Configuration Manual 11/2005 Edition

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SIEMENS

SIMOVERT MASTERDRIVES VC/MC
Induction Motors 1PL6

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Induction Motors 1PL6 MASTERDRIVES

Configuration Manual

(APL6M), 11.2005 Edition
6SN1197-0AC67-0BP1

Safety Guidelines

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ **Danger**

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **Warning**

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **Caution**

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

Caution

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

Notice

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

⚠ **Warning**

This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

All names identified by ® are registered trademarks of the Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Automation and Drives
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GERMANY

Order No.: 6SN1197-0AC67-0BP1
11/2005 Edition

Foreword

Information on the documentation

This document is part of the Technical Customer Documentation which has been developed for SIMOVERT MASTERDRIVES VC (Vector Control) and SIMOVERT MASTERDRIVES MC (Motion Control) drive converter systems. All of the documents are available individually. The documentation list, which includes all Advertising Brochures, Catalogs, Overviews, Short Descriptions, Operating Instructions and Technical Descriptions with Order No., ordering address and price can be obtained from your local Siemens office.

This document does not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

We would also like to point-out that the contents of this document are neither part of nor modify any prior or existing agreement, commitment or contractual relationship. The sales contract contains the entire obligations of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein neither create new warranties nor modify the existing warranty.

Structure of the documentation for 1PH and 1PL motors

Table 1 Configuration Manual, individual documents

Title	Order No. (MLFB)	Language
Induction Motors, General Section	6SN1197–0AC62–0AP0	German
Induction Motors, 1PH2 Motor Section for SIMODRIVE	6SN1197–0AC63–0AP0	German
Induction Motors, 1PH4 Motor Section for SIMODRIVE	6SN1197–0AC64–0AP0	German
Induction Motors, 1PH7 Motor Section for SIMODRIVE	6SN1197–0AC65–0AP1	German
Induction Motors, 1PH7 Motor Section for SIMOVERT MASTERDRIVES VC/MC	6SN1197–0AC66–0AP0	German
Induction Motors, 1PL6 Motor Section for SIMOVERT MASTERDRIVES VC/MC	6SN1197–0AC67–0AP0	German
Induction Motors, 1PH7 Motor Section for SINAMICS, production machines	6SN1197–0AC71–0AP0	German
Induction Motors, 1PH7 Motor Section for SINAMICS, machine tools (processing machines)	6SN1197–0AC72–0AP0	German

Technical Support

If you have any questions, please contact the following Hotline:

Phone:	+49 (0) 180 5050–222
Fax:	+49 (0) 180 5050–223
Internet:	http://www.siemens.com/automation/support-request

Please send any questions about the documentation (e.g. suggestions for improvement, corrections) to the following fax number or email address:

Fax:	+49 (0) 9131 98–63315
Fax form:	Refer to the correction sheet at the end of the document
E-mail:	mailto:motioncontrol.docu@siemens.com

Information on the products

Up-to-date information about our products can be found on the Internet at the following address:

http://www.siemens.com/motioncontrol

Engineering software

The PFAD Plus engineering software provides user-friendly engineering support.

Using this program, SIMOVERT MASTERDRIVES Vector Control and Motion Control drive converters can be simply and quickly engineered.

PFAD Plus is a powerful engineering tool that supports the user in all of the engineering steps - from the supply to the motor.

Order No. for the full version of PFAD Plus: 6SW1710-0JA00-2FC0.

Note

Not for CAT client systems! You can obtain the CAT client version of PFAD Plus from your system administrator.

Danger and warning information

Danger

Commissioning shall not start until it has been absolutely ensured that the machine in which the components described here are to be installed complies with Directive 98/37/EC.

Only appropriately qualified personnel may commission SIMOVERT MASTERDRIVES units and induction motors.

This personnel must carefully observe the technical customer documentation associated with this product and be knowledgeable about and carefully observe the danger and warning information.

Operational electrical equipment and motors have parts and components which are at hazardous voltage levels.

Dangerous mechanical movement may occur in the system during operation.

All work on the electrical system may only be carried-out when the system has been disconnected from the power supply and locked-out so that it cannot be accidently restarted.

SIMOVERT MASTERDRIVES drive units have been designed for operation on low-ohmic grounded line supplies (TN line supplies). For additional information, refer to the appropriate documentation of the drive converter systems.

Warning

The successful and safe operation of this equipment and motors depends on correct transport, proper storage and installation, as well as careful operation and maintenance.

The specifications in the Catalogs and quotations also apply to special variants of the devices and motors.

In addition to the danger and warning information/instructions in the technical customer documentation supplied, the applicable domestic, local and plant-specific regulations and requirements must be carefully taken into account.

Caution

The motors can have surface temperatures of over +100 °C.

For this reason, temperature-sensitive parts (cables or electronic components, for example) may not be placed on or attached to the motor.

When connecting-up cables, please observe that they
– are not damaged
– are not subject to tensile stress
– cannot be touched by rotating components.

Caution

Motors should be connected-up according to the circuit diagram provided. They must not be connected directly to the three-phase supply because this will damage them.

SIMOVERT MASTERDRIVES drive units with induction motors are subject, as part of the routine test, to a voltage test in accordance with EN 50178. While the electrical equipment of industrial machines is being subject to a voltage test in accordance with EN60204-1, Section 19.4, all SIMOVERT MASTERDRIVES drive unit connections must be disconnected/ withdrawn in order to avoid damaging the SIMOVERT MASTERDRIVES drive units.

Note

SIMOVERT MASTERDRIVES units with induction motors fulfill, when operational and in dry operating rooms, the Low-Voltage Directive 73/23/EEC.

SIMOVERT MASTERDRIVES units with induction motors fulfill, in the configuration specified in the associated EC Declaration of Conformity, the EMC Directive 89/336/EEC.

ESDS instructions

Caution

Electro**S**tatic **D**ischarge **S**ensitive Devices (ESDS) are individual components, integrated circuits, or modules that can be damaged by electrostatic fields or discharges.

ESDS regulations for handling boards and equipment:

When handling components that can be destroyed by electrostatic discharge, it must be ensured that personnel, the workstation and packaging are well grounded!

Personnel in ESDS zones with conductive floors may only touch electronic components if they are
– grounded through an ESDS bracelet and
– wearing ESDS shoes or ESDS shoe grounding strips.

Electronic boards may only be touched when absolutely necessary.

Electronic boards may not be brought into contact with plastics and articles of clothing manufactured from man-made fibers.

Electronic boards may only be placed on conductive surfaces (table with ESDS surface, conductive ESDS foam rubber, ESDS packing bag, ESDS transport containers).

Electronic boards may not be brought close to data terminals, monitors or television sets. Minimum clearance to screens > 10 cm.

Measurements may only be carried-out on electronic boards and modules if
– the measuring instrument is grounded (e.g. via a protective conductor) or
– before making measurements with a potential-free measuring device, the measuring head is briefly discharged (e.g. by touching an unpainted blank piece of metal on the control cabinet).

Functional requirements

The appropriate standards, regulations are directly assigned to the functional requirements.

Table of Contents

Motor Description

1

1.1 Characteristics

Overview

1PL6 motors are compact, force-ventilated and also enclosed-ventilated squirrel-cage asynchronous motors with degree of protection IP23. The motors are ventilated, as standard, using a mounted separately-driven fan unit.

The motor can be ordered either with the air flow from the motor drive shaft end (DE) to the motor non-drive shaft end (NDE) - or vice versa.

The motors were specifically developed for operation with SIMOVERT MASTERDRIVES Vector Control and Motion Control drive systems. Depending on the control requirements, the appropriate encoder systems are available for the motors. These encoders are used to sense the motor speed and indirect position.

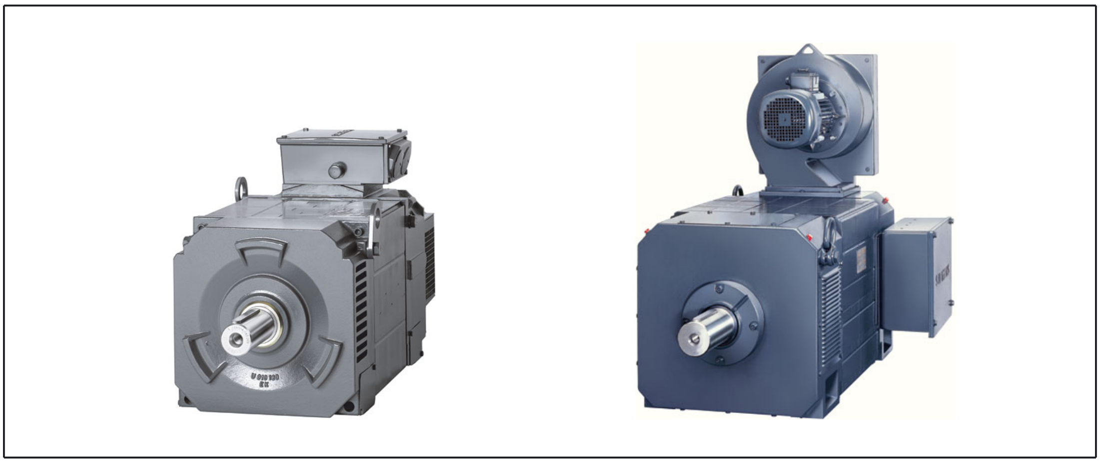

Figure 1-1 1PL6 motors

The motors comply with DIN standards and have degree of protection IP23 in accordance with EN 60034-5 (or IEC 60034-5). With this degree of protection, the motors are not suitable for operation in aggressive atmospheres or for installation outdoors.

DIN EN 60721-3-4 or IEC 721-3-4 Standards can be applied to classify ambient conditions for aggressive environments or mounting outdoors. The environmental effects and their limit values are defined in various Classes in this standard.

Generally, 1PL6 motors can be defined for environmental effects with Quality Class IE41; whereby the following effects must be especially taken into account::

- 4K2 (climatic ambient conditions)
- 4C2 (chemically active substances/materials)
- 4S2 (mechanically active substances/materials)

Benefits

- Extremely high power density with compact dimensions (50 to 60% higher output as compared to 1PH7 in degree of protection IP55)
- Speeds to zero without reduction of the torque
- Robustness
- Essentially maintenance-free
- High cantilever force loading
- High smooth running characteristics, even at the lowest speeds
- Integrated encoder system to sense the motor speed, connected using a connector
- Terminal box for power line connection
- Motor temperature monitoring with KTY 84
- Variable cooling versions
- Basic external cooling using a pipe connection
- Optional bearing designs with re-lubrication device and insulated bearings (NDE)

Applications

Mounted in dry indoor areas (no aggressive atmosphere).

Crane systems:

- Hoisting gears and closing gears for cranes

Printing industry:

- Main drives for printing machines

Manufacture of rubber, plastic and wire:

- Drives for extruders, calenders, rubber injection machines, foil machines, assembly units, fleece plants
- Wire-drawing machines, cable stranding machines, etc.

General applications such as coiler and winder drives.

1.2 Technical features

Table 1-1 Design features

Technical features	Version	
Type of motor	Induction motor	
Type of construction (acc. to EN 60034–7; IEC 60034–7)	IM B3, refer to Options and Chapter "Permissible combinations of mechanical designs"	
Degree of protection (acc. to EN 60034–5; IEC 60034–5)	IP23	
Vibration severity grade (acc. to EN 60034–14, IEC 60034–14)	Shaft heights 180 and 225:	R; refer to options
	SH 280:	N; refer to Chapter "Permissible combinations of mechanical versions" and "Selection and ordering data"
Shaft and flange accuracy, concentricity and axial eccentricity (acc. to DIN 42955, IEC 60072–1)	Tolerance stage N; refer to "Selection and ordering data"	
Shaft end (acc. to DIN 748–3; IEC 60072–1)	with key, half key balancing; refer to options, Chapter "Permissible combinations of mechanical versions" and "Selection and ordering data"	
Cooling (acc. to EN 60034–6; IEC 60034–6)	Shaft heights 180 and 225:	Forced-ventilation and open-circuit cooling axial fan on the NDE, air flow direction from NDE to DE
	SH 225 and SH 280:	Forced ventilation, the fan is radially mounted at the NDE, air flow direction from NDE to DE
	refer to the options, Chapter "Permissible combinations of mechanical versions" and "Selection and ordering data"	
Winding insulation (acc. to EN 60034-1, IEC 60034–1)	Temperature class F for a coolant temperature up to 40 °C	
Thermal motor protection (acc. to EN 60034-11, IEC 60034–11)	KTY 84 temperature sensor in the stator winding for SH 280: Additional KTY 84 as reserve	
Motor voltage	SH 180 to 280:	3-ph. 400 V AC 3-ph. 480 V AC
	SH 280:	refer to options and Chapter "Selection and ordering data"
Motor noise (acc. to DIN 45635, Part 10) Tolerance + 3 dB Air flow direction from NDE to DE	SH 180:	73 dB(A) to n = 2000 RPM
	SH 225:	74 dB(A) to n = 2000 RPM
	SH 280:	74 dB(A) to n= 2000 RPM
Vibration stressing (acc. to IEC 68-2-6)	3 g axial and 6 g radial (higher vibration resistance on request)	
Connection type	Motors and fans:	via terminal box
	Encoders:	via connector (mating connector is not included in the scope of supply)
Terminal box arrangement	SH 180 and 225:	top-mounted, cable entry from the right
	SH 225:	righthand side (NDE), cable entry DE, encoder connector at the top
	SH 280:	righthand side (NDE), cable entry below, encoder connector at the DE
	refer to the options, Chapter "Permissible combinations of mechanical versions" and "Selection and ordering data"	

Technical features	Version
Speed encoder	Refer to options and Chapter "Selection and ordering data"
Balancing (acc. to IEC 60034-14)	Standard: Half-key balancing (dynamic), Code: H on the shaft face
Bearing version DE (Standard)	For coupling out-drive: Deep-groove ball bearings For belt out-drive or increased cantilever forces: Cylindrical roller bearings
Bearing design, non-drive end	Locating bearing: Deep-groove ball bearings Option, insulated design, refer to the following table
Installation height above sea level (acc. to EN 60034-1, IEC 60034-1)	≦ 1000 m above sea level, otherwise power de-rating (refer to Chapter "Cooling")
Paint finish	with primer, refer to options, Chapter "Permissible combinations of mechanical versions" and "Selection and ordering data"
Documentation supplied with the motors	Operating Instructions

Options

Table 1-2 Options

Order code	Option description	For use with 1PL6 induction motors in the appropriate version		
		SH 180 SH 225 Axial cooling	SH 225 Radial ventilation	SH 280
R1Y	Normal paint finish in another color, RAL ...(plain text description required)	■	■	■
R2Y	Special paint finish in another color, RAL ...(plain text description required)	■	■	■
C30	Winding version 690 V	_	_	■
G14	Fan unit with air filter	○	■	■
G 00	Separately-driven fan, radial NDE left	_	■	s. Tab. 1-4
G 02	Separately-driven fan, radial NDE right	_	■	s. Tab. 1-4
G 04	Separately-driven fan, radial NDE top	_	■	s. Tab. 1-4
G80	POG10 pulse encoder, mounting prepared	_	■	■
K08	Encoder connector mounted opposite	_	■	■
K09	Terminal box arrangement, NDE right	_	■	s. Tab. 1-4
K10	Terminal box arrangement, NDE left	_	■	s. Tab. 1-4
K 11	Terminal box arrangement, NDE top	_	■	s. Tab. 1-4
K16	Second standard shaft end (only possible without encoder)	_	○	■
K31	2. Rating plate supplied separately in terminal box	■	■	■
K40	Re-lubrication devices, DE and NDE	■	■	Standard
K45	230 V anti-condensation heating	_	○	■
K55	Cable entry plate, terminal box, customer-specific (plain text is required)	■	■	■
K83	The terminal box is rotated through +90 degrees (basis is the standard)	–	■	■
K84	The terminal box is rotated through –90 degrees (basis is the standard)	–	■	■
K85	The terminal box is rotated through +180 degrees (basis is the standard)	–	■	■
L27	NDE bearing, insulated version	■	■	Standard
M83	Additional thread for a setting screw at the motor feet	_	_	■
Y55	Non-standard shaft end DE	○	○	○
Y80	Different rating plate data (plain text is required)	○	○	○
Y82	Supplementary plate with the orderer's data	○	○	○

■	Option possible
○	On request
–	Not available

1.3 Permissible combinations of mechanical versions for SH 225, radial cooling

Table 1-3 Matrix for options and assignments for SH 225

Order No. [MLFB]													Possibilities of assigning the Order No. [MLFB]													
1PL6 224 1PL6 226 1PL6 228	-	8	9	10	11	12	-	13	14	15	16		-	Z	Separately-drive fan, radial			Z	Terminal box arrangement			Z	Cable entries			
Frame size (technical data) s. Catalog DA 65.3´2004		Separately-driven fan, Version s. Catalog DA 65.3´2004	Encoders s. Catalog DA 65.3´2004	Winding version (technical data) s. Catalog DA 65.3´2004	(radial cooling) Cable entry direction for K09: Power DE, encoder connector top (s. dimension drawing) Cable entry direction for K10: Power DE, encoder connector top Cable entry direction for K11: Power right, encoder connector DE	Construction type (IM B3 or IM B35), Version s. Catalog DA 65.3´2004			Drive type, vibration severity grade, shaft and flange accuracy s. Catalog DA 65.3´2004	Air flow direction NDE --> DE, shaft end s. Catalog DA 65.3´2004	Paint finish s. Catalog DA 65.3´2004			B-side top, air intake from NDE, air flow direction NDE --> DE	B-side right, air intake from NDE, air flow direction NDE --> DE	B-side left, air intake from NDE, air flow direction NDE --> DE		B-side right (when viewing DE)	B-side left (when viewing DE)	B-side top (when viewing DE)		Encoder connector mounted opposite	Terminal box rotated through +90 degrees (basis is standard)	Terminal box rotated through -90 degrees (basis is standard)	Terminal box rotated through +180 degrees (basis is standard)	
Release for availabil.	-	4 / 7	.	.	5	0 / 3	-	0	.	B/D/K	.			G04				K09	K10			K08	K83	K84	K85	
						🟦									G02				K10	K11		K08	K83	K84	K85	
						🟦										G00		K09		K11		K08	K83	K84	K85	
with pipe connection, instead of separately-drive fan:																										
on request	-	6 / 8	.	.	5	0 / 3	-	0	.	B/D/K	.			G04				K09	K10			K08	K83	K84	K85	
						▨									G02				K10	K11		K08	K83	K84	K85	
						▨										G00		K09		K11		K08	K83	K84	K85	
additional possible Z options																										
R1Y Standard paint finish RAL ...														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
R2Y Special paint finish RAL ...														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
G14 with air filter														▨	▨	▨										
G80 Pulse encoder mounting POG 10, prepared for mounting														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
K55 Cable entry plate, terminal box, customer-specific (plain text is required)																		▨	▨	▨		▨	▨	▨	▨	
K16 second standard shaft end (only possible if there is no encoder)															on request											
K31 second rating plate														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
K40 Re-lubrication devices, DE and NDE														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
Y55 Non-standard shaft end DE															on request											
L27 NDE bearing, insulated version														▨	▨	▨		▨	▨	▨		▨	▨	▨	▨	
Y80 different rating plate data (plain text is required)															on request											
Y82 Supplementary plate with the orderer's data															on request											
														🟦	🟦	Standard option										
														▨	▨	possible supplementary options										

1.4 Permissible combinations of mechanical versions for SH 280

Table 1-4 Matrix for options and assignments for SH 280

Order No. [MLFB]												Possibilities of assigning the Order No. [MLFB]																			
1P.. 284	-	8	9	10	11	12	-	13	14	15	16	-	8	Separ.-driven fan						11	Terminal box			12	Type of constr.			14	Drive type		
1P.. 286																															
1P.. 288													0	1	2	3	4	5	6	0	1	2	5	0	1	3	5	A	B	E	F
													B-side top , NDE --> DE	B-side right , NDE --> DE	B-side left , NDE --> DE	A-side top , DE --> NDE	A-side right , DE --> NDE	A-side left , DE --> NDE	Single pipe connection, NDE right (changeover to NDE left subsequently possible)	B-side right , cable entry at the bottom, Encoder connector DE	B-side left , cable entry at the bottom, Encoder connector DE	B-side top , cable entry at the right, Encoder connector DE	A-side top , cable entry at the right, Encoder connector NDE	Type of construction IM B3	Type of construction IM V5 (IM V6)	Type of construction IM B35	Type of construction IM V15 (IM V36)	Coupling N/N	Coupling R/R	Belts/increased cantilever forces N/N	Belts/increased cantilever forces R/R
	-	.	.	.	.	0 🟦	-	Type of construction IM B3					🟦							🟦	🟧		🟧					🟦	🟧	🟧	🟧
						🟦								🟧							🟧	🟧	🟧					🟦	🟧	🟧	🟧
						🟦									🟧					🟦		🟧	🟧					🟦	🟧	🟧	🟧
						🟦										🟧						🟧						🟦	🟧	🟧	🟧
						🟦											🟧					🟧						🟦	🟧	🟧	🟧
						🟦												🟧				🟧						🟦	🟧	🟧	🟧
						🟦													🟧			🟧	🟧					🟦	🟧	🟧	🟧
	-	.	.	.	.	1 🟩	-	Type of construction IM V5					🟦							🟦	🟧		🟧					🟦	🟧		
						🟩		(can be subsequently						🟧							🟧	🟧	🟧					🟦	🟧		
						🟩		changed-over to IM V6)							🟧					🟦		🟧	🟧					🟦	🟧		
						🟩										🟧				🟦	🟧	🟧						🟦	🟧		
						🟩											🟧			🟦	🟧	🟧						🟦	🟧		
						🟩												🟧		🟦	🟧	🟧						🟦	🟧		
						🟩													🟧			🟧	🟧					🟦	🟧		
	-	.	.	.	.	3 🟩	-	Type of construction IM B35					🟦							🟦	🟧							🟦	🟧	🟧	🟧
						🟩								🟧							🟧	🟧						🟦	🟧	🟧	🟧
						🟩									🟧					🟦		🟧						🟦	🟧	🟧	🟧
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						🟩											🟧					🟧						🟦	🟧	🟧	🟧
						🟩												🟧				🟧						🟦	🟧	🟧	🟧
						🟩													🟧			🟧						🟦	🟧	🟧	🟧
	-	.	.	.	.	5 🟩	-	Type of construction IM V15					🟦							🟦	🟧							🟦	🟧		
						🟩		(can be subsequently						🟧							🟧	🟧						🟦	🟧		
						🟩		changed-over to IM V36)							🟧					🟦		🟧						🟦	🟧		
						🟩										🟧				🟦	🟧	🟧						🟦	🟧		
						🟩											🟧			🟦	🟧	🟧						🟦	🟧		
						🟩												🟧		🟦	🟧	🟧						🟦	🟧		
						🟩													🟧			🟧						🟦	🟧		
Z options																															
R1Y Standard paint finish RAL ...													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
R2Y Special paint finish RAL ...													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
G14 with air filter													🟧	🟧	🟧	🟧	🟧	🟧													
K08 Encoder connector mounted opposite																				🟧	🟧	🟧									
K55 Cable entry plate, terminal box, customer-specific (plain text is required)																				🟧	🟧	🟧	🟧								
K83 Terminal box rotated through + 90 degrees (basis is standard)																				🟧	🟧	🟧									
K84 Terminal box rotated through - 90 degrees (basis is standard)																				🟧	🟧	🟧	🟧								
K85 Terminal box rotated through 180 degrees (basis is standard)																				🟧	🟧	🟧	🟧								
K16 second standard shaft end (only possible if there is no encoder)																								🟧		🟧		🟧	🟧		
K31 second rating plate													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
K45 230 V anti-condensation heating													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
C30 690 V version													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
Y55 Non-standard shaft end DE																												🟧	🟧	🟧	🟧
Y80 different rating plate data (plain text is required)													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
Y81 Non-standard fan motor voltage													🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧	🟧
M83 additional thread for a setting screw at the motor feet																								🟧		🟧					
													🟦	🟦		Standard															
													🟩	🟧		Suppl. versions that have been released															

1.5 Selection and ordering data

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening 1) n_1 RPM	Max. permiss. continuous speed 2) n_{S1} RPM	Max. speed 3) n_{max} RPM	Induction motor 1PL 6 Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Vector Control									
400	180	24.5	585	69	300	1000	2000	2000	1PL6 184 – 7 7 B 7 7 – 0 . . .
		31.5	752	90	290	1400	2000	2000	1PL6 186 – 7 7 B 7 7 – 0 . . .
	225	45	1074	117	300	1150	2000	2000	1PL6 224 – 7 7 B 7 7 – 0 . . .
		57	1361	145	305	1400	2000	2000	1PL6 226 – 7 7 B 7 7 – 0 . . .
		72	1719	181	305	1300	2000	2000	1PL6 228 – 7 7 B 7 7 – 0 . . .
1150	180	65	540	121	400	1750	3500 4)	5000	1PL6 184 – 7 7 D 7 7 – 0 . . .
		85	706	158	400	1950	3500 4)	5000	1PL6 186 – 7 7 D 7 7 – 0 . . .
	225	120	997	218	400	2100	3100 4)	4500	1PL6 224 – 7 7 D 7 7 – 0 . . .
		155	1287	275	400	2000	3100 4)	4500	1PL6 226 – 7 7 D 7 7 – 0 . . .
		190	1578	334	400	1850	3100 4)	4500 4)	1PL6 228 – 7 7 D 7 7 – 0 . . .
1750	180	89	486	166	400	3500	3500 4)	5000	1PL6 184 – 7 7 F 7 7 – 0 . . .
		125	682	231	400	3400	3500 4)	5000	1PL6 186 – 7 7 F 7 7 – 0 . . .
	225	165	900	292	400	3000	3100 4)	4500	1PL6 224 – 7 7 F 7 7 – 0 . . .
		200	1091	350	400	2900	3100 4)	4500	1PL6 226 – 7 7 F 7 7 – 0 . . .
		265	1446	470	400	2900	3100 4)	4500 4)	1PL6 228 – 7 7 F 7 7 – 0 . . .
2900	180	113	372	209	400	5000	3500 4)	5000	1PL6 184 – 7 7 L 7 7 – 0 . . .
		150	494	280	390	5000	3500 4)	5000	1PL6 186 – 7 7 L 7 7 – 0 . . .
	225	205	675	365	400	3500	3100 4)	4500	1PL6 224 – 7 7 L 7 7 – 0 . . .
		270	889	470	400	3500	3100 4)	4500	1PL6 226 – 7 7 L 7 7 – 0 . . .
		300	988	530	400	3500	3100 4)	4500 4)	1PL6 228 – 7 7 L 7 7 – 0 . . .

• Separately-driven fan:	
with separately-driven fan	4
without separately-driven fan for pipe connection	6
with separately-driven fan, however metric cable entries acc. to EN 5026 2	7
without separately-driven fan for pipe connection, however metric cable entries acc. to EN 5026 2	8
• Encoder	
without encoder	A
Incremental encoder HTL (1024 P/R)	H
Incremental encoder HTL (2048 P/R)	J
• Terminal box arrangement/cable entry direction (when viewing DE): 6)	
top/from the right	0
top/from DE	1
top/from NDE	2
top/from left	3
• Type of construction:	
IM B 3	0
IM B 3 — Lifting concept for different types of construction (IM B 6, IM B 7, IM B 8, IM V 5, IM V 6)	1
IM B 35 (SH 180: with flange A 450) SH 225: with flange A 550)	3
IM B 35 (SH 180: with flange A 450) SH 225: with flange A 550) — Lifting concept for different types of construction (IM V 15, IM V 36)	5

Power factor $\cos \varphi$	Magnetizing current I_μ A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm^2	Weight approx. kg	Induction motor 1PL 6 Order No..	SIMOVERT MASTERDRIVES VC Inverter/converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Vector Control								
0.86	33	0.80	14.4	0.503	370	1PL6 184 – . . B . . – 0 7 7 7	72	6SE7 027 – 2 7 D61
0.85	47	0.814	14.3	0.666	440	1PL6 186 – . . B . . – 0 7 7 7	92	6SE7 031 – 0 7 E60
0.87	45	0.844	14.2	1.479	630	1PL6 224 – . . B . . – 0 7 7 7	124	6SE7 031 – 2 7 F60
0.85	67	0.868	14.0	1.930	750	1PL6 226 – . . B . . – 0 7 7 7	146	6SE7 031 – 5 7 F60
0.86	77	0.871	14.0	2.326	860	1PL6 228 – . . B . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.86	46	0.906	39.4	0.503	370	1PL6 184 – . . D . . – 0 7 7 7	124	6SE7 031 – 2 7 F60
0.86	62	0.910	39.4	0.666	440	1PL6 186 – . . D . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.85	86	0.930	39.1	1.479	630	1PL6 224 – . . D . . – 0 7 7 7	260	6SE7 032 – 6 7 G60
0.87	92	0.930	39.2	1.930	750	1PL6 226 – . . D . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.88	102	0.931	39.2	2.326	860	1PL6 228 – . . D . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.84	68	0.921	59.3	0.503	370	1PL6 184 – . . F . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.84	92	0.935	59.3	0.666	440	1PL6 186 – . . F . . – 0 7 7 7	260	6SE7 032 – 6 7 G60
0.87	90	0.942	59.2	1.479	630	1PL6 224 – . . F . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.87	122	0.942	59.1	1.930	750	1PL6 226 – . . F . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.86	174	0.948	59.0	2.326	860	1PL6 228 – . . F . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.85	79	0.938	97.6	0.503	370	1PL6 184 – . . L . . – 0 7 7 7	210	6SE7 032 – 1 7 G60
0.84	110	0.943	97.5	0.666	440	1PL6 186 – . . L . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.86	118	0.950	97.5	1.479	630	1PL6 224 – . . L . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.87	160	0.952	97.4	1.930	750	1PL6 226 – . . L . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.86	188	0.952	97.3	2.326	860	1PL6 228 – . . L . . – 0 7 7 7	590	6SE7 036 – 0 7 K/J60

• Drive type	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	R	N	A
Coupling	R	R	B
Coupling	S	R	C
Coupling	SR	R	D
Belt	R	N	E
Belt	R	R	F
Increased cantilever forces	R	N	G
Increased cantilever forces	R	R	H

• Air flow direction:	• Shaft end:	
DE → NDE	with key, half key balancing	A
NDE → DE [5]	with key, half key balancing	B
DE → NDE	with key, full key balancing	C
NDE → DE [5]	with key, full key balancing	D
DE → NDE	plain	J
NDE → DE [5]	plain	K

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special version:	
Please specify using an additional Order code and if required, plain text.	–Z

Converter	E
Inverter	T

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 5 \cdot f_N$.

4) The speed is reduced for increased cantilever forces.

5) Preferred air-flow direction in polluted environment.

6) Number "5" for SH 225 radial cooling, refer to Table 1-3.

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening 1) n_1 RPM	Max. permiss. continuous speed 2) n_{S1} RPM	Max. speed 3) n_{max} RPM	Induction motor 1PL 6 Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Vector Control									
800	280	195	2328	335	400	1340	2200	3300	1PL6 284 – 7 7 C 7 7 – 0 . . .
		250	2984	440	385	1450	2200	3300	1PL6 286 – 7 7 C 7 7 – 0 . . .
		310	3701	570	370	1520	2200	3300	1PL6 288 – 7 7 C 7 7 – 0 . . .
1150	280	280	2325	478	400	2200	2200	3300	1PL6 284 – 7 7 D 7 7 – 0 . . .
		355	2944	637	380	2200	2200	3300	1PL6 286 – 7 7 D 7 7 – 0 . . .
		435	3607	765	385	2200	2200	3300	1PL6 288 – 7 7 D 7 7 – 0 . . .
1750	280	370	2019	616	400	2200	2200	3300	1PL6 284 – 7 7 F 7 7 – 0 . . .
		445	2429	736	400	2200	2200	3300	1PL6 286 – 7 7 F 7 7 – 0 . . .
		560	3055	924	400	2200	2200	3300	1PL6 288 – 7 7 F 7 7 – 0 . . .

• Separately-driven fan: 4)	
with separately-driven fan, NDE top, air-flow direction NDE to DE	0
with separately-driven fan, NDE right, air flow direction NDE to DE	1
with separately-driven fan, NDE left, air-flow direction NDE to DE	2
with separately-driven fan, DE top, air-flow direction DE to NDE	3
with separately-driven fan, DE right, air flow direction DE to NDE	4
with separately-driven fan, DE left, air-flow direction DE to NDE	5
without separately-driven fan, for single right pipe connection at NDE	6

• Encoder	
without encoder	A
Incremental encoder HTL (1024 P/R)	H
Incremental encoder HTL (2048 P/R)	J

• Terminal box arrangement/cable entry direction (when viewing DE): 4)	
Terminal box, NDE right/cable entry from below/encoder connector DE	0
Terminal box NDE left/cable entry from below/encoder connector DE	1
Terminal box NDE top/cable entry from the right/encoder connector DE	2
Terminal box DE top/cable entry from right/encoder connector NDE	5

• Type of construction: 4)	
IM B 3	0
IM V 5 (can be subsequently changed-over to IM V 6)	1
IM B 35 (with flange A 660)	3
IM V 15 (with flange A 660; can be subsequently changed-over to IM V 36)	5

Power factor cos φ	Magnetizing current I_{μ} A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm^2	Weight approx. kg	Induction motor 1PL 6 Order No.	SIMOVERT MASTERDRIVES VC Inverter/converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Vector Control								
0.90	95	0.929	27.3	4.2	1300	1PL6 284 – . . C . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.90	135	0.934	27.3	5.2	1500	1PL6 286 – . . C . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.90	170	0.939	27.3	6.3	1700	1PL6 288 – . . C . . – 0 7 7 7	590	6SE7 036 – 0 7 K/J60
0.89	156	0.950	38.9	4.2	1300	1PL6 284 – . . D . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.89	214	0.953	38.9	5.2	1500	1PL6 286 – . . D . . – 0 7 7 7	690	6SE7 037 – 0 7 K/J60
0.89	248	0.955	38.9	6.3	1700	1PL6 288 – . . D . . – 0 7 7 7	860	6SE7 038 – 6 T K60
0.90	162	0.959	59.0	4.2	1300	1PL6 284 – . . F . . – 0 7 7 7	690	6SE7 037 – 0 7 K/J60
0.91	182	0.960	59.0	5.2	1500	1PL6 286 – . . F . . – 0 7 7 7	860	6SE7 038 – 6 T K60
0.91	232	0.962	59.0	6.3	1700	1PL6 288 – . . F . . – 0 7 7 7	1100	6SE7 041 – 1 T K60

• Drive type: [4]	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	N	N	A
Coupling	R	R	B
Belt/increased cantil. forces	N	N	E
Belt/increased cantil. forces	R	R	F

- Shaft end:
  - with key, half-key balancing A
  - with key, full-key balancing C
  - plain J
- Paint finish:
  - with primer 0
  - anthracite, standard paint finish (RAL) 7016 3
  - anthracite, special paint finish (RAL 7016 6
- Special versions:
  Please specify using an additional Order code and if required, plain text. –Z

Converter E
Inverter T

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1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 5 \cdot f_N$.

4) Possible combination, refer to "Permissible combinations of mechanical versions".

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening [1]) n_1 RPM	Max. permiss. continuous speed [2]) n_{S1} RPM	Max. speed [3]) n_{max} RPM	Induction motor 1PL 6 Order No.
Line supply voltage 3-ph. AC 480 V for drive converter SIMOVERT MASTERDRIVES Vector Control									
500	180	30	573	66	370	1300	2500	2500	1PL6 184 – 7 7 B 7 7 – 0 . . .
		40	764	91	355	1500	2500	2500	1PL6 186 – 7 7 B 7 7 – 0 . . .
	225	55	1050	114	370	1300	2500	2500	1PL6 224 – 7 7 B 7 7 – 0 . . .
		72	1375	147	375	1500	2500	2500	1PL6 226 – 7 7 B 7 7 – 0 . . .
		90	1719	180	380	1400	2500	2500	1PL6 228 – 7 7 B 7 7 – 0 . . .
1350	180	74	523	119	460	2200	3500[4])	5000	1PL6 184 – 7 7 D 7 7 – 0 . . .
		98	693	156	460	2400	3500[4])	5000	1PL6 186 – 7 7 D 7 7 – 0 . . .
	225	137	969	215	460	2500	3100[4])	4500	1PL6 224 – 7 7 D 7 7 – 0 . . .
		172	1217	265	460	2500	3100[4])	4500	1PL6 226 – 7 7 D 7 7 – 0 . . .
		218	1542	332	460	2200	3100[4])	4500[4])	1PL6 228 – 7 7 D 7 7 – 0 . . .
2000	180	98	468	161	460	4200	3500[4])	5000	1PL6 184 – 7 7 F 7 7 – 0 . . .
		135	645	220	460	4200	3500[4])	5000	1PL6 186 – 7 7 F 7 7 – 0 . . .
	225	178	850	275	460	2900	3100[4])	4500	1PL6 224 – 7 7 F 7 7 – 0 . . .
		220	1050	342	460	2900	3100[4])	4500	1PL6 226 – 7 7 F 7 7 – 0 . . .
		288	1375	450	460	2900	3100[4])	4500[4])	1PL6 228 – 7 7 F 7 7 – 0 . . .
2900	180	113	372	209	400	5000	3500[4])	5000	1PL6 184 – 7 7 L 7 7 – 0 . . .
		150	494	280	390	5000	3500[4])	5000	1PL6 186 – 7 7 L 7 7 – 0 . . .
	225	205	675	365	400	3500	3100[4])	4500	1PL6 224 – 7 7 L 7 7 – 0 . . .
		270	889	470	395	3500	3100[4])	4500	1PL6 226 – 7 7 L 7 7 – 0 . . .
		300	988	530	400	3500	3100[4])	4500[4])	1PL6 228 – 7 7 L 7 7 – 0 . . .

• Separately-driven fan:	
with separately-driven fan	4
without separately-driven fan, for pipe connection	6
with separately-driven fan, however metric cable entries acc. to EN 5026 2	7
without separately-driven fan, for pipe connection, however metric cable entries acc. to EN 5026 2	8
• Encoder	
without encoder	A
Incremental encoder HTL (1024 P/R)	H
Incremental encoder HTL (2048 P/R)	J
• Terminal box arrangement/cable entry direction (when viewing DE) 6):	
top/from the right	0
top/from DE	1
top/from NDE	2
top/from left	3

• Type of construction:		
IM B 3		0
IM B 3	Lifting concept for different types of construction (IM B 6, IM B 7, IM B 8, IM V 5, IM V 6)	1
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)		3
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)	Lifting concept for different types of construction (IM V 15, IM V 36)	5

Power factor cos φ	Magnetizing current I_μ A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm²	Weight approx. kg	Induction motor 1PL 6 Order No.	SIMOVERT MASTERDRIVES VC Inverter/converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 480 V for drive converter SIMOVERT MASTERDRIVES Vector Control								
0.84	34	0.844	17.6	0.503	370	1PL6 184 – . . B . . – 0 7 7 7	72	6SE7 027 – 2 7 D61
0.84	46	0.845	17.6	0.666	440	1PL6 186 – . . B . . – 0 7 7 7	92	6SE7 031 – 0 7 E60
0.86	46	0.875	17.5	1.479	630	1PL6 224 – . . B . . – 0 7 7 7	124	6SE7 031 – 2 7 F60
0.85	66	0.887	17.4	1.930	750	1PL6 226 – . . B . . – 0 7 7 7	146	6SE7 031 – 5 7 F60
0.85	79	0.894	17.4	2.326	860	1PL6 228 – . . B . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.86	44	0.918	46.1	0.503	370	1PL6 184 – . . D . . – 0 7 7 7	124	6SE7 031 – 2 7 F60
0.85	60	0.920	46.0	0.666	440	1PL6 186 – . . D . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.85	82	0.940	45.8	1.479	630	1PL6 224 – . . D . . – 0 7 7 7	260	6SE7 032 – 6 7 G60
0.87	88	0.940	45.8	1.930	750	1PL6 226 – . . D . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.88	100	0.938	45.8	2.326	860	1PL6 228 – . . D . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.83	70	0.934	67.5	0.503	370	1PL6 184 – . . F . . – 0 7 7 7	186	6SE7 031 – 8 7 F60
0.83	94	0.94	67.5	0.666	440	1PL6 186 – . . F . . – 0 7 7 7	260	6SE7 032 – 6 7 G60
0.86	91	0.944	67.5	1.479	630	1PL6 224 – . . F . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.86	124	0.948	67.5	1.930	750	1PL6 226 – . . F . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.85	176	0.948	67.3	2.326	860	1PL6 228 – . . F . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.85	79	0.938	97.6	0.503	370	1PL6 184 – . . L . . – 0 7 7 7	210	6SE7 032 – 1 7 G60
0.84	110	0.943	97.5	0.666	440	1PL6 186 – . . L . . – 0 7 7 7	315	6SE7 033 – 2 7 G60
0.86	118	0.950	97.5	1.479	630	1PL6 224 – . . L . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.87	160	0.952	97.4	1.930	750	1PL6 226 – . . L . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.86	188	0.952	97.3	2.326	860	1PL6 228 – . . L . . – 0 7 7 7	590	6SE7 036 – 0 7 K/J60

• Drive type:	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	R	N	A
Coupling	R	R	B
Coupling	S	R	C
Coupling	SR	R	D
Belt	R	N	E
Belt	R	R	F
Increased cantilever forces	R	N	G
Increased cantilever forces	R	R	H

• Air flow direction:	• Shaft end:	
DE → NDE	with key, half key balancing	A
NDE → DE⁵)	with key, half key balancing	B
DE → NDE	with key, full key balancing	C
NDE → DE⁵)	with key, full key balancing	D
DE → NDE	plain	J
NDE → DE⁵)	plain	K

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special version:
Please specify using an additional Order code and if required, plain text. –Z

Converter	E
Inverter	T

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 5 \cdot f_N$.

4) The speed is reduced for increased cantilever forces.

5) Preferred air-flow direction in polluted environment.

6) Number "5" for SH 225 radial cooling, refer to Table 1-3

Rated speed	Shaft height	Rated power	Rated torque	Rated current	Rated voltage	Speed at the start of field weakening 1)	Max. permiss. continuous speed 2)	Max. speed 3)	Induction motor 1PL6
n_N		P_N	M_N	I_N	U_N	n_1	n_{S1}	n_{max}	
RPM		kW	Nm	A	V	RPM	RPM	RPM	Order No.
Line supply voltage 3-ph. AC 480 V for drive converter SIMOVERT MASTERDRIVES Vector Control									
1000	280	235	2244	335	480	1700	2200	3300	1PL6 284– □ □ C □ □ – 0 . . .
		310	2961	440	480	2000	2200	3300	1PL6 286– □ □ C □ □ – 0 . . .
		385	3677	570	460	2050	2200	3300	1PL6 288– □ □ C □ □ – 0 . . .
1350	280	325	2299	478	470	2200	2200	3300	1PL6 284– □ □ D □ □ – 0 . . .
		410	2901	637	445	2200	2200	3300	1PL6 286– □ □ D □ □ – 0 . . .
		505	3573	765	450	2200	2200	3300	1PL6 288– □ □ D □ □ – 0 . . .
2000	280	415	1981	616	455	2200	2200	3300	1PL6 284– □ □ F □ □ – 0 . . .
		500	2387	736	455	2200	2200	3300	1PL6 286– □ □ F □ □ – 0 . . .
		630	3009	924	455	2200	2200	3300	1PL6 288– □ □ F □ □ – 0 . . .

• Separately-driven fan: 4)	
with separately-driven fan, NDE top, air flow direction NDE to DE	0
with separately-driven fan, NDE right, air flow direction NDE to DE	1
with separately-driven fan, NDE left, air flow direction NDE to DE	2
with separately-driven fan, DE top, air flow direction DE to NDE	3
with separately-driven fan, DE right, air flow direction DE to NDE	4
with separately-driven fan, DE left, air flow direction DE to NDE	5
without separately-driven fan, for single pipe connection at NDE right	6

• Encoder	
without encoder	A
Incremental encoder HTL (1024 P/R)	H
Incremental encoder HTL (2048 P/R)	J

• Terminal box arrangement/cable entry direction (when viewing the DE): 4)	
Terminal box, NDE right/cable entry from below/encoder connector DE	0
Terminal box NDE left/cable entry from below/encoder connector DE	1
Terminal box NDE top/cable entry from the right/encoder connector DE	2
Terminal box DE top/cable entry from the right/encoder connector NDE	5

• Type of construction:	
IM B 3	0
IM V 5 (can be subsequently changed-over to IM V 6)	1
IM B 35 (with flange A 660)	3
IM V 15 (with flange A 660; can be subsequently changed-over to IM V 36)	5

Order No.-Supplements for the drive type, air flow direction and paint finish (14th to 16th position of the Order No.)

Power factor cos φ	Magnetizing current I_μ A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm^2	Weight approx. kg	Induction motor 1PL 6 Order No.	SIMOVERT MASTERDRIVES VC Inverter/converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 480 V for drive converter SIMOVERT MASTERDRIVES Vector Control								
0.90	90	0.939	34.0	4.2	1300	1PL6 284 – . . C . . – 0 7 7 7	370	6SE7 033 – 7 7 G60
0.90	135	0.945	34.0	5.2	1500	1PL6 286 – . . C . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.90	170	0.948	34.0	6.3	1700	1PL6 288 – . . C . . – 0 7 7 7	590	6SE7 036 – 0 7 K/J60
0.89	157	0.955	45.5	4.2	1300	1PL6 284 – . . D . . – 0 7 7 7	510	6SE7 035 – 1 7 K/J60
0.89	215	0.957	45.5	5.2	1500	1PL6 286 – . . D . . – 0 7 7 7	690	6SE7 037 – 0 7 K/J60
0.89	248	0.959	45.5	6.3	1700	1PL6 288 – . . D . . – 0 7 7 7	860	6SE7 038 – 6 T K60
0.90	161	0.961	67.3	4.2	1300	1PL6 284 – . . F . . – 0 7 7 7	690	6SE7 037 – 0 7 K/J60
0.91	181	0.963	67.3	5.2	1500	1PL6 286 – . . F . . – 0 7 7 7	860	6SE7 038 – 6 T K60
0.91	231	0.965	67.3	6.3	1700	1PL6 288 – . . F . . – 0 7 7 7	1100	6SE7 041 – 1 T K60

• Drive type: 4)	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	N	N	A
Coupling	R	R	B
Belt/increased cantil. forces	N	N	E
Belt/increased cantil. forces	R	R	F

• Shaft end:	
with key, half-key balancing	A
with key, full-key balancing	C
plain	J

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special versions:	
Please specify using an additional Order code and if required, plain text.	–Z

Converter	E
Inverter	T

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 5 \cdot f_N$.

4) Possible combination, refer to "Permissible combinations of mechanical versions".

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening [1] n_1 RPM	Max. permiss. continuous speed [2] n_{S1} RPM	Max. speed [3] n_{max} RPM	Induction motor 1PL 6 Order No.
Line supply voltage 3-ph. AC 690 V for drive converter SIMODERT MASTERDRIVES Vector Control (Option C30)									
800	280	185	2208	185	690	1440	2200	3300	1PL6 284 – 7 7 C 7 7 – 0 . . .
		240	2865	250	665	1550	2200	3300	1PL6 286 – 7 7 C 7 7 – 0 . . .
		300	3581	320	640	1600	2200	3300	1PL6 288 – 7 7 C 7 7 – 0 . . .
1150	280	272	2259	270	690	2200	2200	3300	1PL6 284 – 7 7 D 7 7 – 0 . . .
		344	2857	359	655	2200	2200	3300	1PL6 286 – 7 7 D 7 7 – 0 . . .
		422	3504	431	665	2200	2200	3300	1PL6 288 – 7 7 D 7 7 – 0 . . .
1750	280	359	1959	347	690	2200	2200	3300	1PL6 284 – 7 7 F 7 7 – 0 . . .
		432	2357	415	690	2200	2200	3300	1PL6 286 – 7 7 F 7 7 – 0 . . .
		543	2963	520	690	2200	2200	3300	1PL6 288 – 7 7 F 7 7 – 0 . . .

• Separately-driven fan: (5)				
with separately-driven fan, NDE top, air-flow direction NDE to DE	0			
with separately-driven fan, NDE right, air flow direction NDE to DE	1			
with separately-driven fan, NDE left, air-flow direction NDE to DE	2			
with separately-driven fan, DE top, air-flow direction DE to NDE	3			
with separately-driven fan, DE right, air flow direction DE to NDE	4			
with separately-drien fan, DE left, air-flow direction DE to NDE	5			
without separately-driven fan, for single pipe connection at NDE right	6			
• Encoder				
without encoder		A		
Incremental encoder HTL (1024 P/R)		H		
Incremental encoder HTL (2048 P/R)		J		
• Terminal box arrangement/cable entry direction (when viewing DE): (5)				
Terminal box, NDE right/cable entry from below/encoder connector DE			0	
Terminal box NDE left/cable entry from below/encoder connector DE			1	
Terminal box NDE top/cable entry from the right/encoder connector DE			2	
Terminal box DE top/cable entry from the right/encoder connector NDE			5	
• Type of construction: (5)				
IM B 3				0
IM V 5 (can be subsequently changed-over to IM V 6)				1
IM B 35 (with flange A 660)				3
IM V 15 (with flange A 660; can be subsequently changed-over to IM V 36)				5

Power factor cos φ	Magnetizing current I_{μ} A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm^2	Weight approx. kg	Induction motor 1PL6 Order No.	SIMOVERT MASTERDRIVES VC Inverter/Converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 690 V for drive converter SIMOVERT MASTERDRIVES Vector Control (Option C30)								
0.90	55	0.928	27.0	4.2	1300	1PL6 284 – . . C . . – 0 7 7 7	208	6SE7 032 – 0 7 G60
0.90	80	0.934	27.0	5.2	1500	1PL6 286 – . . C . . – 0 7 7 7	297	6SE7 033 – 0 7 K/J60
0.90	100	0.938	27.0	6.3	1700	1PL6 288 – . . C . . – 0 7 7 7	354	6SE7 033 – 5 7 K/J60
0.89	89	0.949	38.9	4.2	1300	1PL6 284 – . . D . . – 0 7 7 7	297	6SE7 033 – 0 7 K/J60
0.89	123	0.953	38.9	5.2	1500	1PL6 286 – . . D . . – 0 7 7 7	354⁴⁾	6SE7 033 – 5 7 K/J60
0.89	143	0.955	38.9	6.3	1700	1PL6 288 – . . D . . – 0 7 7 7	452	6SE7 034 – 5 7 K/J60
0.90	93	0.958	59.0	4.2	1300	1PL6 284 – . . F . . – 0 7 7 7	354	6SE7 033 – 5 7 K/J60
0.91	105	0.960	59.0	5.2	1500	1PL6 286 – . . F . . – 0 7 7 7	452	6SE7 034 – 5 7 K/J60
0.91	133	0.962	59.0	6.3	1700	1PL6 288 – . . F . . – 0 7 7 7	570	6SE7 035 – 7 U K60

• Drive type: 5)	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	N	N	A
Coupling	R	R	B
Belt/increased cantil. forces	N	N	E
Belt/increased cantil. forces	R	R	F

• Shaft end:	
with key, half-key balancing	A
with key, full-key balancing	C
plain	J

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special versions:	
Please specify using an additional Order code and if required, plain text.	–C30

Converter	H
Inverter	W

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 5 \cdot f_N$.

4) Notice: The rated converter current is less than the rated motor current.

5) Possible combination, refer to "Permissible combinations of mechanical versions".

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening 1) n_1 RPM	Max. permiss. continuous speed 2) n_{S1} RPM	Max. speed 3) n_{max} RPM	Induction motor 1PL6 Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Motion Control									
400	180	20.5	489	58	290	800	800	800	1PL6 184 – 7 7 B 7 7 – 0 . . .
		30.5	728	87	290	800	800	800	1PL6 186 – 7 7 B 7 7 – 0 . . .
	225	40	955	105	296	800	800	800	1PL6 224 – 7 7 B 7 7 – 0 . . .
		57	1361	145	305	800	800	800	1PL6 226 – 7 7 B 7 7 – 0 . . .
		72	1719	181	305	800	800	800	1PL6 228 – 7 7 B 7 7 – 0 . . .
1000	180	57	544	122	345	1300	2000	2000	1PL6 184 – 7 7 D 7 7 – 0 . . .
		74	707	157	345	1600	2000	2000	1PL6 186 – 7 7 D 7 7 – 0 . . .
	225	105	1003	220	345	1700	2000	2000	1PL6 224 – 7 7 D 7 7 – 0 . . .
		135	1289	278	345	1700	2000	2000	1PL6 226 – 7 7 D 7 7 – 0 . . .
		165	1576	331	348	1700	2000	2000	1PL6 228 – 7 7 D 7 7 – 0 . . .
1500	180	76	484	165	345	3000	3000	3000	1PL6 184 – 7 7 F 7 7 – 0 . . .
		108	688	233	340	3000	3000	3000	1PL6 186 – 7 7 F 7 7 – 0 . . .
	225	142	904	292	345	2500	3000	3000	1PL6 224 – 7 7 F 7 7 – 0 . . .
		175	1114	356	345	3000	3000 4)	3000	1PL6 226 – 7 7 F 7 7 – 0 . . .
		230	1465	468	345	2900	3000 4)	3000	1PL6 228 – 7 7 F 7 7 – 0 . . .
2500	180	100	382	208	345	5000	3500 4)	5000	1PL6 184 – 7 7 L 7 7 – 0 . . .
		130	497	275	340	5000	3500 4)	5000	1PL6 186 – 7 7 L 7 7 – 0 . . .
	225	178	680	358	345	3500	3100 4)	4500	1PL6 224 – 7 7 L 7 7 – 0 . . .
		235	898	476	340	3500	3100 4)	4500	1PL6 226 – 7 7 L 7 7 – 0 . . .
		265	1013	535	345	3500	3100 4)	4500 4)	1PL6 228 – 7 7 L 7 7 – 0 . . .

• Separately-driven fan:	
with separately-driven fan	4
without separately-driven fan, for pipe connection	6
with separately-driven fan, however metric cable entries acc. to EN 5026 2	7
without separately-driven fan, for pipe connection, however metric cable entries acc. to EN 5026 2	8

• Encoder	
Absolute encoder EnDat 2048 P/R	E
Incremental sin/cos 1 V_{pp} (without C and D track)	N
Incremental sin/cos 1 V_{pp} (with C and D track)	M
Resolver 2-pole	R

• Terminal box arrangement/cable entry direction (when viewing the DE): 7)	
top/from right	0
top/from DE	1
top/from NDE	2
top/from left	3

• Type of construction:		
IM B 3		0
IM B 3	Lifting concept for different types of construction (IM B 6, IM B 7, IM B 8, IM V 5, IM V 6)	1
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)		3
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)	Lifting concept for different types of construction (IM V 15, IM V 36)	5

Power factor	Magnetizing current	Efficiency	Rated frequency	Moment of inertia	Weight approx.	Induction motor 1PL 6	SIMOVERT MASTERDRIVES MC Inverter/converter Rated current	
	I_μ	η_N	f_N	J			I_N	
cos φ	A		Hz	kgm^2	kg	Order No.	A	Order No.
Line supply voltage 3-ph. AC 400 V for drive converter SIMOVERT MASTERDRIVES Motion Control								
0.84	33.4	0.820	14.2	0.503	370	1PL6 184 – . . B . . – 0 7 7 7	59	6SE7 026 – 0 7 D51
0.84	48.6	0.828	14.1	0.666	440	1PL6 186 – . . B . . – 0 7 7 7	92	6SE7 031 – 0 7 E50
0.86	45.8	0.864	14	1.479	630	1PL6 224 – . . B . . – 0 7 7 7	124	6SE7 031 – 2 7 F50
0.85	67	0.868	14	1.930	750	1PL6 226 – . . B . . – 0 7 7 7	155	6SE7 031 – 8 7 F50
0.86	77	0.871	14.1	2.326	860	1PL6 228 – . . B . . – 0 7 7 7	218	6SE7 032 – 6 7 G50
0.87	45	0.897	34.4	0.503	370	1PL6 184 – . . D . . – 0 7 7 7	124	6SE7 031 – 2 7 F50
0.86	61	0.907	34.3	0.666	440	1PL6 186 – . . D . . – 0 7 7 7	155	6SE7 031 – 8 7 E50
0.86	86	0.927	34.5	1.479	630	1PL6 224 – . . D . . – 0 7 7 7	218	6SE7 032 – 6 7 G50
0.88	90	0.927	31.1	1.930	750	1PL6 226 – . . D . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.89	103	0.928	34.2	2.326	860	1PL6 228 – . . D . . – 0 7 7 7	423	6SE7 035 – 1 E K50
0.84	70	0.924	50.9	0.503	370	1PL6 184 – . . F . . – 0 7 7 7	175	6SE7 032 – 1 7 G50
0.85	91	0.930	50.9	0.666	460	1PL6 186 – . . F . . – 0 7 7 7	262	6SE7 033 – 2 7 G50
0.87	91	0.940	50.9	1.479	640	1PL6 224 – . . F . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.87	125	0.944	50.7	1.930	760	1PL6 226 – . . F . . – 0 7 7 7	423	6SE7 035 – 1 E K50
0.86	177	0.947	50.7	2.326	870	1PL6 228 – . . F . . – 0 7 7 7	491	6SE7 036 – 0 E K50
0.86	80	0.936	84.2	0.503	390	1PL6 184 – . . L . . – 0 7 7 7	218	6SE7 032 – 6 7 G50
0.85	113	0.943	84.1	0.666	470	1PL6 186 – . . L . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.87	119	0.95	84.1	1.479	640	1PL6 224 – . . L . . – 0 7 7 7	423	6SE7 035 – 1 E K50
0.88	157	0.953	84	1.930	760	1PL6 226 – . . L . . – 0 7 7 7	491	6SE7 036 – 0 E K50
0.87	189	0.952	84	2.326	870	1PL6 228 – . . L . . – 0 7 7 7	491[5]	6SE7 036 – 0 E K50

• Drive type:	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	R	N	A
Coupling	R	R	B
Coupling	S	R	C
Coupling	SR	R	D
Belt	R	N	E
Belt	R	R	F
Increased cantilever forces	R	N	G
Increased cantilever forces	R	R	H

• Air flow direction:	• Shaft end:	
DE → NDE	with key, half key balancing	A
NDE → DE[6]	with key, half key balancing	B
DE → NDE	with key, full key balancing	C
NDE → DE[6]	with key, full key balancing	D
DE → NDE	plain	J
NDE → DE[6]	plain	K

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special versions:	
Please specify using an additional Order code and if required, plain text.	–Z

Converter	E
Inverter	T

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.
2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.
3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 2 \cdot f_N$.
4) The speed is reduced for increased cantilever forces.
5) Notice: The rated converter current is less than the rated motor current
6) Preferred air-flow direction in polluted environment
7) Number "5" for SH 225 radial cooling, refer to Table 1-3.

Rated speed n_N RPM	Shaft height	Rated power P_N kW	Rated torque M_N Nm	Rated current I_N A	Rated voltage U_N V	Speed at the start of field weakening [1] n_1 RPM	Max. permiss. continuous speed [2] n_{S1} RPM	Max. speed [3] n_{max} RPM	Induction motor 1PL6 Order No .
Line supply voltage 3-ph. AC, 480 V for drive converter SIMOVERT MASTERDRIVES Motion Control									
400	180	24.5	585	69	300	800	800	800	1PL6 184 – 7 7 B 7 7 – 0 . . .
		31.5	752	90	290	800	800	800	1PL6 186 – 7 7 B 7 7 – 0 . . .
	225	45	1074	117	300	800	800	800	1PL6 224 – 7 7 B 7 7 – 0 . . .
		57	1361	145	305	800	800	800	1PL6 226 – 7 7 B 7 7 – 0 . . .
		72	1719	181	305	800	800	800	1PL6 228 – 7 7 B 7 7 – 0 . . .
1150	180	65	540	121	400	1750	2300	2300	1PL6 184 – 7 7 D 7 7 – 0 . . .
		85	706	158	400	1950	2300	2300	1PL6 186 – 7 7 D 7 7 – 0 . . .
	225	120	997	218	400	2100	2300	2300	1PL6 224 – 7 7 D 7 7 – 0 . . .
		155	1287	275	400	2000	2300	2300	1PL6 226 – 7 7 D 7 7 – 0 . . .
		190	1578	334	400	1850	2300	2300	1PL6 228 – 7 7 D 7 7 – 0 . . .
1750	180	89	486	166	400	3500	3500[4]	3500	1PL6 184 – 7 7 F 7 7 – 0 . . .
		125	682	231	400	3400	3500[4]	3500	1PL6 186 – 7 7 F 7 7 – 0 . . .
	225	165	900	292	400	3000	3100[4]	3500	1PL6 224 – 7 7 F 7 7 – 0 . . .
		200	1091	350	400	2900	3100[4]	3500	1PL6 226 – 7 7 F 7 7 – 0 . . .
		265	1446	470	400	2900	3100[4]	3500	1PL6 228 – 7 7 F 7 7 – 0 . . .
2900	180	113	372	209	400	5000	3500[4]	5000	1PL6 184 – 7 7 L 7 7 – 0 . . .
		150	494	280	390	5000	3500[4]	5000	1PL6 186 – 7 7 L 7 7 – 0 . . .
	225	205	675	365	400	3500	3100[4]	4500	1PL6 224 – 7 7 L 7 7 – 0 . . .
		270	889	470	400	3500	3100[4]	4500	1PL6 226 – 7 7 L 7 7 – 0 . . .
		300	988	530	400	3500	3100[4]	4500[4]	1PL6 228 – 7 7 L 7 7 – 0 . . .

• Separately-driven fan:		
with separately-driven fan		4
without separately-driven fan, for pipe connection		6
with separately-driven fan, however metric cable entries acc. to EN 5026 2		7
without separately-driven fan, for pipe connection, however metric cable entries acc. to EN 5026 2		8
• Encoder:		
Absolute encoder EnDat 2048 P/R		E
Incremental sin/cos 1 V_{pp} (without C and D track)		N
Incremental sin/cos 1 V_{pp} (with C and D track)		M
Resolver 2-pole		R
• Terminal box arrangement/cable entry direction (when viewing DE): 7)		
top/from right		0
top/from DE		1
top/from NDE		2
top/from left		3
• Type of construction:		
IM B 3		0
IM B 3	Lifting concept for different types of construction (IM B 6, IM B 7, IM B 8, IM V 5, IM V 6)	1
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)		3
IM B 35 (SH 180: with flange A 450), SH 225: with flange A 550)	Lifting concept for different types of construction (IM V 15, IM V 36)	5

Power factor cos φ	Magnetizing current I_μ A	Efficiency η_N	Rated frequency f_N Hz	Moment of inertia J kgm^2	Weight approx. kg	Induction motor 1PL 6 Order No.	SIMOVERT MASTERDRIVES MC Inverter/converter Rated current I_N A	Order No.
Line supply voltage 3-ph. AC 480 V for drive converter SIMOVERT MASTERDRIVES Motion Control								
0.86	33	0.80	14.4	0.503	370	1PL6 184 – . . B . . – 0 7 7 7	72	6SE7 027 – 2 7 D51
0.85	47	0.814	14.3	0.666	440	1PL6 186 – . . B . . – 0 7 7 7	92	6SE7 031 – 0 7 E50
0.87	45	0.844	14.2	1.479	630	1PL6 224 – . . B . . – 0 7 7 7	124	6SE7 031 – 2 7 F50
0.85	67	0.868	14.0	1.930	750	1PL6 226 – . . B . . – 0 7 7 7	155	6SE7 031 – 8 7 F50
0.86	77	0.871	14.0	2.326	860	1PL6 228 – . . B . . – 0 7 7 7	175	6SE7 032 – 1 7 G50
0.86	46	0.906	39.4	0.503	370	1PL6 184 – . . D . . – 0 7 7 7	124	6SE7 031 – 2 7 F50
0.86	62	0.910	39.4	0.666	440	1PL6 186 – . . D . . – 0 7 7 7	155	6SE7 031 – 8 7 F50
0.86	86	0.930	39.1	1.479	630	1PL6 224 – . . D . . – 0 7 7 7	218	6SE7 032 – 6 7 G50
0.87	92	0.930	39.2	1.930	750	1PL6 226 – . . D . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.88	102	0.931	39.2	2.326	860	1PL6 228 – . . D . . – 0 7 7 7	423	6SE7 035 – 1 E K50
0.84	68	0.921	59.3	0.503	370	1PL6 184 – . . F . . – 0 7 7 7	175	6SE7 032 – 1 7 G50
0.84	92	0.935	59.3	0.666	440	1PL6 186 – . . F . . – 0 7 7 7	262	6SE7 033 – 2 7 G50
0.87	90	0.942	59.2	1.479	630	1PL6 224 – . . F . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.87	122	0.945	59.1	1.930	750	1PL6 226 – . . F . . – 0 7 7 7	423	6SE7 035 – 1 E K50
0.86	174	0.948	59.0	2.326	860	1PL6 228 – . . F . . – 0 7 7 7	491	6SE7 036 – 0 E K50
0.85	79	0.938	97.6	0.503	370	1PL6 184 – . . L . . – 0 7 7 7	218	6SE7 032 – 6 7 G50
0.84	110	0.943	97.5	0.666	440	1PL6 186 – . . L . . – 0 7 7 7	308	6SE7 033 – 7 7 G50
0.86	118	0.950	97.5	1.479	630	1PL6 224 – . . L . . – 0 7 7 7	423	6SE7 035 – 1 K U50
0.87	160	0.952	97.4	1.930	750	1PL6 226 – . . L . . – 0 7 7 7	491	6SE7 036 – 0 K U50
0.86	188	0.952	97.3	2.326	860	1PL6 228 – . . L . . – 0 7 7 7	491^5)	6SE7 036 – 0 E K50

• Drive type:	• Vibration severity grade:	• Shaft and flange accuracy:	
Coupling	R	N	A
Coupling	R	R	B
Coupling	S	R	C
Coupling	SR	R	D
Belt	R	N	E
Belt	R	R	F
Increased cantilever forces	R	N	G
Increased cantilever forces	R	R	H

• Air flow direction:	• Shaft end:	
DE → NDE	with key, half key balancing	A
NDE → DE ^{6})	with key, half key balancing	B
DE → NDE	with key, full key balancing	C
NDE → DE ^{6})	with key, full key balancing	D
DE → NDE	plain	J
NDE → DE ^{6})	plain	K

• Paint finish:	
with primer	0
anthracite, standard paint finish (RAL 7016)	3
anthracite, special paint finish (RAL 7016)	6

• Special versions:	
Please specify using an additional Order code and if required, plain text.	–Z

Converter	E
Inverter	T

1) n_1: Max. permissible speed at constant power or speed where for $P=P_N$, there is still a 30% power reserve up to the stall limit.

2) n_{S1}: Max. permissible speed that is continuously permitted without speed duty cycles.

3) n_{max}: Maximum speed. It is not permissible that this speed is exceeded! Notice: The maximum speed is limited to lower values due to $f_{max} < 2 \cdot f_N$.

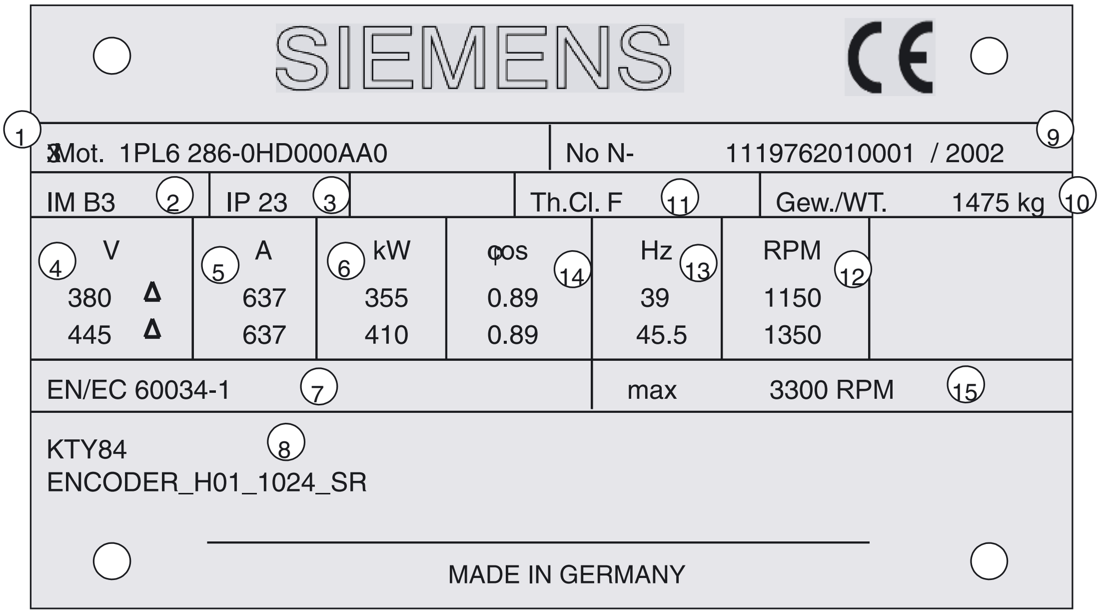
4) The speed is reduced for increased cantilever forces.

5) Notice: The rated converter current is less than the rated motor current

6) Preferred air-flow direction in polluted environment

7) Number "5" for SH 225 radial cooling, refer to Table 1-3

1.6 Rating plate data



SIEMENS

CE

3~Mot. 1PL6 286-0HD000AA0 | No N- 1119762010001 / 2002

IM B3 | IP 23 | Th.Cl. F | Gew./WT. 1475 kg

V		A	kW	cosφ	Hz	RPM
380	Δ	637	355	0.89	39	1150
445	Δ	637	410	0.89	45.5	1350

EN/EC 60034-1 | max 3300 RPM

KTY84
ENCODER_H01_1024_SR

MADE IN GERMANY

Figure 1-2 Rating plate (example for 1PL6286)

Table 1-5 Description of the rating plate data

Position	Description/Technical data
1	Motor type: Induction motor
2	Design
3	Degree of protection
4	Rated voltage [V] and winding circuit
5	Rated current [A]
6	Rated power [kW]
7	Standards and specifications
8	Code, encoder type, temperature sensor
9	Ident. No., production number
10	Motor weight [kg]
11	Temperature class
12	Rated speed [RPM]
13	Rated frequency [Hz]
14	Power factor [cosϕ]
15	Maximum speed [RPM]

1.7 Cooling

Description

1PL6 motors are force ventilated and open-circuit air-cooled low-voltage squirrel-case induction motors and have as standard a mounted separately-driven fan unit.
They have an enclosed design with inner cooling circuit (IC06 cooling type according to DIN EN/IEC 60034–6).

Ambient/cooling medium temperature

Operation: T = -15 °C to +40 °C (without any restrictions)
Storage: T = -20 °C to +70 °C

All of the Catalog data refer to an ambient temperature of 40 °C, mounted so that the motors are not thermally insulated and an installation altitude up to 1000 m above sea level.

If other conditions prevail (ambient temperature > 40 °C or installation altitude > 1000 m above sea level), the permissible torque/power must be defined using the factors from the following table (torque/power reduction according to EN 60034-6).

Ambient temperatures and installation altitudes are rounded-off to 5 °C or 500 m respectively.

Table 1-6 Factors to reduce the torque/power (de-rating)

Installation altitude above sea level	Ambient temperature in °C		
	40	45	50
1000	1.00	0.96	0.92
1500	0.97	0.93	0.89
2000	0.94	0.90	0.86
2500	0.90	0.86	0.83
3000	0.86	0.82	0.79
3500	0.82	0.79	0.75
4000	0.77	0.74	0.71

Caution

The surface of the motors can reach temperatures of over 100° C.

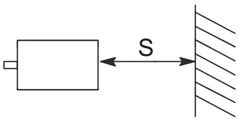
Fan mounting

SH 180 and SH 225:
The fan is axially mounted on the NDE and can be rotated through 4 x 90°.

SH 225 and SH 280:
The fan is radially mounted at the NDE and as far as the mounting type is concerned, can be differently ordered.

The minimum clearance to the customer's mounted parts and components and the air discharge opening as well as the minimum clearance S between the air intake and air discharge openings and adjacent components must be observed and maintained.

Table 1-7 Minimum clearances

Shaft height [mm]	Clearance to the customer's mounted parts and components [mm]	Clearance S [mm]	
180	150	100	
225	150	100	
280	170	120	

Cooling conditions for motors with pipe connection

For 1PL6 motors that have been designed for pipe cooling and/or separately-driven fan operation, the appropriately dimensioned pipes/ducts and fans must be suitably mounted and connected-up.

For motors with pipe/duct connection, the potential pressure drop within the motor is specified in the Table "Air flow rate, air flow direction and air discharge".

Air flow rate, air flow direction and air discharge

Table 1-8 Air flow rate, air flow direction and air discharge

Shaft height [mm]	Air flow direction	Required air flow rate [m³/s]	Air discharge	Pressure drop (Δp) [Pa]
180	NDE - DE	0.27	radial 1)	650
	DE - NDE		radial 1)	
225	NDE - DE	0.38	radial	850
	DE - NDE		radial 1)	
280	NDE - DE	0.52	radial	600
	DE - NDE		radial	

1) Fan can be rotated through 4 x 90°

For air-cooled motors, the cooling ducts, through which the ambient air flows, should be regularly cleaned depending on the degree of pollution at the mounting location. These air ducts can be cleaned, e.g. using dry, oil-free compressed air. Please refer to the Operating Instructions for details.

1.8 Bearing design

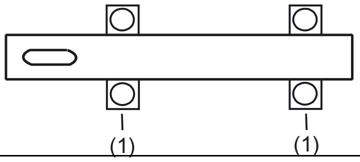
1.8.1 Out-drive types and bearing versions

The 1PL6 induction motors have roller bearings with grease lubrication. A deep-groove ball bearing is used as locating bearing at the NDE.

Depending on the load type, a deep-groove ball bearing or cylindrical roller bearing is used as floating bearing at the DE.

Spring elements are integrated in the bearing insert at the DE in order to compensate for the axial play of the outer bearing rings.

Table 1-9 Out-drive type with the appropriate bearing design

Application	Bearing arrangement
Coupling out-drive	SH 180 to 280 
Belt out-drive with normal cantilever force Belt out-drive with increased cantilever force Note: For a belt out-drive, a minimum cantilever force is required, refer to Chapter .	SH 180 to 280 

(1) = Deep-groove ball bearings
(2) = Cylindrical roller bearings

Bearing version, drive type and maximum speed

Table 1-10 Bearing version, drive type and maximum speeds

Frame size/ motor type	Bearing type/ drive type	Bearing type motor side	Bearing designation	Max. continuous speed in S1 duty [RPM]	Max. speed limit[1] [RPM]	Max. perm. cantilever force [2] [N]
				n_{S1}	n_{max}	F_{Gmax}
180	Deep-groove ball bearing for coupling out-drive	DE NDE	6214 C3 6214 C3	3500	5000	4900
180	Cylindrical roller bearings for belt out-drive	DE NDE	NU2214E 6214 C3	3500	5000	12800
180	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU2214E 6214 C3	3000	5000	16500
225	Deep-groove ball bearing for coupling out-drive	DE NDE	6216 C3 6216 C3	3100	4500	5200
225	Cylindrical roller bearings for belt out-drive	DE NDE	NU2216E 6216 C3	3100	4500	15000
224 226	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU2216E 6216 C3	2700	4500	20000
228	Cylindrical roller bearings for increased cantilever forces	DE NDE	NU2216E 6216 C3	2500	4000	20000
280	Deep-groove ball bearing for coupling out-drive	DE NDE	6220 C3 6220 C3	2200	3300	approx. 8700
280	Cylindrical roller bearings for belt out-drive	DE NDE	NU220E 6220 C3	2200	3300	approx. 26700

1) For continuous operation (with 30 % n_{max}, 60 % 2/3 n_{max}, 10 % standstill) for a duty cycle duration of 10 min.

2) Max. permissible cantilever forces for X=50 mm shaft end length and n=1000 RPM; for additional values, refer to Chapter "Cantilever force/axial force diagrams"

Note

If the motor is operated at speeds between n_{s1} and n_{max}, a speed duty cycle with low speeds and standstill intervals is required in order to reliably guarantee that the grease is well-distributed in the bearings.

Continuous speed n_{S1}

The max. permissible continuous operating speed nS1 depends on the bearings and the shaft height.

1.8.2 Bearing lifetime

The bearing lifetime is limited by material fatigue (fatigue lifetime) **or** if the lubrication fails (grease lifetime). The fatigue lifetime (statistical bearing lifetime L_{10h}) is mainly dependent on the mechanical load. The inter-dependency is shown in the cantilever force/axial force diagrams. The values are determined according to DIN/ISO 281.

The grease lifetime is mainly dependent on the bearing size, speed, temperature as well as the vibrational load.

The grease lifetime can be extended by especially favorable operating conditions (low average speed, low bearing temperatures, cantilever force or vibration load).

A reduction can be expected for difficult operating conditions and when motors are mounted vertically.

Lifetime lubrication (without re-lubricating)

For lifetime lubrication, the grease lifetime is harmonized with the bearing lifetime L_{10h}.

Bearing change interval (t_{LW})

The recommended bearing change intervals (refer to the following tables) are obtained from the inter-dependencies mentioned above for a specific operating point such as:

- Coupling or belt out-drive
- Horizontal mounting
- Cooling-medium temperature up to max. +40 °C
- Complying with the permissible cantilever and axial forces (refer to Chapter "Cantilever and axial forces")
- Complying with the maximum permissible speeds (refer to Chapter "Technical data and characteristics")

Table 1-11 Recommended bearing change intervals (standard bearing design)

Frame size	Out-drive type	Average operating speed RPM]	Stat. bearing lifetime L_{10h} [h]	Recommended bearing change interval t_{Lw} [h]	
				Permanent lubrication	**Re-lubrication**
180	Coupling out-drive	≤ 2000	40000	20000	40000
	Belt out-drive	≤ 1500	24000	12000	24000
	Increased cantilever forces		20000		20000
225	Coupling out-drive	≤ 1750	40000 1)	20000	40000 1)
	Belt out-drive	≤ 1400	24000	12000	24000
	Increased cantilever forces		20000		20000
280	Coupling out-drive	≤ 1500	40000 2)	20000	40000 2)
	Belt out-drive 3)	≤ 1300	24000	12000	24000

1) when vertically mounted 25000 [h]
2) when vertically mounted 24000 [h]
3) vertical mounting not permissible

Re-lubrication

For motors which can be re-lubricated at defined re-lubricating intervals, the bearing lifetime can be extended and/or unfavorable factors such as mounting conditions, speed, bearing size and mechanical load can be compensated (refer to the table "Recommended bearing change intervals (standard bearing design)").

Depending on the frame size, restrictions have to be taken into account - e.g. vertical mounting/shaft position.

For shaft height 280, it is possible to re-lubricate the bearings through a lubricating nipple.

It is possible to re-lubricate motors, shaft heights 180 and 225. A lubricating nipple is optionally provided, Code K40.

Re-lubricating intervals

The re-lubricating intervals are specified on the lubricant plate of the induction motor (technical data, refer to Table "Re-lubricating intervals").

Note

If there are longer periods of time (e.g. greater than 1 re-lubrication interval) between the motor being supplied and commissioned, then the bearings must be lubricated.
When re-lubricating, the shaft must be rotated in order to distribute the grease in the bearing (additional information and instruction, refer to the Operating Instructions).

Table 1-12 Re-lubricating intervals

Frame size	Bearing type/ drive type	Bearing type motor side	Bearing designa-tion	Re-lubricating intervals in operating hours [h]	Quantity of grease for each re-lubrication operation 1) [g]	Grease chamber 2) [g]	Possible number of re-lubricating intervals 3)
180	Deep-groove ball bearings coupling out-drive	DE NDE	6214 C3 6214 C3	8000	15	80	5
180	Cylindrical roller bearings belt out-drive, increased cantilever forces	DE NDE	NU2214E 6214 C3	6000	20	80	4
225	Deep-groove ball bearings coupling out-drive	DE NDE	6216 C3 6216 C3	8000	25	160	6
225	Cylindrical roller bearings belt out-drive, increased cantilever forces	DE NDE	NU2216E 6216 C3	6000	40	160	4
280	Deep-groove ball bearings coupling out-drive	DE NDE	6220 C3 6220 C3	4000	40	400	10
280	Cylindrical roller bearings belt out-drive, increased cantilever forces	DE NDE	NU220E 6220 C3	3000	40	400	10

1) Grease quantity for re-lubrication, normal conditions:
- cooling-medium temperature up to max. +40 °C
- horizontal mounting
- average operating speed, refer to the table "Recommended bearing change intervals (standard bearing design)"
- complying with the permissible cantilever and axial forces (refer to Chapter "Cantilever and axial forces")
- complying with the max. permissible speeds (refer to the characteristics)

2) Quantity of grease that can be injected into the grease chamber when precisely maintaining the quantity of grease for each re-lubrication interval.

3) Calculation number of re-lubricating intervals; the bearing lifetime is specified (refer to Chapter "Bearing lifetime) according to statistical perspectives in accordance with the L_{10h} definition.

Note

Unfavorable factors such as the effects of mounting/installation, speed or mechanical loads require that the re-lubricating intervals are appropriately adapted.

Situations such as these require special consideration or must be be calculated - and must be engineered according to the limitations and constraints together with the responsible motors plant.

1.8.3 NDE bearings, insulated version (option L27)

Relevant, additional bearing currents

When compared to a pure sinusoidal supply, the pulsed output voltage of a frequency converter results in additional motor bearing currents. The relevant additional bearing currents are:

- Circulating currents
- EDM currents
- Rotor ground currents

Factors that influence bearing currents

Above a certain magnitude, bearing currents result in localized melting at the bearing rings and rolling assemblies as well as lubricant wear. This reduces the bearing lifetime. Essential influencing factors include:

- Motor speed and associated operating time
- Pulse frequency of the frequency converter
- Grounding relationships between the motor and the connected load

Application for option L27

At speeds < 500 RPM, the load due to bearing currents increases significantly. Option L27 is required if the motor is operated in the speed range between 0 ... 500 RPM for a longer period of time. Without option L27, the total operating time in the speed range 0 ... 500 RPM may be a maximum of 800 h (for an assumed bearing change interval (t_{LW}) of the bearings of 20,000 h.

The table below is applicable for motors connected to SIMOVERT MASTERDRIVES drive converters and inverters in a closed-loop control version:

- Vector Control (VC) with pulse frequencies of 2.5 kHz and 6 kHz
- Motion Control (MC) with pulse frequencies of 5 kHz and 10 kHz

Table 1-13 Measures that are required for operation in the speed range < 500 RPM

Shaft height	Bearing change interval (t_{LW}) for permanent lubrication [h] 1)	Options that are required	Comments
SH 180	20000	L27	Insulated NDE bearings
SH 225		L27	Insulated NDE bearings
SH 280		–	Generally insulated NDE bearings

1) Definition, refer to the table "Recommended bearing change intervals (standard bearing design)"

Motor grounding

In order to avoid rotor ground currents, the motor frame should be well grounded - e.g. by using shielded motor cables. The motor cable shield should be connected at both ends through the largest possible surface area.

For specific applications, the grounding of the motor Z_{hg} can be more unfavorable than the grounding of the connected loads Z_{rg}, e.g. for long motor cables and when the motor is mounted in an insulated fashion. In this case, the capacitive discharge (leakage) current of the motor flows from the motor frame through the motor shaft to the connected load and from there to ground.

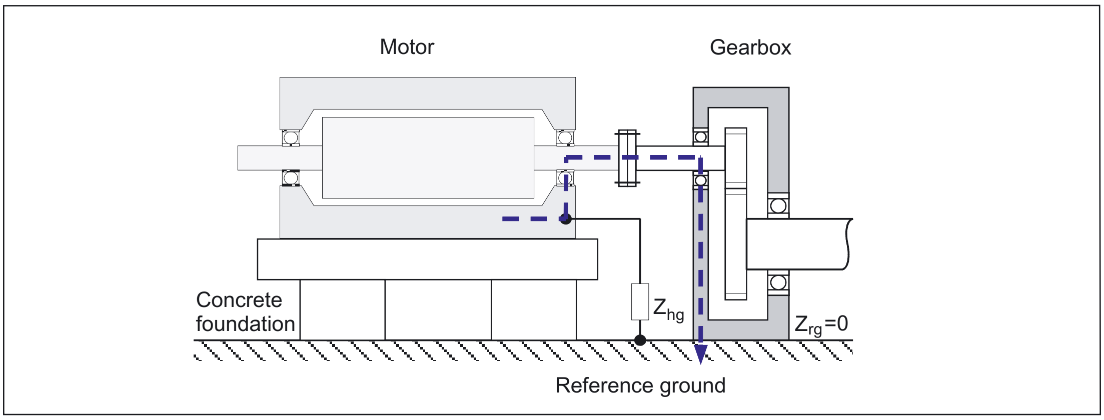


Figure 1-3 Bearing current due to the grounding situation (=rotor ground current)

The rotor ground current should be avoided by using an electrically insulating coupling. If such a coupling cannot be used for mechanical reasons, then the motor frame must be connected to the load through the largest possible surface area. The capacitive discharge (leakage) current then flows from the motor frame to the load and not through the bearings. The connection between the motor frame and load is only effective if it represents an extremely low impedance for the high-frequency discharge (leakage) current. To achieve this, use several flat straps, e.g. grounding straps, metal plates.

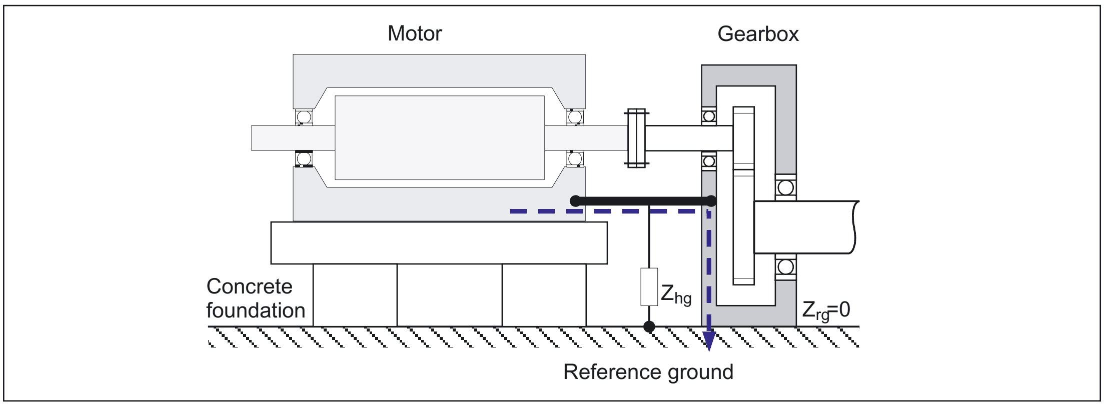


Figure 1-4 Connection between the motor frame and load to avoid rotor ground currents

1.9 Vibration severity – limit values

The diagrams are included in the Configuration Manual, "General Part for Induction Motors".

Foot support

Note

A foot support is required for the following motors in order to maintain the vibration severity limit values:

SH 180 to SH 280 for type of construction IM B35.

For SH 180 to SH 280, a foot support can be eliminated by appropriately engineering the motor - refer to the engineering information and instructions in the Chapter "Mounting".

Permissible vibrations

Note

In order to ensure perfect functioning and a long lifetime, the vibration values specified according to ISO 10816 should not be exceeded at the motor.

Table 1-14 Permissible vibration values

Vibrational velocity V_{rms} [mm/s]	Vibrational frequency f [Hz]	Vibrational acceleration a [m/s^2]
4.5	10	0.4
	250	10

Note

Deviating from this standard, motors may be loaded as following with restrictions regarding the lifetime and operated outside the natural mounting frequency:

Table 1-15 Vibrational values where the lifetime is restricted

Axial	Radial
0.1 g	1 g

Note

The mounted parts and components (belt pulley, coupling components etc.) must be balanced according to ISO 1949. Balancing quality G 2.5

1.10 Mounting

1.10.1 Danger and warning information when mounting

Mounting instructions

Warning

These motors are electrically operated. When electrical equipment is operated, certain parts of these motors are at hazardous voltage levels. If this motor is not correctly handled/operated, this can result in death or severe bodily injury as well as significant material damage. Please carefully observe the warning information in this section an on the product itself.

Only **qualified personnel** may carry-out service or repair work on this motor.

Before starting any work, the motor and the fan must be disconnected from the line supply and grounded.

Only spare parts, certified by the manufacturer, may be used.

The specified service/maintenance intervals and measures as well as the procedures for repair and replacement must be carefully maintained and observed.

Warning

Only qualified personnel are permitted to mounted and carry-out repair work on this motor.

When transporting the motors, use all of the hoisting lugs provided!

A suitable crane/lifting device must be used. Incorrect execution, unsuitable or damaged equipment and resources can result in injury and material damage. The hoisting and transport equipment as well as the load suspension equipment must be in full compliance with the appropriate regulations.

All work should be undertaken with the system in a no-voltage condition!

The motor should be connected up according to the circuit diagram provided.

In the terminal box it must be carefully ensure that the connecting cables are routed and connected so that the are insulated with respect to the terminal box cover.

It must be ensured that the terminal box is sealed.

It is not permissible to use cables with insulation that is either defective or damaged.

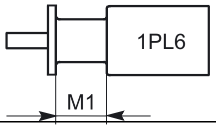
Only spare parts, certified by the manufacturer, may be used.

After the motor has been installed, the brake (if one is used) must be checked to ensure that it is functioning perfectly!

Note

Flange mounting is only possible using studs and nuts. Clearance M1 for threading the nut between the motor flange and motor frame acc. to DIN 42948 (refer to Table "Flange mounting with threaded studs and nuts").

Table 1-16 Flange mounting with threaded studs and nuts

Shaft height	M1 [mm]	
180	36	
225	40	
280	45	

1.10.2 Retaining and mounting instructions

In order to achieve smooth vibration-free operation a stable foundation is required, the motor must be precisely aligned and the parts to be mounted on the shaft end must be correctly balanced.

The following mounting instructions must be carefully observed:

- Use suitable equipment when mounting drive elements. Use the thread at the shaft end.
- Do not apply any blows or axial pressure to the shaft end.
- Especially for high-speed motors with flange mounting, it is important that the mounting is stiff in order to locate any resonant frequency as high as possible so that it remains above the maximum rotational frequency.
- Thin sheets (shims) can be placed under the motor mounting feet to align the motor and to avoid mechanically stressing the motor. The number of shims used should be kept to a minimum.
- In order to securely mount the motors and reliably and safely transfer the drive torque, bolts with strength class 8.8 acc. to ISO 898–1 should be used.

Notice

All flange-mounted motors must have a stable motor suspension assembly and for high field weakening speeds must be supported using the appropriate feet at the bearing endshield (foot flange type of construction).

Support using feet at the bearing endshield is not required if the following conditions are maintained:

- For flange-mounted motors, there is a stable motor suspension design
- The permissible vibration values acc. to DIN ISO 10816 are carefully maintained
- The maximum speed is limited (refer to Table "Restricting the maximum speed")

Motors that are mounted, as a result of their type of construction, to the wall using the motor feet, must be retained in place using an adequately dimensioned positive form fit (e.g. using studs or mounting rails).

When commissioning the motors, it must be ensured that the permissible vibration values in accordance with DIN ISO 10816 are maintained.

Table 1-17 Restricting the maximum speed

Shaft height [mm]	Max. permissible speed [RPM]
180	3000
225	2500
280	2000

Note

1PL6 motors are force-ventilated. When mounting the motors, it must be ensured that the motor can be well ventilated. This is especially true when mounting the motors in enclosures. It is not permissible that the hot discharged air is drawn in again.

Mount air-cooled motors so that the cooling air can enter and be discharged without any restrictions (also refer to Section "Cooling").

Caution

Liquid must be prevented from collecting in the flange, both in the vertical as well as horizontal mounting positions. This would have a negative impact on the bearing and bearing grease.

1.10.3 Natural frequency when mounted

The motor is a system which is capable of vibration at its natural frequency. For all motors, this resonant frequency lies above the specified maximum speed.

When the motor is mounted onto a machine, a new system, which is capable of vibration, is created with modified natural frequencies. These can lie within the motor speed range.

This can result in undesirable vibrations in the mechanical drive transmission.

Notice

Motors must be carefully mounted on adequately stiff foundations or bedplates. Additional elasticities of the foundation/bedplates can result in resonance effects of the natural frequency at the operating speed and therefore result in inadmissibly high vibration values.

The magnitude of the natural frequency when the motor is mounted depends on various factors and can be influenced by the following points:

- Mechanical transmission elements (gearboxes, belts, couplings, pinions, etc.)
- Stiffness of the machine design to which the motor is mounted
- Stiffness of the motor in the area around the foot or customer flange
- Motor weight
- Machine weight and the weight of the mechanical system in the vicinity of the motor
- Damping properties of the motor and the driven machine
- Mounting type, mounting position (IM B5, IM B3, IM B35, IM V1 etc.)
- Motor weight distribution, i.e. length, shaft height

After the motors have been mounted, the caps for the screw holes in the mounting feet must be re-located.

Electrical Connections

2

2.1 Power connection

Caution

Carefully observe the current which the motor draws for your particular application! Adequately dimension the connecting cables according to IEC 60204-1.

