.4	21	D	**4EM49 08-8CB00**	0.470	2.200
13	11.7	2.5	–	0.21	0.2	16	D	**4EM48 05-3CB00**	0.220	1.100
14	12.6	25	–	2.45	1.1	47	▶	**4EM53 08-2CB00**	1.700	7.900
16	14.4	6.5	–	0.83	0.5	25	D	**4EM50 04-3CB00**	0.660	3.000
18	16.2	7.5	–	1.22	0.6	28	D	**4EM51 07-8CB00**	0.790	3.800
18.5	16.6	3.1	–	0.53	0.4	20	D	**4EM49 10-0CB00**	0.470	2.200
20	18	5	–	1	0.6	28	D	**4EM51 04-6CB00**	0.620	3.600
20	18	12.5	–	2.5	1.1	47	B	**4EM53 08-1CB00**	1.590	7.800
23.5	21.1	2.9	–	0.8	0.5	25	D	**4EM50 04-4CB00**	0.670	3.000
4ET iron-core smoothing reactors										
10	9	80	S	4	2	105	C	**4ET25 11-0AA00-0A**	1.450	11.100
20	18	20	P							
14	12.6	40	S	3.9	2	105	C	**4ET25 11-1AA00-0A**	1.340	10.900
28	25.2	10	P							
10	9	126	S	6.3	3	137	C	**4ET27 11-0AA00-0A**	1.960	16.300
20	18	31.5	P							
14	12.6	64	S	6.3	3	137	C	**4ET27 11-1AA00-0A**	1.980	16.300
28	15.2	16	P							
7	6.3	400	S	9.8	3.5	176	D	**4ET30 11-3AA00-0A**	2.970	23.500
14	12.6	100	P							
20	18	50	S	10	4.8	176	C	**4ET30 11-4AA00-0A**	2.940	23.500
40	36	12.5	P							
28	25.2	25	S	9.8	3.5	176	D	**4ET30 11-5AA00-0A**	2.940	23.500
56	50.4	6.3	P							
28	25.2	40	S	15.7	7	234	D	**4ET36 11-0BA00-0A**	4.250	33.300
56	50.4	10	P							
20	18	80	S	16	7	234	D	**4ET36 11-8AA00-0A**	4.920	34.000
40	36	20	P							

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

Single-phase reactors

Iron-core smoothing reactors with selectable inductance and current

CE c UL us [1])

	Energy content	Max. possible rated direct current (standard version)	Max. possible rated direct current [2]) (plus surcharge)	Losses		DT	Core section of Order No. [3])	Weight per PU approx.
	E	I_{dn}	I_{dn}	P_{FE}	P_W			
	Ws	A	A	W	W			kg
4EM iron-core smoothing reactors								
	0.112	40	200	0.1	10.7	X	**4EM46**	0.500
	0.14	40	200	0.15	12.1	X	**4EM47**	0.600
	0.28	40	200	0.2	15.9	X	**4EM48**	1.100
	0.5	40	200	0.4	20.4	X	**4EM49**	2.000
	0.71	40	250	0.5	24.7	X	**4EM50**	2.700
	1.0	40	250	0.6	27.1	X	**4EM51**	3.500
	1.25	40	250	0.7	31	X	**4EM61**	4.300
	1.6	40	400	0.8	35	X	**4EM52**	5.100
	2.25	40	400	1	39	X	**4EM62**	7.000
	2.5	40	400	1.1	47	X	**4EM53**	7.600
	3.55	40	400	1.5	52	X	**4EM54**	10.200
	5.0	40	400	2.3	58	X	**4EM55**	13.200
	6.3	40	400	2.5	65	X	**4EM59**	15.000
	7.7	40	400	3	71	X	**4EM60**	18.000
4ET iron-core smoothing reactors								
	4.5	50	630	1.6	105	X	**4ET25**	11.200
	8.0	50	630	2.5	137	X	**4ET27**	17.400
	11.2	50	630	3.5	176	X	**4ET30**	23.700
	22.5	200	630	5.4	315	X	**4ET36**	37.000
	31.5	200	630	7.1	400	X	**4ET39**	48.000
	56	200	630	11	516	X	**4ET43**	75.000
	71	200	630	15	554	X	**4ET45**	94.000
	100	200	630	19	595	X	**4ET47**	123.000
	112	630	800	19	1080	X	**4ET51**	130.000
	125	630	800	22	1120	X	**4ET52**	143.000
	140	630	800	24	1160	X	**4ET53**	157.000
	180	630	800	30	1360	X	**4ET54**	194.000
	200	630	800	33	1400	X	**4ET55**	213.000
	250	630	800	38	1460	X	**4ET56**	252.000
	315	630	1000	48	2160	X	**4ET58**	297.000
	355	630	1000	55	2250	X	**4ET59**	331.000
	400	630	1000	62	2370	X	**4ET60**	372.000
	500	1250	1600	76	2900	X	**4ET62**	459.000
	630	1250	1600	88	3030	X	**4ET63**	538.000
	710	1250	1600	101	3200	X	**4ET64**	604.000
	910	1250	1600	116	3360	X	**4ET65**	712.000
	1250	1600	2500	185	5580	X	**4ET72**	1050.000
	1600	2000	2500	214	6080	X	**4ET74**	1240.000
	2250	2000	2500	278	6700	X	**4ET75**	1600.000
	2800	2000	2500	347	7420	X	**4ET76**	1960.000
	3550	2000	2500	407	7930	X	**4ET78**	2350.000
	4500	2000	2500	510	8700	X	**4ET79**	2890.000
	6300	2000	2500	650	9650	X	**4ET80**	3700.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

1) 4EM46 to 4ET54 - UL Recognised

2) Higher rated direct current I_{dn} for reduced energy content on request

3) Please specify any additional technical data in plain text (see Chapter "Selecting iron-core smoothing reactors with selectable inductance and current" in catalogue PD 60 "Technische Informationen", Chapter "Drosseln"). The type designation will be added to the Order No. on the delivery note, so that you will know the exact order number if you want to re-order any items.

SIDAC-D
Smoothing air-core reactors

7

Single-phase reactors

7/2 Application
7/2 Technical data
7/3 Selection and ordering data

Single-phase reactors

Application

CE

Fig. 7/1 Smoothing air-core reactor

4PK smoothing air-core reactors (natural air cooling, energy content *E* from 380 Ws to 1.9 kWs) are used in the DC circuit of converter units. These are primarily used to limit the current rise in the event of faults, especially in the case of through-conductions. They cause the high-speed DC circuit-breaker in the electric circuit to interrupt the rising fault current fast enough to prevent the fuses in the thyristor branches from responding.

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Technical data

Rated direct current I_{dn} **Inductance for I_{dn}** **Energy content *E*** **Maximum rated direct current I_{dn} of a reactor type** **Power loss P_{Al} for 4PK** **Weight**	See table "Selection and ordering data" and catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Degree of protection	IP00 according to DIN VDE 0470-1/EN 60529
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	2 kV
Reduction of the rated voltage for insulation (at site altitudes > 2000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Ambient conditions **Permissible ambient temperature during operation**	from –25 °C to +80 °C
Deviation of permissible direct current from rated direct current I_{dn} (at coolant temperatures ≠ +40 °C)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Temperature classes	Temperature class F
Site altitude	≤ 1000 m above sea level
Deviation of permissible direct current from rated direct current I_{dn} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	The reactors comply with DIN VDE 0532
Storage temperature	from –25 °C to +80 °C
Permissible humidity rating	Relative humidity at +40 °C occasionally up to 100%, annual mean, up to 80% occasional condensation permissible
Permissible short-circuit current	20 · I_{dn} for 1 s

Selection and ordering data

	Energy content (max.) for I_{dn}	Rated direct current (max. standard version)	Losses	DT	Core section of Order No.	Weight per PU approx.
	E	I_{dn}	P_{Al}			
	Ws	A	W			kg
4PK smoothing air-core reactors						
	380	1600	5500	X	**4PK40**	180.000
	940	3200	11000	X	**4PK40**	360.000
	740	1600	8200	X	**4PK60**	250.000
	1900	3200	16400	X	**4PK60**	500.000

Package sizes for reactors; 1 item, i.e.
1 item or a multiple thereof can be ordered.

A reactor is selected according to the required energy content *E*, which is determined from the desired inductance and rated direct current I_{dn}. Due to the design of the reactors, each has a specific maximum value for the rated direct current I_{dn} (see Selection and ordering data table).

The Selection and ordering data table provides an overview of the range of reactors.

To make sure you order the correct reactor type, please refer to the data in catalogue PD 60 "Technische Informationen", Chapter "Drosseln", in the "Selection of smoothing air-core reactors" section.

If you are interested in any of our products or need further assistance, please copy the query form provided in chapter 13. Enter the parameters of your specific requirement profile and fax it to the number provided.

We will get back to you as soon as possible.

Note:

This query form is also available on our home page at http://www.siemens.de/sidac

Notes

SIDAC-D
Filter reactors

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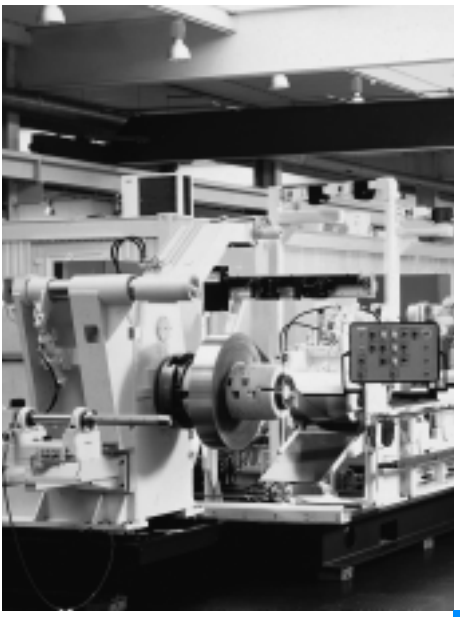

Three-phase reactors

8/2 Application
8/2 Technical data
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Three-phase reactors

Application

Fig. 8/1 Filter reactors

Nowadays, more and more harmonics-generating consumers in our networks are operated with inductive load. These include fluorescent lamps, dimmers, variable-speed drives, three-phase bridge connections and rectifiers.

This increases the harmonic loading and the total harmonic distortion of the supply system. The reactive power also increases energy costs and transmission losses, as well as the loading of transmission and distribution equipment. In combination with the feeding transformer and the mains inductance in the supply system, the capacitors required for load compensation create an oscillating circuit. This causes undefined resonance due to the harmonics which, in turn, can reinforce the harmonics.

The use of filter reactors prevents this physical effect. Taking audio-frequency remote control operation into account, the filter reactors with the capacitors are set to a defined series resonant frequency.

Technical data

Degree of protection	IP00 according to DIN VDE 0470-1/EN 60529
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 690 V AC Version with flat terminations: 1000 V AC All versions: 600 V AC for 4EP and 4EU according to UL
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Inductance factor	5.67%, 7%, 14%
Performance range	5 kvar ... 100 kvar
Temperature classes	Type 4EP: temperature class B Type 4EU: temperature class H
Monitoring	Temperature switch is integrated, contacts are fitted on terminals.
Ambient conditions Permissible ambient temperature during operation	40 °C
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} at coolant temperatures ≠ +40 °C	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Deviation of the permissible alternating current from rated alternating current I_{Ln} at site altitudes > 1000 m above sea level	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Storage temperatures	from –25 °C to +80 °C
Permissible humidity rating	Relative humidity at +40 °C occasionally up to 100%, annual mean, up to 80%, occasional condensation permissible
Standards/approvals	The reactors comply with EN 61558 or VDE 0532. The reactors are UL Recognised under Guide No. XQNX2 and File No. E103902 and cUL approved under Guide No. XQNX8 File No. E103902 (applies to reactors with U_N ≤ 600 V according to UL)

Selection and ordering data

U_N = 3 AC 400 V 50 Hz, overload capability I_{thmax} · 1.05 [1])

	Max. continuous thermal current	Rated current	Filter bank capacity	Required capacity for capacitors in delta connection	Inductance	Total losses	Connections[2]) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	Q_C kvar	C_D µF	L_x mH	P_V W				kg	kg	kg
Inductance factor p = 5.67%, L = constant to 1.82 · I_{thmax}, f_{RES} = 210 Hz												
	8.8	7.9	5	94	6.12	53.1	T	C	**4EP37 00-5MS00**	–	1.190	3.700
	10.9	9.8	6.2	116	4.936	62	T	C	**4EP38 00-8MS00**	–	0.900	4.600
	13.2	11.8	7.5	141	4.081	62	T	C	**4EP38 01-0MS00**	–	1.400	5.000
	17.5	15.8	10	188	3.06	64	T	C	**4EP39 00-5MS00**	–	2.400	6.400
	21.9	19.7	12.5	235	2.45	89	T	C	**4EP40 01-3MS00**	–	1.970	9.100
	26.3	23.7	15	281	2.04	89	T	C	**4EP40 01-4MS00**	–	2.920	9.300
	35.1	31.6	20	375	1.53	100	T	C	**4EP43 00-4MS00**	–	4.400	13.000
	43.9	39.5	25	469	1.22	127	T	C	**4EP44 01-4MS00**	–	4.160	18.300
	52.6	47.4	30	563	1.02	164	F	C	**4EU25 32-2MA08-4CA0**	–	3.800	18.000
	70.2	63.2	40	750	0.765	221	F	C	**4EU27 32-6MA08-0AA0**	2.600	–	25.300
	87.7	78.9	50	938	0.612	235	F	C	**4EU30 32-5MA08-0AA0**	2.700	–	33.900
	105	95	60	1130	0.51	288	F	C	**4EU30 32-6MA08-0AA0**	4.200	–	35.600
	175	157.9	100	1880	0.31	393	F	C	**4EU36 32-3MA08-0AA0**	6.200	–	51.500
Inductance factor p = 7%, L = constant to 1.66 · I_{thmax}, f_{RES} = 189 Hz												
	8	7.2	5	93	7.66	52	T	C	**4EP37 00-6MS00**	–	1.000	3.300
	10	9	6.2	115	6.18	52	T	C	**4EP37 00-7MS00**	–	1.600	4.000
	12.1	10.9	7.5	139	5.11	61	T	C	**4EP38 00-7MS00**	–	1.100	4.800
	16.1	14.5	10	185	3.83	73	T	C	**4EP39 00-6MS00**	–	2.000	5.900
	20.1	18.1	12.5	231	3.07	87	T	C	**4EP40 01-2MS00**	–	1.520	8.600
	24.1	21.7	15	277	2.56	87	T	C	**4EP40 01-5MS00**	–	2.100	8.800
	32.1	28.9	20	370	1.92	102	T	C	**4EP43 00-5MS00**	–	4.030	12.800
	40.2	36.2	25	462	1.53	130	T	C	**4EP44 01-3MS00**	–	2.930	17.100
	48.2	43.4	30	555	1.28	120	T	C	**4EP44 01-5MS00**	–	4.300	17.000
	64.3	57.9	40	740	0.958	210	F	C	**4EU27 32-7MA08-0AA0**	2.100	–	24.700
	80.3	72.3	50	925	0.766	223	F	C	**4EU27 32-5MA08-0AA0**	3.600	–	26.500
	96.4	86.8	60	1110	0.64	271	F	C	**4EU30 32-7MA08-0AA0**	2.800	–	34.100
	160.7	144.5	100	1850	0.383	368	F	C	**4EU36 32-4MA08-0AA0**	4.800	–	50.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

Considered harmonic voltages:
106% mains overvoltage in the fundamental component (50 Hz)
0.5% of U_N for 3rd harmonic (150 Hz)
5% of U_N for 5th harmonic (250 Hz)
5% of U_N for 7th harmonic (350 Hz)
Further types on request

1) The current I_{thmax} is the maximum continuous thermal current permitted. It applies to the aforementioned harmonic spectrum. In order to cope with a changing harmonic content, the reactor can be continuously overloaded with I_{thmax} · 1.05.

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14.

Three-phase reactors

U_N = 3 AC 400 V 50 Hz, overload capability I_{thmax} · 1.05 [1])

	Max. continuous thermal current	Rated current	Filter bank capacity	Required capacity for capacitors in delta connection	Inductance	Total losses	Connections[2]) T=Terminal F=Flat termination	DT	Order No.	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax} A	I_{Ln} A	Q_C kvar	C_D µF	L_x mH	P_V W				kg	kg	kg
Inductance factor p = 14%, L = constant to 1.4 · I_{thmax}, f_{RES} = 134 Hz												
	7.7	6.9	5	86	16.6	61	T	C	**4EP38 01-1MS00**	–	1.300	5.100
	9.5	8.6	6.2	106	13.4	72	T	C	**4EP39 00-7MS00**	–	2.100	6.100
	11.5	10.4	7.5	128	11.1	87	T	C	**4EP40 01-6MS00**	–	1.300	8.100
	15.4	13.8	10	171	8.29	87	T	C	**4EP40 01-7MS00**	–	2.600	9.400
	19.2	17.3	12.5	214	6.63	100	T	C	**4EP43 00-6MS00**	–	4.000	12.000
	23.1	20.8	15	257	5.53	120	T	C	**4EP44 01-6MS00**	–	2.500	16.000
	30.8	27.7	20	342	4.14	120	T	C	**4EP44 01-7MS00**	–	5.200	18.000
	38.5	34.6	25	428	3.32	210	F	C	**4EU27 32-0MB08-4CA0**	–	3.500	25.000
	46.2	41.5	30	513	2.76	210	F	C	**4EU27 32-8MA08-4CA0**	–	5.600	26.000
	61.6	55.4	40	684	2.07	269	F	C	**4EU30 32-8MA08-0AA0**	3.800	–	35.200
	76.9	69.2	50	855	1.66	337	F	C	**4EU30 32-0MB08-0AA0**	5.600	–	37.200
	92.3	83.1	60	1030	1.38	365	F	C	**4EU36 32-5MA08-0AA0**	5.800	–	51.100
	153.9	138.6	100	1710	0.829	450	F	C	**4EU39 31-1MA80-0A**	–	12.200	62.000

Package sizes for reactors; 1 item, i.e. 1 item or a multiple thereof can be ordered.