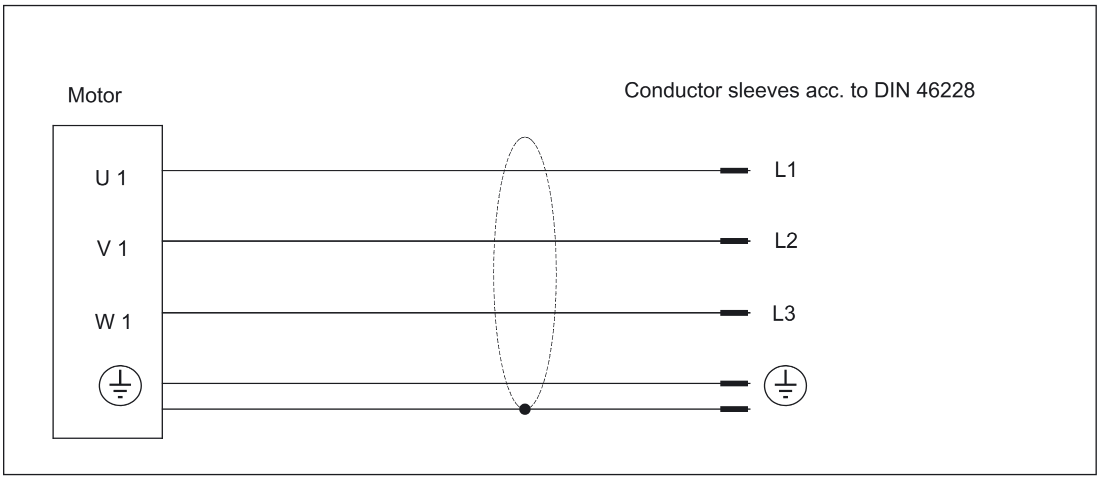
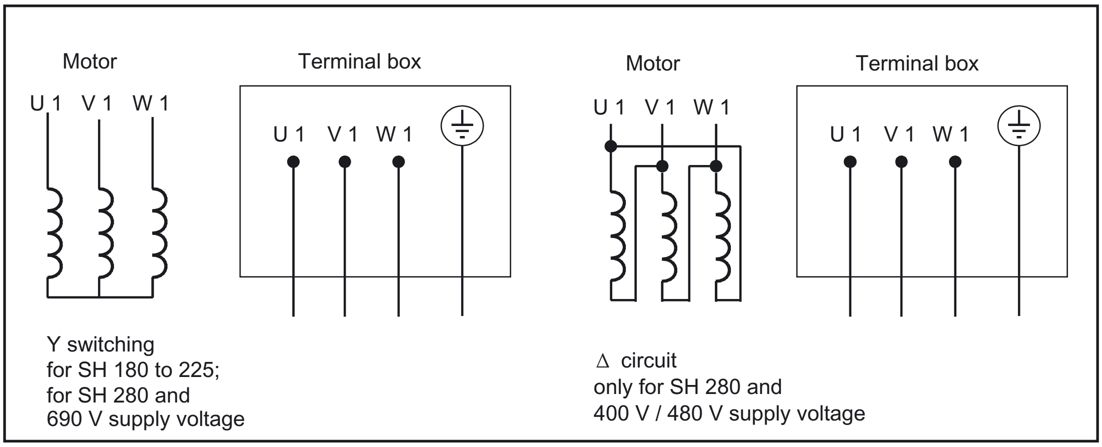


Figure 2-1 Power cable

Terminal box connection

The type designation of the mounted terminal box as well as details for connecting-up the line feeder cables can be taken from Table "Terminal box assignment, max. cable cross-sections that can be connected for the 1PL6 series". A circuit diagram to connected-up the motor winding is provided in the terminal box when the motors are shipped.



Y switching
for SH 180 to 225;
for SH 280 and
690 V supply voltage

∆ circuit
only for SH 280 and
400 V / 480 V supply voltage

Figure 2-2 Circuit diagram

Cross-sections

When connecting cables to the terminal board, the connecting cables must be dimensioned corresponding to the rated current and the size of the cable lugs must match the dimensions of the terminal studs.

Table 2-1 Current load capability acc. to EN 60204-1 for PVC insulated cables with copper conductors for an ambient temperature of 40 °C and routing type C (cables and conductors routed along walls/panels and in cable ducts).

I_{rms} [A]	Cross-section required [mm^2]	Comments
50	10	Correction factors regarding the ambient temperature and routing type must be applied in compliance with EN 60204-1.
66	16	
84	25	
104	35	
123	50	
155	70	
192	95	
221	120	
234	150	
267	185	
> 221	Refer to VDE0298 Standard 0298 Cross-sections up to 300 mm^2 are specified in this standard.	

Note

The cables are available in a UL version or for higher mechanical requirements up to a cross-section of 185 mm^2.

For technical data of the cables, refer to Catalog DA 65.3.

2.2 Connecting-up information

Note

The overall system compatibility is only guaranteed when using shielded power cables.

Shields must be incorporated in the protective grounding concept. Conductors that are open circuit and which are not being used and also electrical cables which can be touched should be connected to protective ground. If the brake feeder cables in the SIEMENS cable are not used, then the brake conductor cores and shields must be connected to the cabinet ground (open-circuit cables result in capacitive charges!).

Use EMC cable glands for fixed cable entries. The cable glands are screwed into the threaded holes of the cable entry plate that can be removed.

Openings that are not used must be closed using an appropriate metal cap.

⚠ Warning

Before carrying out any work on the AC motor, please ensure that it is powered-down and the system is locked-out so that the motor cannot re-start!

Please observe the rating plate data and circuit diagram in the terminal box. Appropriately dimension all of the connecting cables.

Internal potential bonding

The potential bonding between the grounding terminal in the box enclosure and the motor housing is established through the terminal box retaining bolts. The contact locations below the heads of the bolts are bare and are protected against corrosion.

The standard screws that are used to connect the terminal box cover to the terminal box are sufficient as potential bonding between the terminal box cover and the terminal box enclosure.

Note

Connecting points are provided at the frame or bearing endshield to connect an external protective conductor or a potential bonding conductor.

Motor and connecting cables

- Twisted or three-core cables with additional ground conductor should be used for the motor feeder cables. The insulation should be removed from the ends of the conductors so that the remaining insulation extends up to the cable lug or terminal.

- The connecting cables should be freely arranged in the terminal box so that the protective conductor has an overlength and the cable conductor insulation cannot be damaged. Connecting cables should be appropriately strain relieved.
- Carefully ensure that the specified 10 mm air clearances are maintained as a minimum.

After connecting-up, the following should be checked/tested

- The inside of the terminal box must be clean and free of any cable pieces
- All of the terminal screws must be tight
- The minimum air clearances must be maintained
- The cable glands must be reliably sealed
- Unused cable glands must be closed and the plugs must be tightly screwed in place
- All of the sealing surfaces must be in a perfect condition

Connect-up the ground conductor

The grounding conductor cross-section must be compliance with the appropriate installation/erection regulations, e.g. acc. to IEC/EN 60204–1.

For shaft heights 225 and 280, the ground conductor must be additionally connected to the motor bearing endshield. There is a terminal lug for the ground cable at the designated connection point. This is suitable for connecting multi-conductor cables with cable lugs or ribbon cables with the appropriate conductor terminations.

Please note the following when connecting-up:

- The connecting surface must be bare and must be protected against corrosion using a suitable substance, e.g. using acid-free Vaseline
- Spring washer and normal washer must be located under the head of the screw
- The minimum necessary screw-in depth and the tightening torque for the clamping bolts must be maintained

Table 2-2 Screw-in depth and tightening torque

Screw	Penetration depth	Tightening torque
M8 x 30	> 8 mm	20 Nm

Terminal box assignments

Table 2-3 Terminal box assignment, max. cable cross-sections that can be connected for the 1PL6

Shaft height	Motor type	Terminal box type	Cable gland	Max. possible outer cable diameter mm	Cable gland	Max. possible outer cable diameter mm2)	No. of main terminals	Max. connectable cross-section per terminal [mm^2]	Max. possible current for each terminal 1) [A]
			Valid for the 8th position of the Order No. "2", "4" or "6"3)		Valid for the 8th position of the Order No. "7" or "8"				
180	1PL6184-□□B	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6184-□□D	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6184-□□F	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6184-□□L	1XB7422	2 x M 72 x 2	56	2 x M63 x 1.5	53	3 x M12	2 x 70	242
	1PL6186-□□B	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6186-□□D	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6186-□□F	1XB7422	2 x M 72 x 2	56	2 x M63 x 1.5	53	3 x M12	2 x 70	242
	1PL6186-□□L	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
225	1PL6224-□□B	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6224-□□D	1XB7422	2 x M 72 x 2	56	2 x M63 x 1.5	53	3 x M12	2 x 70	242
	1PL6224-□□F	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6224-□□L	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6226-□□B	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6226-□□D	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6226-□□F	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6226-□□L	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6228-□□B	1XB7322	2 x PG 42	40	2 x M50 x 1.5	38	3 x M12	2 x 50	191
	1PL6228-□□D	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6228-□□F	1XB7700	3 x M 72 x 2	56	3 x M75 x 1.5	68	3 x 2 x M12	3 x 150	583
	1PL6228-□□L	1XB7700	3 x M 72 x 2	56	3 x M72 x 2	68	3 x 2 x M12	3 x 150	583
280	1PL628□-□□□	1XB7712	4 x M 75 x 1.5	68	-	-	(3+1) 4) x 4 x M16	4 x 185	925

1) Current load capability based on IEC 60204-1, routing type C.

2) Dependent on the design of the metric cable gland

3) Not for shaft height 280

4) Including grounding terminal

Routing cables in a wet/moist environment

Notice

For motors in wet/moist environments, cables should be routed as shown in the following diagram.

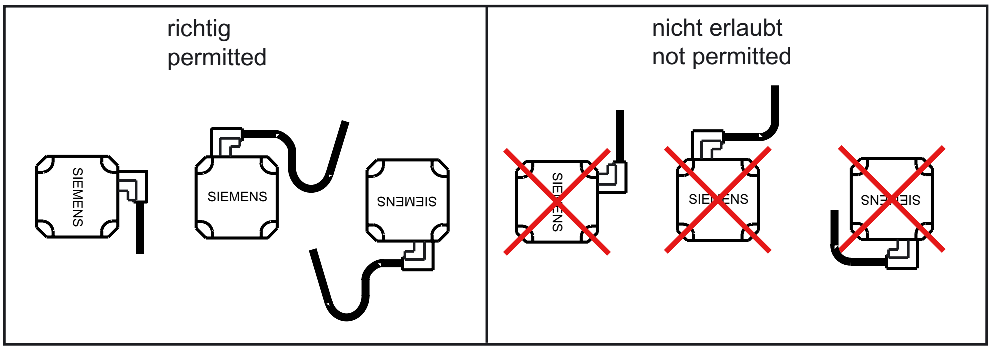


Figure 2-3 Routing cables in a wet/moist environment

2.3 Connecting-up a separately-driven fan

Caution

The separately-driven fan unit is only designed for one direction of rotation corresponding to the direction of rotation arrow. The direction of rotation arrow and the direction of rotation of the fan impeller can be seen at the rear of the fan.

It is not permissible to operate the motor with incorrect direction of rotation of the fan and this could destroy the motor.

Changing the direction of rotation: If the separately-driven fan unit rotates in the wrong direction, then two line supply conductors must be interchanged in the terminal box.

Recommended connection

The connection is realized through the terminal box or through the terminal box of the separately-driven fan. The fan should be operated through motor protection circuit-breakers.

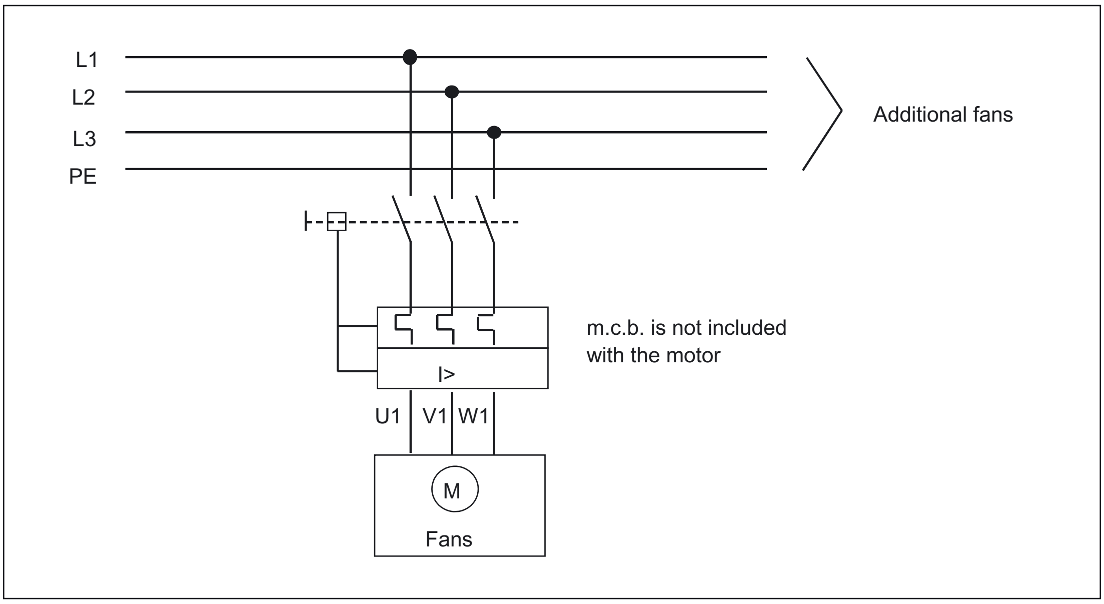


Figure 2-4 Recommended connection

Table 2-4 Connection values for the separately-driven fan

Shaft height [mm]	Air flow direction	Rated current [A] at		
		400 V/50 Hz (±10%)	400 V/60 Hz (±10%)	480 V/60 Hz (+5%, -10%)
180	DE --> NDE	0.8	1.1	1.1
	NDE --> DE	0.8	1.1	1.1
225	DE --> NDE	2.8	2.8	2.8
	NDE --> DE	1.9	2.2	2.2
280	DE --> NDE	2.55	2.6	2.6
	NDE --> DE	2.55	2.6	2.6

Technical Data and Motor Characteristics

3

The induction motors must be continually cooled in operation independent of the operating mode.

The speed-power diagrams P = f(n) and the speed-torque diagrams M = f(n) for operation with SIMOVERT MASTERDRIVES are described in the motor characteristics.

Constant-torque operation is possible from standstill up to the rated operating point n_N. The field and therefore the motor torque remain constant in this base speed range. This is the reason that the power increases linearly with the speed.

This is then followed by a constant-power range where the field is weakened. The field-weakening range is limited by the stall limit. In order that safe, reliable operation is guaranteed even when the line supply voltage fluctuates and the motor parameters vary, a safety margin of 30% should always be maintained to the torque limit at every operating point. This safety margin is shown in the diagrams P = f/n).

In addition, the calculated stall torque M = f(n) (without
30 % safety margin) is specified in the diagrams.

In addition to the S1 characteristics, the S6 characteristics are also shown. The S6 power values for a relative power-on duration of 25 %, 40 % and 60 % are specified, where technically possible. In addition, the required motor current is specified that is used as a basis to select a suitable drive converter.

Table 3-1 Explanation of the codes in alphabetical order

Abbreviation	Unit	Description
f_N	Hz	Rated frequency
I_N	A	Rated current
I_μ	A	No-load current
M_N	Nm	Rated torque
n_1	RPM	Speed for field weakening with constant power
n_{max}	RPM	Maximum rotational speed
n_N	RPM	Rated speed
n_{S1}	RPM	Continuous speed for field weakening
P_N	kW	Rated power
T_{th}	min	Thermal time constant
V_N	V	Rated voltage

3.1 Technical data and characteristics for MASTERDRIVES VC

3.1.1 P/n and M/n diagrams for 3-ph. 400 V AC

Table 3-2 MASTERDRIVES VC, 400 V, 1PL6184-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	24.5	585	69	300	14.4	1000	2000	2000	30	33

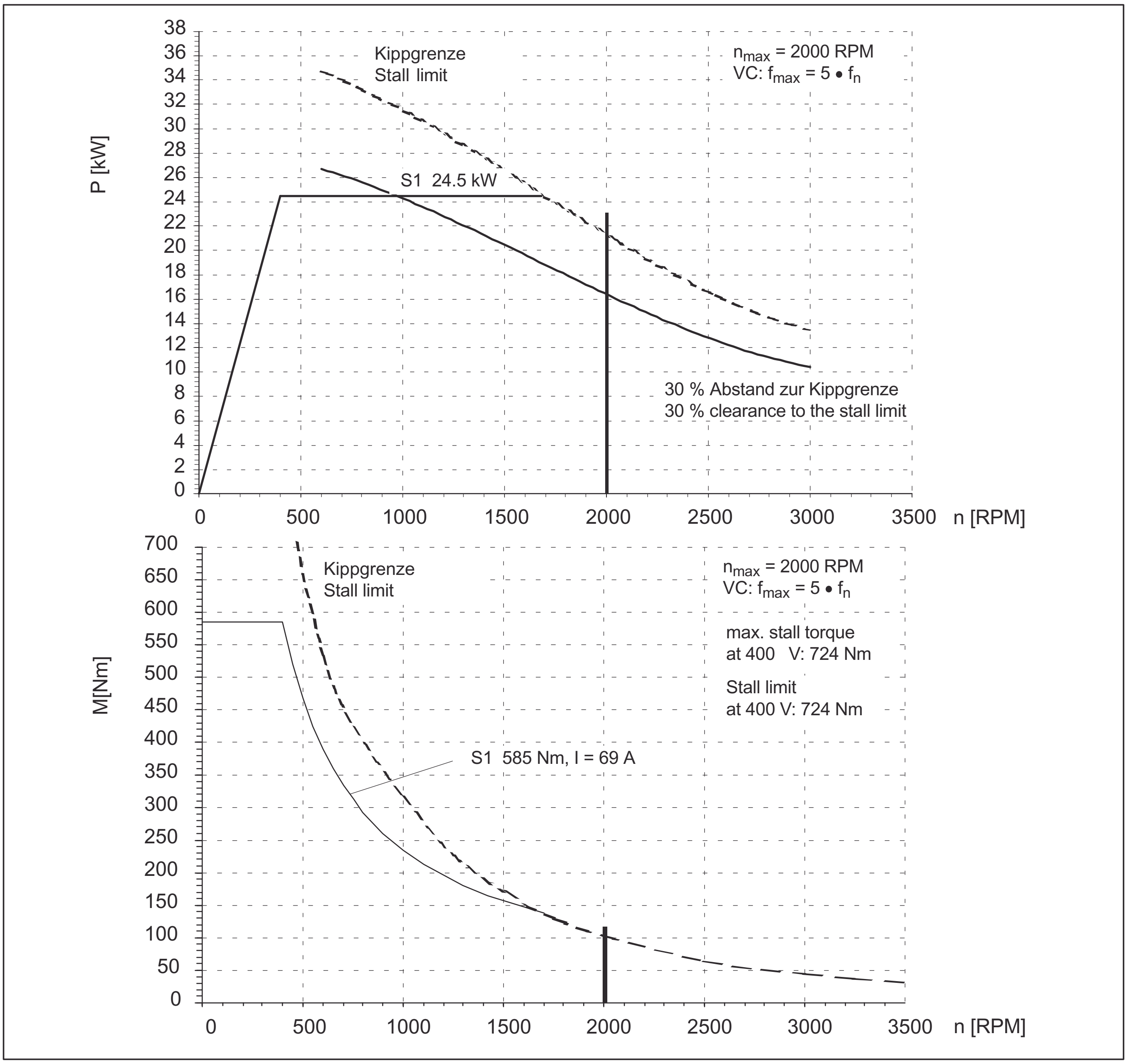


Figure 3-1 MASTERDRIVES VC, 1PL6184-□□B□□

Table 3-3 MASTERDRIVES VC, 400 V, 1PL6186-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	31.5	752	90	290	14.3	1400	2000	2000	30	47

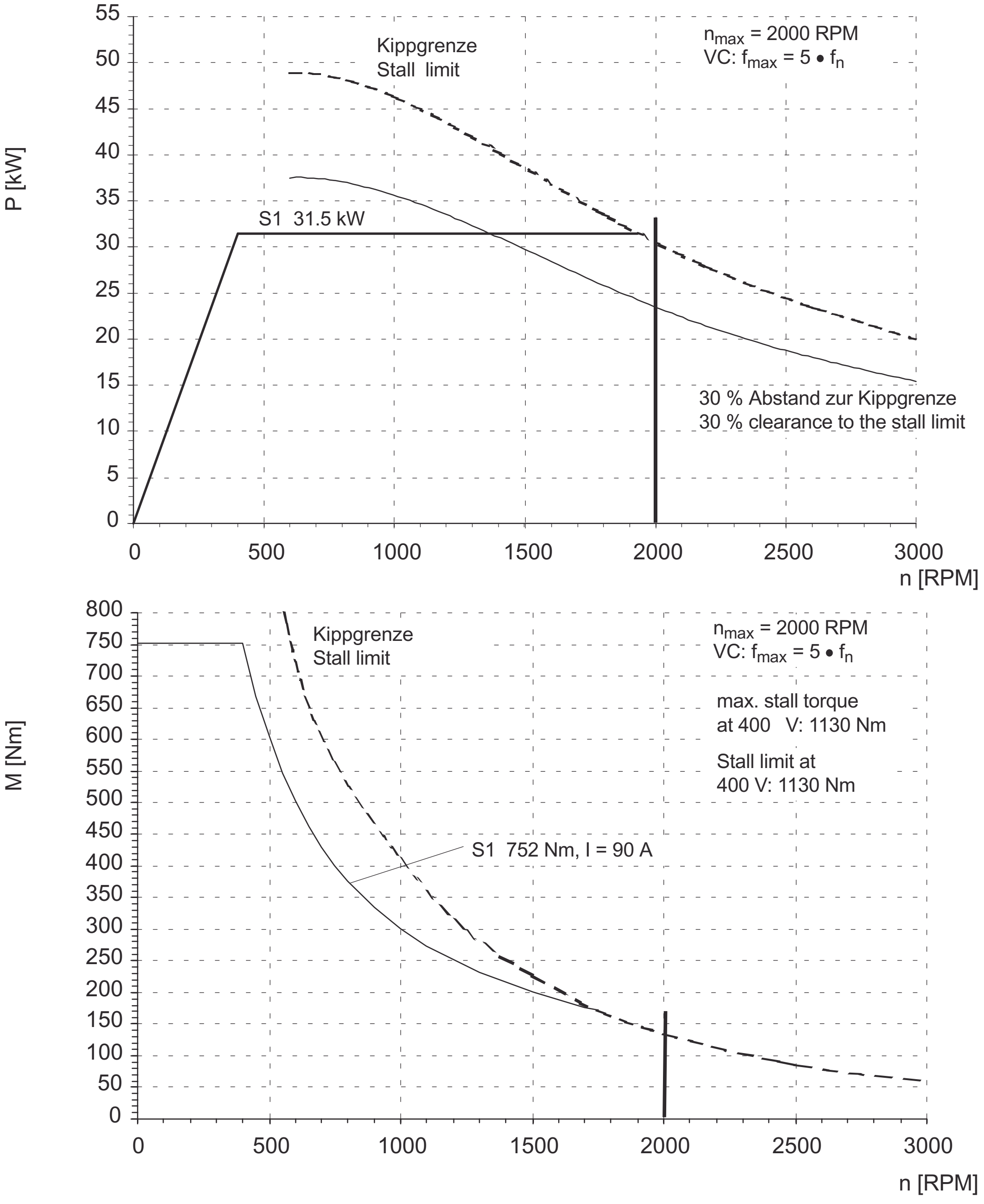


Figure 3-2 MASTERDRIVES VC, 1PL6186-□□B□□

Table 3-4 MASTERDRIVES VC, 400 V, 1PL6224-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	45	1074	117	300	14.2	1150	2000	2000	30	45

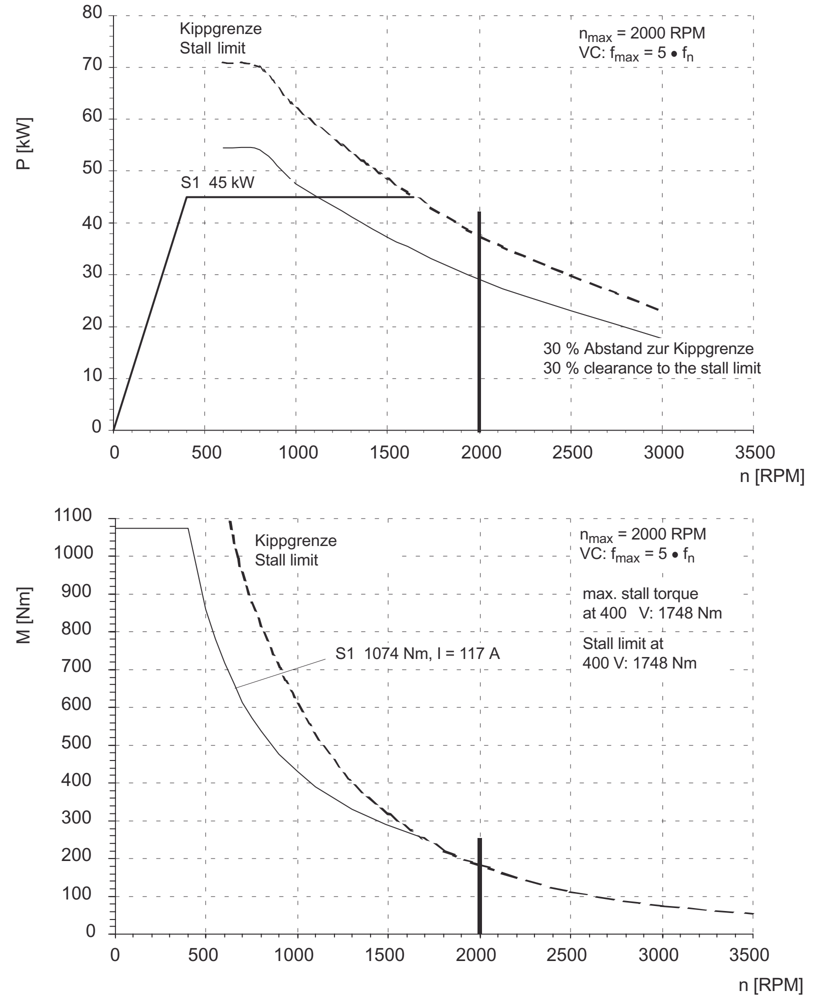


Figure 3-3 MASTERDRIVES VC, 1PL6224-□□B□□

Table 3-5 MASTERDRIVES VC, 400 V, 1PL6226-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	57	1361	145	305	14.0	1400	2000	2000	30	67

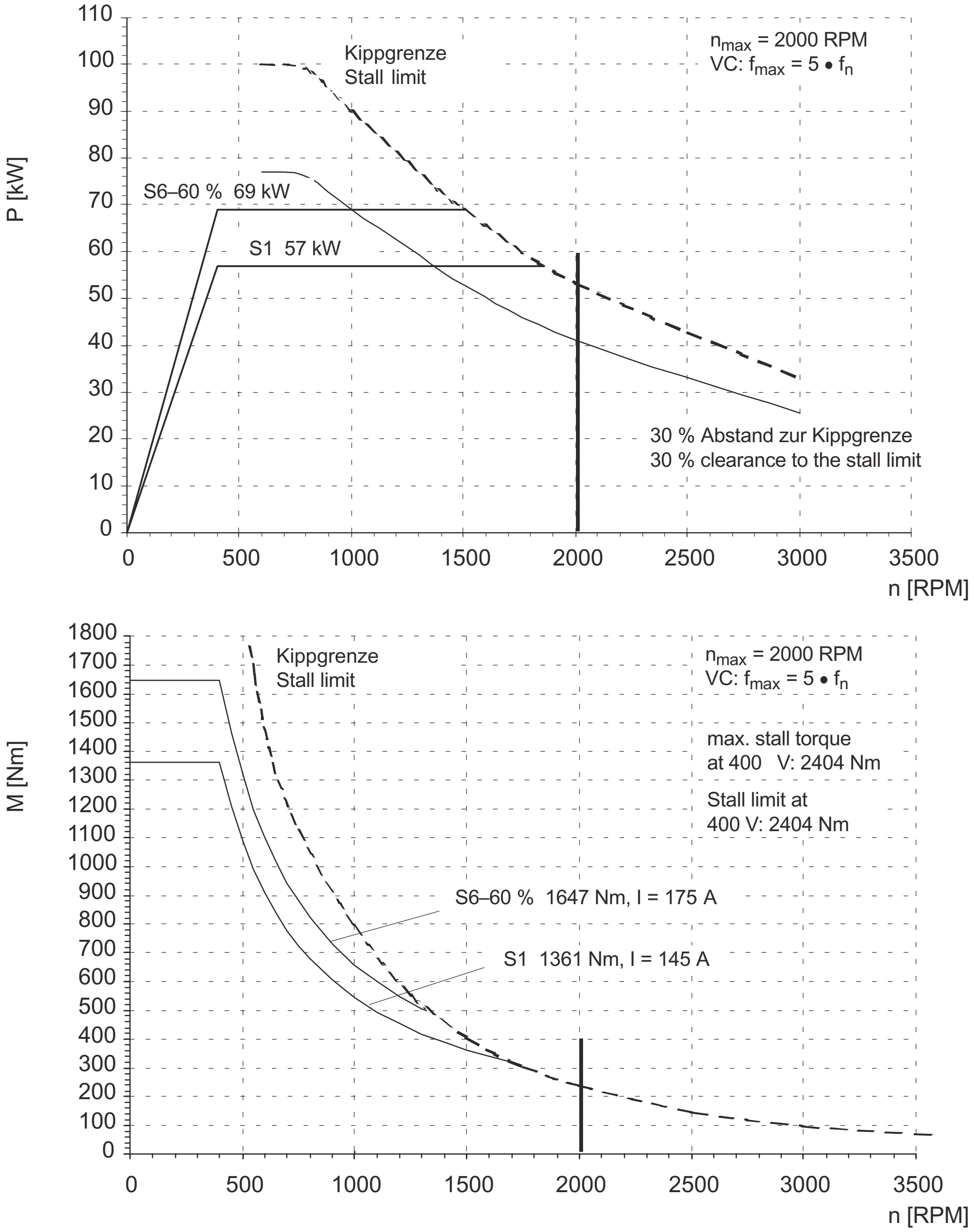


Figure 3-4 MASTERDRIVES VC, 1PL6226-□□B□□

Table 3-6 MASTERDRIVES VC, 400 V, 1PL6228-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	72	1719	181	305	14.0	1300	2000	2000	30	77

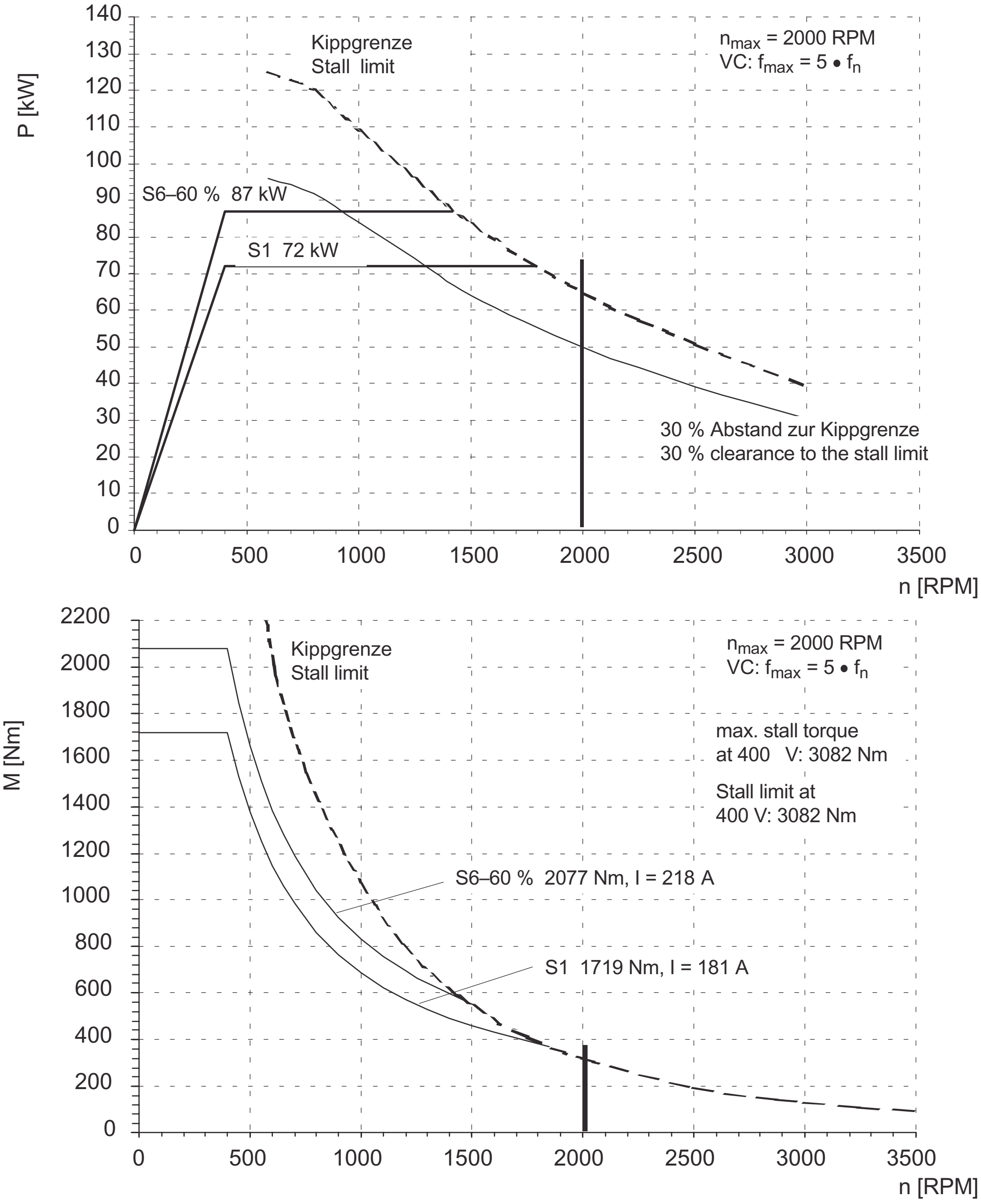


Figure 3-5 MASTERDRIVES VC, 1PL6228-□□B□□

Table 3-7 MASTERDRIVES VC, 400 V, 1PL6284-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
800	195	2328	335	400	27.3	1340	2200	3300	53	95

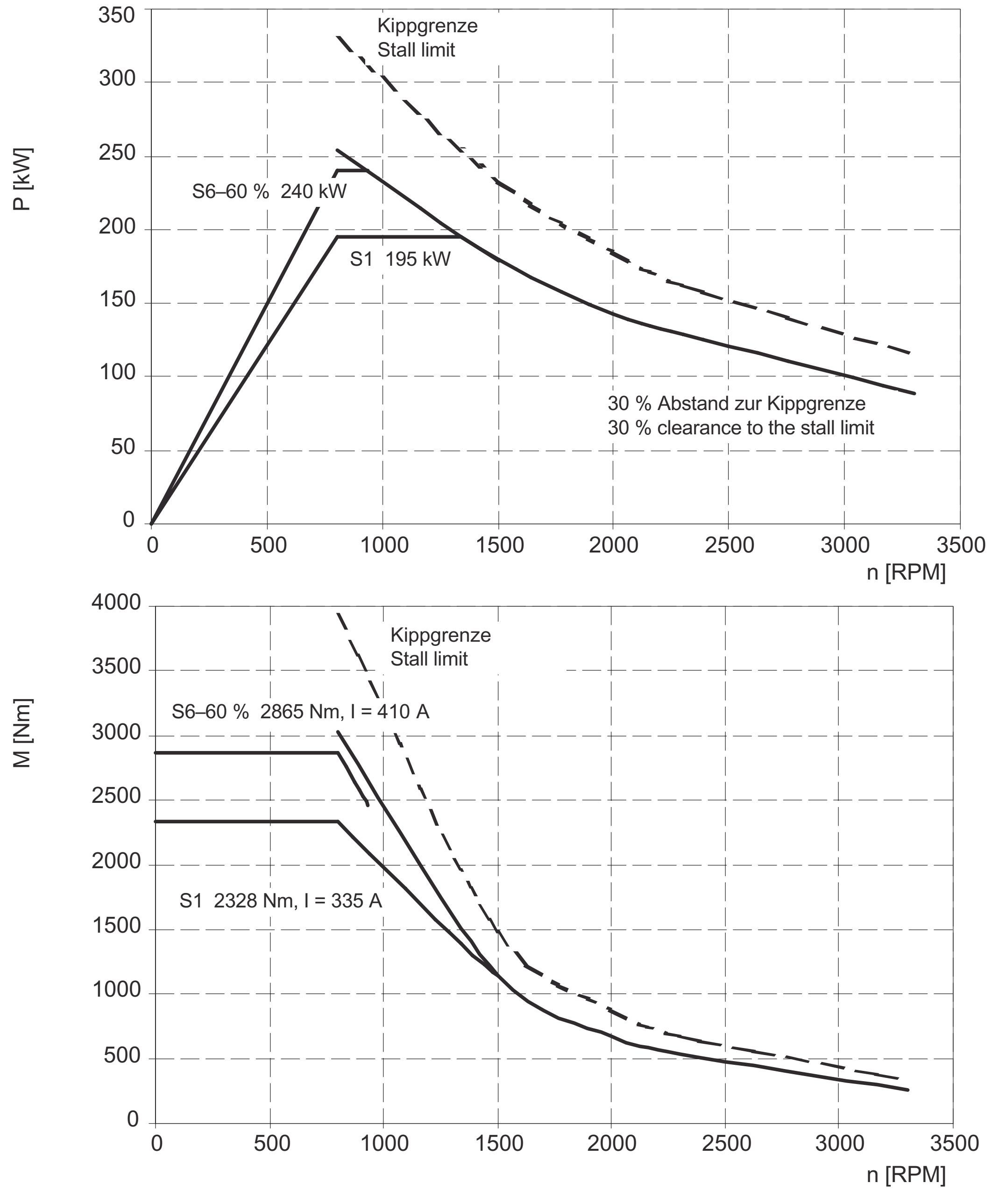


Figure 3-6 MASTERDRIVES VC, 1PL6284-□□C□□

Table 3-8 MASTERDRIVES VC, 400 V, 1PL6286-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
800	250	2984	440	385	27.3	1450	2200	3300	65	135

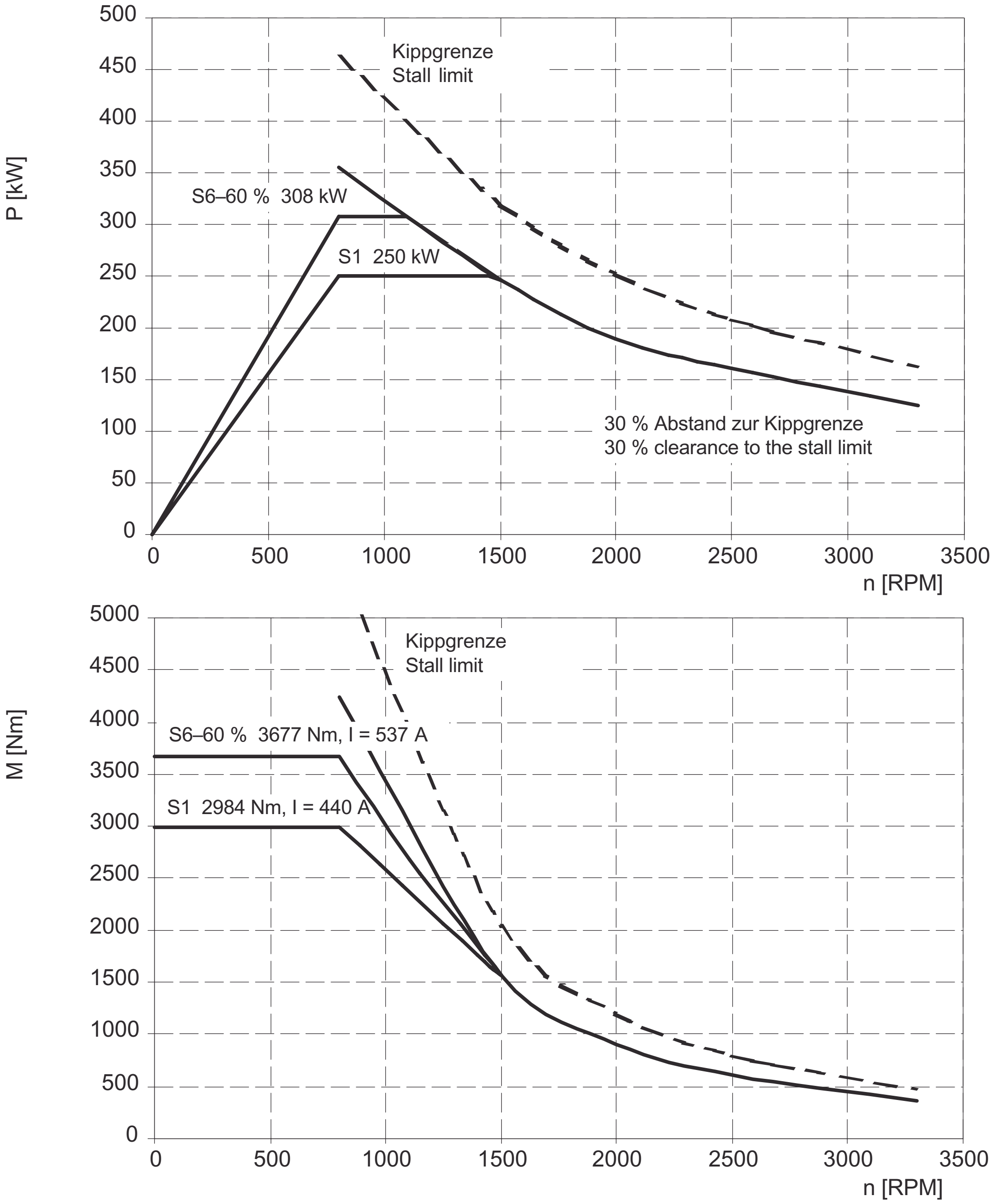


Figure 3-7 MASTERDRIVES VC, 1PL6286-□□C□□

Table 3-9 MASTERDRIVES VC, 400 V, 1PL6288-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
800	310	3701	570	370	27.3	1520	2200	3300	72	170

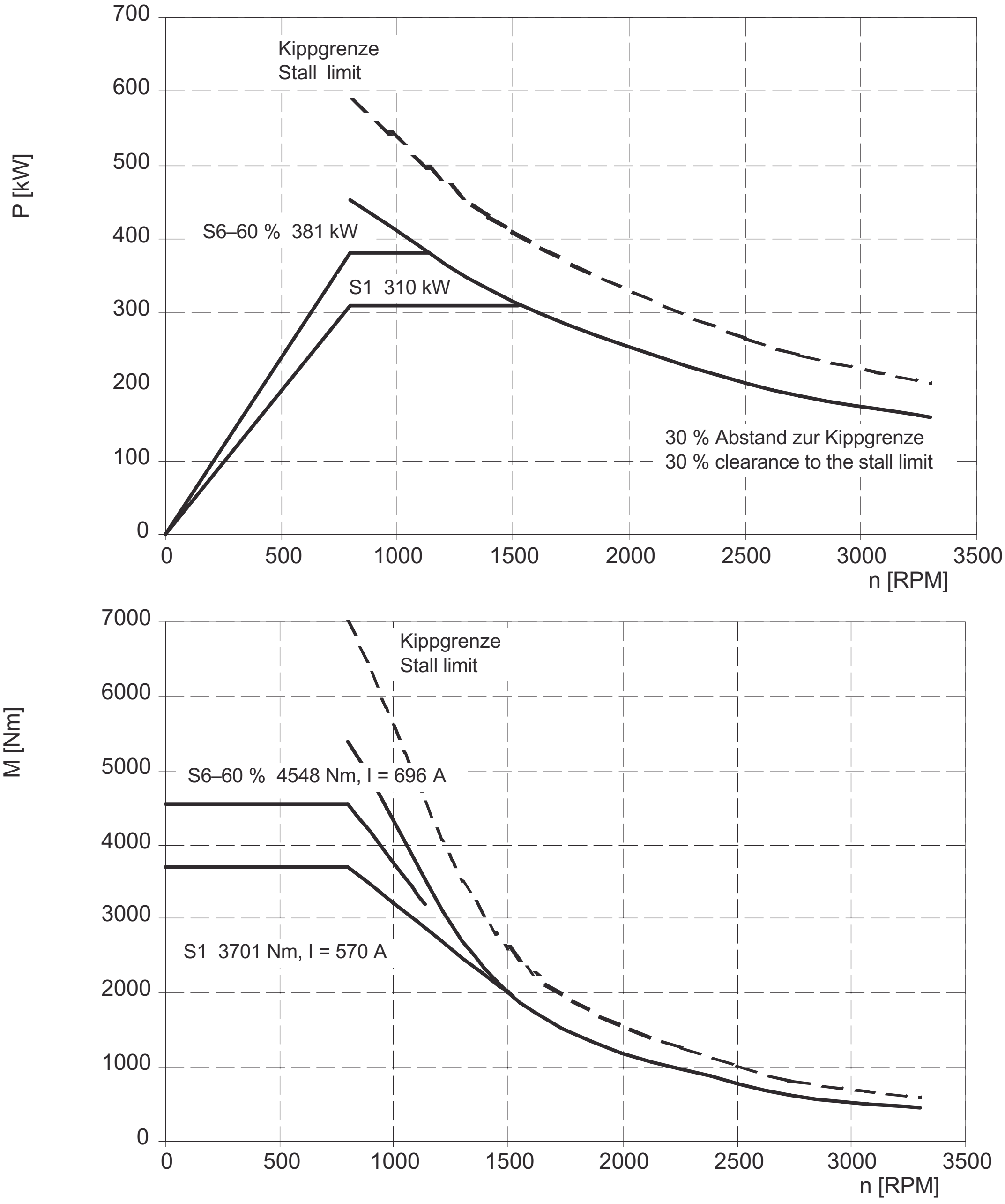


Figure 3-8 MASTERDRIVES VC, 1PL6288-□□C□□

Table 3-10 MASTERDRIVES VC, 400 V, 1PL6184-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	65	540	121	400	39.4	1750	3500 1)	5000	30	46

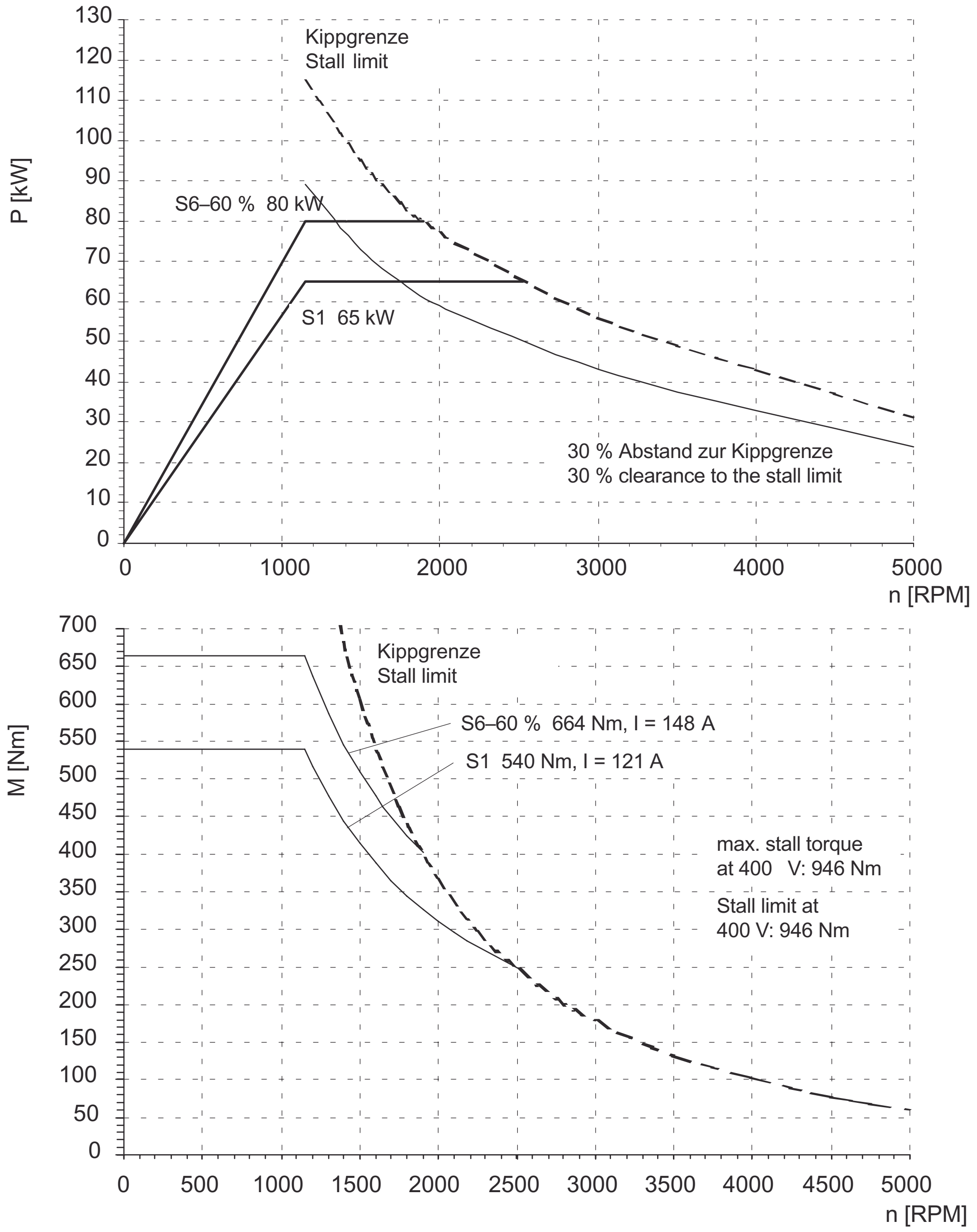


Figure 3-9 MASTERDRIVES VC, 1PL6184-□□D□□

1) 3000 RPM for increased cantilever forces

Table 3-11 MASTERDRIVES VC, 400 V, 1PL6186-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	85	706	158	400	39.4	1950	3500 [1)]	5000	30	62

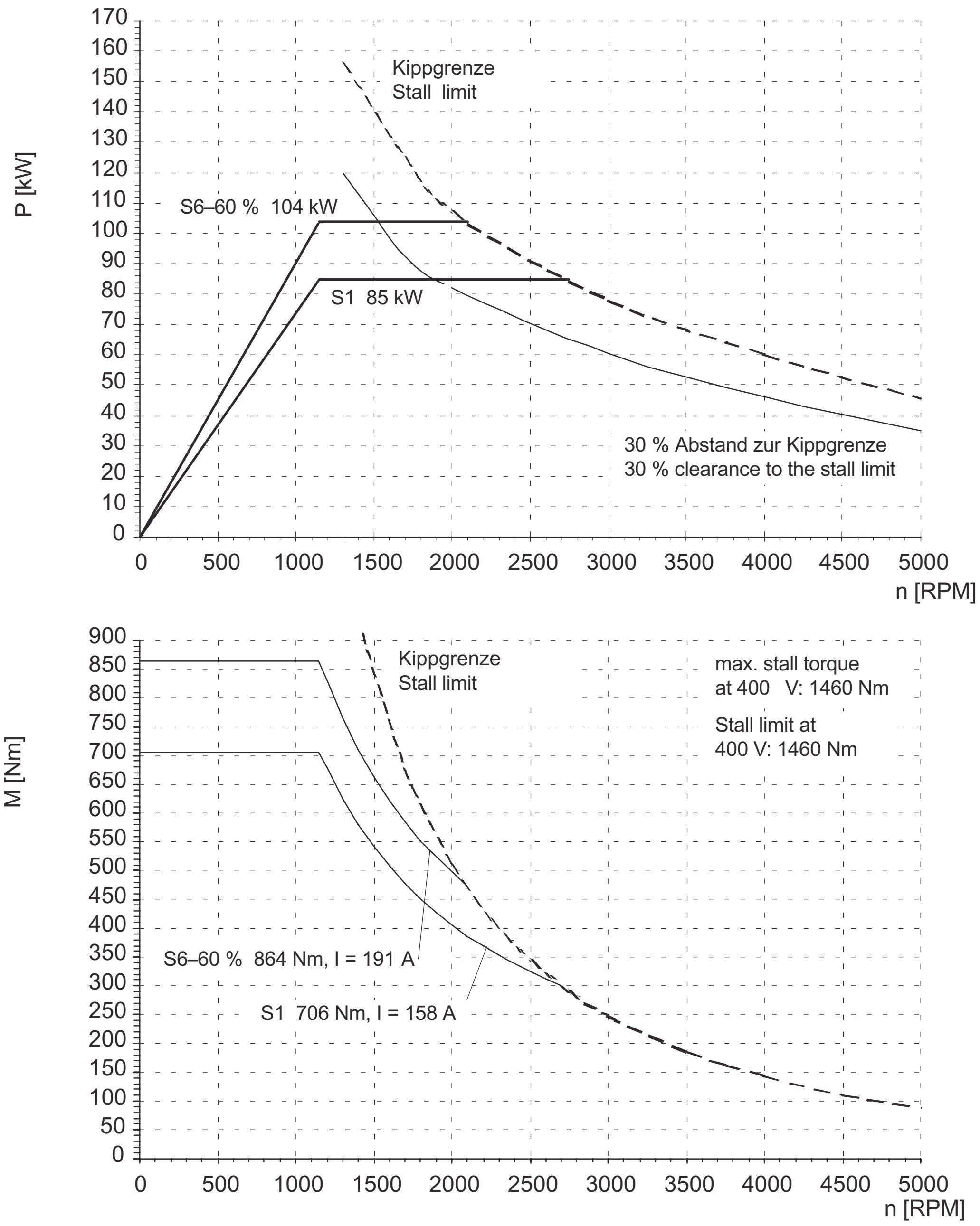


Figure 3-10 MASTERDRIVES VC, 1PL6186-□□D□□

1) 3000 RPM for increased cantilever forces

Table 3-12 MASTERDRIVES VC, 400 V, 1PL6224-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	120	997	218	400	39.1	2100	3100 [1)]	4500	30	86

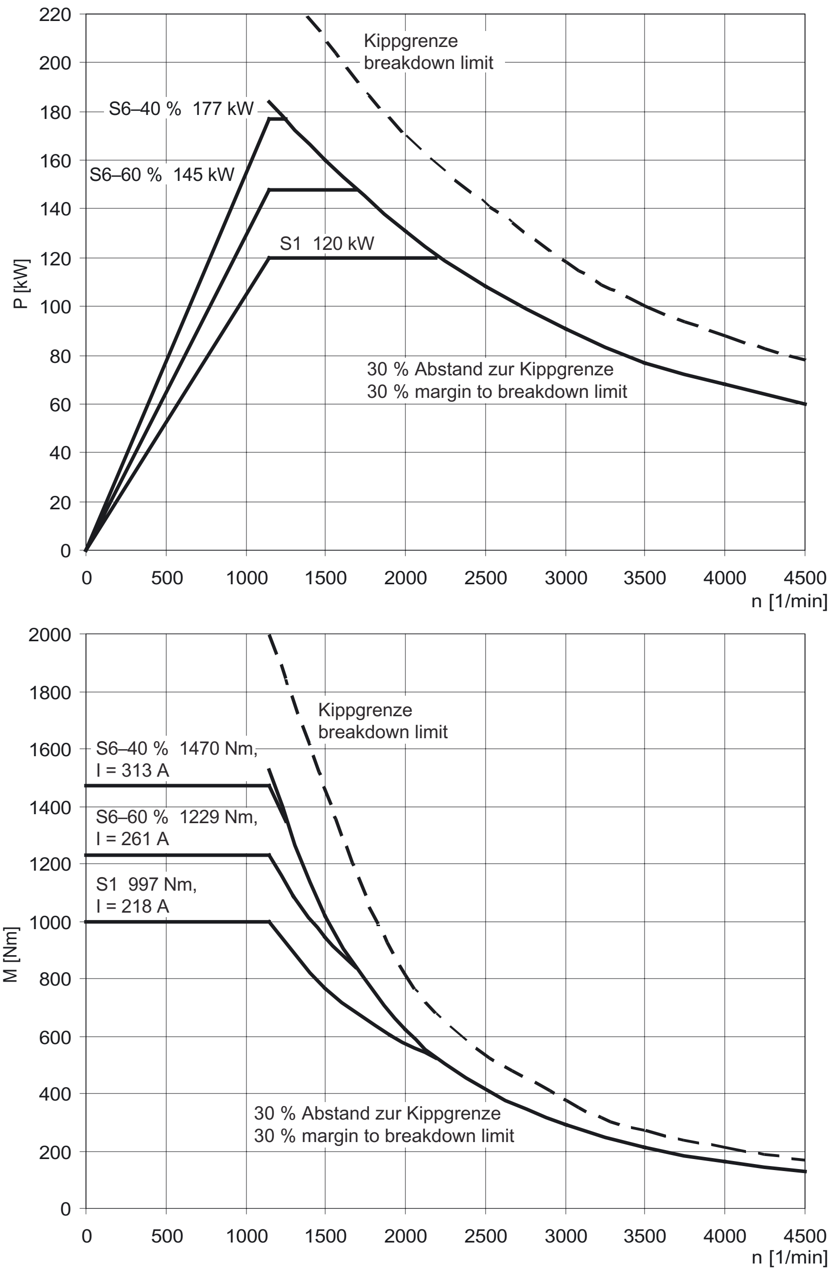


Figure 3-11 MASTERDRIVES VC, 1PL6224-□□D□□

1) 2700 RPM for increased cantilever forces

Table 3-13 MASTERDRIVES VC, 400 V, 1PL6226-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	155	1287	275	400	39.2	2000	3100 1)	4500	30	92

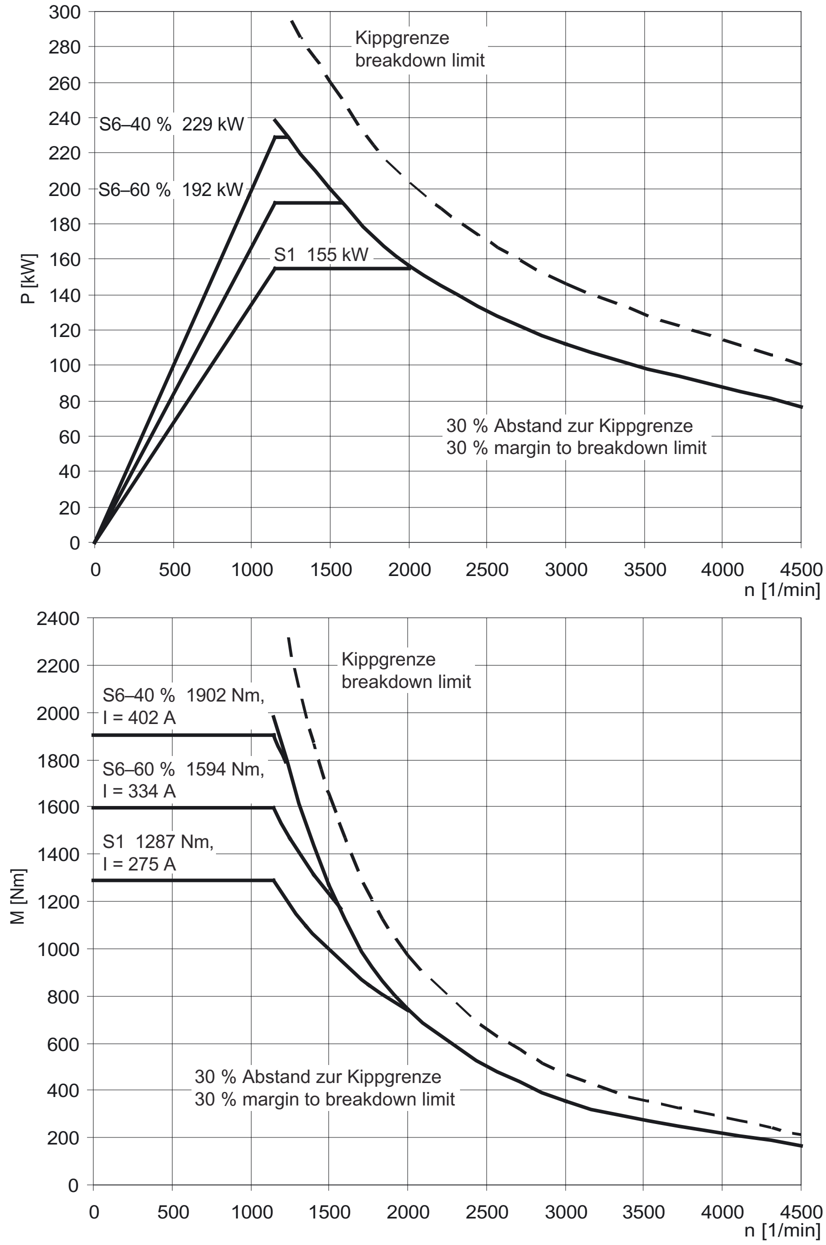


Figure 3-12 MASTERDRIVES VC, 1PL6226-□□D□□

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1) 2700 RPM for increased cantilever forces

Table 3-14 MASTERDRIVES VC, 400 V, 1PL6228-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	190	1578	334	400	39.2	1850	3100 1)	4500 2)	30	102

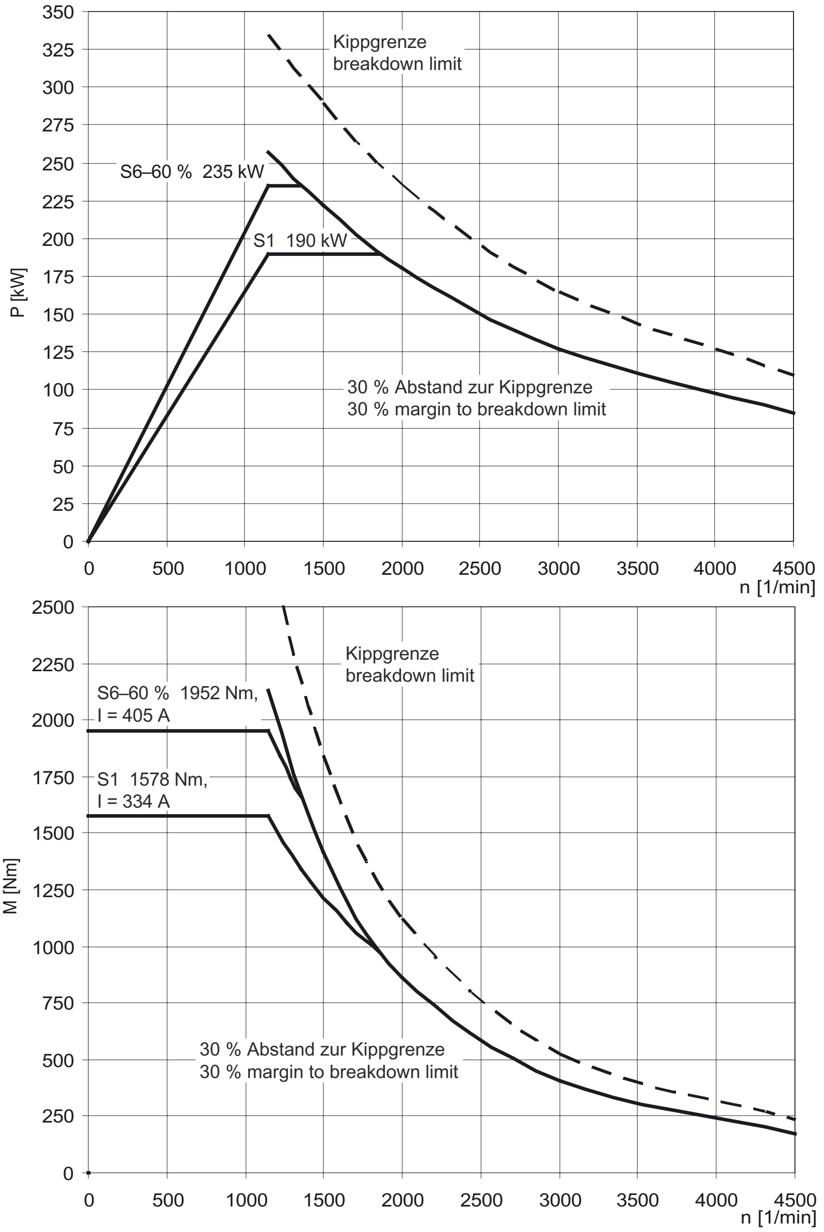

Figure 3-13 MASTERDRIVES VC, 1PL6228-□□D□□

1) 2500 RPM for increased cantilever forces
2) 4000 RPM for increased cantilever forces

Table 3-15 MASTERDRIVES VC, 400 V, 1PL6284-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	280	2325	478	400	38.9	2200	2200	3300	53	156

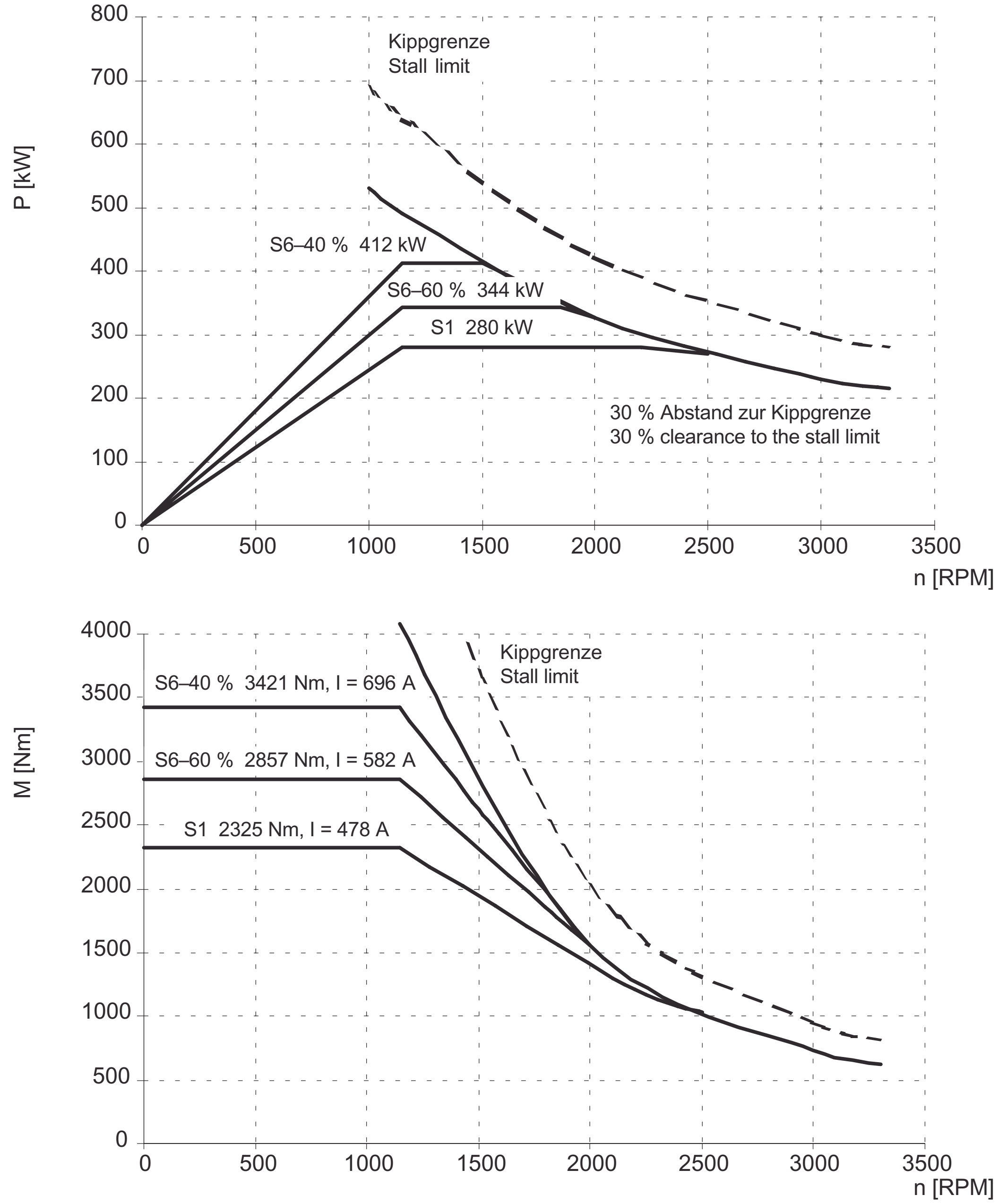

Figure 3-14 MASTERDRIVES VC, 1PL6284-□□D□□

Table 3-16 MASTERDRIVES VC, 400 V, 1PL6286-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	355	2944	637	380	38.9	2200	2200	3300	65	214

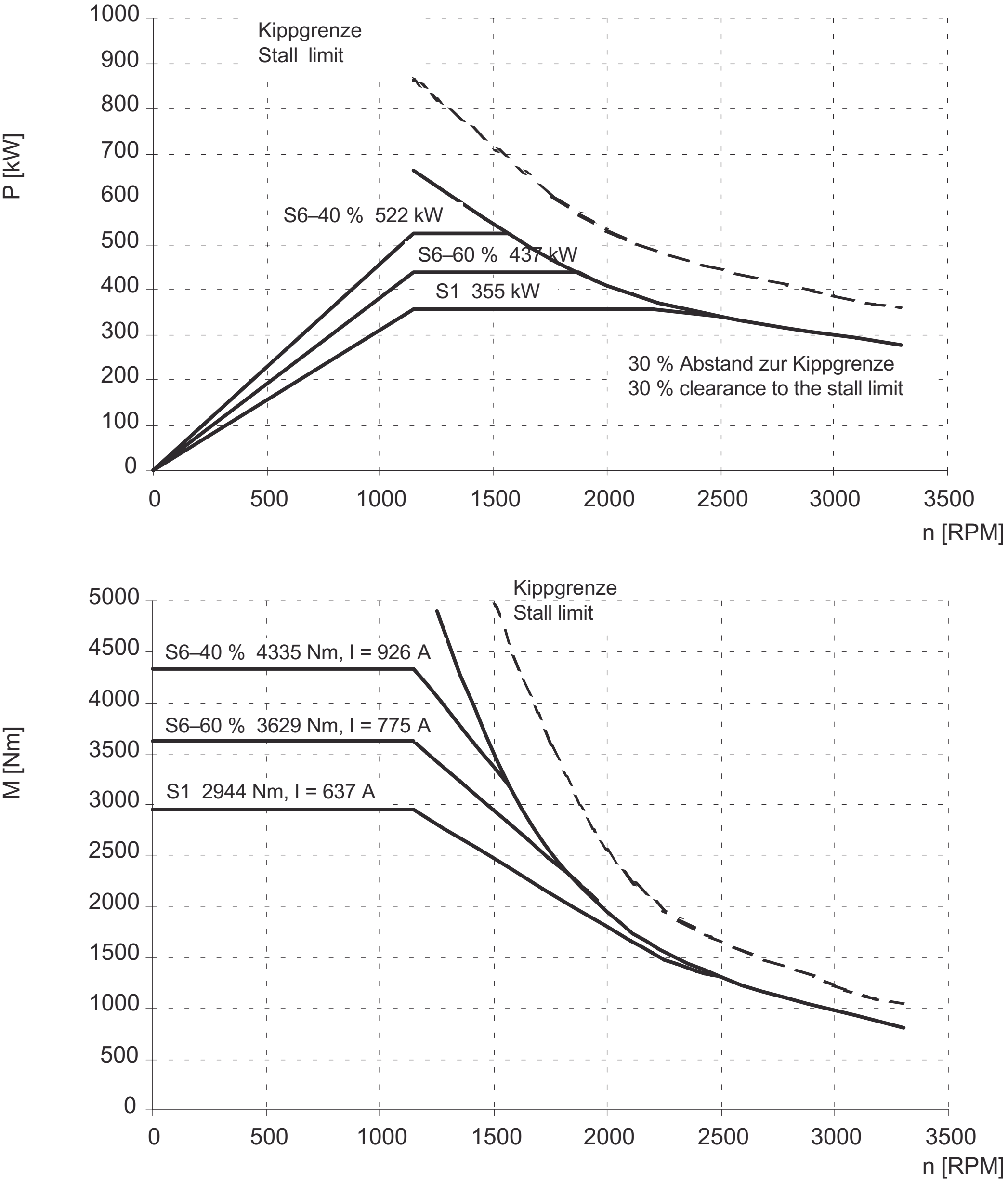

Figure 3-15 MASTERDRIVES VC, 1PL6286-□□D□□

Table 3-17 MASTERDRIVES VC, 400 V, 1PL6288-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1150	435	3607	765	385	38.9	2200	2200	3300	72	248

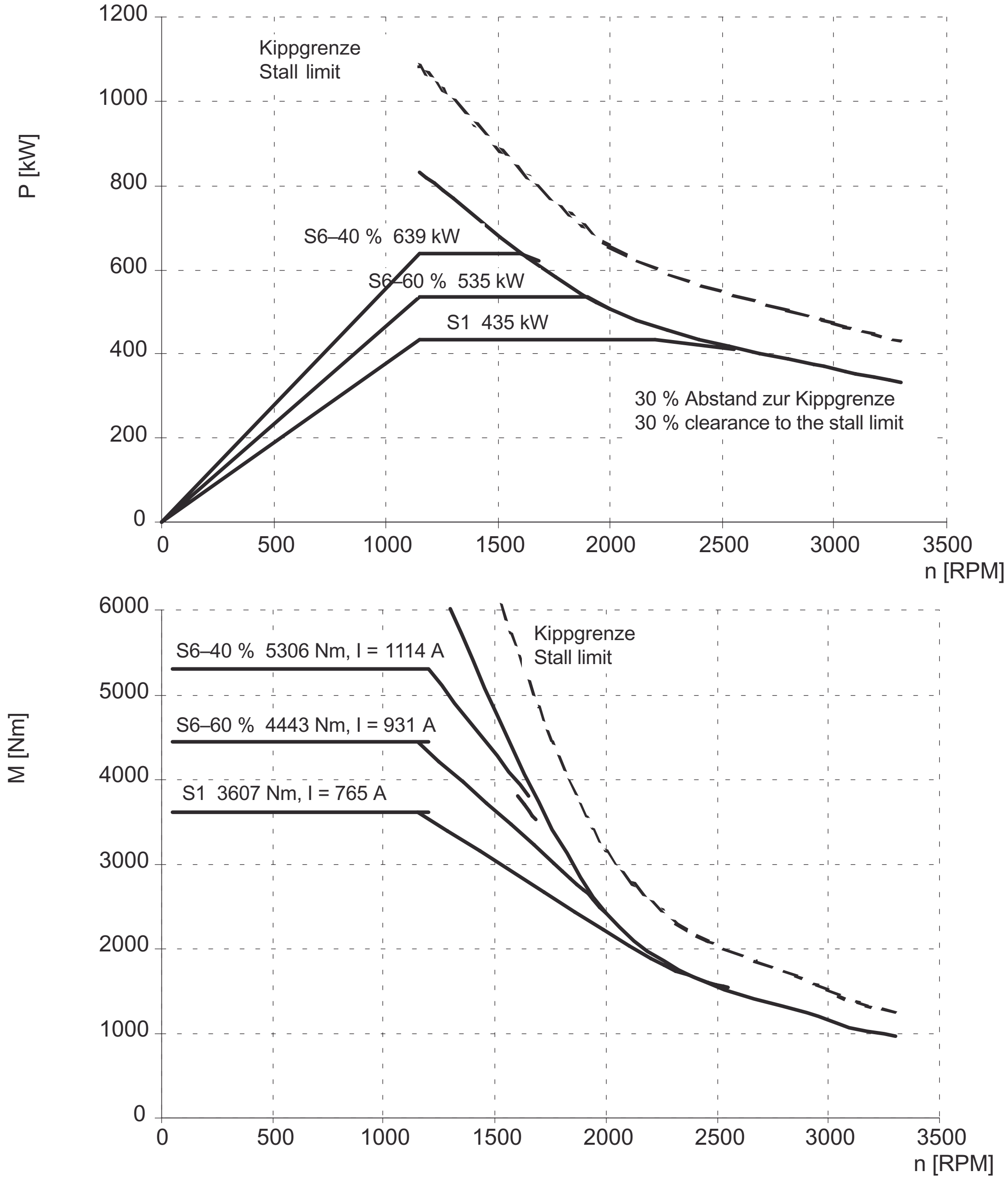

Figure 3-16 MASTERDRIVES VC, 1PL6288-□□D□□

Table 3-18 MASTERDRIVES VC, 400 V, 1PL6184-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	89	486	166	400	59,3	3500	3500 1)	5000	30	68

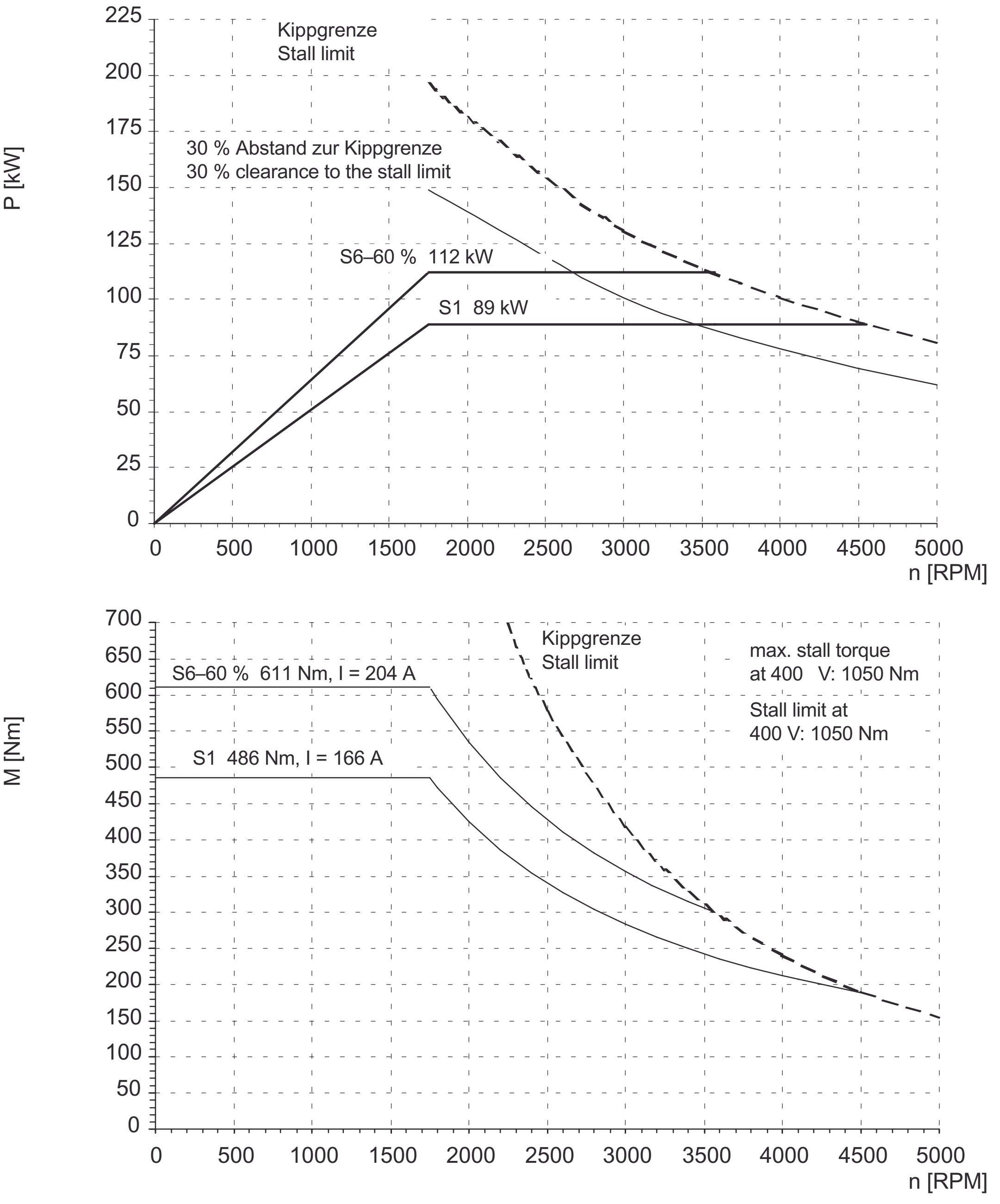

Figure 3-17 MASTERDRIVES VC, 1PL6184-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-19 MASTERDRIVES VC, 400 V, 1PL6186-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	125	682	231	400	59,3	3400	3500 1)	5000	30	92

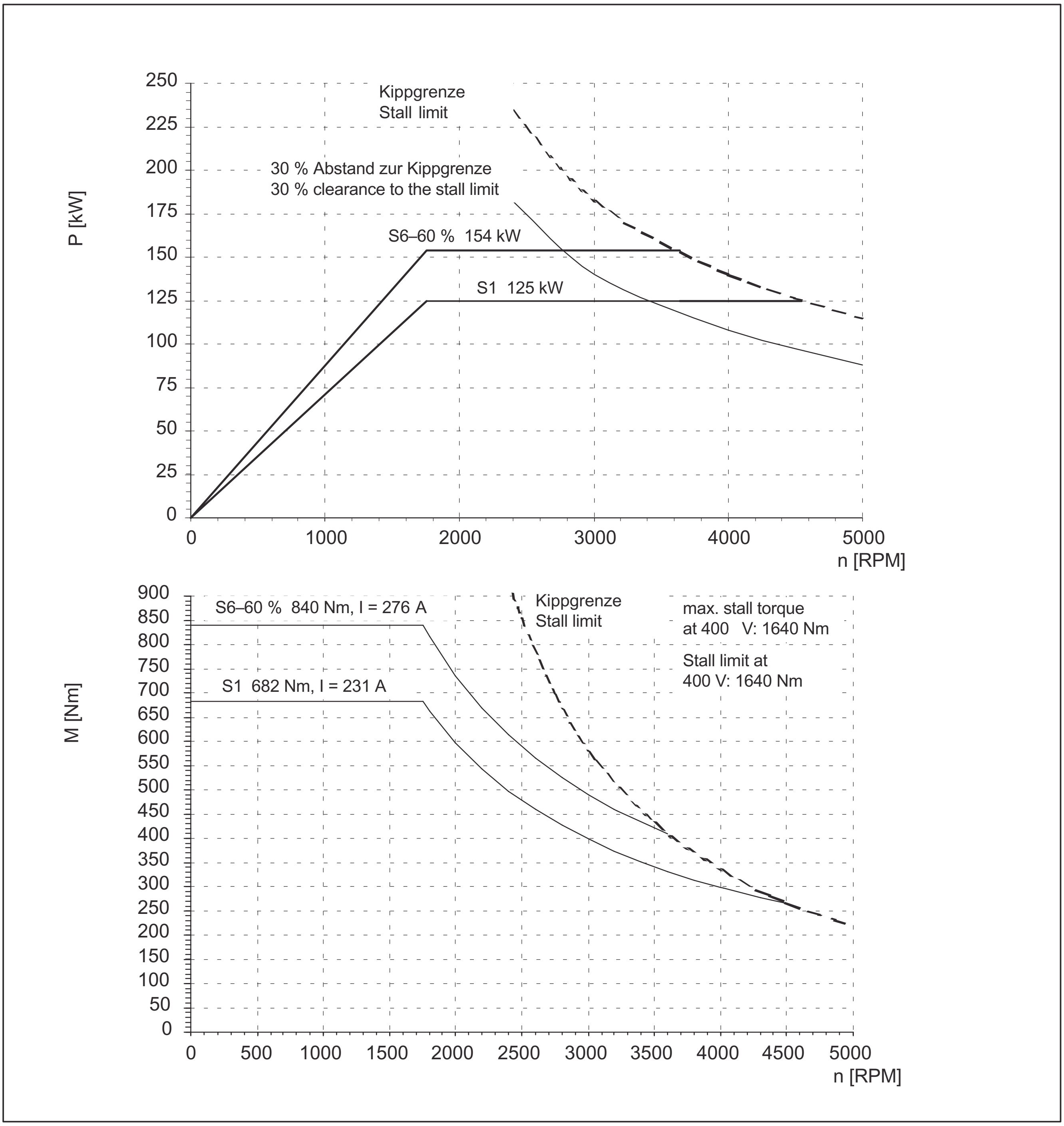

Figure 3-18 MASTERDRIVES VC, 1PL6186-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-20 MASTERDRIVES VC, 400 V, 1PL6224-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	165	900	292	400	59,2	3000	3100 1)	4500	30	90

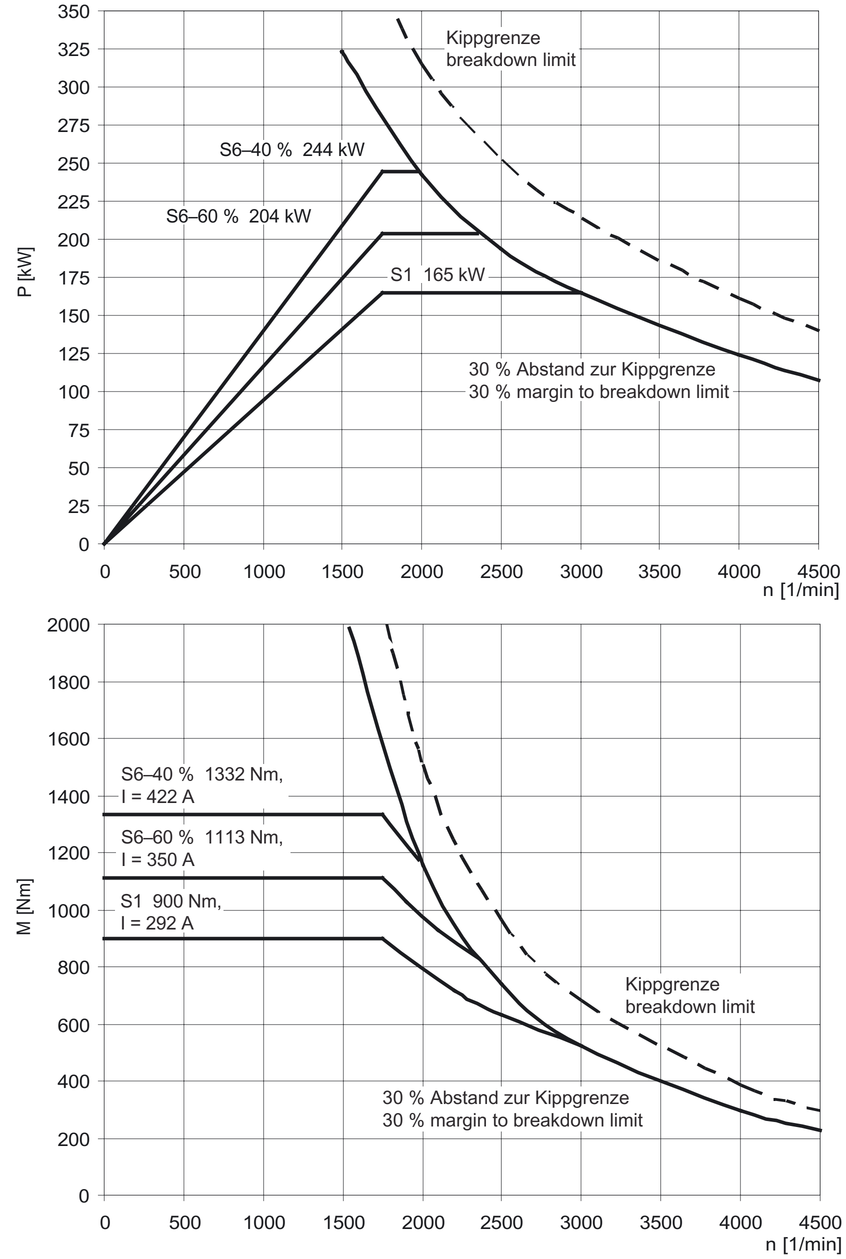

Figure 3-19 MASTERDRIVES VC, 1PL6224-□□F□□

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1) 2700 RPM for increased cantilever forces

Table 3-21 MASTERDRIVES VC, 400 V, 1PL6226-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	200	1091	350	400	59,1	2900	3100 1)	4500	30	122

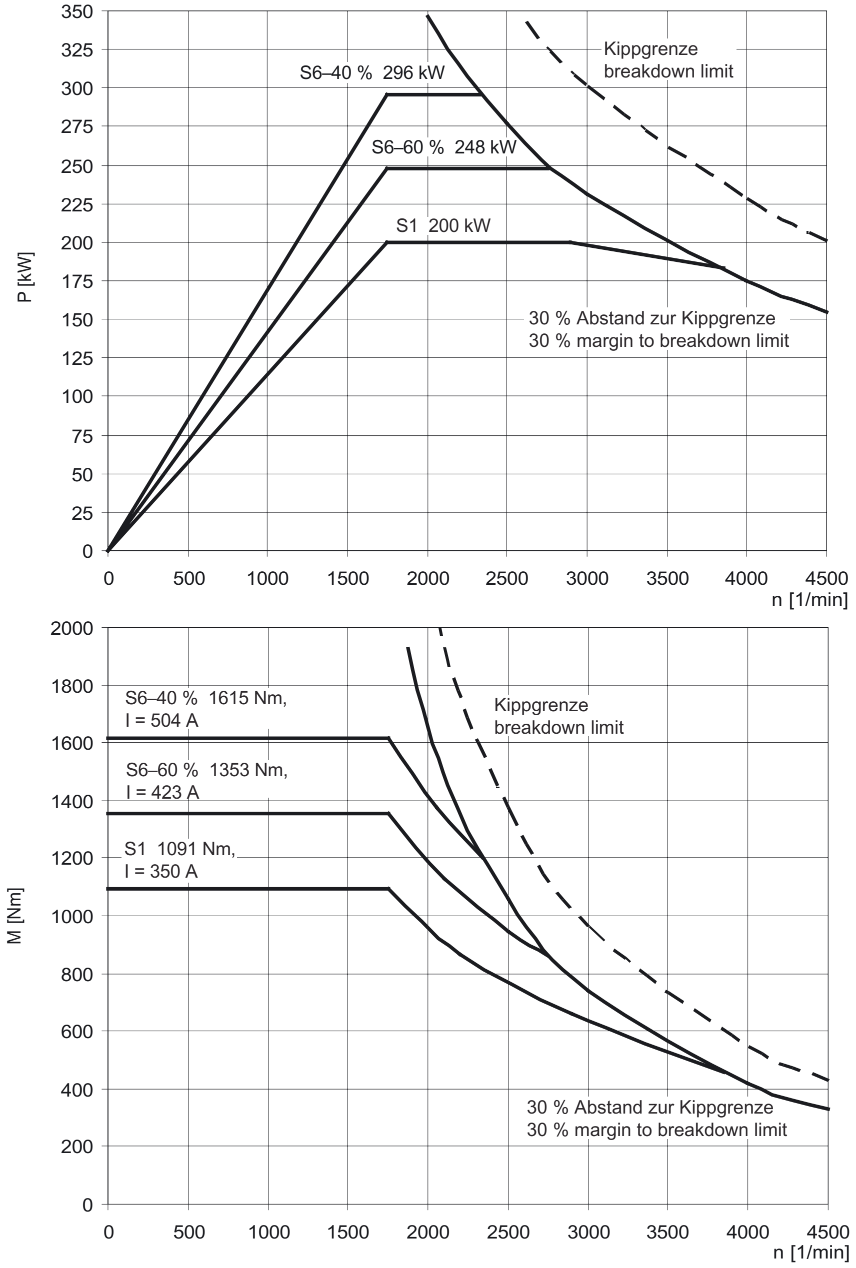

Figure 3-20 MASTERDRIVES VC, 1PL6226-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-22 MASTERDRIVES VC, 400 V, 1PL6228-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	265	1446	470	400	59.0	2900	3100 1)	4500 2)	30	174

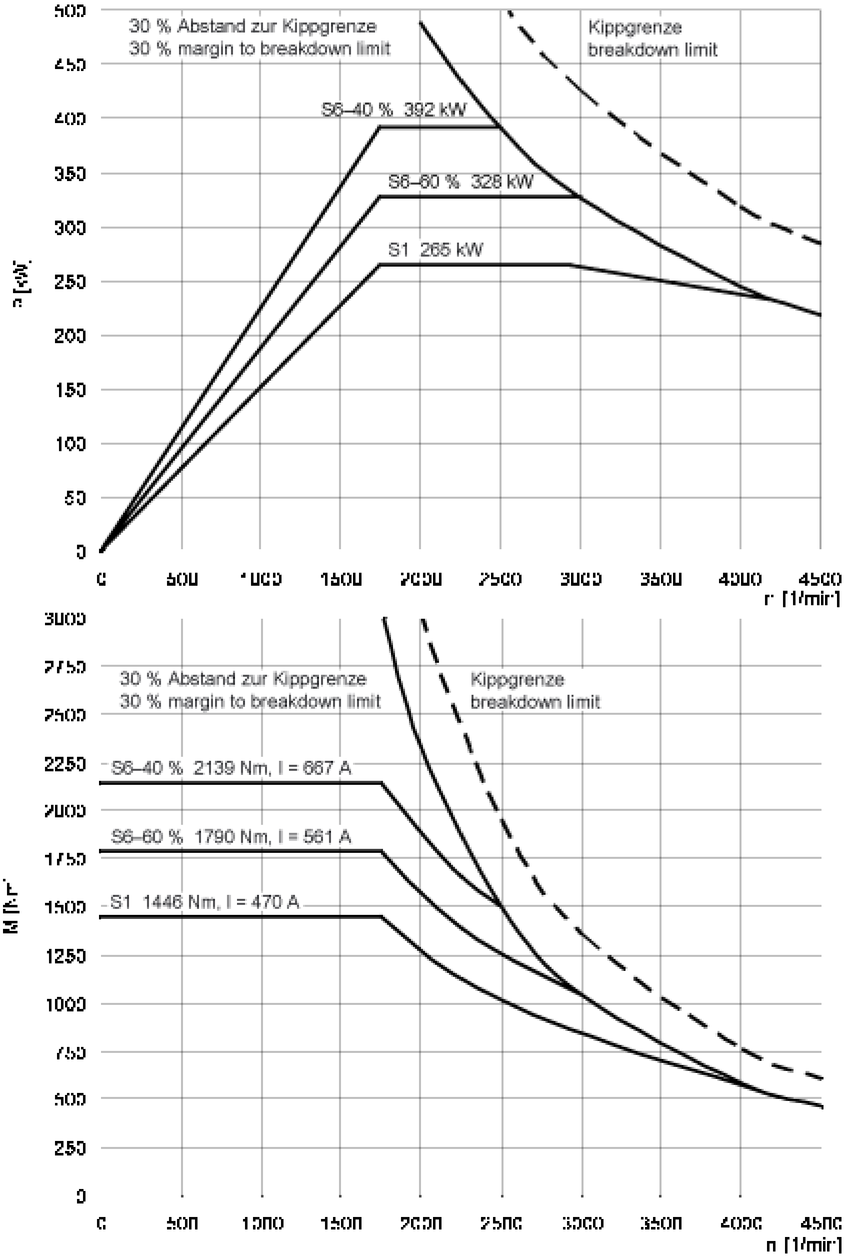

Figure 3-21 MASTERDRIVES VC, 1PL6228-□□F□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

Table 3-23 MASTERDRIVES VC, 400 V, 1PL6284-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	370	2019	616	400	59.0	2200	2200	3300	53	162

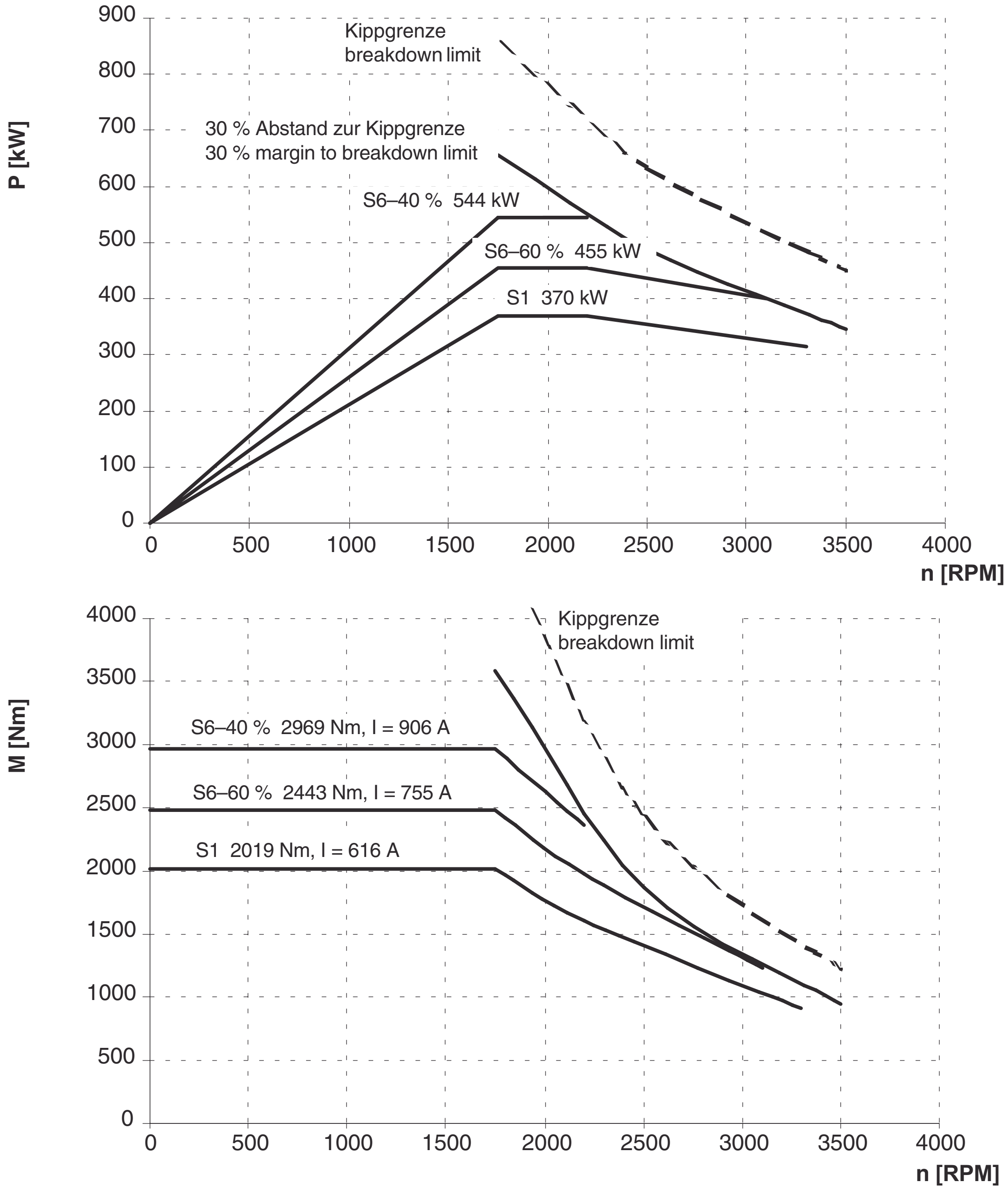

Figure 3-22 MASTERDRIVES VC, 1PL6284-□□F□□

Table 3-24 MASTERDRIVES VC, 400 V, 1PL6286-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	445	2429	736	400	59.0	2200	2200	3300	65	182

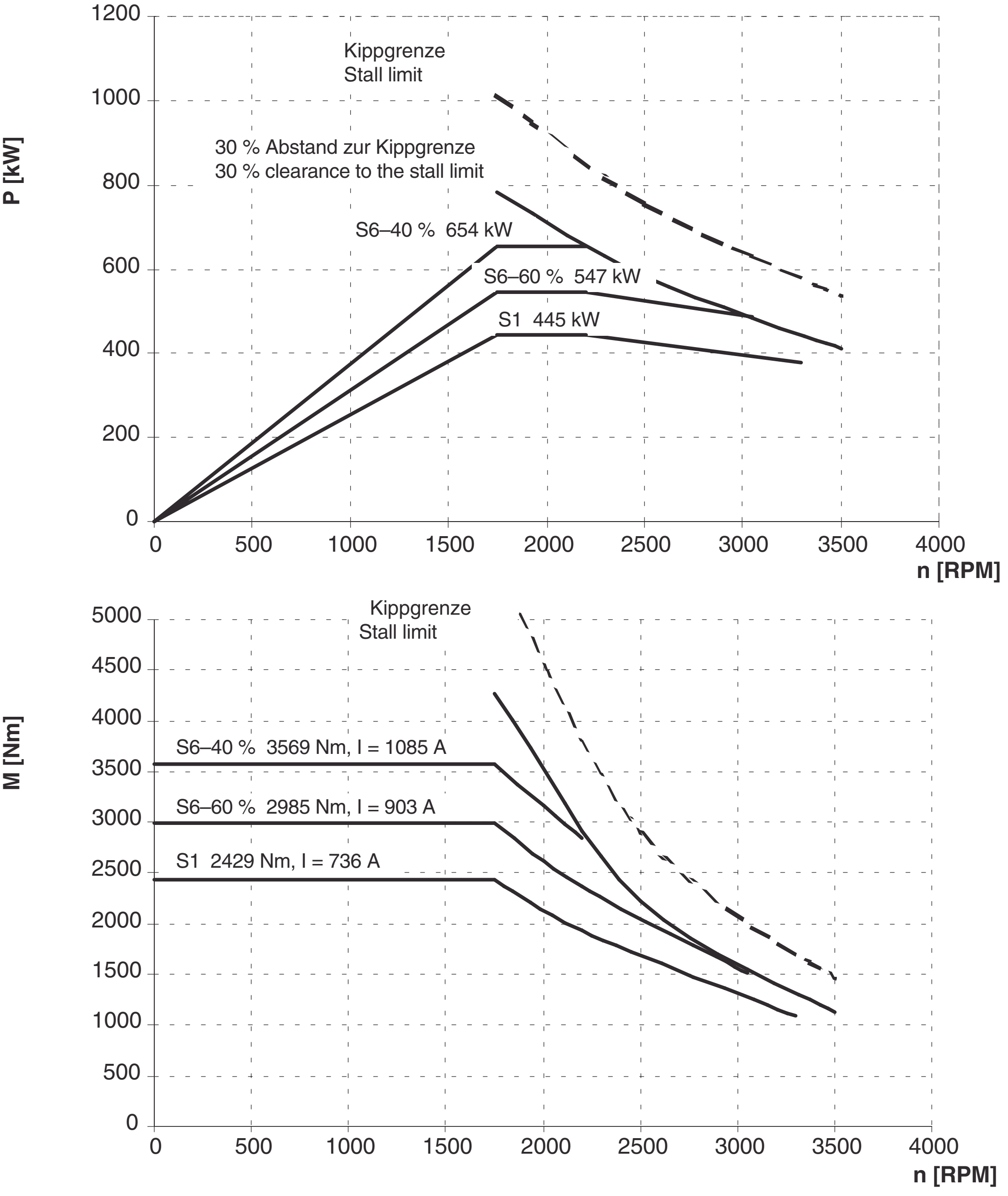

Figure 3-23 MASTERDRIVES VC, 1PL6286-□□F□□

Table 3-25 MASTERDRIVES VC, 400 V, 1PL6288-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	560	3055	924	400	59.0	2200	2200	3300	72	232

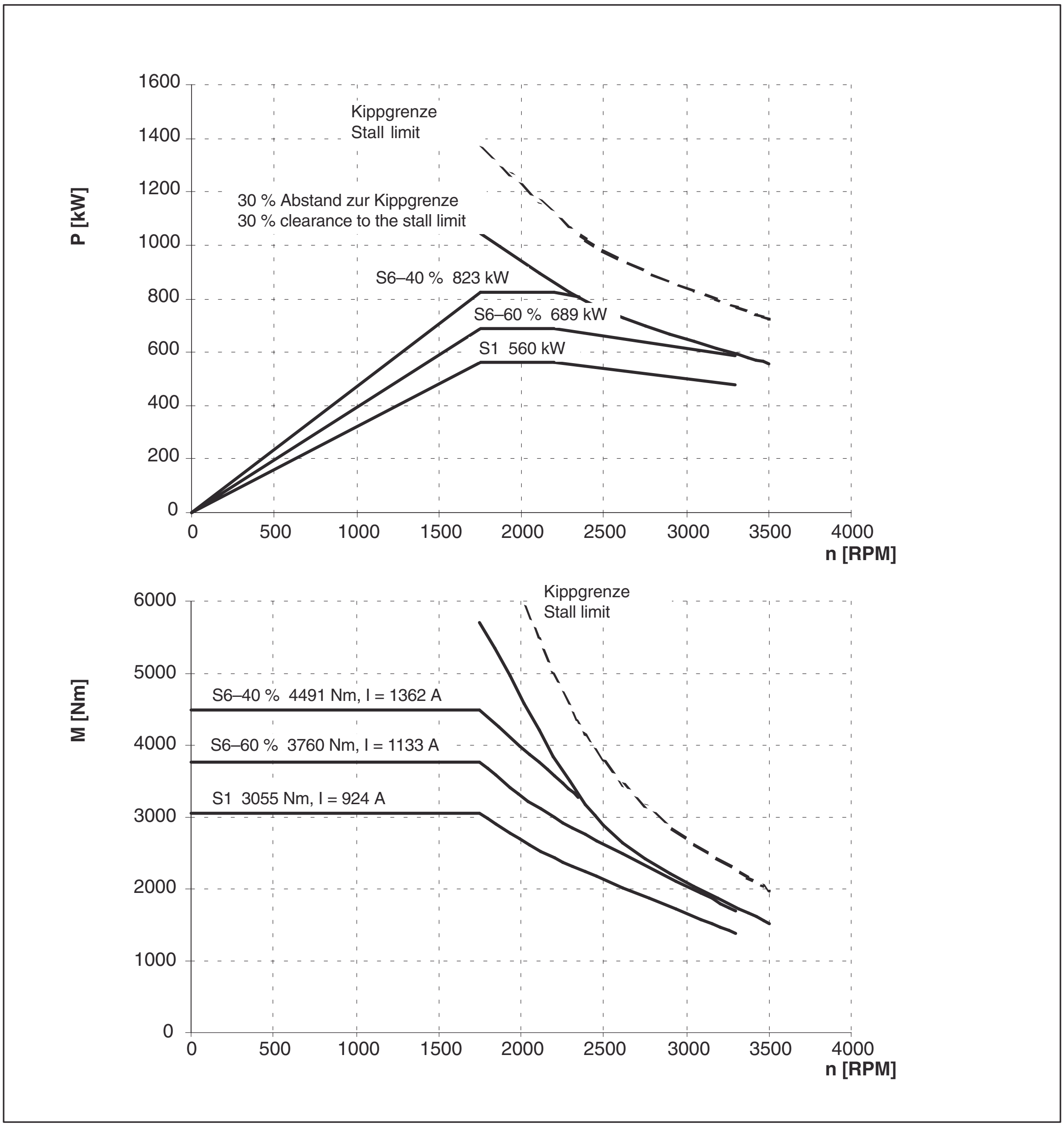

Figure 3-24 MASTERDRIVES VC, 1PL6288-□□F□□

Table 3-26 MASTERDRIVES VC, 400 V, 1PL6184-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	113	372	209	400	97.6	5000	3500 [1)]	5000	30	79

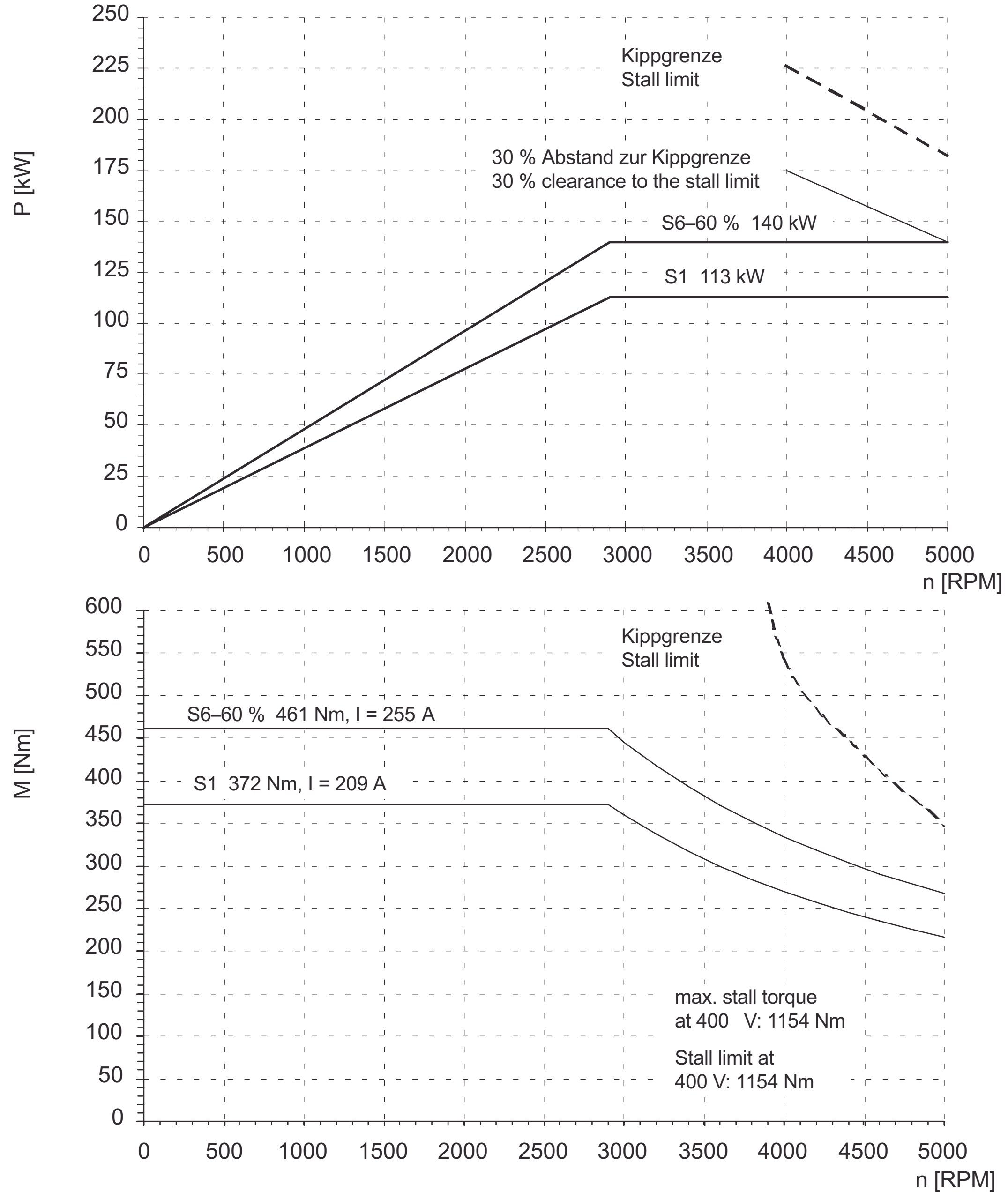

Figure 3-25 MASTERDRIVES VC, 1PL6184-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-27 MASTERDRIVES VC, 400 V, 1PL6186-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	150	494	280	390	97,5	5000	3500 [1)]	5000	30	110

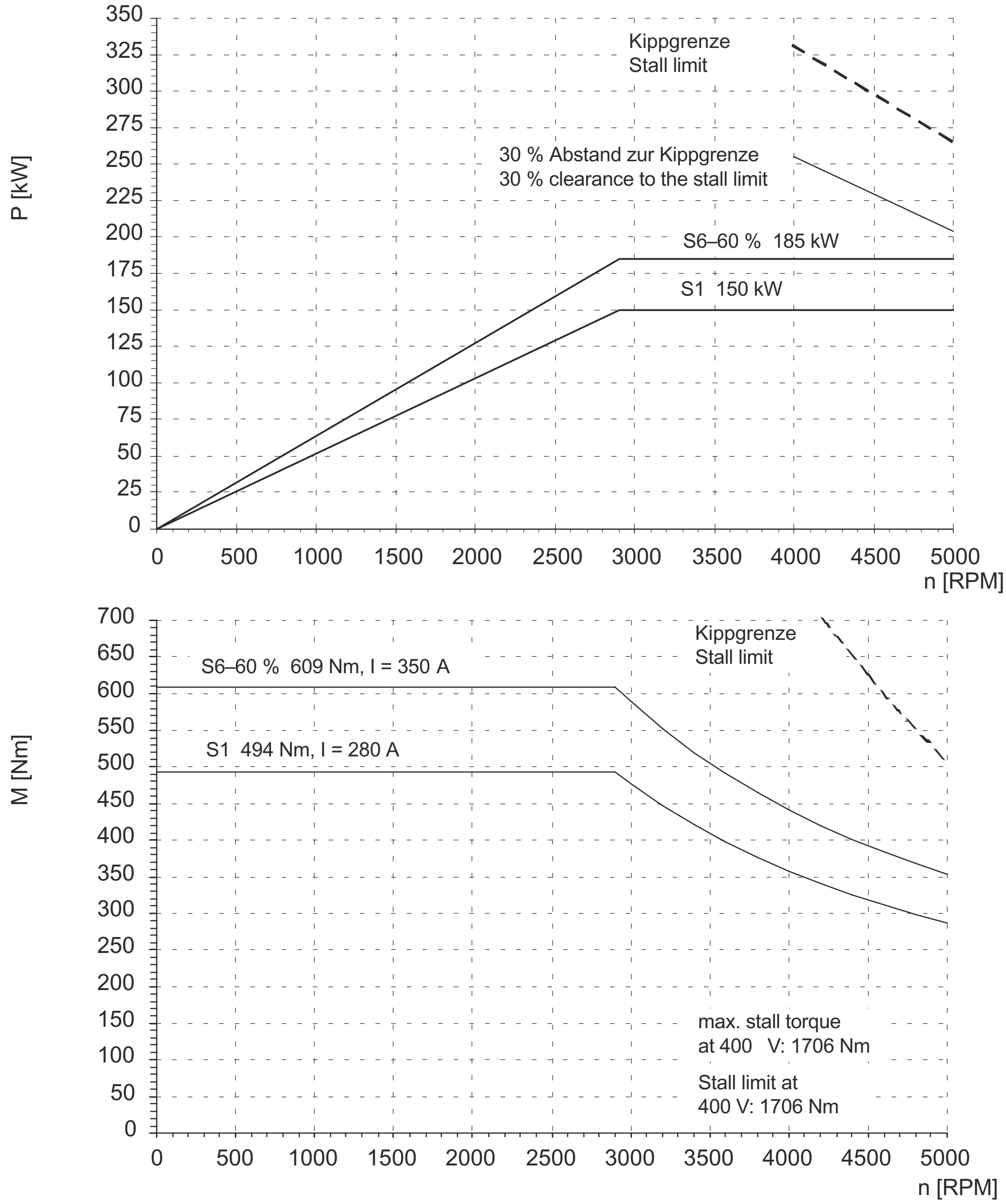

Figure 3-26 MASTERDRIVES VC, 1PL6186-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-28 MASTERDRIVES VC, 400 V, 1PL6224-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	205	675	365	400	97,5	3500	3100 [1)]	4500	30	118

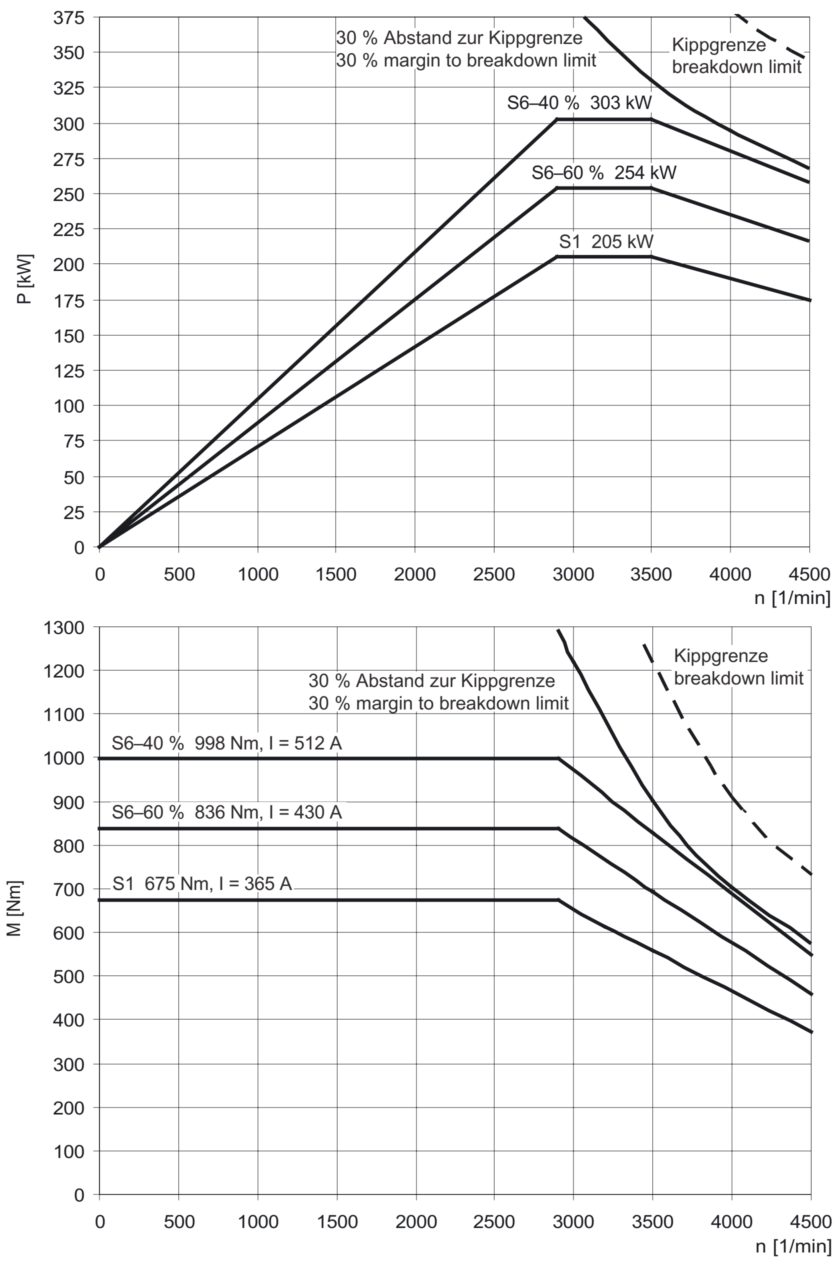

Figure 3-27 MASTERDRIVES VC, 1PL6224-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-29 MASTERDRIVES VC, 400 V, 1PL6226-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	270	889	470	400	97,4	3500	3100 1)	4500	30	160

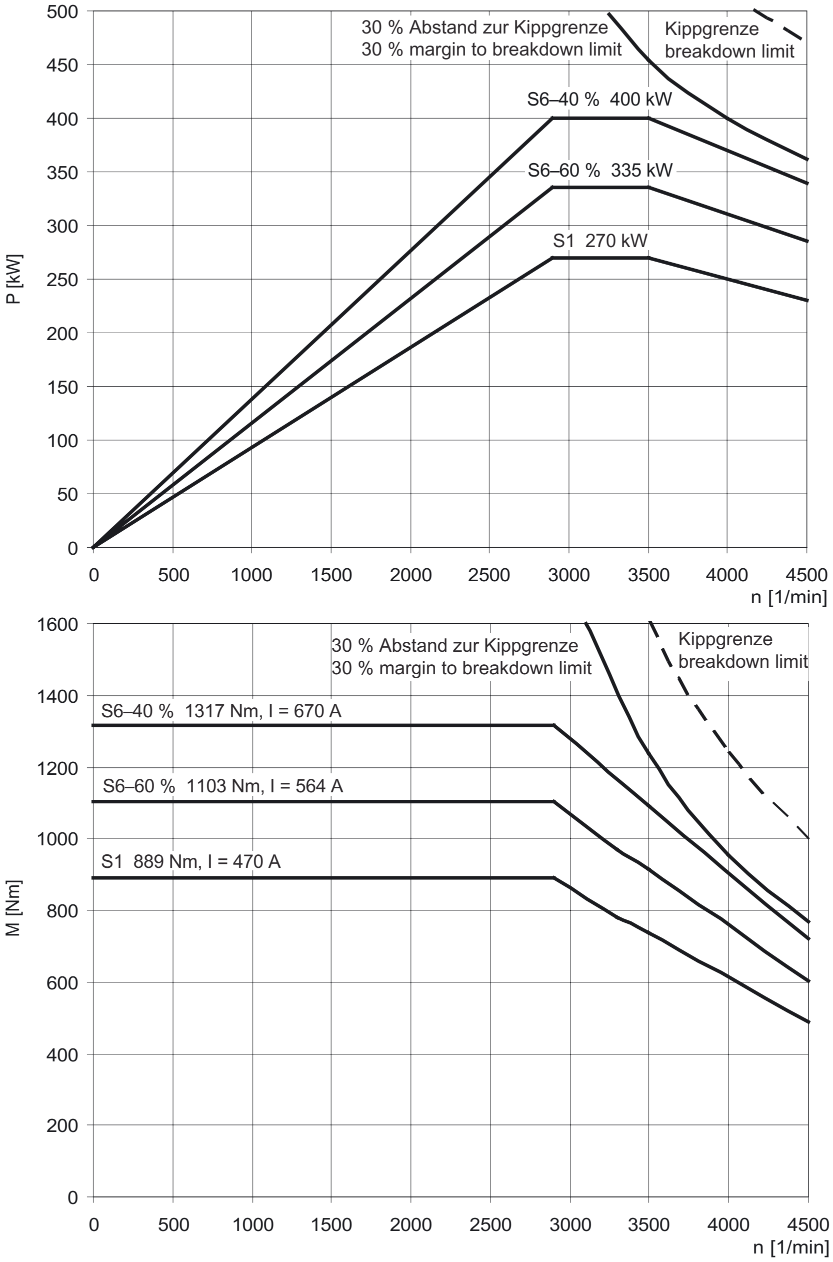

Figure 3-28 MASTERDRIVES VC, 1PL6226-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-30 MASTERDRIVES VC, 400 V, 1PL6228-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	300	988	530	400	97,3	3500	3100 1)	4500 2)	30	188

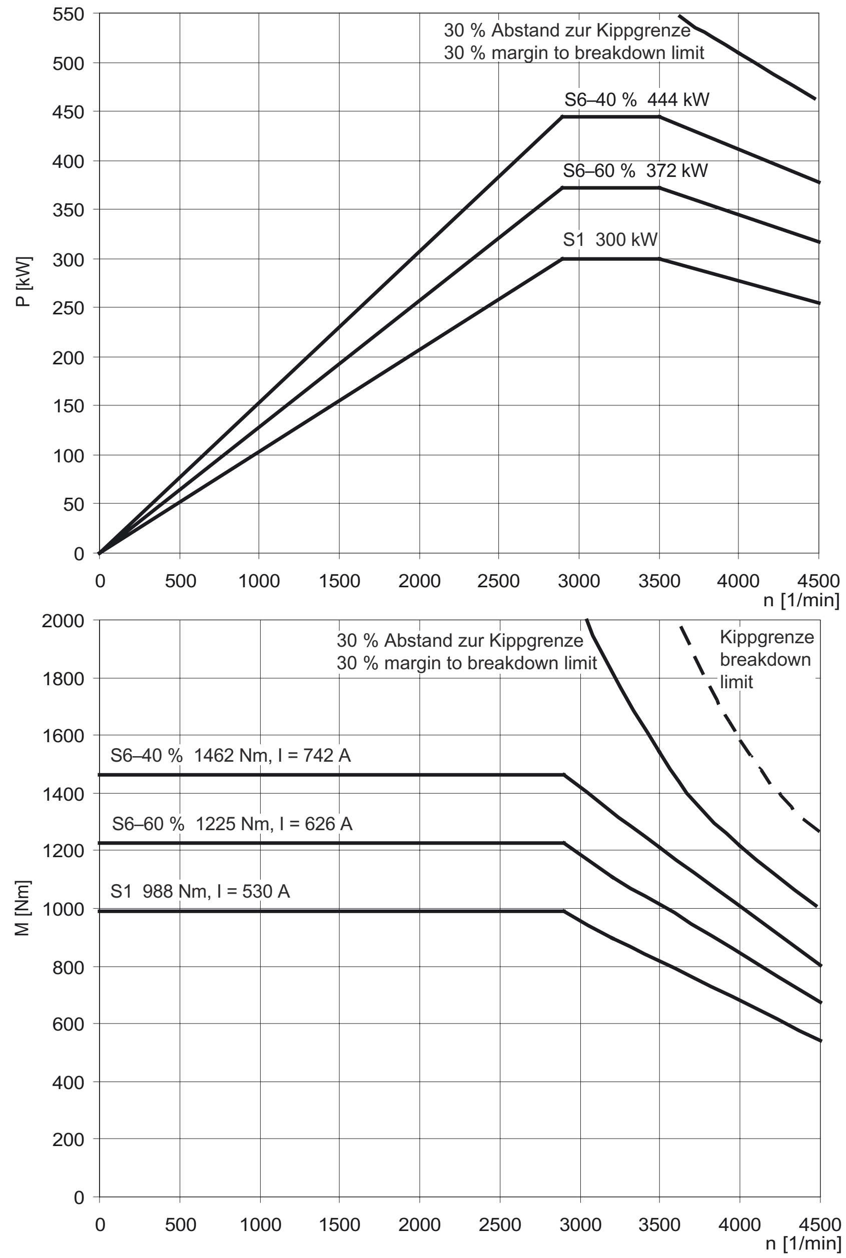

Figure 3-29 MASTERDRIVES VC, 1PL6228-□□L□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

3.1.2 P/n and M/n diagrams for 3-ph. 480 V AC

Table 3-31 MASTERDRIVES VC, 480 V, 1PL6184-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
500	30	573	66	370	17.6	1300	2500	2500	30	34

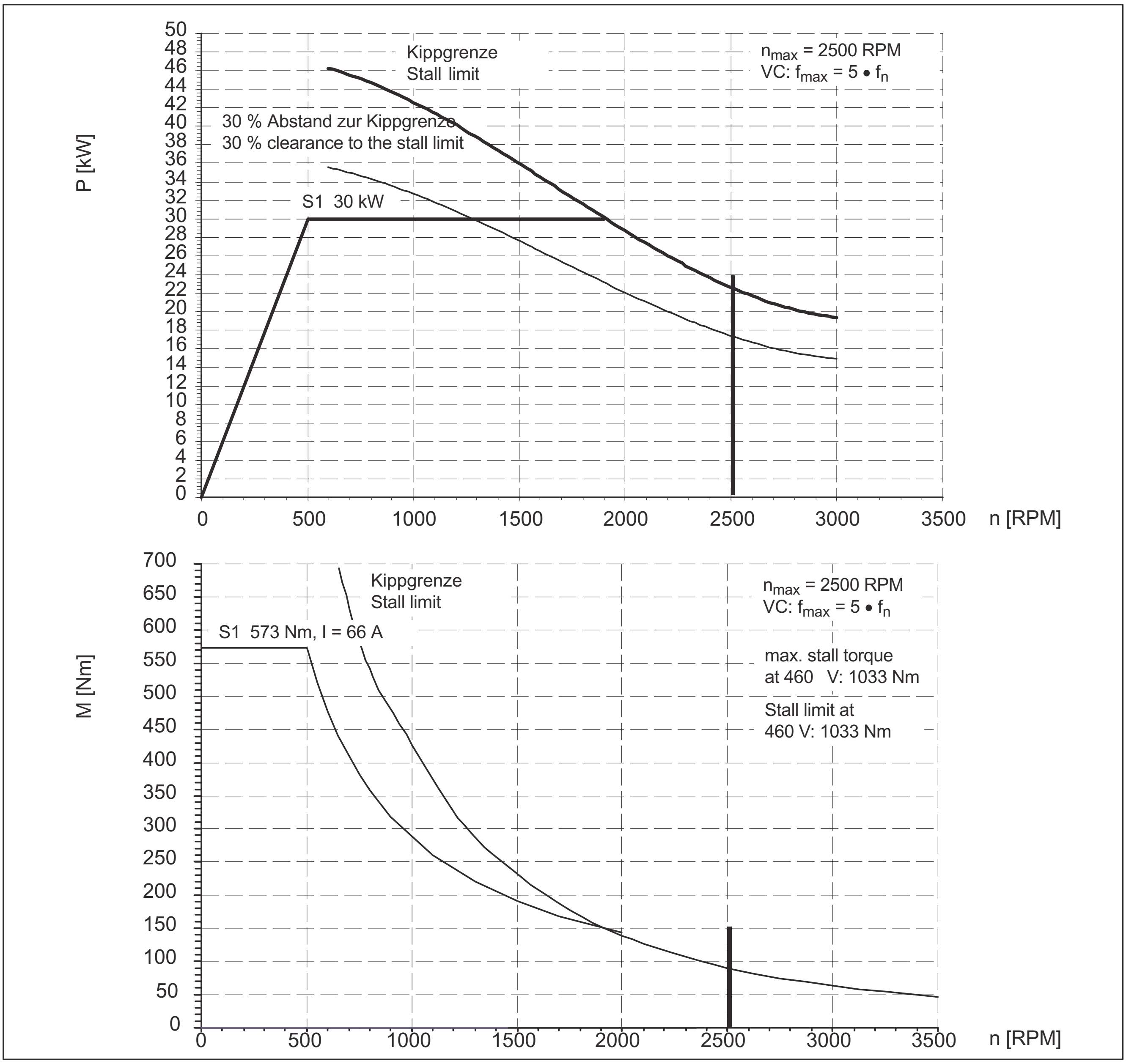

Figure 3-30 MASTERDRIVES VC, 1PL6184-□□B□□

Table 3-32 MASTERDRIVES VC, 480 V, 1PL6186-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
500	40	764	91	355	17.6	1500	2500	2500	30	46

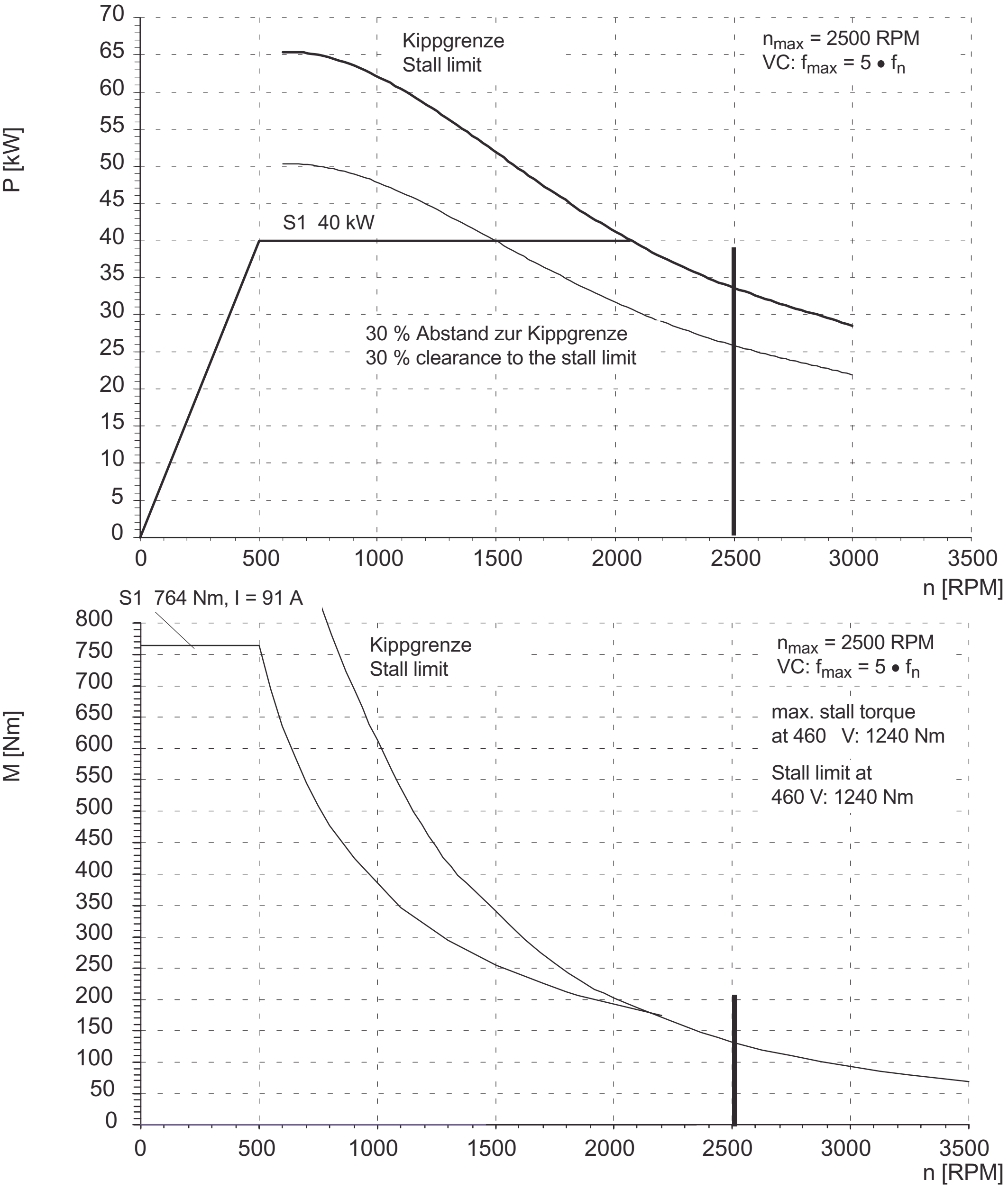

Figure 3-31 MASTERDRIVES VC, 1PL6186-□□B□□

Table 3-33 MASTERDRIVES VC, 480 V, 1PL6224-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
500	55	1050	114	370	17,5	1300	2500	2500	30	46

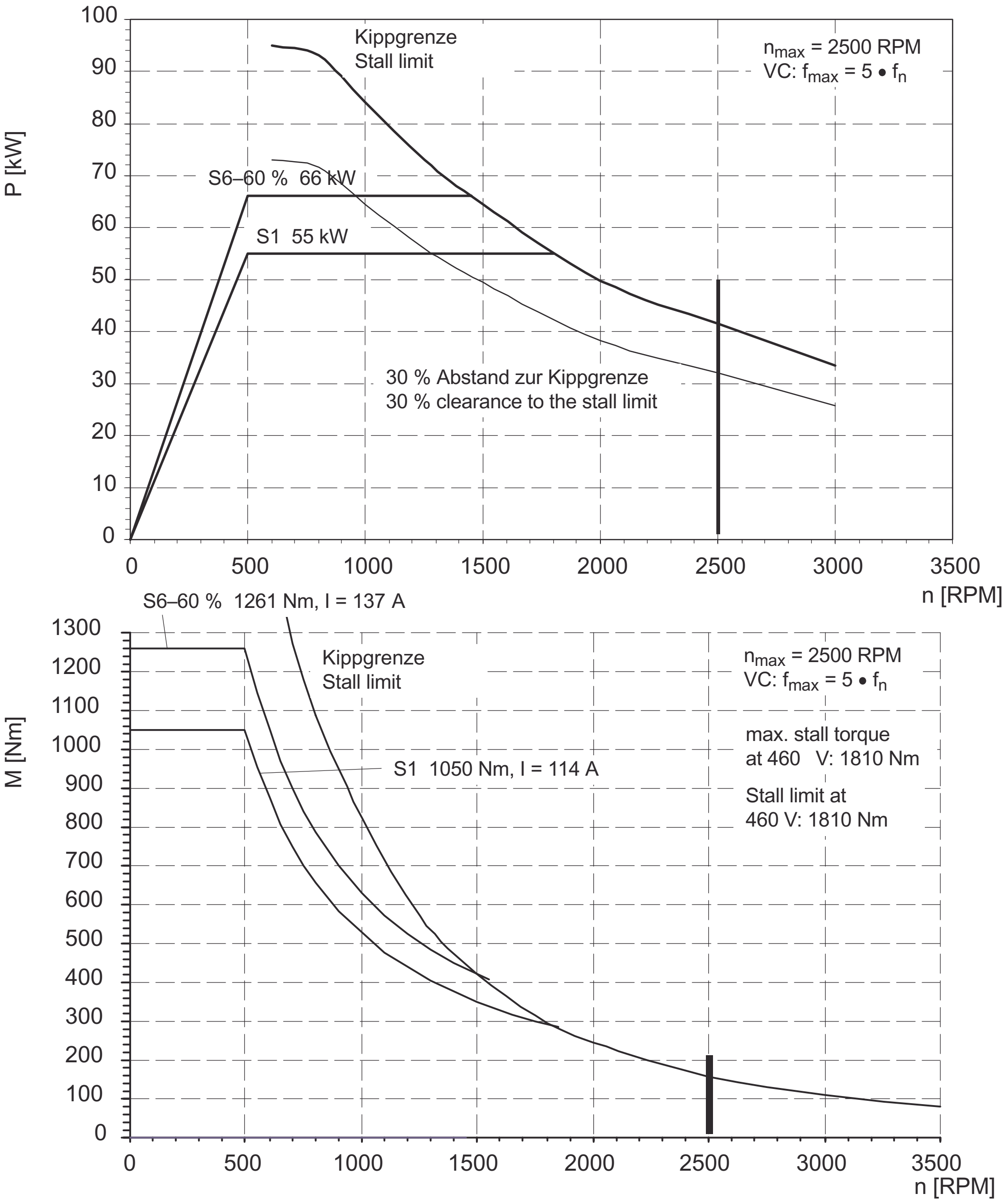

Figure 3-32 MASTERDRIVES VC, 1PL6224-□□B□□

Table 3-34 MASTERDRIVES VC, 480 V, 1PL6226-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
500	72	1375	147	375	17,4	1500	2500	2500	30	66

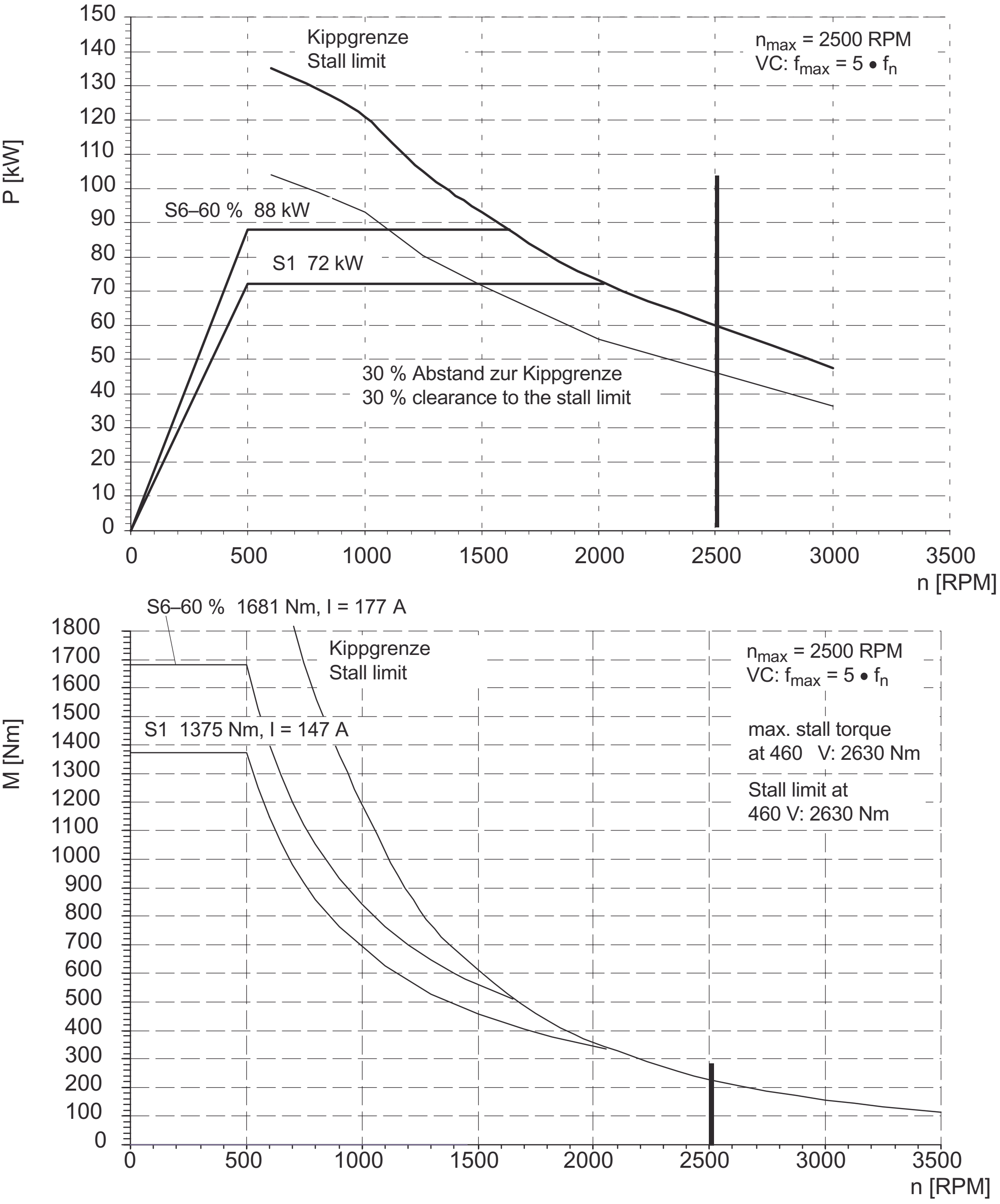

Figure 3-33 MASTERDRIVES VC, 1PL6226-□□B□□

Table 3-35 MASTERDRIVES VC, 480 V, 1PL6228-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
500	90	1719	180	380	17,4	1400	2500	2500	30	79

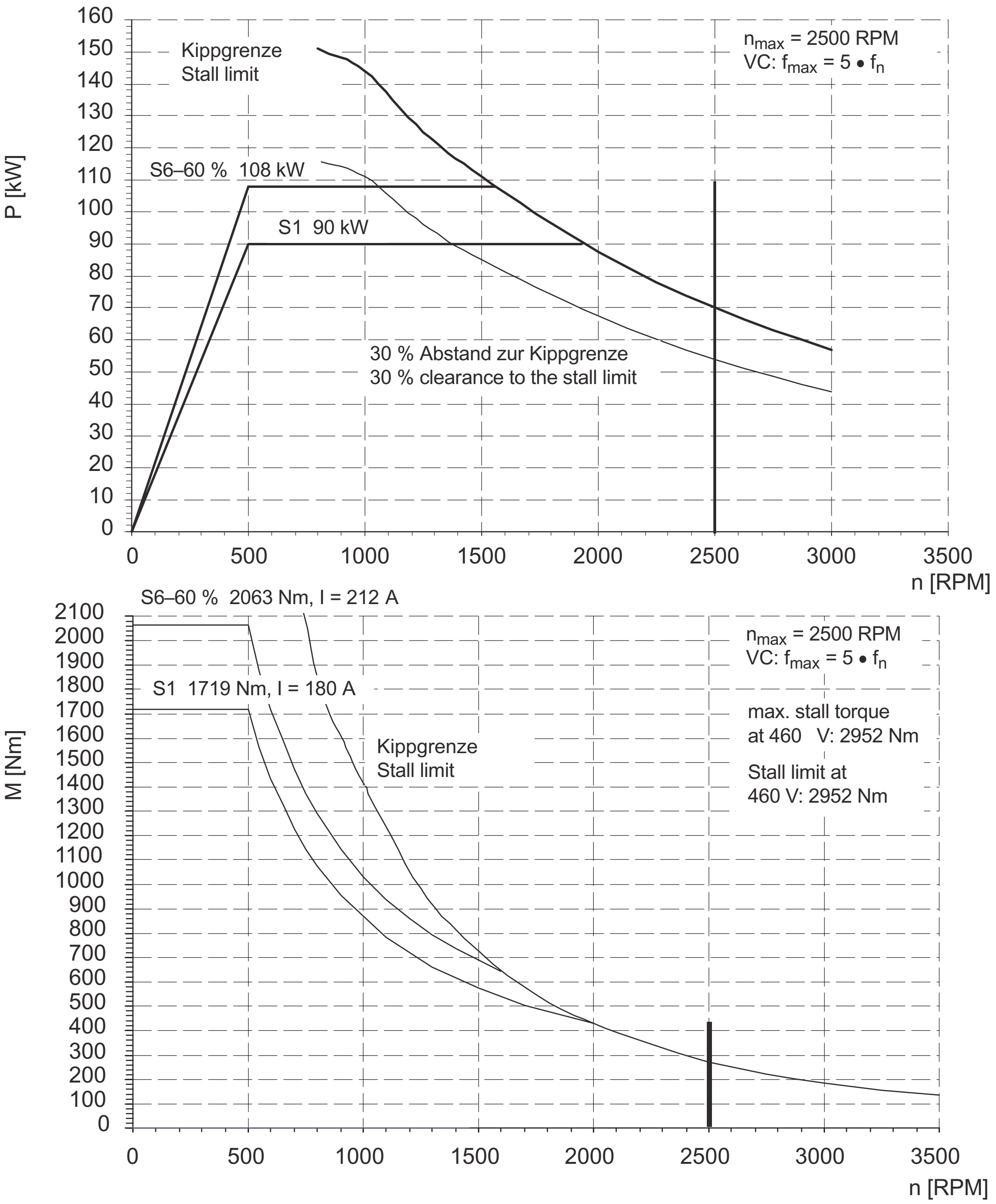

Figure 3-34 MASTERDRIVES VC, 1PL6228-□□B□□

Table 3-36 MASTERDRIVES VC, 480 V, 1PL6284-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	235	2244	335	480	34.0	1700	2200	3300	53	90

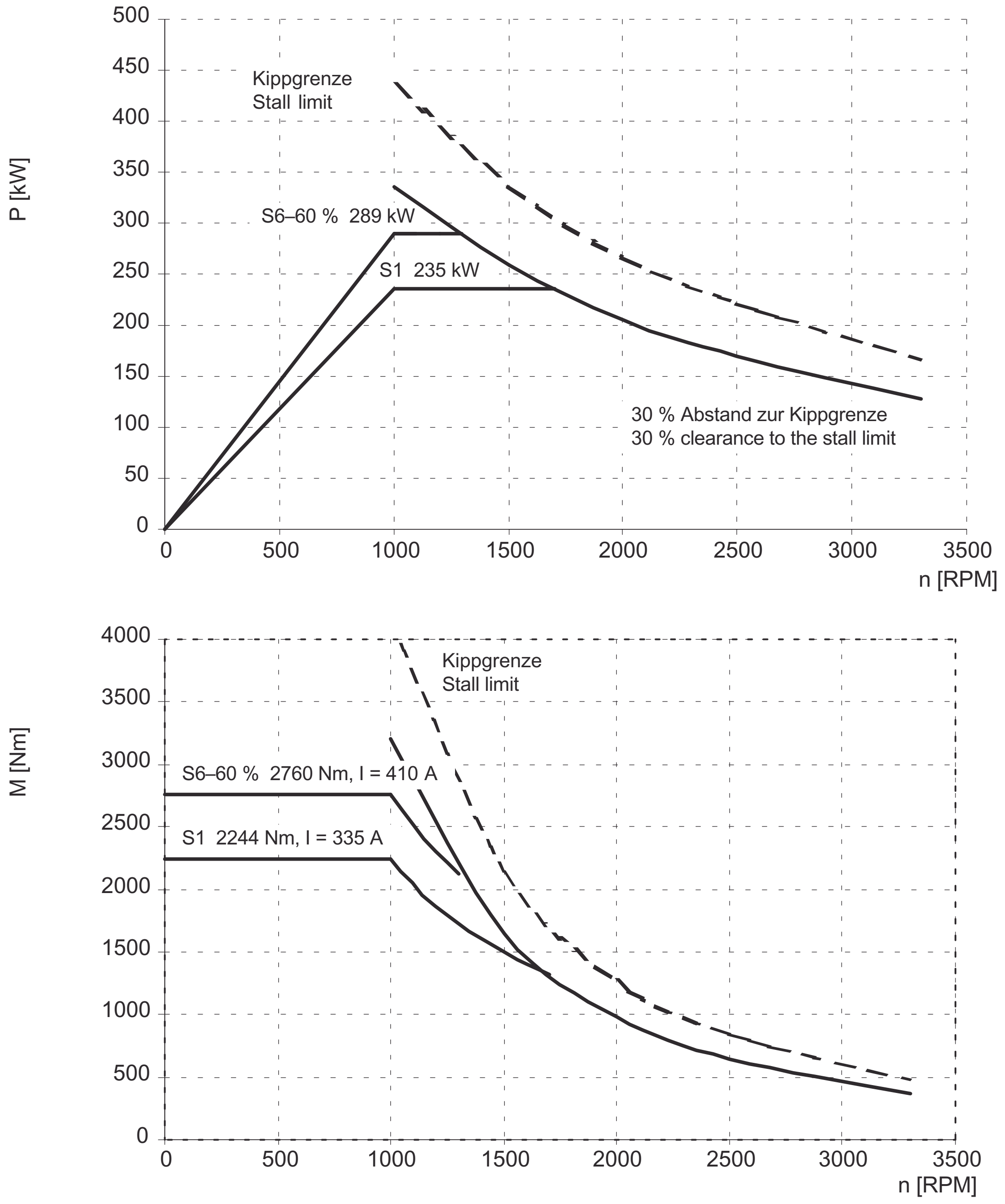

Figure 3-35 MASTERDRIVES VC, 1PL6284-□□C□□

Table 3-37 MASTERDRIVES VC, 480 V, 1PL6286-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	310	2961	440	480	34.0	2000	2200	3300	65	135

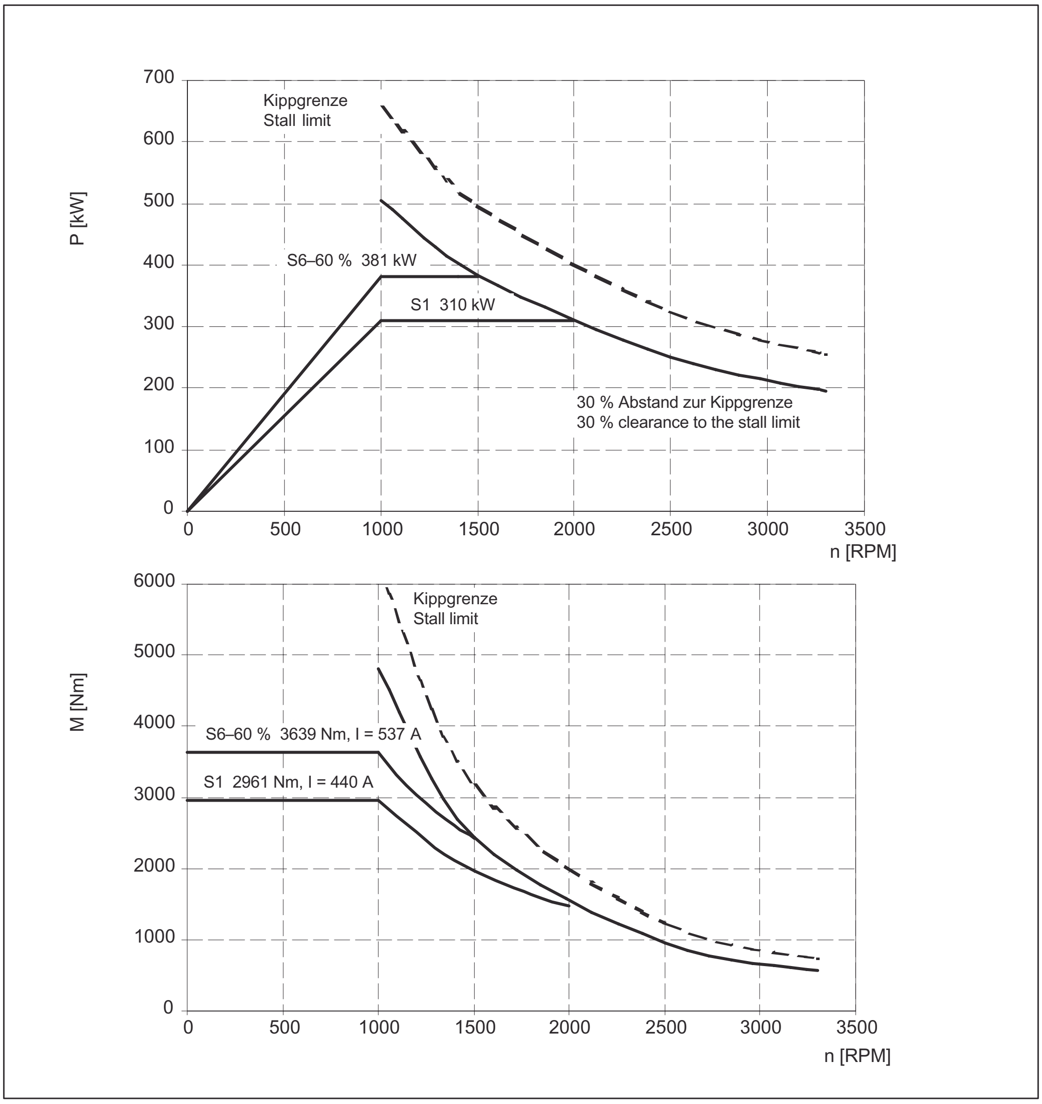

Figure 3-36 MASTERDRIVES VC, 1PL6286-□□C□□

Table 3-38 MASTERDRIVES VC, 480 V, 1PL6288-□□C□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	385	3677	570	460	34.0	2050	2200	3300	72	170

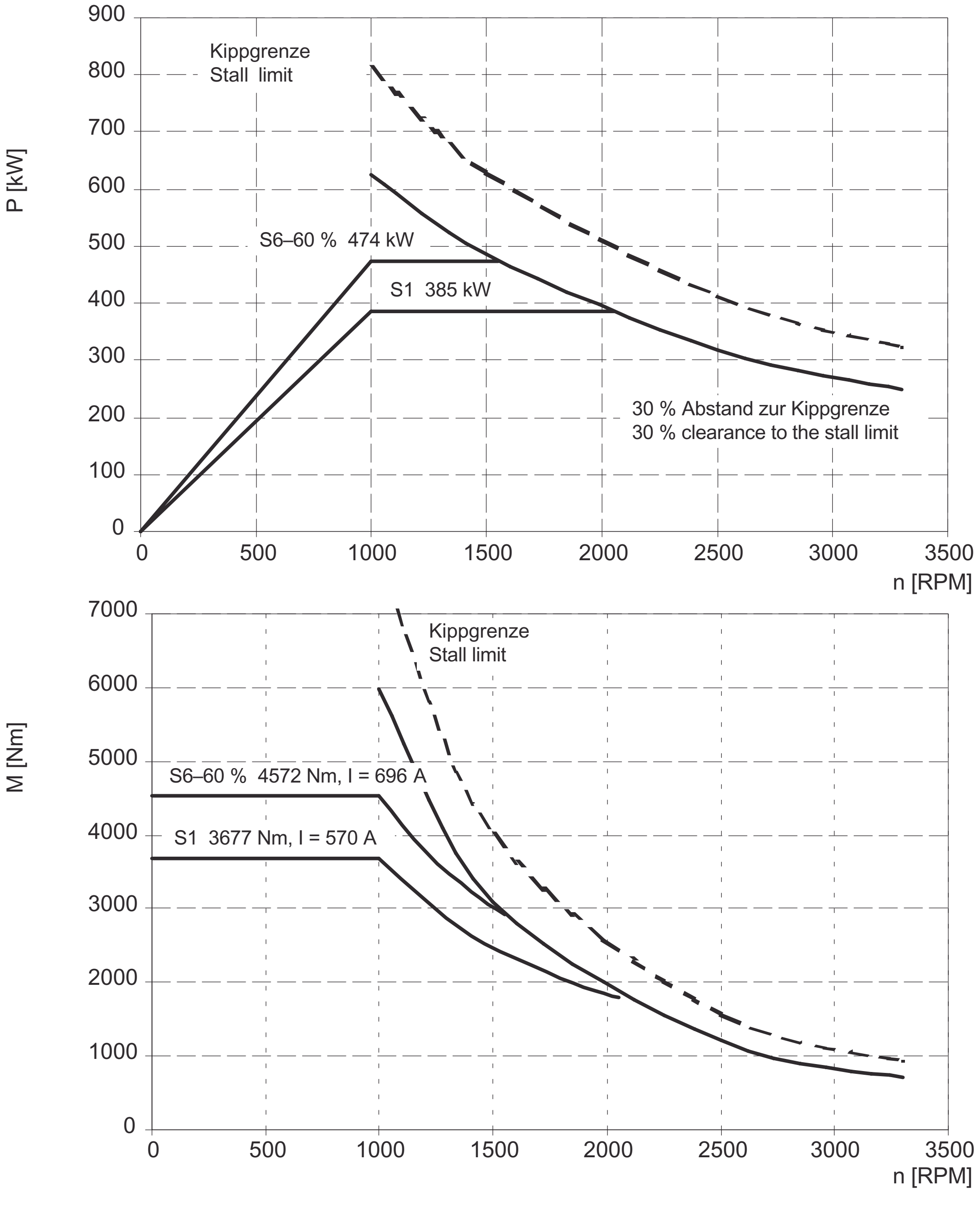

Figure 3-37 MASTERDRIVES VC, 1PL6288-□□C□□

Table 3-39 MASTERDRIVES VC, 480 V, 1PL6184-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1350	74	523	119	460	46,1	2200	3500 [1)]	5000	30	44

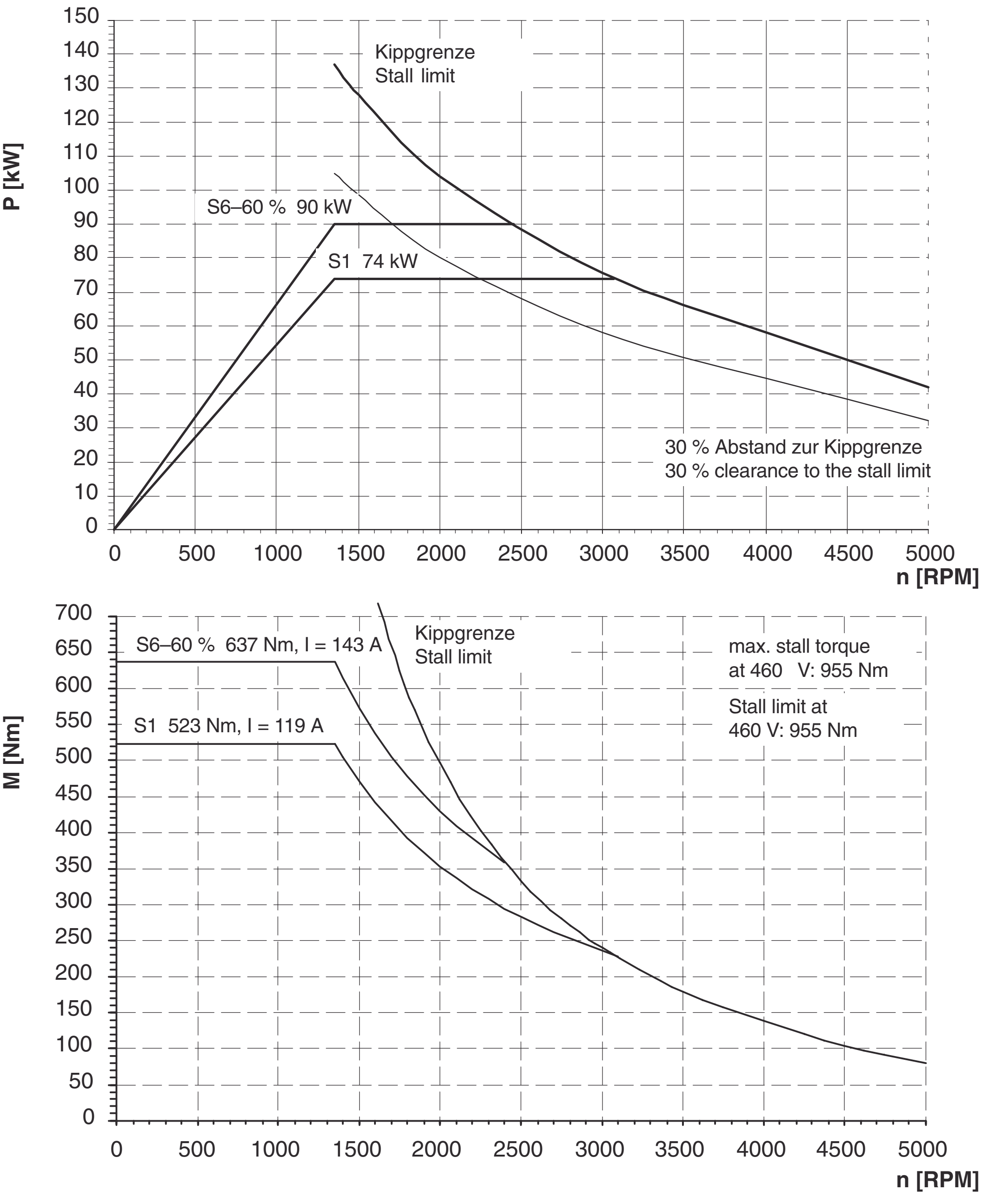

Figure 3-38 MASTERDRIVES VC, 1PL6184-□□D□□

1) 3000 RPM for increased cantilever forces

Table 3-40 MASTERDRIVES VC, 480 V, 1PL6186-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1350	98	693	156	460	46.0	2400	3500 1)	5000	30	60

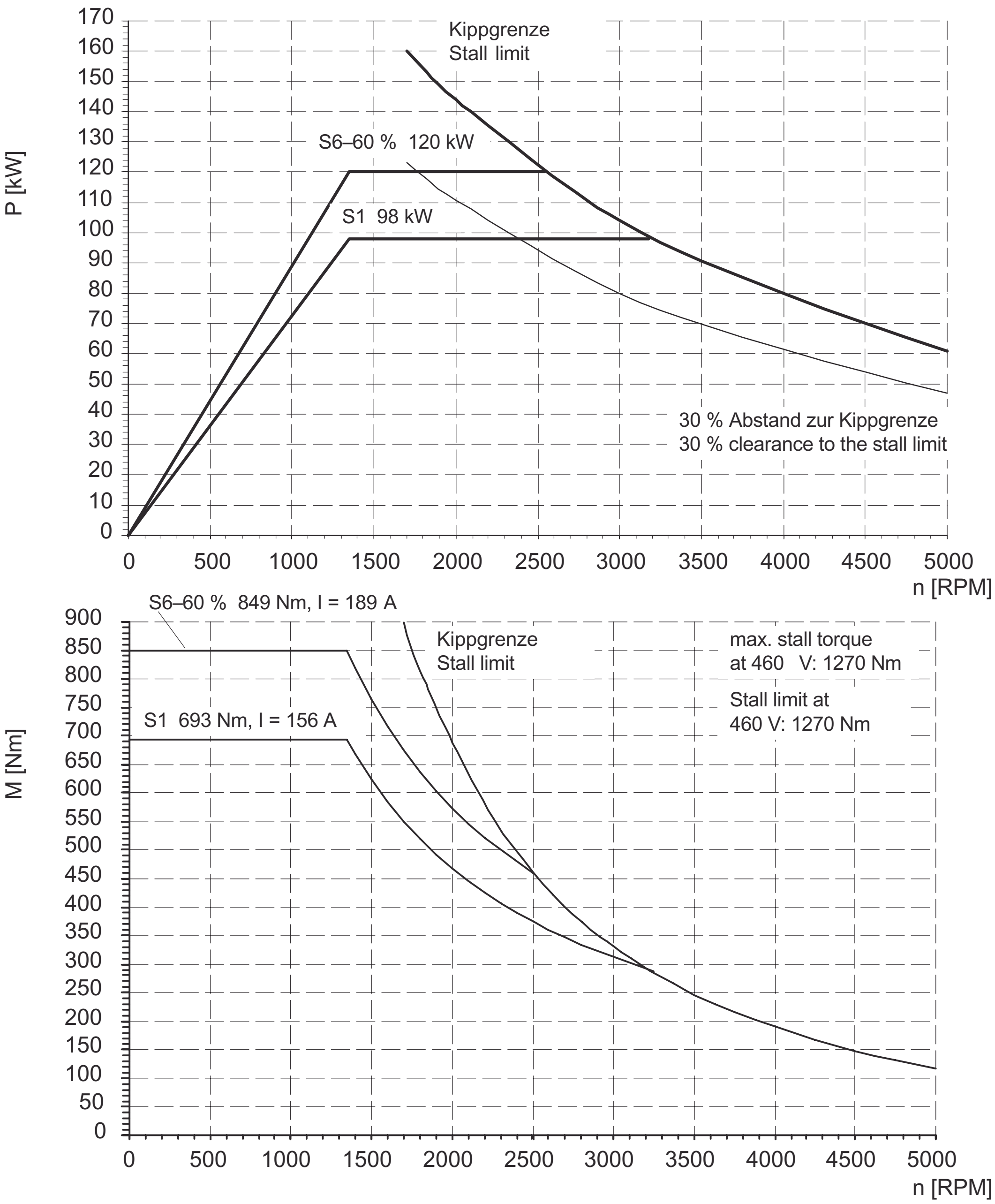

Figure 3-39 MASTERDRIVES VC, 1PL6186-□□D□□

1) 3000 RPM for increased cantilever forces

Table 3-41 MASTERDRIVES VC, 480 V, 1PL6224-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1350	137	969	215	460	45.8	2500	3100 $^{1)}$	4500	30	82

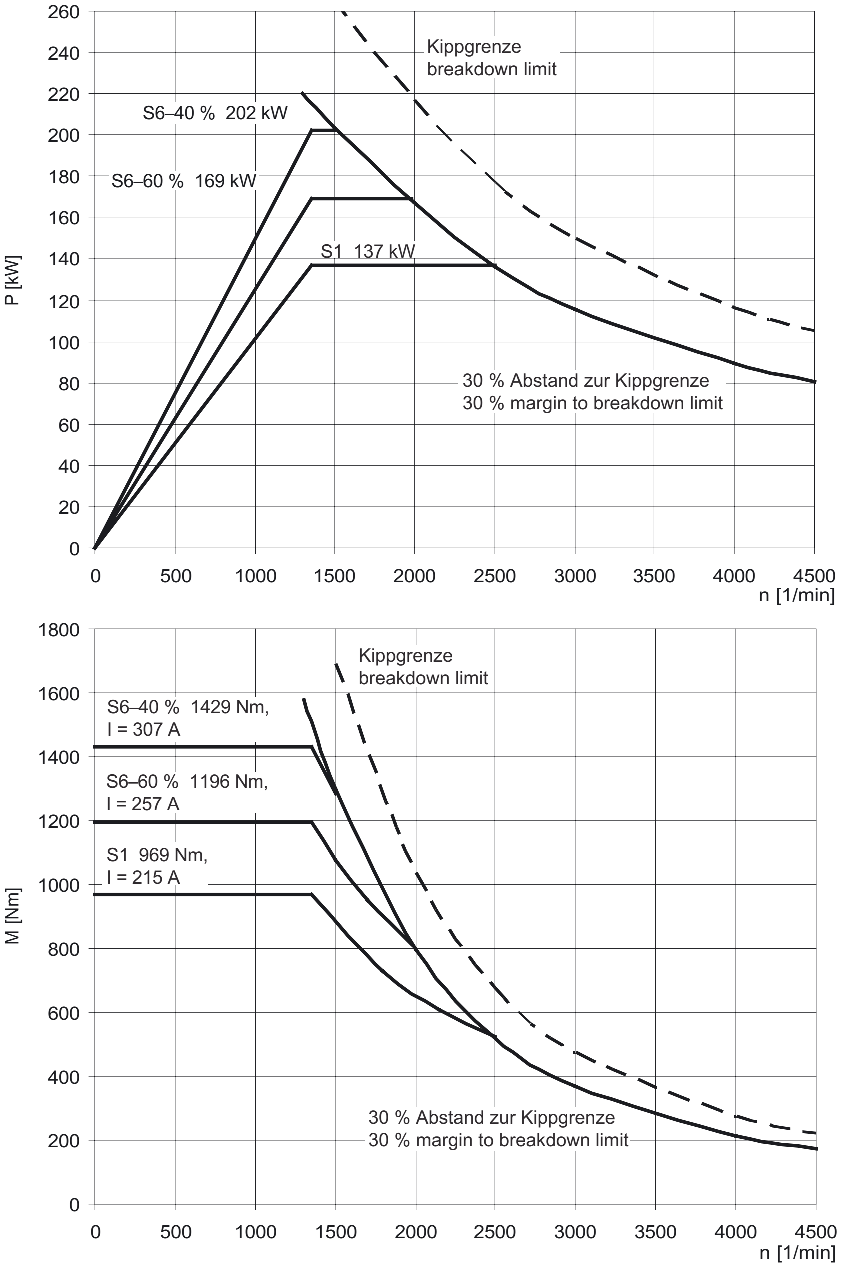

Figure 3-40 MASTERDRIVES VC, 1PL6224-□□D□□

1) 2700 RPM for increased cantilever forces

Table 3-42 MASTERDRIVES VC, 480 V, 1PL6226-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1350	172	1217	265	460	45.8	2500	3100 1)	4500	30	88

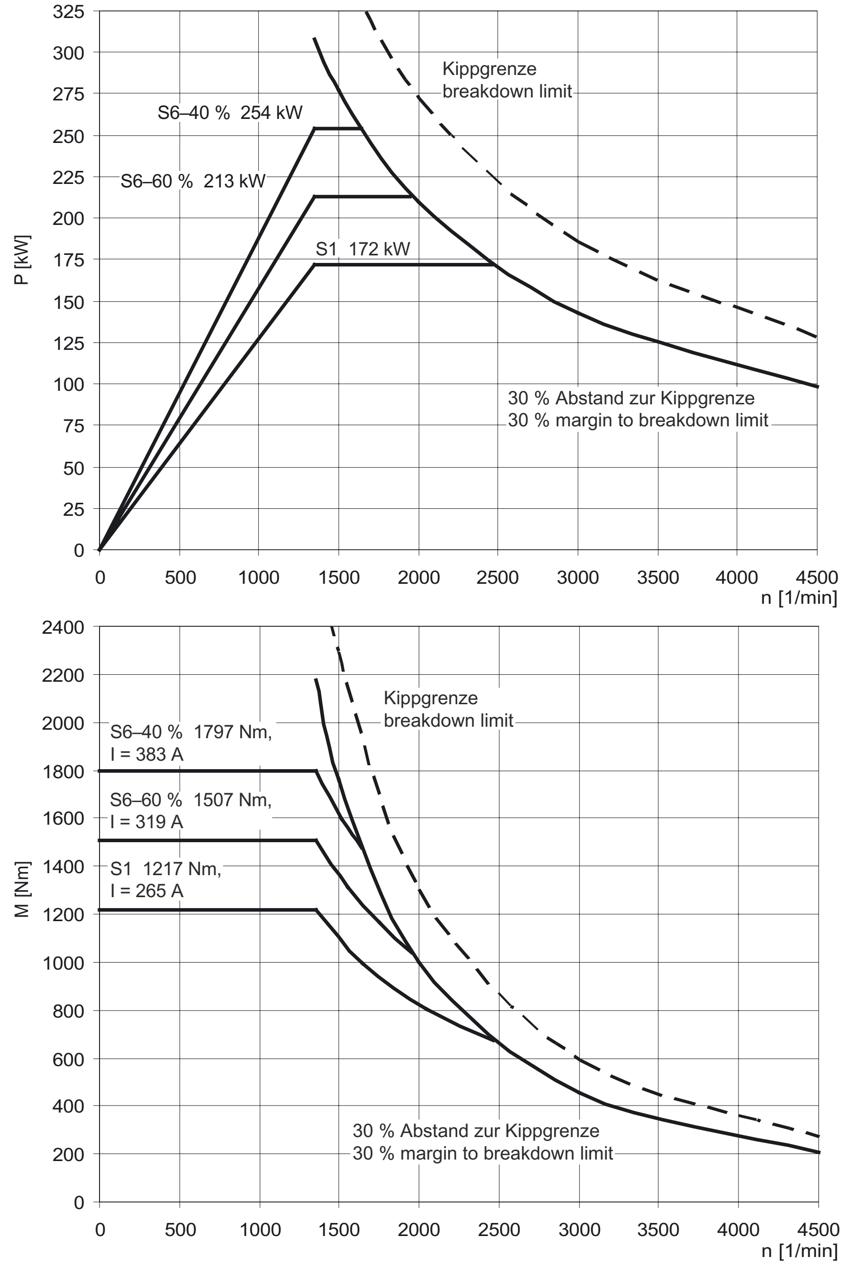

Figure 3-41 MASTERDRIVES VC, 1PL6226-□□D□□

1) 2700 RPM for increased cantilever forces

Table 3-43 MASTERDRIVES VC, 480 V, 1PL6228-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1350	218	1542	332	460	45.8	2200	3100 (1)	4500 (2)	30	100

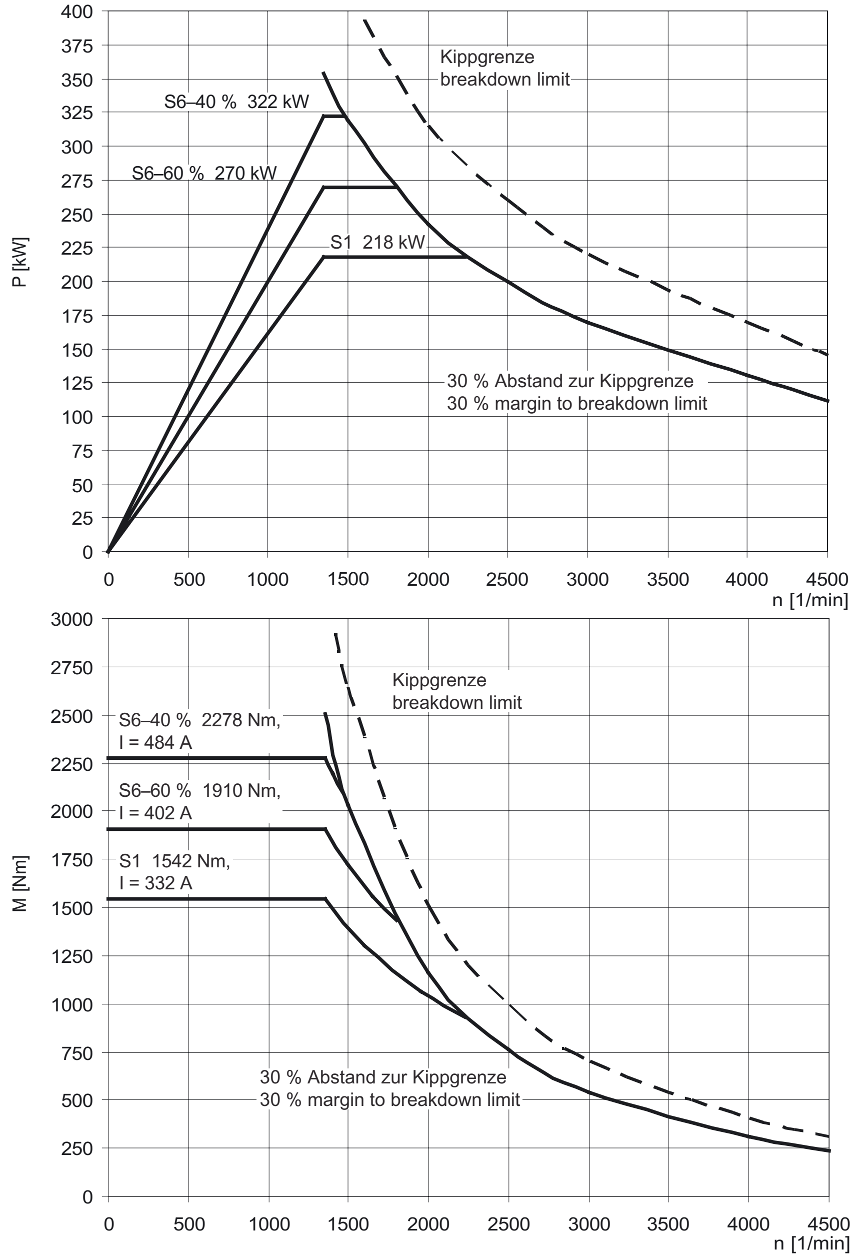

Figure 3-42 MASTERDRIVES VC, 1PL6228-□□D□□

1) 2700 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

Table 3-44 MASTERDRIVES VC, 480 V, 1PL6284-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1350	325	2299	478	470	45.5	2200	2200	3300	53	157

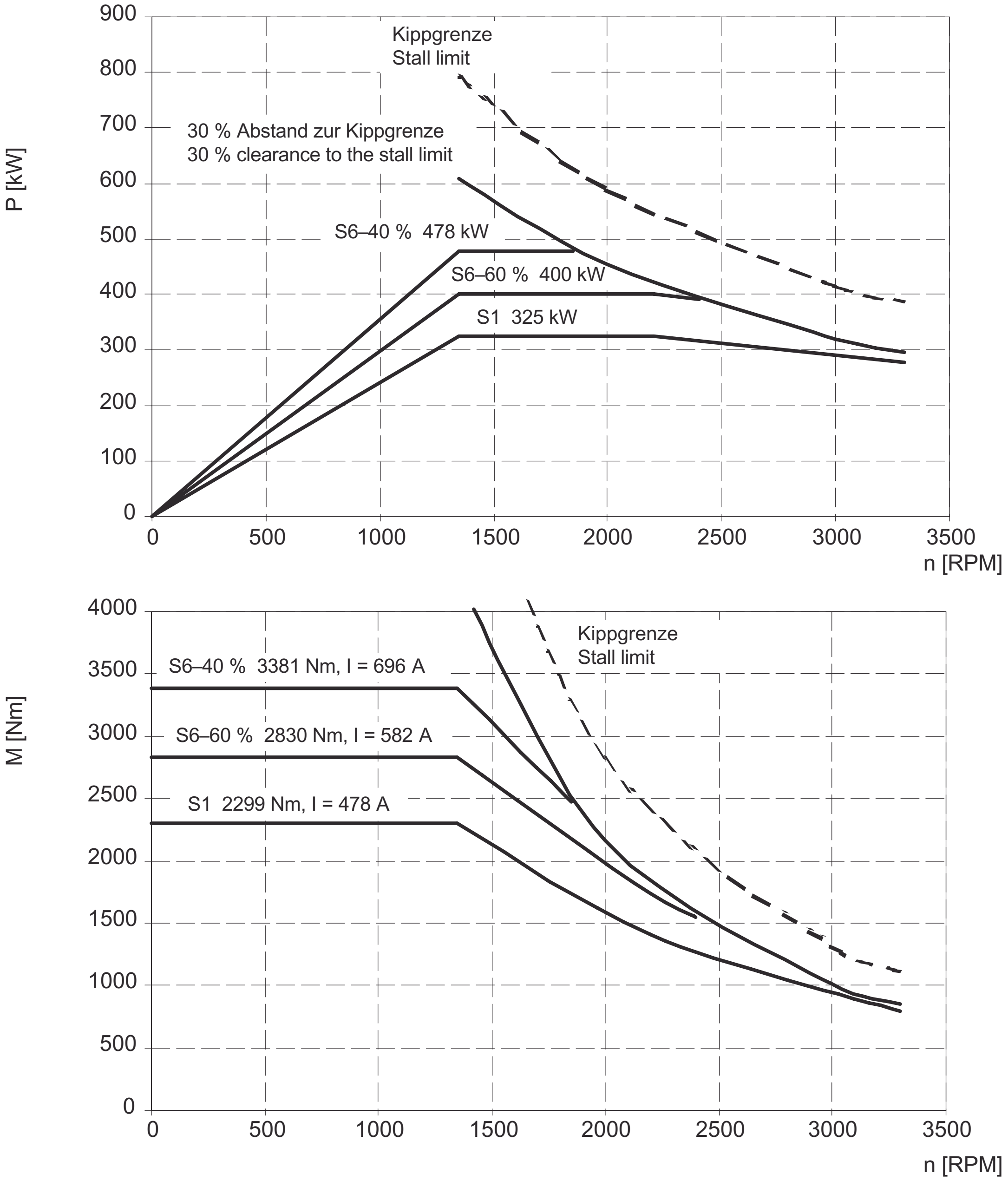

Figure 3-43 MASTERDRIVES VC, 1PL6284-□□D□□

Table 3-45 MASTERDRIVES VC, 480 V, 1PL6286-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1350	410	2901	637	445	45.5	2200	2200	3300	65	215

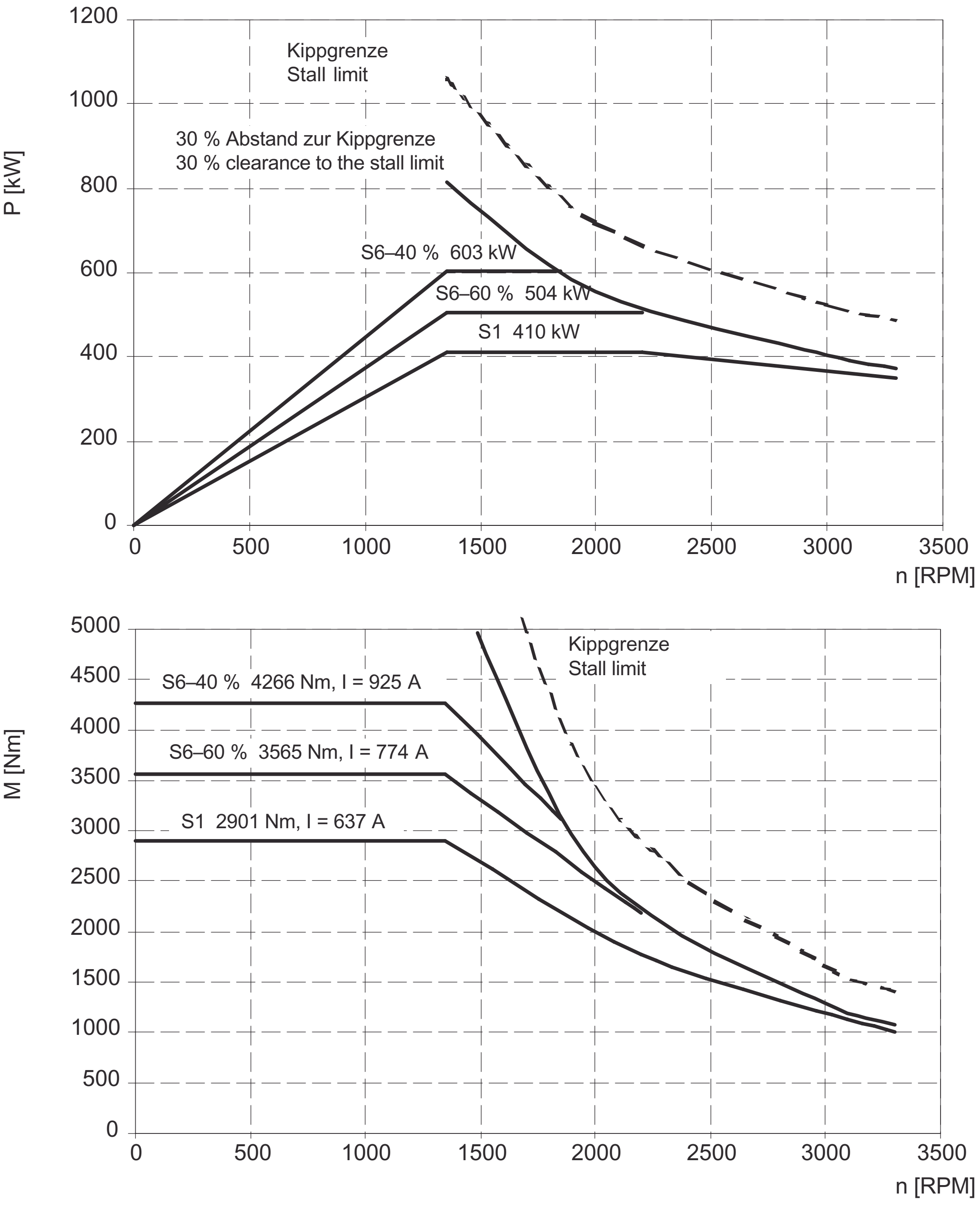

Figure 3-44 MASTERDRIVES VC, 1PL6286-□□D□□

Table 3-46 MASTERDRIVES VC, 480 V, 1PL6288-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1350	505	3573	765	450	45.5	2200	2200	3300	72	248

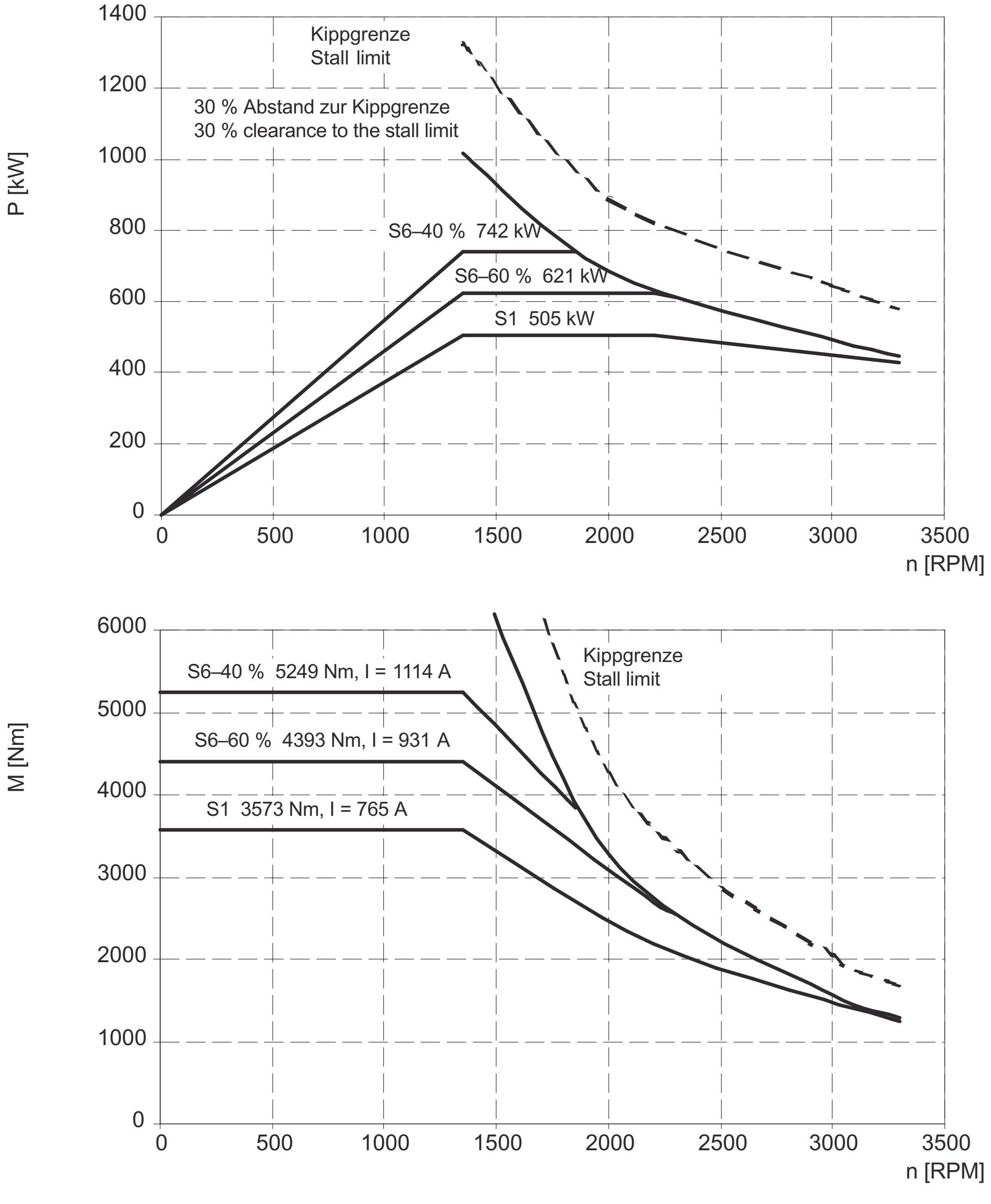

Figure 3-45 MASTERDRIVES VC, 1PL6288-□□D□□

Table 3-47 MASTERDRIVES VC, 480 V, 1PL6184-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	98	468	161	460	67.5	4200	3500 1)	5000	30	70

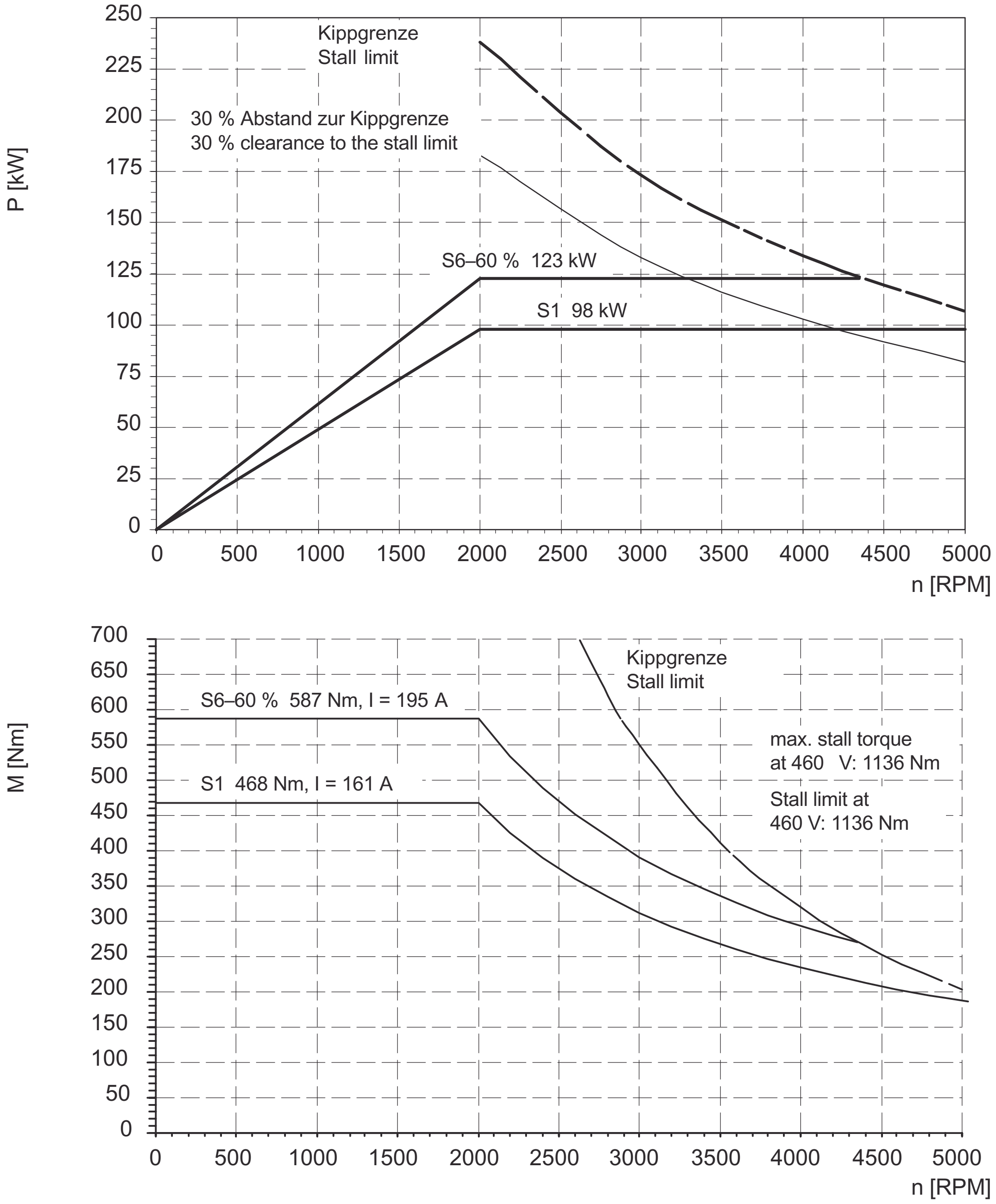

Figure 3-46 MASTERDRIVES VC, 1PL6184-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-48 MASTERDRIVES VC, 480 V, 1PL6186-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	135	645	220	460	67.5	4200	3500 [1)]	5000	30	94