Considered harmonic voltages:
106% mains overvoltage in the fundamental component (50 Hz)
0.5% of U_N for 3rd harmonic (150 Hz)
5% of U_N for 5th harmonic (250 Hz)
5% of U_N for 7th harmonic (350 Hz)
Further types on request

1) The current I_{thmax} is the maximum continuous thermal current permitted. It applies to the aforementioned harmonic spectrum. In order to cope with a changing harmonic content, the reactor can be continuously overloaded with I_{thmax} · 1.05.

2) Terminal covers for protection against accidental contact with the flat terminations; see "Accessories", Chapter 14.

SIDAC-D Application-specific reactors

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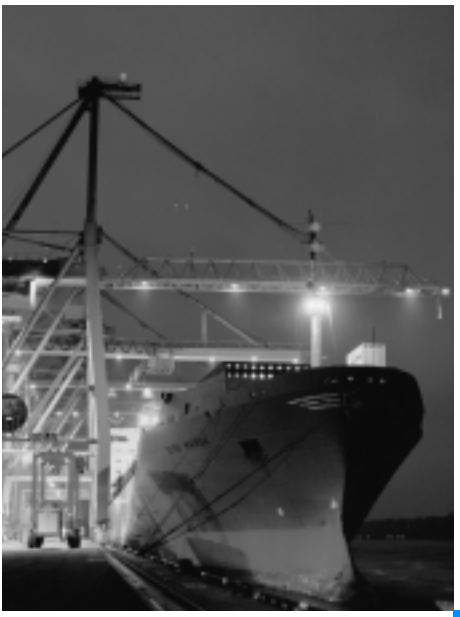

Sintered metal reactors
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Three-phase reactors

Application

CE

Fig. 9/1 Sintered metal reactor

Sintered metal reactors for three-phase supplies comprise three mutually independent single-phase reactors. They are installed in the main supply line of converters and alternating currents at the line frequency, and the harmonics generated by the converter flow through them. Sintered metal reactors are always used where, as well as a commutation reactor, interference suppression is required from the low to high frequency range. The special material characteristics of these reactors enable excellent interference suppression for frequencies up to 150 kHz.

Fig. 9/2 Sintered metal reactor, single-phase

The closed design of the pot-type cores reduces radiation-linked interferences to a minimum, thus enabling non-critical installation of reactors in close proximity to electronic devices. Applications are in the field of controlled frequency converter rectifier/regenerative units that operate in high-frequency systems. Interference suppression in converter connections for uninterruptible power supplies is also cost-effective. As individual components, sintered metal reactors can be used as either input or output reactors.

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Technical data

Recommended supply voltage	3 AC 400 V ± 10% to 690 V +6%, –10%
Maximum converter output frequency	600 Hz
Performance range P_n	from 1 to 120 kW
Frequency	Line frequency 50 … 60 Hz ± 10%
Degree of protection	IP00 according to DIN EN 60529 (IEC 60529)
Terminal	Terminal or customised
Rating of creepage distances and clearances	Degree of soiling 1 according to DIN VDE 0110
Test voltage	2.5 kV AC
Temperature classes	t_a 40 °C/H
Permissible ambient temperature during operation	from –25 °C to +40 °C, for reduced performance up to +55 °C
Site altitude	≤ 1000 m above sea level
Standards	The reactors comply with EN 61558
Storage temperature	from –25 °C to +80 °C
Permissible humidity rating	Low air temperature 0 °C Condensation and ice formation excluded DIN IEC 721-3-3/04.90 Class 3K5

Application

Fig. 9/3 Discharge reactor

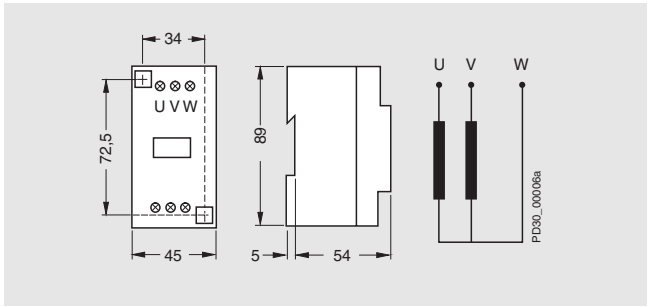

Fig. 9/4 Dimensioned drawing and circuit diagram

Discharge reactors for compensation equipment

Capacitor banks in p.f. compensation equipment can be connected and disconnected to and from the supply system as required. Connecting a supply system to a capacitor bank that is not fully discharged can cause mains overvoltages, which can damage connected devices. The capacitors must be discharged quickly following disconnection of a capacitor bank to allow rapid reconnection. In this case, discharge reactors offer significant advantages. The resulting losses are considerably lower when compared to the previously used discharge resistors. The ambient temperature rise is lower which has a positive effect on the service life of the phase shift capacitors.

The discharge reactors meet the requirement for permanently installed and connected discharge devices as well as the requirement for short capacitor discharge times of just a few seconds. Due to high AC resistance, power losses during operation are lower than 1.8 W and therefore negligible.

Technical data

Recommended supply voltage	3 AC 230 to 690 V
Operating losses	< 1.8 W
No-load current	< 4.5 mA
Total weight	0.5 kg
Frequency	50 … 60 Hz
Degree of protection	IP40 according to DIN 40050
Terminal	Terminals for 0.75 mm^2 to 2 x 2 mm^2
Inductance	230 V 730 μH 400 V 710 μH 525 V 670 μH 690 V 350 μH
Discharge time	230 V less than 20 s for 50 kvar ≥ 400 V less than 20 s for 100 kvar
Permissible discharges	1 x/(1 min (100 kvar))
Temperature classes	t_a 40 °C/B Natural air cooling (S) according to DIN 41751
Standards	The reactor complies with EN 61558
Dimensions	See dimensioned drawing
Ambient temperature	from –25 °C to +55 °C (average over 24 h)
Storage temperature	from –25 °C to +70 °C
Installation	Inside

Order No. 4EJ99 00–0EG

Supply voltage	Capacitor bank output	Discharge time
230 V	to 25 kvar	< 10 s
	to 50 kvar	< 20 s
	to 100 kvar	< 40 s
400 V to 690 V	to 25 kvar	< 5 s
	to 50 kvar	< 10 s
	to 100 kvar	< 20 s

Single-phase reactors

Application

CE

Fig. 9/5 Mains reactors for frequency converters

Mains reactors for frequency converters are installed in the line-side supply cable.

The reactors limit the circuit feedback that occurs in the form of harmonics. They also limit the alternating currents with the frequencies determined by the switching of the input rectifier in the DC link capacitors.

We recommend using 2% reactors if the mains inductance of the power supply is very small. Recommended system short-circuit power to apparent drive power > 33 : 1.

All the reactors here can be customised by adapting the winding and the core air gaps.

Technical data

Recommended supply voltage	1 AC 230 V ± 10%
Rated alternating current	3.0 A to 26.0 A
Test voltage	4 kV AC live parts against casing
Reference voltage drop Δu per phase for I_{Ln} and f = 50 Hz or f = 60 Hz	2%, 4% (application and type-specific) customised design
Performance range P_n	0.75 to 11 kW, higher outputs on request
Inductance per phase mH	0.57 to 9.5 mH (application and type-specific)
Total power loss W	On request
Total weight kg	On request
Frequency	47 … 63 Hz
Degree of protection	Assembly in zinc-plated steel housing in IP20
Terminal	Line-side bushing terminals, free cable end for connection of frequency converter input, cable acc. to customer requirements
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 600 V AC
Temperature classes	t_a 50 °C/F (B)
Permissible ambient temperature during operation	–10 °C to +50 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at coolant temperatures ≠ +40 °C)	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	The reactors comply with EN 61558 Electromagnetic compatibility according to EN 61000-4-2, 3, 4 Vibration EN 60068-2-31 All reactors are built according to UL506, approval on request
Dimensions	Reactor casing with a maximum height of 50 mm for P_n ≤ 11 kW. Further dimensions by separate agreement
Storage temperature	–20 °C to +70 °C
Permissible humidity rating	Relative humidity at +40 °C to 95% Condensation not permissible

Application

CE

Fig. 9/6 Mains reactors for frequency converters

Mains reactors for frequency converters are installed in the line-side supply cable. Reactors limit the circuit feedback that occurs in the form of harmonics. They also limit the alternating currents with the frequencies determined by the switching of the input rectifier in the DC link capacitors.

We recommend using 2% reactors if the mains inductance of the power supply is very small. Recommended system short-circuit power to apparent drive power> 33 : 1.

All the reactors here can be customised by adapting the winding and the core air gaps.

Technical data

Recommended supply voltage	3 AC 600 V ± 10%
Rated alternating current	1.7A to 200 A
Test voltage	4 kV AC live parts against casing
Reference voltage drop Δu per phase for I_{Ln} and f = 50 Hz or f = 60 Hz	2%, 4% (application and type-specific) customised design
Performance range of corresponding converter P_n	0.75 to 75 kW, higher outputs on request
Inductance per phase mH	0.07 mH to 11.5 mH (application-specific)
Total power loss W	On request
Total weight kg	On request
Frequency	47 … 63 Hz
Degree of protection	Assembly in zinc-plated steel housing in IP20
Terminal	Line-side bushing terminals, free cable end for connection of frequency converter input, cable acc. to customer requirements
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 600 V AC
Temperature classes	t_a 50 °C/F (B)
Permissible ambient temperature during operation	–10 °C to +50 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln}	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	The reactors comply with EN 61558 Electromagnetic compatibility according to EN 61000-4-2,3,4 Vibration EN 60068-2-31 All reactors are built according to UL506, approval on request
Dimensions	Reactor casing with a maximum height of 50 mm to P_n = 22 kW, Maximum height of casing 60 mm to P_n ≤ 75 kW. Further dimensions by separate agreement
Storage temperature	–20 °C to +70 °C
Permissible humidity rating	Relative humidity at +40 °C to 95% Condensation not permissible

9

Single-phase reactors

Application

Fig. 9/7 DC-link reactors for frequency converters

DC-link reactors for frequency converters are installed after the input rectifier in the voltage link. The reactors limit the circuit feedback that occurs in the form of harmonics. They also reduce load current peaks in the DC link capacitors, which significantly reduces the load on the components in the DC link. This, in turn increases the service life of the converter.

A DC-link reactor can either be permanently integrated in the DC link of the converter during its development, or it is fitted with terminals that permit connection of an additional inductance in the DC link. Appropriately dimensioned, DC-link reactors can be a suitable alternative to three-phase mains reactors. We recommend using them if the mains inductance of the power supply is very small.

All the reactors here can be customised by adapting the winding and the core air gaps.

Technical data

Recommended supply voltage	648 V DC ± 10%, 3 AC 480 V ± 10%
Rated alternating current	4 A to 180 A
Test voltage	4 kV AC live parts against casing
Total weight kg	On request
Inductance per phase mH	0.75 to 75 kW, higher outputs on request
Performance range of corresponding converter P_n	0.25 mH to 10 mH (application and type specific)
Total power loss W	On request
Frequency	50 … 60 Hz ± 10%
Degree of protection	Assembly in zinc-plated steel housing in IP20
Terminal	Shielded cable end for connection to the voltage link input, cable acc. to customer requirements
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 600 V AC
Temperature classes	t_a 50 °C/F (B)
Permissible ambient temperature during operation	–10 °C to +50 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln}	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	The reactors comply with EN 61558 Electromagnetic compatibility according to EN 61000-4-2,3,4 Vibration EN 60068-2-31 All reactors are built according to UL506, approval on request
Dimensions	Reactor casing with a maximum height of 50 mm to P_n= 22 kW, Maximum height of casing 60 mm to P_n ≤ 75 kW. Further dimensions by separate agreement
Storage temperature	–20 °C to +70 °C
Permissible humidity rating	Relative humidity at +40 °C to 95% Condensation not permissible

Application

CE

Fig. 9/8 Output reactors for frequency converters

Output filter reactors for frequency converters are installed at the converter output. The reactors compensate capacitive charge-reversal currents in long cables and, in the case of long motor cables, limit the dv/dt at the motor terminals. The output reactors are used with standard asynchronous motors with a maximum frequency of 200 Hz - or with reluctant or permanently excited synchronous motors with a maximum frequency of 120 Hz. This supports operation with a maximum converter output frequency of f_{max} = 400 Hz. It is not possible to generalise on the maximum permissible length of the motor supply cables required for the output reactors. Please refer to catalogue PD 60 "Technische Informationen", Chapter "Drosseln", for guidelines regarding the use of shielded and unshielded motor cables together with output reactors.

All the reactors here can be customised by adapting the winding and the core air gaps.

Technical data

Recommended supply voltage (converter output voltage)	3 AC 600 V ± 10%
Rated alternating current	3.9 A to 178 A
Test voltage	4 kV AC live parts against casing
Performance range of corresponding converter P_n	0.75 to 75 kW, higher outputs on request
Inductance per phase mH	0.029 to 2.6 mH (application-specific)
Total power loss W	On request
Total weight kg	On request
Frequency	f_{max} = 400 Hz at converter output Clock frequency ≤ 4 kHz
Degree of protection	Assembly in zinc-plated steel housing in IP20
Terminal	Bushing terminals for the connection of motor supply cable, shielded cable end for connection to frequency converter output, cable acc. to customer requirements
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 600 V AC
Temperature classes	t_a 50 °C/F
Permissible ambient temperature during operation	–10 °C to +50 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln}	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	The reactors comply with EN 61558 Electromagnetic compatibility according to EN 61000-4-2,3,4 Vibration EN 60068-2-31 All reactors are built according to UL506, approval on request
Dimensions	Reactor casing with a maximum height of 80 mm to P_n ≤ 75 kW. Further dimensions by separate agreement
Storage temperature	–20 °C to +70 °C
Permissible humidity rating	Relative humidity at +40 °C to 95% Condensation not permissible

9

Single- and three-phase reactors

Application

CE

Fig. 9/9 On-board network container/acceptor circuit reactor/chopper reactor

These include reactors for use in electrical railcars. These reactors are used in trams, subway trains and modern high-speed railcars. The components have been specially designed and manufactured for the harsh environmental conditions that prevail during railway operation. This includes increased requirements in terms of resistance to extreme climates, humidity and pollutants in the atmosphere.

All reactors comply with mechanical requirements demanded of them with regard to the permanent vibrations during railway operation.

A key feature of these reactors is their low sound emission.

- On-board network containers with transformer, reactor and change-over switch are used to supply on-board power for different infeed conditions.
- Acceptor circuit reactors are used to smooth the DC link voltage and reduce the harmonics in the DC link
- Chopper reactors limit the current gradient of the clocked chopper current and the short-circuit currents.
- Rod core reactors as a component of the line filter for overvoltage protection and to limit the line harmonics or DC link harmonic currents

Technical data

Rated alternating current	From 450 A to 3000 A
System supply voltages available	15 kV AC 16 $^{2}/_{3}$ Hz 25 kV AC 50 Hz 1.5 kV DC
Inductance per phase mH	0.3 mH to 16 mH, typical ratings 0.5 mH at 830 A with E = 139 Ws 2.0 mH at 3000 A with E = 9000 Ws 16.0 mH at 670 A with E = 3592 Ws
Total power loss W	On request
Total weight kg	On request
Frequency	Application-specific 33$^{1}/_{3}$ Hz, 50 Hz, 100 Hz, 0 – 300 Hz
Degree of protection	IP00, exposed to all weather factors
Safety class	I according to VDE 0106
Terminal	Free cable, flat copper (application-related)
Installation	Hanging, underfloor (application-related)
Cooling	CF, forced air cooling Typically 10 to 12 m/s at 40 °C
Climatic conditions	Loads due to "damp heat" and "salt mist" DIN IEC 721 – 3-5 Class 5C2 (chemically active materials) DIN IEC 721 – 3-5 Class 5F2 (contaminated materials) DIN IEC 721 – 3-5 Class 5S2 (mechanically active materials)
Insulation	Up to 25 kV rated voltage for clearances in air 32 mm clearances in air (minimum value) 4000 V DC insulation rated voltage for creepage distances
Temperature classes	t_a 40 °C/F to t_a 65 °C/F, t_a 55°C/H
Permissible ambient temperature during operation	–40 °C to +40 °C
Mechanical load	DIN IEC 68-2-6/06.90 Vibration, sinusoidal approx. 2 g DIN IEC 9/426/CDV Vibration wide-band noise DIN IEC 68-2-27/08.89 Shock UIC 566 Vibration and shock resistance
Standards	The reactors comply with VDE 0535, EN 60310
Dimensions	On request
Storage temperature	–40 °C to +80 °C

Application

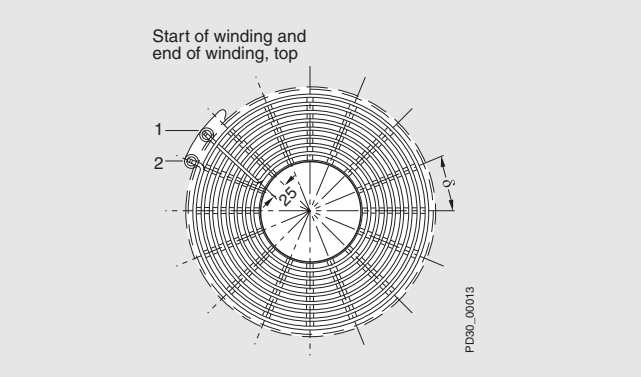

Fig. 9/10 Air-core reactors

These include reactors for used in electrical railcars. These reactors are used in trams, subway trains and modern high-speed railcars. Components are specially designed and manufactured for the harsh environmental conditions that prevail during railway operation.