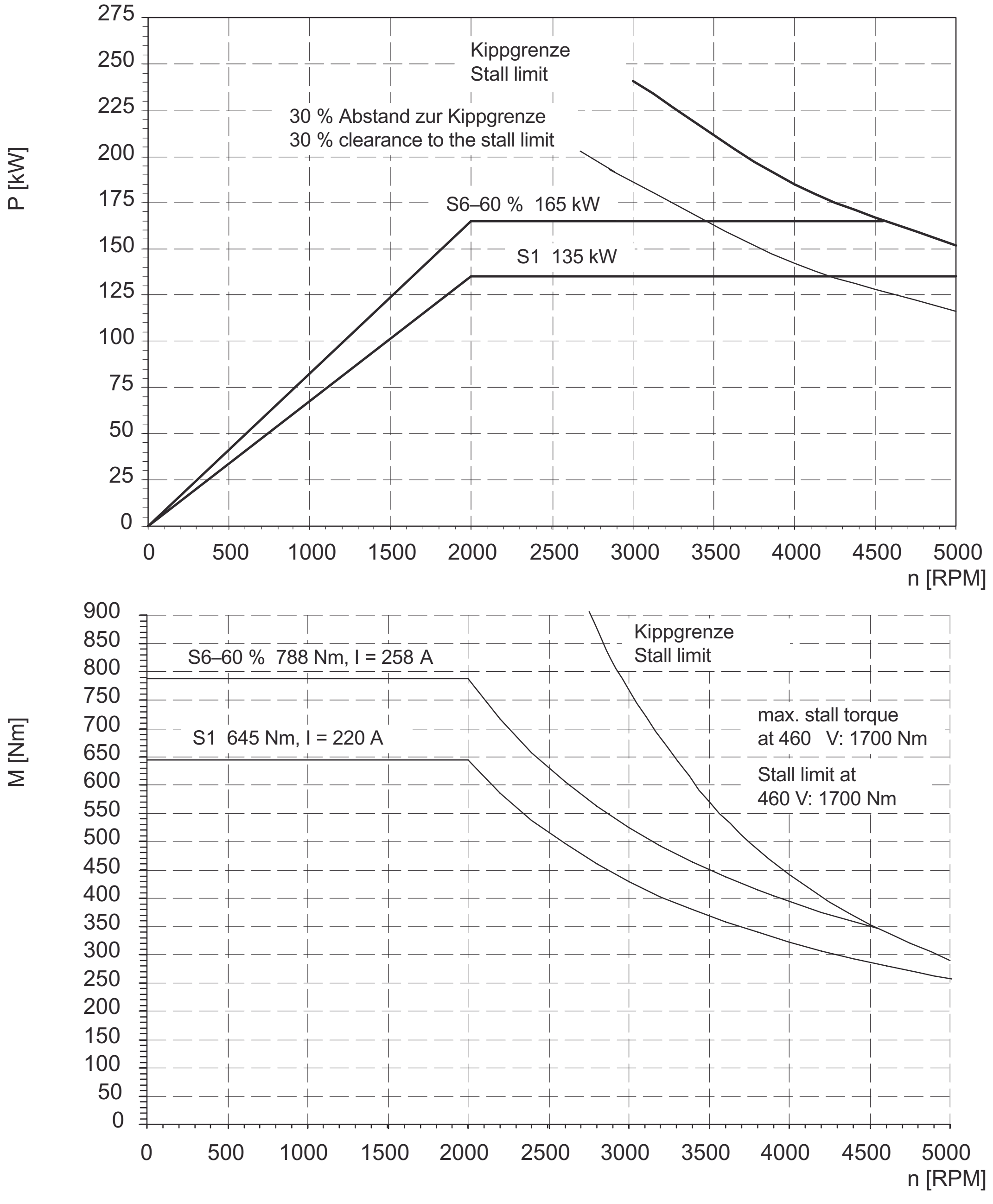

Figure 3-47 MASTERDRIVES VC, 1PL6186-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-49 MASTERDRIVES VC, 480 V, 1PL6224-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	178	850	275	460	67.5	2900	3100 1)	4500	30	91

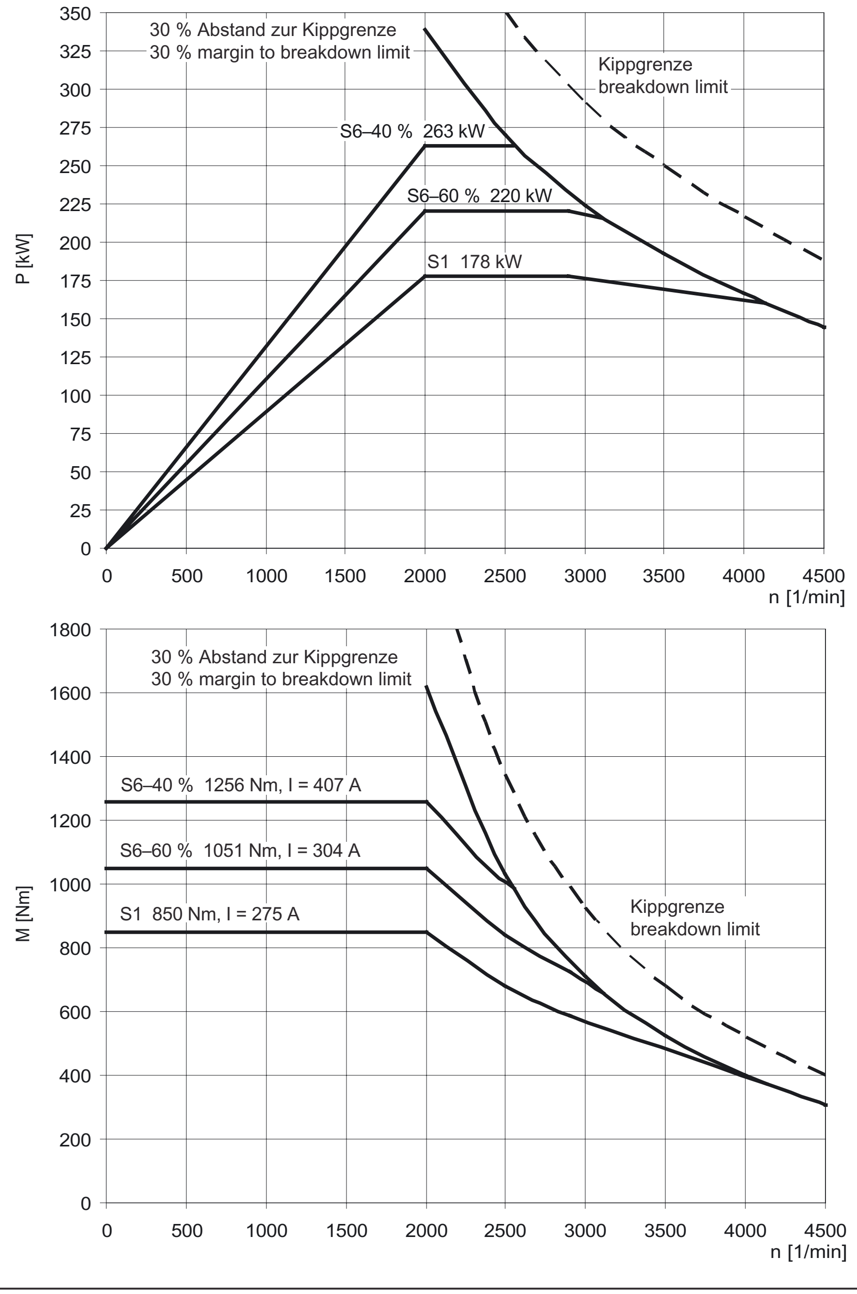

Figure 3-48 MASTERDRIVES VC, 1PL6224-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-50 MASTERDRIVES VC, 480 V, 1PL6226-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	220	1050	342	460	67.5	2900	3100 1)	4500	30	124

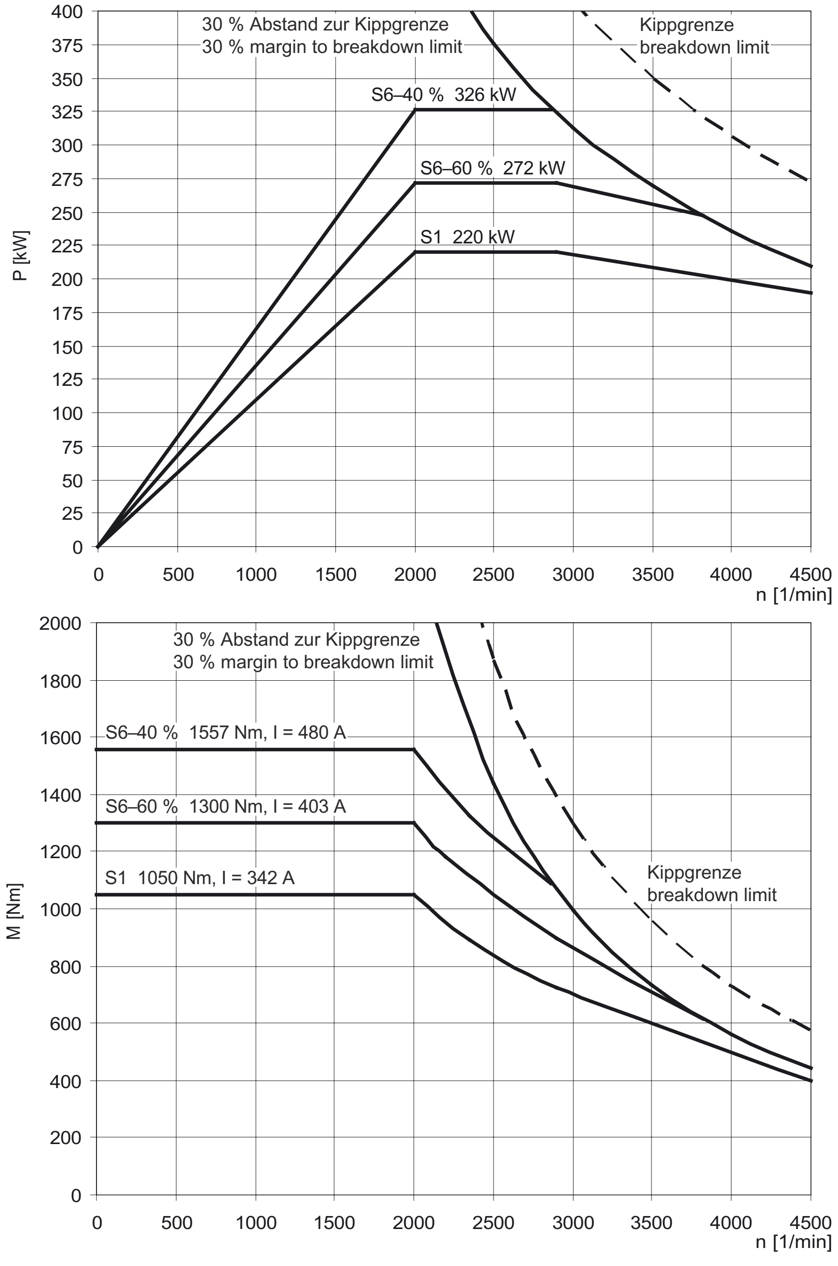

Figure 3-49 MASTERDRIVES VC, 1PL6226-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-51 MASTERDRIVES VC, 480 V, 1PL6228-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	288	1375	450	460	67.3	2900	3100 1)	4500 2)	30	176

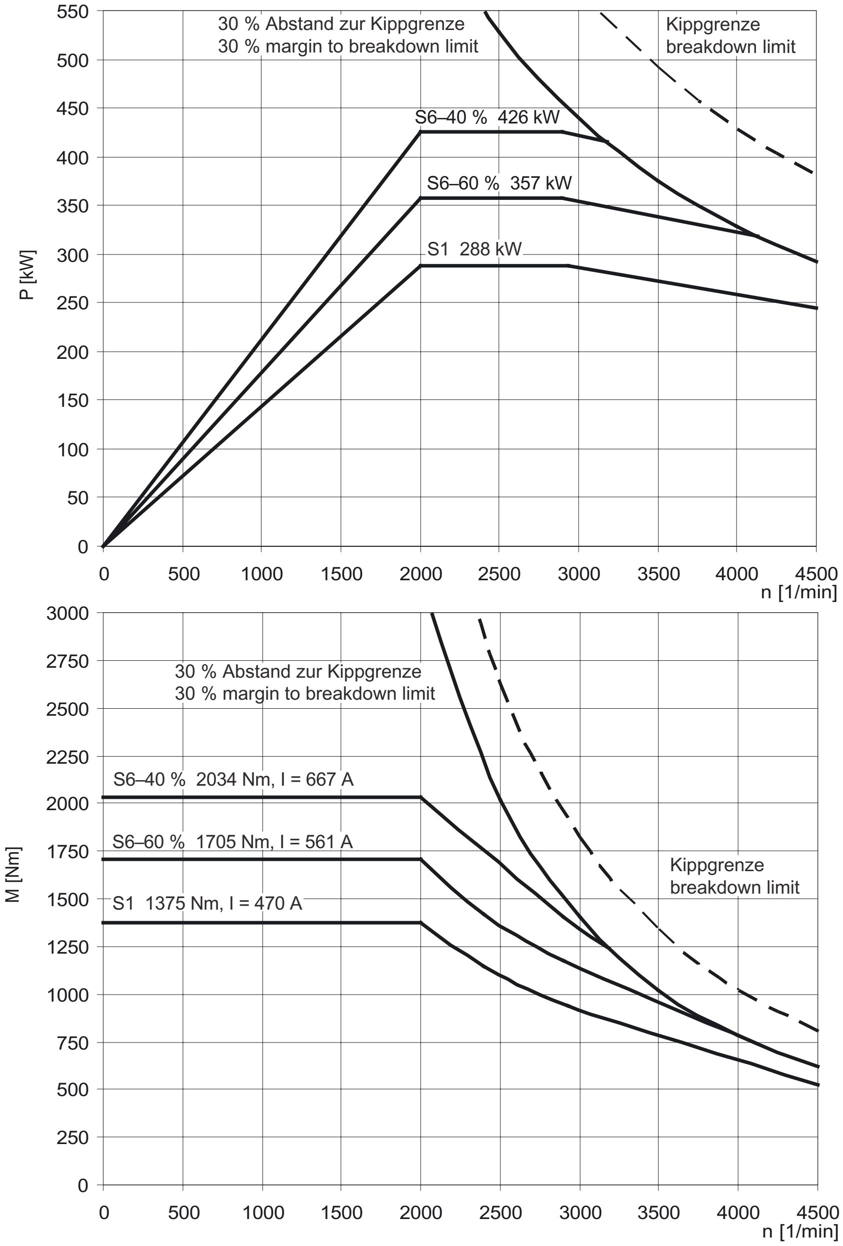

Figure 3-50 MASTERDRIVES VC, 1PL6228-□□F□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

Table 3-52 MASTERDRIVES VC, 480 V, 1PL6284-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
2000	415	1981	616	455	67.3	2200	2200	3300	53	161

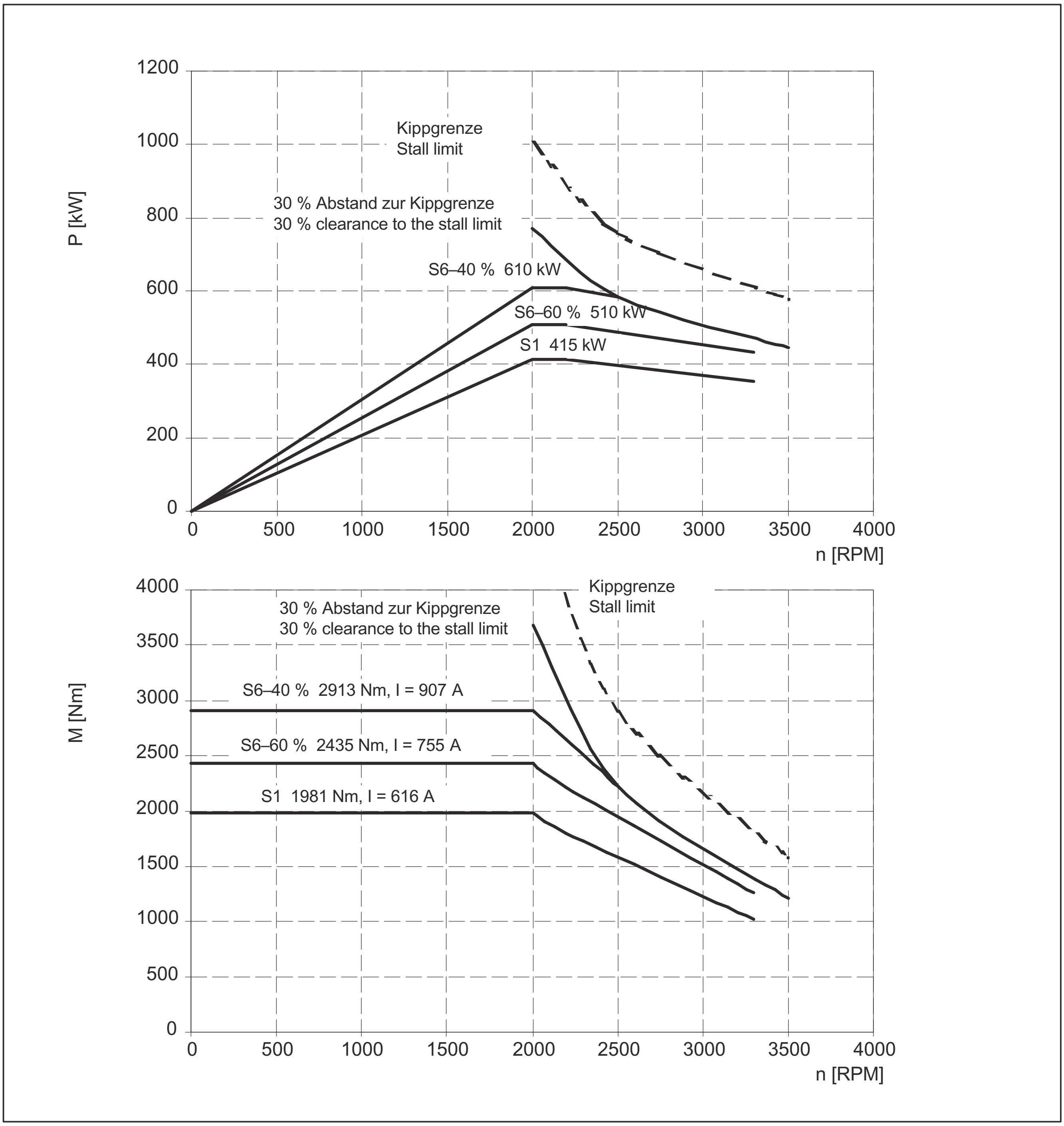

Figure 3-51 MASTERDRIVES VC, 1PL6284-□□F□□

Table 3-53 MASTERDRIVES VC, 480 V, 1PL6286-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
2000	500	2387	736	455	67.3	2200	2200	3300	65	181

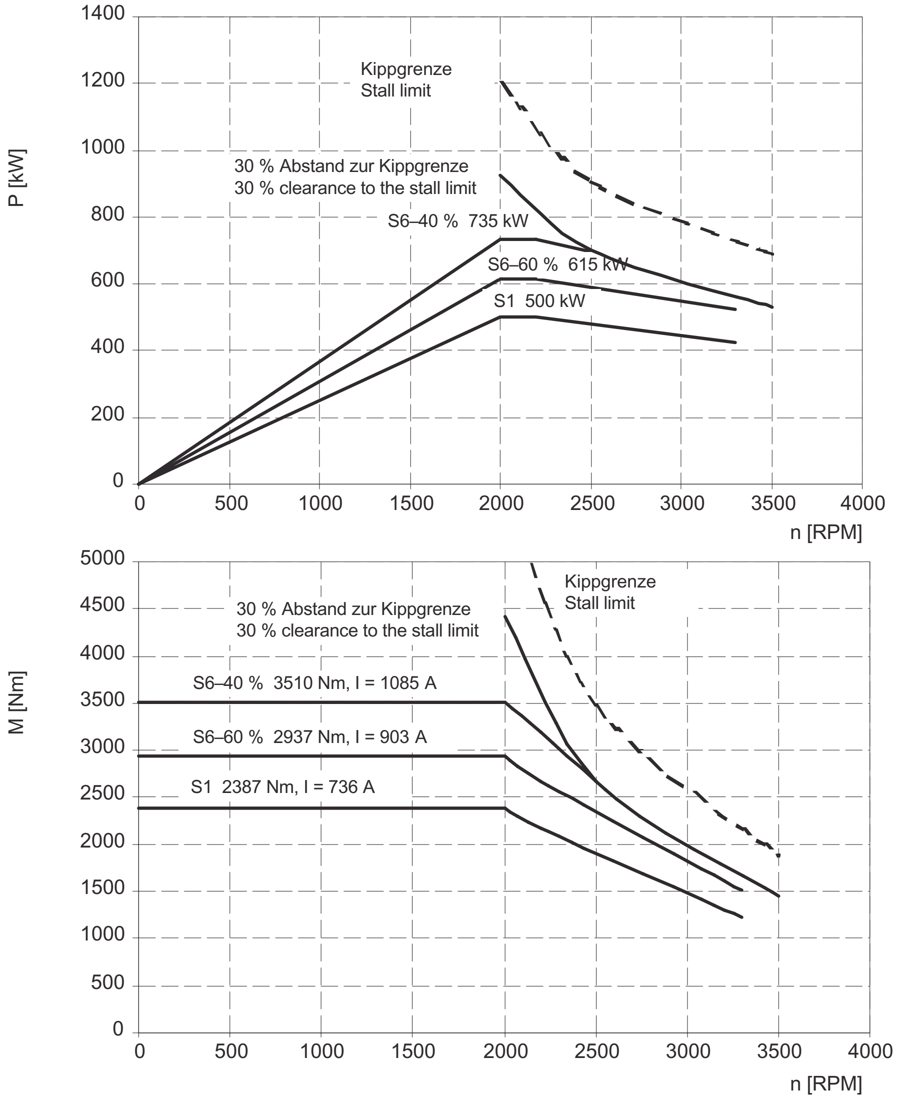

Figure 3-52 MASTERDRIVES VC, 1PL6286-□□F□□

Table 3-54 MASTERDRIVES VC, 480 V, 1PL6288-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2000	630	3009	924	455	67.3	2200	2200	3300	72	231

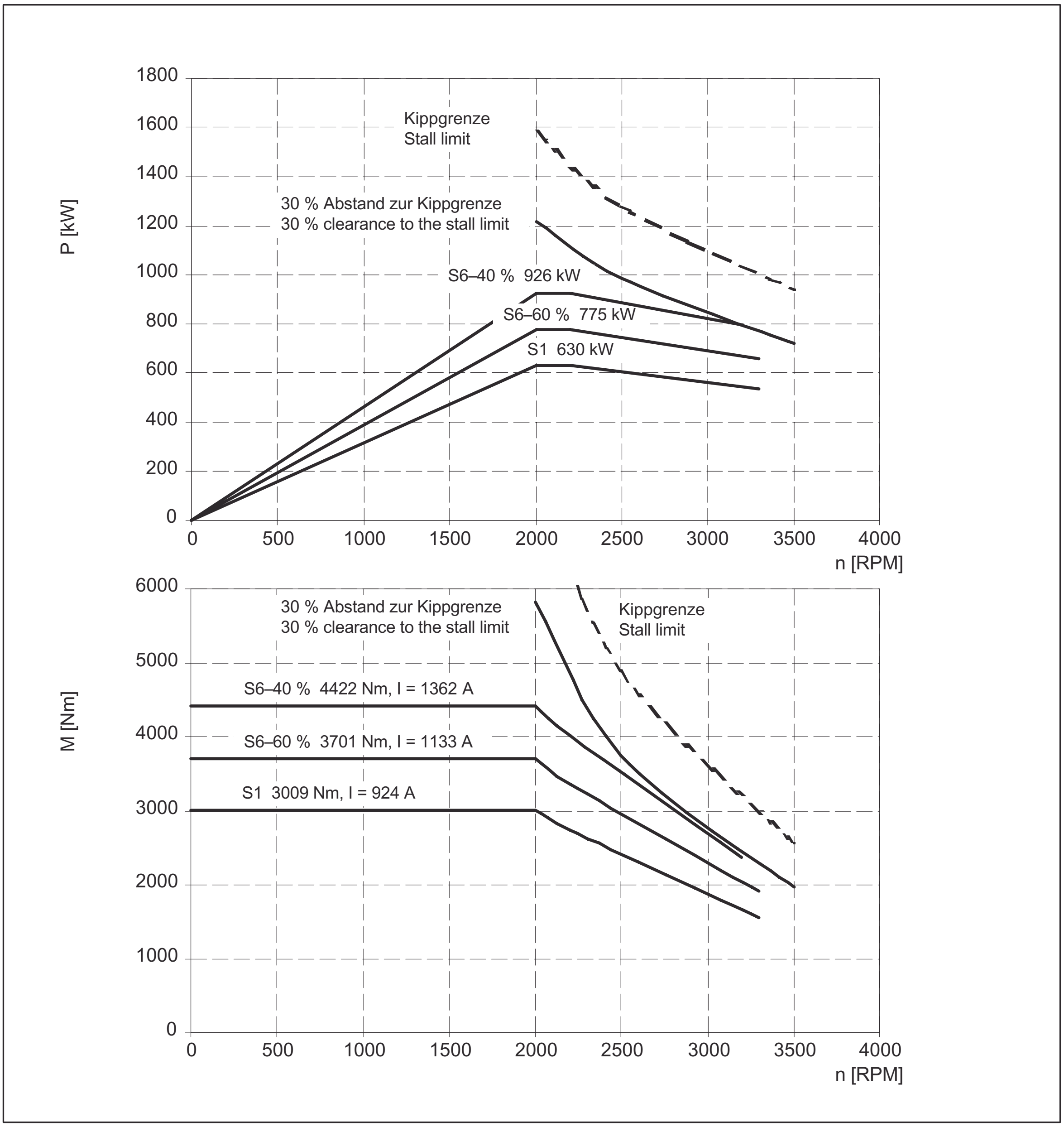

Figure 3-53 MASTERDRIVES VC, 1PL6288-□□F□□

Table 3-55 MASTERDRIVES VC, 480 V, 1PL6184-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	113	372	209	400	97.6	5000	3500 1)	5000	30	79

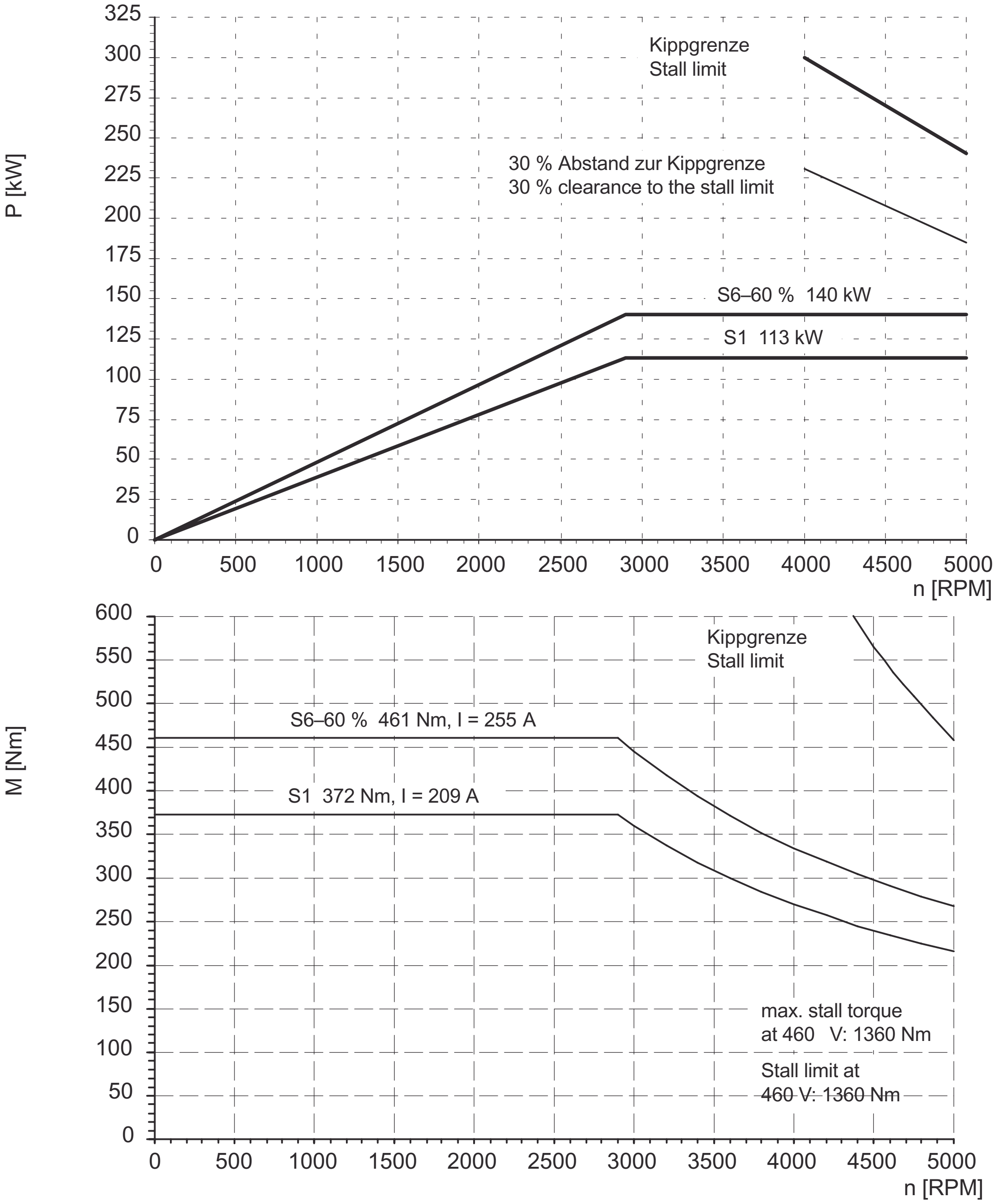

Figure 3-54 MASTERDRIVES VC, 1PL6184-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-56 MASTERDRIVES VC, 480 V, 1PL6186-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	150	494	280	390	97.5	5000	3500 1)	5000	30	110

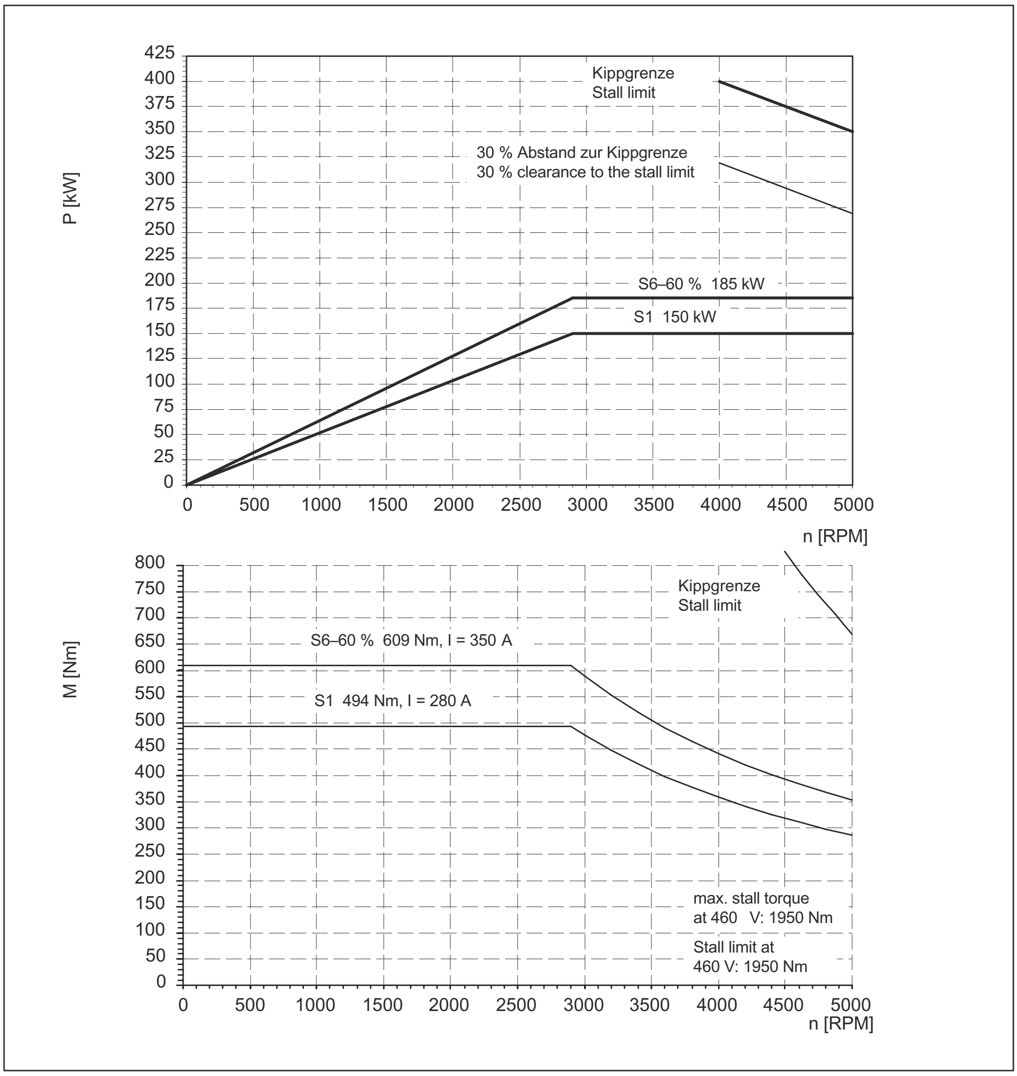

Figure 3-55 MASTERDRIVES VC, 1PL6186-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-57 MASTERDRIVES VC, 480 V, 1PL6224-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	205	675	365	400	97.5	3500	3100 [1)]	4500	30	118

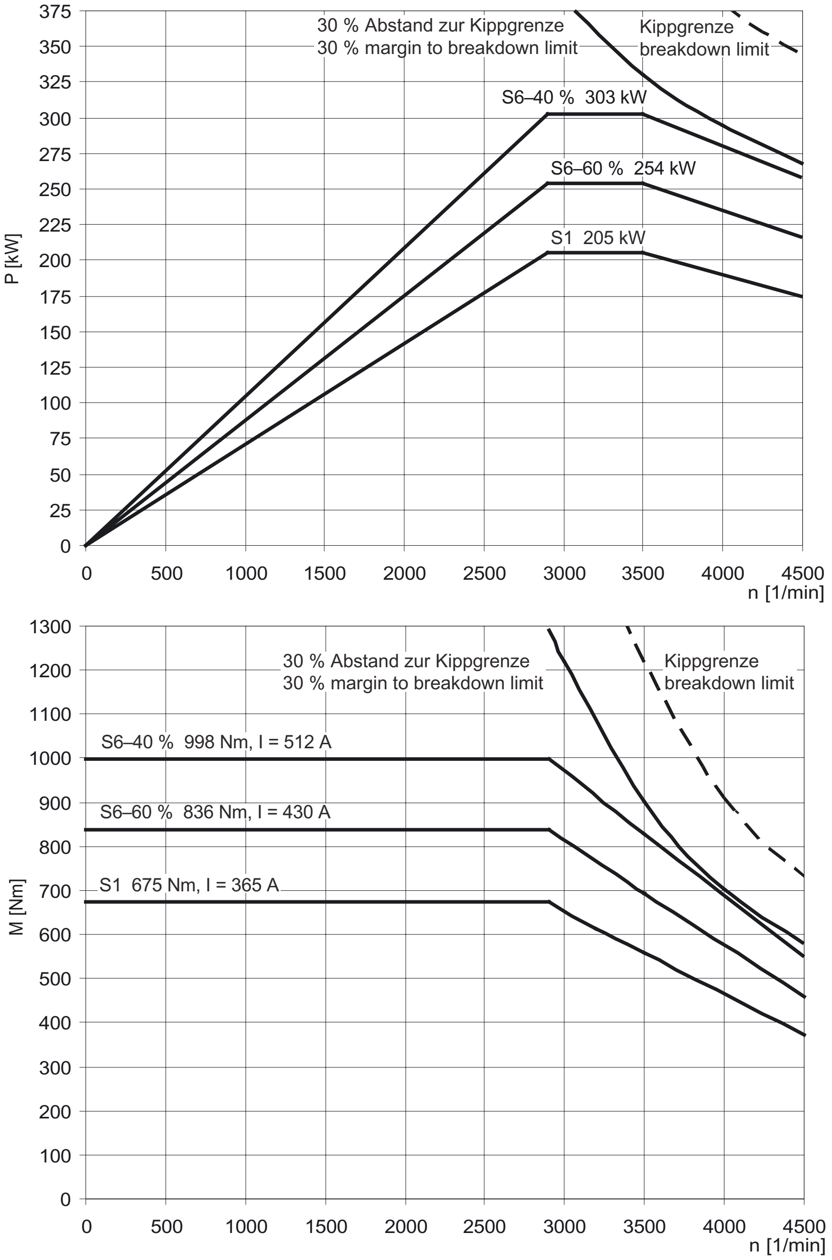

Figure 3-56 MASTERDRIVES VC, 1PL6224-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-58 MASTERDRIVES VC, 480 V, 1PL6226-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	270	889	470	395	97.4	3500	3100 [1]	4500	30	160

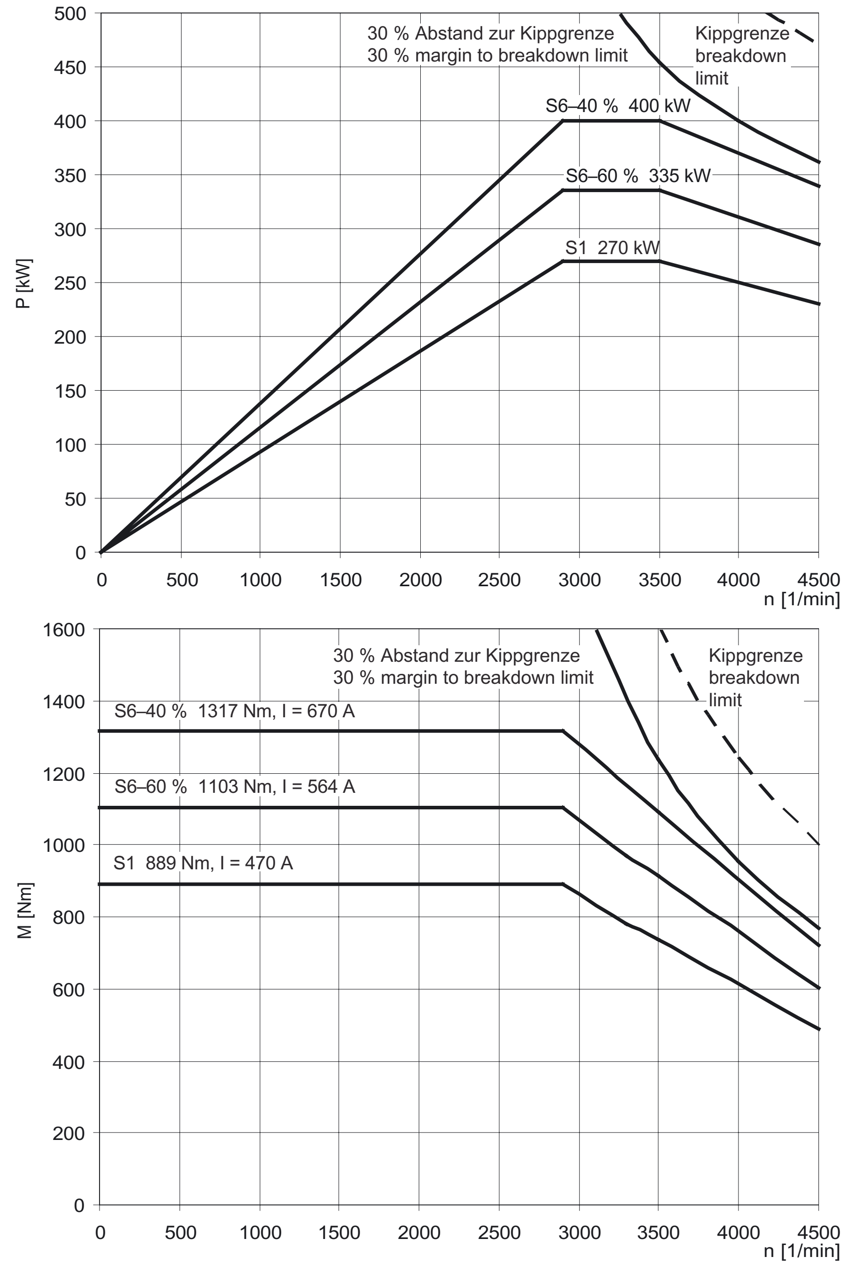

Figure 3-57 MASTERDRIVES VC, 1PL6226-□□L□□

[1] 2700 RPM for increased cantilever forces

Table 3-59 MASTERDRIVES VC, 480 V, 1PL6228-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	300	988	530	400	97.3	3500	3100 1)	4500 2)	30	188

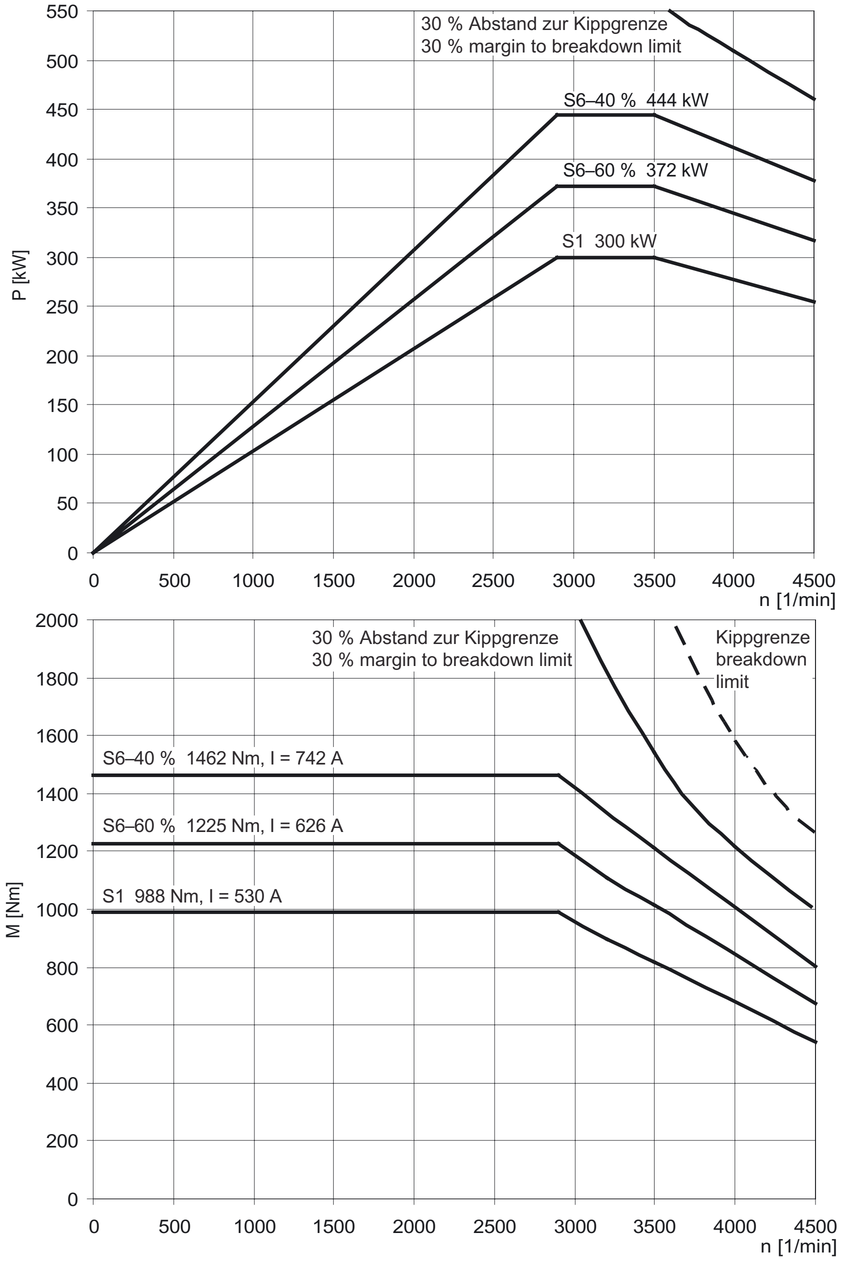

Figure 3-58 MASTERDRIVES VC, 1PL6228-□□L□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

3.1.3 P/n and M/n diagrams for 3-ph. 690 V AC

Table 3-60 MASTERDRIVES VC, 690 V, 1PL6284-□□C□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
800	185	2208	185	690	27.0	1440	2200	3300	53	55

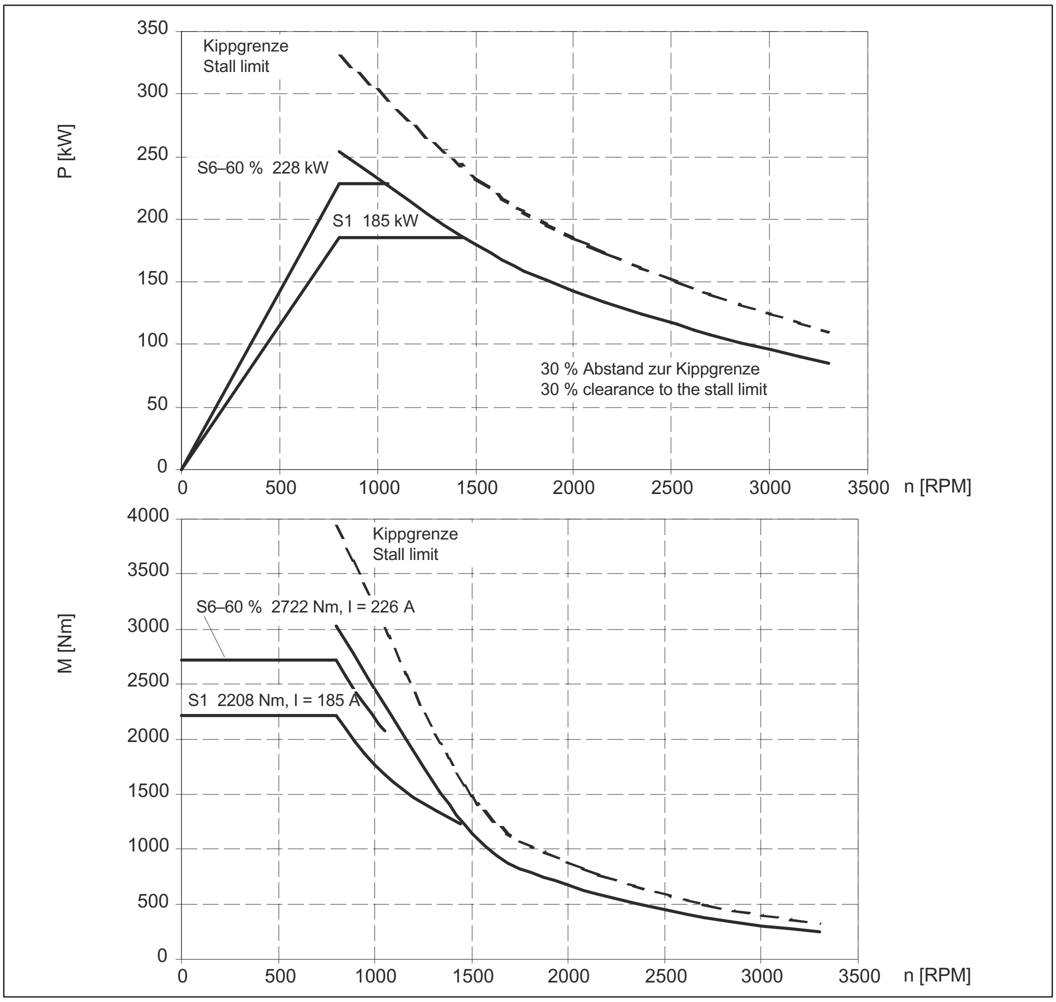

Figure 3-59 MASTERDRIVES VC, 1PL6284-□□C□□

Table 3-61 MASTERDRIVES VC, 690 V, 1PL6286-□□C□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
800	240	2865	250	665	27.0	1550	2200	3300	65	80

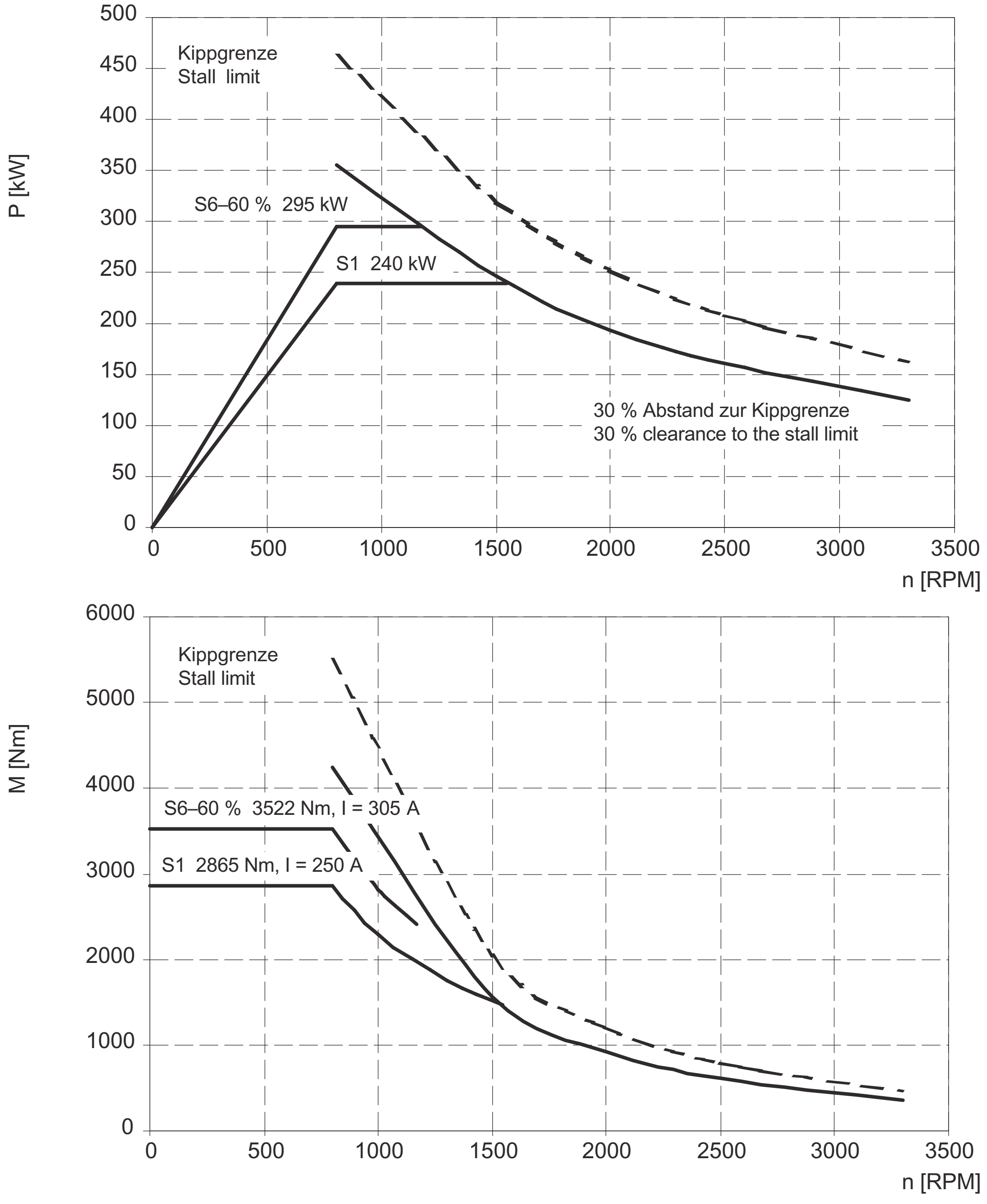

Figure 3-60 MASTERDRIVES VC, 1PL6286-□□C□□

Table 3-62 MASTERDRIVES VC, 690 V, 1PL6288-□□C□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
800	300	3581	320	640	27.0	1600	2200	3300	72	100

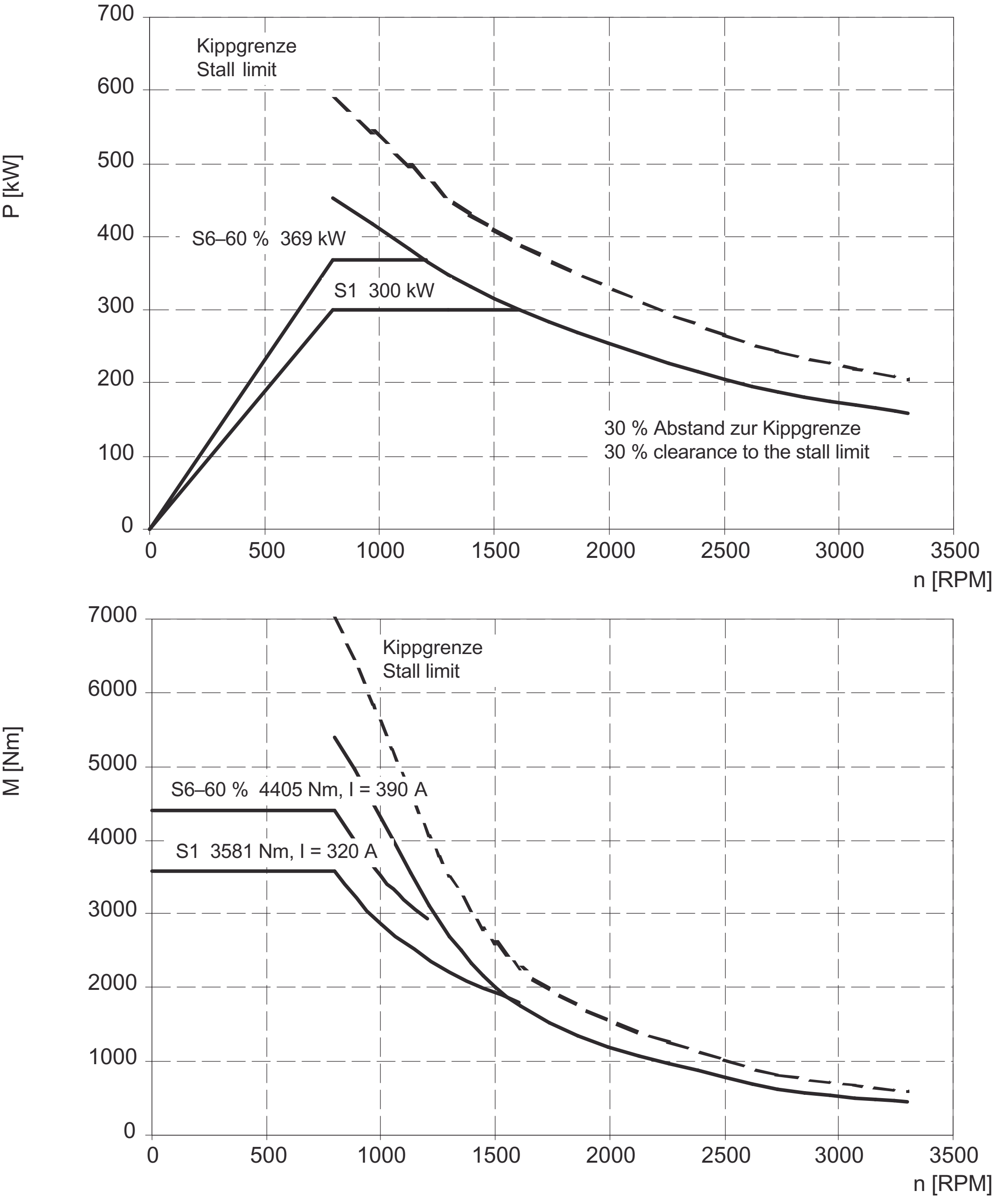

Figure 3-61 MASTERDRIVES VC, 1PL6288-□□C□□

Table 3-63 MASTERDRIVES VC, 690 V, 1PL6284-□□D□□(Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1150	272	2259	270	690	38.9	2200	2200	3300	53	89

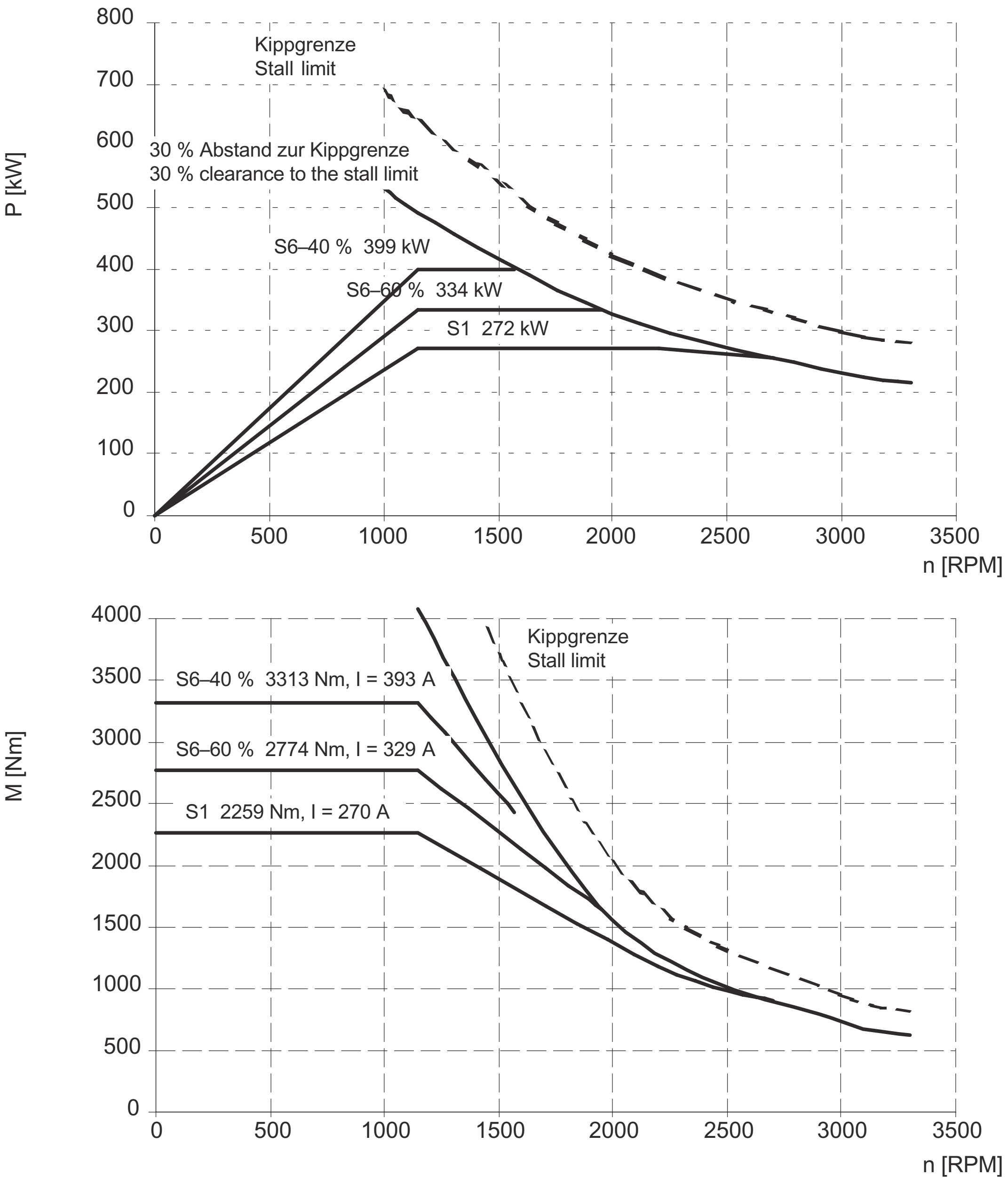

Figure 3-62 MASTERDRIVES VC, 1PL6284-□□D□□ (Option C30)

Table 3-64 MASTERDRIVES VC, 690 V, 1PL6286-□□D□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	344	2857	359	655	38.9	2200	2200	3300	65	123

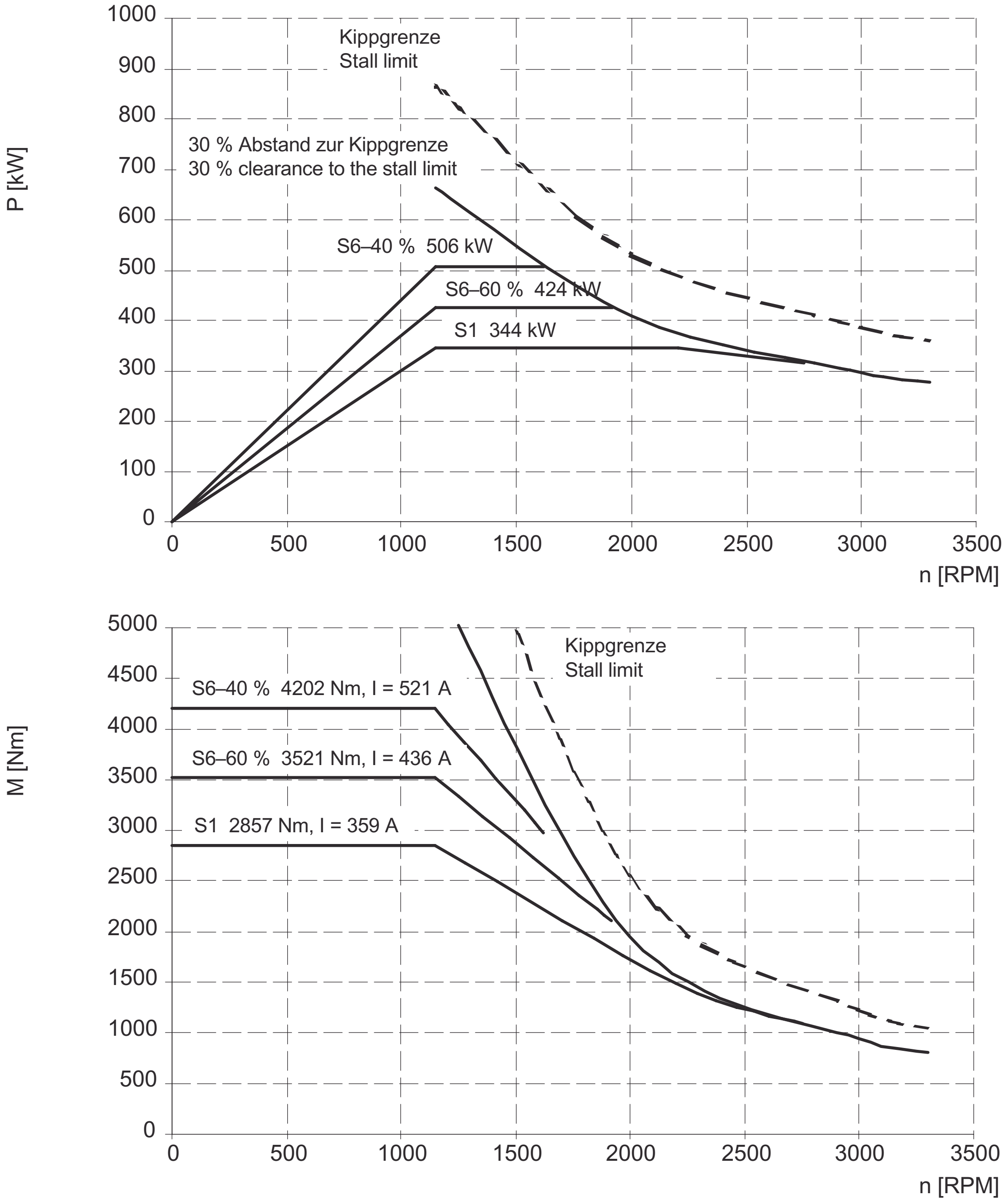

Figure 3-63 MASTERDRIVES VC, 1PL6286-□□D□□ (Option C30)

Table 3-65 MASTERDRIVES VC, 690 V, 1PL6288-□□D□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	422	3504	431	665	38.9	2200	2200	3300	72	143

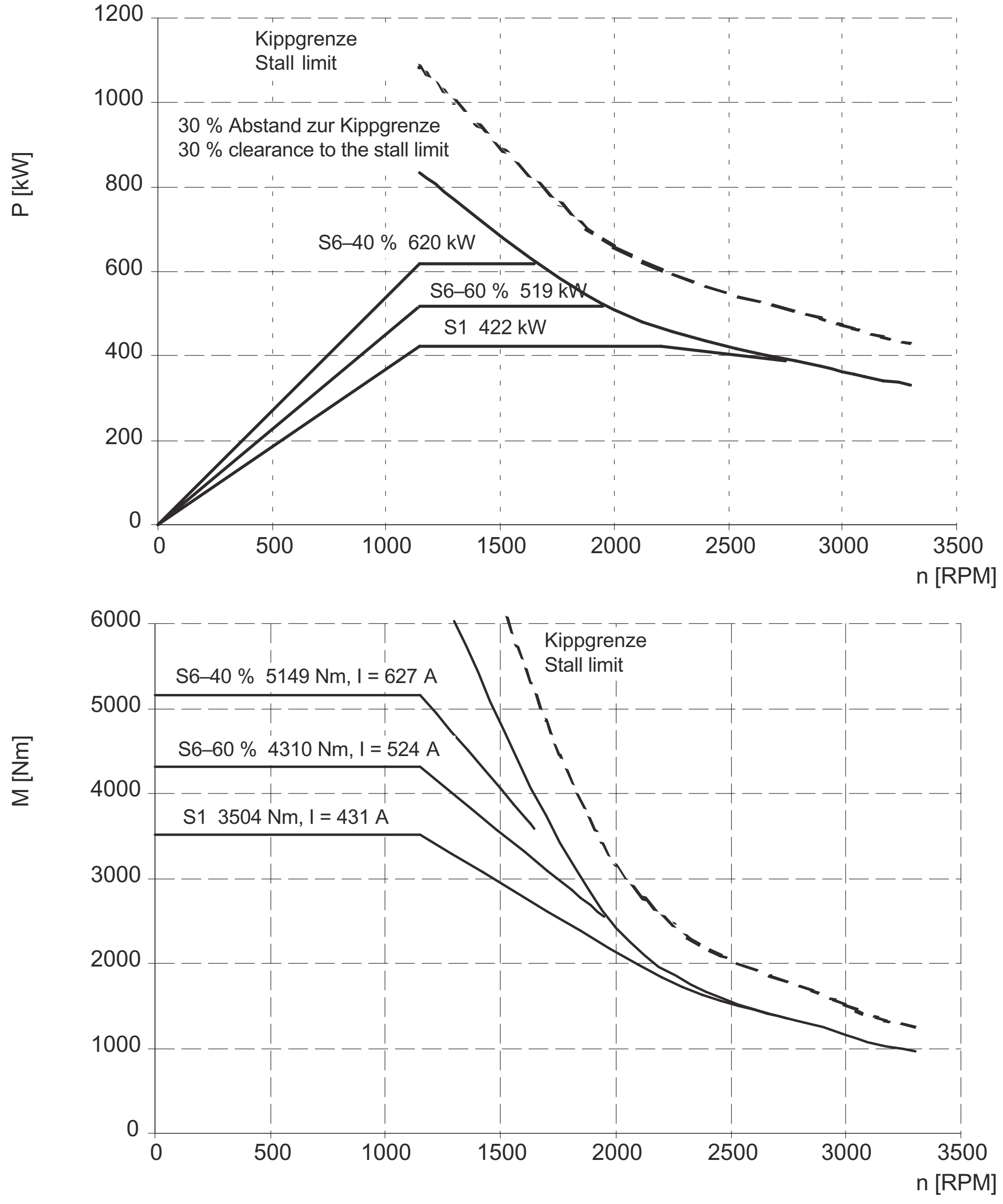

Figure 3-64 MASTERDRIVES VC, 1PL6288-□□D□□ (Option C30)

Table 3-66 MASTERDRIVES VC, 690 V, 1PL6284-□□F□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	359	1959	347	690	59.0	2200	2200	3300	53	93

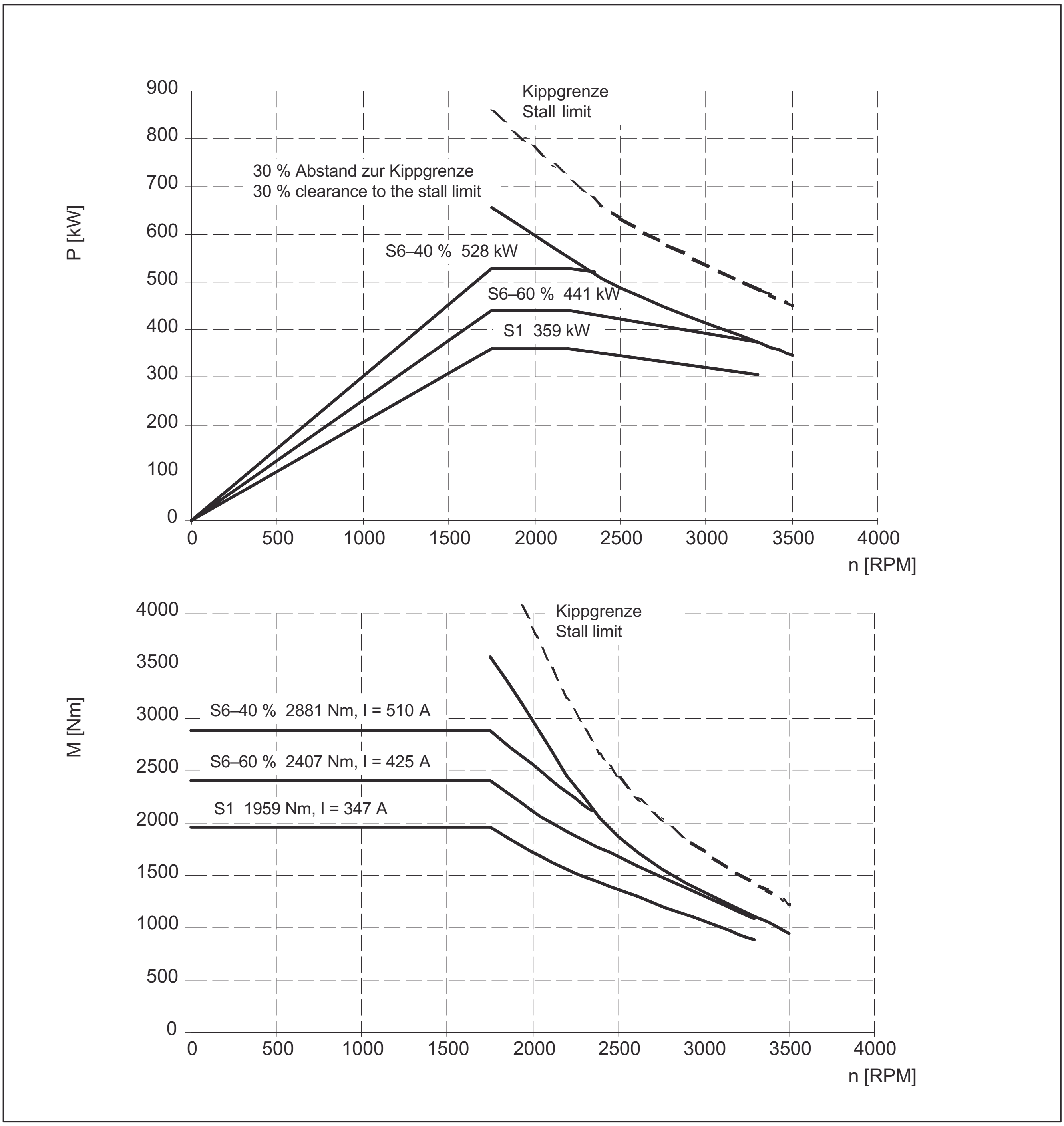

Figure 3-65 MASTERDRIVES VC, 1PL6284-□□F□□ (Option C30)

Table 3-67 MASTERDRIVES VC, 690 V, 1PL6286-□□F□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	432	2357	415	690	59.0	2200	2200	3300	65	105

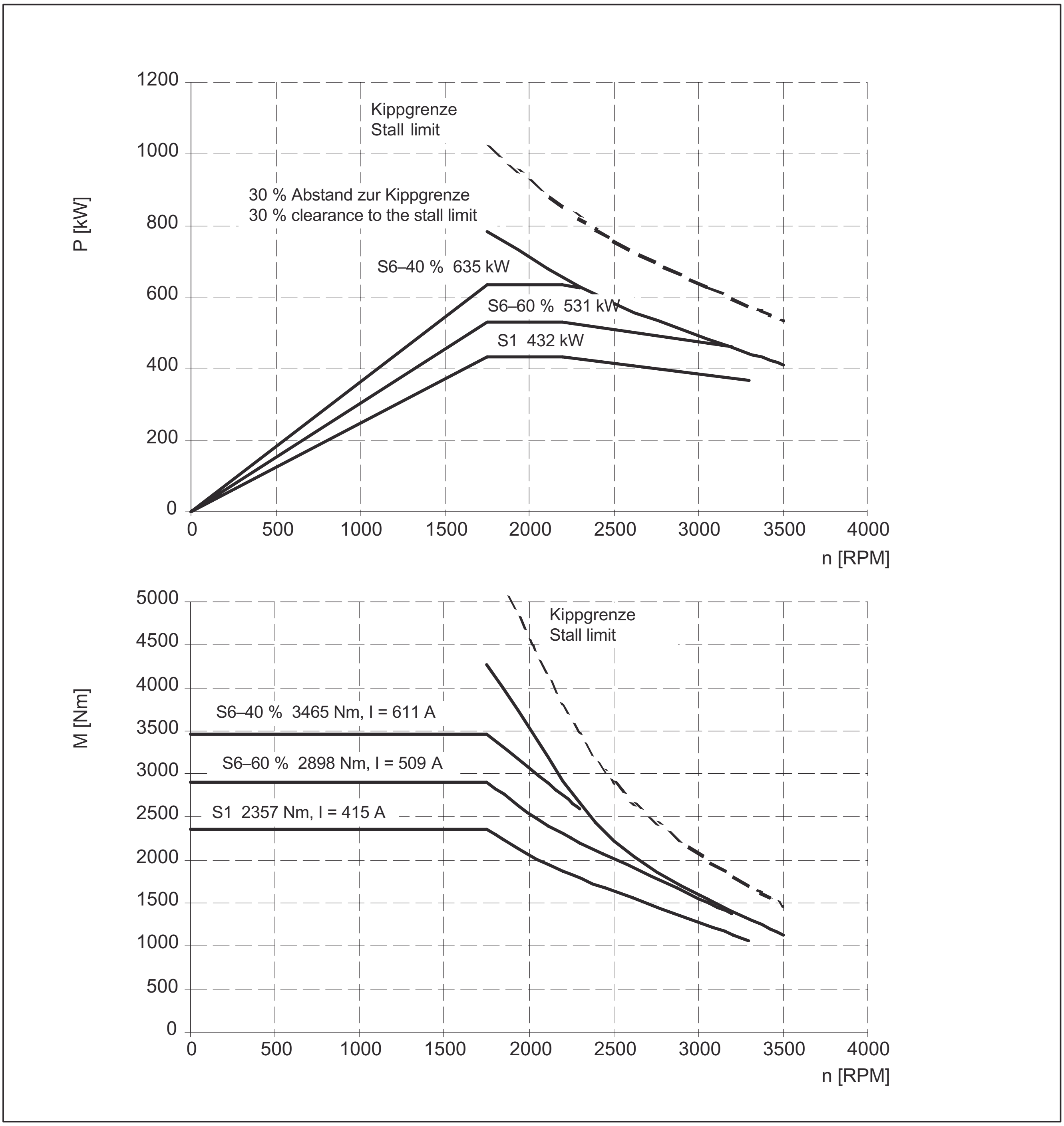

Figure 3-66 MASTERDRIVES VC, 1PL6286-□□F□□ (Option C30)

Table 3-68 MASTERDRIVES VC, 690 V, 1PL6288-□□F□□ (Option C30)

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	543	2963	520	690	59.0	2200	2200	3300	72	133

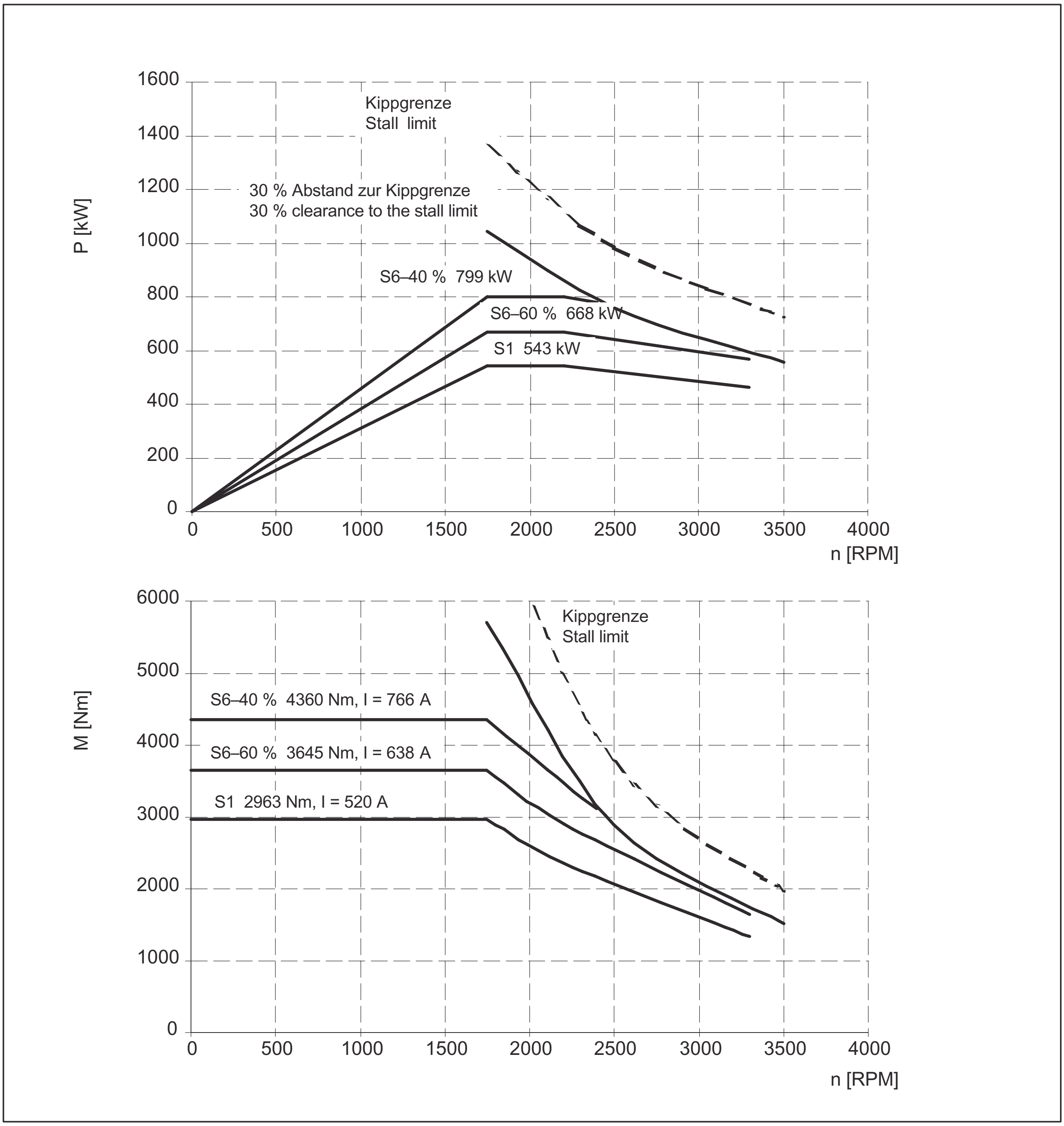

Figure 3-67 MASTERDRIVES VC, 1PL6288-□□F□□ (Option C30)

3.2 Technical data and characteristics for MASTERDRIVES MC

3.2.1 P/n diagrams for 3-ph. 400 V AC

Table 3-69 MASTERDRIVES MC, 400 V, 1PL6184-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	20.5	489	58	290	14.2	800	800	800	30	33.4

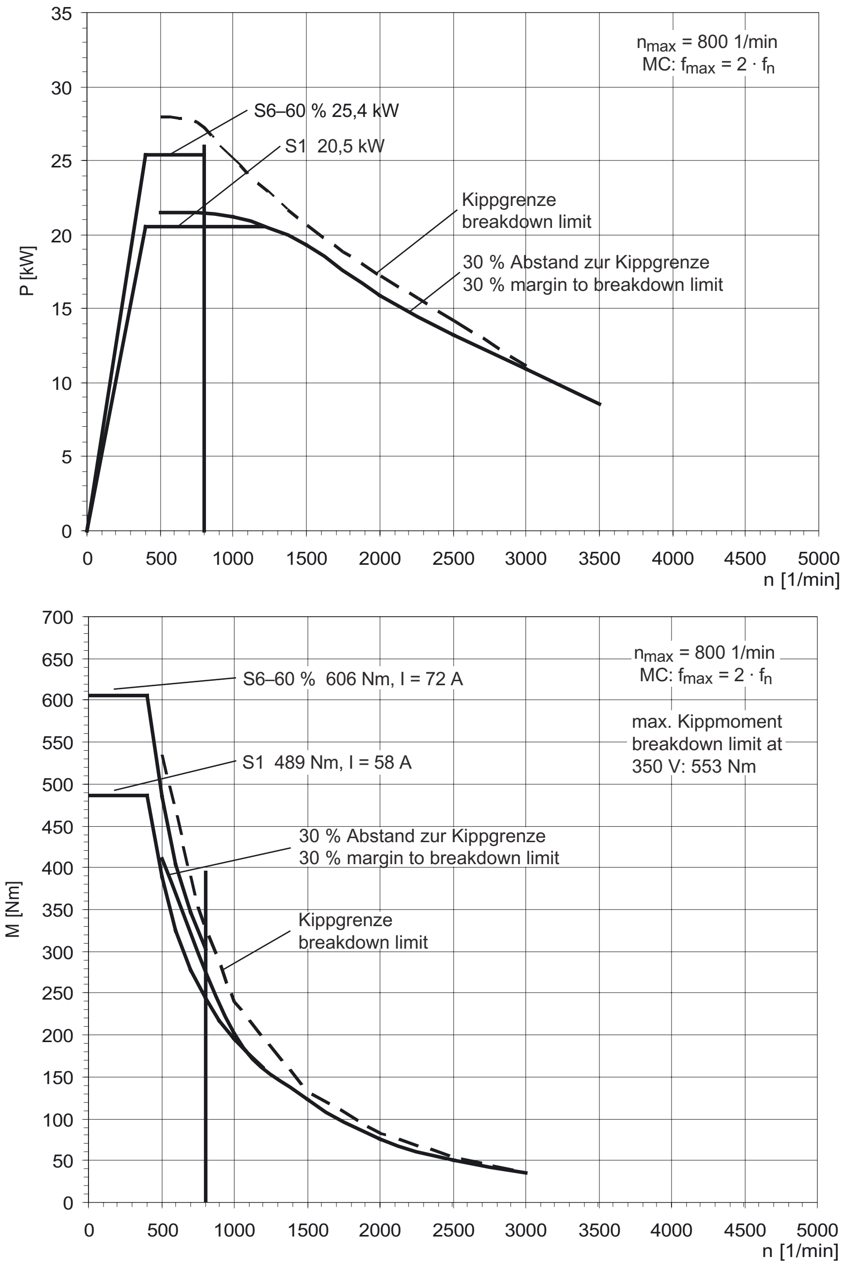

Figure 3-68 MASTERDRIVES MC, 1PL6184-□□B□□

Table 3-70 MASTERDRIVES MC, 400 V, 1PL6186-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	30.5	728	87	290	14.1	800	800	800	30	48.6

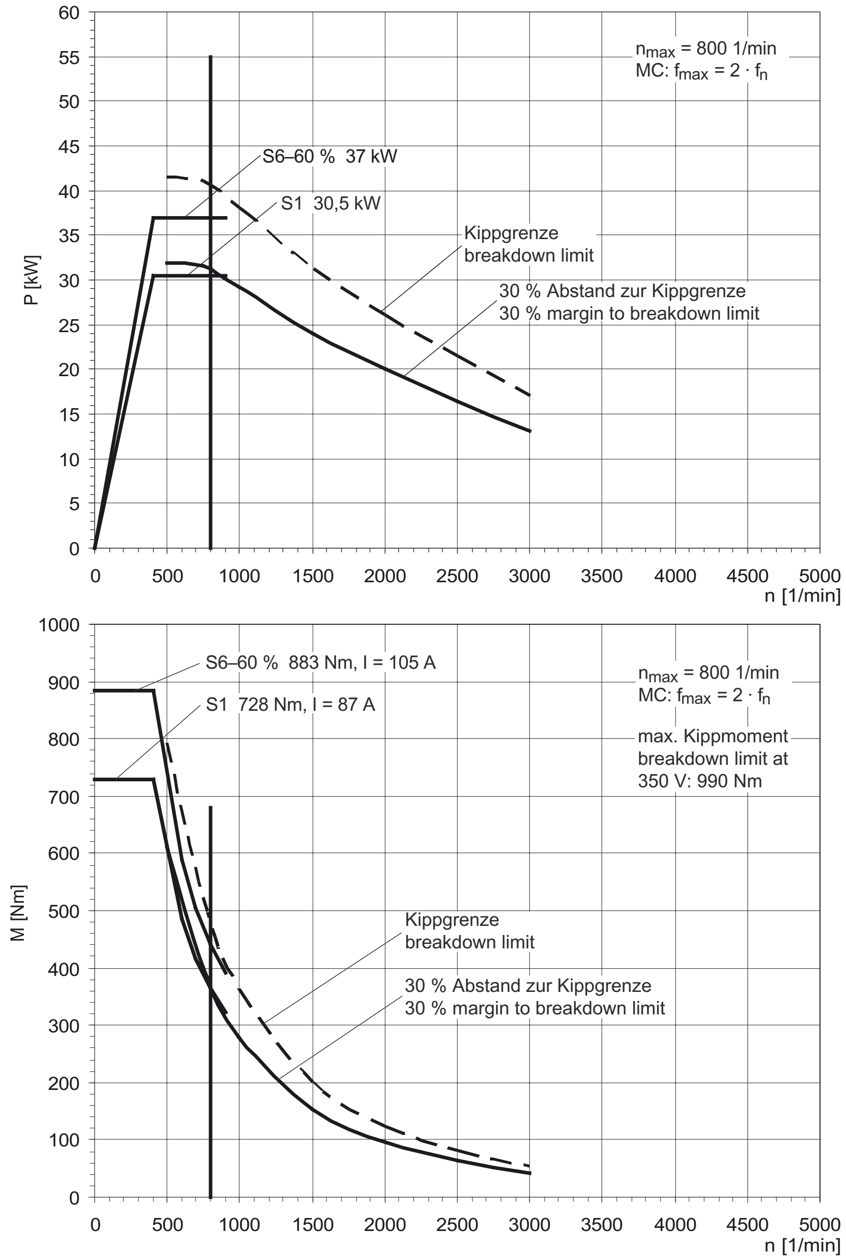

Figure 3-69 MASTERDRIVES MC, 1PL6186-□□B□□

Table 3-71 MASTERDRIVES MC, 400 V, 1PL6224-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	40	955	105	296	14	800	800	800	30	45.8

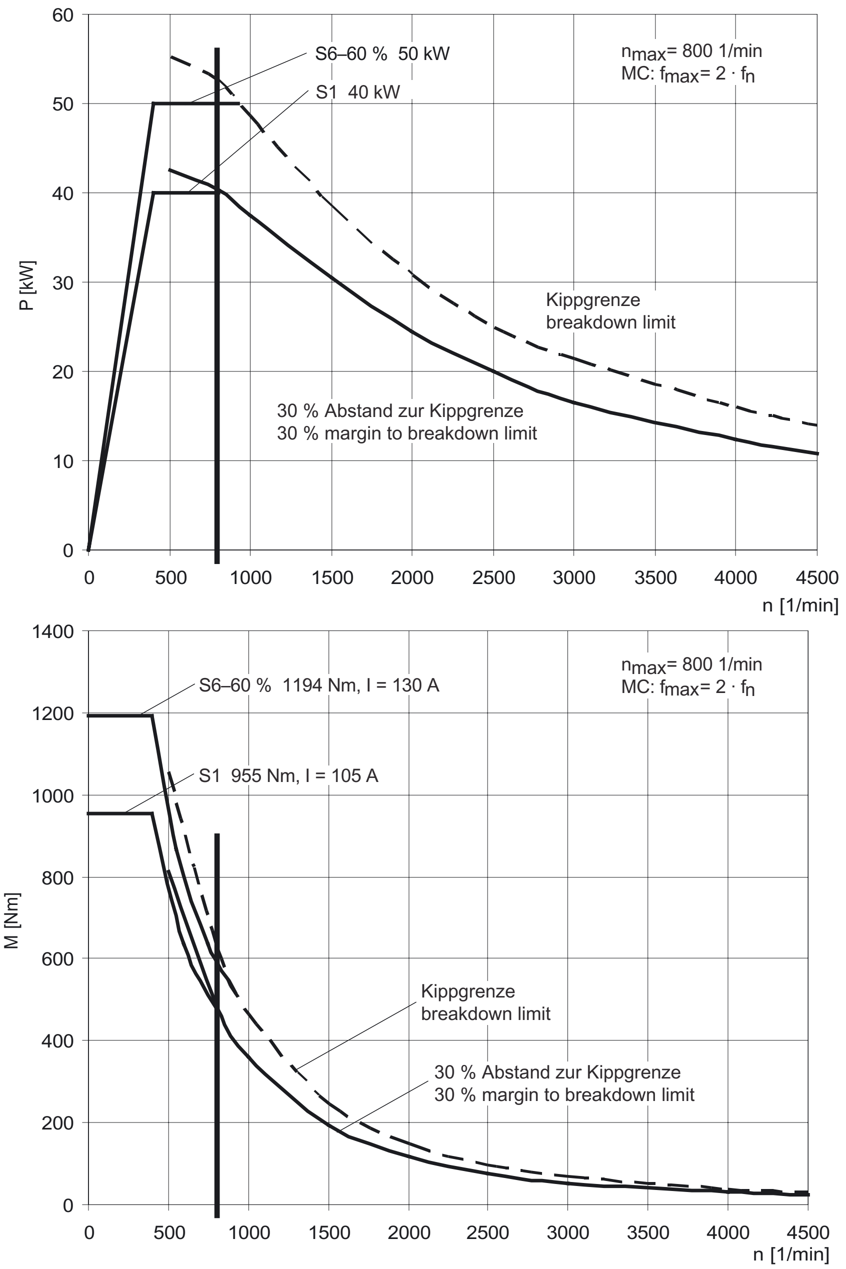

Figure 3-70 MASTERDRIVES MC, 1PL6224-□□B□□

Table 3-72 MASTERDRIVES MC, 400 V, 1PL6226-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	57	1361	145	305	14	800	800	800	30	67