This includes increased requirements in terms of resistance to extreme climates, humidity and pollutants in the atmosphere. All reactors comply with mechanical requirements with regard to the permanent vibrations during railway operation.

Air-core reactors are used as mains reactors in DC drive systems to smooth the motor current.
The rates of current rise are limited in the event of faults, and through-conductions in particular. The aim is to prevent unacceptably high currents before any protective devices can be triggered.

Technical data

Rated alternating current	Up to 600 A
System supply voltages available	2.3 kV DC
Inductance per phase mH	9 mH to 17 mH, typical ratings 6 to 9 mH at 230 A to 400 A with E = 230 Ws 17 mH for 500 to 800 A
Total power loss W	On request
Total weight kg	On request
Frequency	DC applications, the aforementioned currents take into account a 30% ripple of the alternating current
Degree of protection	IP00, exposed to all weather factors
Safety class	I according to VDE 0106
Terminal	Free cable, flat copper (application-related)
Installation	Hanging, underfloor (application-related)
Cooling	CF, forced air cooling Typically 10 to 12 m/s at 40 °C
Climatic conditions	Load due to "damp heat" and "salt mist" DIN IEC 721 – 3-5 Class 5C2 (chemically active materials) DIN IEC 721 – 3-5 Class 5F2 (contaminated materials) DIN IEC 721 – 3-5 Class 5S2 (mechanically active materials) DIN IEC 721 – 3-5 Class 5K3 (climatic category) DIN IEC 721 – 3-5 Class 5B2 (biologically active materials)
Insulation	Up to 12 kV rated voltage for clearances in air >20 mm clearances in air (minimum value) 1900 V DC insulation rated voltage for creepage distances
Temperature classes	t_a 60 °C/H
Permissible ambient temperature during operation	–30 °C to +70 °C
Mechanical load	DIN IEC 68-2-6/06.90 Vibration sinusoidal approx. 2 g DIN IEC 9/426/CDV Vibration wide-band noise DIN IEC 68-2-27/08.89 Shock UIC 566 Vibration and shock resistance
Standards	The reactors comply with VDE 0535, EN60310
Dimensions	On request
Storage/transport temperature	–40 °C to +70 °C

Notes

SIDAC-F
Radio interference suppression filter

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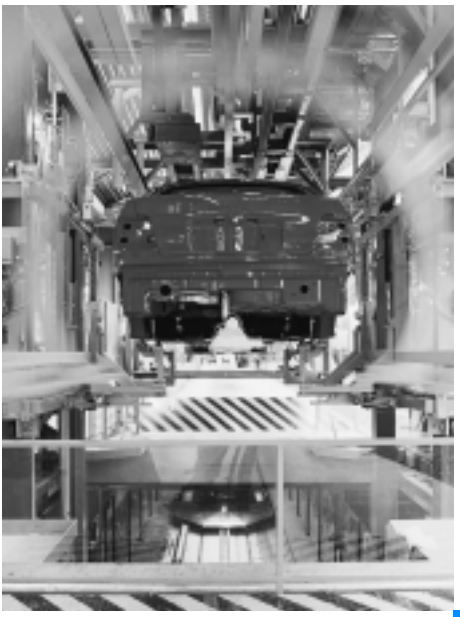

Three-phase filters

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Three-phase filters

Application

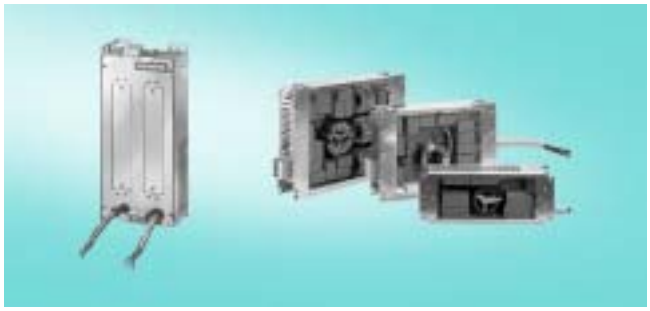

Fig. 10/1 Radio interference suppression filters in customised footprint version

Radio interference suppression filters for frequency converters are used in line-side supply cables for the purpose of attenuating mains-borne radio interference voltages. If there are special requirements for the dv/dt values at the motor supply terminals, the housing can also be fitted with an output reactor.

Using a radio interference suppression filter ensures compliance with interference suppression level A or B to EN 50081 (depending on customer requirements). It is also possible to use significantly longer motor supply cables in compliance with the limit values of EN 50081.

By using a combination filter (radio interference suppression filter and output reactor), it is possible to increase the length of the motor cable even further while still maintaining the required radio interference suppression level. Combining the radio interference suppression filter with an input reactor enables further reduction of circuit feedback.

Technical data

Recommended supply voltage	3 AC 500 V ± 10%
Rated alternating current	7.0 to 100 A, higher outputs on request
Test voltage	2.7 kV DC 2 secondary live parts against casing
Voltage drop output reactor for U_n = 400 V, f_{max}	< 5% of the rated voltage
Total power loss W	On request
Performance range P_n of converter	Up to 85 kW, higher outputs on request
Total weight kg	On request
Leakage current at 3 AC 400 V (50 Hz) **Symmetrical system** **Worst case**	With reference to the aforementioned design ratings 5 to 30 mA 30 to 130 mA
Frequency	50 ... 60 Hz line frequency, output reactors up to f_{max} = 50 to 200 Hz
Degree of protection	Assembly in zinc-plated steel housing in IP20
Terminal	Line-side bushing terminals, Shielded cable ends for connection to frequency converter input/ output, cable acc. to customer requirements
Rating of creepage distances and clearances	Degree of soiling 1 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	Version with terminals: 600 V AC
Temperature classes	Customised and application-specific (t_a 40 °C/B, t_a 40 °C/F/H)
Permissible ambient temperature during operation	–10 °C to +45 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at coolant temperatures ≠ +40 °C)	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	Assembly according to EN133200 All devices are built according to UL1283, approval on request
Dimensions	Casing with a maximum height of 100 mm, further dimensions on request
Storage temperature	–20 °C to +70 °C
Permissible humidity rating	Relative humidity at +40 °C up to 95% Condensation not permitted

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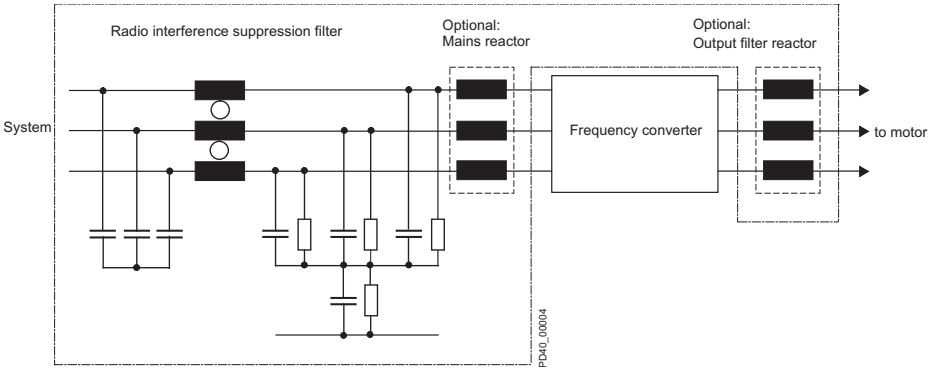
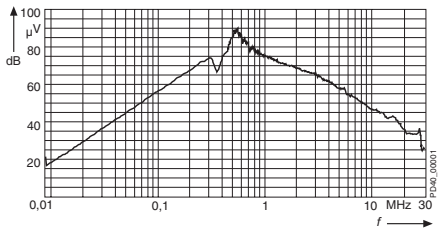
Selection and ordering data

Circuit design

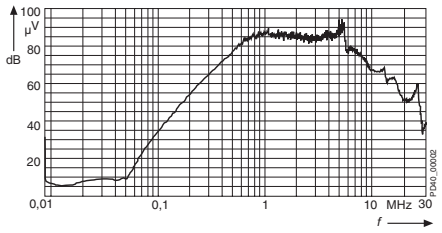


Typical insertion losses for used component according to CISPR 17

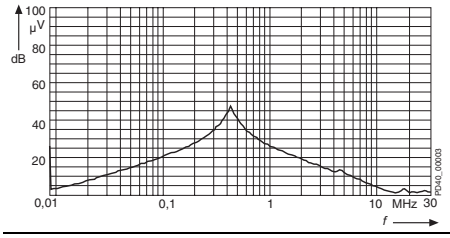
Insertion losses of radio-interference suppression component (50 Ω)



Asymmetrical insertion losses a_{asym} in dBμV



Symmetrical insertion losses a_{sym} in dBμV



Insertion losses of output reactor a_{adr} in dBμV

Example of possible motor supply cables

- 50 m for compliance with interference suppression level A EN 50081 with radio interference suppression filter
- 50 m for compliance with interference suppression level B EN 50081 with combination filter (radio interference suppression filter + output reactor)

Applications

Frequency converters for motor drives, e.g.

- Lifts
- Pumps
- Conveying systems
- Ventilation and air-conditioning technology

Type overview

Rated current [A]	From 8 to 100 A	8 A, 12 A, 20 A, 30 A, 40 A, 63 A, 80 A, 100 A

Versions:

- Radio interference suppression filter alone
- Combination of radio interference suppression filter and output reactor
- Combination of radio interference suppression filter and commutation reactor

Orders:

The type sizes shown in the above table are available. When placing an order or making enquiries, please fill out the "Specification sheet for customised filters" on page 13/4. The specified data will enable us to provide a detailed offer. The offer will also contain details of delivery times and dimensions.

Notes

SIDAC-F
dv/dt filters

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Three-phase filters

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Three-phase filters

Application

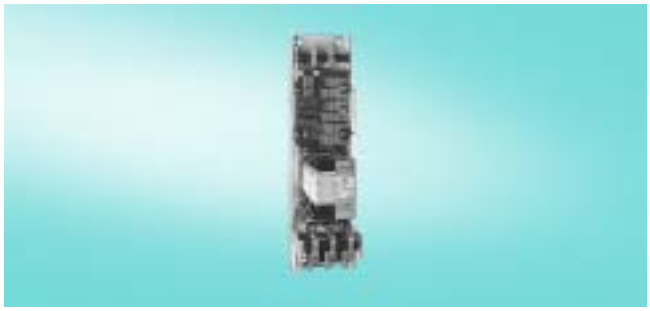


Fig. 11/1 dv/dt filter

dv/dt filters comprise capacitors and a reactor. The filter is installed at the output of frequency converters whereby the motor currents flow through the reactor. Connecting the filter to the output of the frequency converter, transient voltage peaks are reduced and voltage gradients in the motor winding to non-critical values of less than 500 V/μs. If long motor cables are used, the dv/dt filter also reduces capacitive load current peaks resulting from the capacitance per unit length of motor cable.

Technical data

Recommended supply voltage	3 AC 400 V to 500 V (690 V on request)
Rated alternating current	up to 860 A (on request)
Test voltage	3.6 kV DC live parts against casing
Performance range of the drive	up to 800 kW on request
Total power loss W	On request
Total weight kg	On request
Frequency	f_{max} = 200 Hz at converter output Clock frequencies ≤ 4 kHz to 8 kHz
Degree of protection	IP00 safe to touch terminals (BGV A2)
Safety class	I according to DIN VDE 0160-1/05.82 IEC 536/1976
Terminal	Flat copper/screw terminals depending on performance class
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	800 V AC
Temperature classes	t_a 40 °C/F or t_a 40 °C/H depending on performance class
Permissible ambient temperature during operation	0 °C to +40 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at coolant temperatures ≠ +40 °C)	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	Reactors comply with EN 61558 Assembly according to UL508
Dimensions	On request
Storage temperature	–25 °C to +55 °C
Transport temperature	–25 °C to +70 °C
Permissible environmental conditions	humidity 5% to 95% occasional condensation allowed

Selection and ordering data

	Max. continuous thermal current 4 kHz I_{thmax} A	Rated current I_{Ln} A	Connections T=Terminal F=Flat termination	DT	Core section of Order No.
3 AC 500 V 200 Hz maximum clock frequency 4 kHz					
	4	3.6	T	X	on request
	6	5.4	T	X	on request
	10	9	T	X	on request
	17.5	15.8	T	X	on request
	26	23.4	T	X	on request
	38	34.2	T	X	on request
	48	43.2	T	X	on request
	63	56.7	T	X	on request
	90	81	T	X	on request
	150	135	T	X	on request

For enquiries, please fill out the "Specification sheet for customised dv/dt filters" on page 13/5. The specified data will enable us to provide a detailed offer.
The offer will also contain details of delivery times and dimensions.

Notes

SIDAC-F
Sinewave filters

12

Three-phase filters

12/2 Application
12/2 Technical data
12/3 Selection and ordering data

Three-phase filters

Application

Fig. 12/1 Sinewave filter

The sinewave filter is installed at the output of frequency converters whereby motor currents flow through the filter. The frequency converter output variables are filtered such that an almost sinusoidal motor voltage and an absolutely sinusoidal motor current result. Stray losses in the motor are reduced and the motor runs significantly quieter. If long motor cables are used, the sinewave filter also reduces the load current peaks caused by cable capacities.

EX(d) motors can be converter-fed if a sinewave filter is used.
Motor cable lengths when using sinewave filters:
- 200 m shielded motor supply cable
- 300 m unshielded motor supply cable.

Technical data

Recommended supply voltage	3 AC 400 V to 500 V
Rated alternating current	4.0 to 150 A (260 A on request)
Test voltage	3.6 kV AC live parts against casing
Performance range of the drive	1.5 to 75 kW, higher outputs on request
Total power loss W	See table "Selection and ordering data"
Total weight kg	See table "Selection and ordering data"
Frequency	f_{max} = 100 Hz Clock frequency ≥ 4 kHz; ≤ 8 kHz
Degree of protection	IP00 safe to touch terminals (BGV A2)
Safety class	I according to DIN VDE 0160-1/05.82 IEC 536/1976
Terminal	Screw terminal
Rating of creepage distances and clearances	Degree of soiling 2 according to DIN VDE 0110
Rated voltage for insulation (for site altitudes up to 2000 m above sea level)	800 V AC
Temperature classes	t_a 40 °C/F for 1.5 to 7.5 kW units t_a 40 °C/H for 11 to 75 kW units
Permissible ambient temperature during operation	0 °C to +40 °C
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at coolant temperatures ≠ +40 °C)	On request
Site altitude	≤ 1000 m above sea level
Deviation of the permissible alternating current from rated alternating current I_{Ln} (at site altitudes > 1000 m above sea level)	See catalogue PD 60 "Technische Informationen", Chapter "Drosseln"
Standards	Reactors comply with EN 61558 Assembly according to UL508
Dimensions	On request
Storage temperature	–25 °C to +55 °C
Transport temperature	–25 °C to +70 °C
Permissible environmental conditions	humidity 5% to 95% occasional condensation allowed

Selection and ordering data

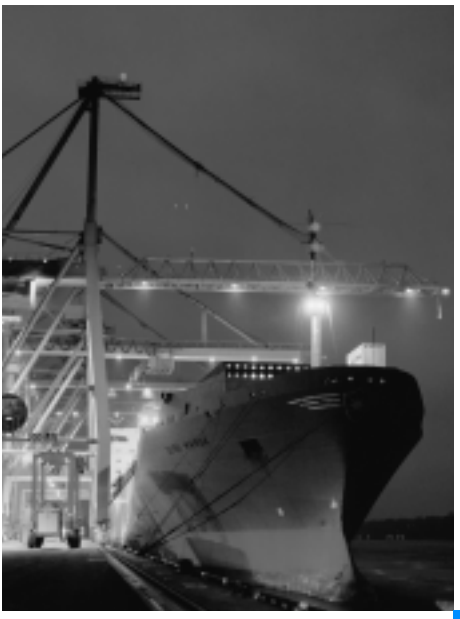
	Max. continuous thermal current 8 kHz	Rated current	Inductance	Total losses	Connections T=Terminal F=Flat termination	DT	Order No. [1]	Al weight per PU approx.	Cu weight per PU approx.	Total weight per PU approx.
	I_{thmax}	I_{Ln}	L_x	P_V						
	A	A	mH	W				kg	kg	kg
3 AC 500 V 100 Hz, minimum clock frequency = 4 kHz, maximum clock frequency 8 kHz										
	4	3.6	12	69.8	T	X	**4EF11 05-0GB**	–	1.20	4.0
	6	5.4	9	81.3	T	X	**4EF11 05-1GB**	–	1.35	4.3
	10	9	5	81.3	T	X	**4EF11 05-2GB**	–	1.60	5.8
	17.5	15.8	3.2	80.7	T	X	**4EF11 05-3GB**	–	2.30	9.5
	26	23.4	2.1	237.2	T	X	**4EF11 05-4GB**	–	4.00	13.5
	38	34.2	1.5	230.5	T	X	**4EF11 05-5GB**	–	6.20	20.0
	48	43.2	1.3	237.2	T	X	**4EF11 05-6GB**	–	9.10	28.0
	63	56.7	1.2	230.5	T	X	**4EF11 05-7GB**	–	11.00	35.0
	90	81	0.7	389	T	X	**4EF11 05-8GB**	–	11.70	47.0
	150	135	0.5	533	T	X	**4EF11 06-0GB**	–	26.90	70.0

1) Available 12/2004

Notes

Specification sheets

13



Fax reply form

13/2 Specification sheet for customised reactors

13/3 Specification sheet for customised smoothing reactors, selectable inductance and current

13/4 Specification sheet for customised radio interference suppression filters

13/5 Specification sheet for customised dv/dt filters

13/6 Specification sheet for customised sinewave filters

☐ DC reactors (smoothi
DC-link reactors)
L_1 [mH]: _____
I_{d1} [A]: _____
L_2 [mH]: _____
I_{d2} [A]: _____
I_{therm} [A]: _____
U_{sys} [V]: _____
Ripple
DC link
☐ 300 Hz ☐ ____
☐ 30 % ☐

FAX reply form

Specification sheet for customised reactors

FAX recipient:

Siemens AG
A&D CD MD PM
Richard-Dunkel-Str. 120
D-28199 Bremen
Fax: +49 421 5125-333
Tel: +49 421 5125-528/-616/-644

FAX sender: **Date:** _____

Company: _____
Department: _____
Name: _____
City: _____
Tel: _____
Fax: _____
E-mail: _____

Application:

☐ 1-phase ☐ 3-phase

Please specify all currents and voltages as r.m.s. values!

☐ DC reactors (smoothing/ DC-link reactors)

L_1 [mH]: _____
I_{d1} [A]: _____
L_2 [mH]: _____
I_{d2} [A]: _____
I_{therm} [A]: _____
U_{sys} [V]: _____
Ripple

DC link
☐ 300 Hz ☐ _____
☐ 30 % ☐ _____

☐ Commutation reactors

U_{Dr} [V]: _____
u_D [%]: _____
I_n [A]: _____
I_{max} [A]: _____
U_{sys} [V]: _____
f_{sys} [Hz]: _____
Harmonics *)

I_1 [A]:_____ f_1 [Hz]:_____
I_2 [A]:_____ f_2 [Hz]:_____
I_3 [A]:_____ f_3 [Hz]:_____
I_4 [A]:_____ f_4 [Hz]:_____
I_5 [A]:_____ f_5 [Hz]:_____
*) List other currents and frequencies below

☐ Output reactors

L_n [mH]: _____
P_{nMot} [kW]: _____
f_{max} [Hz]: _____
U_{sys} [V]: _____
f_{clock1} [Hz]: _____
I_{n1} [A]: _____
f_{clock2} [Hz]: _____
I_{n2} [A]: _____
f_{clock3} [Hz]: _____
I_{n3} [A]: _____

☐ Filter reactors

Qc [kvar]: _____
L_n [mH]: _____
$I_{n,eff}$ [A]: _____
U_{sys} [V]: _____
f_{sys} [Hz]: _____
Reactance [%]: _____
Fundamental and harmonic component
$U_{1[\%]}$ = _____ $I_{1[\%]}$ = _____
$U_{3[\%]}$ = _____ $I_{3[\%]}$ = _____
$U_{5[\%]}$ = _____ $I_{5[\%]}$ = _____
$U_{7[\%]}$ = _____ $I_{7[\%]}$ = _____
$U_{11[\%]}$ = _____ $I_{11[\%]}$ = _____
$U_{13[\%]}$ = _____ $I_{13[\%]}$ = _____
See catalogue PD 60 "Technische Informationen"

General Information

Ambient temperature:
☐ 40°C ☐ 55°C
☐ _____

Operating mode:
☐ continuous duty
☐ ON-time [%] _____
Varying load according to specifications

Degree of protection:
☐ IP00 ☐ IP23
☐ IP _____

Design
☐ Book size
☐ Footprint
☐ According to customer specifications

Please enter any alternative or supplementary data on converters and motors:

Converter

Rated power P_n [kW]: _____
$I_{n\ output}$ [A]: _____
$U_{DC\ link}$ [V]: _____
Permitted overload in [%] of $I_{n\ output}$: _____

Motor

P_n [kW]: _____ η: _____
Operating load in [%] of P_n: ____ U_N[V] = ____ In [A] = ____ cos φ = ___
M = constant
M ~ n^2 (fan, pump)
r.p.m.$_n$: _____
r.p.m.$_{operation}$: from: _____ to: _____

Special features/comments:

_____

_____

_____

Scheduled delivery date: _____ No. of items: _____ per annum/per order Target price: _____

Documents: ☐ Dimensioned drawings ☐ Load cycle ☐ Electrical data of drive ☐ _____

Specification sheet for customised smoothing reactors, selectable inductance and current

FAX recipient:

Siemens AG
A&D CD MD PM
Richard-Dunkel-Str. 120
D-28199 Bremen
Fax: +49 421 5125-333
Tel: +49 421 5125-528/-616/-644

FAX sender: **Date:** _____

Company: _____
Department: _____
Name: _____
City: _____
Tel: _____
Fax: _____
E-mail: _____

Application:

☐ Smoothing reactors with selectable inductance and current

Please specify all currents and voltages as r.m.s. values!

	Iron-core smoothing reactors	Iron-core smoothing reactors	Smoothing air-core reactors
	$I_x = I_{dn}$ $L_x = L_0$	$I_x > I_{dn}$ $L_x \leq L_0$	
Rated direct current I_{dn} [A]			
Inductance [mH] for I_{dn}		_____	
Inductance L_x [mH] for I_x (I_{max})	_____		_____
Inductance L_0 [mH] for I_d = 0A	_____		_____
Connection of converter			
No-load voltage of converter U_{di} [V]			
Line frequency f [Hz]			
Ambient temperature			
Additional information [1)]	mandatory	mandatory	mandatory

1) If you have any special requirements with regard to degree of soiling, reference voltage for the rating of insulation, etc., please enter in the Comments box

For further details on dimensioning and selection, see catalogue PD 60 "Technische Informationen", "Drosseln"

Special features/comments:

_____

_____

_____

_____

_____

Scheduled delivery date: _____ No. of items: _____ per annum/per order Target price: _____

Documents: ☐ Dimensioned drawings ☐ Load cycle ☐ Electrical data of drive ☐ _____

FAX reply form

Specification sheet for customised radio interference suppression filters

FAX recipient:

Siemens AG
A&D CD MD PM
Richard-Dunkel-Str. 120
D-28199 Bremen
Fax: +49 421 5125-333
Tel: +49 421 5125-528/-616/-644

FAX sender: **Date:** _____

Company: _____
Department: _____
Name: _____
City: _____
Tel: _____
Fax: _____
E-mail: _____

Application:

Please specify currents and voltages as r.m.s. values!

☐ Radio interference suppression filters DIN EN 133200

P_{nFu} [kW]: _____
I_n [A]: _____
U_{sys} [V]: _____
I_{deriv} [mA]: _____
f_{sys} [Hz]: _____

Adherence to interference level:
☐ A Industry, DIN EN 50081-2 "Second environment"
☐ B Living and business, DIN EN 50081-1 "First environment"

Optional
Commutation reactors:
☐ u_D = 2% ☐ u_D = 4% ☐ u_D = ____ %

Optional
Output reactors:
f_{max} [Hz]: ____ f_{clock} [Hz]: ____

Maximum desired length of motor supply cable [m]:

☐ Shielded cable ☐ Unshielded cable Cable type = _____
Capacitance if known: L' [mH/m]= _____ C' [nF/m] = _____

General Information

Ambient temperature:
☐ 40°C ☐ 55°C
☐ _____

Operating mode:
☐ continuous duty
☐ ON-time [%] _____
Varying load according to specifications

Degree of protection:
☐ IP00 ☐ IP23
☐ IP _____

Design:
☐ Book size
☐ Footprint
☐ According to customer specifications

Please enter any alternative or supplementary data on converters and motors:

Converters
Rated power P_n [kW]: _____
$I_{n\ output}$ [A]: _____
$U_{DC\ link}$ [V]: _____
Permitted overload in [%] of $I_{n\ output}$: _____

Motor
P_n [kW]: _____ η: _____
Operating load in [%] of P_n: ___ U_n [V]: ___ I_n [A]: ___ cos φ: ___
M = constant
M ~ n^2 (fan, pump)
r.p.m.$_n$: _____
r.p.m.$_{operation}$: from: _____ to: _____

Special features/comments:

_____

_____

_____

Scheduled delivery date: _____ No. of items: _____ per annum/per order Target price: _____

Documents: ☐ Dimensioned drawings ☐ Load cycle ☐ Electrical data of drive ☐ _____

Specification sheet for customised dv/dt filters

FAX recipient:

Siemens AG
A&D CD MD PM
Richard-Dunkel-Str. 120
D-28199 Bremen
Fax: +49 421 5125-333
Tel: +49 421 5125-528/-616/-644

FAX sender: **Date:** _____

Company: _____
Department: _____
Name: _____
City: _____
Tel: _____
Fax: _____
E-mail: _____

Application:

Please specify currents and voltages as r.m.s. values!

☐ dv/dt filters

P_{nFu} [kW]: _____
I_n [A]: _____
U_{sys} [V]: _____
f_{max} [Hz]: _____
f_{clock} [Hz]: _____

Maximum desired length of motor supply cable [m]:

☐ Shielded cable ☐ Unshielded cable Cable type = _____
Capacitance if known: L‘ [mH/m]= _____ C‘ [nF/m] = _____

General Information

Ambient temperature:
☐ 40°C ☐ 55°C
☐ _____

Operating mode:
☐ continuous duty
☐ ON-time [%] _____
Varying load according to specifications

Degree of protection:
☐ IP00 ☐ IP23
☐ IP _____

Design:
☐ Book size
☐ Footprint
☐ According to customer specifications

Please enter any alternative or supplementary data on converters and motors:

Converters
Rated power P_n [kW]: _____
$I_{n\ output}$ [A]: _____
$U_{DC\ link}$ [V]: _____
Permitted overload in [%] of $I_{n\ output}$: _____

Motor
P_n [kW]: _____ η: _____
Operating load in [%] of P_n: ___ U_n [V]: ___ I_n [A]: ___ cos φ: ___
M = constant
M ~ n^2 (fan, pump)
r.p.m.$_n$: _____
r.p.m.$_{operation}$: from: _____ to: _____

Special features/comments:

_____
_____
_____

Scheduled delivery date: _____ No. of items: _____ per annum/per order Target price: _____

Documents: ☐ Dimensioned drawings ☐ Load cycle ☐ Electrical data of drive ☐ _____

FAX reply form

Specification sheet for customised sinewave filters

FAX recipient:

Siemens AG
A&D CD MD PM
Richard-Dunkel-Str. 120
D-28199 Bremen
Fax: +49 421 5125-333
Tel: +49 421 5125-528/-616/-644

FAX sender: **Date:** _____

Company: _____
Department: _____
Name: _____
City: _____
Tel: _____
Fax: _____
E-mail: _____

Application:

Please specify currents and voltages as r.m.s. values!

☐ Sinewave filters

P_{nFu} [kW]: _____
I_n [A]: _____
U_{sys} [V]: _____
f_{max} [Hz]: _____
f_{clock} [Hz]: _____

Maximum desired length of motor supply cable [m]:

☐ Shielded cable ☐ Unshielded cable Cable type = _____
Capacitance if known: L' [mH/m]= _____ C' [nF/m] = _____

General Information

Ambient temperature:
☐ 40°C ☐ 55°C
☐ _____

Operating mode:
☐ continuous duty
☐ ON-time [%] _____
Varying load according to specifications

Degree of protection:
☐ IP00 ☐ IP23
☐ IP _____

Design:
☐ Book size
☐ Footprint
☐ According to customer specifications

Please enter any alternative or supplementary data on converters and motors:

Converters
Rated power P_n [kW]: _____
$I_{n\ output}$ [A]: _____
$U_{DC\ link}$ [V]: _____
permitted overload in [%] of $I_{n\ output}$: _____

Motor
P_n [kW]: _____ η: _____
Operating load in [%] of P_n: _ U_n [V]: ____ I_n [A]: ____ cos φ: ____
M = constant
M ~ n^2 (fan, pump)
r.p.m.$_n$: _____
r.p.m.$_{operation}$: from: _____ to: _____

Special features/comments:

_____
_____
_____

Scheduled delivery date: _____ No. of items: _____ per annum/per order Target price: _____

Documents: ☐ Dimensioned drawings ☐ Load cycle ☐ Electrical data of drive ☐ _____

Accessories

14

Terminal covers
14/2 Selection and ordering data

Terminal covers

Selection and ordering data

	Version		DT	Order No.	PS*	Weight per PU approx.
						kg
Terminal covers for protection against inadvertent contact with the exposed busbar connections (DIN VDE 0106 Part 100)						
 3TX6 526-3B	The covers are suitable for all reactors and filters with 1 hole-Flat-connector. The assignment of the terminal covers to the reactors and filters can be carried out by the diameter of the flatconnector-hole, see chapter 15 "Configuration notes". As long as no different note is placed in the Technical data, the covers protect against accidental contact of live parts (save to the back of the hand).					
	Can be screwed on free screw end. Covers one rail connection (1 set = 6 units).	M6 M8 M10 M12	B B B B	**3TX6 506-3B** **3TX6 526-3B** **3TX6 546-3B** **3TX6 346-3B**	1 set 1 set 1 set 1 set	0.075 0.140 0.249 0.260

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* This number of units or a multible thereof can be ordered.

Configuration notes

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Commutation reactors for converters
15/2 Single-phase reactors
15/4 Three-phase reactors

Iron-core output reactors
15/4 Three phase reactors

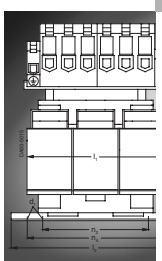
Mains reactors for frequency converters
15/8 Three-phase reactors

Iron-core smoothing reactors
15/12 Single-phase reactors

Smoothing air-core reactors
15/18 Single-phase reactors

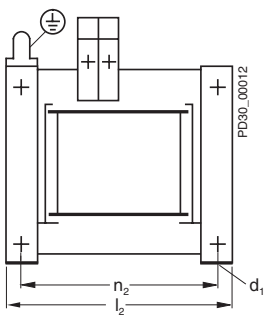
Filter reactors
15/19 Three-phase reactors

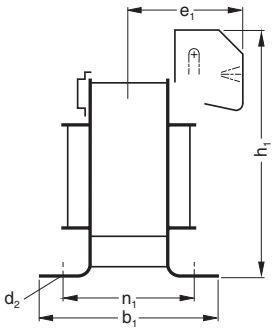
Sinewave filters
15/21 Three phase filters



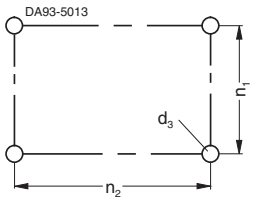
Single-phase reactors

Dimensioned drawings





4EM (I_{Ln} ≤ 20 A)

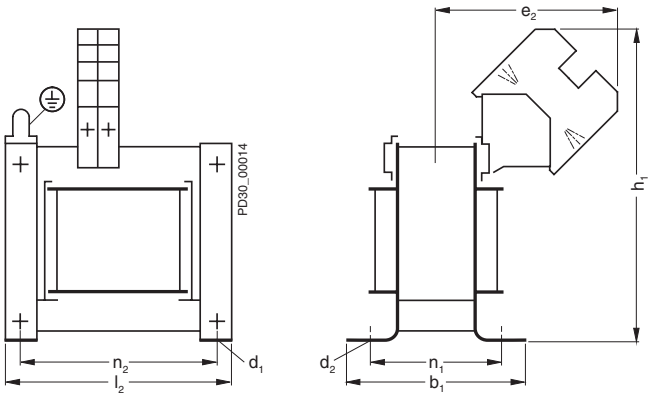


Mounting holes

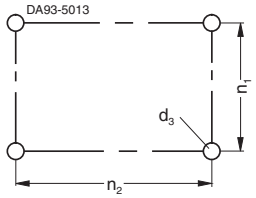
4EM (I_{Ln} ≤ 20 A)
Terminal 8WA9 200
Cross-sections: Solid: 0.5 mm² to 6 mm²
Finely stranded: 1.5 mm² to 4 mm²

4EM (I_{Ln} 22.4 to 40 A)
Terminal RKW 110 or TRKSD 10
Cross-sections: Solid: 1 mm² to 16 mm²
Finely stranded: 1 mm² to 10 mm²

Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	$e_{1\ max.}$	$h_{1\ max.}$	$l_{2\ max.}$	n_1	n_2
Rated alternating current for terminal connections, for user-defined arrangement of reactors										
4EM46	Up to 40 A	51	3.6	7	M3	53.0	85.0	61	39	50.0
4EM47	Up to 40 A	60	4.8	9	M4	54.0	89.0	67	45	55.0
4EM48	Up to 40 A	69	4.8	9	M4	56.5	98.0	79	53	65.0
4EM49	Up to 40 A	85	4.8	9	M4	65.0	103.0	85	69	70.0
4EM50	Up to 40 A	97	5.8	11	M5	66.0	111.5	97	77	80.0
4EM51	Up to 40 A	111	5.8	11	M5	73.0	111.5	97	91	80.0
4EM52	Up to 40 A	115	5.8	11	M5	70.5	131.0	121	92	100.0
4EM61	Up to 40 A	110	5.8	11	M5	73.5	118.0	106	92	87.5



4EM (I_{Ln} 22 to 50 A)