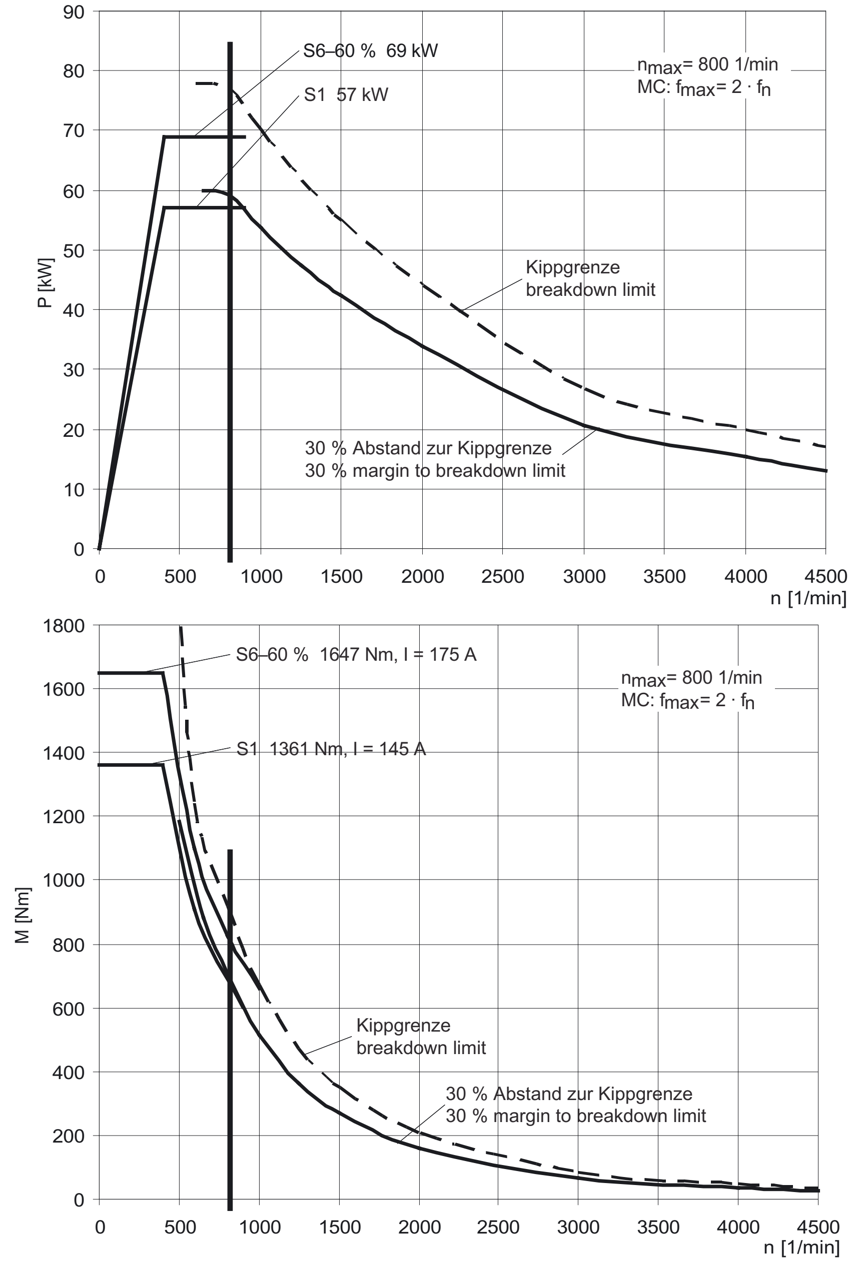

Figure 3-71 MASTERDRIVES MC, 1PL6226-□□B□□

Table 3-73 MASTERDRIVES MC, 400 V, 1PL6228-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	72	1719	181	305	14.1	800	800	800	30	77

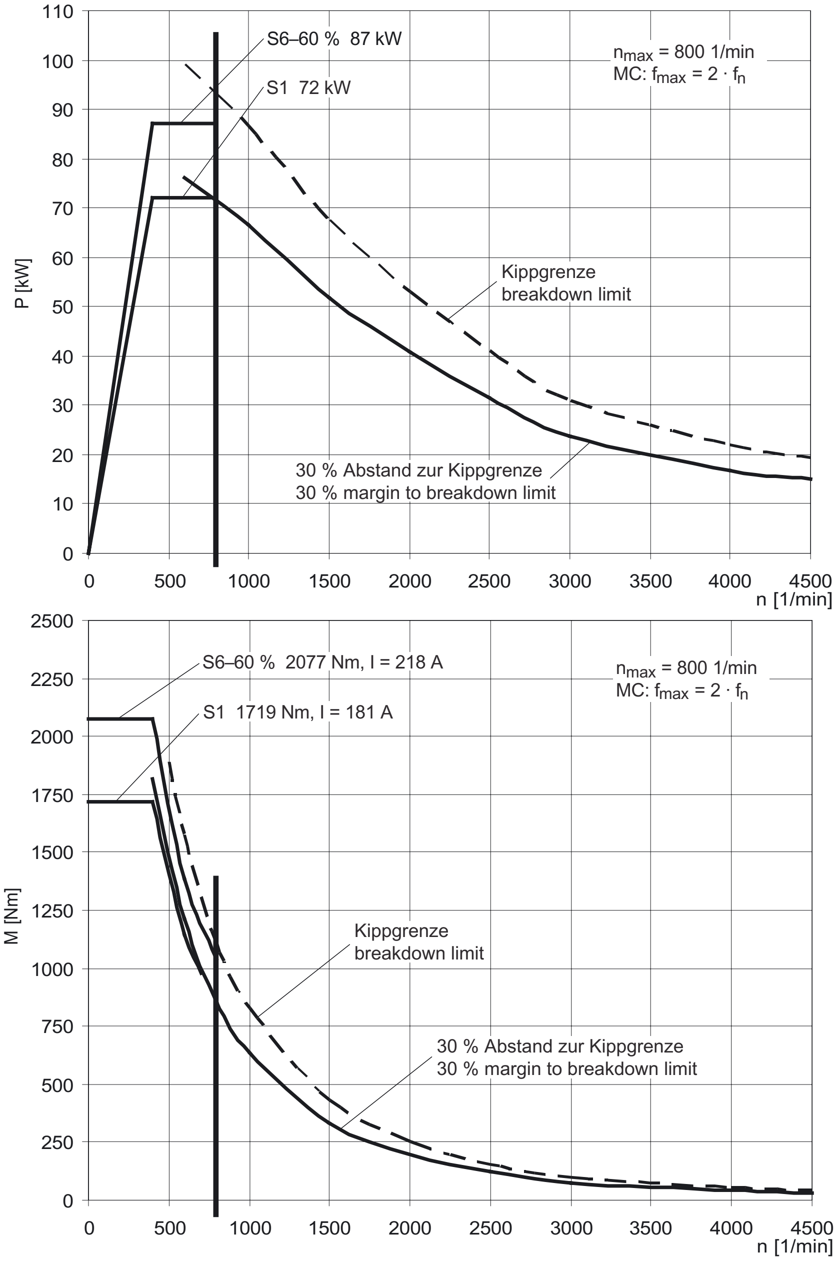

Figure 3-72 MASTERDRIVES MC, 1PL6228-□□B□□

Table 3-74 MASTERDRIVES MC, 400 V, 1PL6184-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	57	544	122	345	34.4	1300	2000	2000	30	45

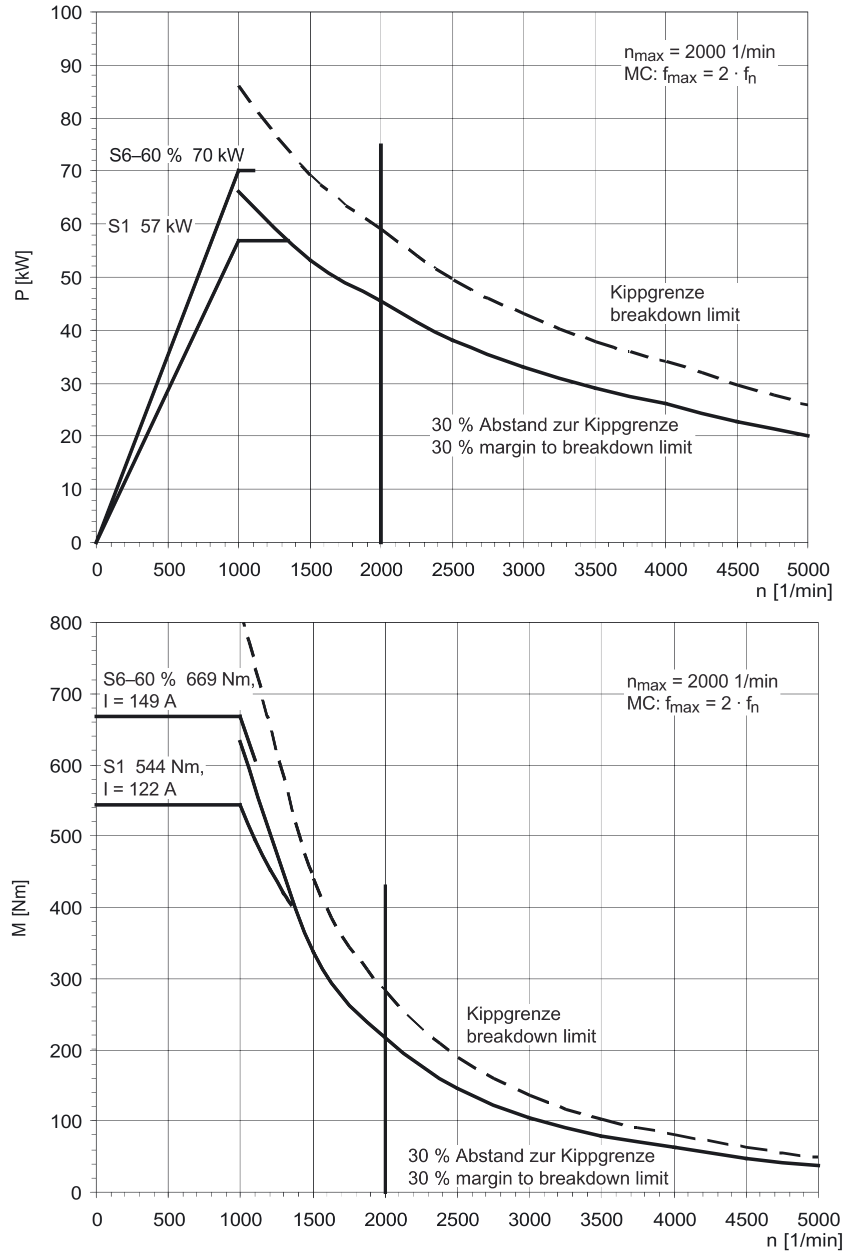

Figure 3-73 MASTERDRIVES MC, 1PL6184-□□D□□

Table 3-75 MASTERDRIVES MC, 400 V, 1PL6186-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1000	74	707	157	345	34.3	1600	2000	2000	30	61

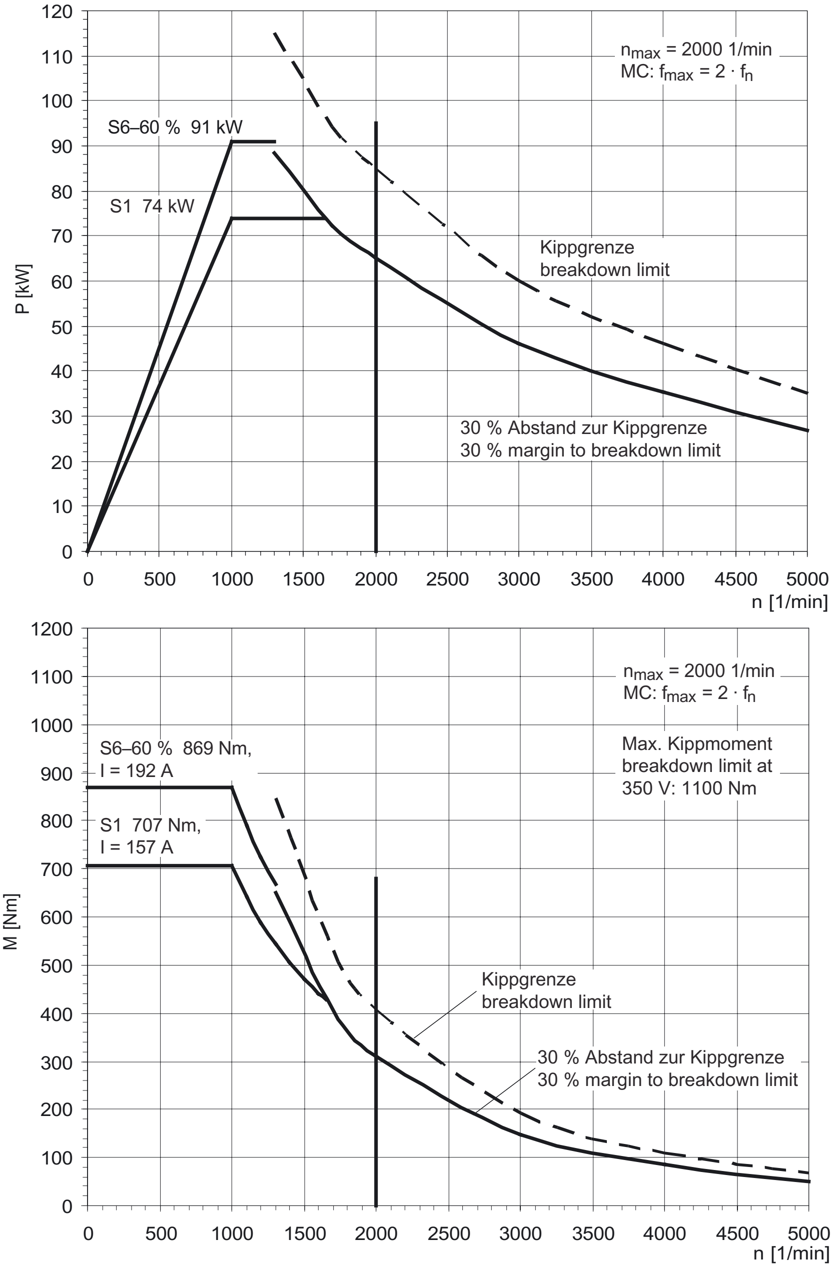

Figure 3-74 MASTERDRIVES MC, 1PL6186-□□D□□

Table 3-76 MASTERDRIVES MC, 400 V, 1PL6224-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	105	1003	220	345	34.5	1700	2000	2000	30	86

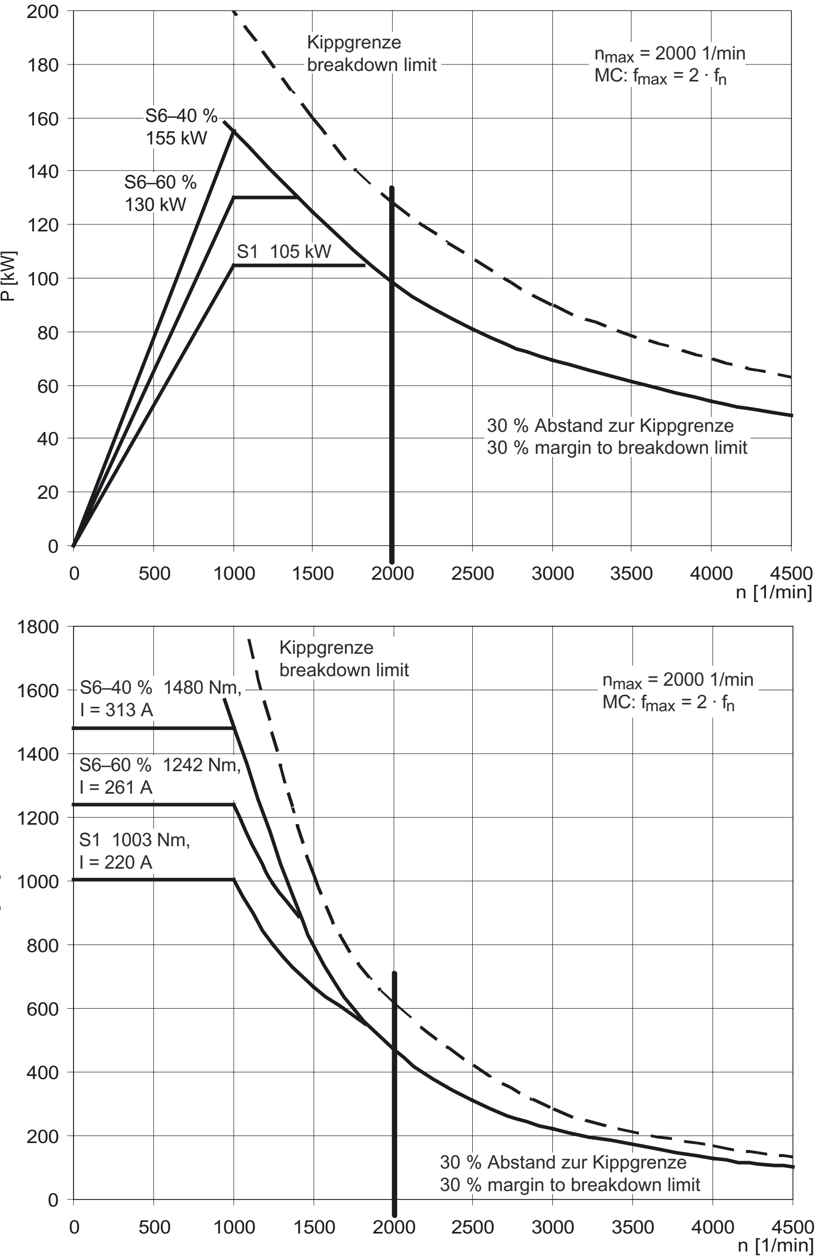

Figure 3-75 MASTERDRIVES MC, 1PL6224-□□D□□

Table 3-77 MASTERDRIVES MC, 400 V, 1PL6226-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1000	135	1289	278	345	31.1	1700	2000	2000	30	90

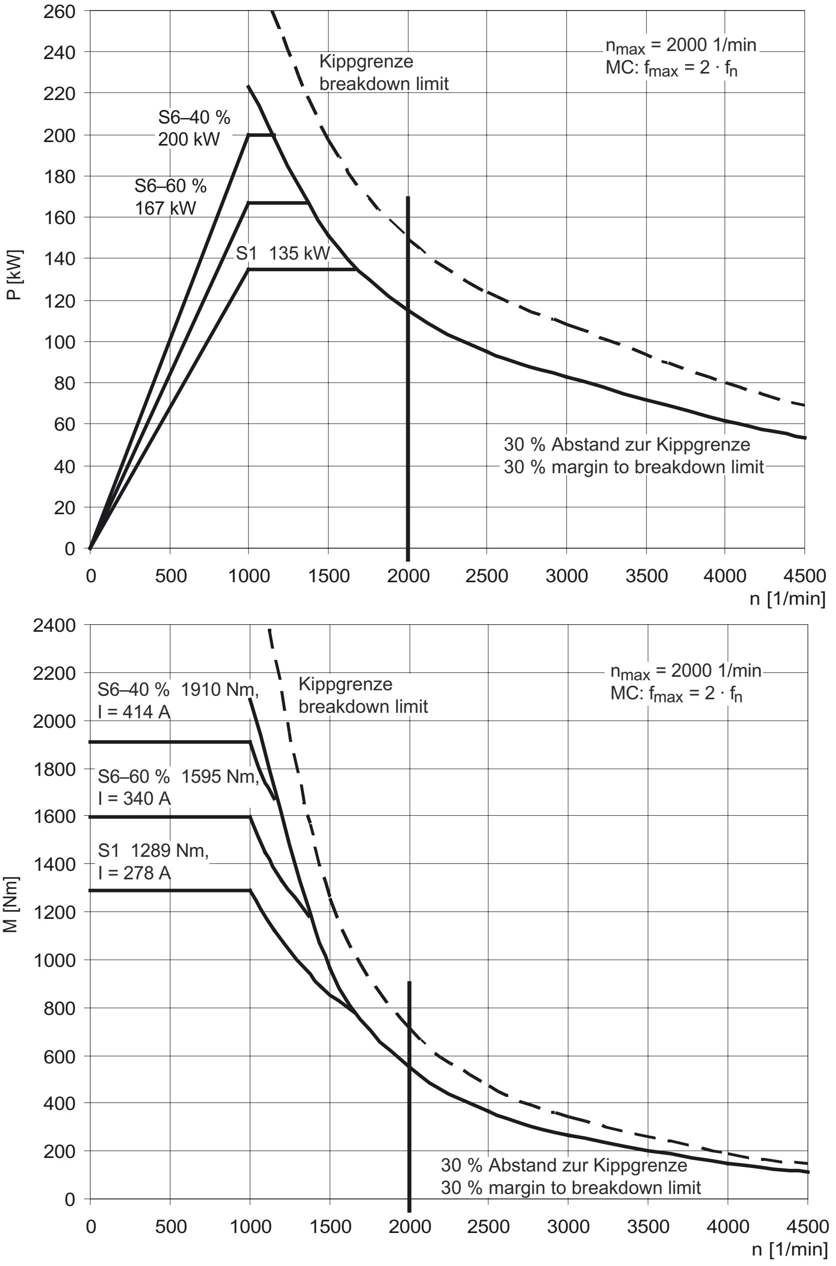

Figure 3-76 MASTERDRIVES MC, 1PL6226-□□D□□

Table 3-78 MASTERDRIVES MC, 400 V, 1PL6228-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1000	165	1576	331	348	34.2	1700	2000	2000	30	103

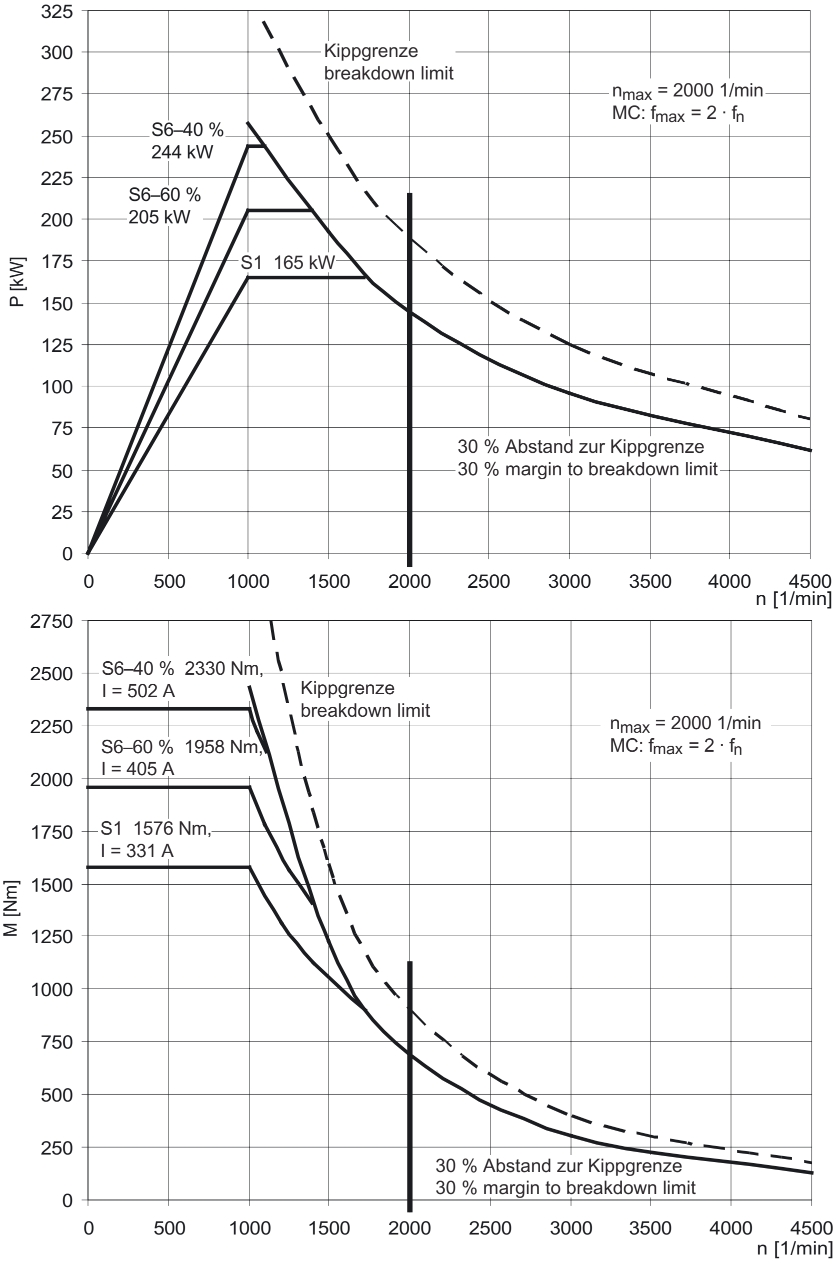

Figure 3-77 MASTERDRIVES MC, 1PL6228-□□D□□

Table 3-79 MASTERDRIVES MC, 400 V, 1PL6184-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1500	76	484	165	345	50.9	3000	3000	3000	30	70

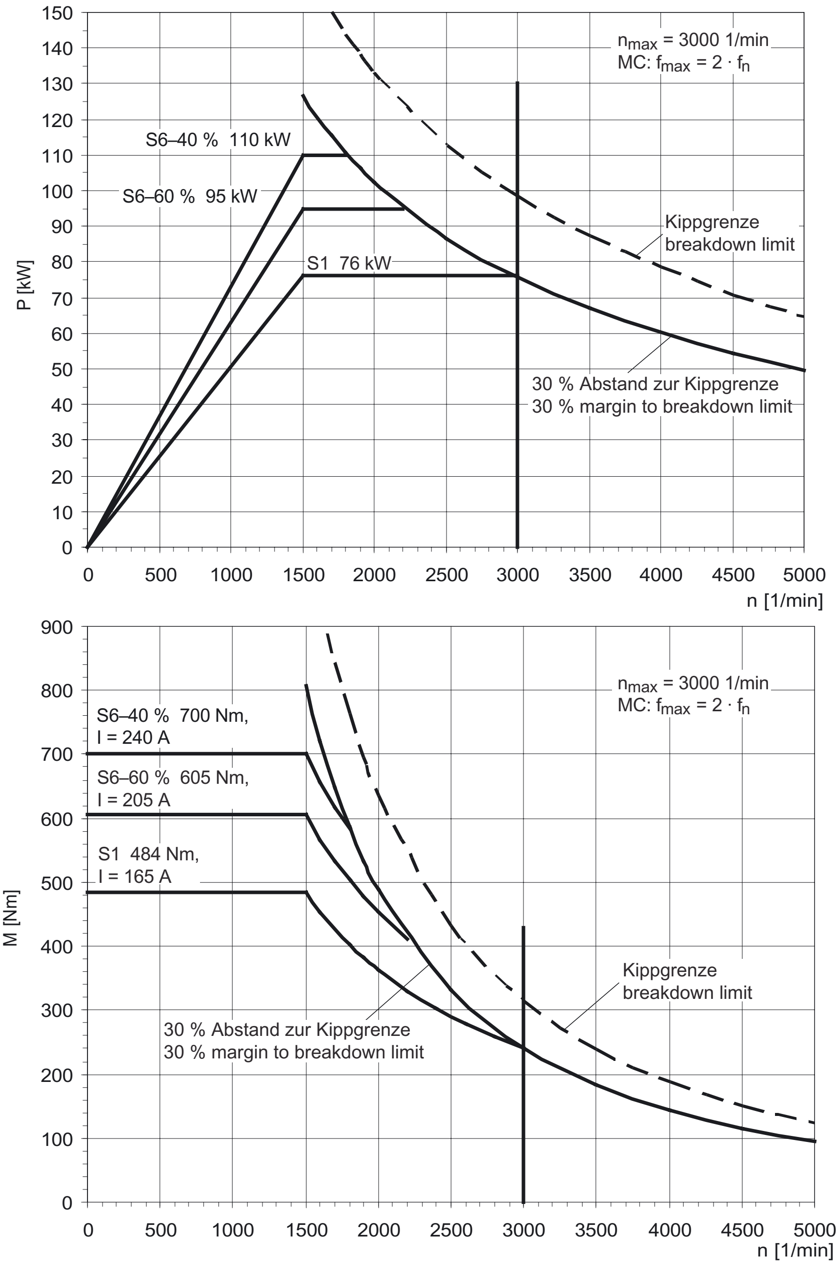

Figure 3-78 MASTERDRIVES MC, 1PL6184-□□F□□

Table 3-80 MASTERDRIVES MC, 400 V, 1PL6186-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1500	108	688	233	340	50.9	3000	3000	3000	30	91

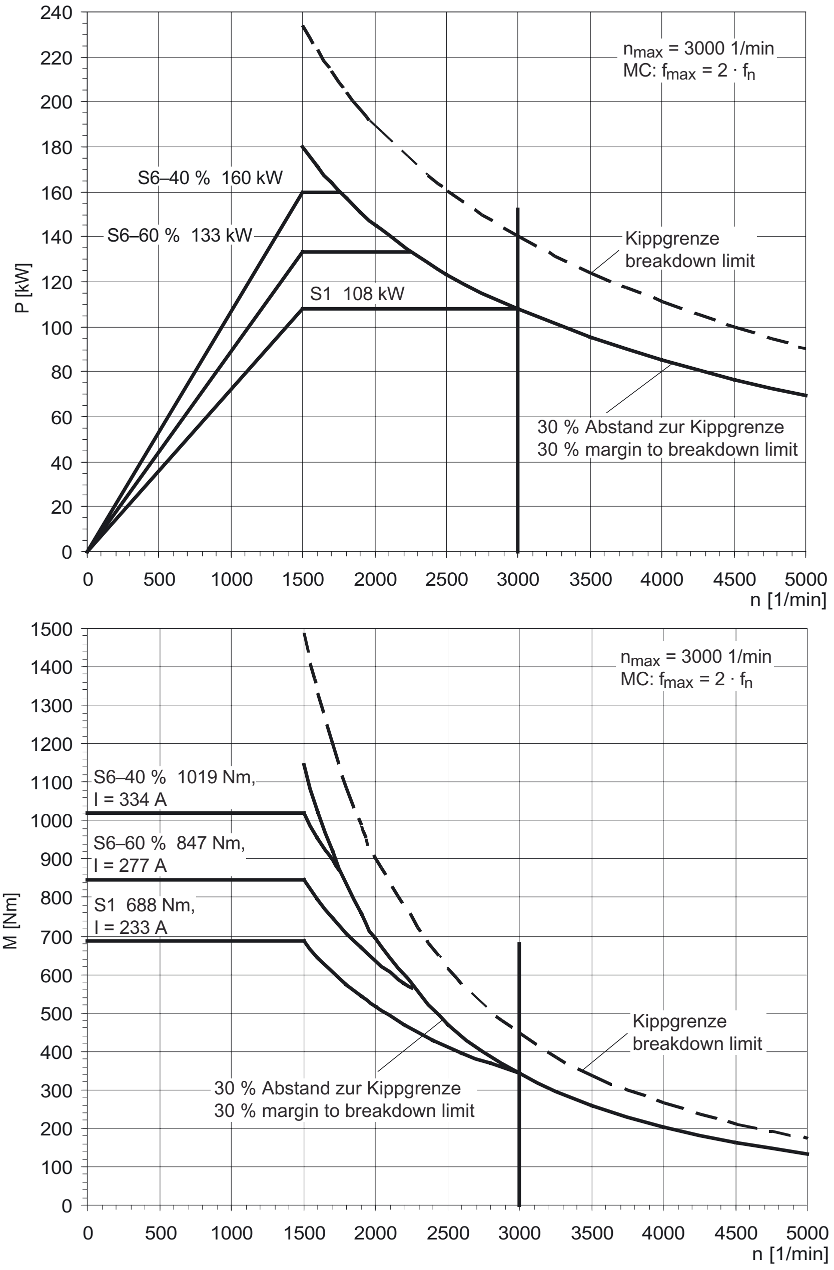

Figure 3-79 MASTERDRIVES MC, 1PL6186-□□F□□

Table 3-81 MASTERDRIVES MC, 400 V, 1PL6224-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1500	142	904	292	345	50.9	2500	3000 1)	3000	30	91

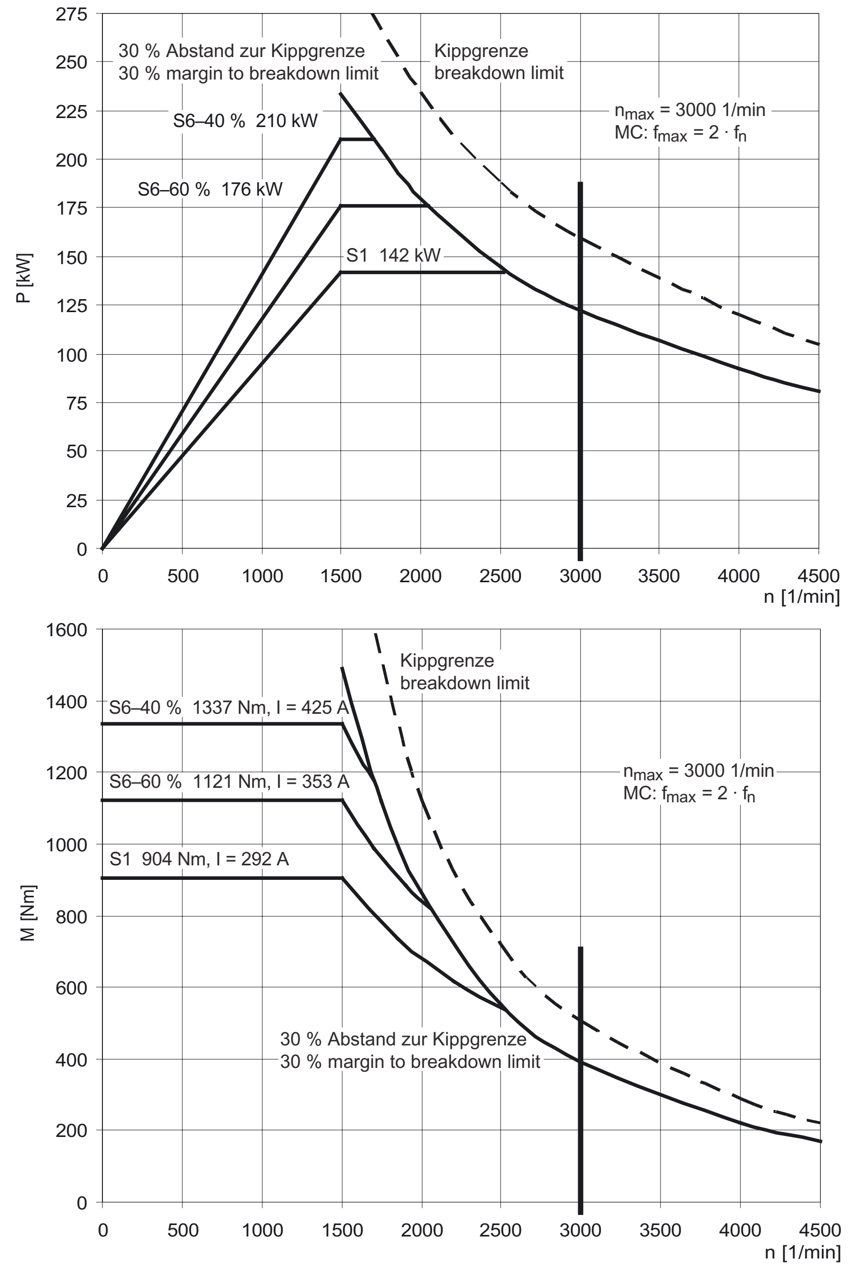

Figure 3-80 MASTERDRIVES MC, 1PL6224-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-82 MASTERDRIVES MC, 400 V, 1PL6226-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1500	175	1114	356	345	50.7	3000	3000 [1]	3000	30	125

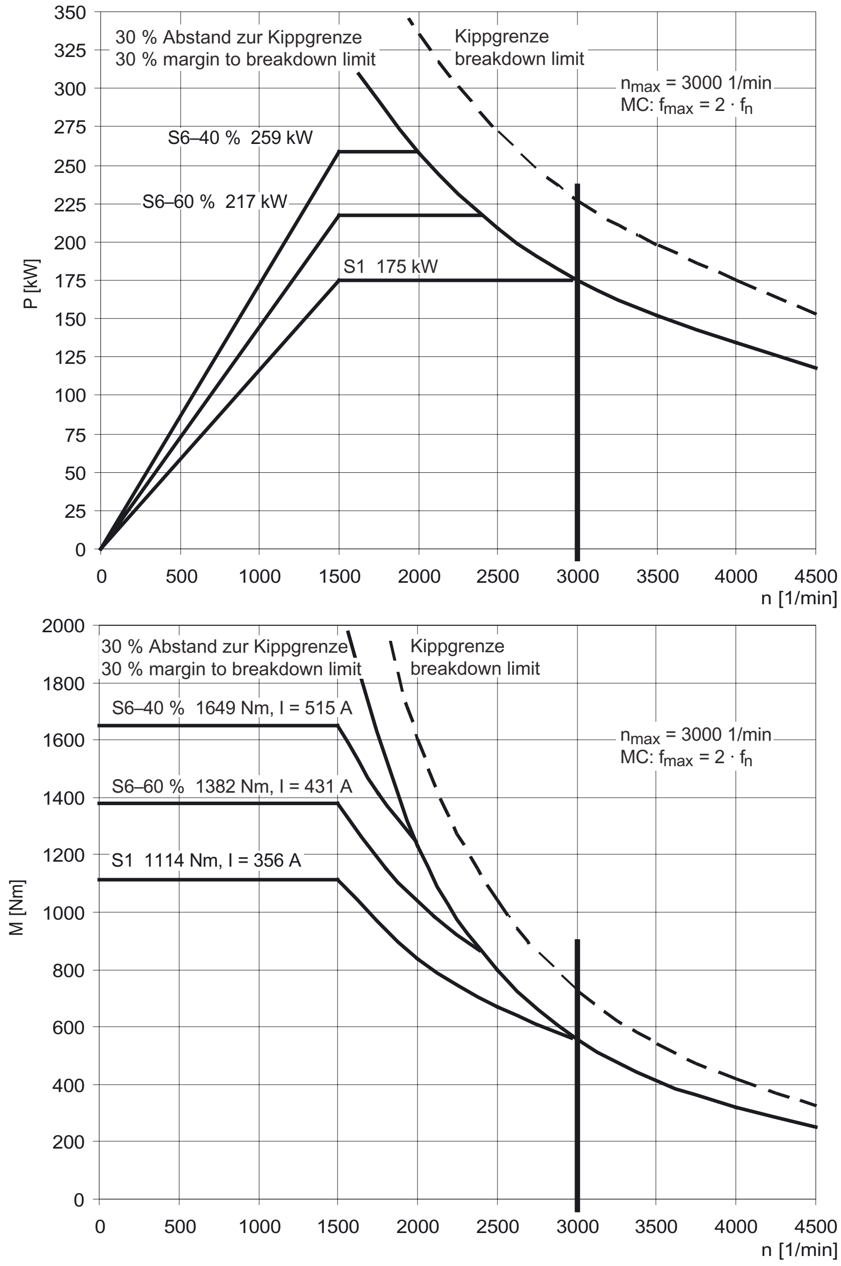

Figure 3-81 MASTERDRIVES MC, 1PL6226-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-83 MASTERDRIVES MC, 400 V, 1PL6228-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1500	230	1465	468	345	50.7	2900	3000 1)	3000	30	177

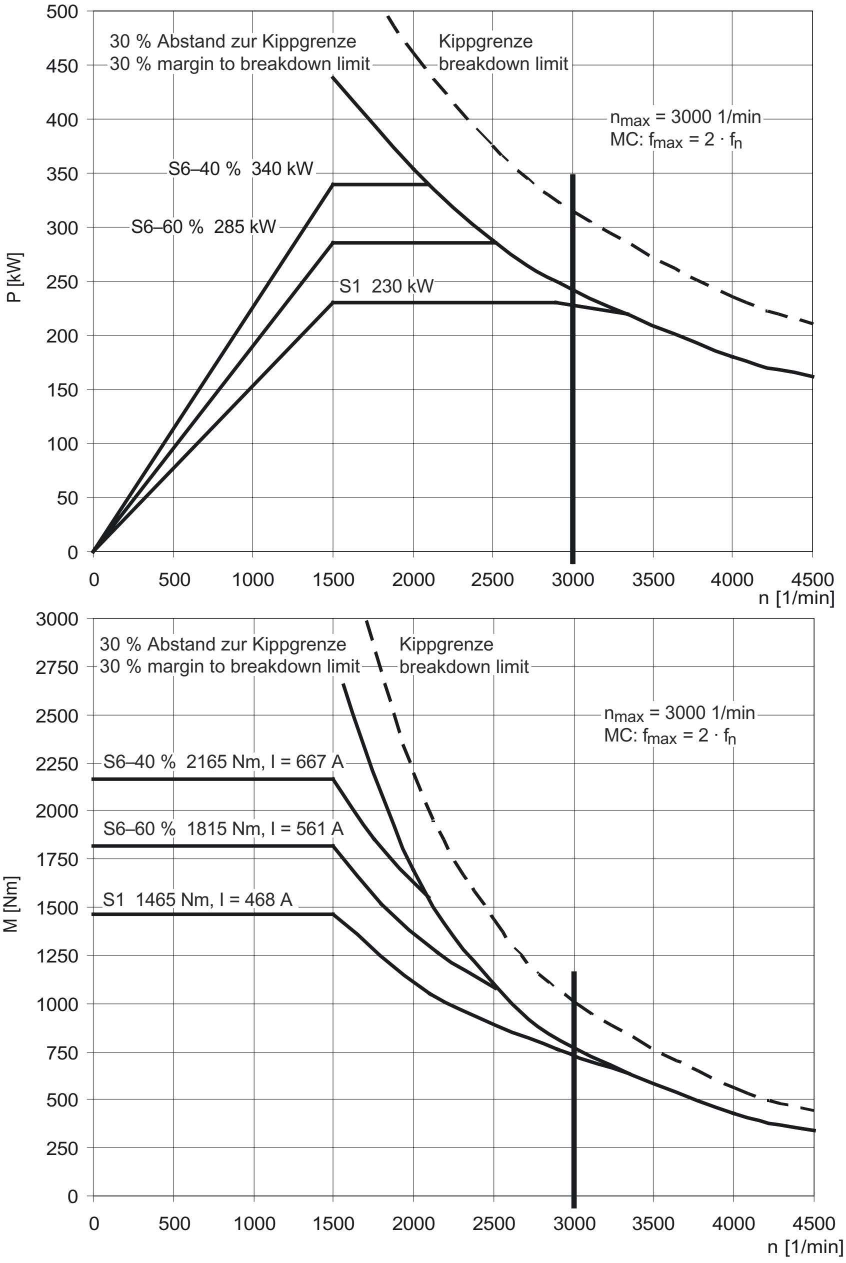

Figure 3-82 MASTERDRIVES MC, 1PL6228-□□F□□

1) 2500 RPM for increased cantilever forces

Table 3-84 MASTERDRIVES MC, 400 V, 1PL6184-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2500	100	382	208	345	84.2	5000	3500 1)	5000	30	80

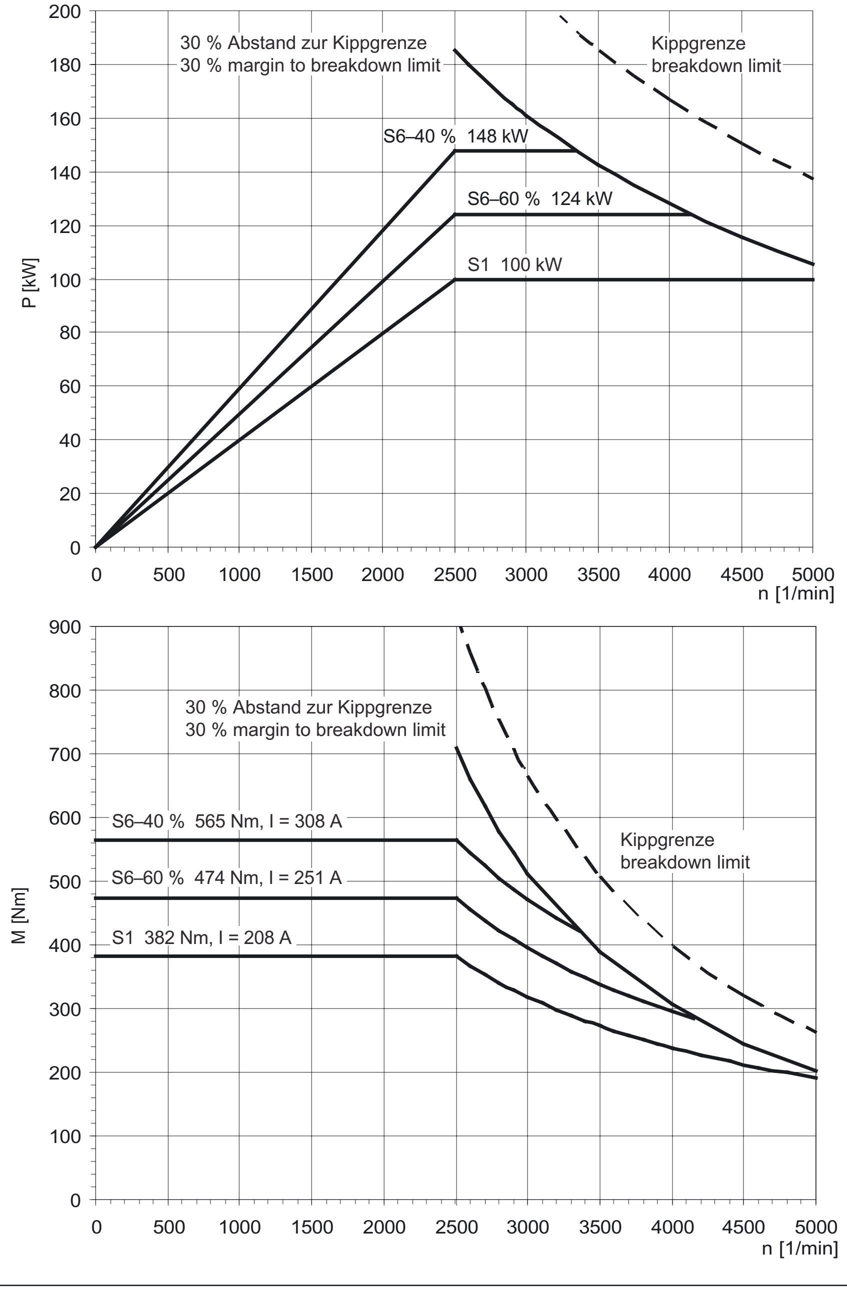

Figure 3-83 MASTERDRIVES MC, 1PL6184-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-85 MASTERDRIVES MC, 400 V, 1PL6186-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2500	130	497	275	340	84.1	5000	3500 [1]	5000	30	113

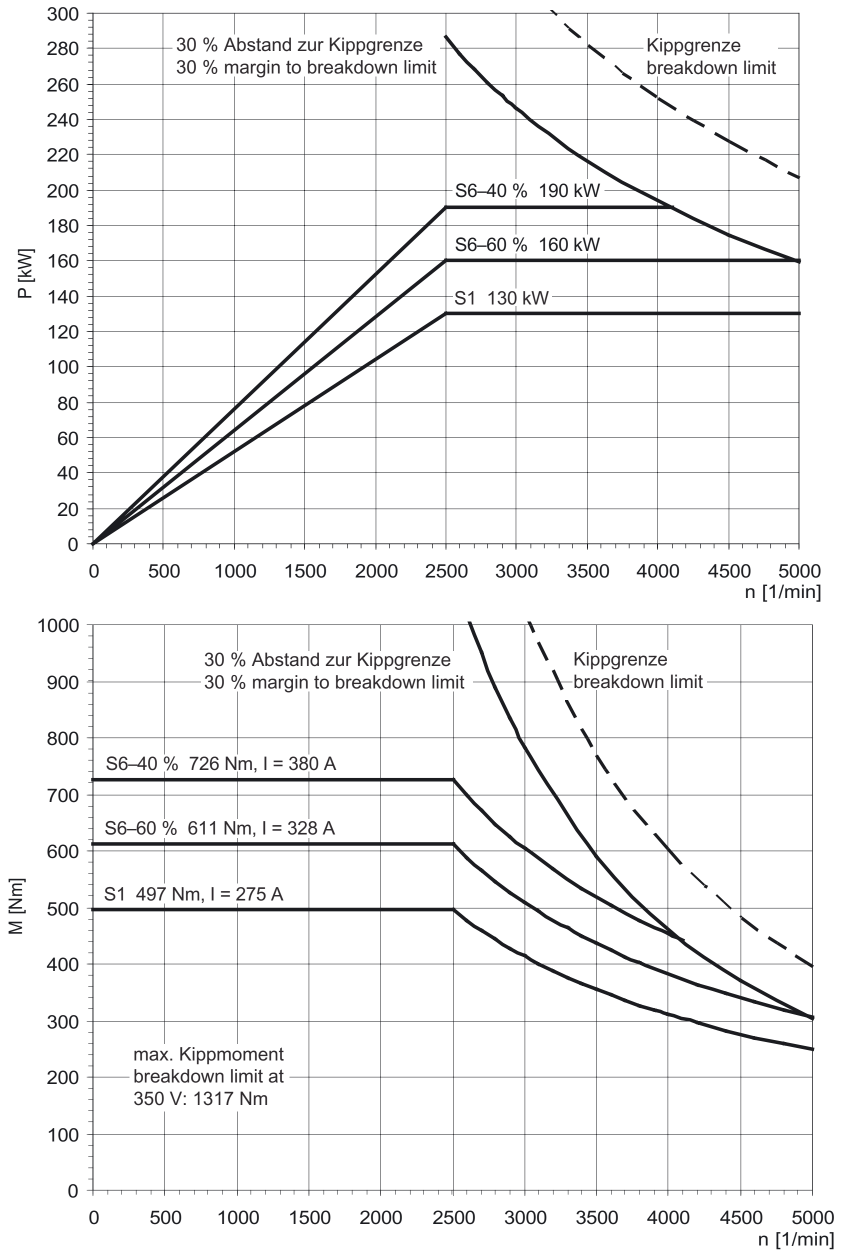

Figure 3-84 MASTERDRIVES MC, 1PL6186-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-86 MASTERDRIVES MC, 400 V, 1PL6224-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2500	178	680	358	345	84.1	3500	3100 [1)]	4500	30	119

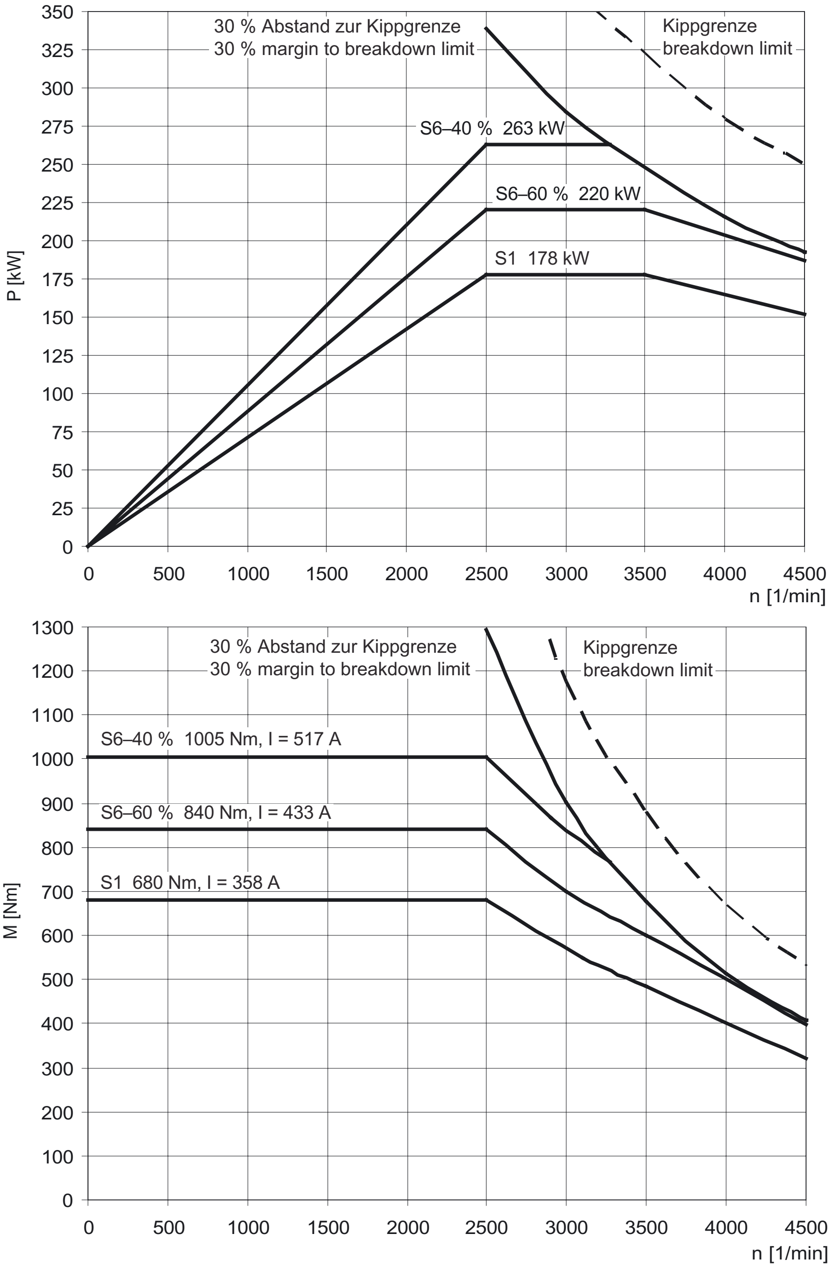

Figure 3-85 MASTERDRIVES MC, 1PL6224-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-87 MASTERDRIVES MC, 400 V, 1PL6226-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
2500	235	898	476	340	84	3500	3100 1)	4500	30	157

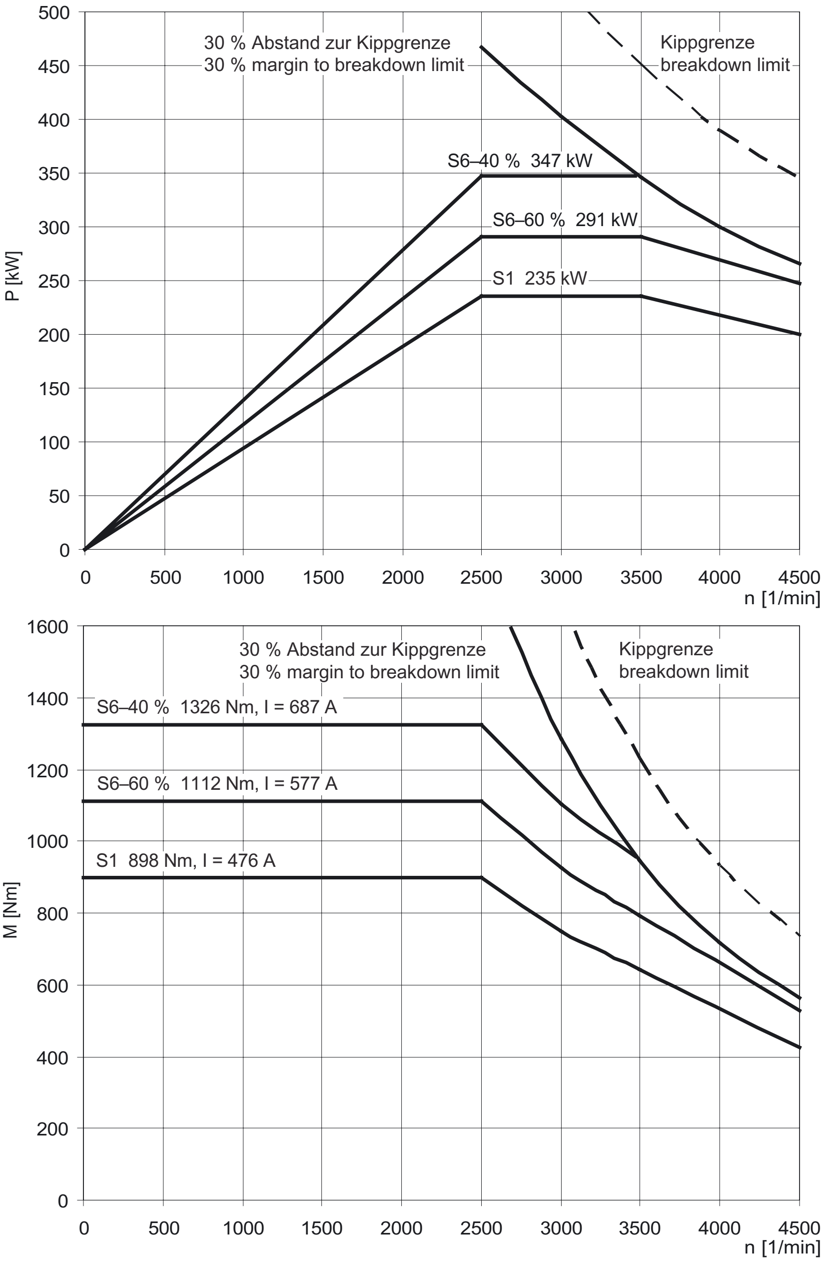

Figure 3-86 MASTERDRIVES MC, 1PL6226-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-88 MASTERDRIVES MC, 400 V, 1PL6228-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2500	265	1013	535	345	84	3500	3100 1)	4500 2)	30	189

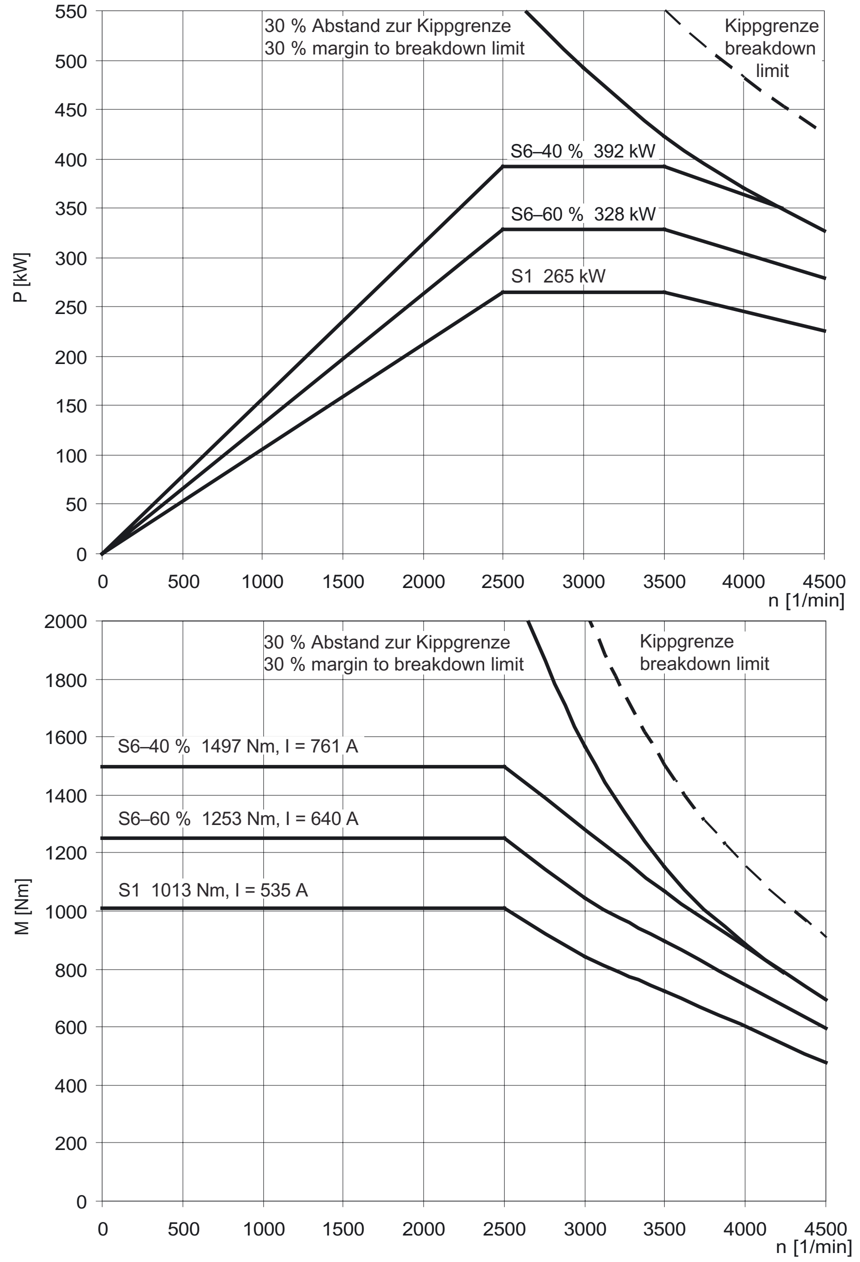

Figure 3-87 MASTERDRIVES MC, 1PL6228-□□L□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

3.2.2 P/n diagrams for 3-ph. 480 V AC

Table 3-89 MASTERDRIVES MC, 480 V, 1PL6184-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	24.5	585	69	300	14.4	800	800	800	30	33

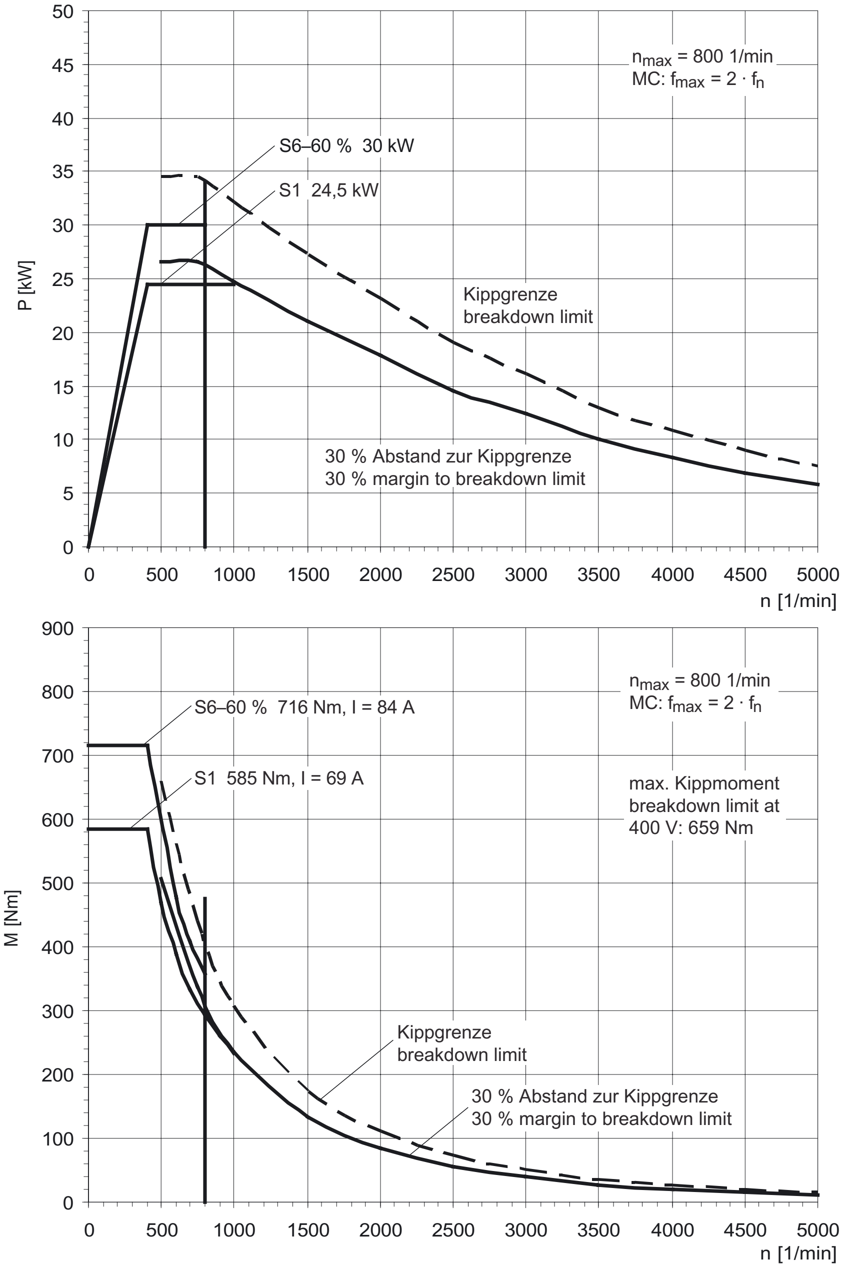

Figure 3-88 MASTERDRIVES VC, 1PL6184-□□B□□

Table 3-90 MASTERDRIVES MC, 480 V, 1PL6186-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	31.5	752	90	290	14.3	800	800	800	30	47

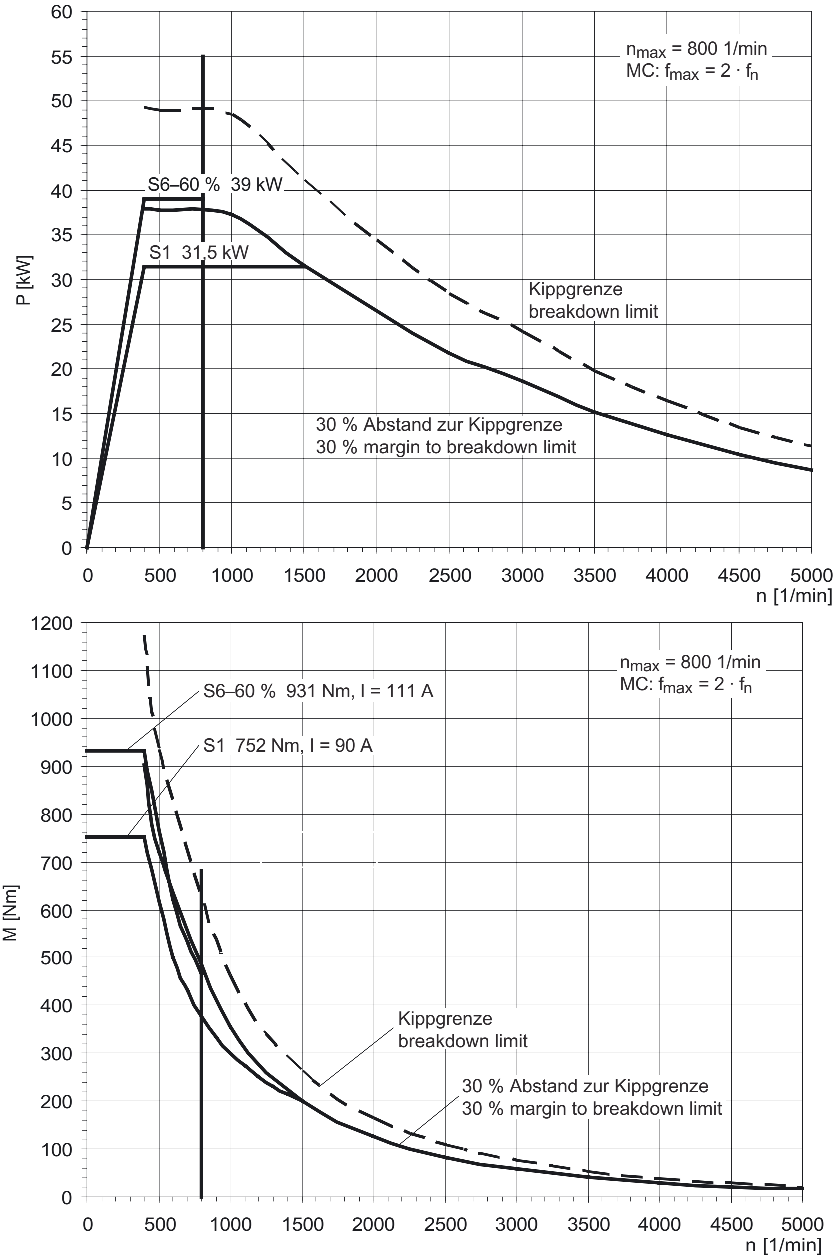

Figure 3-89 MASTERDRIVES MC, 1PL6186-□□B□□

Table 3-91 MASTERDRIVES MC, 480 V, 1PL6224-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
400	45	1074	117	300	14.2	800	800	800	30	45

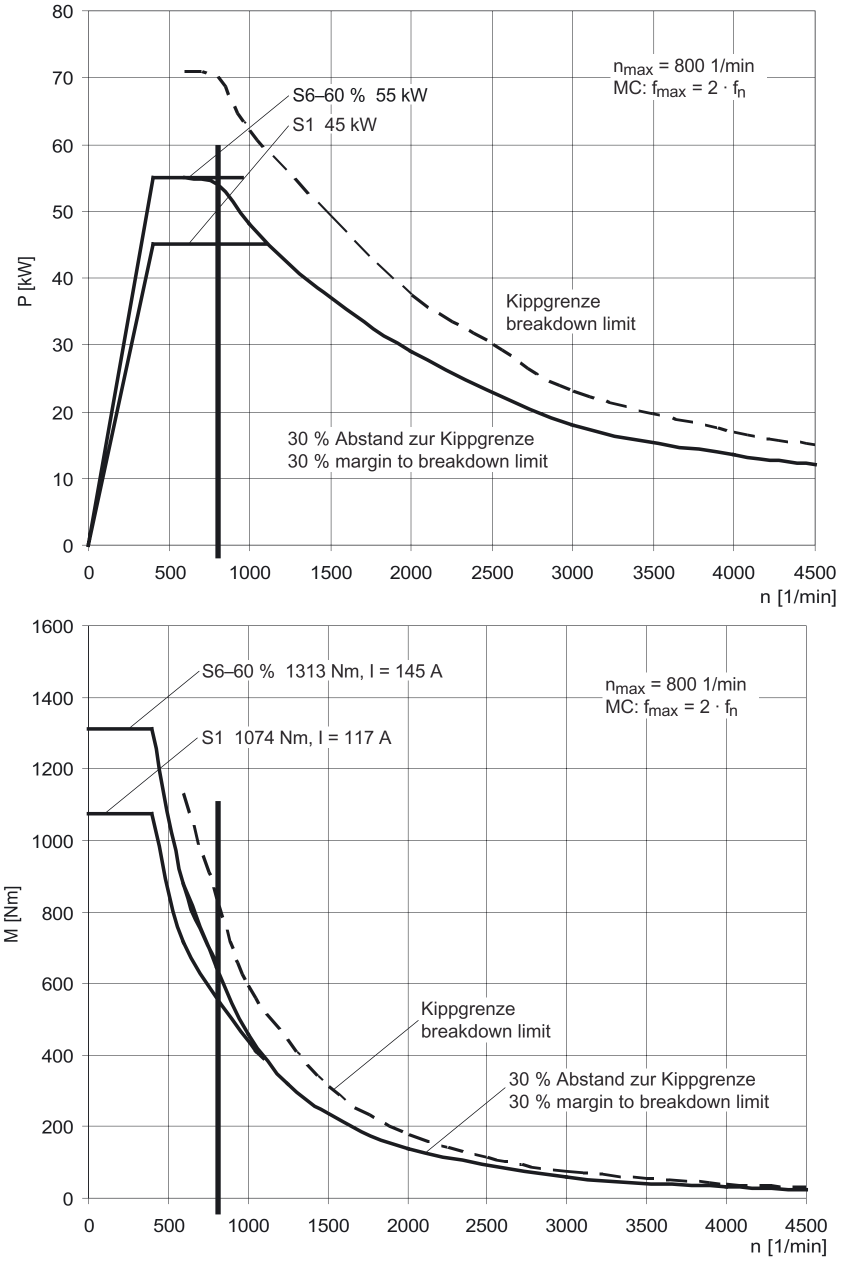

Figure 3-90 MASTERDRIVES MC, 1PL6224-□□B□□

Table 3-92 MASTERDRIVES MC, 480 V, 1PL6226-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
400	57	1361	145	305	14.0	800	800	800	30	67

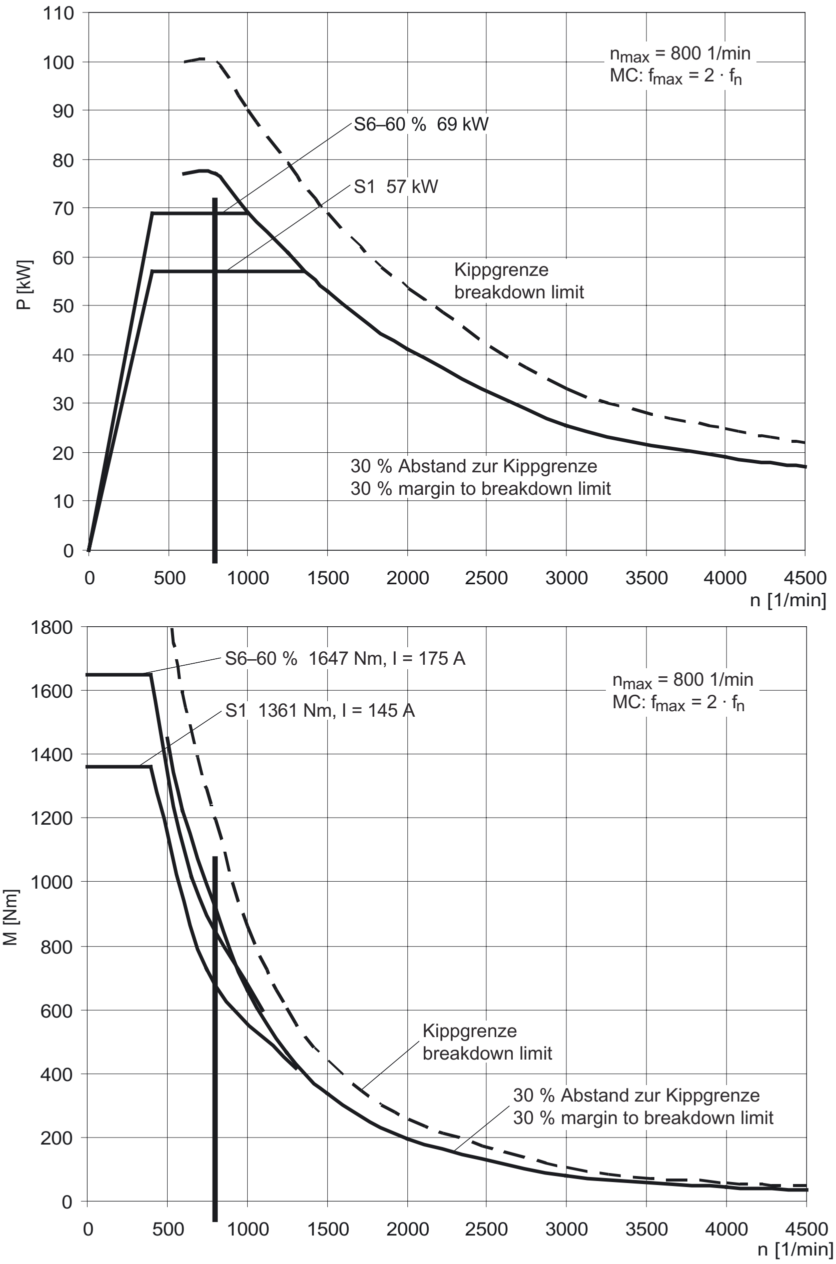

Figure 3-91 MASTERDRIVES MC, 1PL6226-□□B□□

Table 3-93 MASTERDRIVES MC, 480 V, 1PL6228-□□B□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
400	72	1719	181	305	14.0	800	800	800	30	77

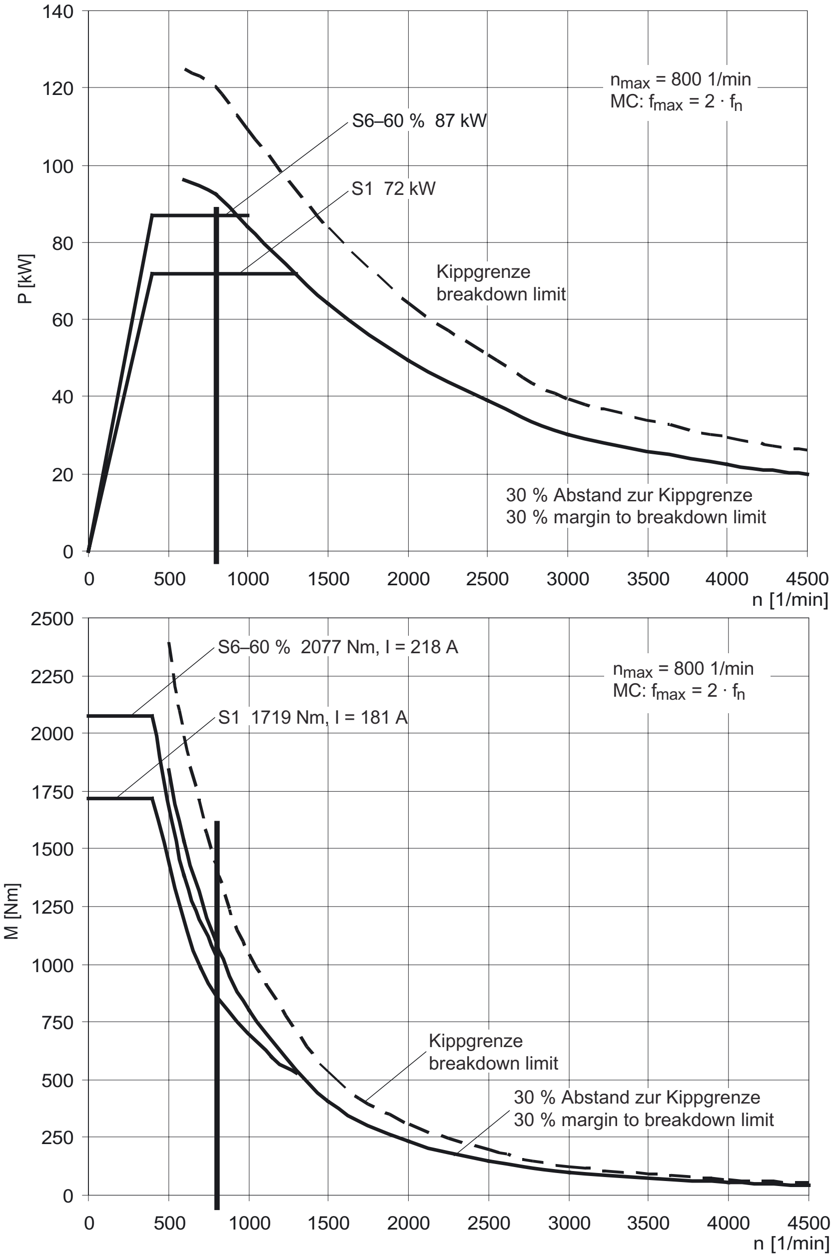

Figure 3-92 MASTERDRIVES MC, 1PL6228-□□B□□

Table 3-94 MASTERDRIVES MC, 480 V, 1PL6184-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	65	540	121	400	39.4	1750	2300	2300	30	46

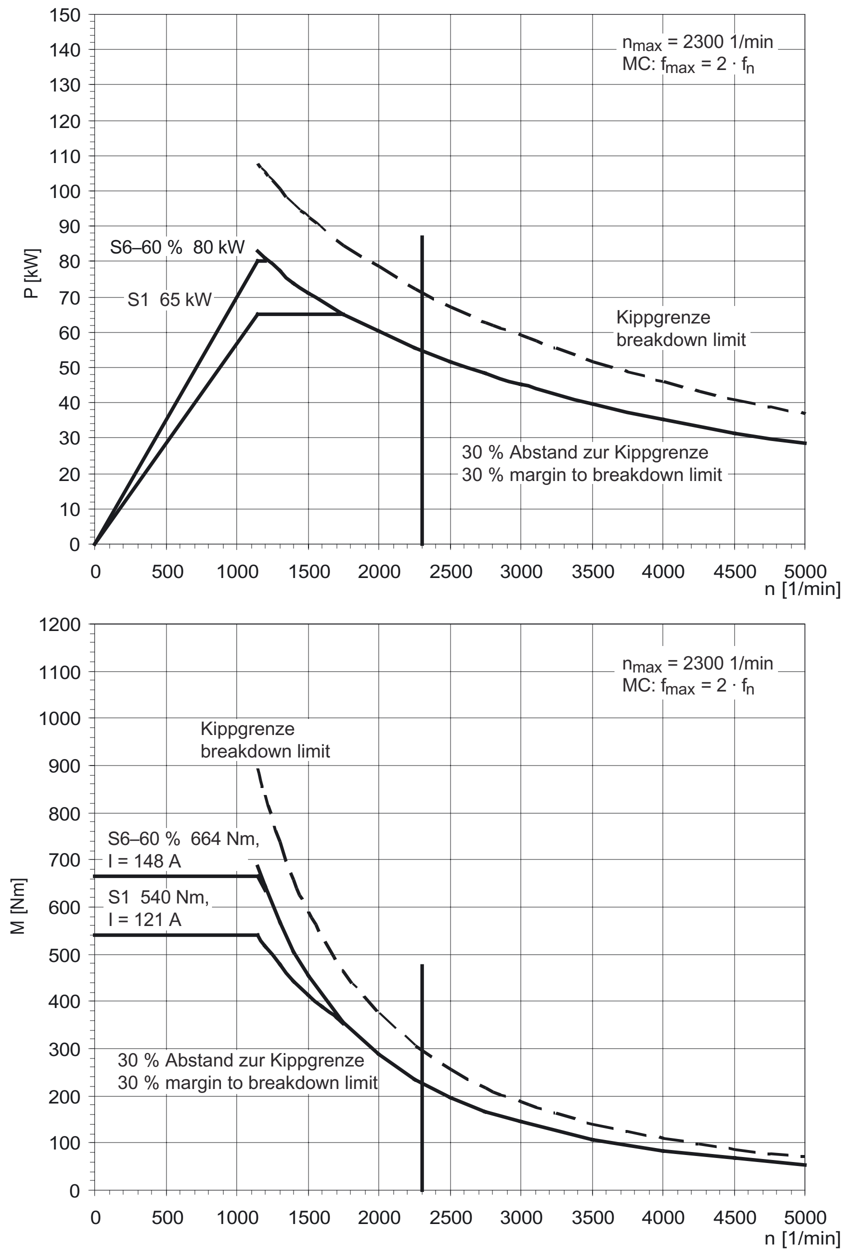

Figure 3-93 MASTERDRIVES MC, 1PL6184-□□D□□

Table 3-95 MASTERDRIVES MC, 480 V, 1PL6186-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	85	706	158	400	39.4	1950	2300	2300	30	62

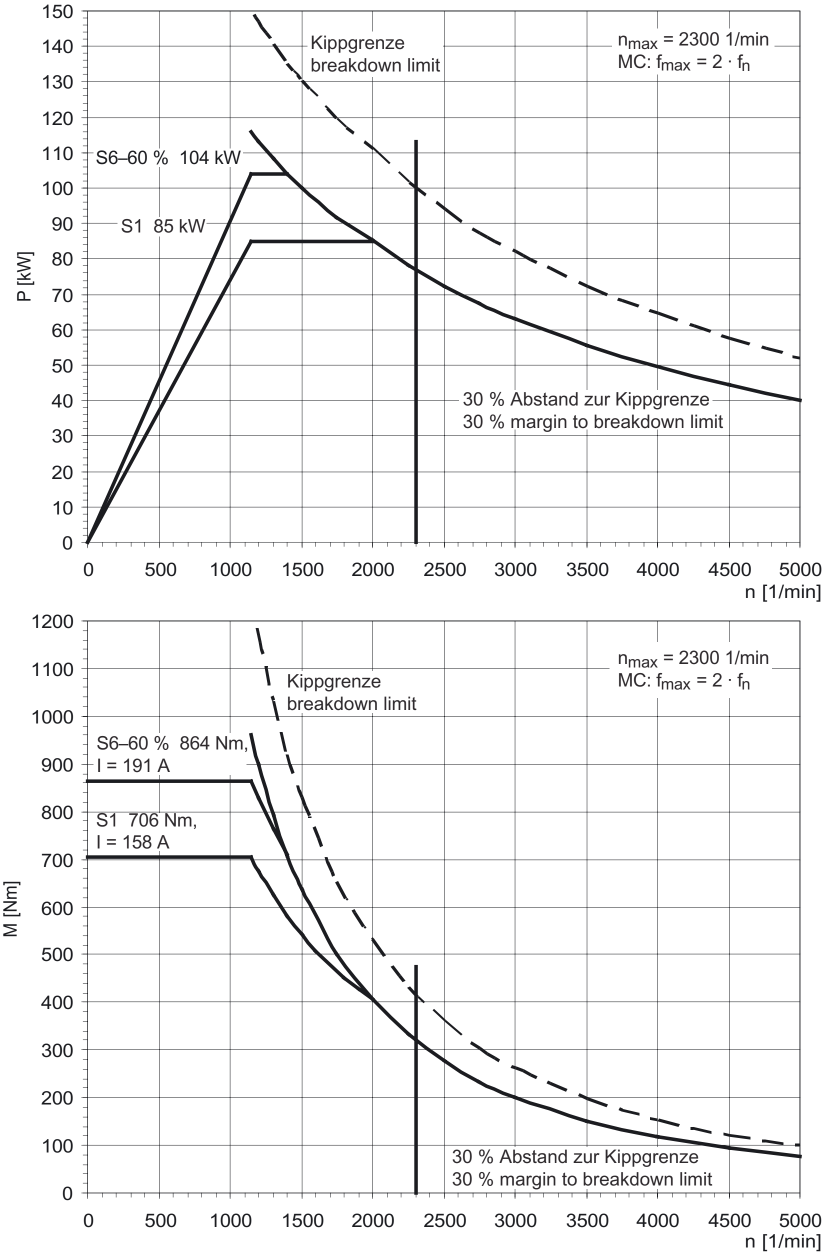

Figure 3-94 MASTERDRIVES MC, 1PL6186-□□D□□

Table 3-96 MASTERDRIVES MC, 480 V, 1PL6224-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	120	997	218	400	39.1	2100	2300	2300	30	86

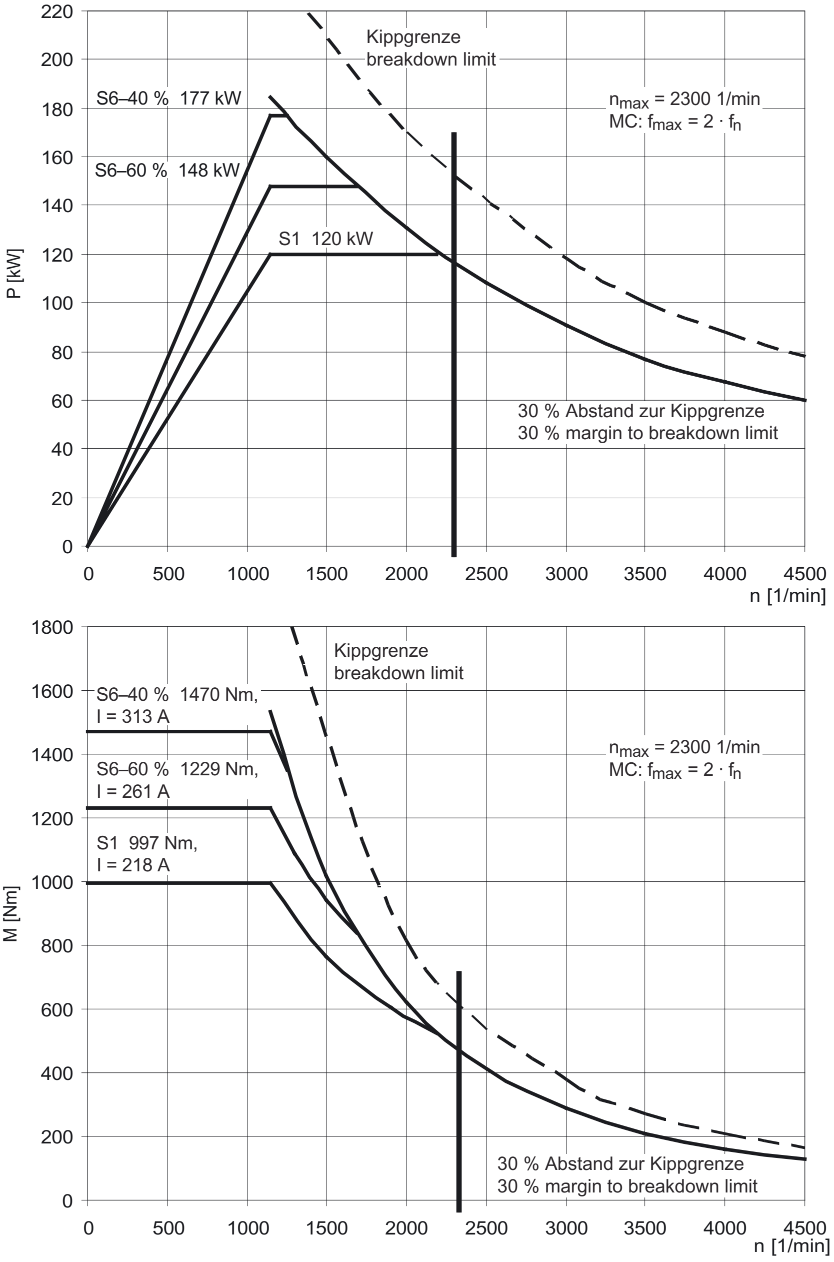

Figure 3-95 MASTERDRIVES MC, 1PL6224-□□D□□

Table 3-97 MASTERDRIVES MC, 480 V, 1PL6226-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	155	1287	275	400	39.2	2000	2300	2300	30	92

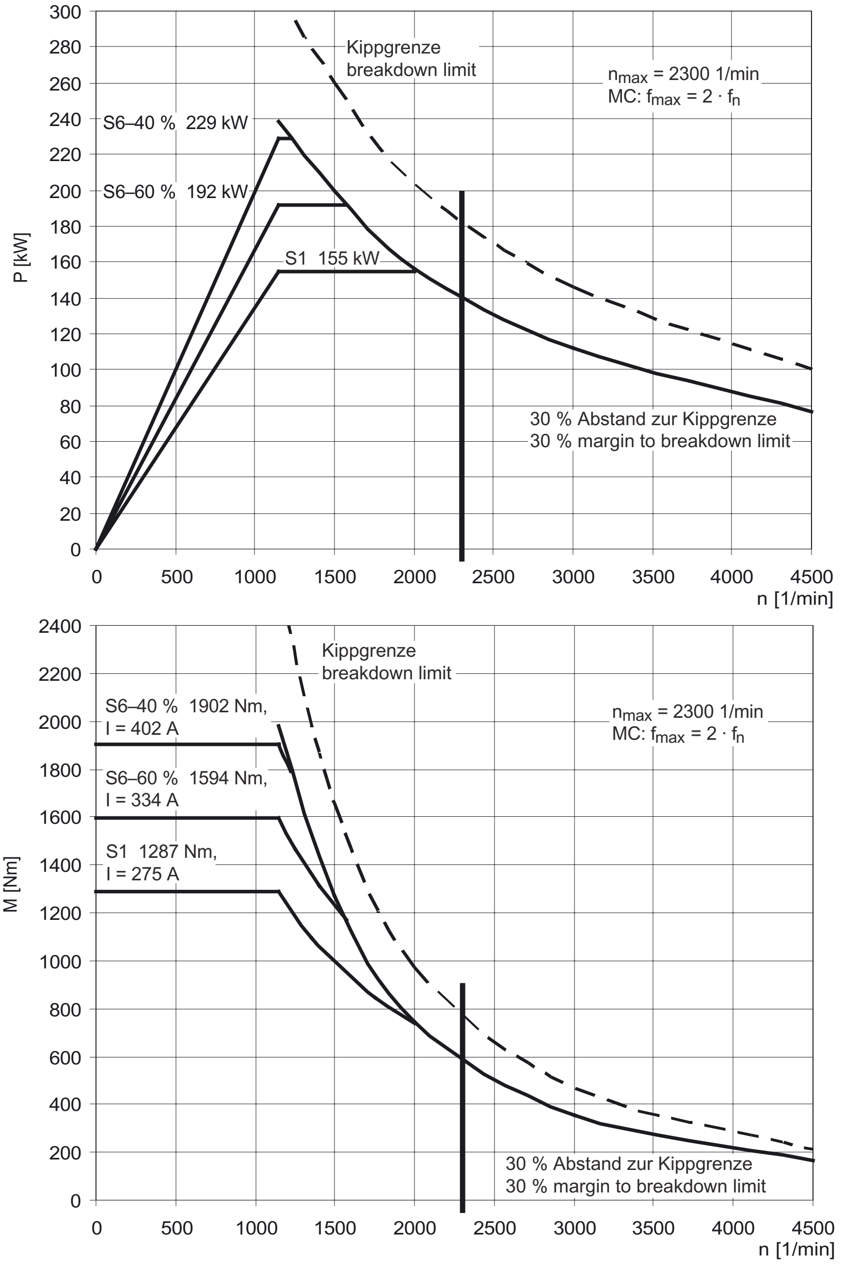

Figure 3-96 MASTERDRIVES MC, 1PL6226-□□D□□

Table 3-98 MASTERDRIVES MC, 480 V, 1PL6228-□□D□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1150	190	1578	334	400	39.2	1850	2300	2300	30	102

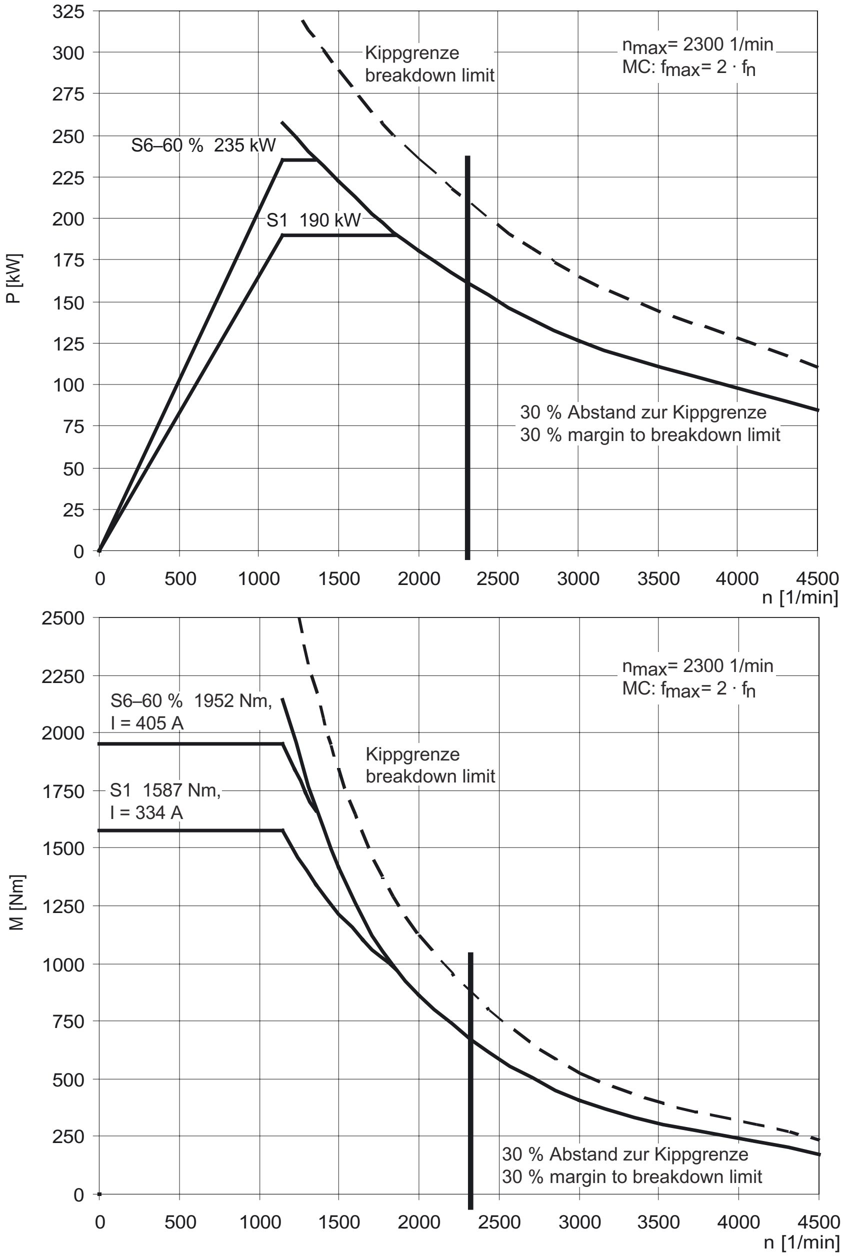

Figure 3-97 MASTERDRIVES MC, 1PL6228-□□D□□

Table 3-99 MASTERDRIVES MC, 480 V, 1PL6184-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	89	486	166	400	59.3	3500	3500 [1)]	3500	30	68