Mounting holes

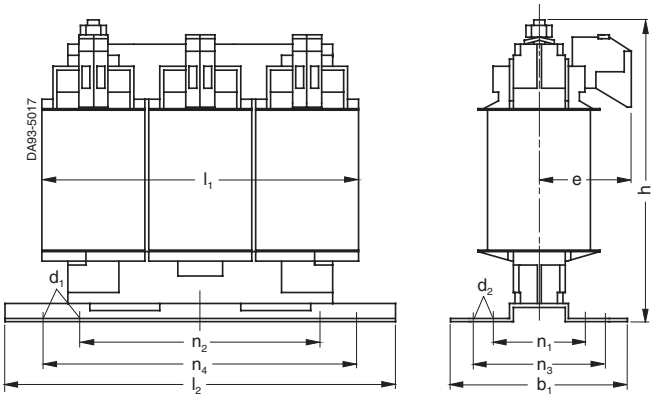
4EM (I_{Ln} 22 to 50 A)
Terminal 8WA1 204
Cross-sections:

Solid:	0.5 mm^2 to 6 mm^2
Stranded:	10 mm^2 to 25 mm^2
Finely stranded:	2.5 mm^2 to 16 mm^2

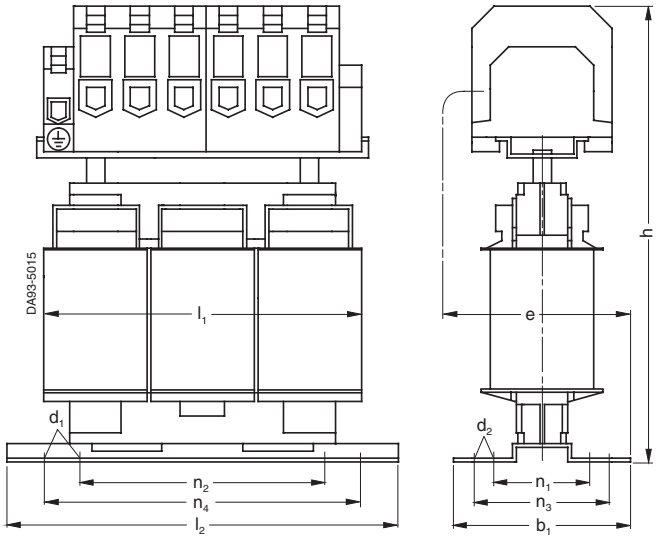
Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	$e_{2\ max.}$	$h_{1\ max.}$	$l_{2\ max.}$	n_1	n_2
Rated alternating current for terminal connections, for user-defined arrangement of reactors										
4EM49	22 to 50 A	85	4.8	9	M4	75	120.0	85	69	70.0
4EM50	22 to 50 A	97	5.8	11	M5	76	128.5	97	77	80.0
4EM51	22 to 50 A	111	5.8	11	M5	83	128.5	97	91	80.0
4EM53	22 to 50 A	120	7.0	13	M6	79	168.5	151	92	125.0
4EM61	22 to 50 A	110	5.8	11	M5	83	135.5	106	92	87.5
4EM62	22 to 50 A	135	5.8	11	M5	90	148.0	121	112	100.0

Commutation reactors for converters/Iron-core output reactors

Three-phase reactors



4EP ≤ 40 A



4EP 41 to 50 A

Terminal RKW110 or TRKSD10
(for I_{Ln} ≤ 40 A)

Cross-sections:	Solid:	1 mm² to 16 mm²
	Finely stranded:	1 mm² to 10 mm²

Ground stud M6 x 12

Cross-sections:	Solid:	2.5 mm² to 10 mm²
	Finely stranded:	4 mm² to 10 mm²

Terminal 8WA1 304
(for I_{Ln} = 41 to 50 A)

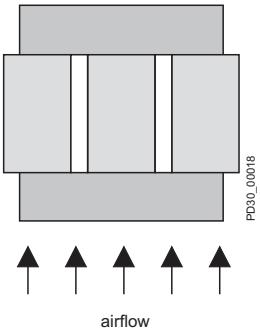
Cross-sections:	Solid:	1 mm² to 16 mm²
	Stranded:	10 mm² to 25 mm²
	Finely stranded:	2.5 mm² to 16 mm²

Corresponding ground terminal EK16/35

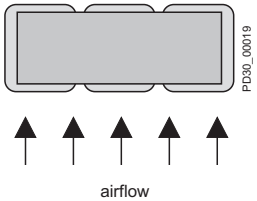
Cross-sections:	Solid:	2.5 mm² to 16 mm²
	Finely stranded:	4 mm² to 16 mm²

Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	e	h	l_1	l_2	n_1	n_2	n_3	n_4
Rated alternating current for terminal connections													
4EP36	Up to 40 A	78	4.8	9	M4	62.0	139	120	148	49	90	58	136
4EP37	Up to 40 A	73	5.8	11	M5	60.0	159	150	178	49	113	53	166
4EP38	Up to 40 A	88	5.8	11	M5	67.0	159	150	178	64	113	68	166
4EP39	Up to 40 A	99	7.0	13	M6	62.0	181	182	219	56	136	69	201
4EP40	Up to 40 A	119	7.0	13	M6	72.0	181	182	219	76	136	89	201
4EP37	41 to 50 A	73	5.8	11	M5	78.5	193	150	178	49	113	53	166
4EP38	41 to 50 A	88	5.8	11	M5	86.0	193	150	178	64	113	68	166
4EP39	41 to 50 A	99	7.0	13	M6	91.5	220	182	219	56	136	69	201
4EP40	41 to 50 A	119	7.0	13	M6	101.5	220	182	219	76	136	89	201

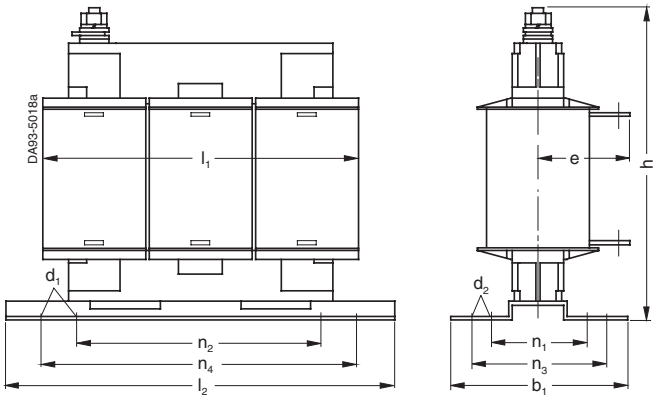
Arrangement:
- userdefined for commutation reactors
- for iron-core output reactors see drawing



Permissible arrangement of iron-core output reactors, vertikal



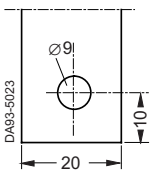
Permissible arrangement of iron-core output reactors, horizontal



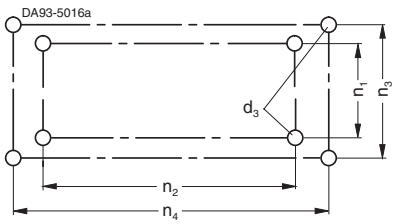
4EP > 51 A

Type	Rated alternating current I_{Ln}	b_1	d_1	d_2	d_3	e	h	l_1	l_2	n_1	n_2	n_3	n_4
Rated alternating currents for flat terminations													
4EP37	over 51 A	73	5.8	11	M5	68	153	150	178	49	113	53	166
4EP38	over 51 A	88	5.8	11	M5	76	153	150	178	64	113	68	166
4EP39	over 51 A	99	7.0	13	M6	73	179	182	219	56	136	69	201
4EP40	over 51 A	119	7.0	13	M6	83	179	182	219	76	136	89	201

Flat termination



Mounting holes

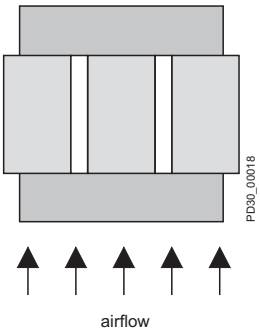


n1 and n2 mounting holes according to DIN 41308

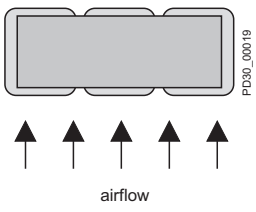
n3 and n4 mounting holes according to EN 60852-4

Arrangement:

- userdefined for commutation reactors
- for iron-core output reactors see drawing



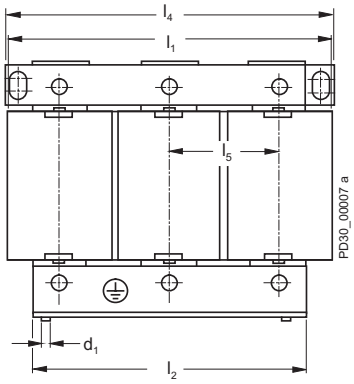
Permissible arrangement of iron-core output reactors, vertikal

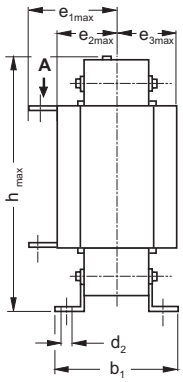


Permissible arrangement of iron-core output reactors, horizontal

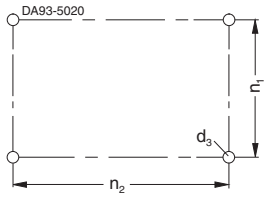
Commutation reactors for converters/Iron-core output reactors

Three-phase reactors



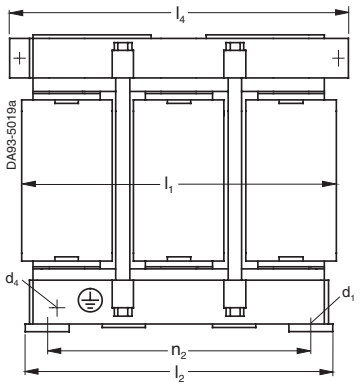


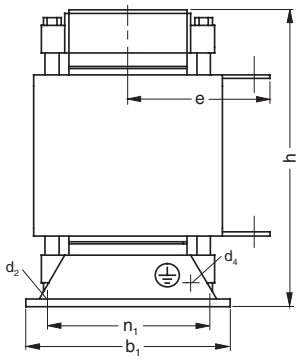
4EU24 to **4EU36**



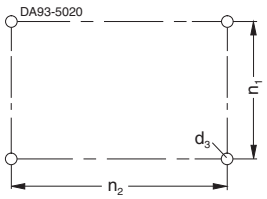
Mounting holes

Type	b_1	d_1	d_2	d_3	$e_{1\ max.}$	$e_{2\ max.}$	$e_{3\ max.}$	h_{max}	l_1	l_2	l_4	l_5	n_1	n_2	Ground
for 4EU24 to 4EU36 with flat terminations															
4EU24	91	7	12	M6	90.5	56.5	48.5	210	225	190	–	76	70	176	M6
4EU25	115	7	12	M6	102.5	68.5	60.5	210	225	190	–	76	94	176	M6
4EU27	133	10	18	M8	120.5	79.5	67.5	248	260	220	270	88	101	200	M6
4EU30 (Cu)	148	10	18	M8	137.0	89.0	73.0	269	295	250	300	100	118	224	M6
4EU30	148	10	18	M8	144.0	98.0	86.0	269	295	250	300	100	118	224	M6
4EU36 (Cu)	169	10	18	M8	142.0	94.0	78.0	321	357	300	350	120	138	264	M8
4EU36	169	10	18	M8	161.0	111.0	91.0	321	357	300	350	120	138	264	M8



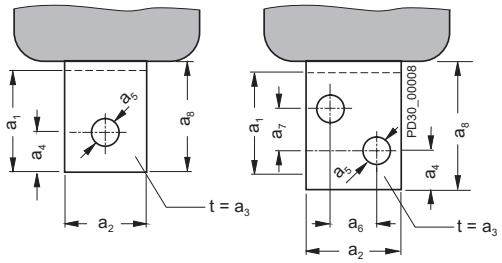


4EU39 to **4EU51**



Mounting holes

Type	b_1	d_1	d_2	d_3	$e_{1\ max.}$	$e_{2\ max.}$	$e_{3\ max.}$	h_{max}	l_1	l_2	l_4	l_5	n_1	n_2	Ground
for 4EU39 to 4EU51 with flat terminations															
4EU39	174	12.0	18.0	M10	142	–	–	385	405	366	410	–	141	316	M6
4EU43	194	15.0	22.0	M12	168	–	–	435	458	416	460	–	155	356	M6
4EU45	221	15.0	22.0	M12	182	–	–	435	458	416	460	–	182	356	M6
4EU47	251	15.0	22.0	M12	197	–	–	435	458	416	460	–	212	356	M6
4EU50	195	12.5	12.5	M10	220	–	–	565	533	470	518	–	158	410	M12
4EU51	207	12.5	12.5	M10	242	–	–	565	533	470	518	–	170	410	M12

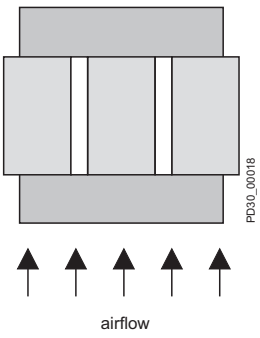


Version
up to 1000 A

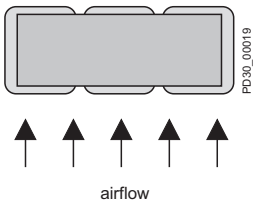
Version
> 1000 A

Flat termination	a_1	a_2	a_3 Al	a_3 Cu	a_4	a_5	a_6	a_7	$a_{8\ max.}$
for 4EU24 to 4EU36 with flat terminations									
≤ 200 A	20	20	4	3	10.0	9	–	–	34
≤ 400 A	25	25	6	5	12.5	11	–	–	41
≤ 630 A	30	30	8	6	15.0	11	–	–	48
≤ 800 A	30	30	10	8	15.0	14	–	–	50
≤ 1000 A	40	40	10	8	20.0	14	–	–	60
≤ 1250 A	50	50	10	8	14.0	14	22	22	70
for 4EU39 to 4EU51 with flat terminations									
≤ 200 A	35	20	–	3	10.0	9	–	–	–
≤ 400 A	35	30	–	5	12.5	11	–	–	–
≤ 630 A	40	30	–	6	15.0	11	–	–	–
≤ 800 A	40	30	–	8	15.0	14	–	–	–
≤ 1000 A	50	40	–	8	20.0	14	–	–	–
≤ 1250 A	50	50	–	8	14.0	14	22	22	–
≤ 1640 A	60	60	–	12	17.0	14	26	26	–

Arrangement:
- userdefined for commutation reactors
- for iron-core output reactors see drawing

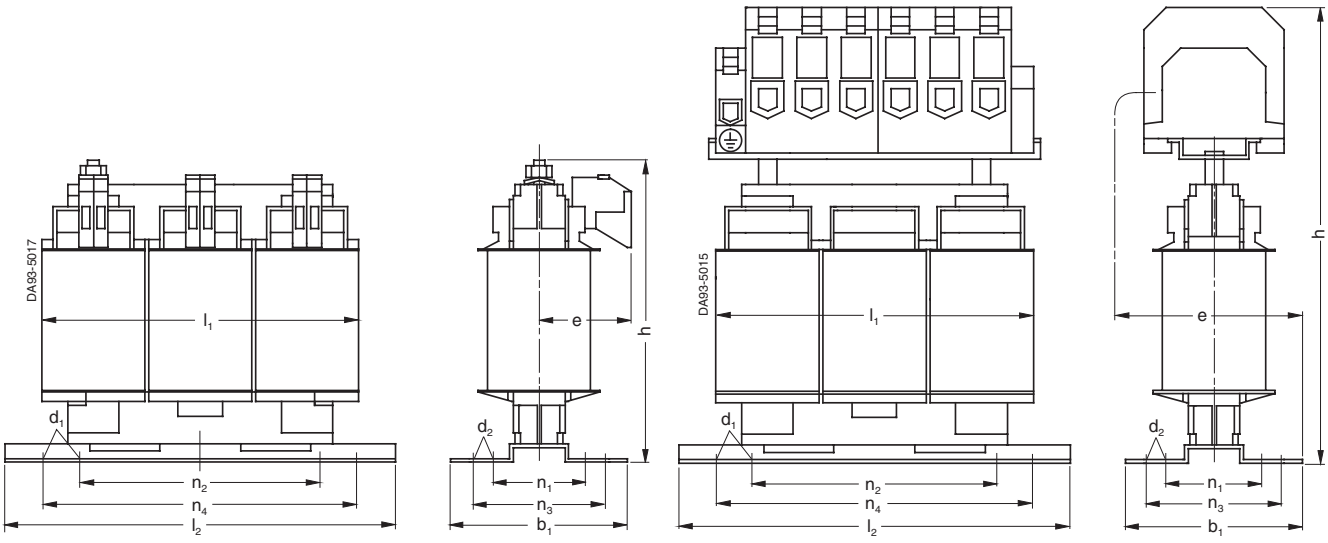


Permissible arrangement of iron-core output reactors, vertikal



Permissible arrangement of iron-core output reactors, horizontal

Three-phase reactors



4EP ≤ 35 A

4EP 40 A to 50 A

Terminal 8WA9 200
(for I_{Ln} ≤ 15 A)

Cross-sections:
Solid: 0.5 mm² to 6 mm²
Finely stranded: 1.5 mm² to 4 mm²

Terminal RKW110 or TRKSD10
(for I_{Ln} ≤ 16 to 35.5 A)

Cross-sections:
Solid: 1 mm² to 16 mm²
Finely stranded: 1 mm² to 10 mm²

Ground stud M6 x 12

Cross-sections:
Solid: 2.5 mm² to 10 mm²
Finely stranded: 4 mm² to 10 mm²

Terminal 8WA1 304
(for I_{Ln} = 40 A to 50 A)

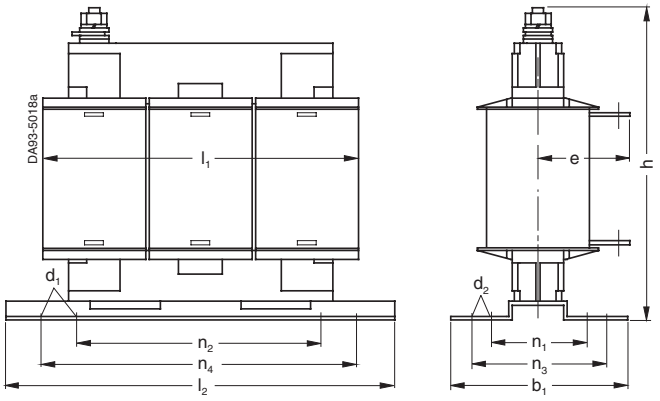
Cross-sections:
Solid: 1 mm² to 16 mm²
Stranded: 10 mm² to 25 mm²
Finely stranded: 2.5 mm² to 16 mm²

Corresponding ground terminal EK16/35

Cross-sections:
Solid: 2.5 mm² to 16 mm²
Finely stranded: 4 mm² to 16 mm²

Type	b_1	d_1	d_2	d_3	e	h	l_1	l_2	n_1	n_2	n_3	n_4
I_{Ln} ≤ 35 A, terminal connections for user-defined arrangement of reactors												
4EP32	57.5	4.8	9	M4	56	108	78	88.5	34	1)	42.5	79.5
4EP33	64	4.8	9	M4	55	122	96	124	33	1)	44	112
4EP34	73	4.8	9	M4	59	122	96	124	42	1)	53	112
4EP35	68	4.8	9	M4	57	139	120	148	39	90	48	136
4EP36	78	4.8	9	M4	62	139	120	148	49	90	58	136
4EP37	73	5.8	11	M5	60	159	150	178	49	113	53	166
4EP38	88	5.8	11	M5	67	159	150	178	64	113	68	166
4EP39	99	7.0	13	M6	62	181	182	219	56	136	69	201
4EP40	119	7.0	13	M6	72	181	182	219	76	136	89	201
I_{Ln} 40 A to 50 A, terminal connections for user-defined arrangement of reactors												
4EP37	73	5.8	11	M5	78.5	193	150	178	49	113	53	166
4EP38	88	5.8	11	M5	86.0	193	150	178	64	113	68	166
4EP39	99	7.0	13	M6	91.5	220	182	219	56	136	69	201
4EP40	119	7.0	13	M6	101.5	220	182	219	76	136	89	201

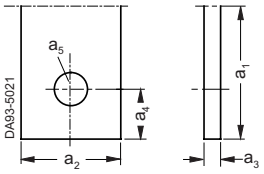
1) Fixing slot in the base centre



4EP ≥ 51 A

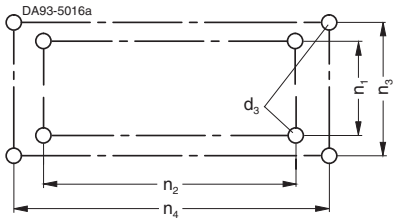
Type	b_1	d_1	d_2	d_3	e	h	l_1	l_2	n_1	n_2	n_3	n_4
I_{Ln} ≥ 51 A, flat termination for user-defined arrangement of reactors												
4EP38	88	5.8	11	M5	76	153	150	178	64	113	68	166
4EP39	99	7.0	13	M6	73	179	182	219	56	136	69	201
4EP40	119	7.0	13	M6	83	179	182	219	76	136	89	201

Flat termination



I_{Ln}	a_1	a_2	a_3	a_4	a_5
Flat termination					
51 to 80 A	30	20	3	10	9
81 to 200 A	35	25	5	12.5	11

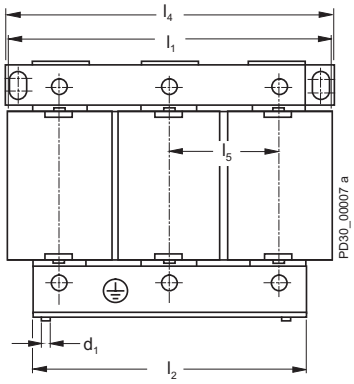
Mounting holes

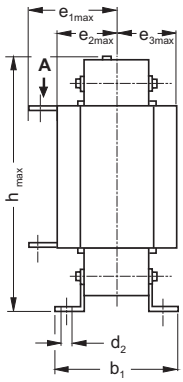


n1 and n2 mounting holes according to DIN 41308

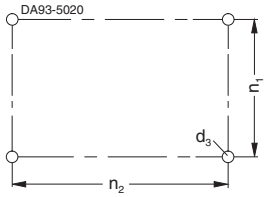
n3 and n4 mounting holes according to EN 60852-4

Three-phase reactors



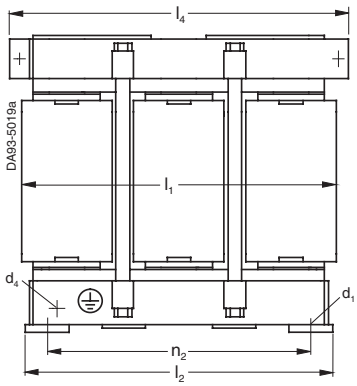


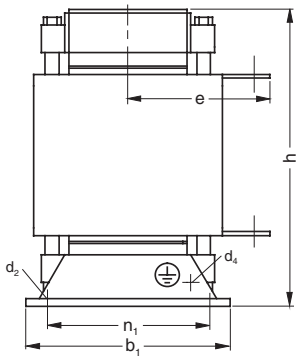
4EU24 to **4EU36**



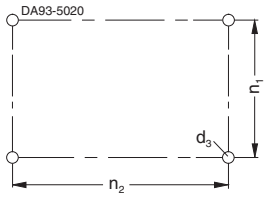
Mounting holes

Type	b_1	d_1	d_2	d_3	$e_{1\ max.}$	$e_{2\ max.}$	$e_{3\ max.}$	h_{max}	l_1	l_2	l_4	l_5	n_1	n_2	Ground
for 4EU24 to 4EU36 with flat terminations, for user-defined arrangement of reactors															
4EU24	91	7	13	M6	101.5	60.5	48.5	210	225	190	–	76	70	176	M6
4EU25	115	7	13	M6	118.5	72.5	60.5	210	225	190	–	76	94	176	M6
4EU27	133	10	18	M8	141.5	83.5	67.5	248	260	220	270	88	101	200	M6
4EU30	148	10	18	M8	147.0	89.0	73.0	269	295	250	300	100	118	224	M6
4EU36 (Cu)	169	10	18	M8	152.0	94.0	78.0	321	357	300	350	120	138	264	M8
4EU36	169	10	18	M8	197.0	115.0	91.0	321	357	300	350	120	138	264	M8



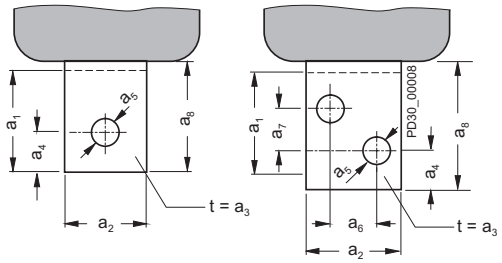


4EU39 to **4EU51**



Mounting holes

Type	b_1	d_1	d_2	d_3	$e_{1\ max.}$	$e_{2\ max.}$	$e_{3\ max.}$	h_{max}	l_1	l_2	l_4	l_5	n_1	n_2	Ground
for 4EU39 to 4EU52 with flat terminations, for user-defined arrangement of reactors															
4EU39	174	12.0	18.0	M10	197	–	–	385	405	366	410	–	141	316	M6
4EU43	194	15.0	22.0	M12	212	–	–	435	458	416	460	–	155	356	M6
4EU45	221	15.0	22.0	M12	211	–	–	435	458	416	460	–	182	356	M6
4EU47	251	15.0	22.0	M12	231	–	–	435	458	416	460	–	212	356	M6
4EU50	195	12.5	12.5	M10	220	–	–	565	533	470	518	–	158	410	M12
4EU52	220	12.5	12.5	M10	242	–	–	565	533	470	518	–	183	410	M12

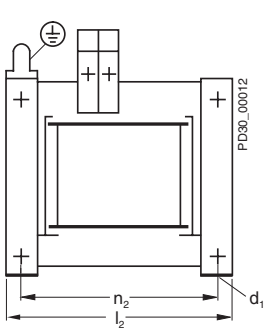


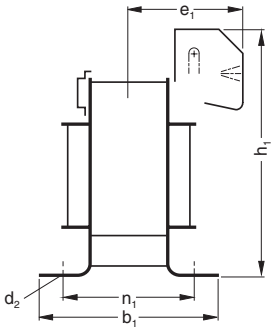
Version
to 1000 A

Version
> 1000 A

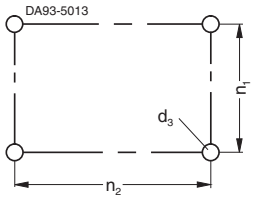
Flat termination	a_1	a_2	a_3 Al	a_3 Cu	a_4	a_5	a_6	a_7	$a_{8\ max.}$
for 4EU24 to 4EU36									
≤ 80 A	20	20	4	3	10.0	9	–	–	34
≤ 200 A	25	25	6	5	12.5	11	–	–	41
≤ 315 A	30	30	6	6	15.0	14	–	–	46
≤ 800 A	40	40	8	6	20.0	14	–	–	58
≤ 1000 A	40	40	10	8	20.0	14	–	–	60
≤ 1600 A	60	60	12	12	17.0	14	26	26	82
for 4EU39 to 4EU52									
45 A to 80 A	30	20	–	3	10.0	9	–	–	–
81 A to 200 A	35	25	–	5	12.5	11	–	–	–
201 A to 315 A	40	30	–	6	15.0	14	–	–	–
316 A to 800 A	50	40	–	6	20.0	14	–	–	–
801 A to 1000 A	50	40	–	8	20.0	14	–	–	–
1001 A to 1600 A	60	60	–	12	17.0	14	26	26	–

Single-phase reactors





4EM ≤ 40 A



Mounting holes

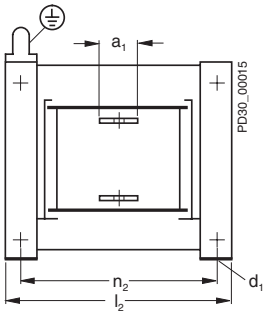
Terminal 8WA9 200
(for I_{dn} = 21 A)

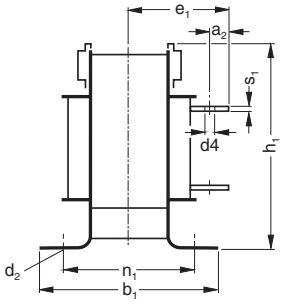
Cross-sections:	Solid:	0.5 mm² to 6 mm²
	Finely stranded:	0.5 mm² to 4 mm²

Terminal RKW110 or TRKSD10
(for I_{dn} = 22 A to 40 A)

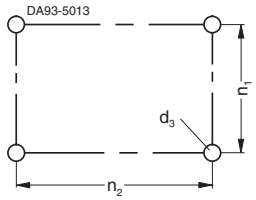
Cross-sections:	Solid:	1 mm² to 16 mm²
	Finely stranded:	1 mm² to 10 mm²

Type	b_1	d_1	d_2	d_3	e_1	h1	l_2	n_1	n_2
Rated direct current I_{dn} ≤ 40 A, with terminal connections, for user-defined arrangement of reactors									
4EM46	51	3.6	7	M3	54	85	61	39	50
4EM47	60	4.8	9	M4	55	89	67	45	55
4EM48	69	4.8	9	M4	57	98	79	53	65
4EM49	85	4.8	9	M4	66	103	85	69	70
4EM50	97	5.8	11	M5	67	111	97	77	80
4EM51	111	5.8	11	M5	74	111	97	91	80
4EM52	115	5.8	11	M5	71	131	121	92	100
4EM53	120	7.0	13	M6	69	151	151	92	125
4EM54	137	7.0	13	M6	78	151	151	109	125
4EM55	157	7.0	13	M6	90	151	151	135.5	125
4EM59	145	7.0	15	M6	84	176	167	118.5	145
4EM60	167	7.0	15	M6	94	176	167	138.5	145
4EM61	110	5.8	11	M5	74	118	106	92	87.5
4EM62	135	5.8	11	M5	81	131	121	112	100





4EM > 40 A

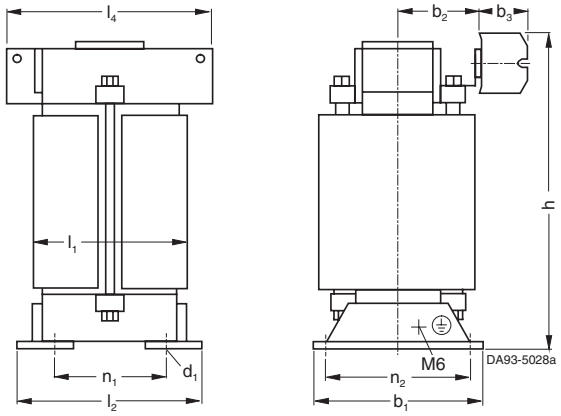


Mounting holes

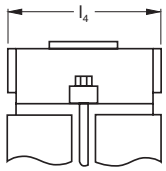
Type	b_1	d_1	d_2	d_3	e_1 (up to 200 A)	e_1 (up to 400 A)	h1	l_2	n_1	n_2
Rated direct current I_{dn} > 40 A with flat terminations, for user-defined arrangement of reactors										
4EM46	51	3.6	7	M3	58	63	59	61	39	50
4EM47	60	4.8	9	M4	61	66	64	67	45	55
4EM48	69	4.8	9	M4	65	70	73	79	53	65
4EM49	85	4.8	9	M4	74	79	78	85	69	70
4EM50	97	5.8	11	M5	78	83	87.5	97	77	80
4EM51	111	5.8	11	M5	85	90	87.5	97	91	80
4EM52	115	5.8	11	M5	87	92	109	121	92	100
4EM53	120	7.0	13	M6	90	95	135	151	92	125
4EM54	137	7.0	13	M6	99	104	135	151	109	125
4EM55	157	7.0	13	M6	115	120	135	151	135.5	125
4EM59	145	7.0	15	M6	108	113	155	167	118.5	145
4EM60	167	7.0	15	M6	120	125	155	167	118.5	145
4EM61	110	5.8	11	M5	87	92	96.5	106	92	87.5
4EM62	135	5.8	11	M5	97	102	109	121	112	100

Rated current up to	a_1	a_2	d_4	s_1
Flat termination				
100 A	16	8	7	2.5
200 A	20	10	9	3.0
400 A	25	12.5	11	5.0

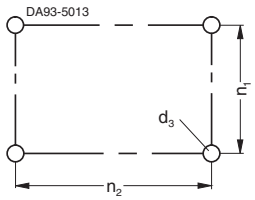
Single-phase reactors



Version **4ET36** to **4ET47**
(shown without terminals)



Version **4ET25** to **4ET30**
(shown without terminals)



Mounting holes

Terminal 8WA1 011-1DG11
(for I_{dn} = 21 A) b_3 = 30 mm

Cross-sections:	Solid:	0.5 mm² to 6 mm²
	Finely stranded:	0.5 mm² to 4 mm²

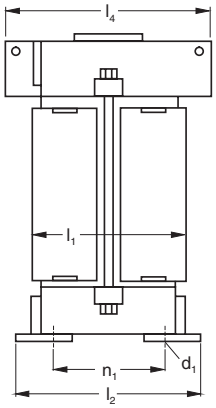
Terminal 8WA1 011-1DH11
(for I_{dn} = 22 A to 27 A) b_3 = 30 mm

Cross-sections:	Solid:	0.75 mm² to 10 mm²
	Finely stranded:	1.5 mm² to 6 mm²

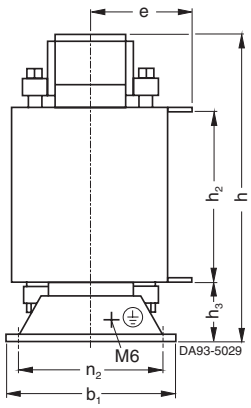
Terminal 8WA1 204
(for I_{dn} = 20 A to 50 A) b_3 = 38 mm

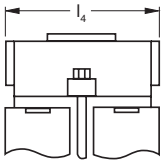
Cross-sections:	Solid:	1.0 mm² to 16 mm²
	Stranded:	10 mm² to 25 mm²
	Finely stranded:	2.5 mm² to 16 mm²

Type	b_1	b_2	d_1	d_2	d_3	h	l_1	l_2	l_4	n_1	n_2	b_3
Rated direct current $I_{dn} \leq$ 50 A, with terminal connections, for arrangement on horizontal surfaces												
4ET25	128	73	7	13	M6	220	140	131	123	94	100	See terminals above
4ET27	146	77	10	18	M8	250	164	148	141	101	112	
4ET30	155	80	10	18	M8	280	180	165	159	118	124	
4ET36	169	85	10	18	M8	335	220	195	241	138	144	
4ET39	174	82	12	18	M10	385	260	227	271	141	176	
4ET43	194	87	15	22	M12	435	290	257	301	155	196	
4ET45	221	101	15	22	M12	435	290	257	301	182	196	
4ET47	251	116	15	22	M12	435	290	257	301	212	196	