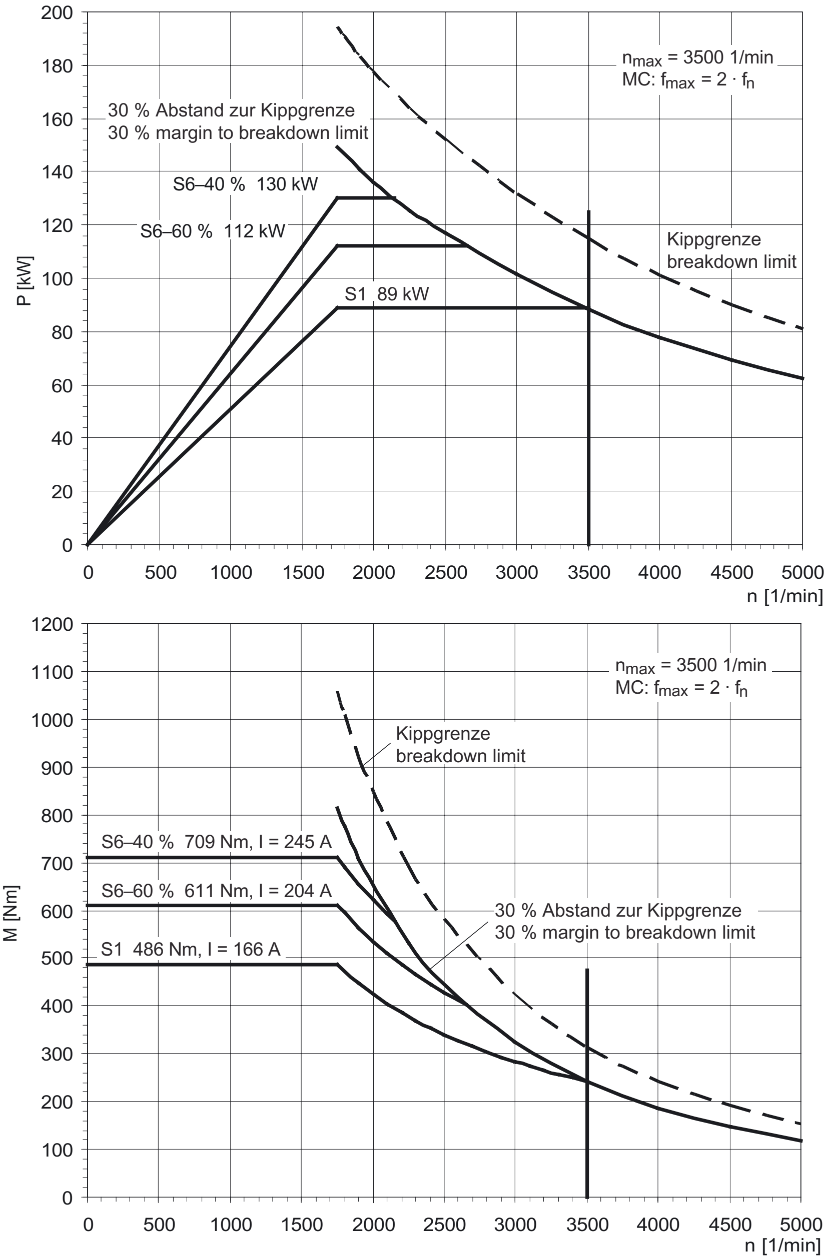

Figure 3-98 MASTERDRIVES MC, 1PL6184-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-100 MASTERDRIVES MC, 480 V, 1PL6186-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	125	682	231	400	59.3	3400	3500 1)	3500	30	92

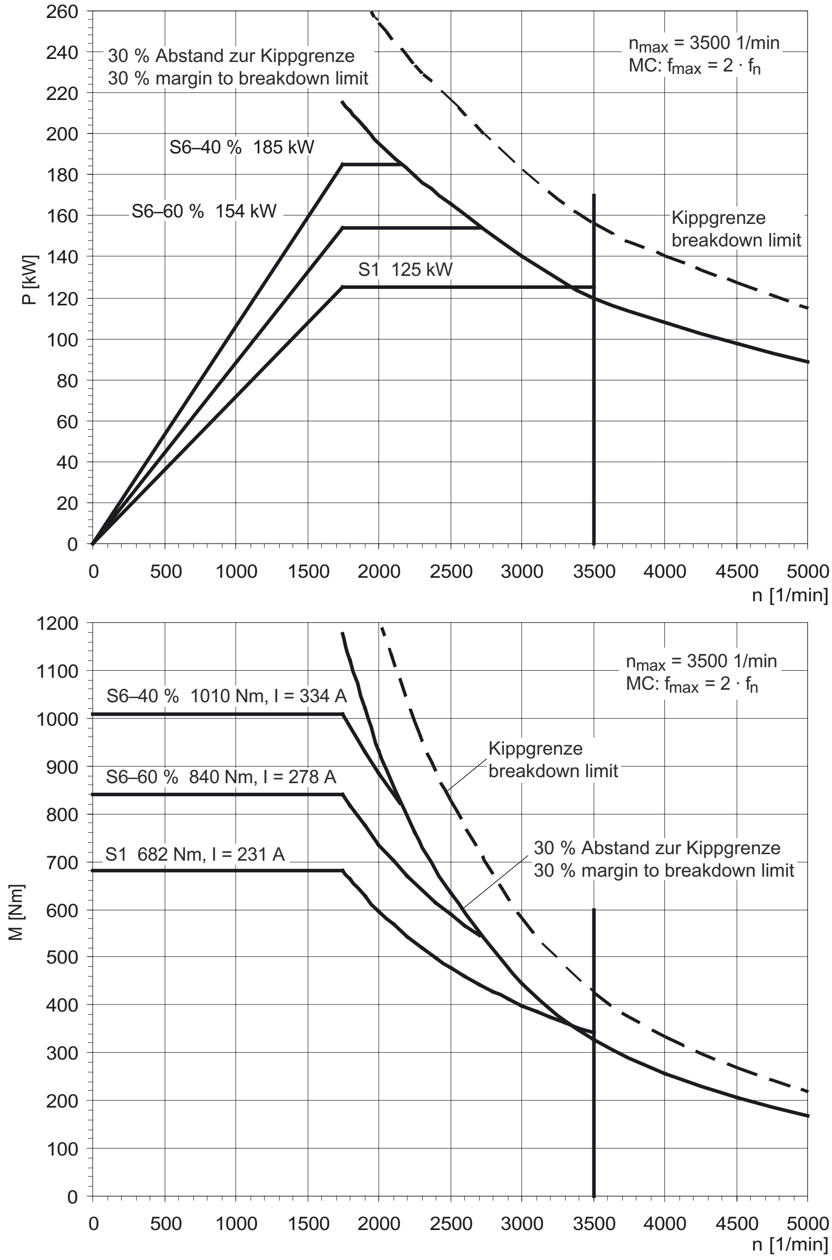

Figure 3-99 MASTERDRIVES MC, 1PL6186-□□F□□

1) 3000 RPM for increased cantilever forces

Table 3-101 MASTERDRIVES MC, 480 V, 1PL6224-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	165	900	292	400	59.2	3000	3100 [1)]	3500	30	90

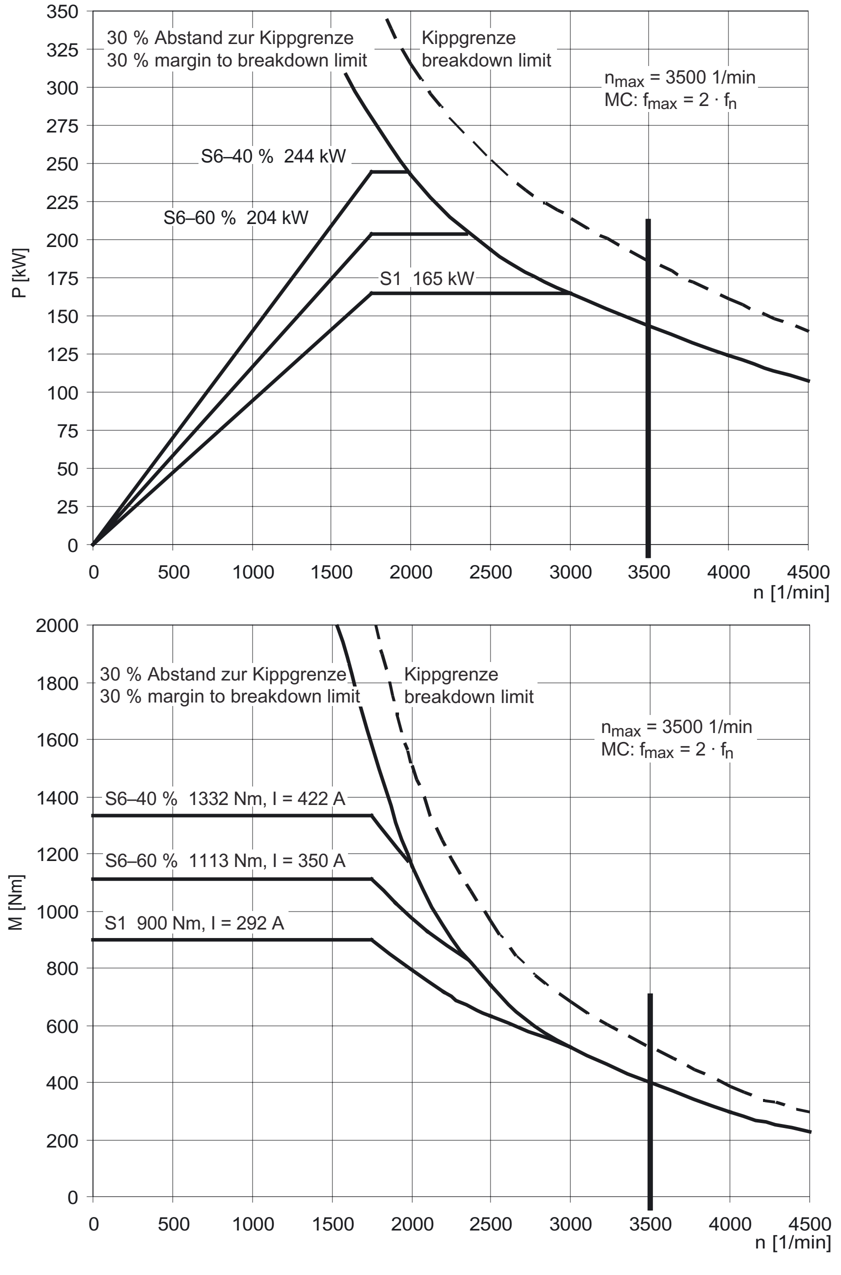

Figure 3-100 MASTERDRIVES MC, 1PL6224-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-102 MASTERDRIVES MC, 480 V, 1PL6226-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
1750	200	1091	350	400	59.1	2900	3100 1)	3500	30	122

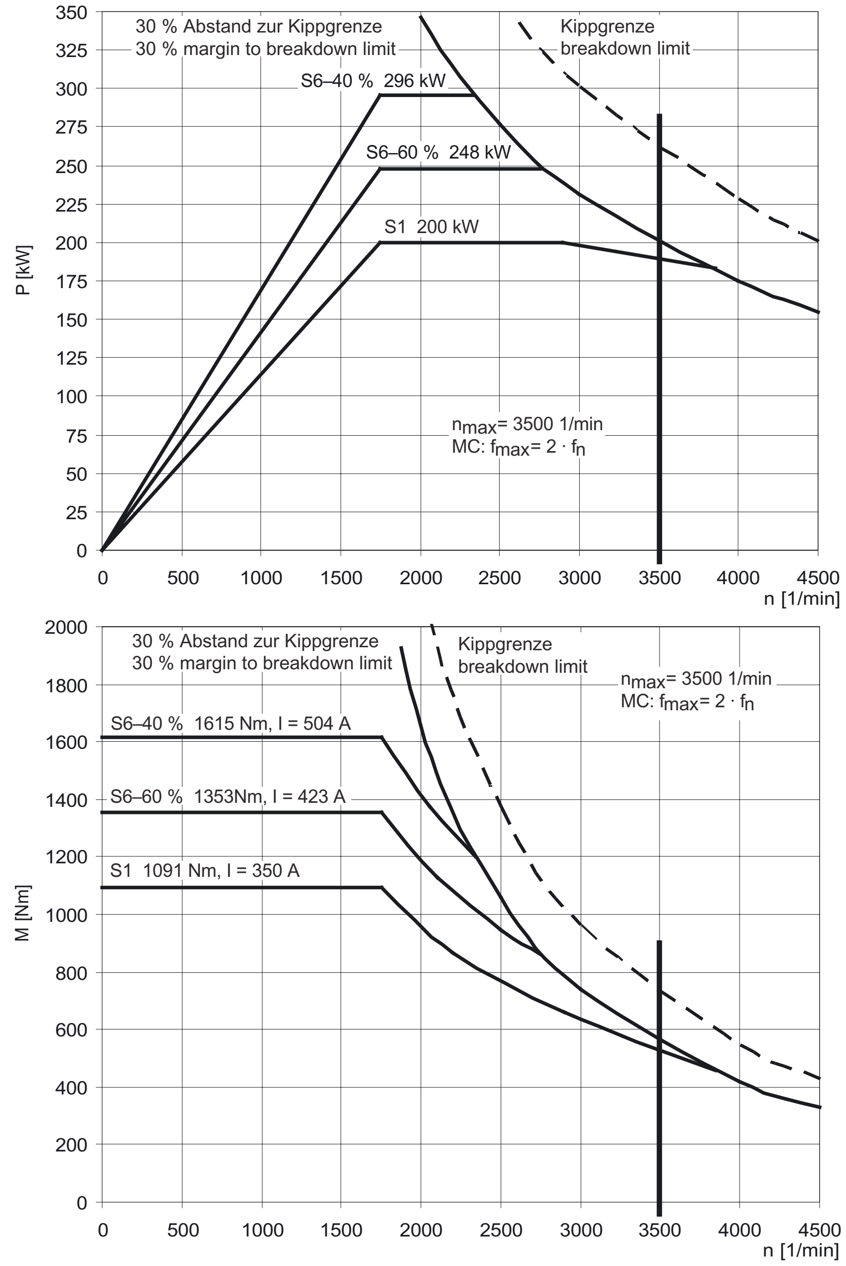

Figure 3-101 MASTERDRIVES MC, 1PL6226-□□F□□

1) 2700 RPM for increased cantilever forces

Table 3-103 MASTERDRIVES MC, 480 V, 1PL6228-□□F□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	$I_μ$ [A]
1750	265	1446	470	400	59.0	2900	3100 1)	3500	30	174

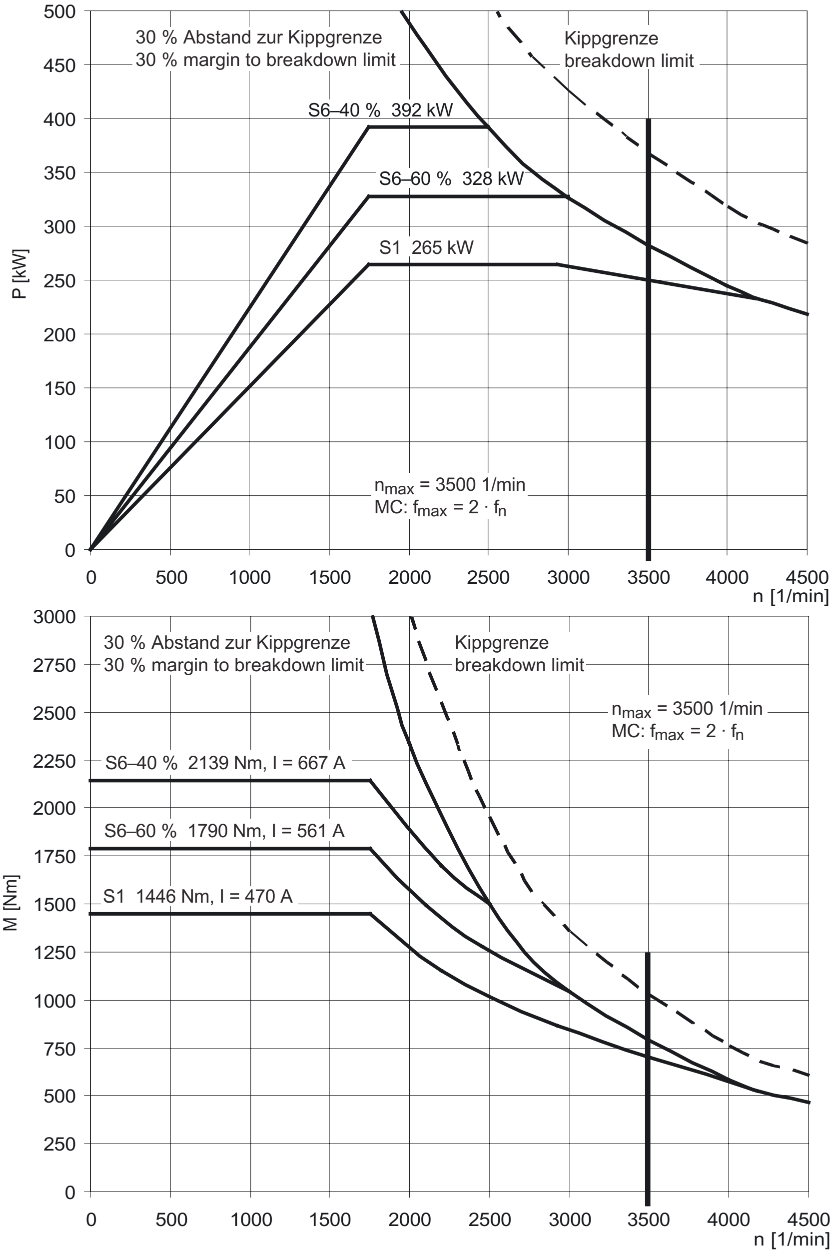

Figure 3-102 MASTERDRIVES MC, 1PL6228-□□F□□

1) 2500 RPM for increased cantilever forces

Table 3-104 MASTERDRIVES MC, 480 V, 1PL6184-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	113	372	209	400	97.6	5000	3500 [1]	5000	30	79

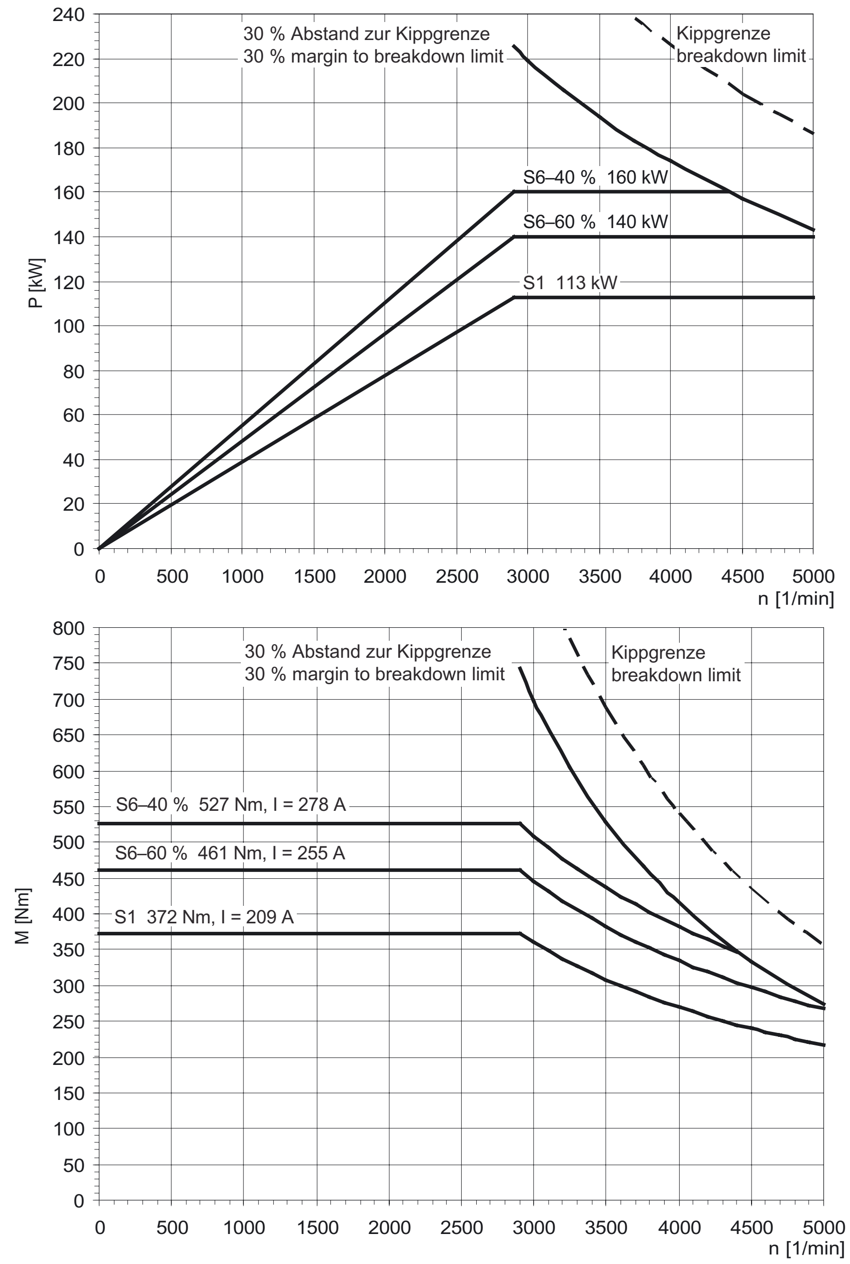

Figure 3-103 MASTERDRIVES MC, 1PL6184-□□L□□

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[1] 3000 RPM for increased cantilever forces

Table 3-105 MASTERDRIVES MC, 480 V, 1PL6186-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	150	494	280	390	97.5	5000	3500 1)	5000	30	110

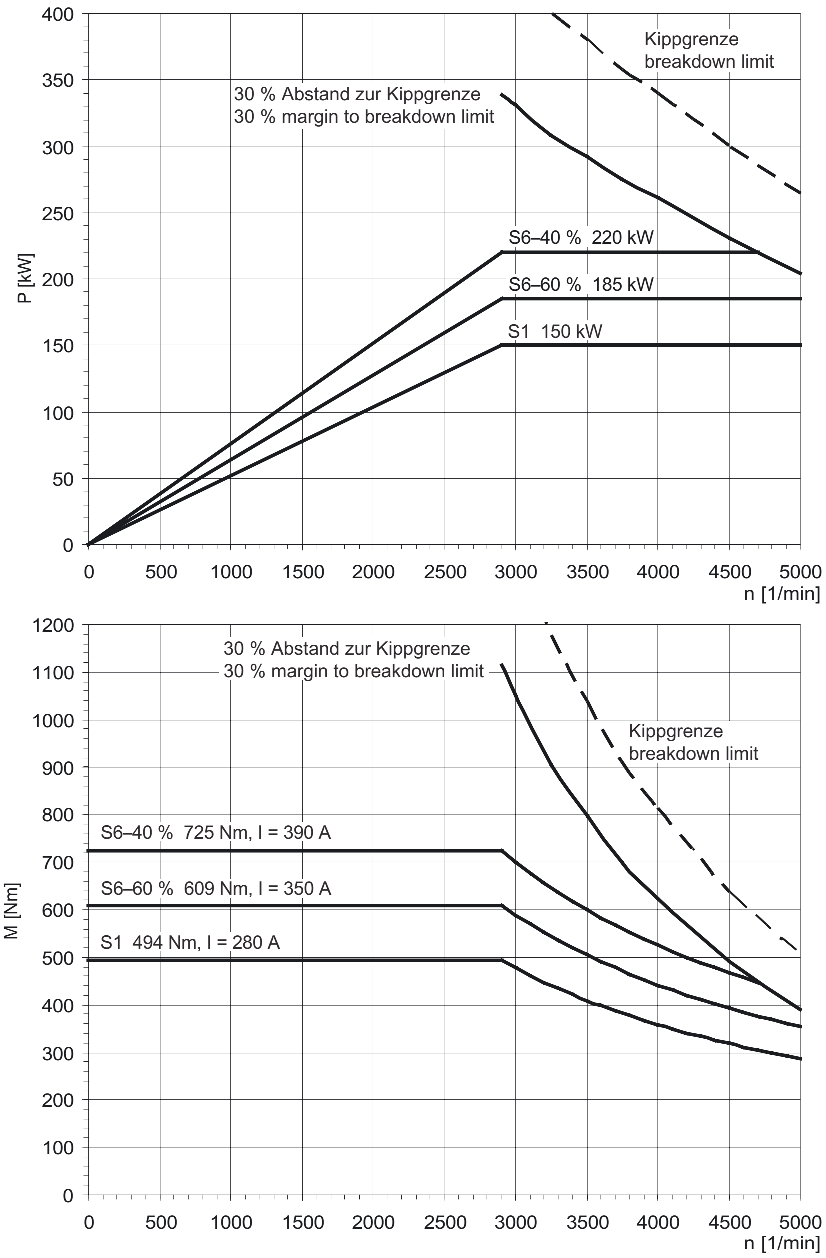


Figure 3-104 MASTERDRIVES MC, 1PL6186-□□L□□

1) 3000 RPM for increased cantilever forces

Table 3-106 MASTERDRIVES MC, 480 V, 1PL6224-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	205	675	365	400	97.5	3500	3100 [1]	4500	30	118

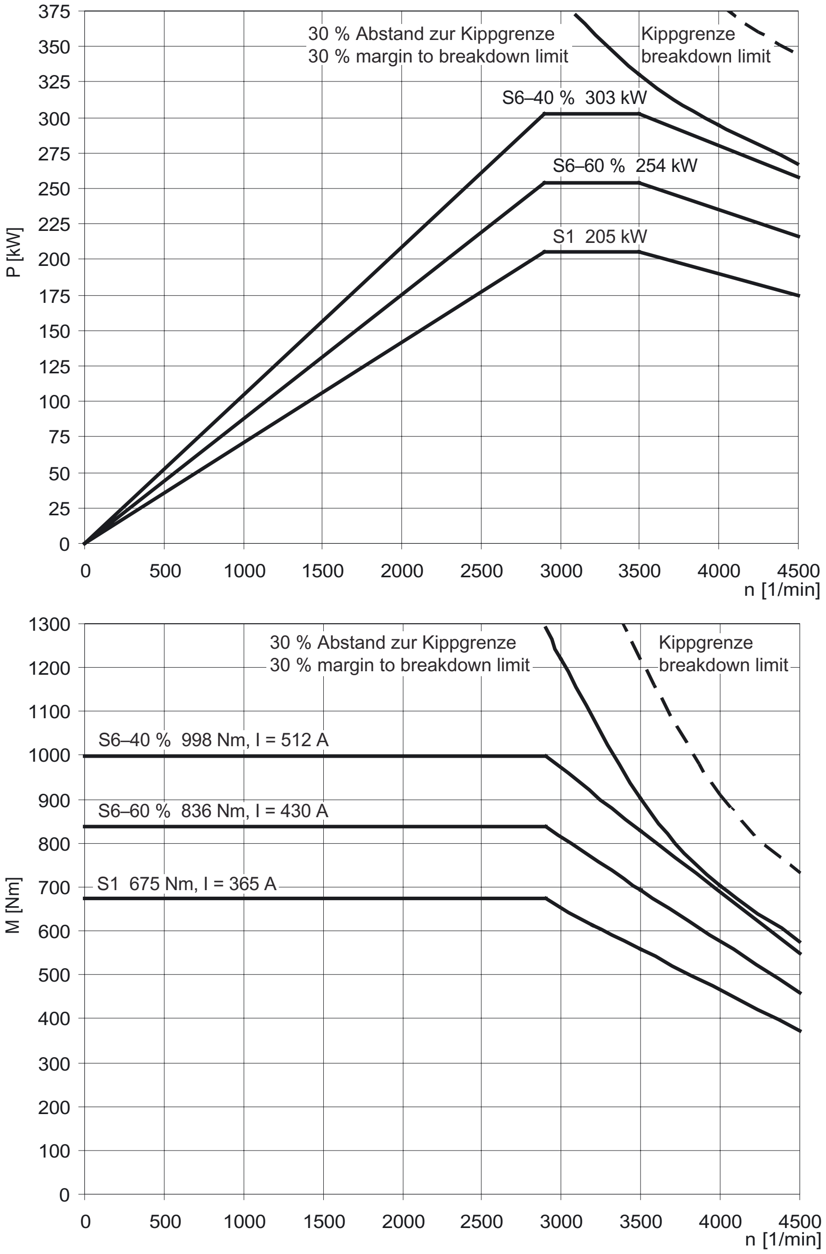


Figure 3-105 MASTERDRIVES MC, 1PL6224-□□L□□

[1] 2700 RPM for increased cantilever forces

Table 3-107 MASTERDRIVES MC, 480 V, 1PL6226-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	270	889	470	400	97.4	3500	3100 1)	4500	30	160

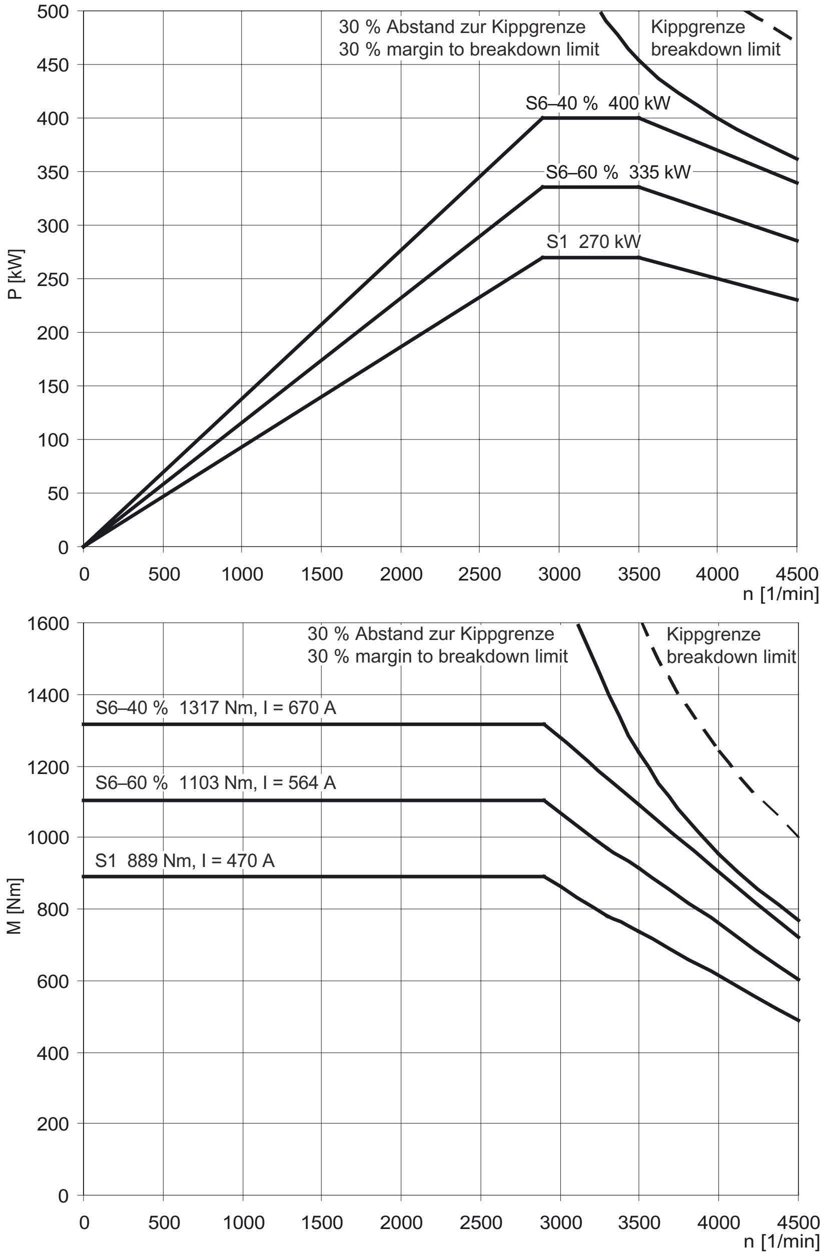


Figure 3-106 MASTERDRIVES MC, 1PL6226-□□L□□

1) 2700 RPM for increased cantilever forces

Table 3-108 MASTERDRIVES MC, 480 V, 1PL6228-□□L□□

n_N [RPM]	P_N [kW]	M_N [Nm]	I_N [A]	V_N [V]	f_N [Hz]	n_1 [RPM]	n_{s1} [RPM]	n_{max} [RPM]	T_{th} [min]	I_μ [A]
2900	300	988	530	400	97.3	3500	3100 1)	4500 2)	30	188

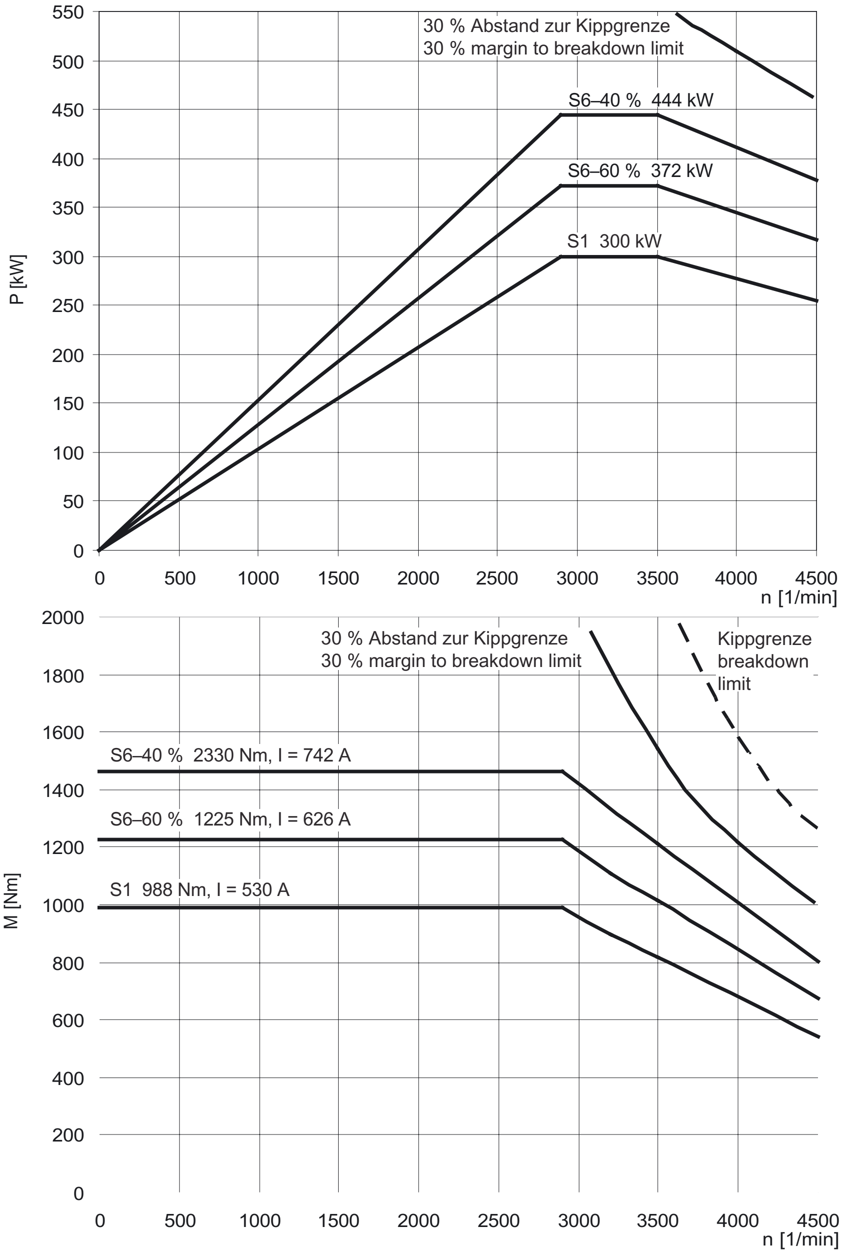


Figure 3-107 MASTERDRIVES MC, 1PL6228-□□L□□

1) 2500 RPM for increased cantilever forces

2) 4000 RPM for increased cantilever forces

3.3 Cantilever force/axial force diagrams

3.3.1 Cantilever force

⚠ Caution

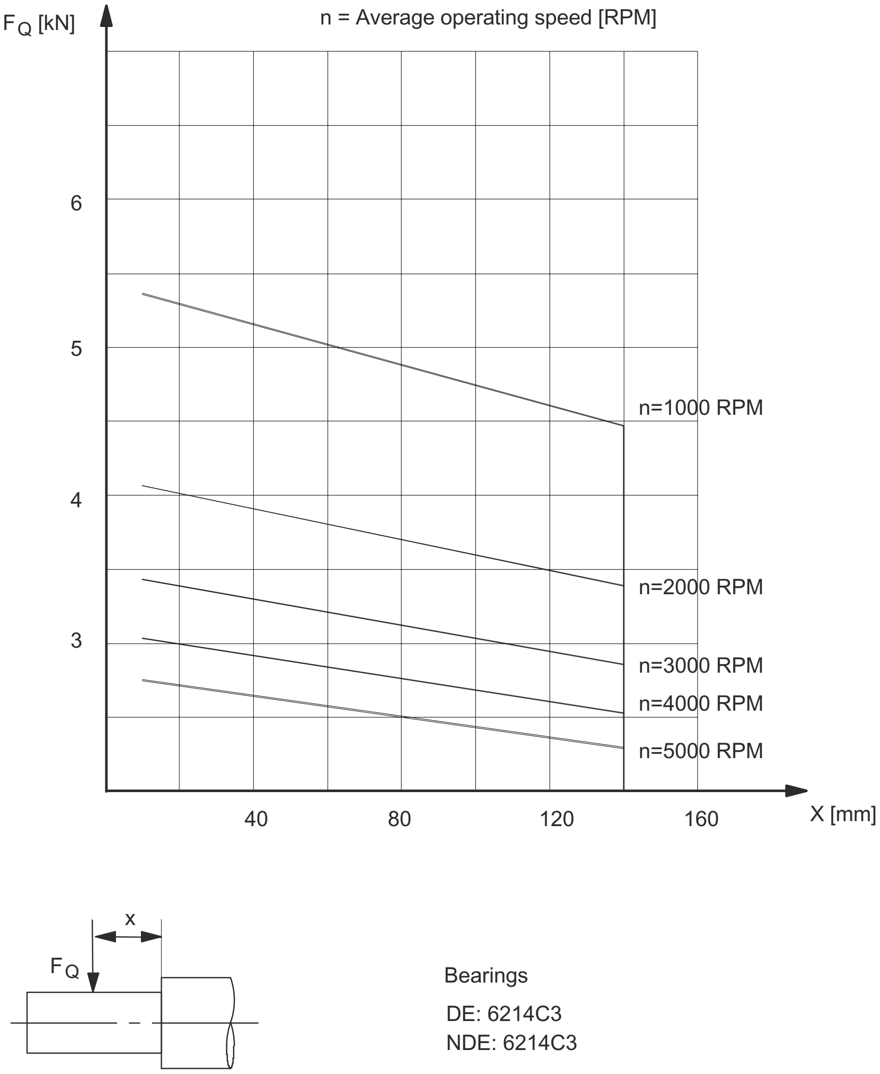
When using mechanical transmission elements, which subject the shaft end to a cantilever force, it should be ensured that the **maximum limit values, specified in the cantilever force diagrams, are not exceeded.**

Note

For applications with an extremely low cantilever force load, it should be ensured that the motor shaft is subject to a **minimum cantilever force load as specified in the diagrams**. Lower cantilever forces can cause the cylindrical bearings to roll in an undefined fashion. This results in increased bearing wear and higher noise. For these applications, bearing designs for a coupling out-drive should be selected.

The diagrams specify the maximum permissible cantilever forces and the cantilever forces that are required as a minimum.

SH 180, permissible cantilever forces for a coupling out-drive



Bearings

DE: 6214C3
NDE: 6214C3

Figure 3-108 Cantilever force diagram, shaft height 180 for coupling out-drive

SH 180, permissible cantilever forces for belt out-drives

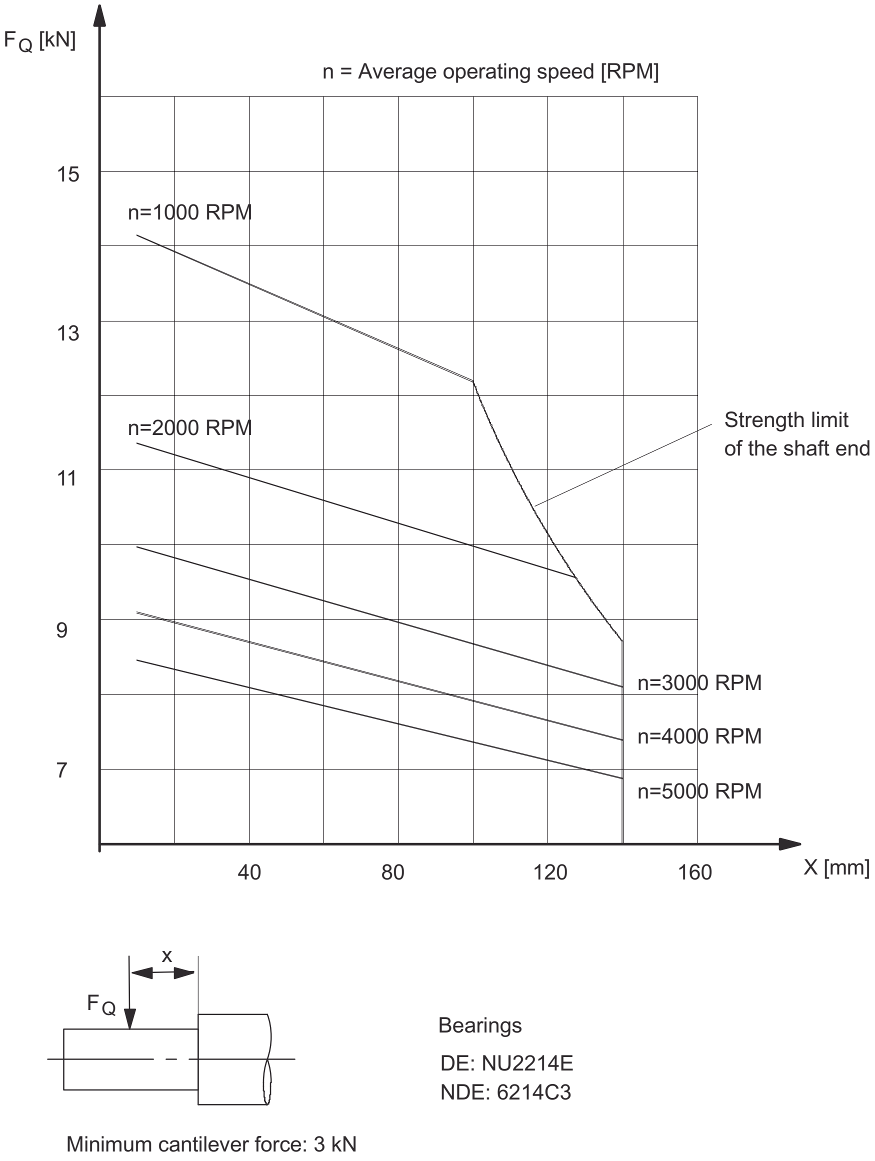


Figure 3-109 Cantilever force diagram, shaft height 180 for belt out-drive

SH 180, permissible increased cantilever forces for belt out-drives

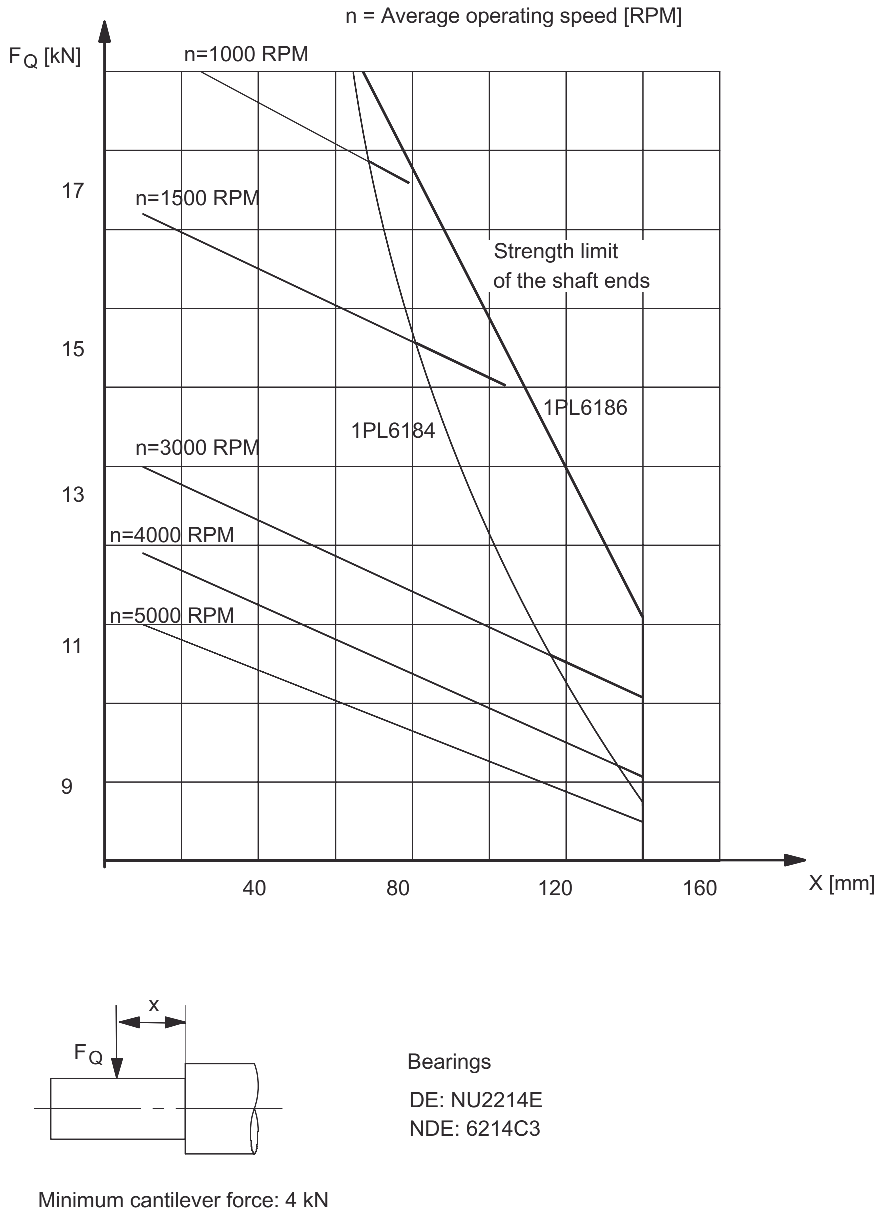
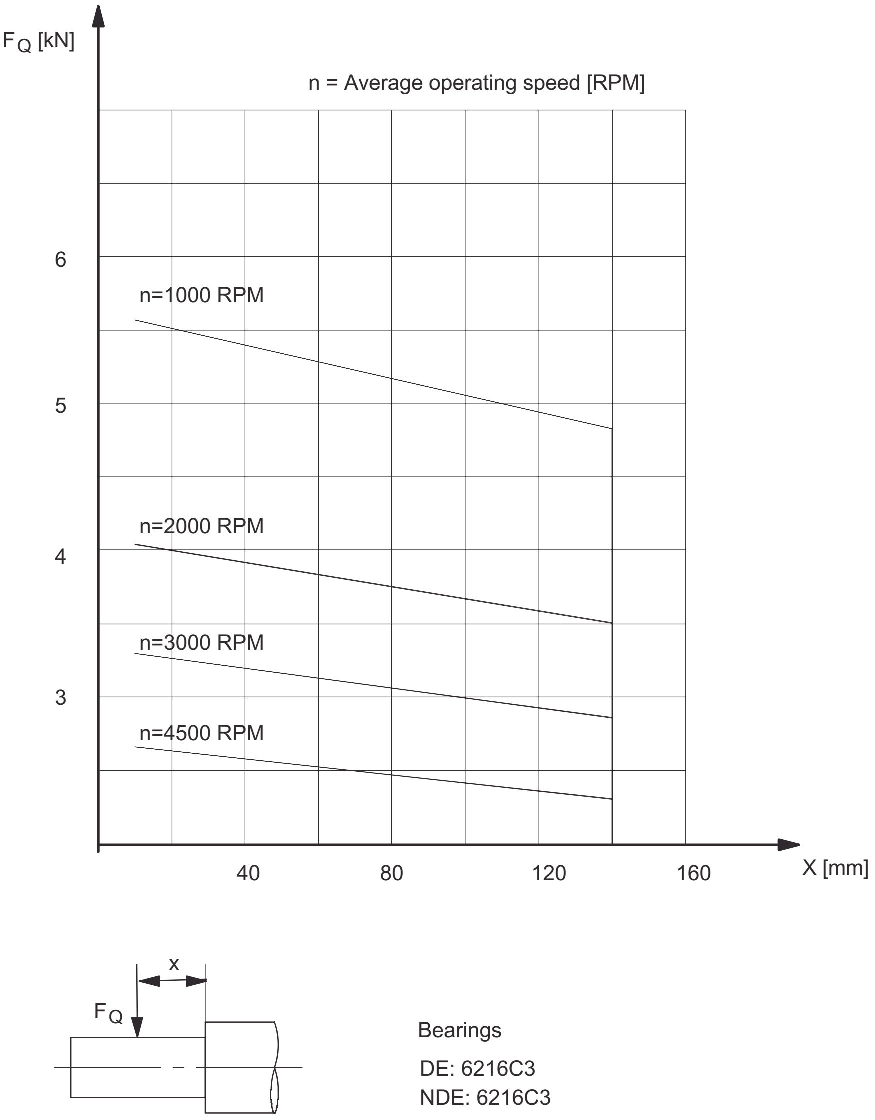


Figure 3-110 Cantilever force diagram, shaft height 180 for belt out-drives (increased cantilever forces)

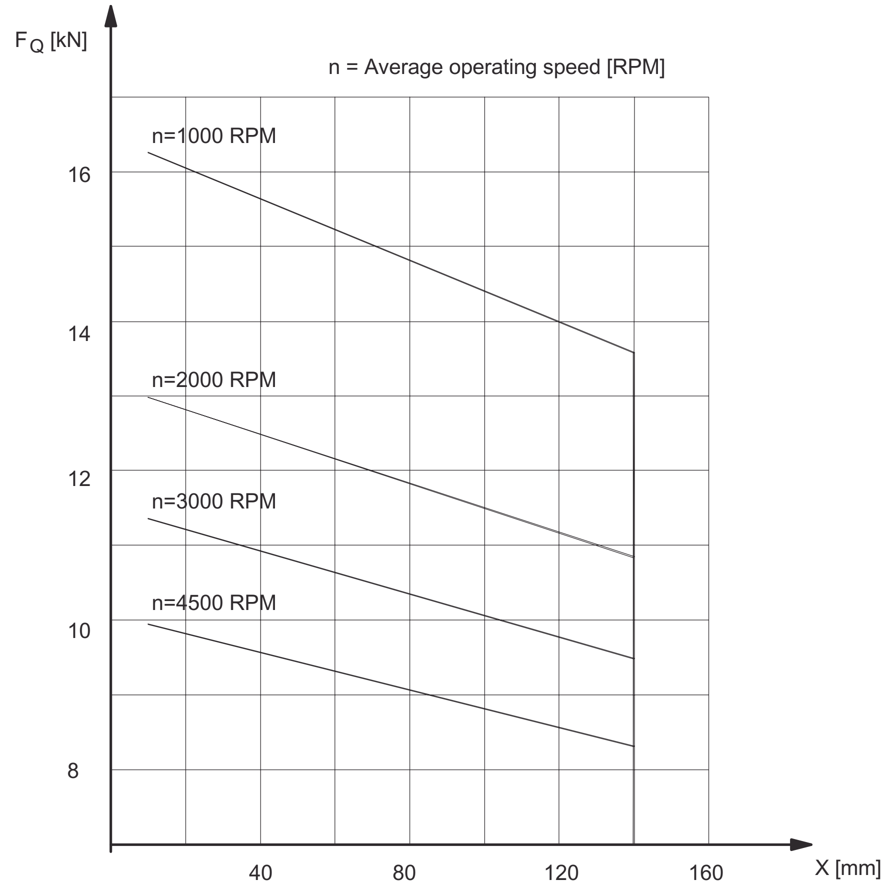
SH 225, permissible cantilever forces for a coupling out-drive

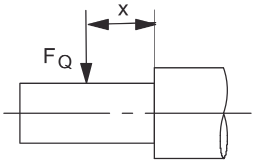


Bearings
DE: 6216C3
NDE: 6216C3

Figure 3-111 Cantilever force diagram, shaft height 225 for coupling out-drive

SH 225, permissible cantilever forces for belt out-drives





Bearings

DE: NU2216E
NDE: 6216C3

Minimum cantilever force: 4 kN

Figure 3-112 Cantilever force diagram, shaft height 225 for belt out-drive

SH 225, permissible increased cantilever forces for belt out-drives

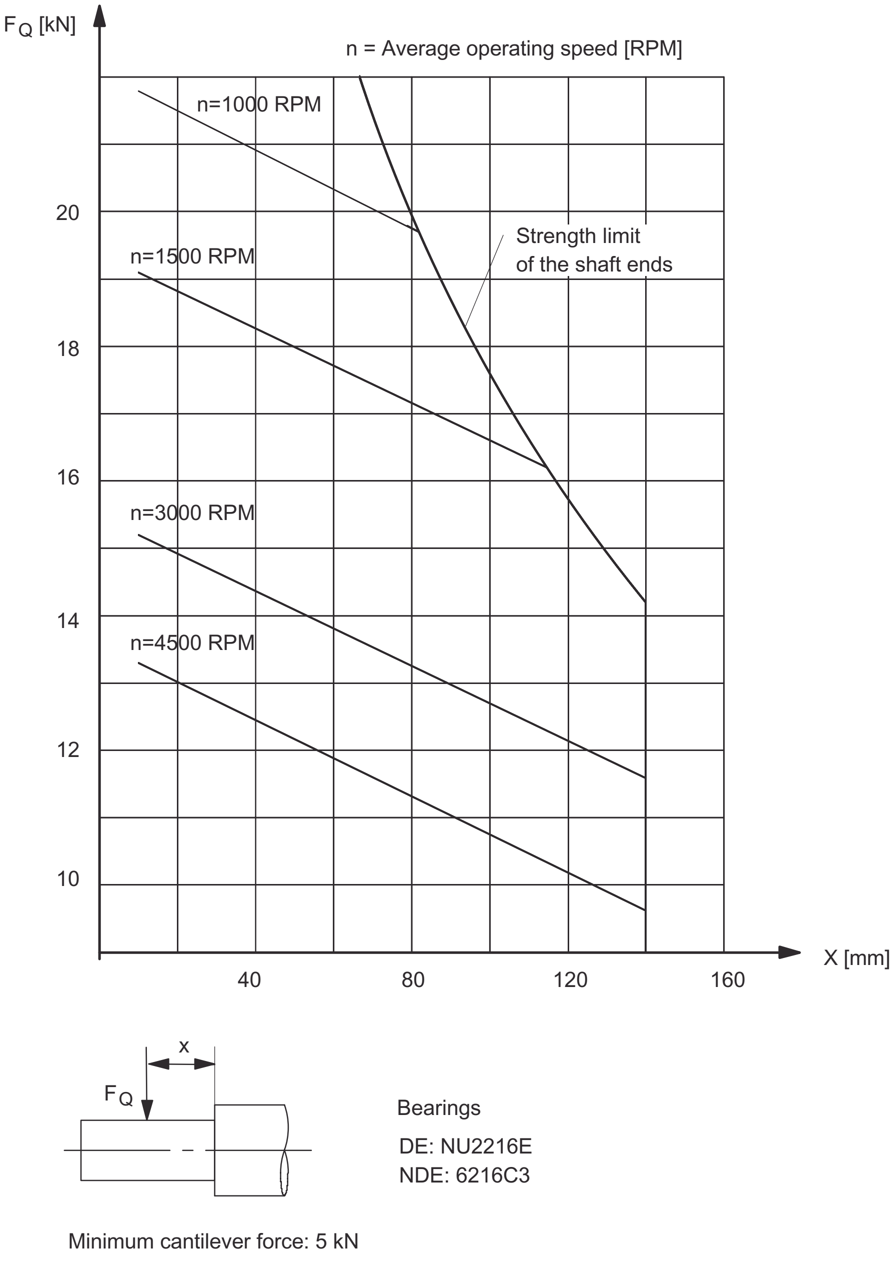
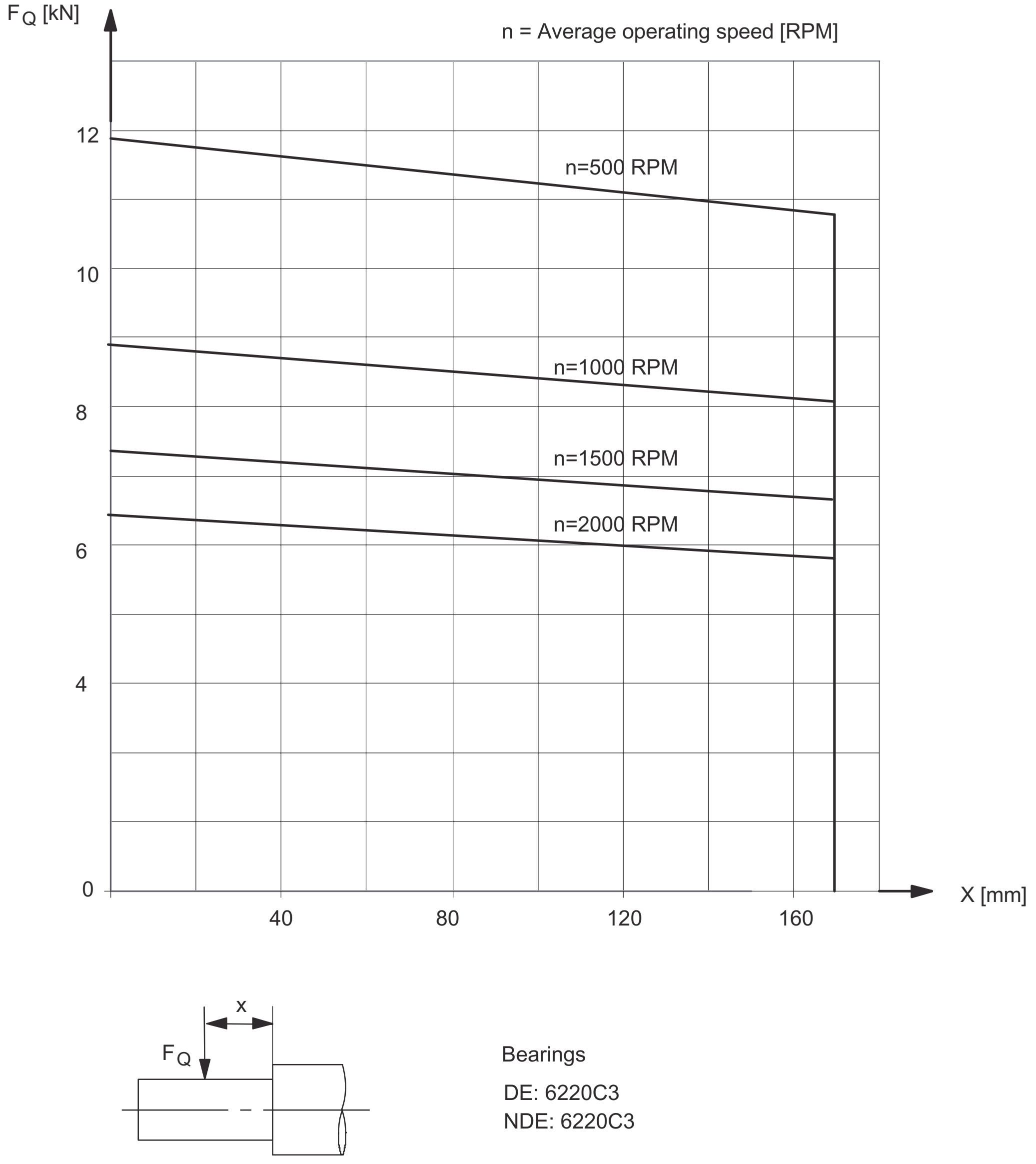


Figure 3-113 Cantilever force diagram, shaft height 225 for belt out-drives (increased cantilever forces)

SH 280, permissible cantilever forces for a coupling out-drive



Bearings

DE: 6220C3
NDE: 6220C3

Figure 3-114 Cantilever force diagram, shaft height 280 for coupling out-drive

SH 280, permissible cantilever forces for belt out-drives

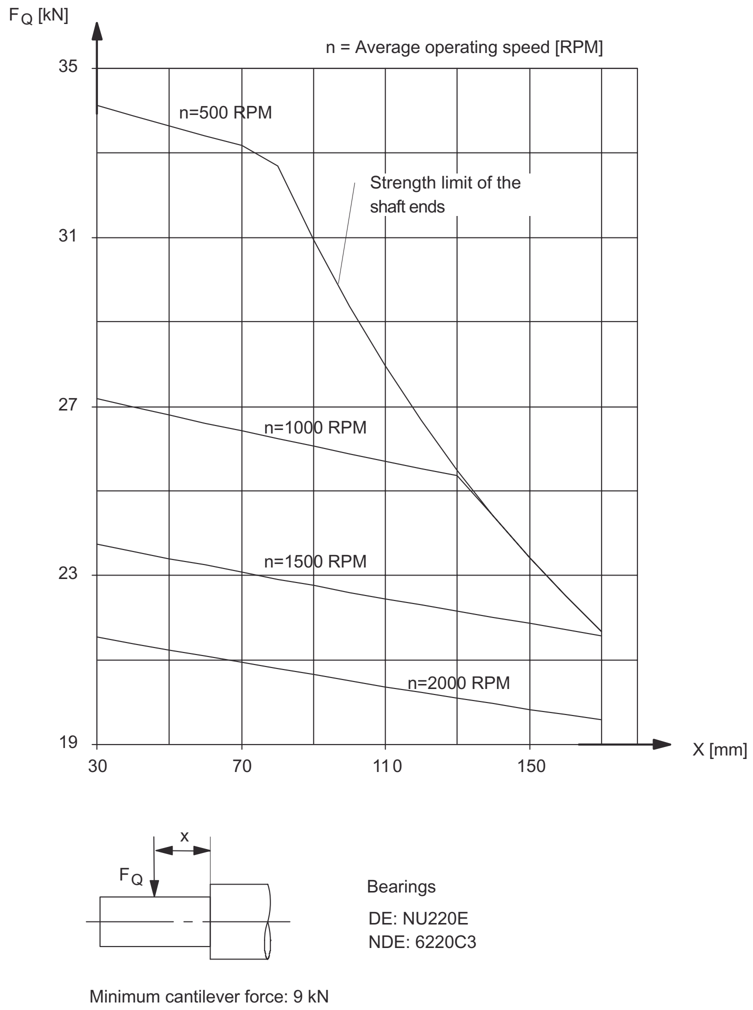


Figure 3-115 Cantilever force diagram, shaft height 280 for belt out-drive

3.3.2 Axial force

For coupling, belt or pinion out-drives with straight teeth, generally, only low axial forces occur. The locating bearing is adequately dimensioned so that these forces can be accepted in all mounting positions.

The following forces due to the weight of the drive-out element are permissible at the shaft end in order to ensure perfect vibration characteristics (i.e. low vibration):

- SH 180: max. 500 N
- SH 225: max. 600 N
- SH 280: max. 900 N

For pinion out-drives with helical gearing, please contact your local Siemens office.

Forces due to the rotor weight

Note

The permissible axial force at the shaft end without taking into account the alignment forces, the rotor weight, the mounting position and the force direction.

For information regarding axial forces, refer to the Configuration Manual "General Part for Induction Motors".

Table 3-109 Force due to weight of the rotor and the rotor alignment force

Motor type	Force due to weight F_L [N]	Alignment force F_C [N]
1PL6184	980	500 1)
1PL6186	1220	500 1)
1PL6224	1720	550 1)
1PL6226	2100	550 1)
1PL6228	2500	550 1)
1PL6284	3200	600 1)
1PL6286	4000	600 1)
1PL6288	4600	600 1)

1) only for coupling out-drive

Motor Components

4

4.1 Thermal motor protection

Table 4-1 Features and technical data

Type	KTY 84–130
Resistance when cold (20°C)	Approx. 580 Ohm
Resistance when hot (100°C)	Approx. 1000 Ohm
Connection	Via signal cable
Response temperature	Pre-warning < 145 °C ± 5 °C Alarm/trip at max. 150 °C ± 5 °C

The resistance change is proportional to the winding temperature change. For 1PL motors, the temperature characteristic is taken into account in the closed-loop control.

For SIMOVERT MASTERDRIVES drive converters, the response temperature for pre-warning and trip can be set using the following parameters:

- MASTERDRIVES VC: P131 = 0 (KTY 84 - 130; factory setting)
- MASTERDRIVES MC: P131 = 1 (KTY 84 - 130; factory setting)
- MASTERDRIVES VC/MC: P380 (pre-warning) and P381 (alarm/trip)

High short-term overload conditions require additional protective measures as a result of the thermal coupling time of the sensor.

The cables for the temperature sensor are included in the pre-fabricated encoder cable.

Warning

If the user carries-out an additional high-voltage test, then the ends of the temperature sensor cables must be short-circuited before the test is carried-out! If the test voltage is connected to only one terminal of the temperature sensor, it will be destroyed.

Warning

There is no adequate protection for thermally critical load situations, e.g. a high overload at motor standstill. In this case, other protective measures must be provided, e.g. a thermal overcurrent relay.

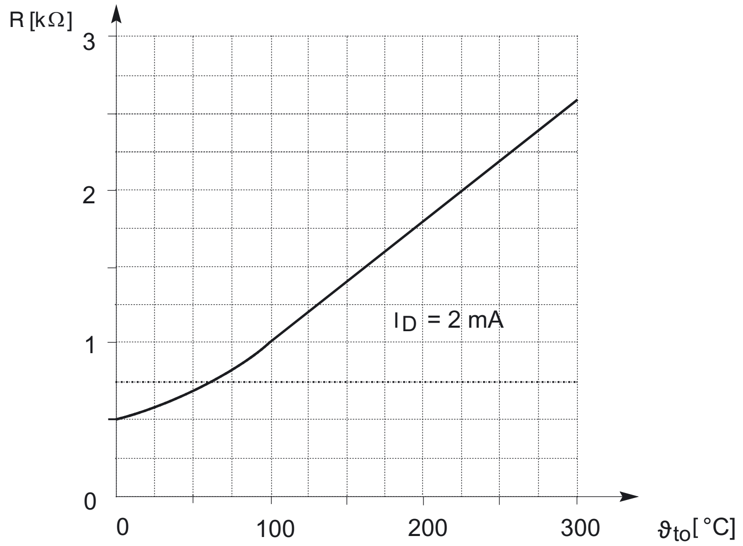


Figure 4-1 Resistance characteristic as a function of the KTY 84 thermistor temperature

4.2 Encoders

4.2.1 HTL incremental encoder

Table 4-2 Features and technical data

Version	Optical encoder system
Application	Tachometer for speed actual value sensing
Coupling	at the NDE: for SH 180 and 225 integrated in the motor for SH 280, mounted onto the motor
Output signals	• Incremental track • Reference signal
Connection	Plug connection
Operating voltage	+ 10 ... 30 V
Number of pulses	1024 (option: 2048)
Incremental signals	HTL Track A, track B Zero pulse and inverted signals
Precision	± 1'

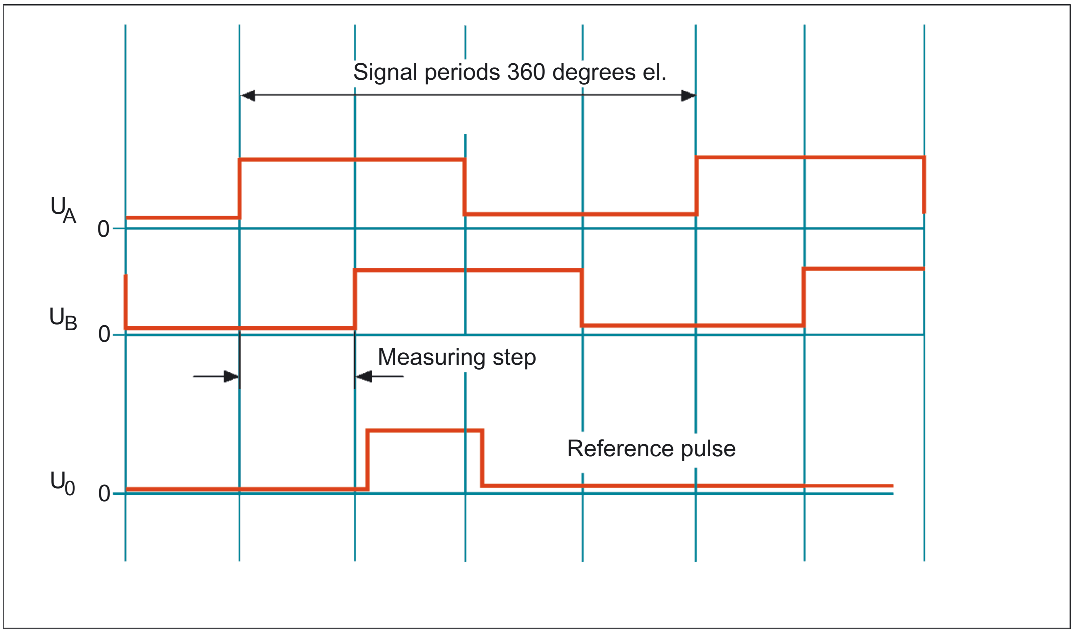
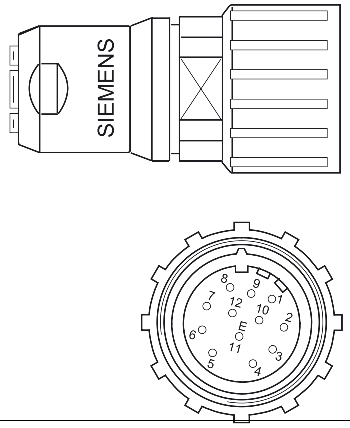


Figure 4-2 Output signals

Connection

Table 4-3 Connection assignment, 12-pin flange-mounted socket

Signal name	PIN	Connector type
*B	1	6FX2003-0CE12 
KTY84+	2	
ZERO TRACK	3	
*ZERO TRACK	4	
A	5	
*A	6	
CTRL TACH	7	
B	8	
Unassigned	9	
0 V	10	
KTY84-	11	
15 V	12	
Outer shield at the connector housing	Yes	

Lines

Table 4-4 Pre-fabricated cable for MASTERDRIVES:

6FX	□	002	-	2AH00	-	□□□	0
	↓ ↓ 5 MOTION-CONNECT®500 8 MOTION-CONNECT®800					↓ ↓ ↓ Length Max. cable lengths: without transfer of inverted signals,150 m with transfer of inverted signals, 300 m	

For other technical data and length code, refer to Catalog, Chapter "MOTION-CONNECT connection system"

4.2.2 Incremental encoder sin/cos 1 Vpp

Table 4-5 Features and technical data

Version	Optical encoder system
Application	• Tachometer for speed actual value sensing • Indirect measuring system for the position control loop
Coupling	at the NDE: for SH 180 and 225 integrated in the motor for SH 280, mounted onto the motor
Output signals	• Incremental track, sinusoidal • One zero pulse (reference mark) per revolution
Connection	Plug connection
Operating voltage	+ 5 V ± 5 %
Number of pulses	2048
Output signals	1 Vpp
Precision	± 40"
Current consumption	Max. 150 mA

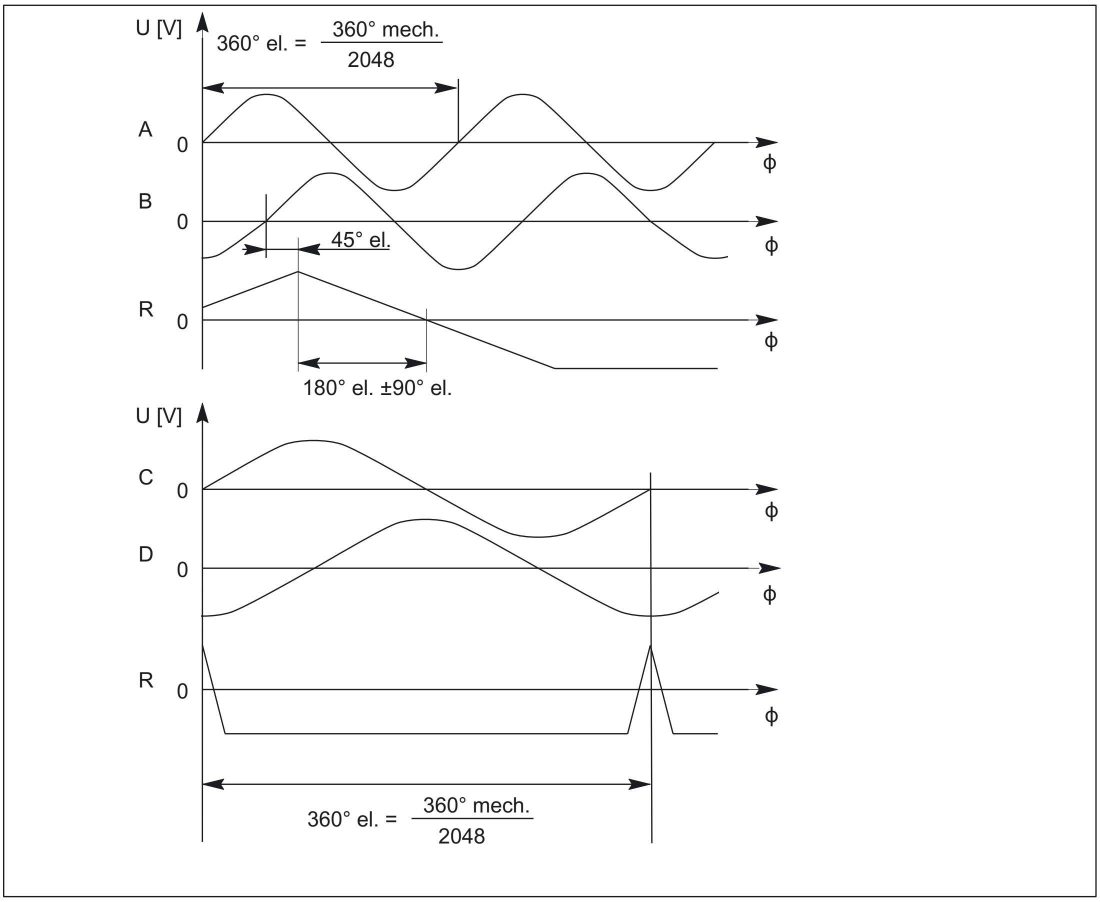
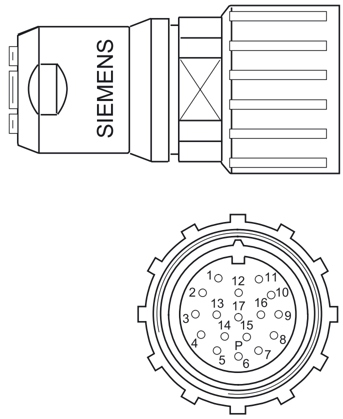


Figure 4-3 Signal sequence and assignment for a positive direction of rotation (clockwise direction rotation when viewing the drive end)

Connection

Table 4-6 Connection assignment, 17-pin flange-mounted socket

Signal name	PIN	Connector type
Ua1	1	6FX2003-0CE17 
*Ua1	2	
Inner shield	17	
Ua2	11	
*Ua2	12	
Inner shield	17	
Ua0	3	
*Ua0	13	
Inner shield	17	
Ua3	5	
*Ua3	6	
Ua4	14	
*Ua4	4	
+1R1	8	
-1R2	9	
P encoder	10	
5 V sense	16	
M encoder	7	
0 V sense	15	
Outer shield at the connector housing	yes	

Cables

Table 4-7 Pre-fabricated cable

6FX	□	002	-	2CA31	-	□□□	0
	↓ ↓ 5 MOTION-CONNECT®500 8 MOTION-CONNECT®800					↓ ↓ ↓ Length Max. cable length 100 m	

For other technical data and length code, refer to Catalog, Chapter "MOTION-CONNECT connection system"

4.2.3 Absolute encoder (EnDat)

Table 4-8 Features and technical data

Version	Optical encoder system
Application	• Tachometer for speed actual value sensing • Measuring system for the position control loop
Coupling	at the NDE: for SH 180 and 225 integrated in the motor for SH 280, mounted onto the motor
Output signals	Serial interface
Connection	Plug connection
Operating voltage	+ 5 V ± 5 %
Number of pulses	2048
Output signals	1 Vpp
Precision	± 40"
Code signals	Synchronous-serial EnDat interface Binary code, 4096 coded revolutions

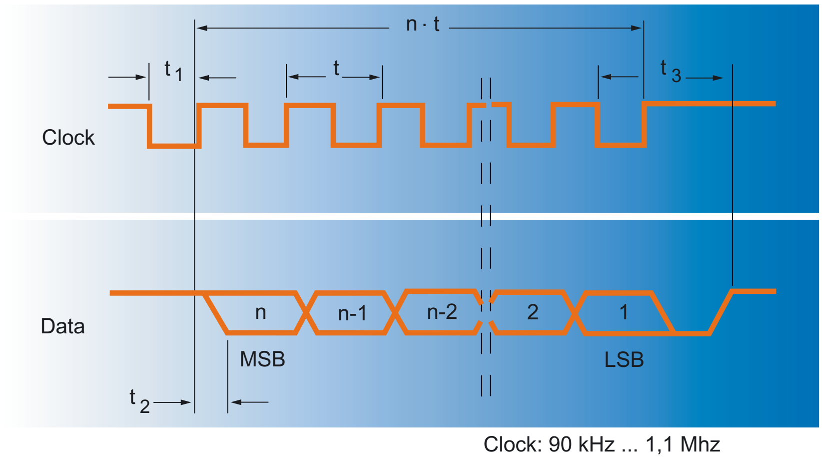
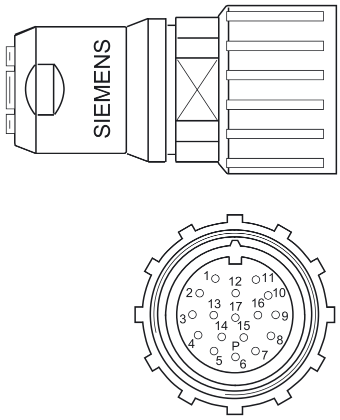


Figure 4-4 Output signals, absolute encoders

Connection

Table 4-9 Connection assignment, 17-pin flange-mounted socket

Signal name	PIN	Connector type
Ua1	1	6FX2003-0CE17 
*Ua1	2	
Inner shield	17	
Ua2	11	
*Ua2	12	
Inner shield	17	
Data	3	
*Data	13	
Inner shield	17	
Clock	5	
*Clock cycle	14	
+1R1	8	
-1R2	9	
P encoder	10	
	16	
5 V sense	16	
M encoder	7	
	15	
0 V sense	15	
Outer shield at the connector housing	yes	

Cables

Table 4-10 Pre-fabricated cable MASTERDRIVES MC

6FX	□	002	-	2EQ10	-	□□□	0
	↓ ↓ 5 MOTION-CONNECT®500 8 MOTION-CONNECT®800					↓ ↓ ↓ Length Max. cable length 100 m	

For other technical data and length code, refer to Catalog, Chapter "MOTION-CONNECT connection system"

4.2.4 2-pole resolver

Table 4-11 Features and technical data

Version	Inductive encoder system
Application	Tachometer for speed actual value sensing
Coupling	at the NDE: for SH 180 and 225 integrated in the motor
Output signals	Sinusoidal and cosinusoidal tracks
Connection	Plug connection
Operating voltage/frequency	+ 5 V/4 kHz
Output signals	Ratio, ü = 0.5 ± 5 % $V_{\text{sinusoidal track}} = ü \cdot V_{\text{excitation}} \cdot \sin \alpha$ $V_{\text{cosine track}} = ü \cdot V_{\text{excitation}} \cdot \cos \alpha$
Angular error width	< 14' (2–pole)

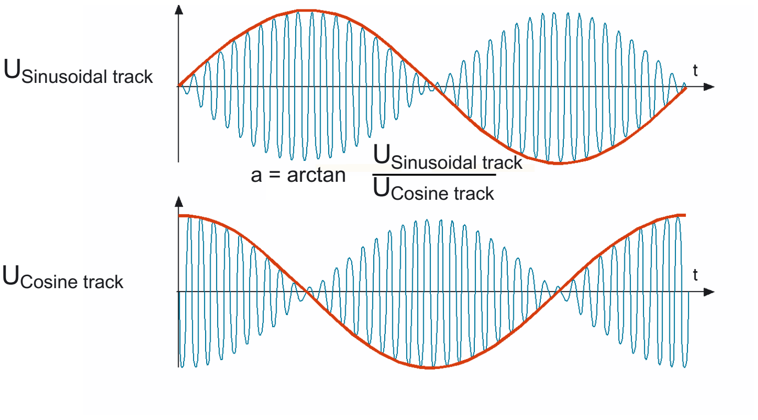
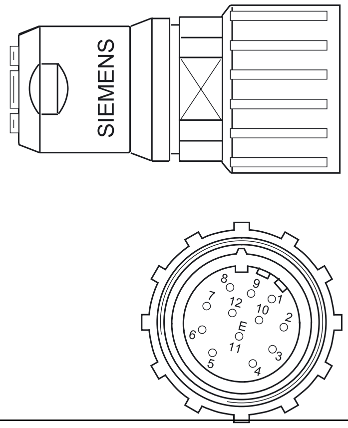


Figure 4-5 Resolver output signals

Connection

Table 4-12 Connection assignment, 12-pin flange-mounted socket

Signal name	PIN	Connector type
SIN	1	6FX2003-0CE12 
*SIN	2	
Inner shield	3	
COS	11	
*COS	12	
Inner shield	5	
+1R1	8	
-1R2	9	
Inner shield	4	
+Vpp	10	
-Vpp	7	
Outer shield at the connector housing	yes	

Cables

Table 4-13 Pre-fabricated cable MASTERDRIVES MC

6FX	□	002	-	2CF02	-	□□□	0
	↓ ↓ 5 MOTION-CONNECT®500 8 MOTION-CONNECT®800					↓ ↓ ↓ Length Max. cable length 150 m	

For other technical data and length code, refer to Catalog, Chapter "MOTION-CONNECT connection system"

Dimension Drawings

5

5.1 Introduction

Note

CAD CREATOR

Using a configuration interface that is very easy to understand, CAD CREATOR allows you to quickly find motor-specific

- technical data

- dimension drawings

- 2D/3D CAD data

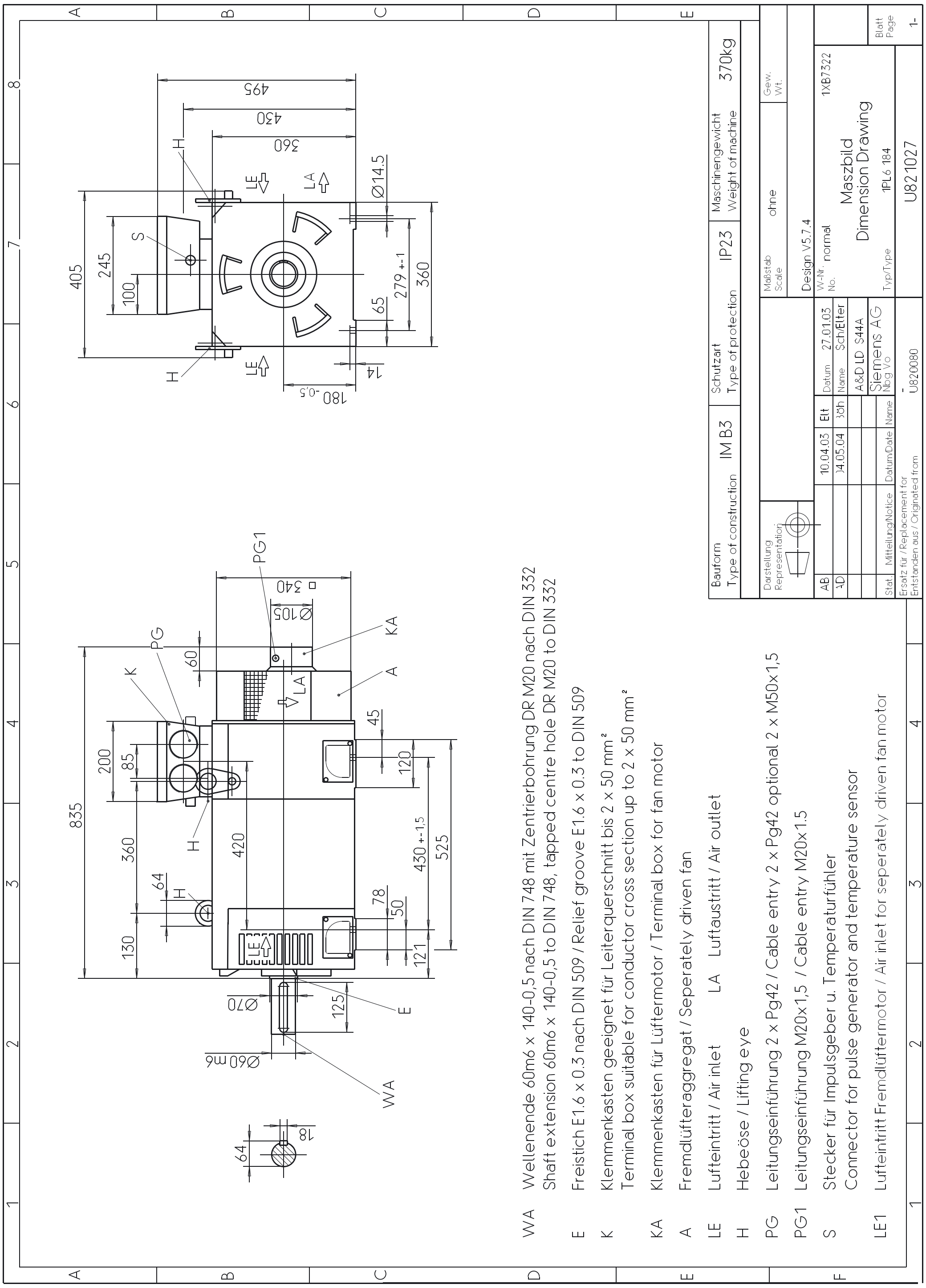
and supports you when generating plant/system documentation regarding project-specific information and parts lists.

Internet: http://www.siemens.com/cad-creator

Note

Siemens AG reserves the right to change the dimensions of the motors as part of mechanical design improvements without prior notice. This means that dimensions drawings can go out-of-date. Up-to-date dimension drawings can be requested at no charge from your local SIEMENS sales department.