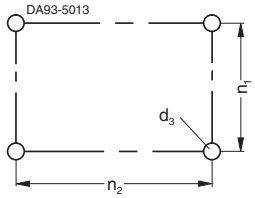


Version **4ET36** to **4ET47**



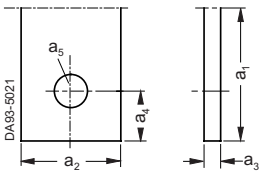


Version **4ET25** to **4ET30**



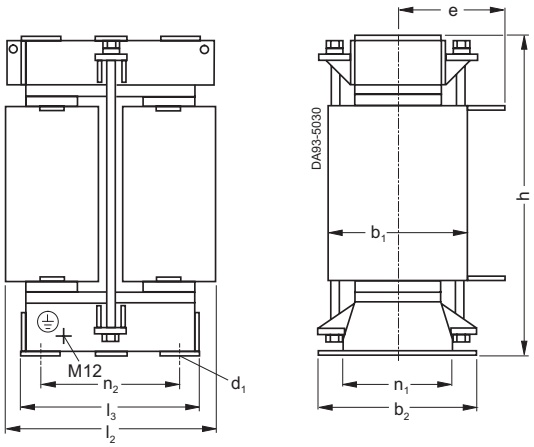
Mounting holes

Type	b_1	d_1	d_2	d_3	h	h2	h3	l_1	l_2	l_4	n_1	n_2	e
Rated direct current I_{dn} > 50 A, for arrangement on horizontal surfaces													
4ET25	128	7	13	M6	220	124	54	140	131	123	94	100	95
4ET27	146	10	18	M8	250	142	60	164	148	141	101	112	102
4ET30	155	10	18	M8	280	160	66	180	165	159	118	124	104
4ET36	169	10	18	M8	335	190	76	220	195	241	138	144	112
4ET39	174	12	18	M10	385	220	86	260	227	271	141	176	114
4ET43	194	15	22	M12	435	250	96	290	257	301	155	196	119
4ET45	221	15	22	M12	435	250	96	290	257	301	182	196	133
4ET47	251	15	22	M12	435	250	96	290	257	301	212	196	148

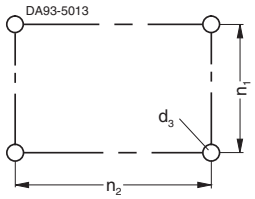


Rated current up to	a_1	a_2	a_3	a_4	a_5
Flat termination					
200 A	35	20	3	10.0	9
400 A	35	25	5	12.5	11
630 A	40	30	6	15.0	11

Single-phase reactors

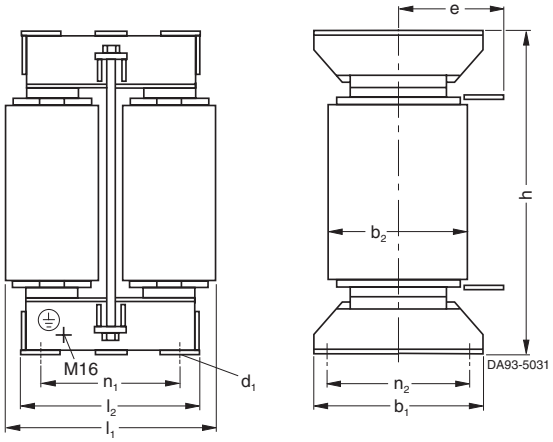


4ET51 to **4ET65**

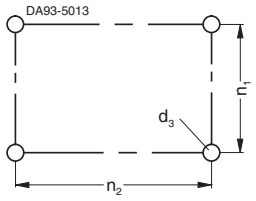


Mounting holes

Type	b_1	b_2	d_1	d_3	h	l_2	l_3	n_1	n_2	e
Rated direct current I_{dn} > 50 A, for arrangement on horizontal surfaces										
4ET51	267	210	13.5	M10	565	340	289	170	225	205
4ET52	280	223	13.5	M10	565	340	289	183	225	210
4ET53	295	238	13.5	M10	565	340	289	198	225	220
4ET54	295	248	16.0	M12	650	390	334	198	260	220
4ET55	310	263	16.0	M12	650	390	334	213	260	230
4ET56	330	283	16.0	M12	650	390	334	233	260	240
4ET58	330	293	16.0	M12	745	480	404	241	320	240
4ET59	350	313	16.0	M12	745	480	404	261	320	250
4ET60	375	338	16.0	M12	745	480	404	286	320	260
4ET62	405	318	22.0	M16	880	610	499	261	395	275
4ET63	430	343	22.0	M16	880	610	499	298	395	290
4ET64	460	373	22.0	M16	880	610	499	323	395	300
4ET65	490	403	22.0	M16	880	610	499	353	395	320

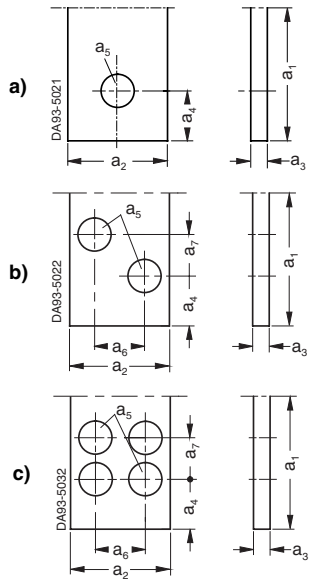


4ET72 to **4ET80**



Mounting holes

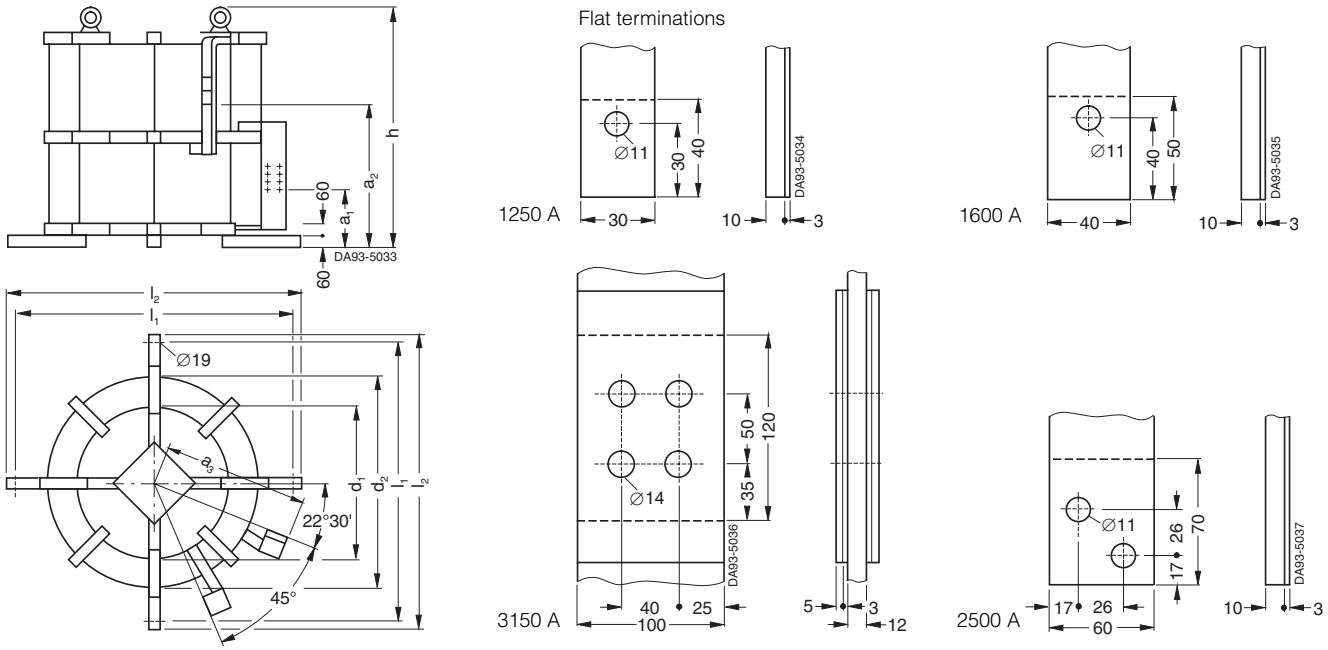
Type	b_1	b_2	d_1	d_3	h	l_1	l_2	n_1	n_2	e
Rated direct current I_{dn} > 50 A, for arrangement on horizontal surfaces										
4ET72	520	550	24	–	965	710	560	420	440	270
4ET74	490	510	28	–	1135	850	670	530	390	270
4ET75	560	580	28	–	1135	850	670	530	460	290
4ET76	640	660	28	–	1135	850	670	530	540	330
4ET78	620	600	34	–	1340	990	790	650	480	290
4ET79	700	680	34	–	1340	990	790	650	560	330
4ET80	800	780	34	–	1340	990	790	650	660	380



Rated current up to	a_1	a_2	a_3	a_4	a_5	a_6	a_7
a) Flat termination							
100 A	25	16	2.5	8.0	7	–	–
200 A	30	20	3.0	10.0	9	–	–
400 A	35	25	5.0	12.5	11	–	–
630 A	40	30	6.0	15.0	11	–	–
800 A	40	30	8.0	15.0	14	–	–
1000 A	50	40	8.0	20.0	14	–	–
b) Flat termination							
1250 A	60	50	8	14	14	22	22
1600 A	70	60	12	17	14	26	26
c) Flat termination							
2500 A	90	80	12	20	14	40	40

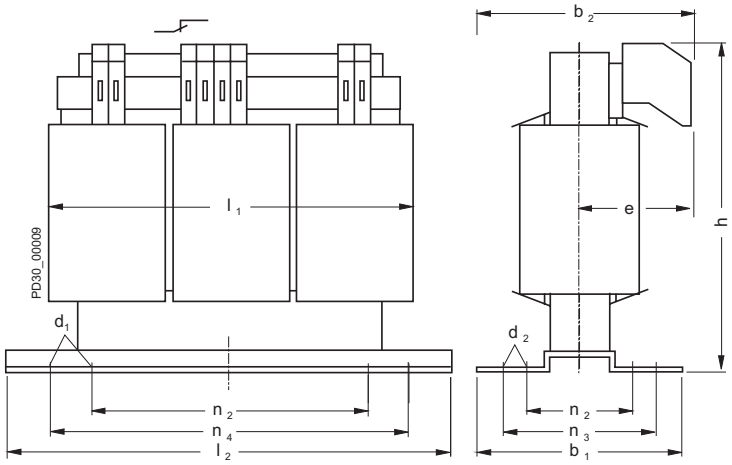
Smoothing air-core reactors

Single-phase reactors



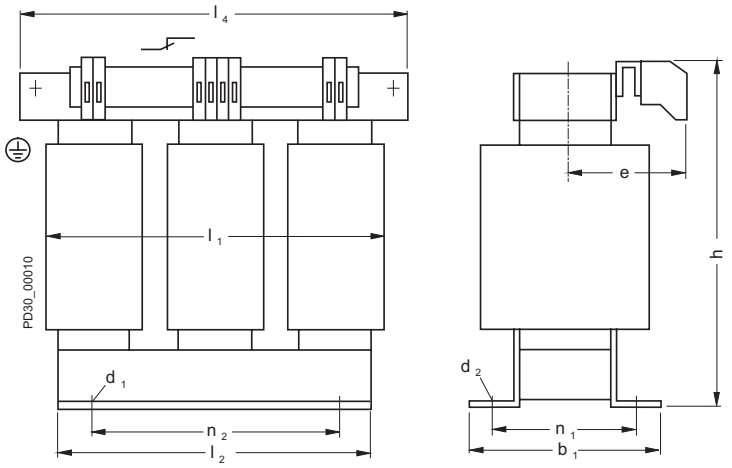
Type	a_1	a_2	a_3	d_1	d_2	h	l_1	l_2
4PK40	Position of connections as agreed		593	500	846	1150	1100	1200
4PK60	with the customer		743	800	1146	1150	1400	1500

Ironless zone	Distance between two reactors
axial ≥ 500 radial ≥ 300	axial ≥ 500 radial ≥ 500



I_{eff} < 15 A: Terminal 4 mm^2
15 A < I_{eff} < 48 A: Terminal 10 mm^2

Type	b_1	b_2	d_1	d_2	d_3	e_{max}	h_{max}	$l_{1\ max.}$	l_2	n_1	n_2	n_3	n_4
4EP37	73	97	5.8	11	M5	60	159	150	178	49	113	53	166
4EP38	88	111	5.8	11	M5	67	159	150	178	64	113	68	166
4EP39	99	112	7.0	13	M6	62	181	182	219	56	136	69	201
4EP40	119	132	7.0	13	M6	72	181	182	219	76	136	89	201
4EP43	107	120	7.0	13	M6	66	221	228	267	70	176	77	249
4EP44	131	145	7.0	13	M6	79	221	228	267	94	176	101	249

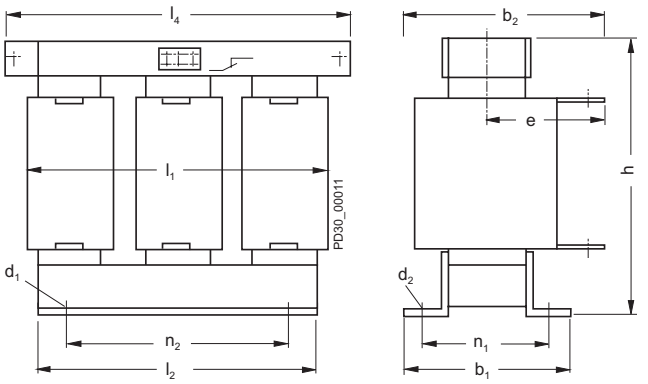


Version with terminal 10 mm^2

Type	b_1	b_2	d_1	d_2	d_3	e_{max}	h_{max}	$l_{1\ max.}$	l_2	l_4	n_1	n_2
4EU27	162	189	10	18	M8	108	291	264	220	270	101	200

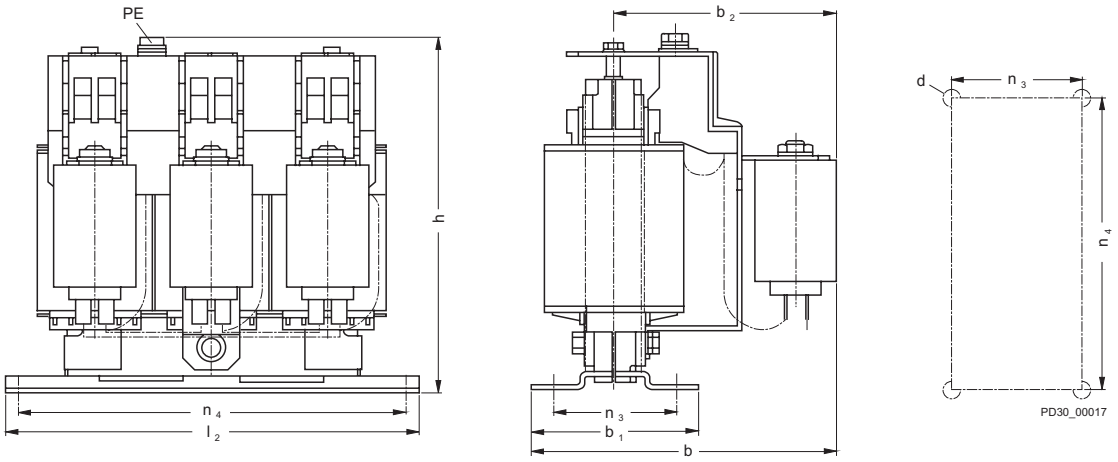
Filter reactors

Three-phase reactors

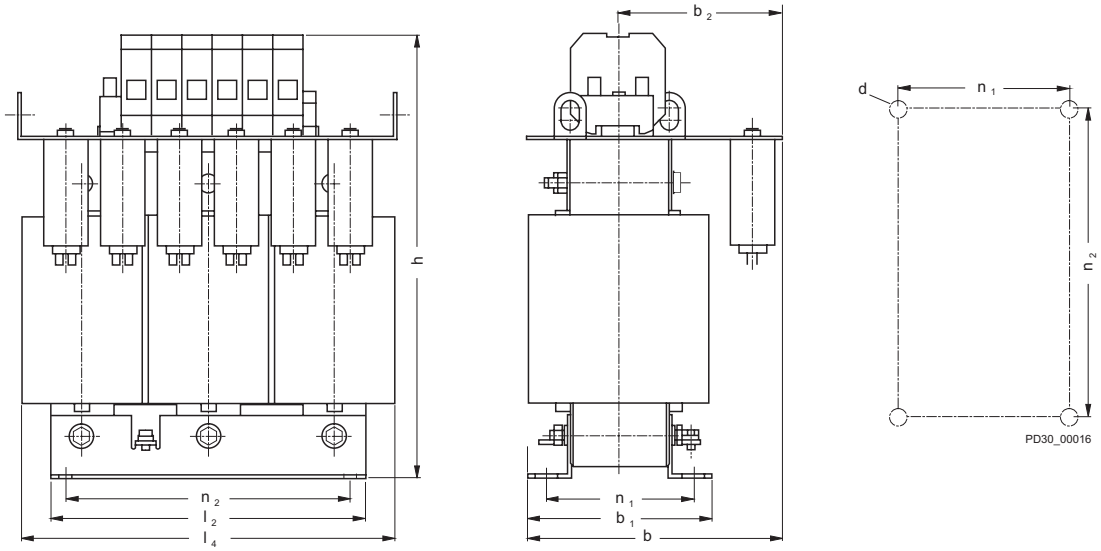


Version with flat termination

Type	b_1	b_2	d_1	d_2	d_3	e	h	l_1	l_2	l_4	n_1	n_2
4EU25	115	164	7	12	M6	103	210	225	190	-	94	176
4EU27	133	178	10	18	M8	121	248	260	220	270	101	200
4EU30	148	188	10	18	M8	137	269	295	250	300	118	224
4EU36	169	202	10	18	M8	142	321	357	300	350	138	264
4EU39	174	258	12	18	M10	171	385	405	350	410	141	316