5.2 Type of construction IM B3 with separately-driven fan



WA	Wellenende 60m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 60m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 50 mm² Terminal box suitable for conductor cross section up to 2 x 50 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x Pg42 / Cable entry 2 x Pg42 optional 2 x M50x1,5
PG1	Leitungseinführung M20x1,5 / Cable entry M20x1.5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-1 1PL6184-B-F,air flow direction DE→NDE, U821027

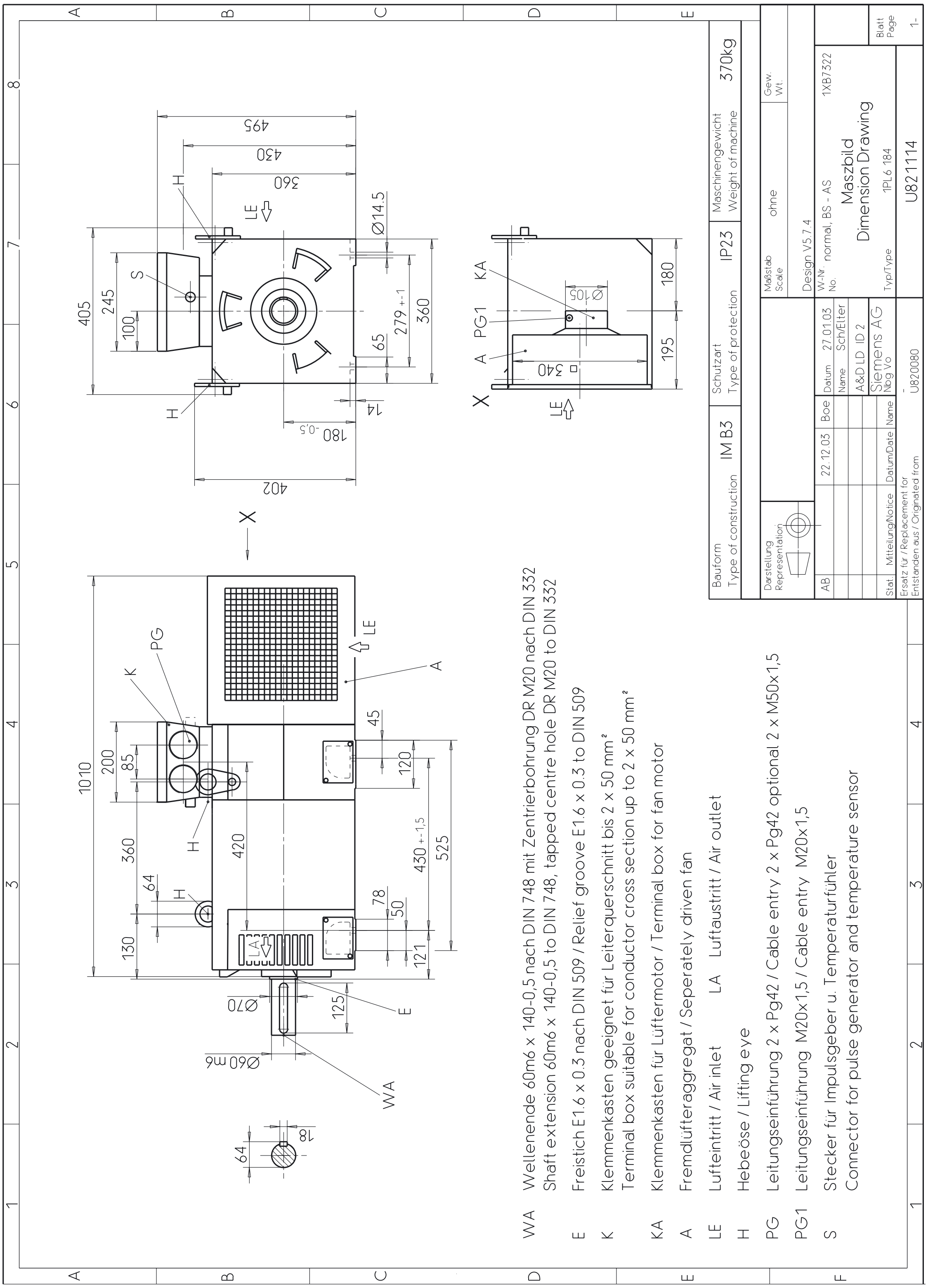
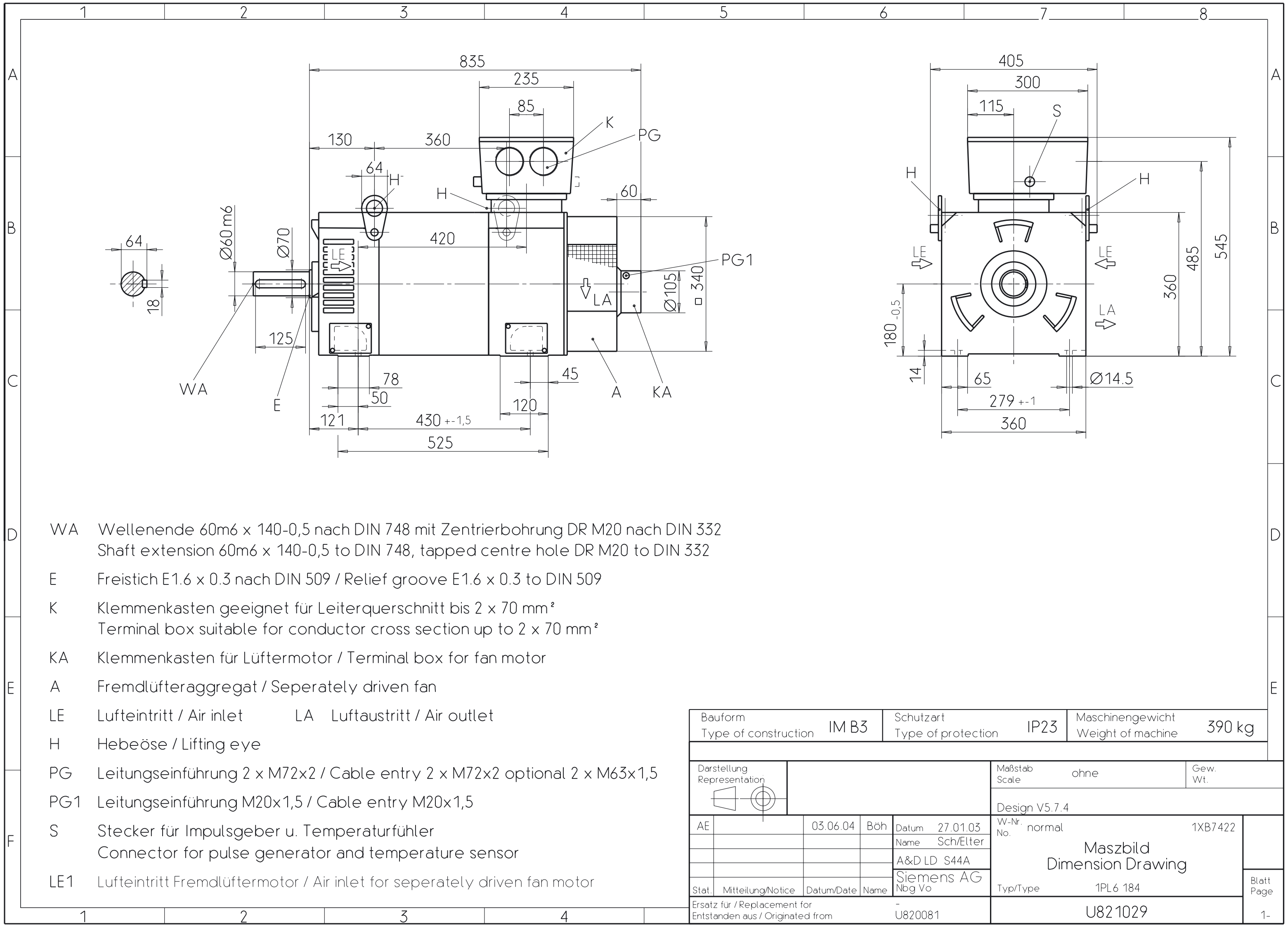
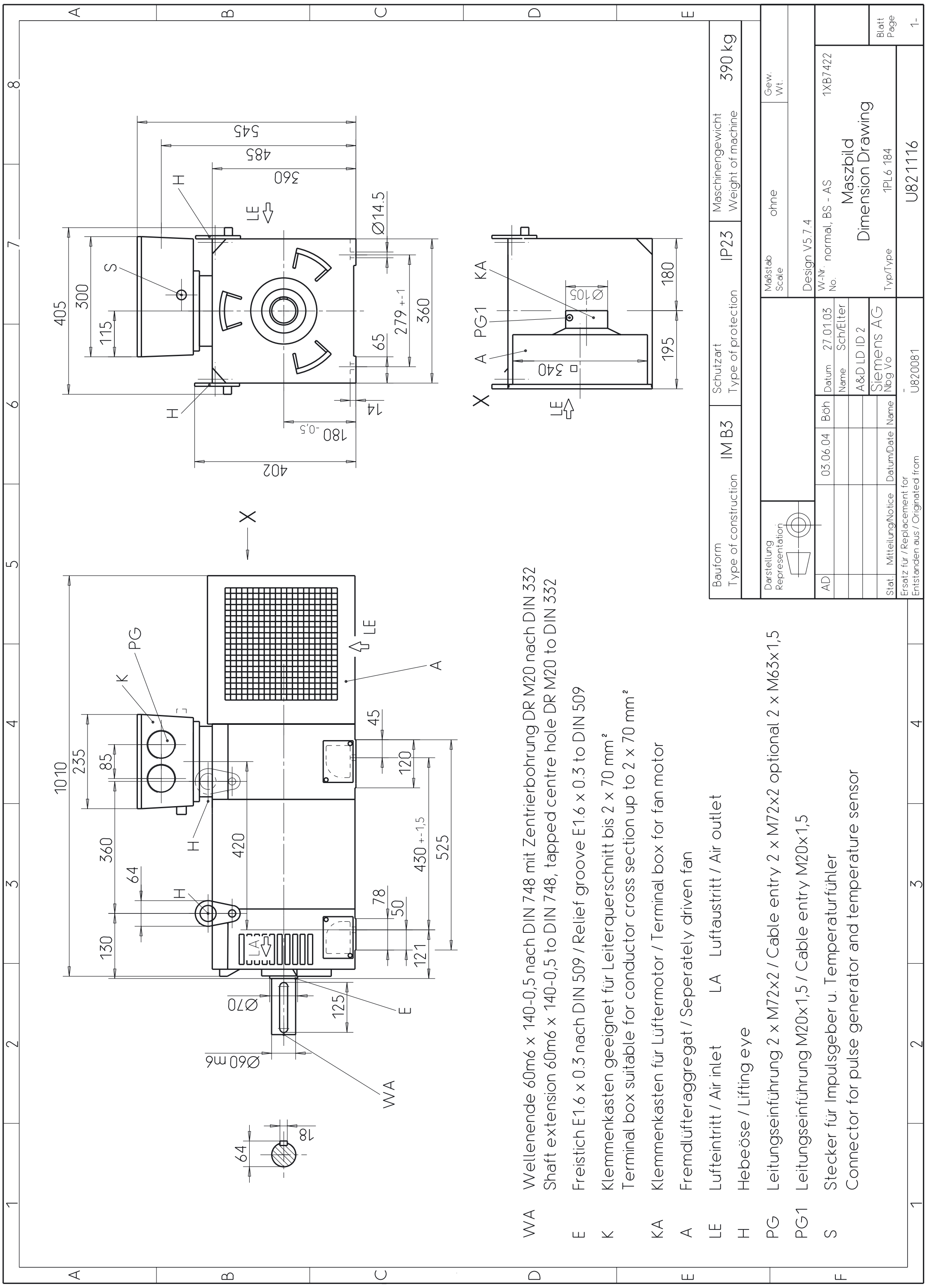


Figure 5-2 1PL6184-B-F,air flow direction NDE→DE, U821114



WA	Wellenende 60m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 60m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 70 mm² Terminal box suitable for conductor cross section up to 2 x 70 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x M72x2 / Cable entry 2 x M72x2 optional 2 x M63x1,5
PG1	Leitungseinführung M20x1,5 / Cable entry M20x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-3 1PL6184-L, air flow direction DE→NDE, U821029



WA Wellenende 60m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 60m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332

E Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 70 mm²
Terminal box suitable for conductor cross section up to 2 x 70 mm²

KA Klemmenkasten für Lüftermotor / Terminal box for fan motor

A Fremdlüfteraggregat / Seperately driven fan

LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

H Hebeöse / Lifting eye

PG Leitungseinführung 2 x M72x2 / Cable entry 2 x M72x2 optional 2 x M63x1,5

PG1 Leitungseinführung M20x1,5 / Cable entry M20x1,5

S Stecker für Impulsgeber u. Temperaturfühler
Connector for pulse generator and temperature sensor

Figure 5-4 1PL6184-L, air flow direction NDE→DE, U821116

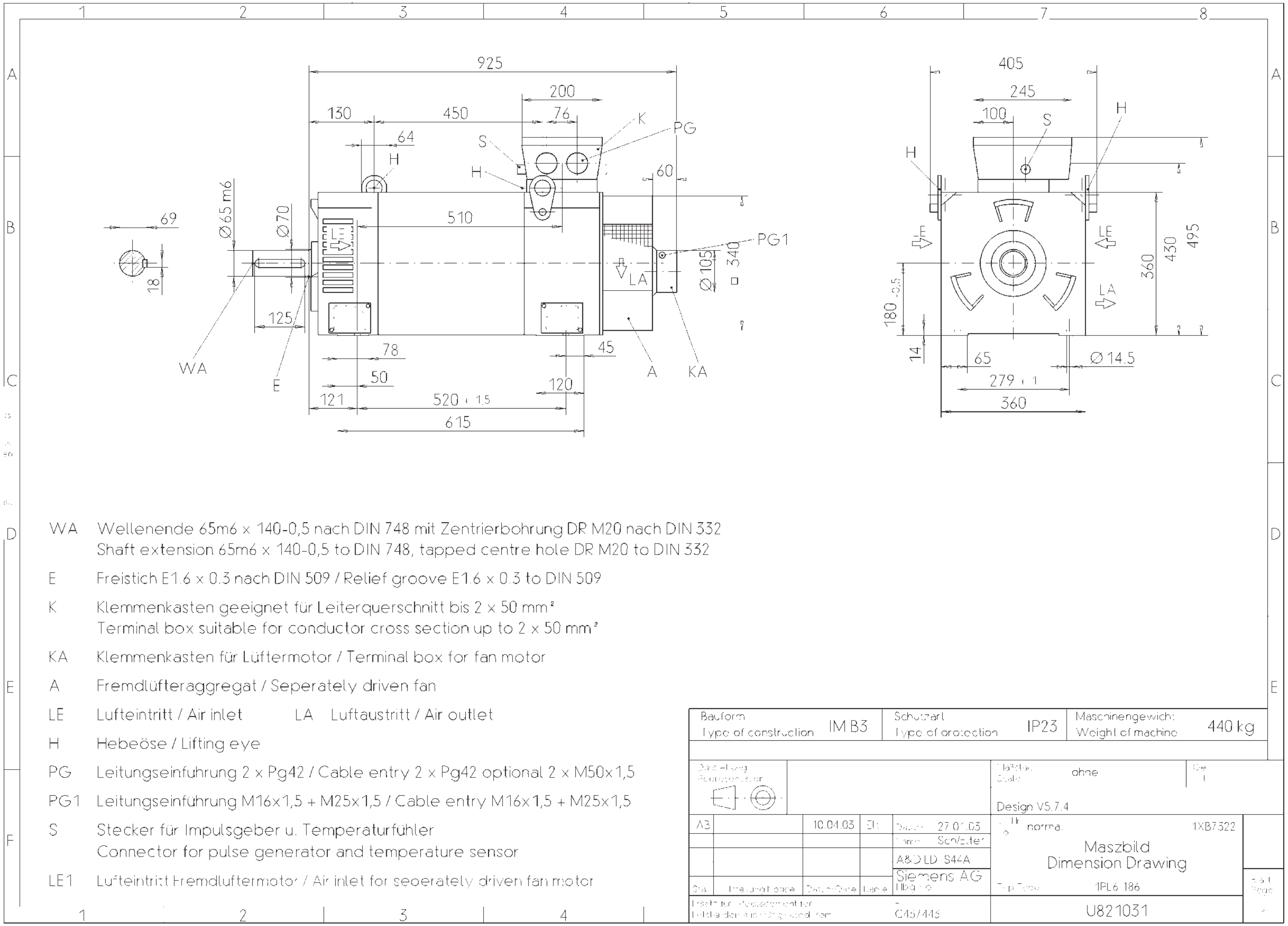


Figure 5-5 1PL6186-B-D, air flow direction DE→NDE, U821031

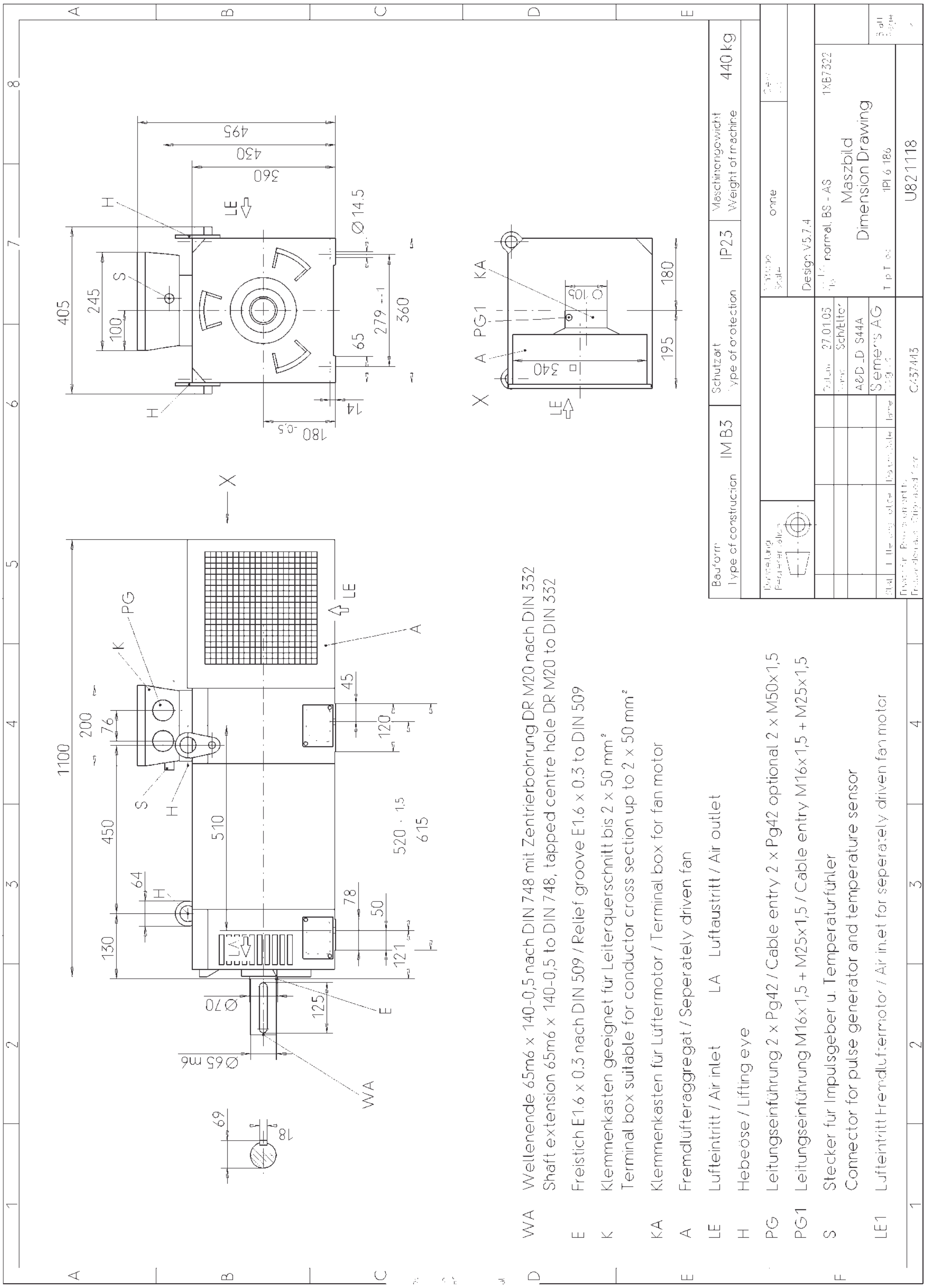


Figure 5-6 1PL6186-B-D, air flow direction NE→DE, U821118

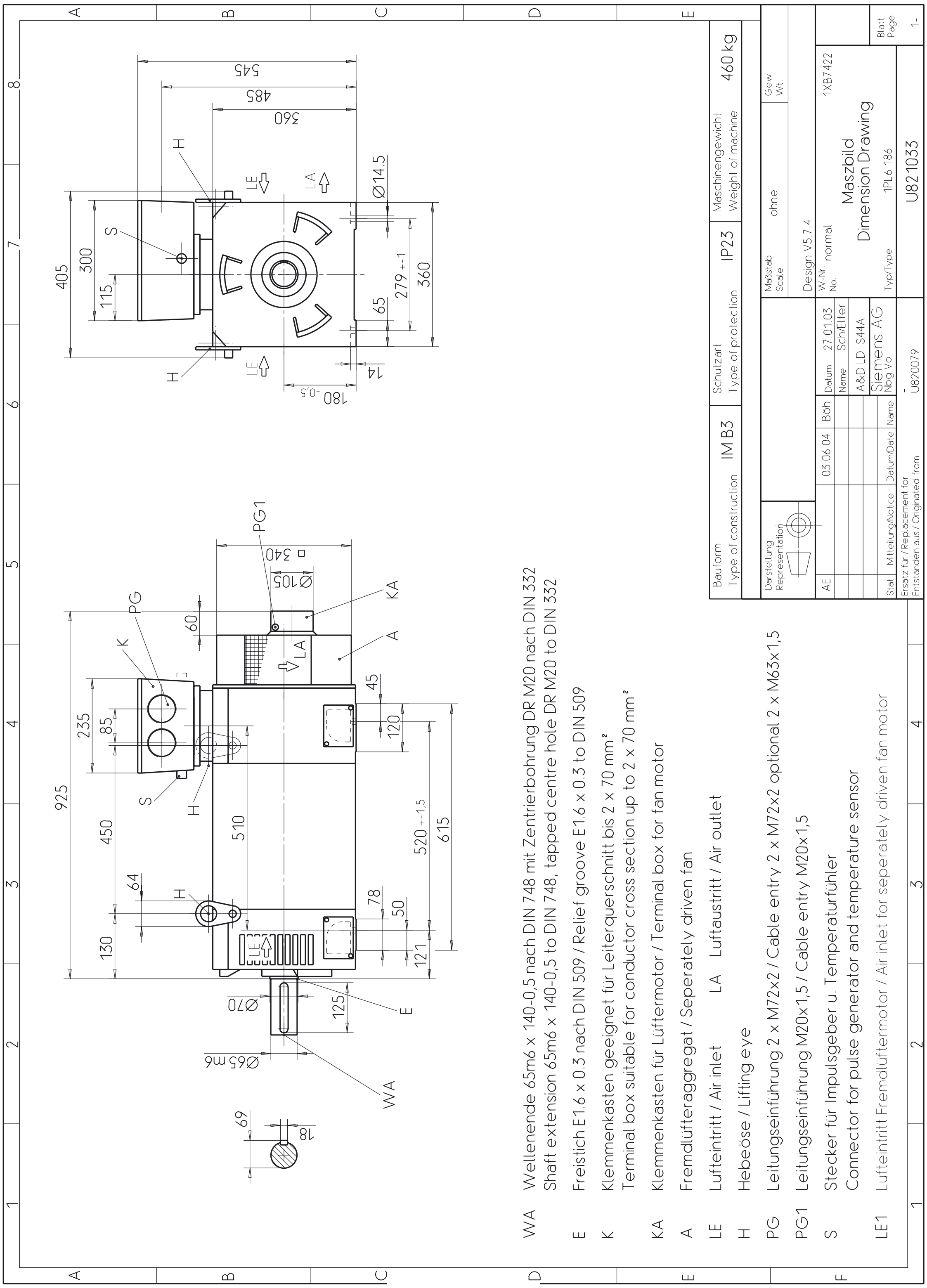


Figure 5-7 1PL6186-F, air flow direction DE→NDE, U821033

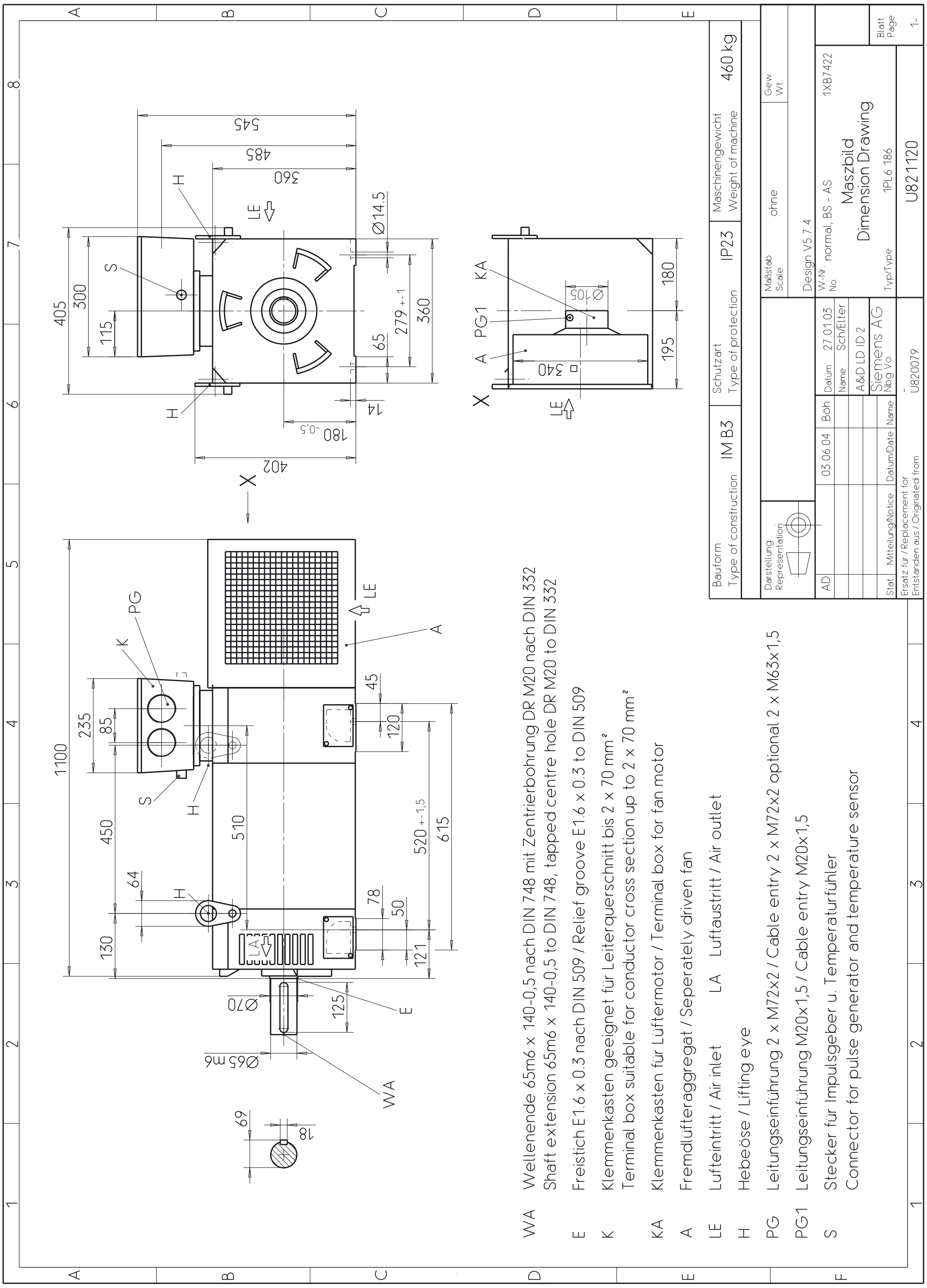
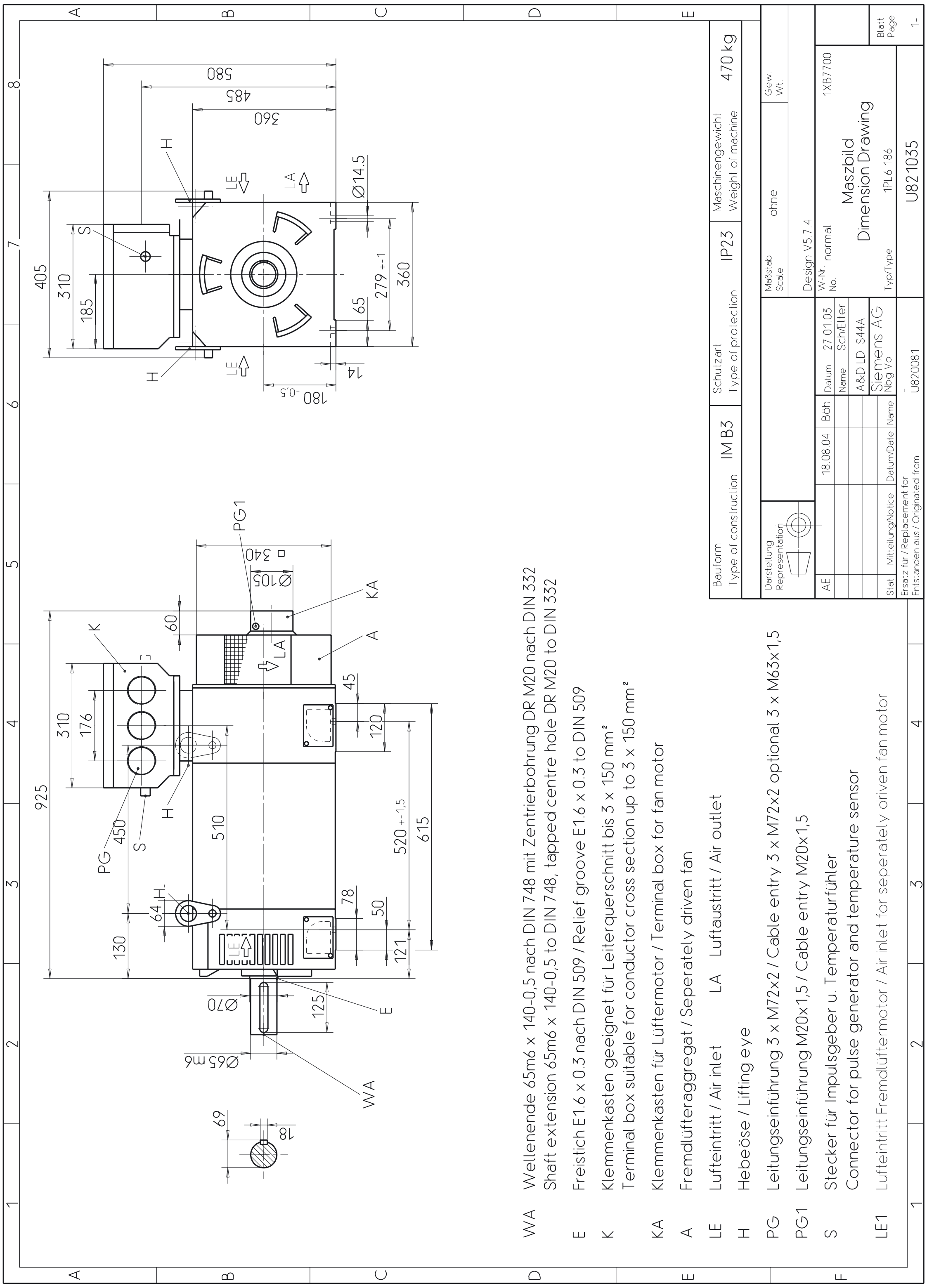


Figure 5-8 1PL6186-F, air flow direction NE→DE, U821120



WA Wellenende 65m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 65m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332

E Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis 3 x 150 mm²
Terminal box suitable for conductor cross section up to 3 x 150 mm²

KA Klemmenkasten für Lüftermotor / Terminal box for fan motor

A Fremdlüfteraggregat / Seperately driven fan

LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

H Hebeöse / Lifting eye

PG Leitungseinführung 3 x M72x2 / Cable entry 3 x M72x2 optional 3 x M63x1,5

PG1 Leitungseinführung M20x1,5 / Cable entry M20x1,5

S Stecker für Impulsgeber u. Temperaturfühler
Connector for pulse generator and temperature sensor

LE1 Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-9 1PL6186-L, air flow direction DE→NDE, U821035

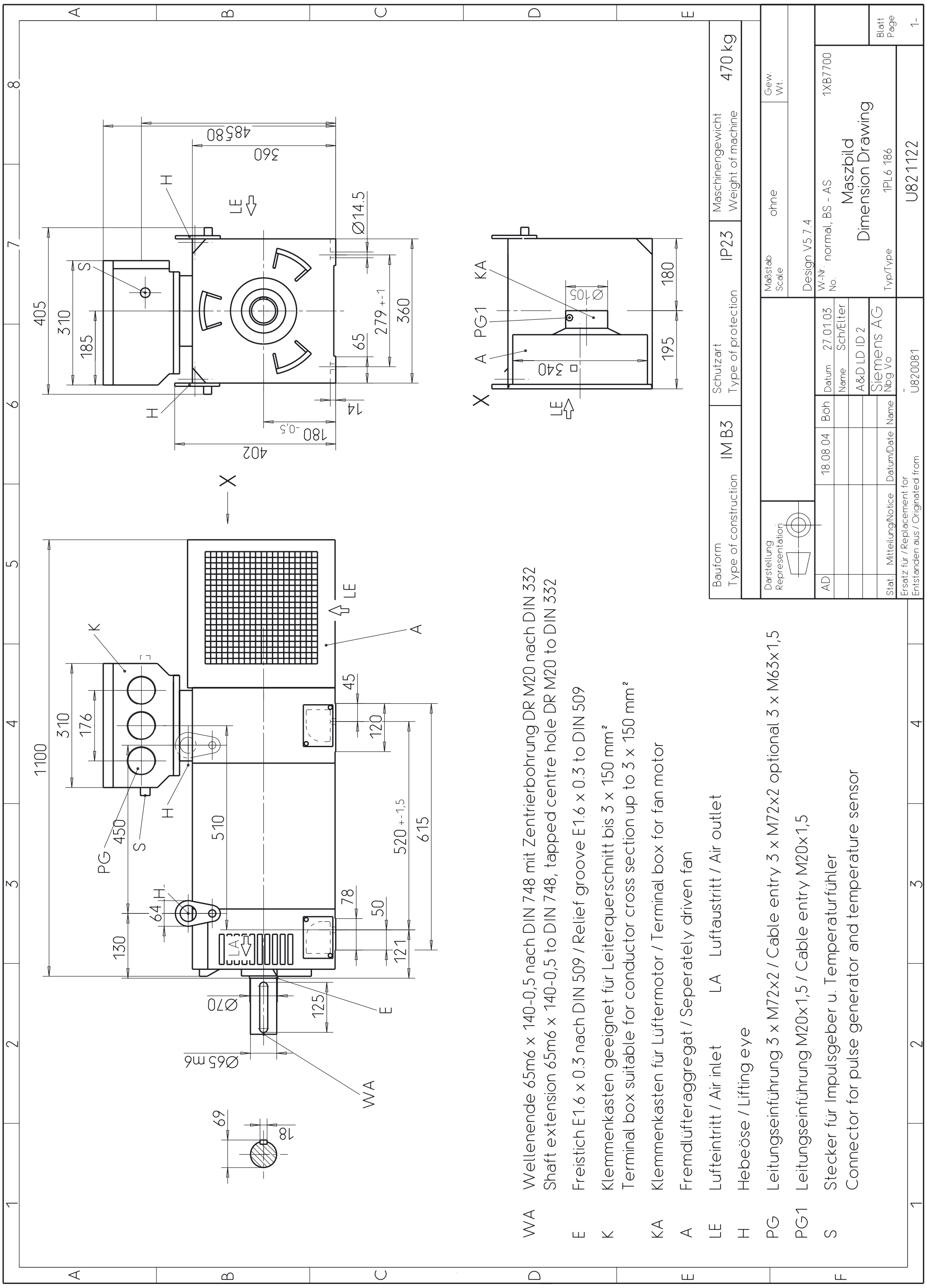


Figure 5-10 1PL6186-L, air flow direction NDE→DE, U821122

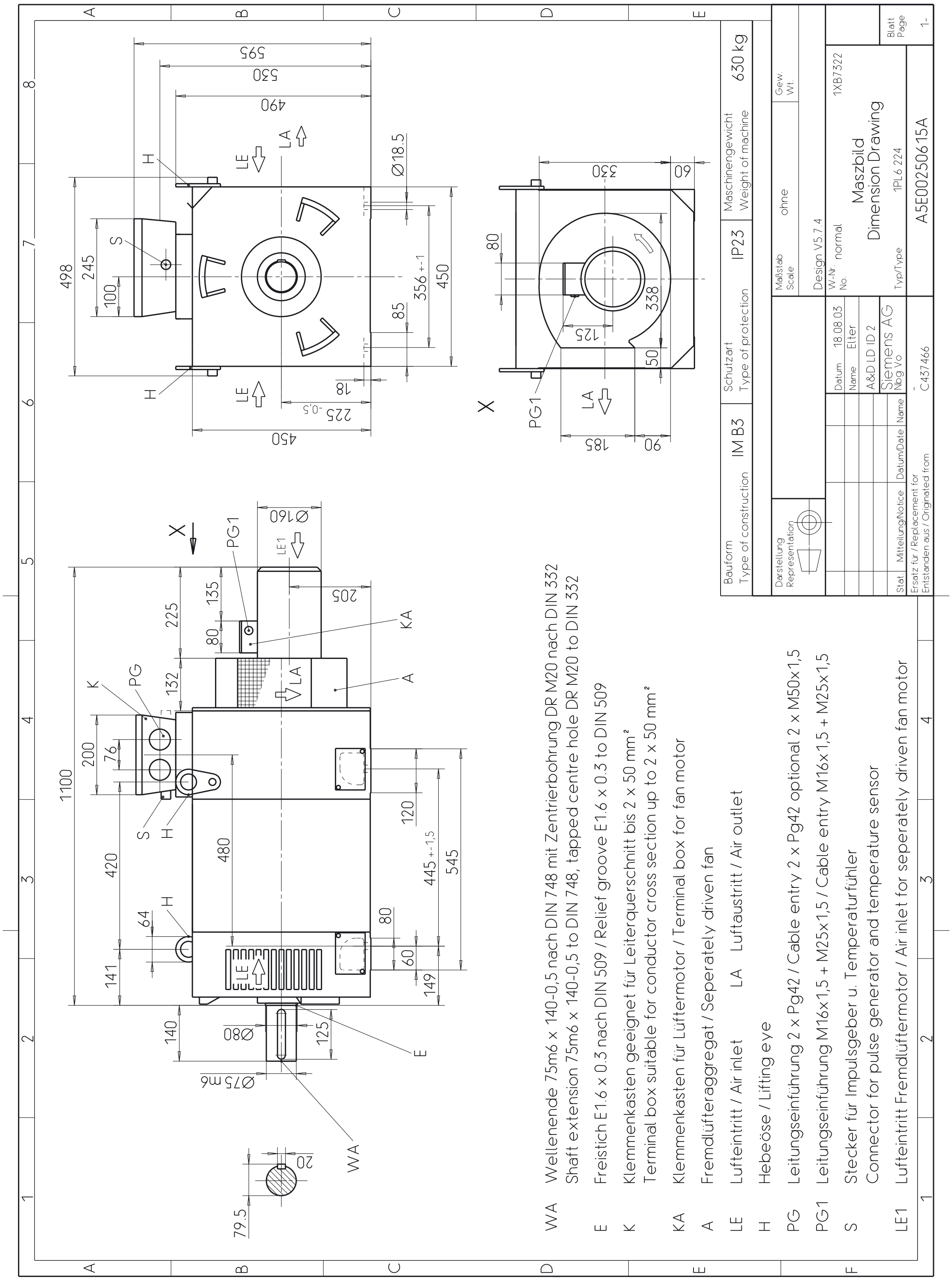


Figure 5-11 1PL6224-B, air flow direction DE→NDE, A5E00250615A

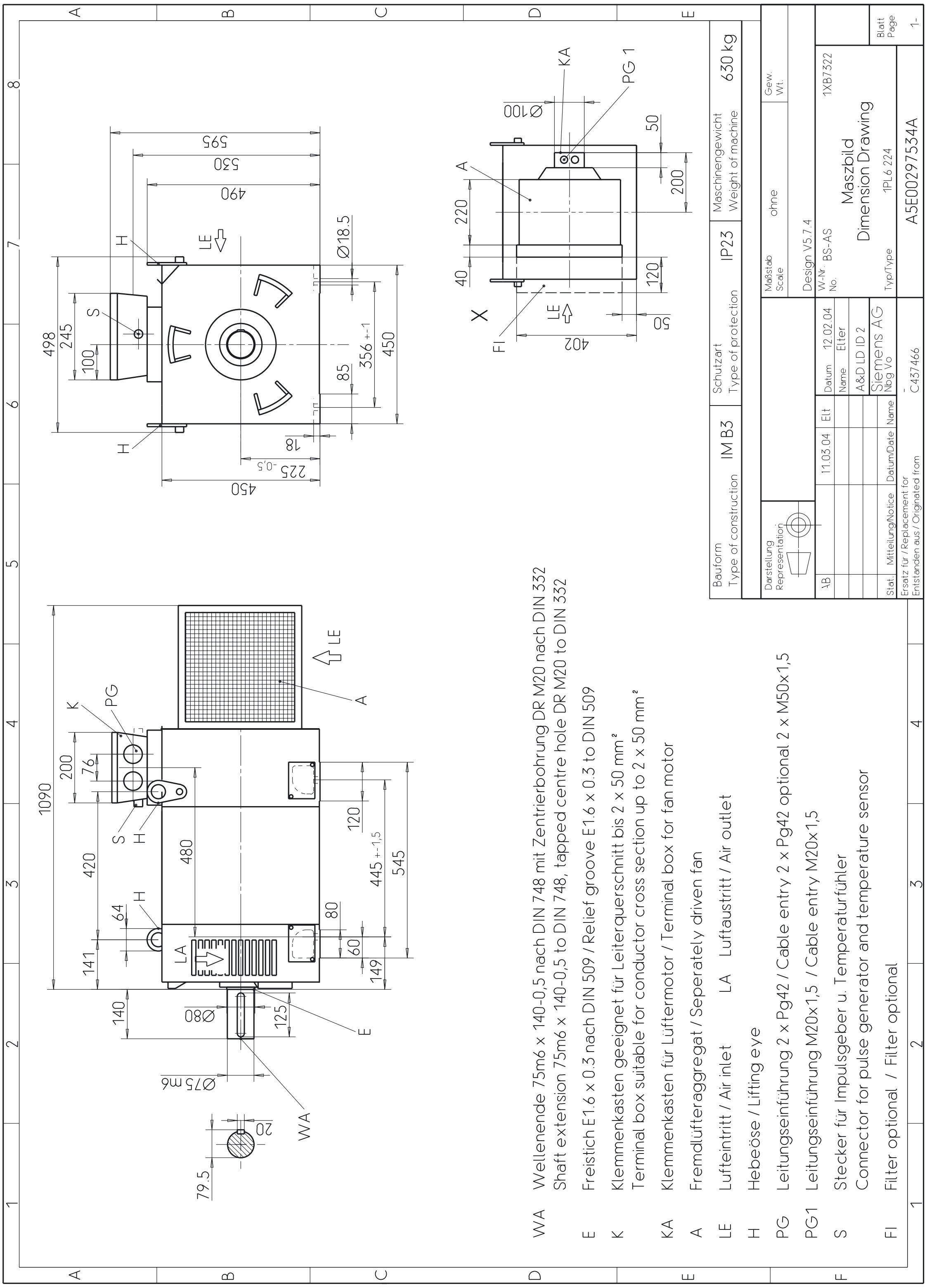


Figure 5-12 1PL6224-B, air flow direction NDE→DE, A5E00297534A

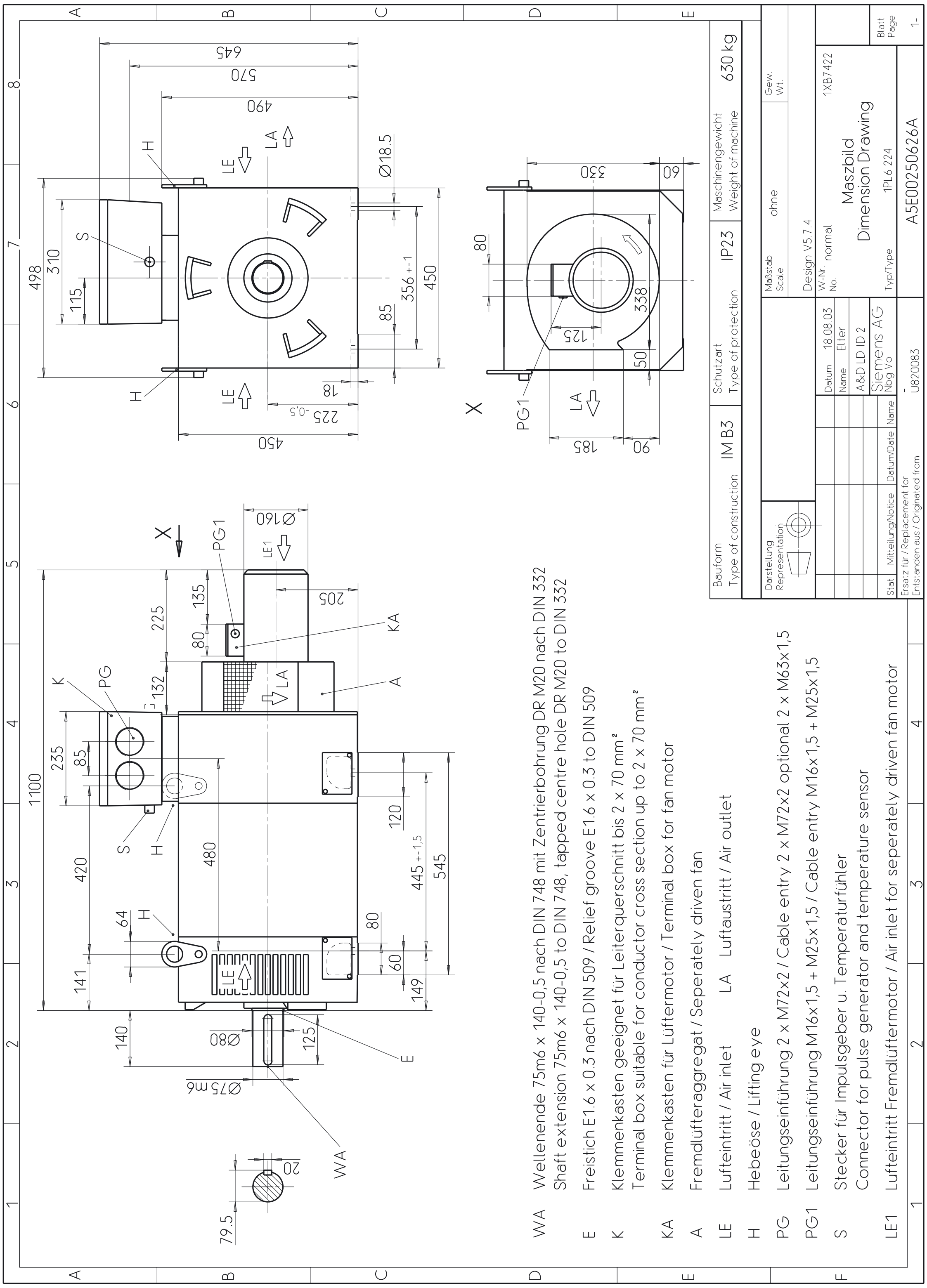


Figure 5-13 1PL6224-D, air flow direction DE→NDE, A5E00250626A

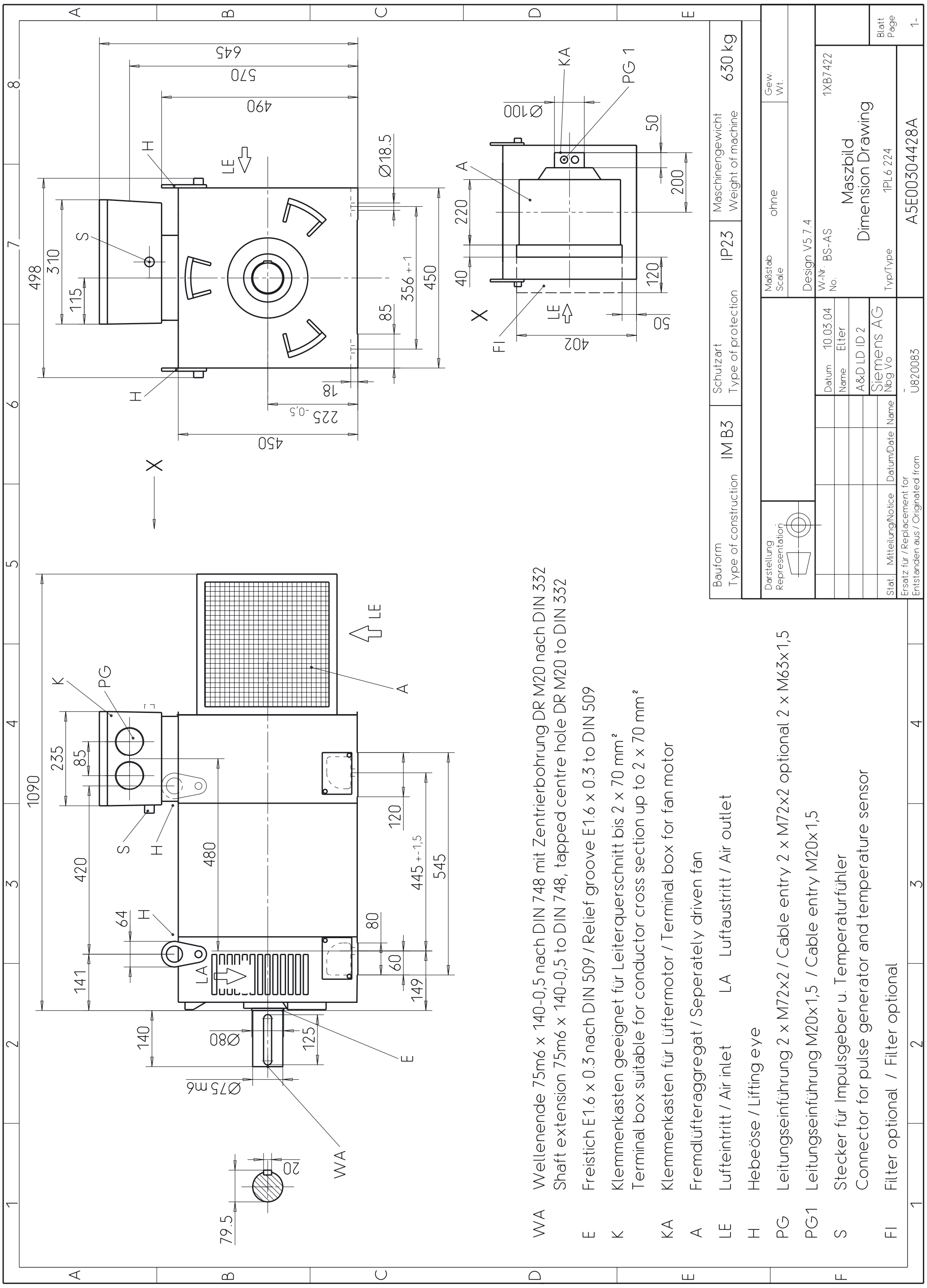


Figure 5-14 1PL6224-D, air flow direction NDE→DE, A5E00304428A

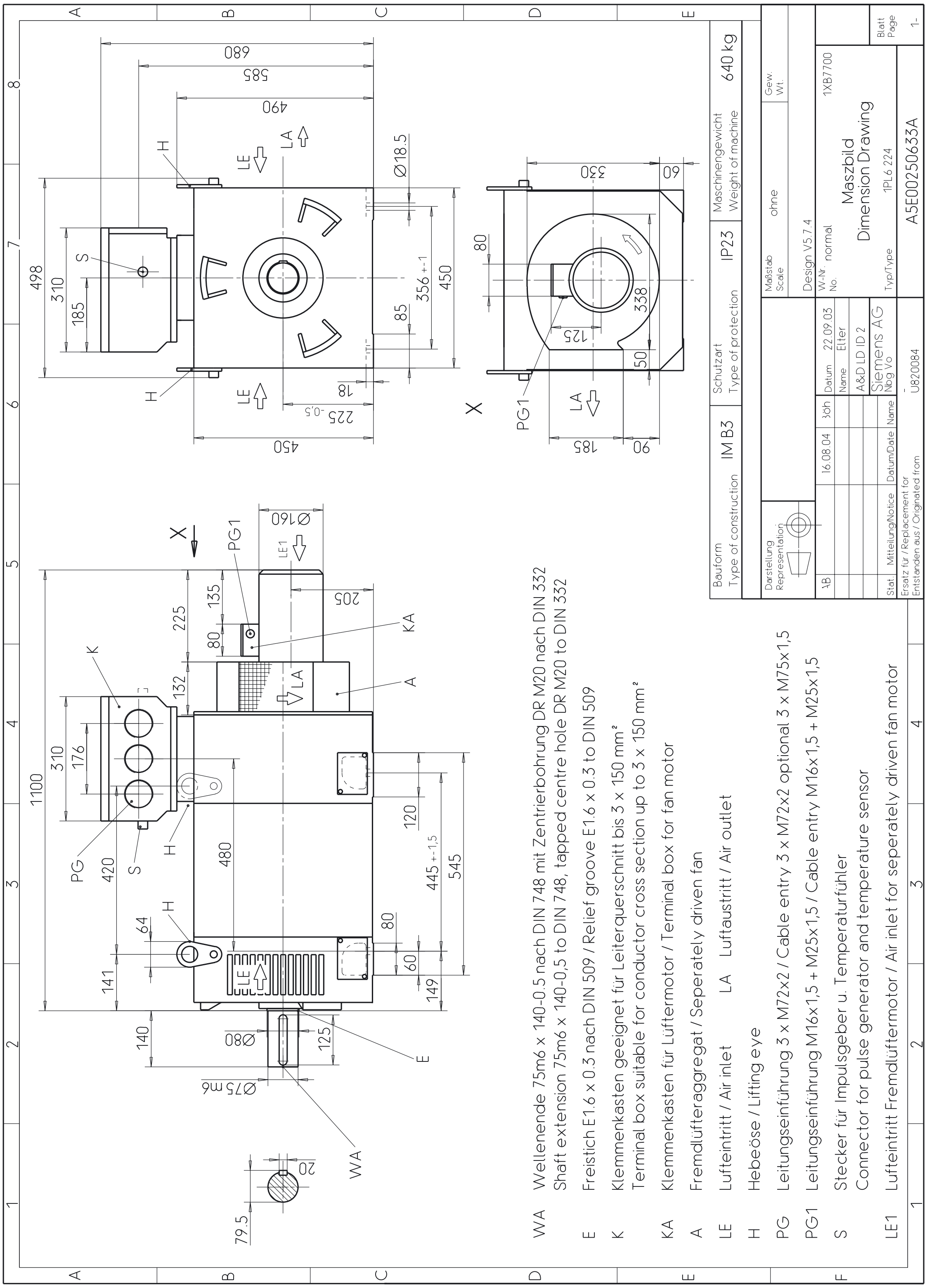


Figure 5-15 1PL6224-F-L, air flow direction DE→NDE, A5E00250633A

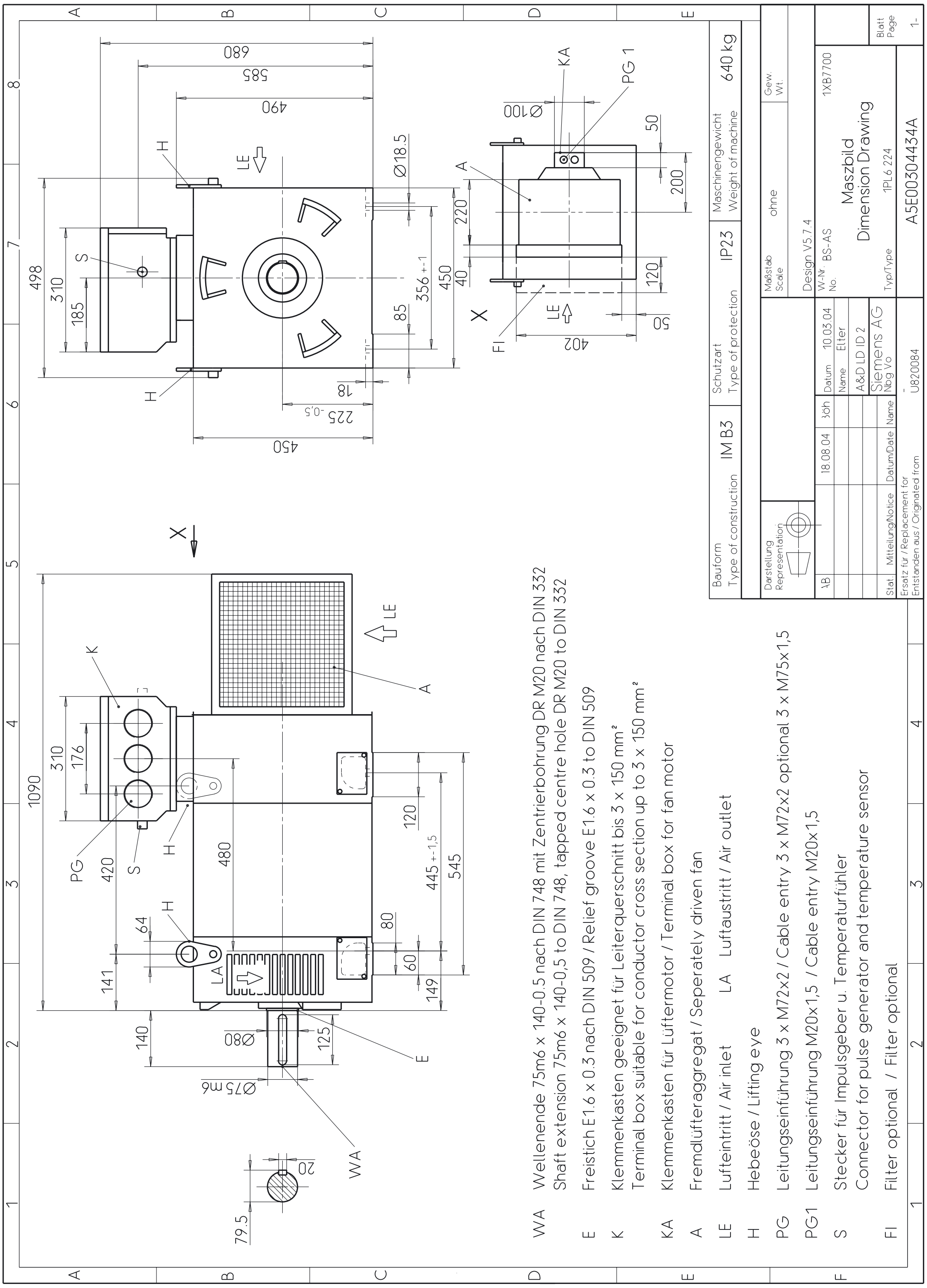
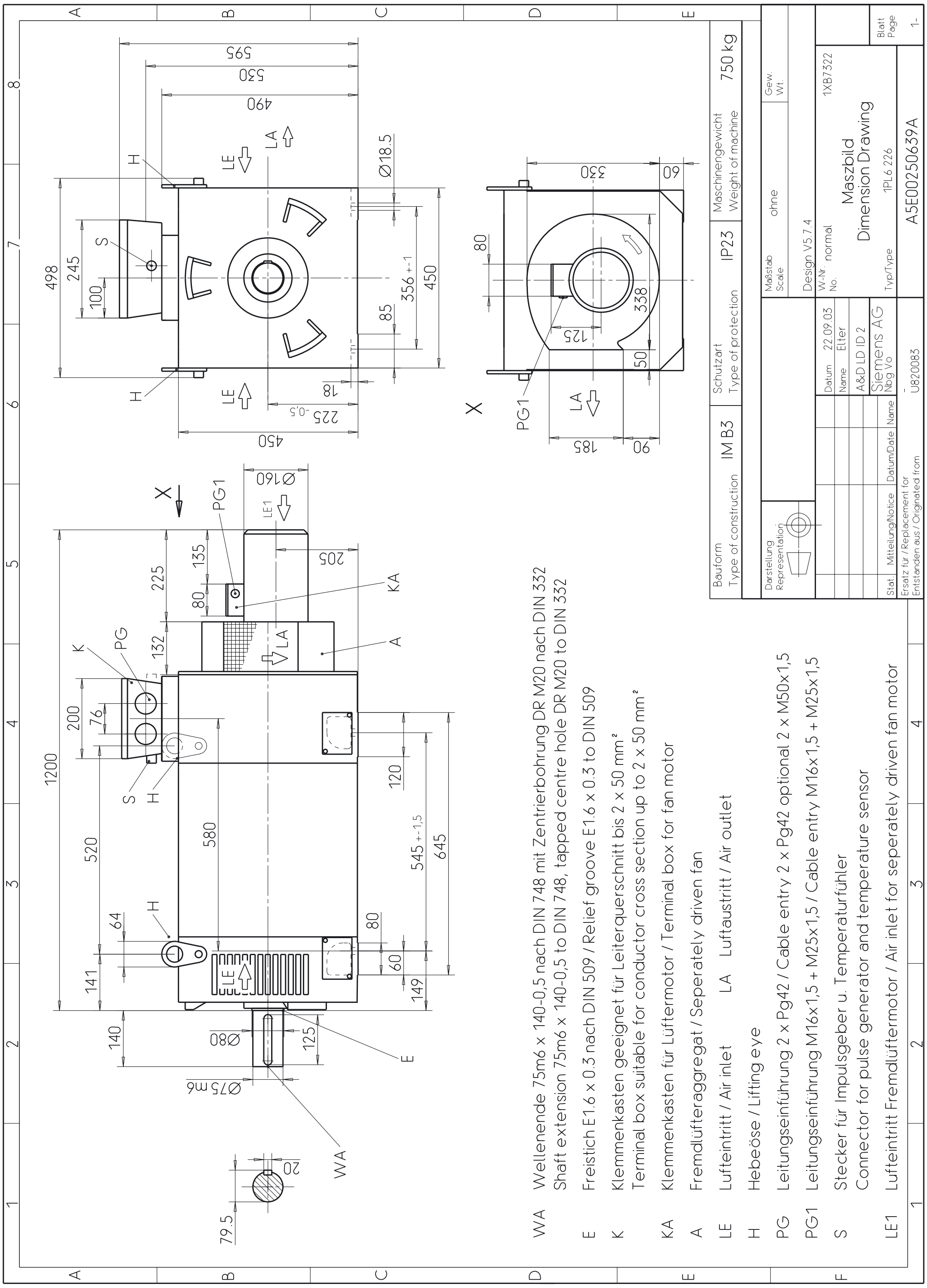


Figure 5-16 1PL6224-F-L, air flow direction NDE→DE, A5E00304434A



WA	Wellenende 75m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 75m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 50 mm² Terminal box suitable for conductor cross section up to 2 x 50 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x Pg42 / Cable entry 2 x Pg42 optional 2 x M50x1,5
PG1	Leitungseinführung M16x1,5 + M25x1,5 / Cable entry M16x1,5 + M25x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-17 1PL6226-B, air flow direction DE→NDE, A5E00250639A

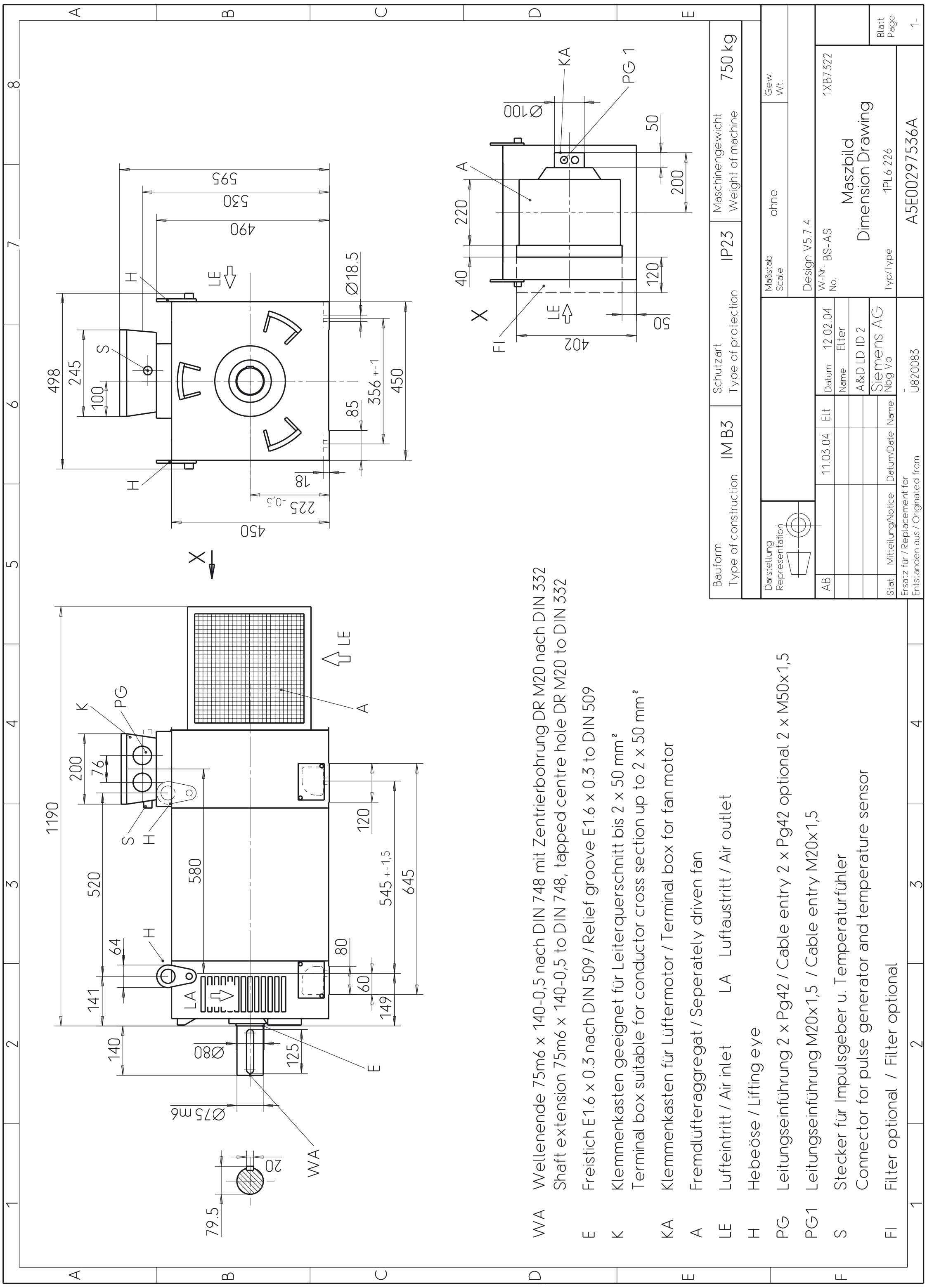


Figure 5-18 1PL6226-B, air flow direction NDE→DE, A5E00297536A

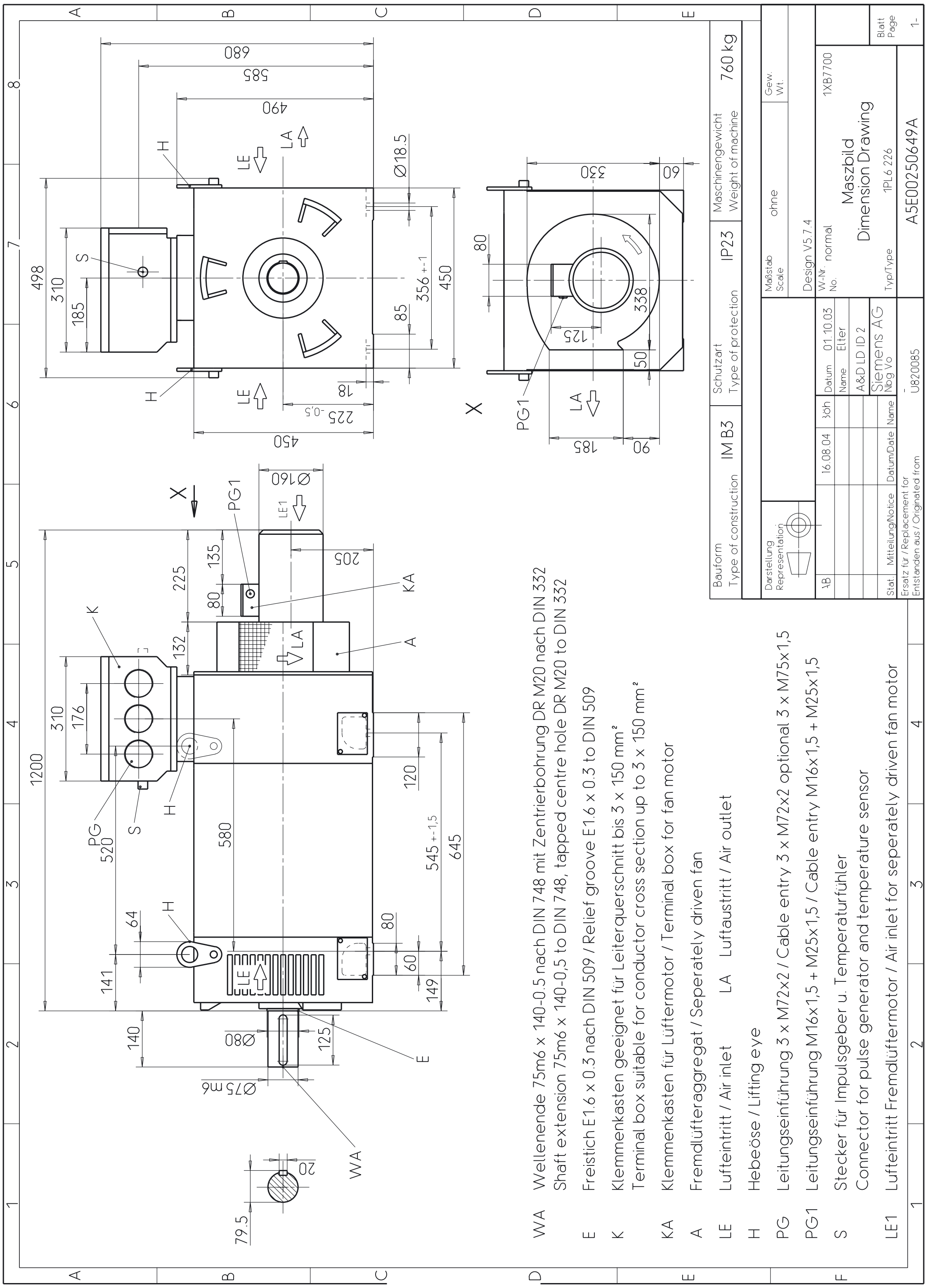


Figure 5-19 1PL6226-D-L, air flow direction DE→NDE, A5E00250649A

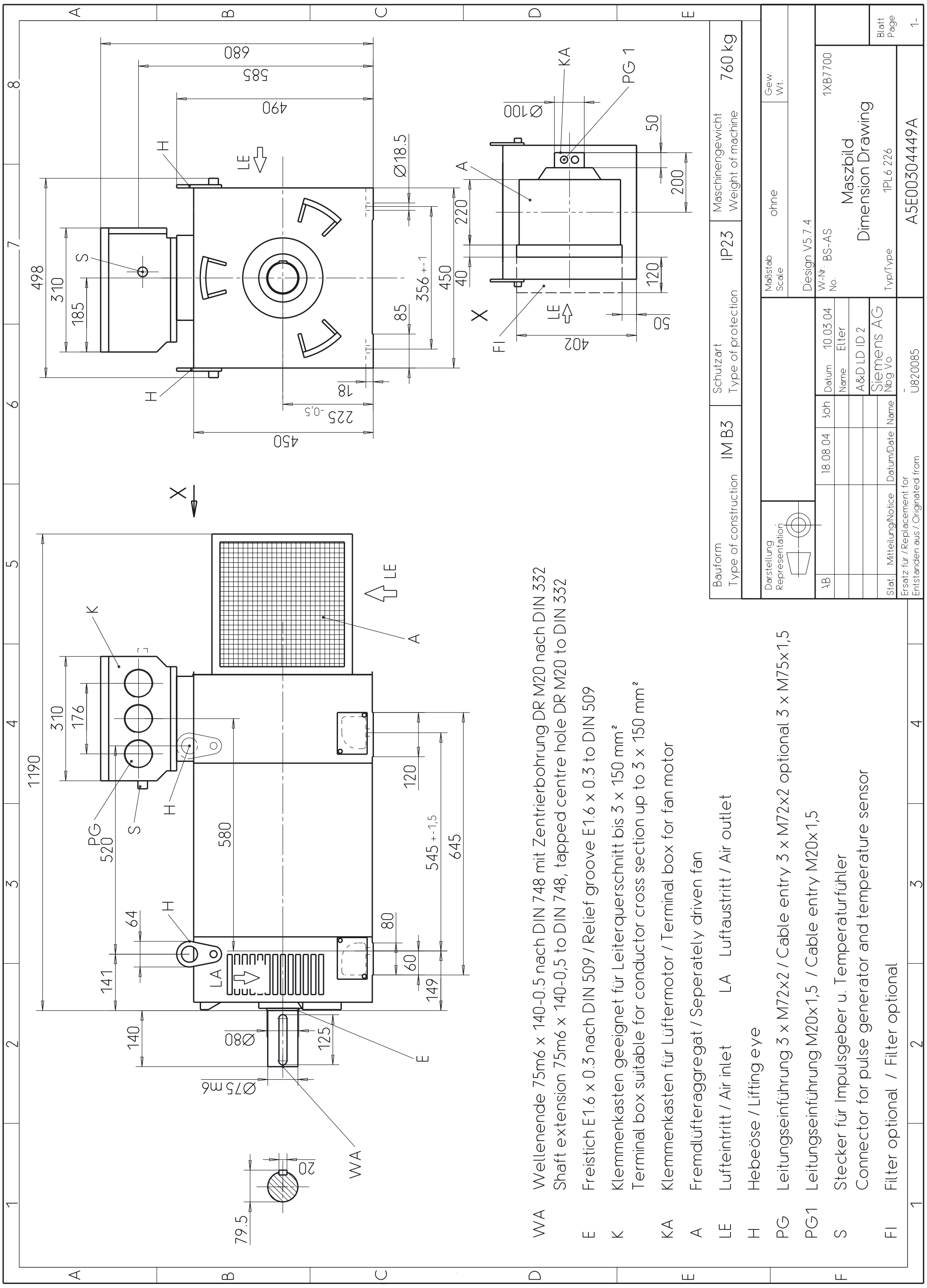
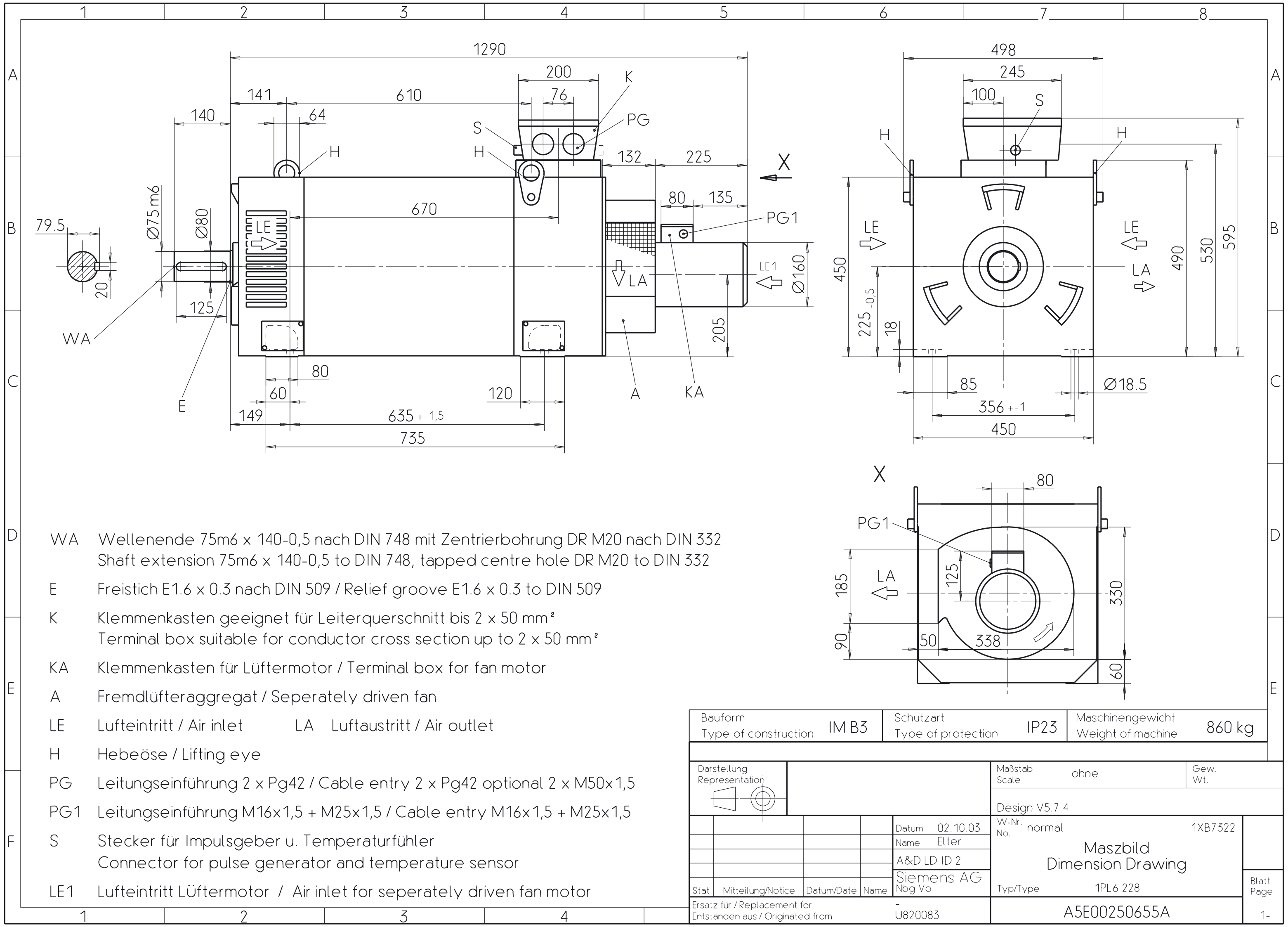


Figure 5-20 1PL6226-D-L, air flow direction NDE→DE, A5E00304449A



WA	Wellenende 75m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 75m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 50 mm² Terminal box suitable for conductor cross section up to 2 x 50 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x Pg42 / Cable entry 2 x Pg42 optional 2 x M50x1,5
PG1	Leitungseinführung M16x1,5 + M25x1,5 / Cable entry M16x1,5 + M25x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Lüftermotor / Air inlet for seperately driven fan motor

Figure 5-21 1PL6228-B, air flow direction DE→NDE, A5E00250655A

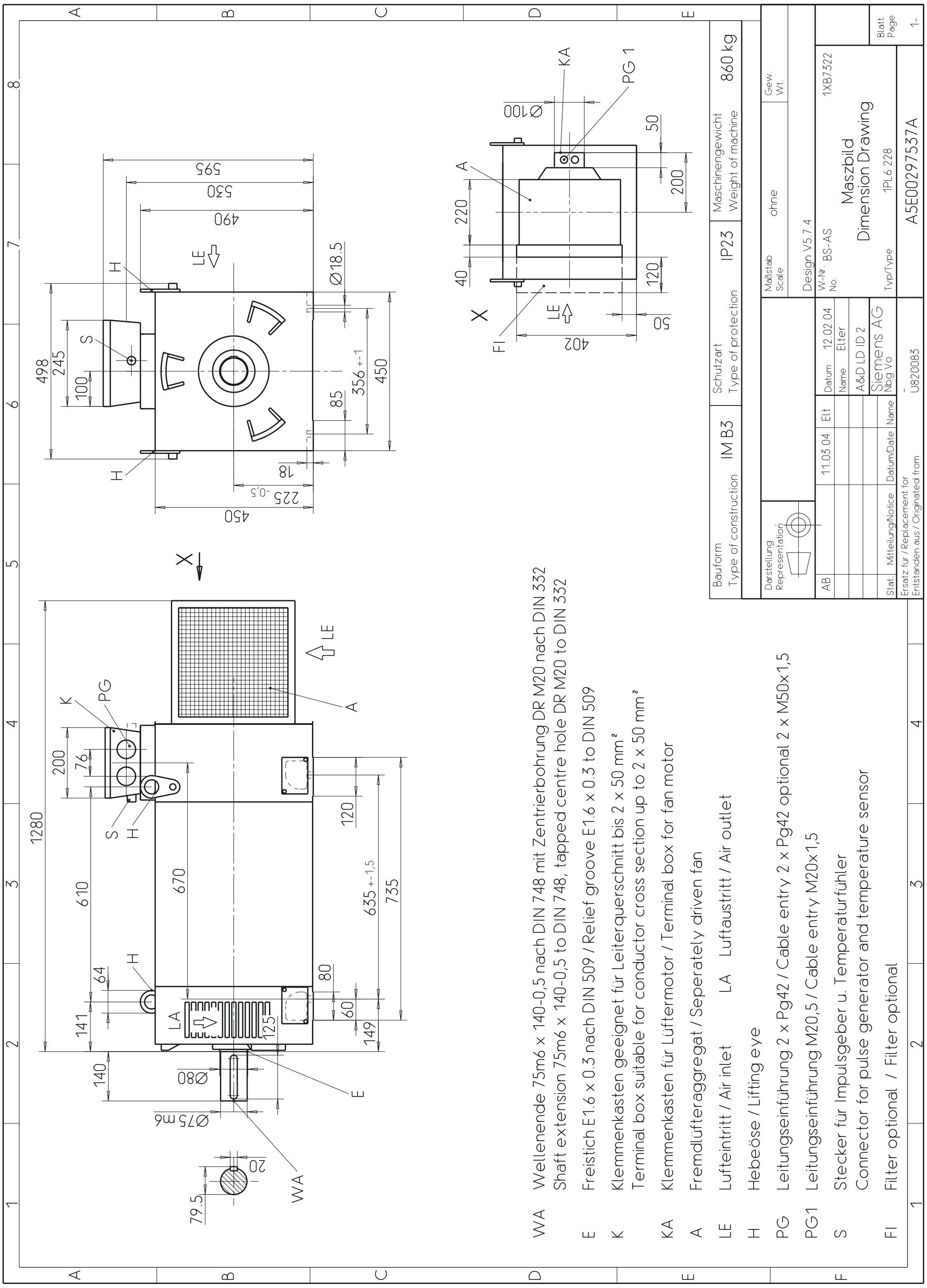
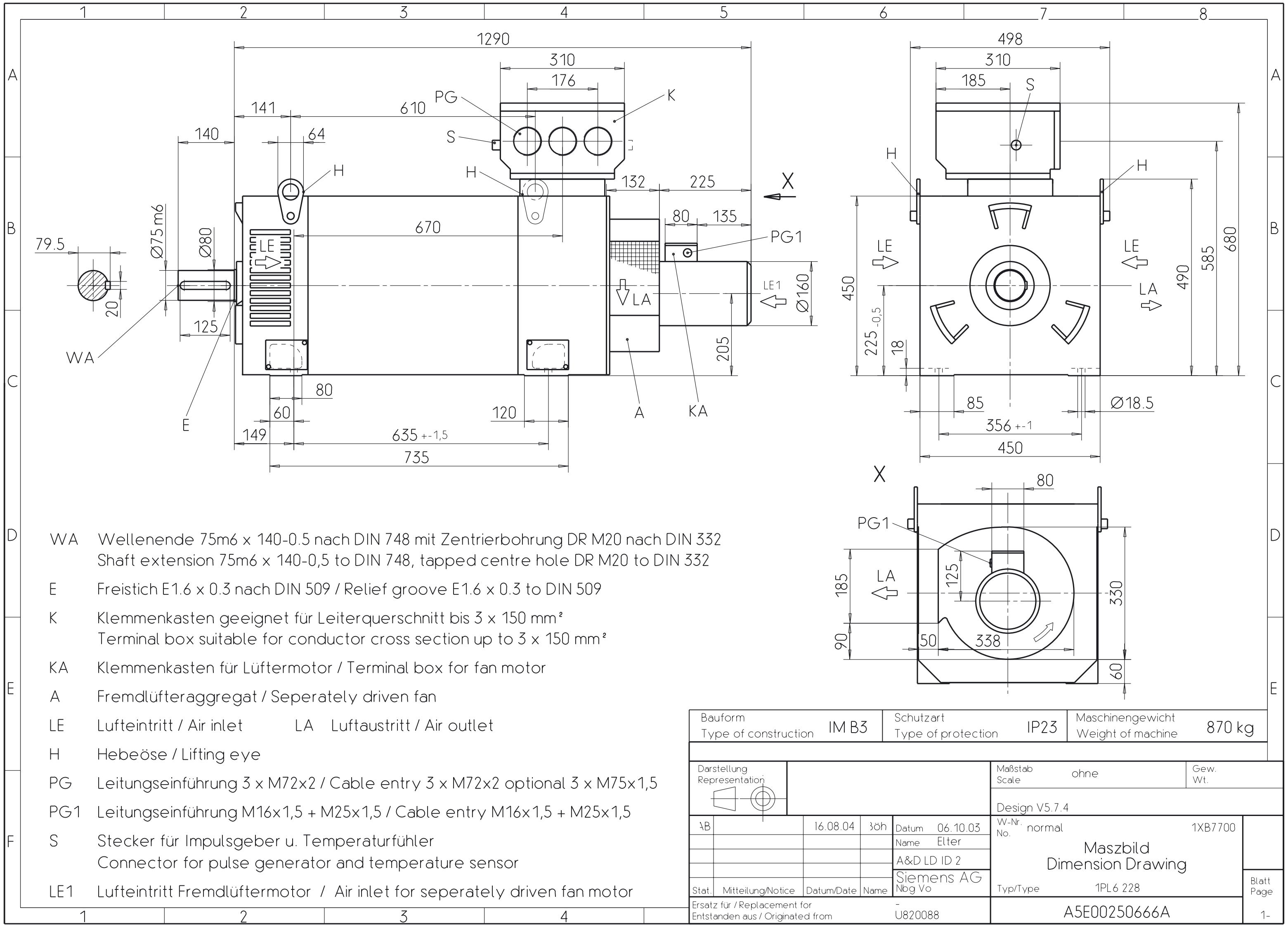


Figure 5-22 1PL6228-B, air flow direction NDE→DE, A5E00297537A



WA	Wellenende 75m6 x 140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 75m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 3 x 150 mm² Terminal box suitable for conductor cross section up to 3 x 150 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 3 x M72x2 / Cable entry 3 x M72x2 optional 3 x M75x1,5
PG1	Leitungseinführung M16x1,5 + M25x1,5 / Cable entry M16x1,5 + M25x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-23 1PL6228-D-L, air flow direction DE→NDE, A5E00250666A

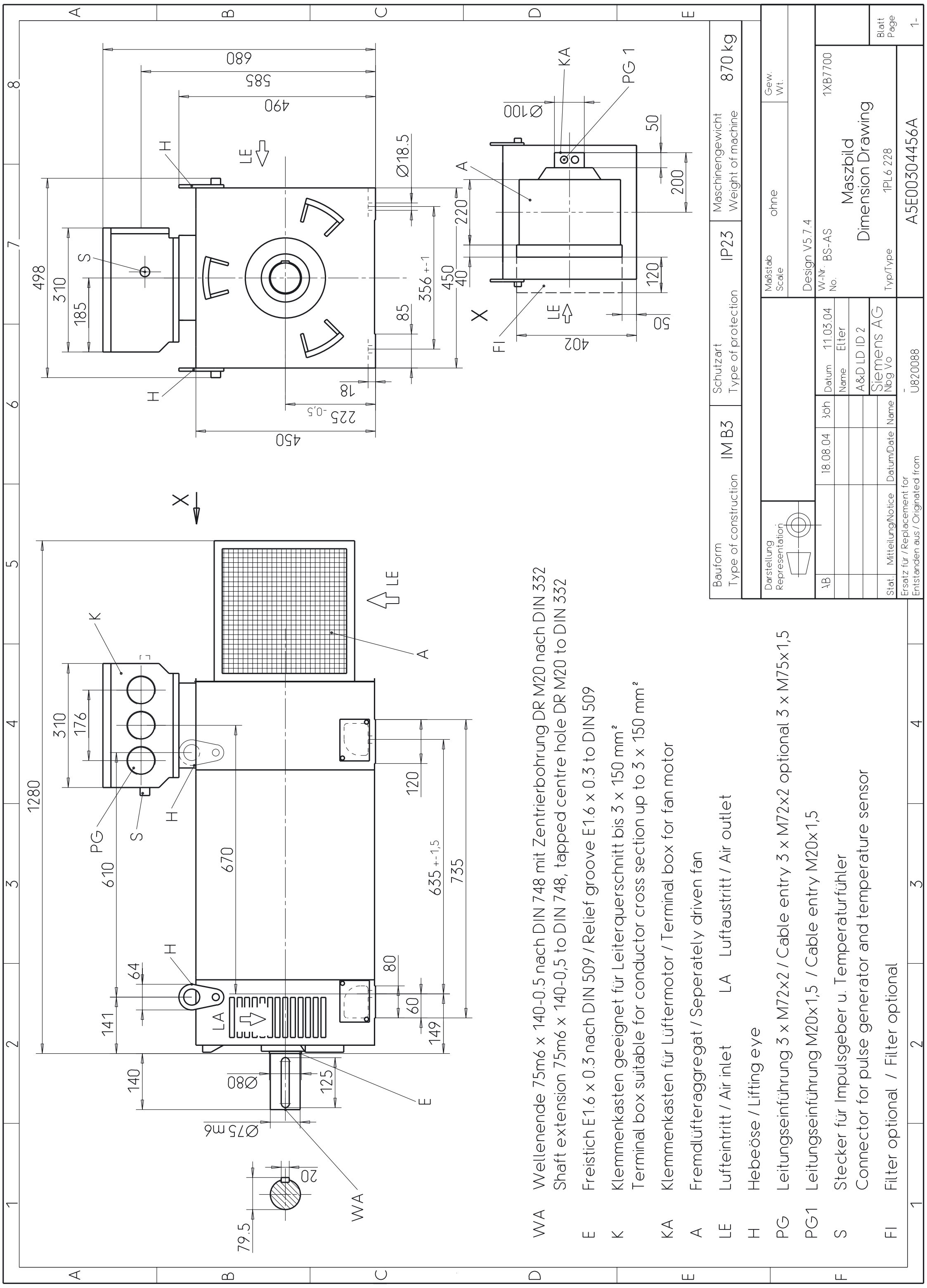
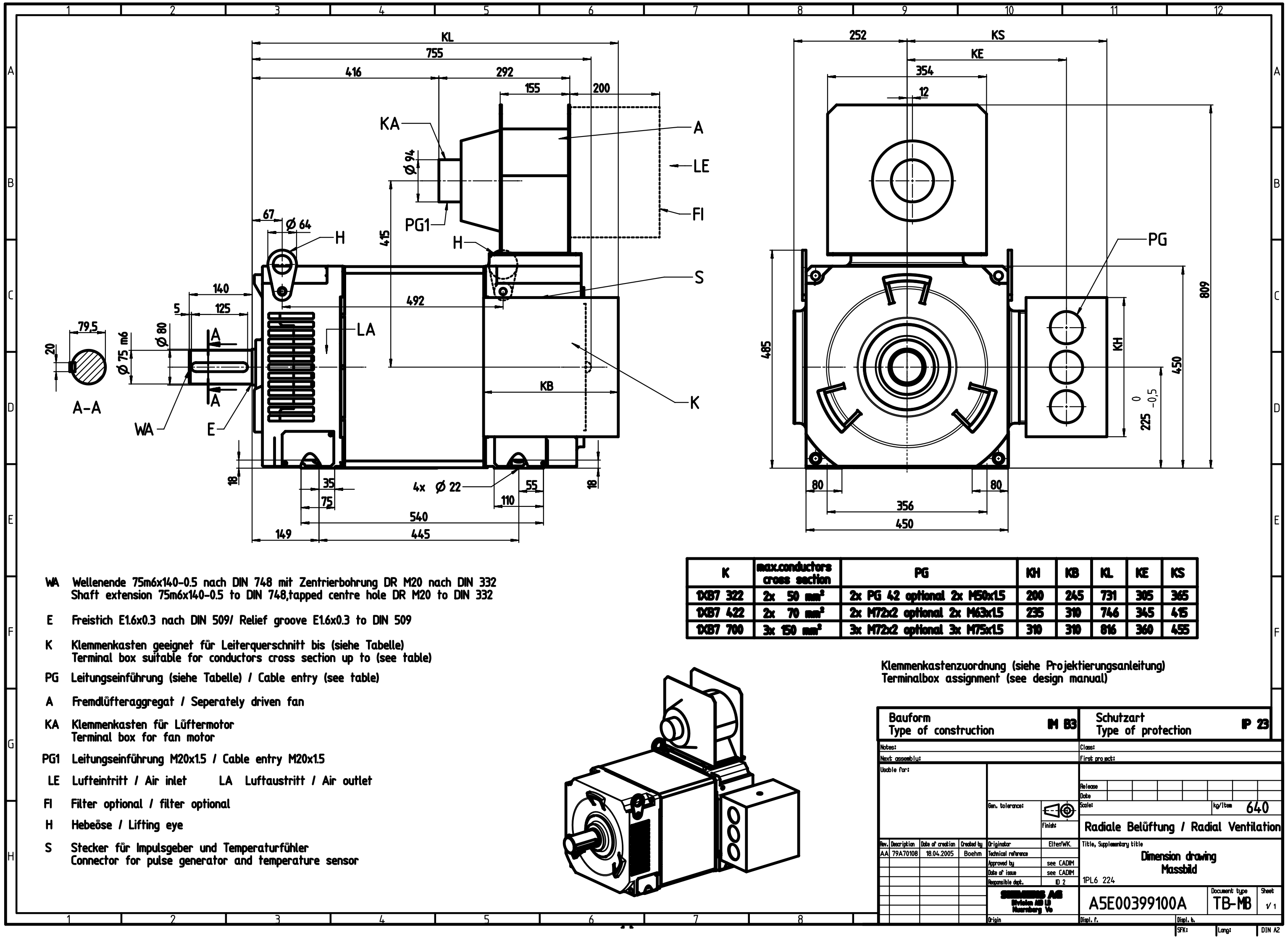


Figure 5-24 1PL6228-D-L, air flow direction NDE→DE, A5E00304456A



K	max.conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	731	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	746	345	415
1XB7 700	3x 150 mm²	3x M72x2 optional 3x M75x1.5	310	310	816	360	455

Klemmenkastenzuordnung (siehe Projektierungsanleitung)
Terminalbox assignment (see design manual)

WA Wellenende 75m6x140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 75m6x140-0.5 to DIN 748,tapped centre hole DR M20 to DIN 332

E Freistich E1.6x0.3 nach DIN 509/ Relief groove E1.6x0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis (siehe Tabelle)
Terminal box suitable for conductors cross section up to (see table)

PG Leitungseinführung (siehe Tabelle) / Cable entry (see table)

A Fremdlüfteraggregat / Seperately driven fan

KA Klemmenkasten für Lüftermotor
Terminal box for fan motor

PG1 Leitungseinführung M20x1.5 / Cable entry M20x1.5

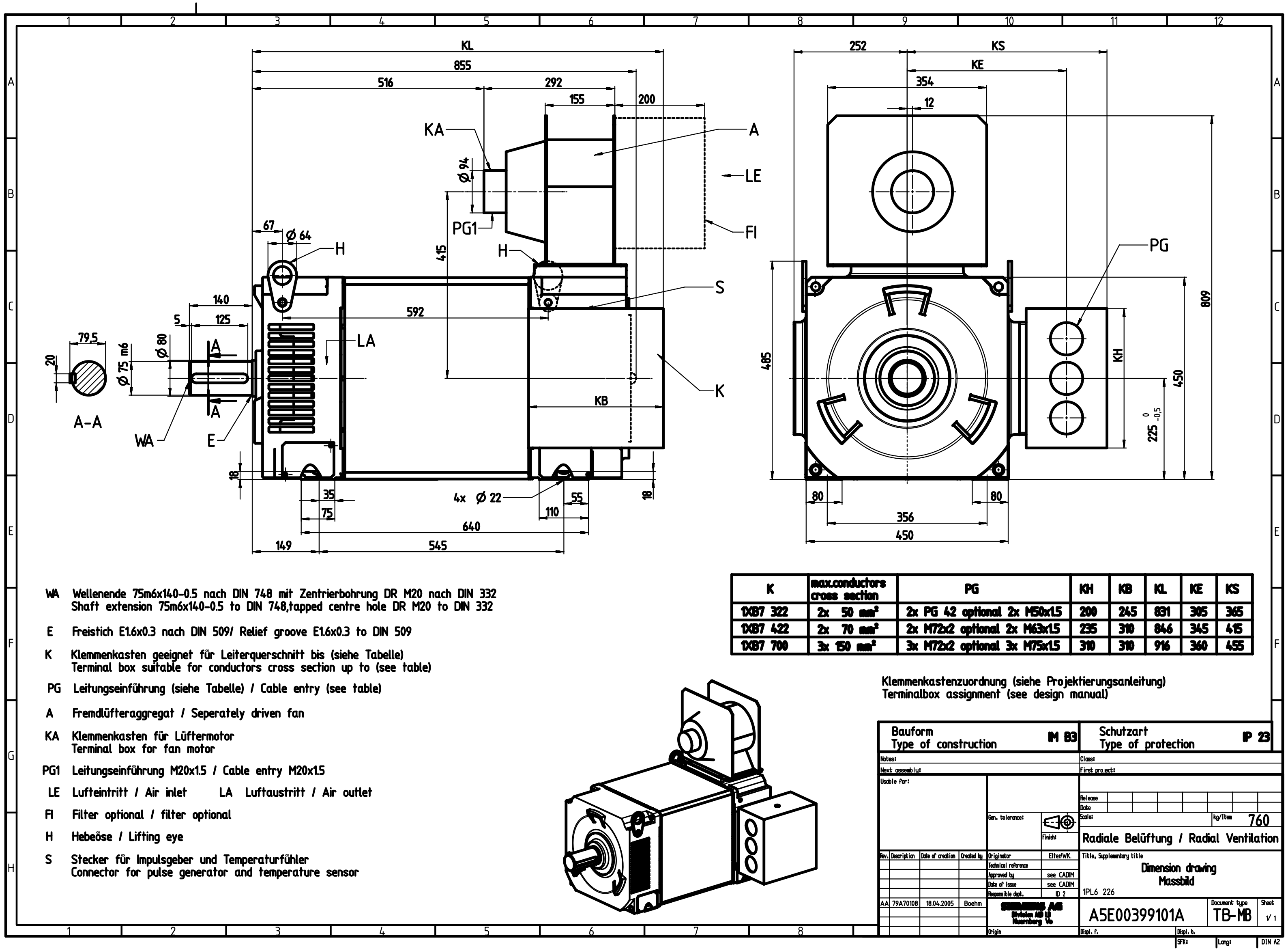
LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

FI Filter optional / filter optional

H Hebeöse / Lifting eye

S Stecker für Impulsgeber und Temperaturfühler
Connector for pulse generator and temperature sensor

Figure 5-25 1PL6224-F-L, air flow direction NDE→DE radial, A5E00399100A



K	max.conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	831	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	846	345	415
1XB7 700	3x 150 mm²	3x M72x2 optional 3x M75x1.5	310	310	916	360	455

Klemmenkastenzuordnung (siehe Projektierungsanleitung)
Terminalbox assignment (see design manual)

WA Wellenende 75m6x140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 75m6x140-0.5 to DIN 748,tapped centre hole DR M20 to DIN 332

E Freistich E1.6x0.3 nach DIN 509/ Relief groove E1.6x0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis (siehe Tabelle)
Terminal box suitable for conductors cross section up to (see table)

PG Leitungseinführung (siehe Tabelle) / Cable entry (see table)