4EF11 (for drives from 1.5 kW to 7.5 kW)



4EF11 (for drives from 11 kW to 75.0 kW)

Drawing example, solution with 3 capacitors possible whereas outline dimensions does not change

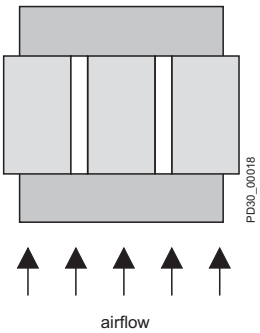
For drives with	b_{max}	b_1	$b_{2\,max}$	d	h_{max}	l_2	n_3	n_4	Ground
Sinewave filter 4EF11 for drives from 1.5 kW to 7.5 kW drive output, for vertical mounting									
1.5 kW/2.2 kW	133	73	98	M5	157	178	53	166	M6
4.0 kW	148	88	105	M5	157	178	68	166	M6
7.5 kW	175	119	112	M6	182	219	89	201	M6

For drives with	b_{max}	b_1	b_2	d	h_{max}	l_2	$l_{4\,max}$	n_1	n_2	Ground
Sinewave filter 4EF11 for drives from 11.0 kW to 75.0 kW drive output, for vertical mounting										
11.0 kW	145	91	100	M6	253	189	225	70	176	M6
18.5 kW	169	115	112	M6	253	189	225	94	176	M6
22.0 kW	168	118	112	M8	300	220	260	86	200	M6
30.0 kW	183	133	120	M8	300	220	260	101	200	M6
45.0 kW	208	148	134	M8	362	249	295	118	224	M6
75.0 kW	224	168	136	M8	418	299	357	138	264	M8

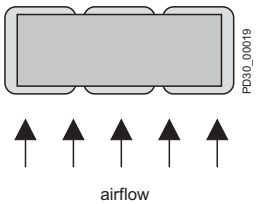
Sinewave filter

Three-phase filters

Arrangement:



Permissible arrangement of sinewave filter reactor-core, vertikal



Permissible arrangement of sinewave filter reactor-core, horizontal

Annex

16

16/2	**Ordering notes**
PD 60[1)]	**Standards and approvals**
16/4	**Siemens contacts**
16/5	**Online services**
16/6	**Customer support**
16/7	**Index**
16/8	**Order number index**
16/11	**Fax form – suggestions for improving the catalogue**
16/12	**Conditions of sale and delivery, Export regulations**

[1)] See catalogue PD 60 "Technische Informationen"

Ordering notes

Logistics

General

Our logistics service ensures "quality from the time of ordering to delivery" regarding delivery service, communications and environmental protection. We concentrate on optimizing logistics processes by designing our infrastructure to customer requirements and implementing electronic order processing.

Personal consulting, on-time delivery and limiting transport times to 1 day - within Germany - are essential to us.

For this reason, we supply the preferred types marked with ▶ from stock.

The DIN-ISO-9001 approval and subsequent quality check are indispensable prerequisites for us.

Electronic order processing is fast, cost-efficient and error-free. Please contact us if you want to benefit from these advantages.

Packing, packing units

The packaging in which our equipment is dispatched provides protection against dust and mechanical damage during transport thus ensuring that you receive our products in a perfect state.
We select our packaging for maximum environmental compatibility and reusability (e.g. crumpled paper instead of polystyrene chips for protection during transport in packages up to 32 kg) and, in particular, with a view to reducing waste.

With our multi-unit packaging, we offer you specific types of packaging that are both kind to the environment and tailored to your requirements:

Your advantages at a glance:

- Lower ordering overhead
- Cost savings through uniform-type packaging: low/no disposal costs.
- Less time and personnel required thanks to short unpacking times.
- Delivery on time and direct to the production line reduces your inventories: Cost savings through reduction of storage area.
- Fast assembly thanks to supply in sets.
- Standardized Euro standard boxes corresponding to modules of the Euro range are suitable for most conveyor systems.
- Active contribution to environmental protection.

Where nothing is stated to the contrary in the selection and ordering data of this catalog, our products are supplied individually packed.

For small parts/accessories, we offer you economical packing units as standard packs containing more than one item, e.g. 5, 10, 50 or 100 units. It is essential that whole number multiples of these quantities be ordered to ensure satisfactory quality of the products and problem-free order processing.

The products are delivered in a neutral, white carton. The label includes warning notices, the CE mark, the open arrow recycling symbol, and product description information in English and German. In addition to the Order No. (MLFB) and the number of items in the packing, the Instr. Order No. is also specified for the operating instructions that you can order from your local Siemens branch. (For Siemens contact, see http://www.siemens.de/automation/partner).

The device order nos. of most devices can also be acquired via the EAN barcode to simplify ordering and storage logistics. The assignment of order nos. to EAN codes is stored electronically in the master data of Low-voltage Controlgear, Switchgear and Systems

Multi-unit and reusable packs

Set deliveries (reusable, different devices)

On request, we also deliver order-related packs of larger quantities of different unpacked devices in Euro standard boxes.

For terms of delivery, for set deliveries or other types of delivery, such as container delivery/return delivery in Euro standard boxes/multi-unit transport containers, please contact your local Siemens branch (please visit our Web site at http://www.siemens.de/automation/partner). To find out the location of your nearest contact). They will work out an agreement that best suits your individual requirements.

Ag and Cu surcharges

Surcharges for copper (Cu) and silver (Ag) will be added to the product prices; these surcharges will take the form of percentages of the list prices. Calculation of the surcharges will be governed by the official Ag quotation for refined silver and by the Cu-DEL quotation applying on the date of receipt of order or of call-off.

The prices for products of catalogue LV 10, Chapters 12 and 13 and LV6X include the price of copper calculated on the basis of a list price of € 150/100 kg.If the copper rate exceeds this price, a surcharge will be made on the basis of the current copper price in the month preceding the date of invoice.

Orders for special designs

For ordering products that differ from the versions listed in the catalog, the order number specified in the catalog must be supplemented with **"–Z"**; the required features must be specified by means of the alphanumeric order codes or in plain text.

Small orders

When small orders are placed, the costs associated with order processing are greater than the order value. We recommend therefore that you combine several small orders. Where this is not possible, we unfortunately find it necessary to charge a processing supplement of € 20.-- to cover our costs for order processing and invoicing for all orders with a net goods value of less than € 250.--.

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,
- Sales or
- Consultation/engineering.

You start by selecting a

- Country,
- Product or
- Sector.

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

A&D on the WWW

A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

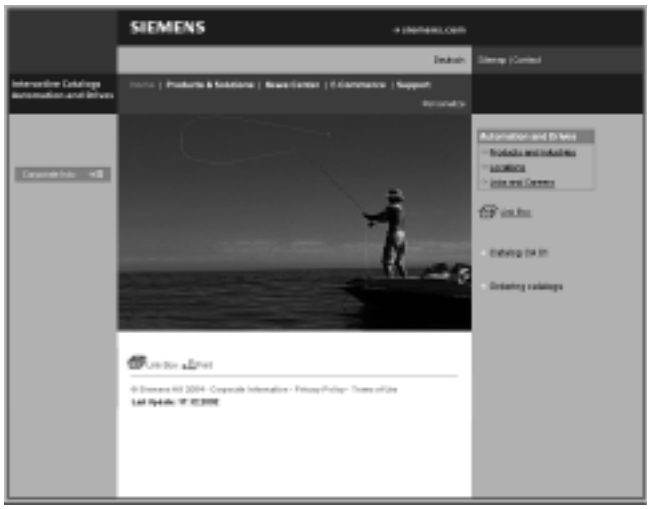
The Siemens Automation and Drives (A&D) Group has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

At 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 catalogs



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

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalogs can be found on the Internet under

http://www.siemens.com/automation/ca01

or on CD-ROM or DVD.

Easy Shopping with the A&D Mall

The A&D Mall is the virtual department store of Siemens AG on the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availablilty. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the A&D Mall on the Internet under:

http://www.siemens.de/automation/mall

and

http://www.siemens.de/sidac

Customer Support

In the face of harsh competition you need optimum conditions to keep ahead all the time.
A strong starting position, a sophisticated strategy and team for the necessary support - in every phase.
Service & Support from Siemens provides this support; with a complete range of different services for automation and drives.

In every phase: from planning and startup to maintenance and upgrading.

Our specialists know when and where to act to keep the productivity and cost-effectiveness of your system running in top form.

Online Support

The comprehensive information system available round the clock via Internet ranging from Product Support and Service & Support services to Support Tools in the shop.
http://www.siemens.com/automation/service&support

Technical Consulting

Support in the planning and designing of your project from detailed actual-state analysis, target definition and consulting on product and system questions right up to the creation of the automation solution. [2])

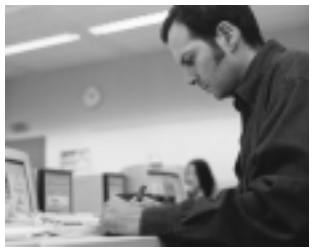
Technical Assistance

Expert technical assistance[1]) for low-voltage controlgear, switchgear and systems and electrical installation.

Tel.: +49 (9 11) 8 95-59 00
Fax: +49 (9 11) 8 95-59 07

E-Mail: technical-assistance @siemens.com

Configuring and Software Engineering



Support in configuring and developing with customer-oriented services from actual configuration to implementation of the automation project. [2])

Technical Support

Competent consulting in technical questions covering a wide range of customer-oriented services for all our products and systems.

Tel.: +49 (180) 50 50 222
Fax: +49 (180) 50 50 223
E-Mail:
adsupport@siemens.com

Service On Site

With Service On Site we offer services for startup and maintenance, essential for ensuring system availability.
In Germany
Tel.: +49 (180) 50 50 444 [2])

Repairs and Spare Parts

In the operating phase of a machine or automation system we provide a comprehensive repair and spare parts service ensuring the highest degree of operating safety and reliablity.
In Germany
Tel.: +49 (180) 50 50 448 [2])

Optimization and Upgrading

To enhance productivity and save costs in your project we offer high-quality services in optimization and upgrading.[2])

1) Contact:
Technical assistance for product selection · old/new code coding · competitor code conversion· special variants · special requirements · sales promotion (info line).
Your regional contacts for sales support (prices, discounts, delivery times).
Technical support for commissioning support and after-sales service.

2) For country-specific telephone numbers go to our Internet site
http://www.siemens.com/automation/service&support

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4EM4604-1CB	4EM4604-1CB00
4EM4605-4CB	4EM4605-4CB00
4EM4605-5CB	4EM4605-5CB00
4EM4605-6CB	4EM4605-6CB00
4EM4605-7CB	4EM4605-7CB00
4EM4605-8CB	4EM4605-8CB00
4EM4606-0CB	4EM4606-0CB00
4EM4700-0CB	4EM4700-0CB00
4EM4700-5CB	4EM4700-5CB00
4EM4700-8CB	4EM4700-8CB00
4EM4704-1CB	4EM4704-1CB00
4EM4704-2CB	4EM4704-2CB00
4EM4704-3CB	4EM4704-3CB00
4EM4800-3CB	4EM4800-3CB00
4EM4800-8CB	4EM4800-8CB00
4EM4801-8CB	4EM4801-8CB00
4EM4804-6CB	4EM4804-6CB00
4EM4805-1CB	4EM4805-1CB00
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4EM4900-5CB	4EM4900-5CB00
4EM4903-2CB	4EM4903-2CB00
4EM4905-3CB	4EM4905-3CB00
4EM4905-4CB	4EM4905-4CB00
4EM4905-5CB	4EM4905-5CB00
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4EM5001-1CB	4EM5001-1CB00
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4EM5004-3CB	4EM5004-3CB00
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4EM5005-6CB	4EM5005-6CB00
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4EM5104-4CB	4EM5104-4CB00
4EM5104-5CB	4EM5104-5CB00
4EM5104-6CB	4EM5104-6CB00
4EM5107-7CB	4EM5107-7CB00
4EM5107-8CB	4EM5107-8CB00
4EM5111-1CB	4EM5111-1CB00
4EM5200-1CB	4EM5200-1CB00
4EM5212-8CB	4EM5212-8CB00
4EM5308-1CB	4EM5308-1CB00
4EM5308-2CB	4EM5308-2CB00
4EM5308-3CB	4EM5308-3CB00
4EM5308-4CB	4EM5308-4CB00
4EM5316-6CB	4EM5316-6CB00
4EM6100-2CB	4EM6100-2CB00
4EM6100-3CB	4EM6100-3CB00
4EM6100-4CB	4EM6100-4CB00

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4EM6200-3CB	4EM6200-3CB00
4EP3200-1US	4EP3200-1US00
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4EP3200-5US	4EP3200-5US00
4EP3300-0US	4EP3300-0US00
4EP3400-1US	4EP3400-1US00
4EP3400-2US	4EP3400-2US00
4EP3400-3US	4EP3400-3US00
4EP3500-0US	4EP3500-0US00
4EP3600-2DS	4EP3600-2DS00
4EP3600-2US	4EP3600-2US00
4EP3600-3DS	4EP3600-3DS00
4EP3600-3US	4EP3600-3US00
4EP3600-4DS	4EP3600-4DS00
4EP3600-4US	4EP3600-4US00
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4EP3600-6DS	4EP3600-6DS00
4EP3600-7DS	4EP3600-7DS00
4EP3600-8DS	4EP3600-8DS00
4EP3600-8US	4EP3600-8US00
4EP3601-0DS	4EP3601-0DS00
4EP3601-0US	4EP3601-0US00
4EP3601-2DS	4EP3601-2DS00
4EP3601-3DS	4EP3601-3DS00
4EP3601-4DS	4EP3601-4DS00
4EP3601-5DS	4EP3601-5DS00
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4EP3602-0DS	4EP3602-0DS00
4EP3700-0DS	4EP3700-0DS00
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4EP3700-1US	4EP3700-1US00
4EP3700-2US	4EP3700-2US00
4EP3700-4DS	4EP3700-4DS00
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4EP3700-6US	4EP3700-6US00
4EP3700-7DS	4EP3700-7DS00
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4EP3800-3DS	4EP3800-3DS00
4EP3800-4DS	4EP3800-4DS00
4EP3800-7MS	4EP3800-7MS00
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4EP3801-1DS	4EP3801-1DS00
4EP3801-1MS	4EP3801-1MS00
4EP3801-1US	4EP3801-1US00
4EP3801-2DS	4EP3801-2DS00
4EP3801-2US	4EP3801-2US00
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4EP3801-6DS	4EP3801-6DS00
4EP3801-7DS	4EP3801-7DS00
4EP3801-8DS	4EP3801-8DS00
4EP3802-0DS	4EP3802-0DS00
4EP3883-2DS	4EP3883-2DS00
4EP3900-0DS	4EP3900-0DS00
4EP3900-1DS	4EP3900-1DS00
4EP3900-1US	4EP3900-1US00
4EP3900-2DS	4EP3900-2DS00
4EP3900-2US	4EP3900-2US00
4EP3900-3DS	4EP3900-3DS00
4EP3900-5MS	4EP3900-5MS00
4EP3900-5US	4EP3900-5US00
4EP3900-6MS	4EP3900-6MS00
4EP3900-7MS	4EP3900-7MS00
4EP3901-0DS	4EP3901-0DS00
4EP3901-2DS	4EP3901-2DS00
4EP3901-3DS	4EP3901-3DS00
4EP3901-4DS	4EP3901-4DS00
4EP3901-5DS	4EP3901-5DS00
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4EP4001-2US	4EP4001-2US00
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1) Order No. old: according to VDE 0550
Order No. new: according to EN 61558

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Order number key conversion table[1])

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1) Order No. old: according to VDE 0550
Order No. new: according to EN 61558

Fax form – suggestions for improving the catalogue

To

Siemens AG
A&D CD Marketing Management
Catalogue management

Fax. +49 (9 11) 8 95-21 06

Your address

Name

Function

Company/department

Street/No.

Postcode/City

Tel. no./Fax

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We welcome your help and would be grateful if you could answer these questions and fax them to us.

Thank you!

Please give us your personal assessment of the following points with values from 1 (= good) to 6 (= bad):

- ☐ Does the catalogue meet your requirements?
- ☐ Was it easy to find the required information?
- ☐ Is the text easy to understand?
- ☐ Do the technical details meet your requirements?
- ☐ How do you rate the quality of the pictures, graphics and tables?
- ☐ Can you do without dimensioned drawings in the catalogue if we make them available in a separate document, on CD-ROM and/or on the Internet?
- ☐ How do you rate the appearance of the catalogue?

Which catalogue best meets your requirements:

- ☐ A compressed overall catalogue with our core range (select types)?
- ☐ Comprehensive individual catalogs with all product versions?

Did you find any errors?

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The sales tax (value added tax) is not included in the prices. It shall be debited separately at the respective rate according to the applicable legal regulations.

In addition to the prices of products which include silver and/or copper, surcharges may be calculated if the respective limits of the notes are exceeded.

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.

Insofar as there are no remarks on the corresponding pages, - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

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

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

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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/En 14.11.03

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

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