A Fremdlüfteraggregat / Seperately driven fan

KA Klemmenkasten für Lüftermotor
Terminal box for fan motor

PG1 Leitungseinführung M20x1.5 / Cable entry M20x1.5

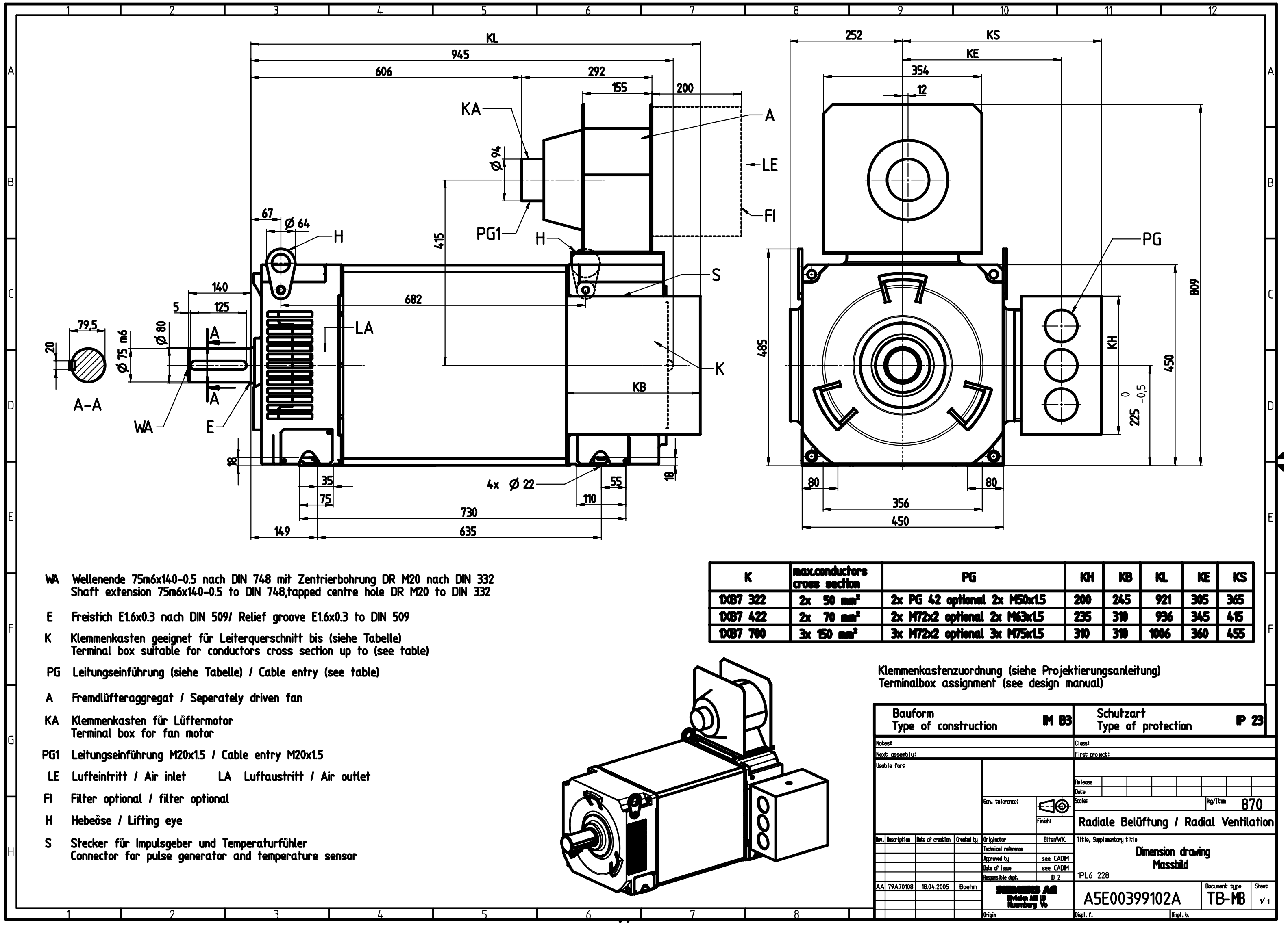
LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

FI Filter optional / filter optional

H Hebeöse / Lifting eye

S Stecker für Impulsgeber und Temperaturfühler
Connector for pulse generator and temperature sensor

Figure 5-26 1PL6226-D-L, air flow direction NDE→DE radial, A5E00399101A



K	max.conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	921	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	936	345	415
1XB7 700	3x 150 mm²	3x M72x2 optional 3x M75x1.5	310	310	1006	360	455

Klemmenkastenzuordnung (siehe Projektierungsanleitung)
Terminalbox assignment (see design manual)

WA Wellenende 75m6x140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 75m6x140-0.5 to DIN 748,tapped centre hole DR M20 to DIN 332

E Freistich E1.6x0.3 nach DIN 509/ Relief groove E1.6x0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis (siehe Tabelle)
Terminal box suitable for conductors cross section up to (see table)

PG Leitungseinführung (siehe Tabelle) / Cable entry (see table)

A Fremdlüfteraggregat / Seperately driven fan

KA Klemmenkasten für Lüftermotor
Terminal box for fan motor

PG1 Leitungseinführung M20x1.5 / Cable entry M20x1.5

LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

FI Filter optional / filter optional

H Hebeöse / Lifting eye

S Stecker für Impulsgeber und Temperaturfühler
Connector for pulse generator and temperature sensor

Figure 5-27 1PL6228-D-L, air flow direction NDE→DE radial, A5E00399102A

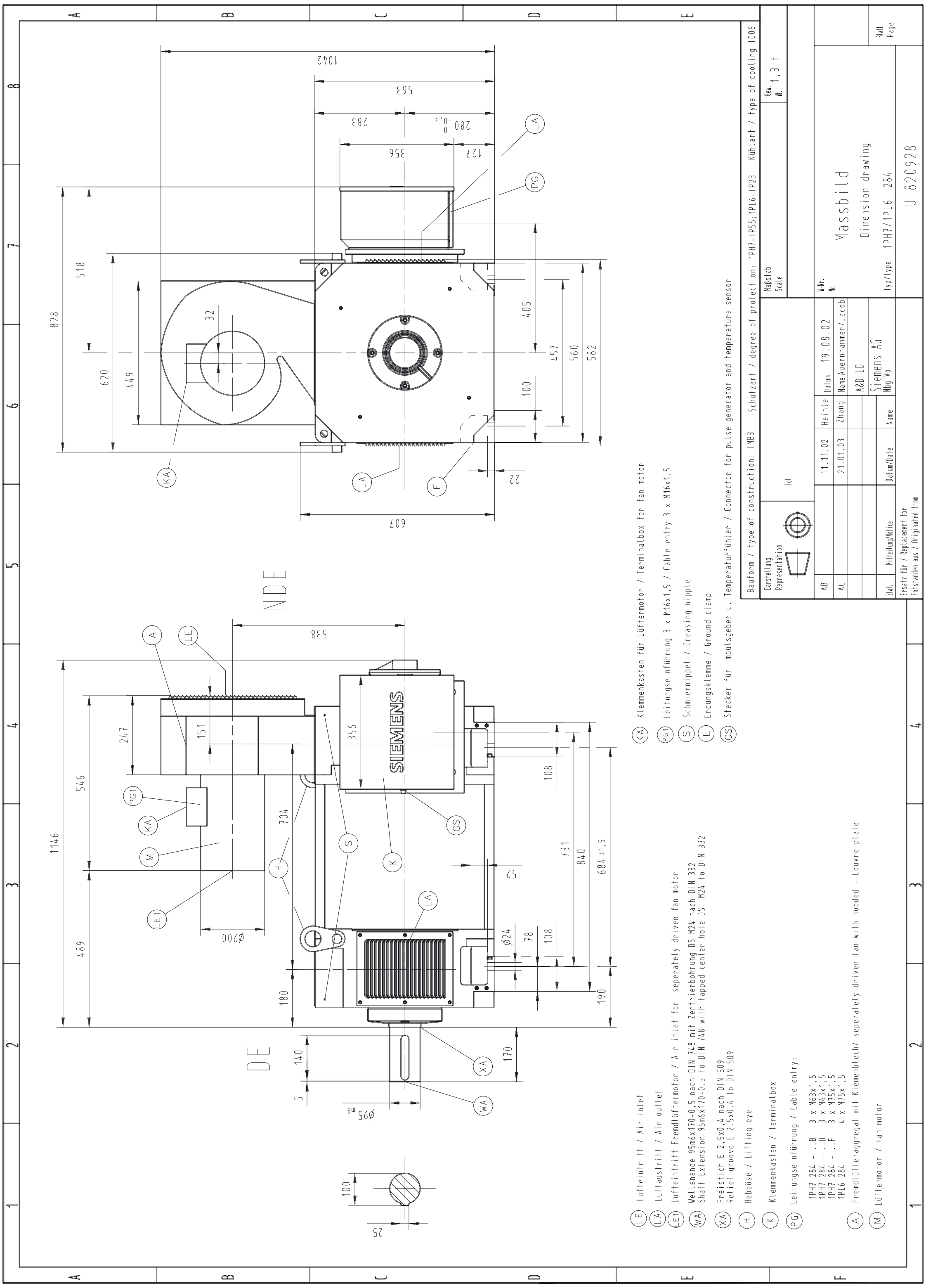


Figure 5-28 1PL6284, air flow direction NDE→DE, U820928

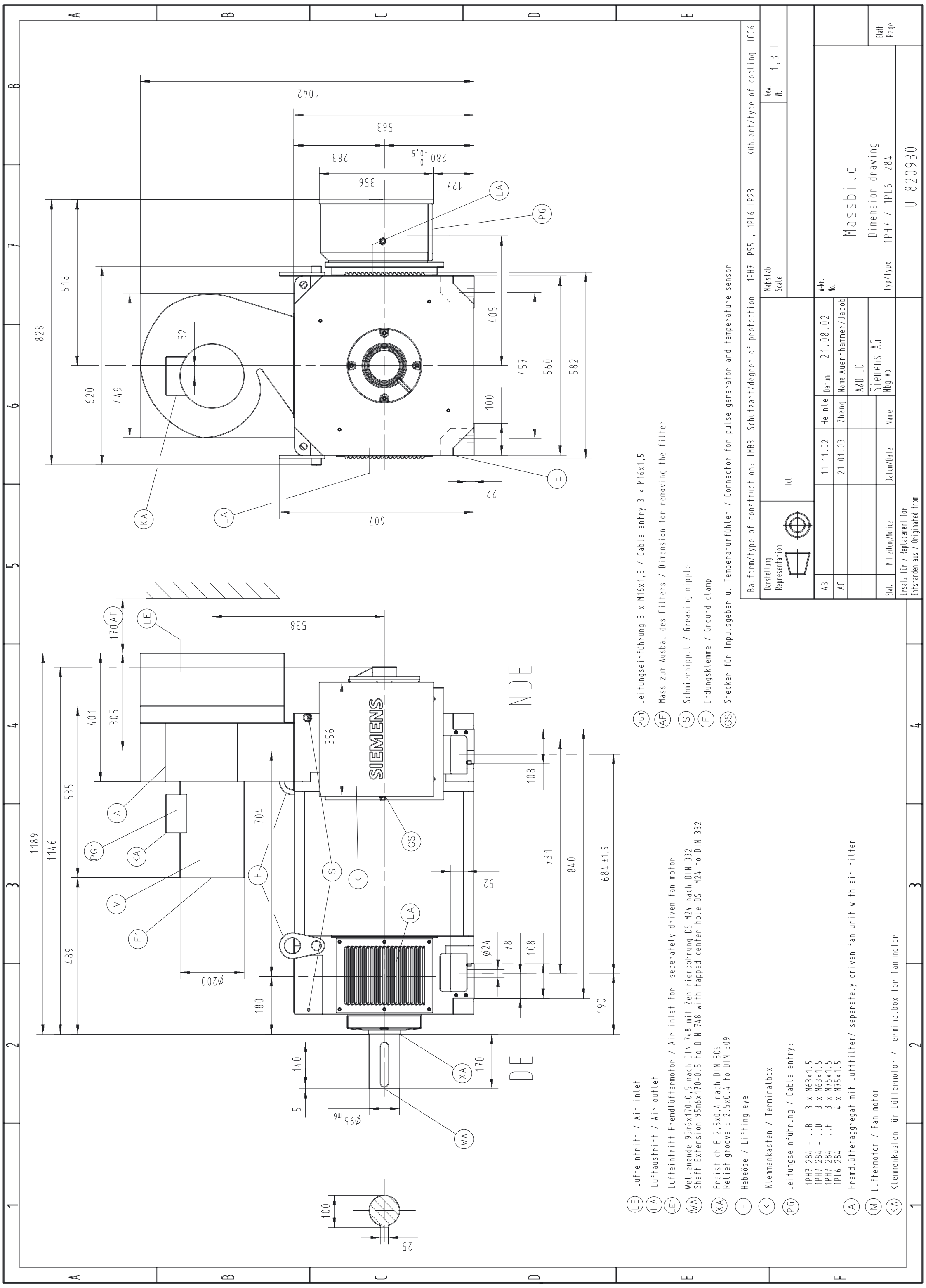


Figure 5-29 1PL6284, air flow direction NDE→DE, filter, U820930

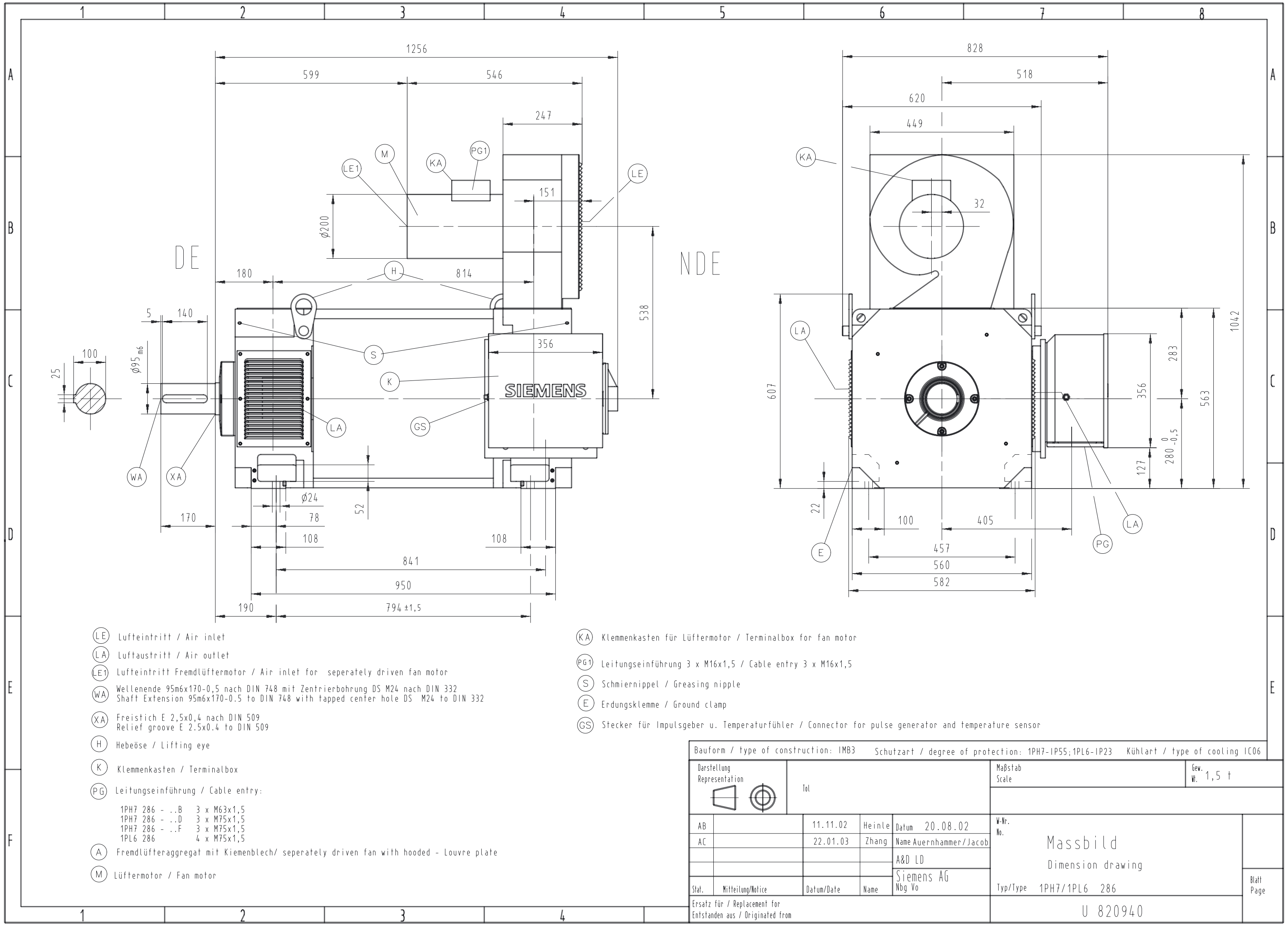


Figure 5-30 1PL6286, air flow direction NDE→DE, U820940

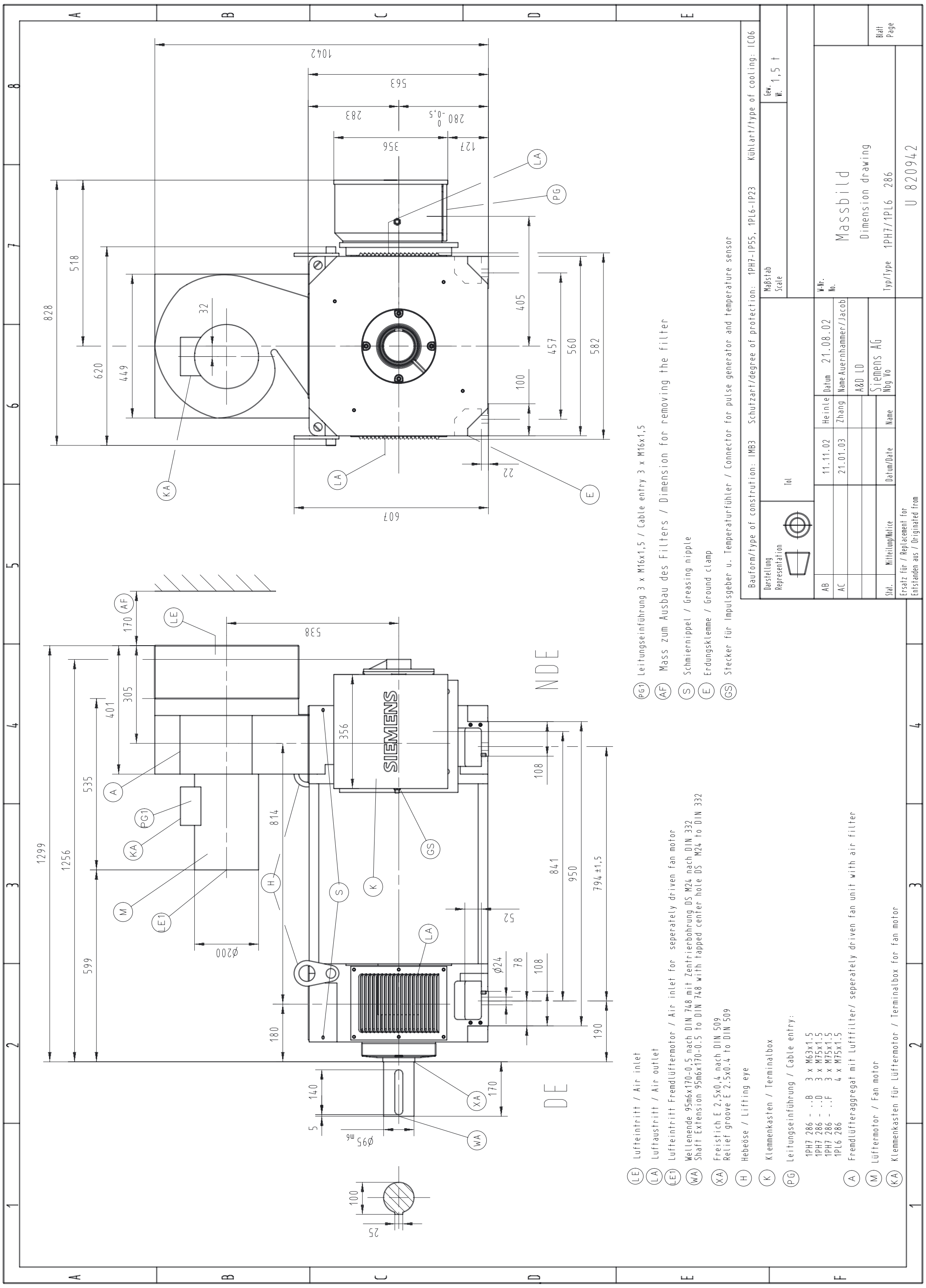


Figure 5-31 1PL6286, air flow direction NDE→DE, filter, U820942

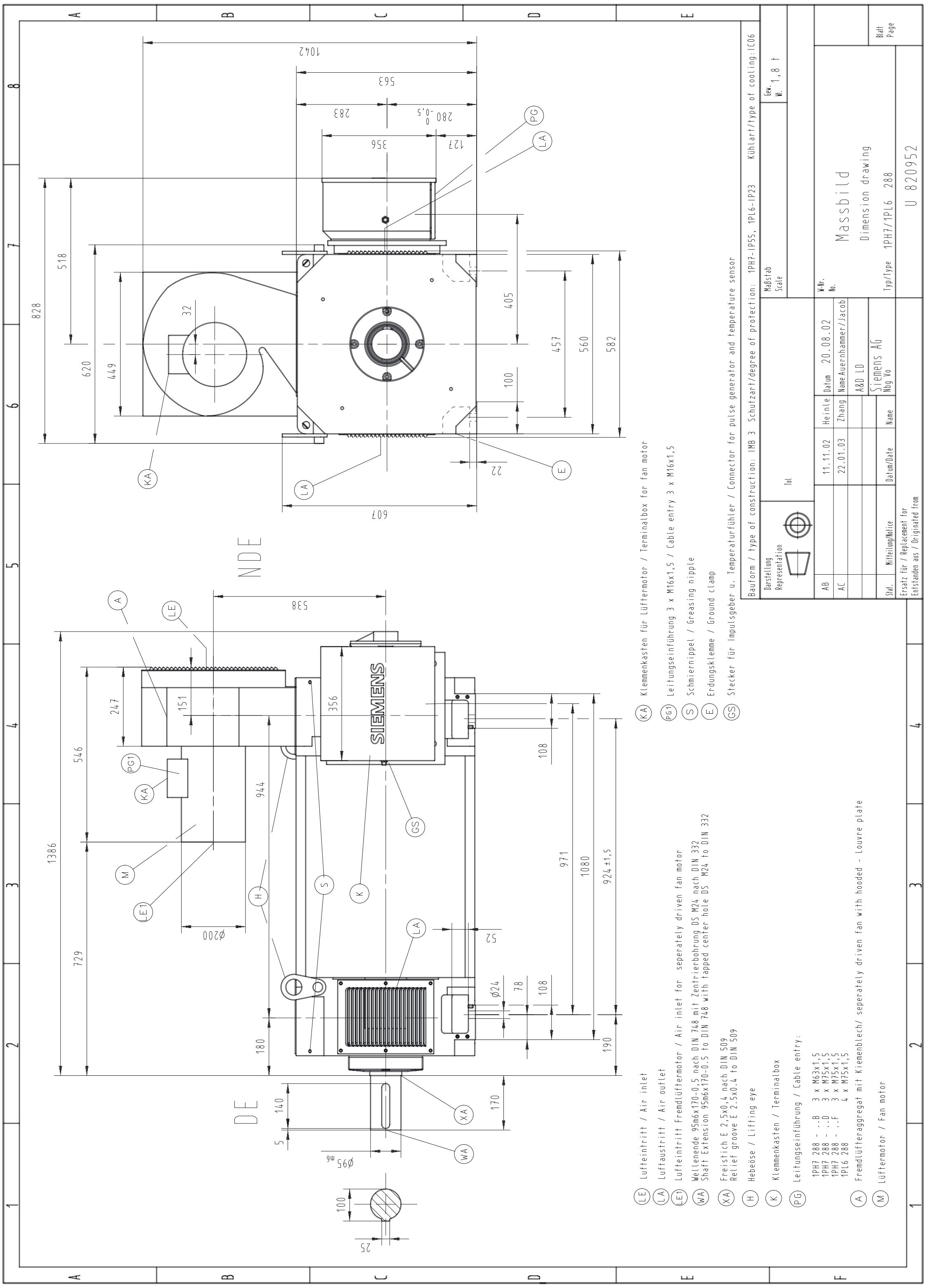


Figure 5-32 1PL6288, air flow direction NDE→DE, U820952

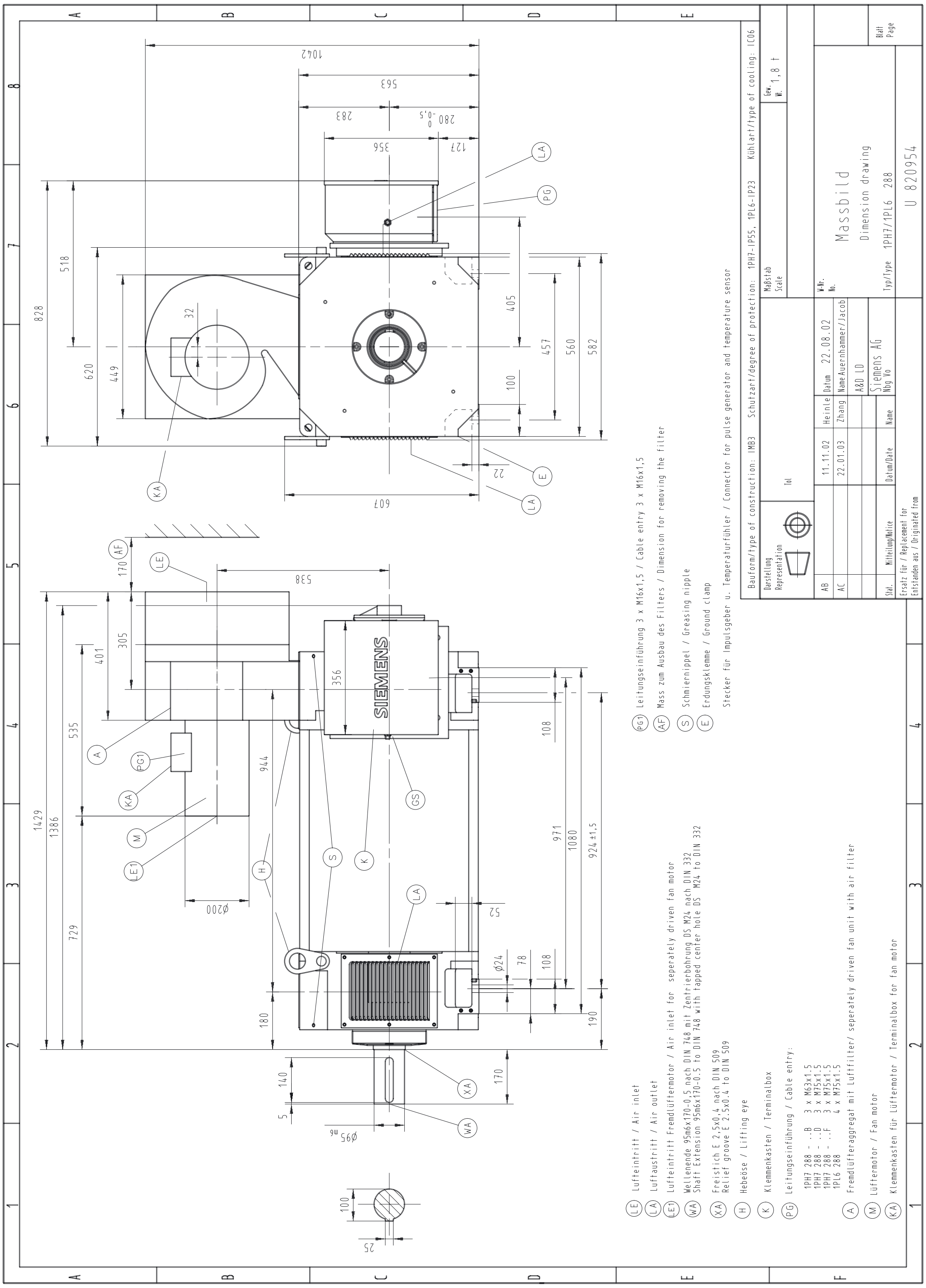


Figure 5-33 1PL6288, air flow direction NDE→DE, filter, U820954

5.3 Type of construction IM B3 with second shaft end (SH 280)

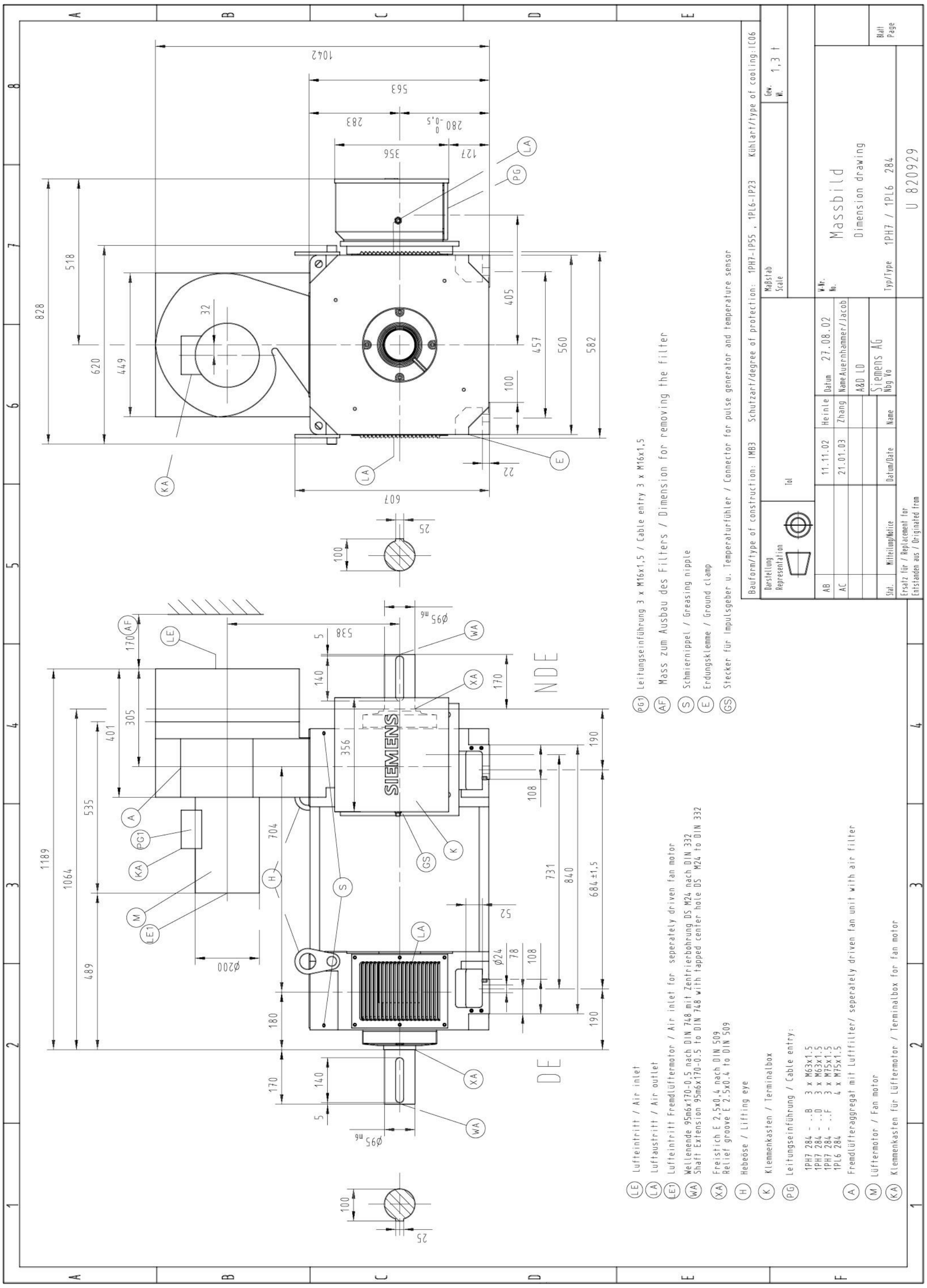


Figure 5-34 1PL6284, air flow direction NDE→DE, filter, U820929

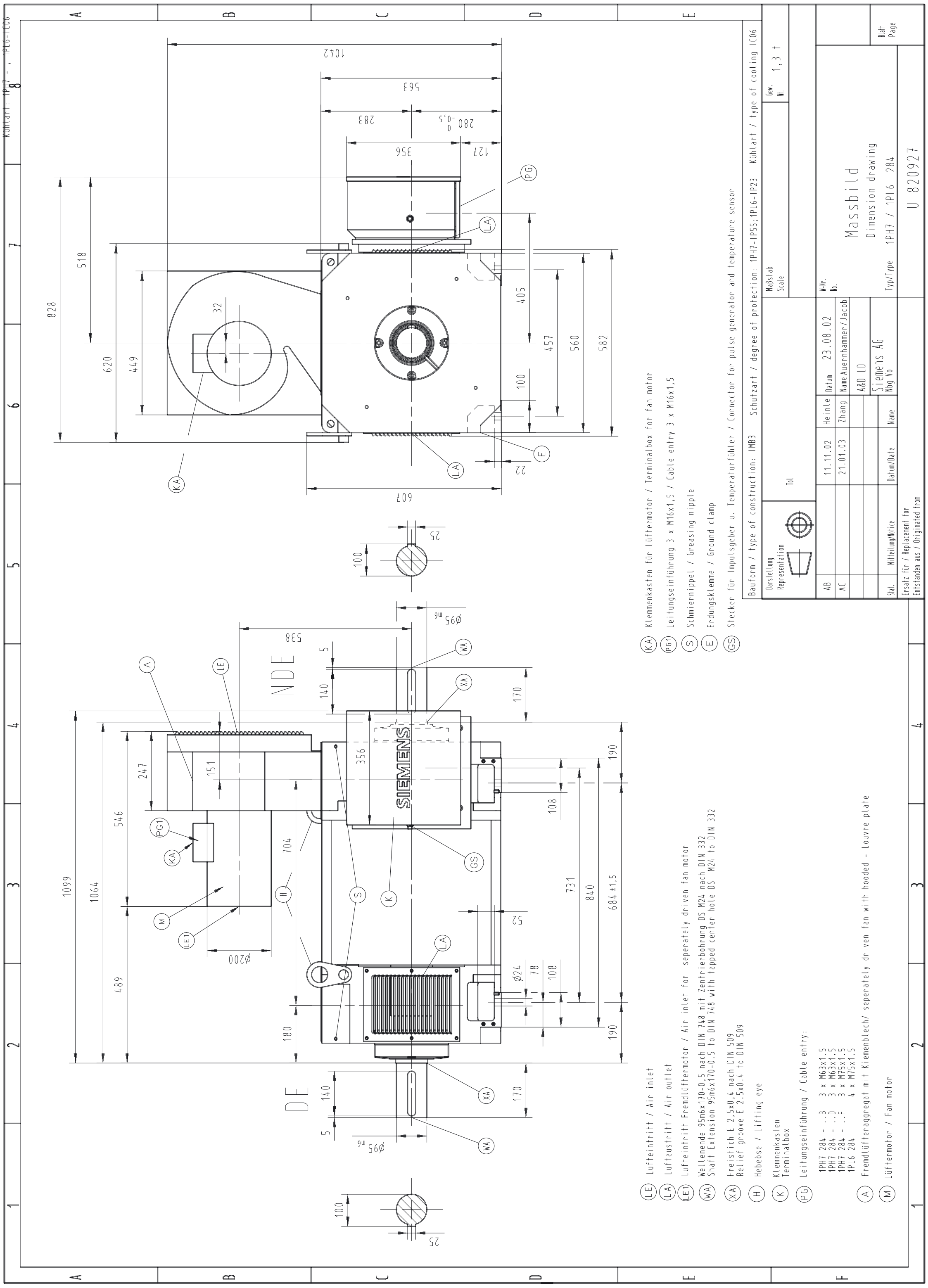


Figure 5-35 1PL6284, air flow direction NDE→DE, U820927

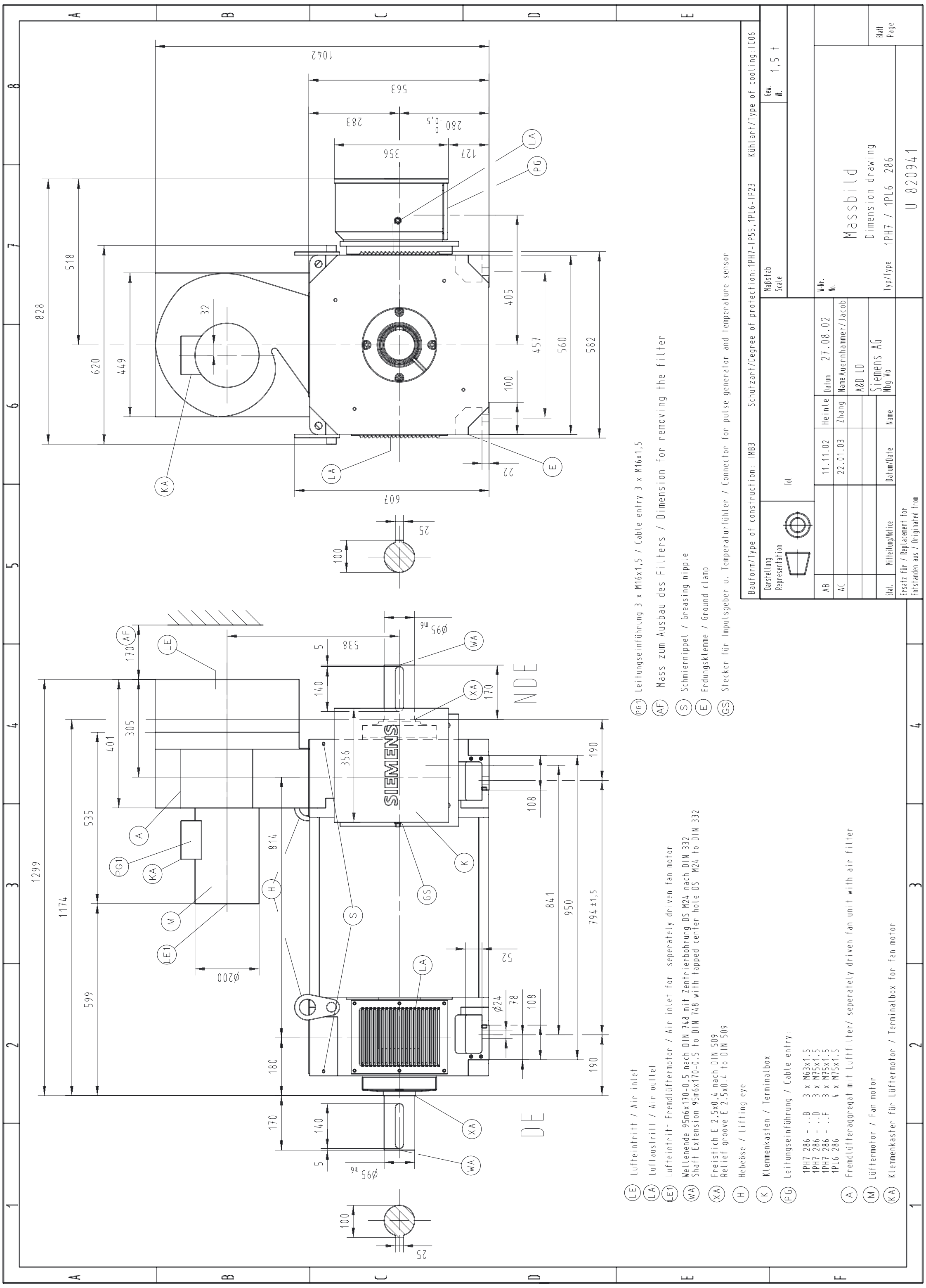


Figure 5-36 1PL6286, air flow direction NDE→DE, filter, U820941

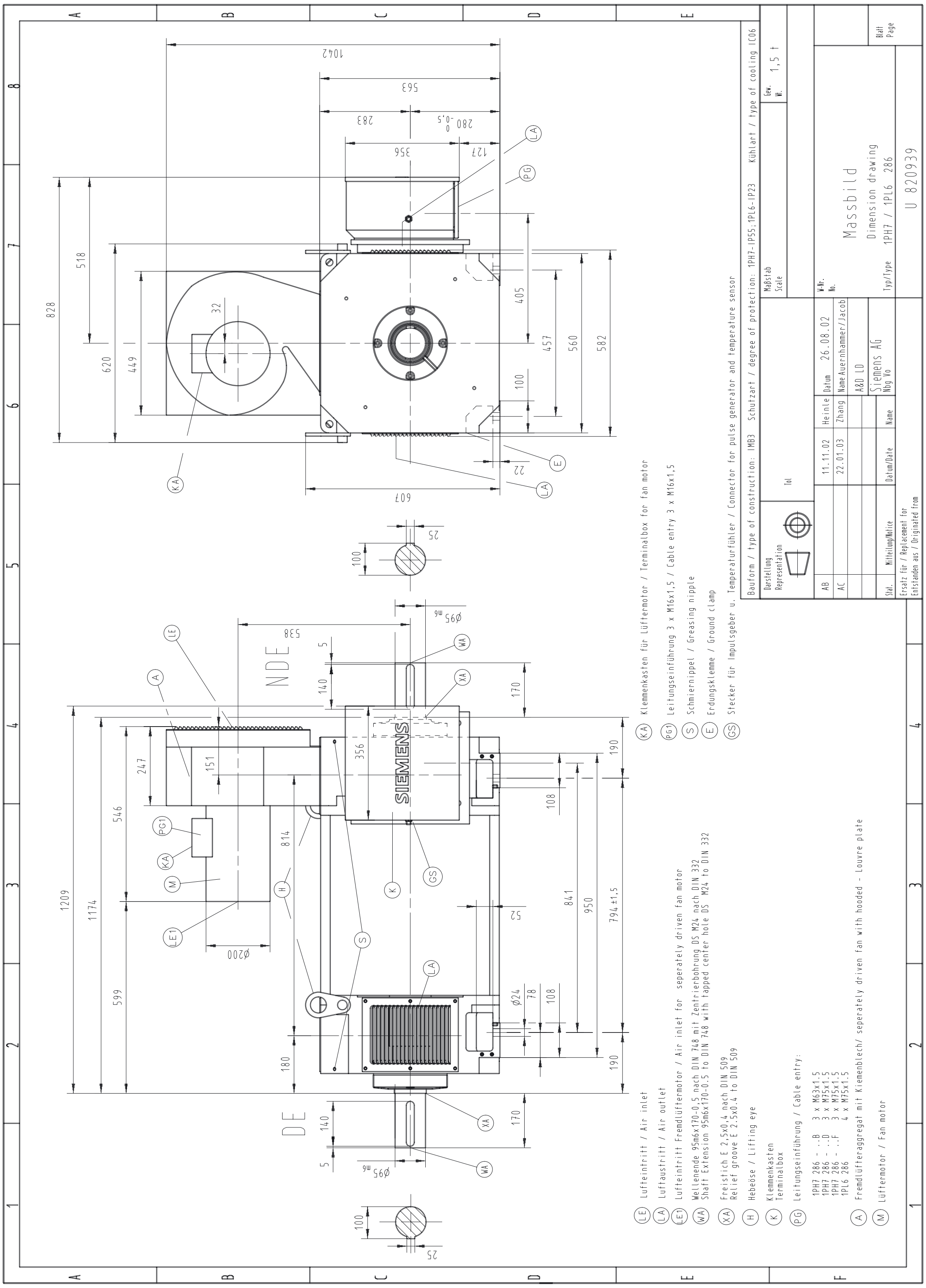


Figure 5-37 1PL6286, air flow direction NDE→DE, U820939

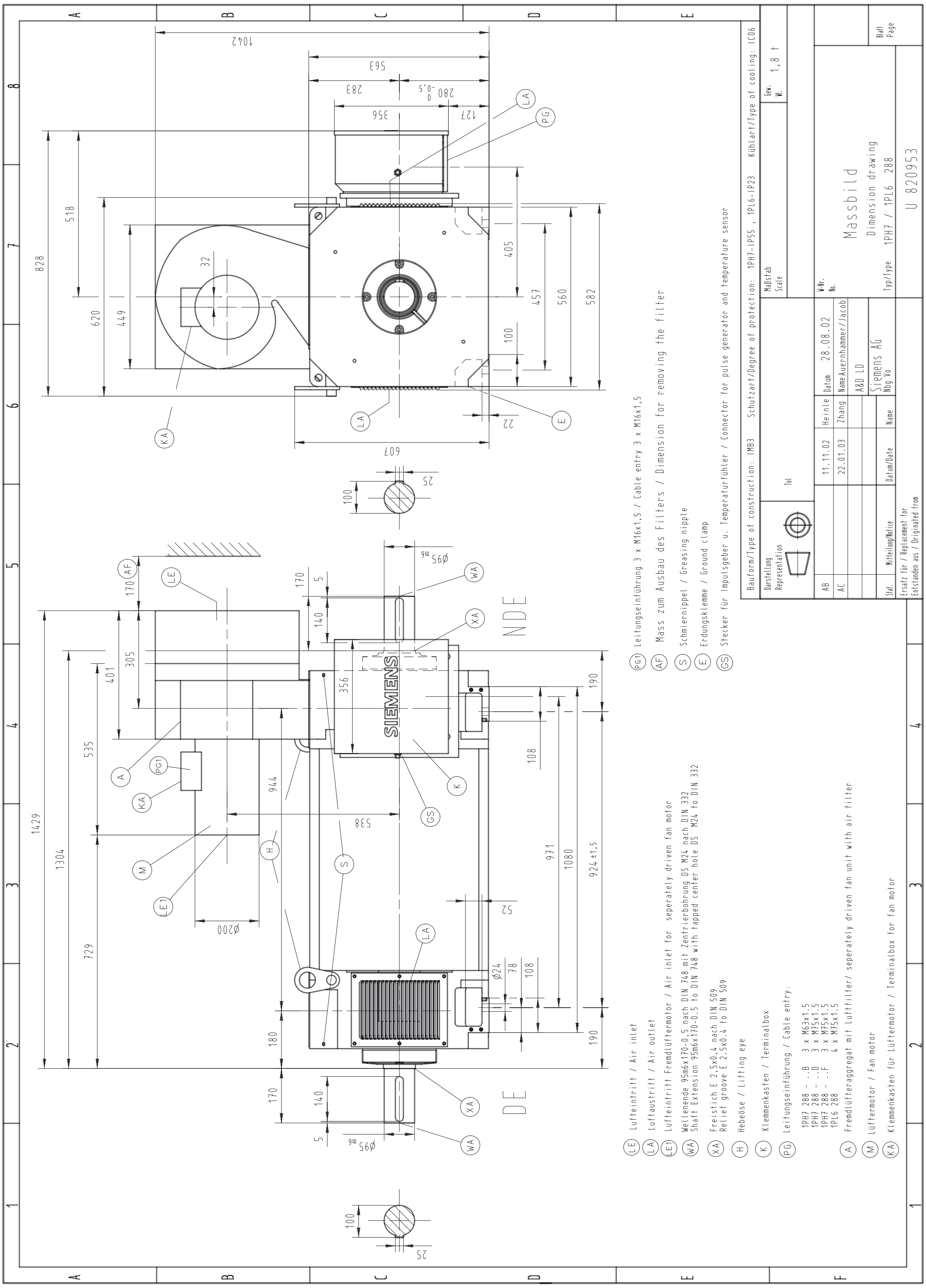


Figure 5-38 1PL6288, air flow direction NDE→DE, filter, U820953

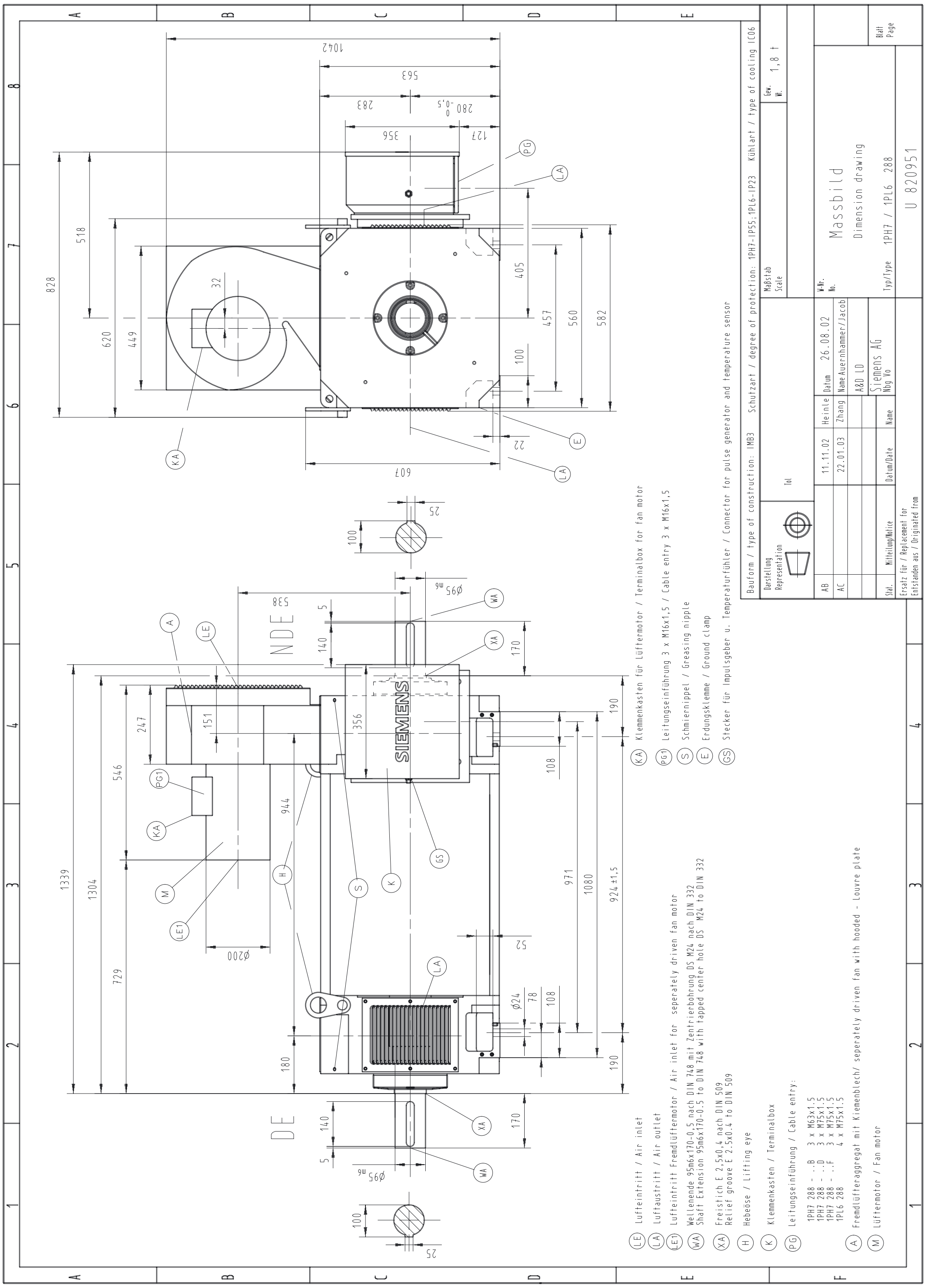


Figure 5-39 1PL6288, air flow direction NDE→DE, U820951

5.4 Type of construction IM B35 with separately-driven fan

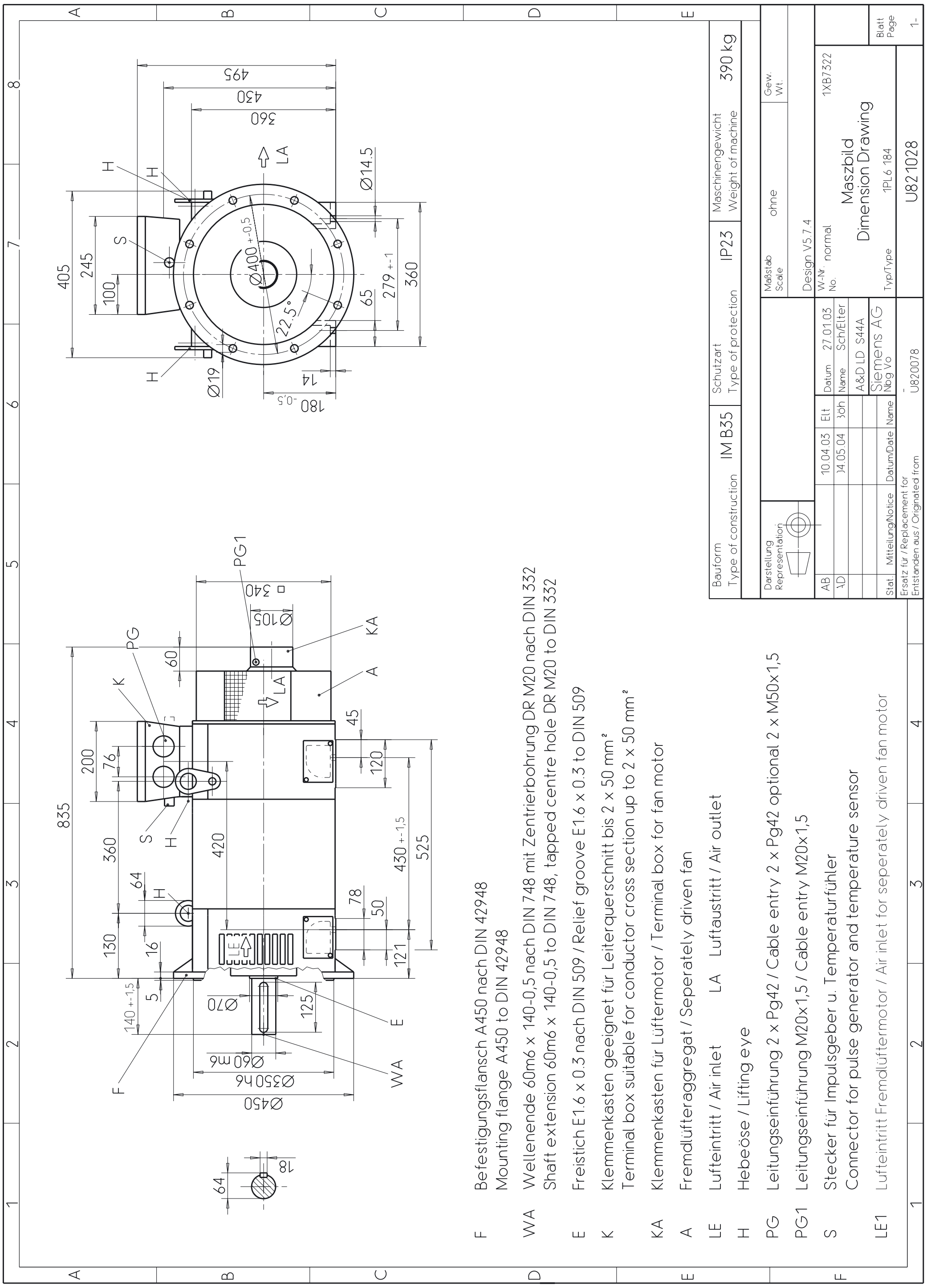


Figure 5-40 1PL6184-B-F, air flow direction DE→NDE, U821028

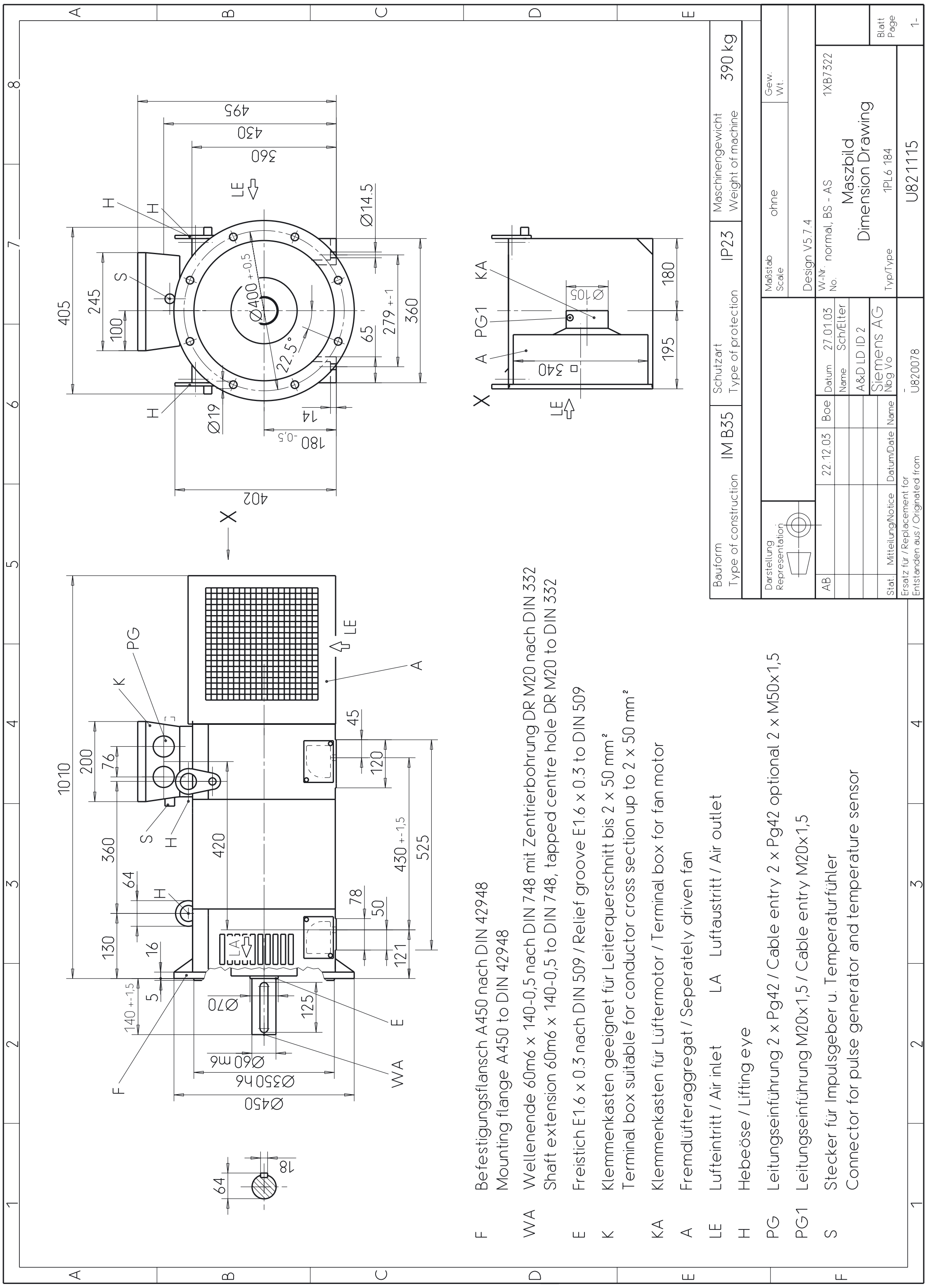


Figure 5-41 1PL6184-B-F, air flow direction NDE→DE, U821115

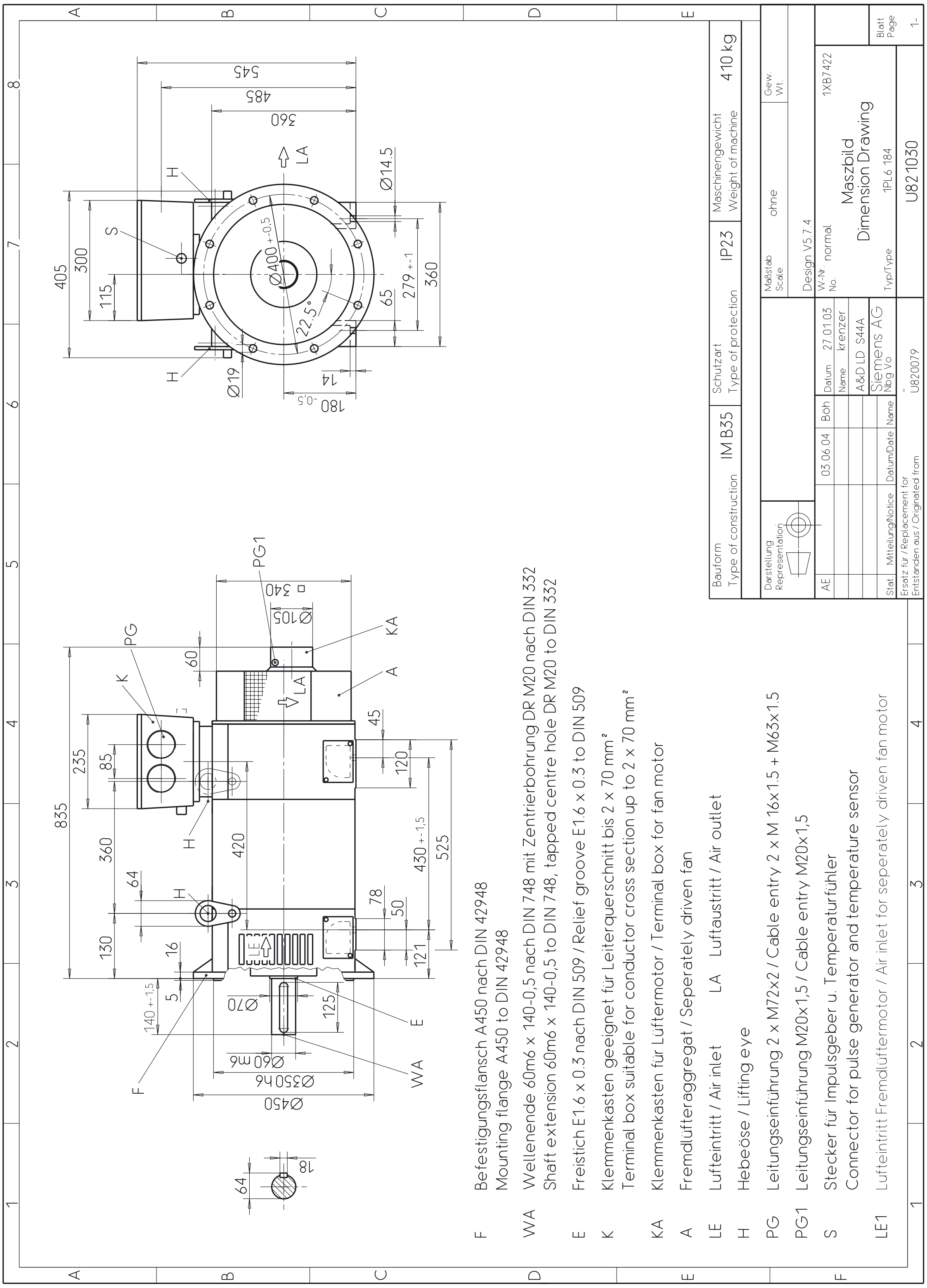


Figure 5-42 1PL6184-L, air flow direction DE→NDE, U821030

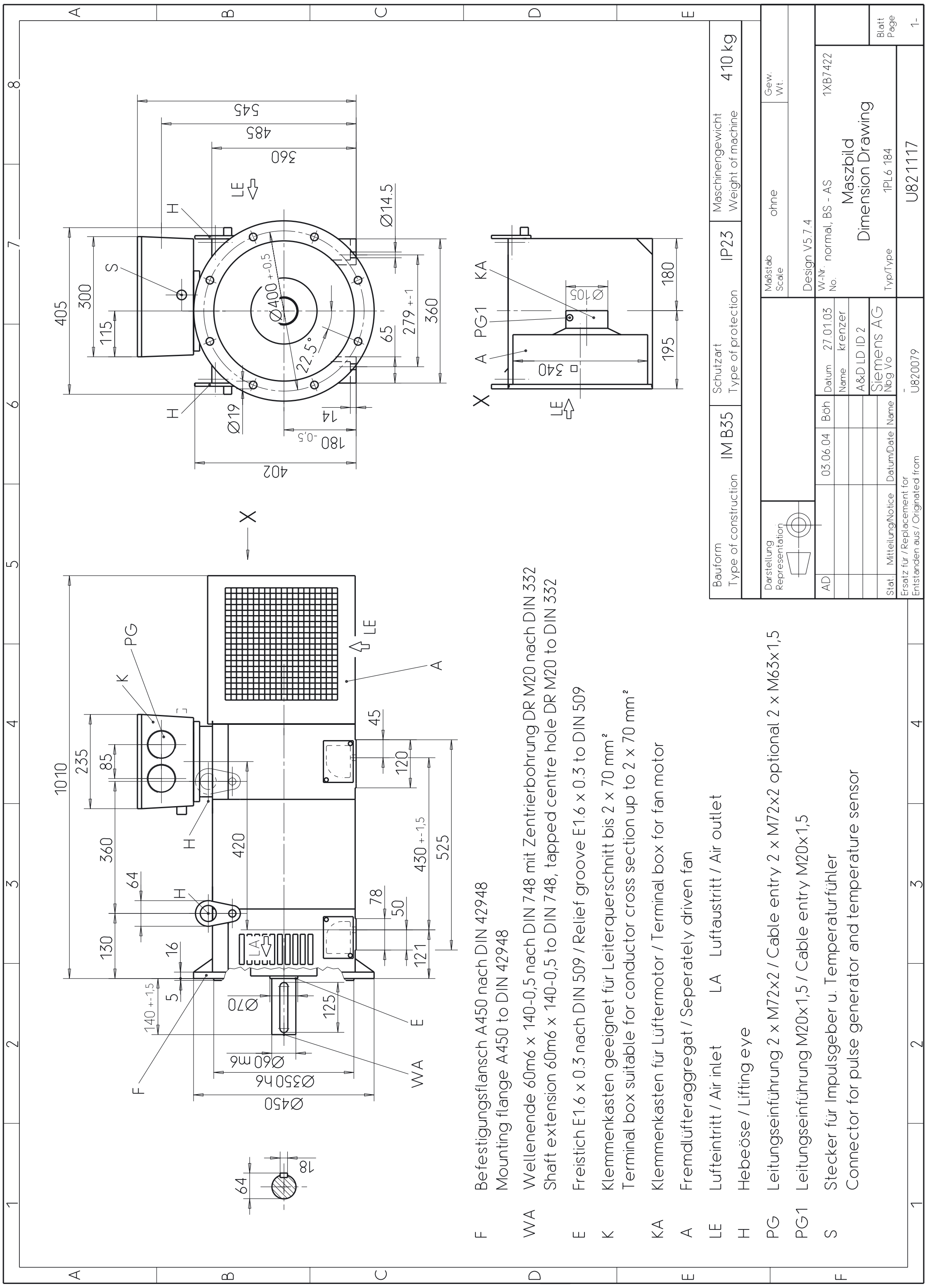
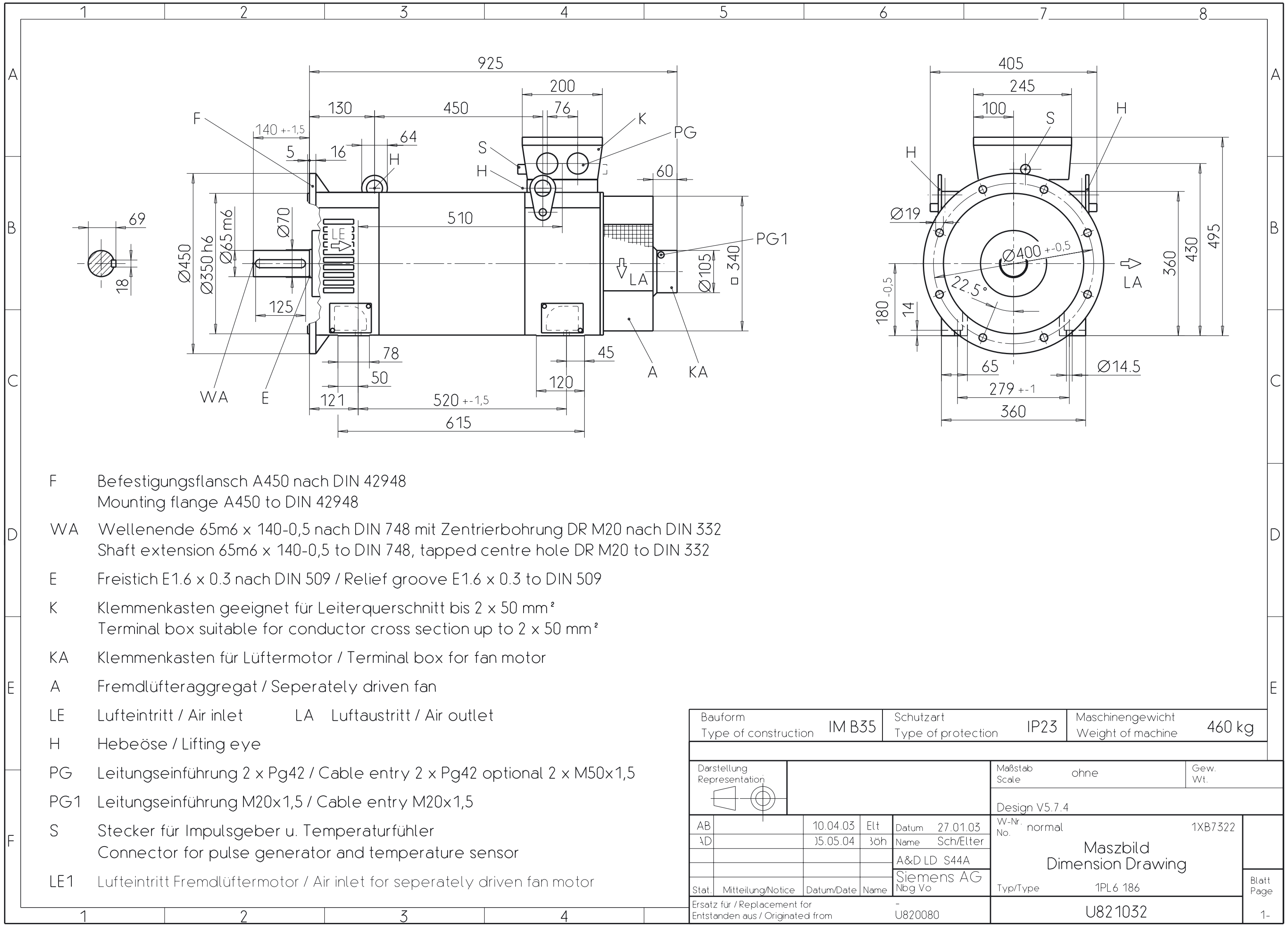


Figure 5-43 1PL6184-L, air flow direction NDE→DE, U821117



F Befestigungsflansch A450 nach DIN 42948
Mounting flange A450 to DIN 42948

WA Wellenende 65m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 65m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332

E Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 50 mm²
Terminal box suitable for conductor cross section up to 2 x 50 mm²

KA Klemmenkasten für Lüftermotor / Terminal box for fan motor

A Fremdlüfteraggregat / Seperately driven fan

LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

H Hebeöse / Lifting eye

PG Leitungseinführung 2 x Pg42 / Cable entry 2 x Pg42 optional 2 x M50x1,5

PG1 Leitungseinführung M20x1,5 / Cable entry M20x1,5

S Stecker für Impulsgeber u. Temperaturfühler
Connector for pulse generator and temperature sensor

LE1 Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Bauform / Type of construction: IM B35
Schutzart / Type of protection: IP23
Maschinengewicht / Weight of machine: 460 kg

Darstellung / Representation
Maßstab / Scale: ohne
Gew. / Wt.
Design V5.7.4
W-Nr. / No.: normal 1XB7322
Maszbild
Dimension Drawing
Typ/Type: 1PL6 186
U821032
Blatt / Page: 1-

Stat.	Mitteilung/Notice	Datum/Date	Name
AB		10.04.03	Elt
AD		15.05.04	Söh

Datum 27.01.03
Name Sch/Elter
A&D LD S44A
Siemens AG
Nbg Vo

Ersatz für / Replacement for: -
Entstanden aus / Originated from: U820080

Figure 5-44 1PL6186-B-D, air flow direction DE→NDE, U821032

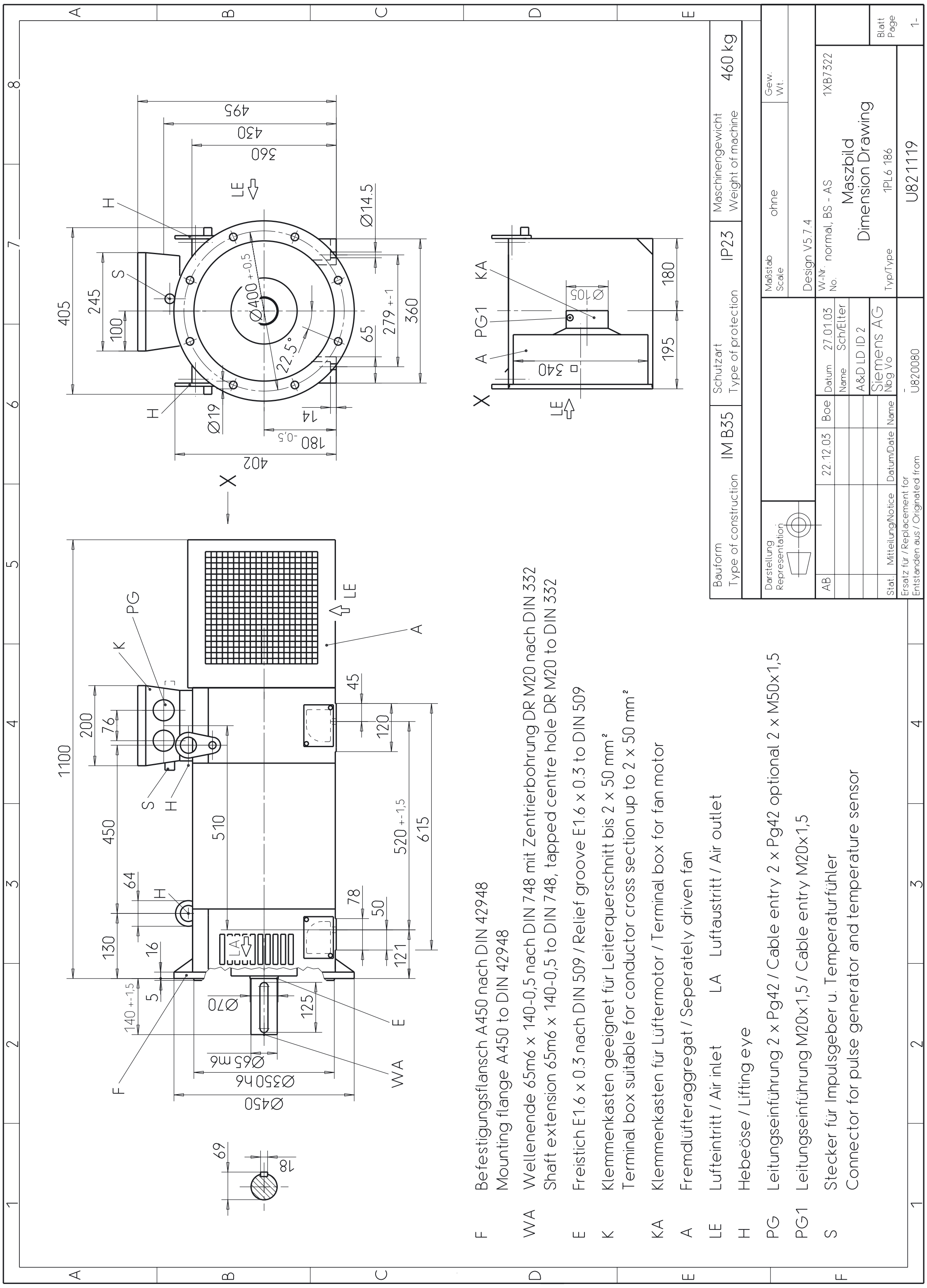
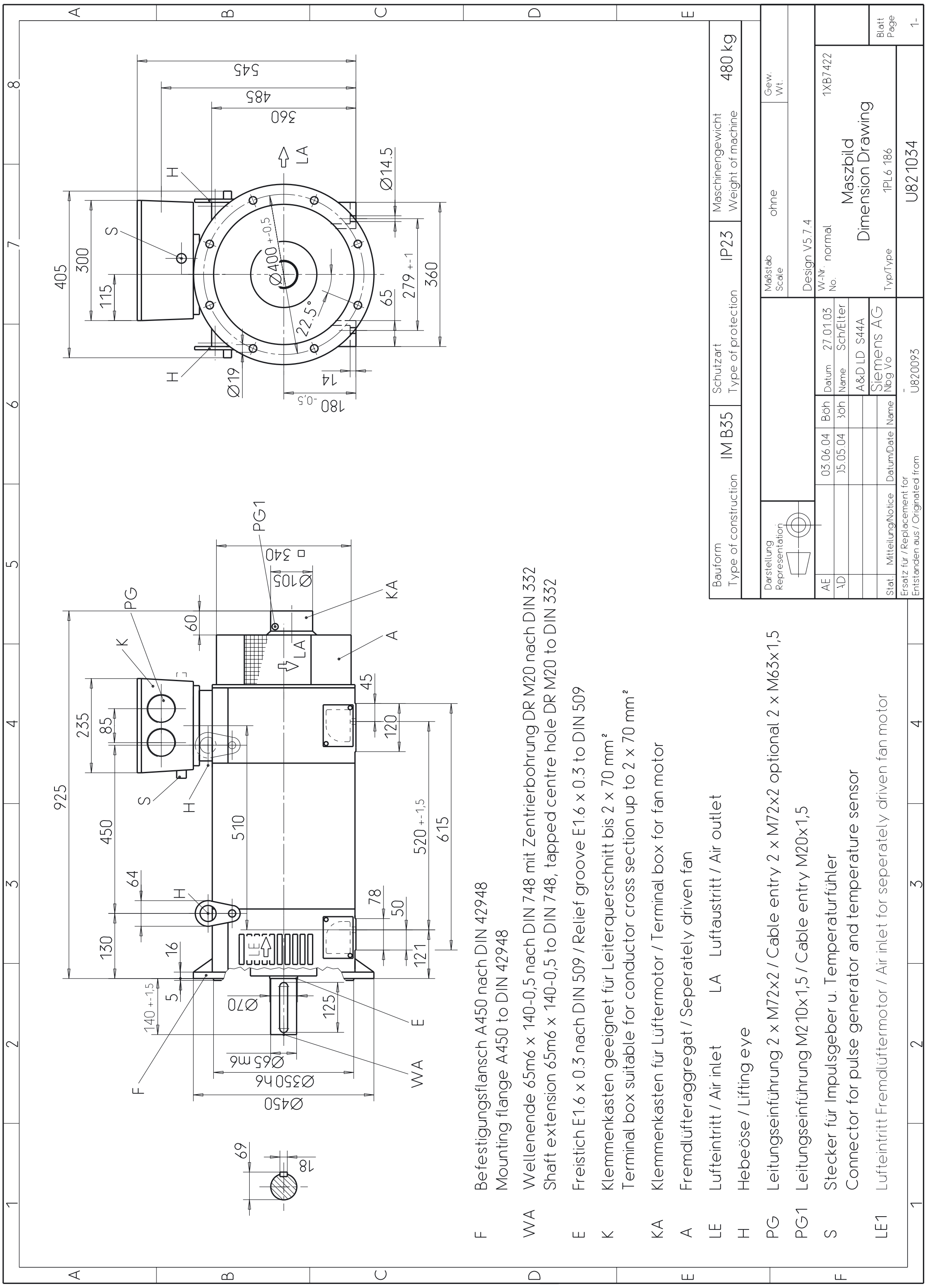


Figure 5-45 1PL6186-B-D, air flow direction NDE→DE, U821119



F	Befestigungsflansch A450 nach DIN 42948 Mounting flange A450 to DIN 42948
WA	Wellenende 65m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 65m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 70 mm² Terminal box suitable for conductor cross section up to 2 x 70 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x M72x2 / Cable entry 2 x M72x2 optional 2 x M63x1,5
PG1	Leitungseinführung M20x1,5 / Cable entry M20x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-46 1PL6186-F, air flow direction DE→NDE, U821034

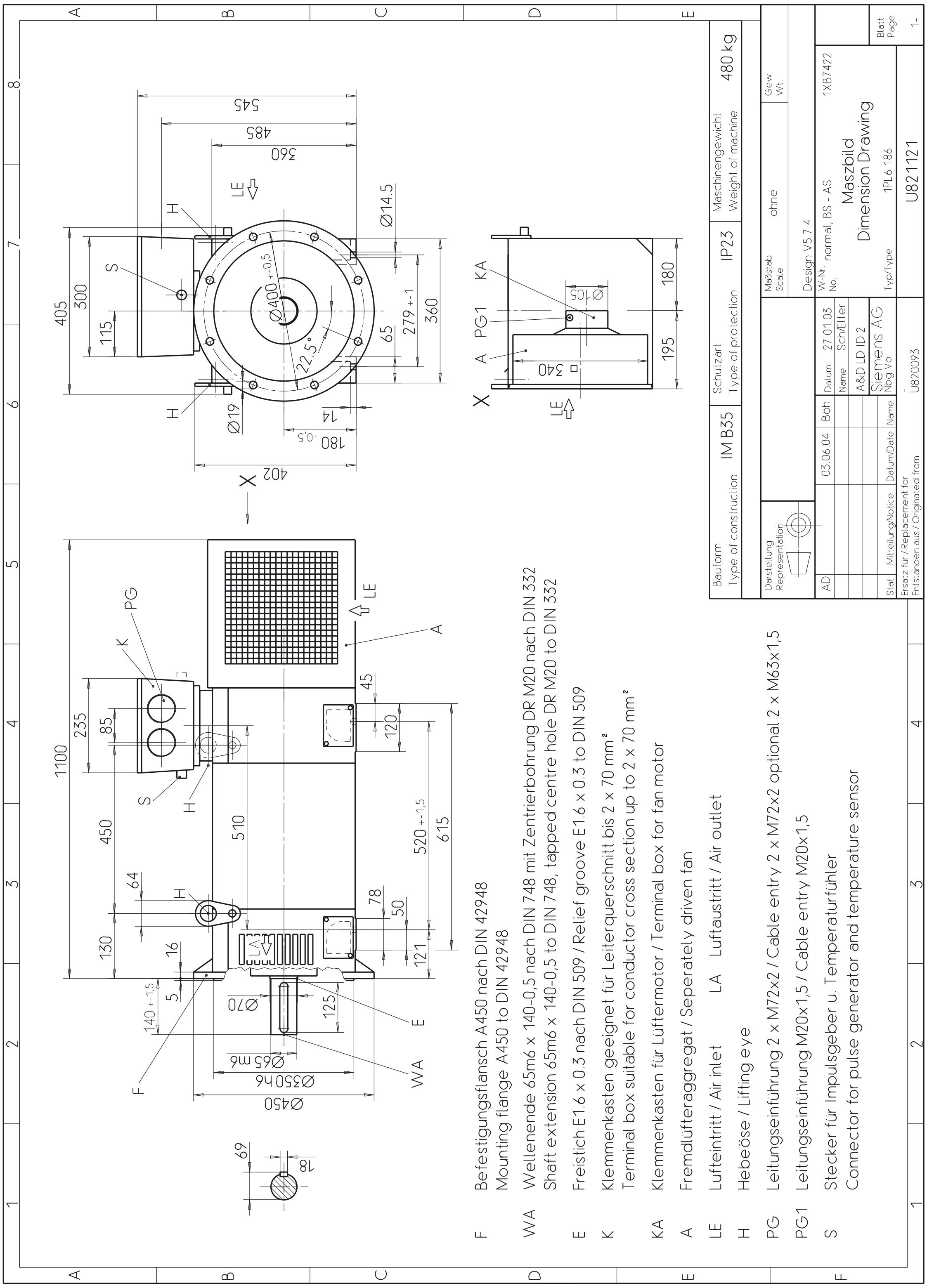


Figure 5-47 1PL6186-F, air flow direction NDE→DE, U821121

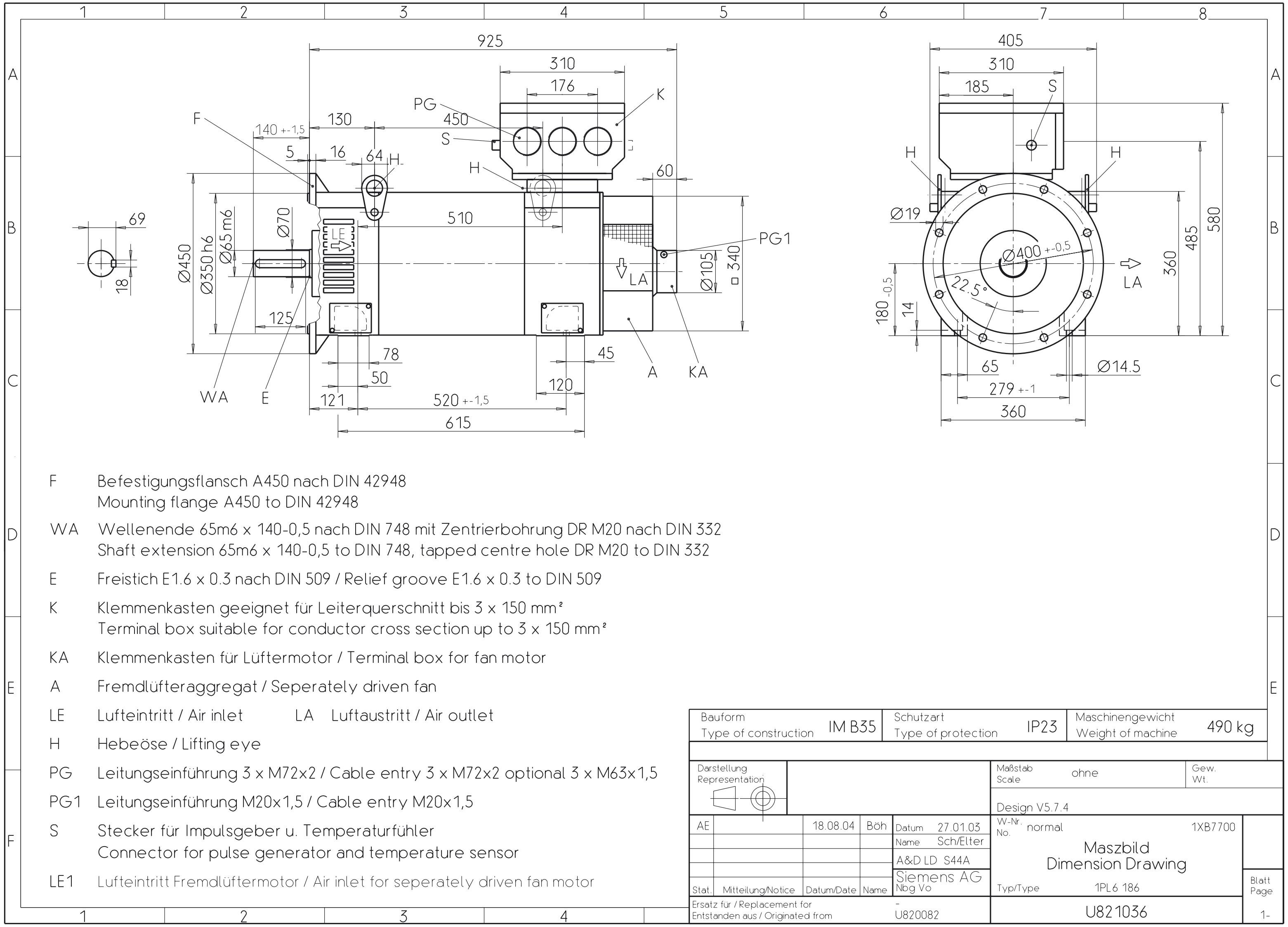


Figure 5-48 1PL6186-L, air flow direction DE→NDE, U821036

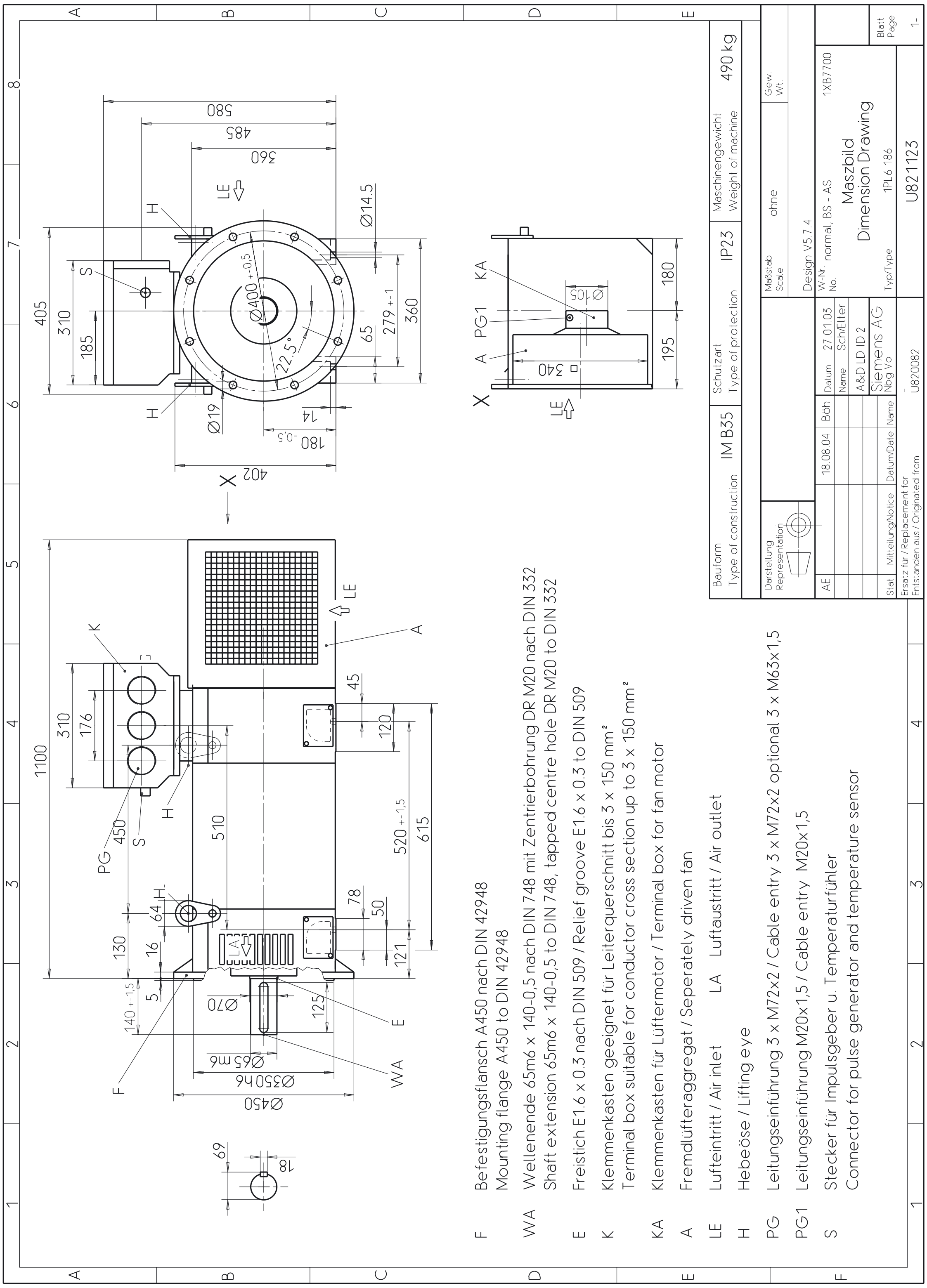


Figure 5-49 1PL6186-L, air flow direction NDE→DE, U821123

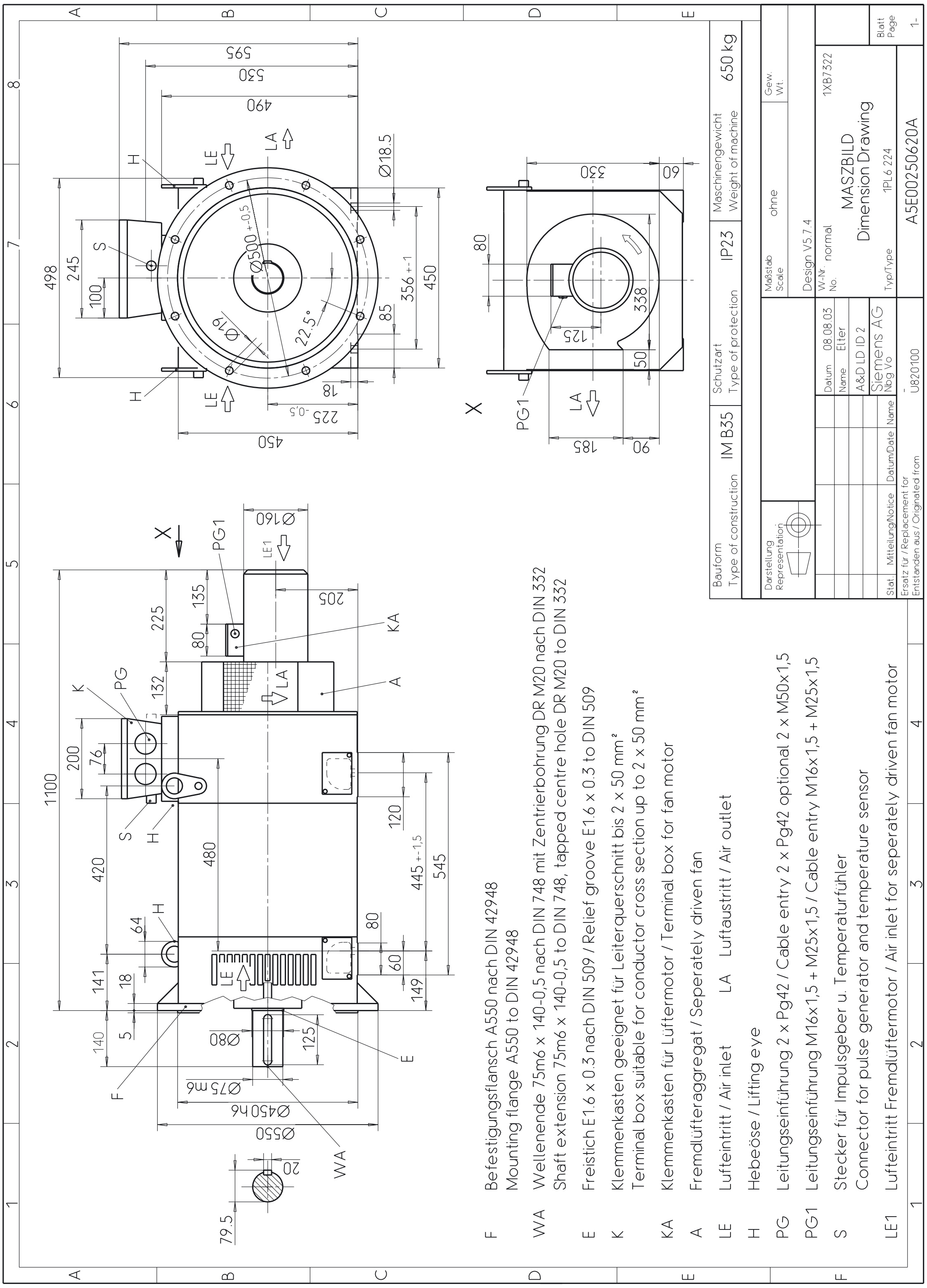


Figure 5-50 1PL6224-B, air flow direction DE→NDE, A5E00250620A

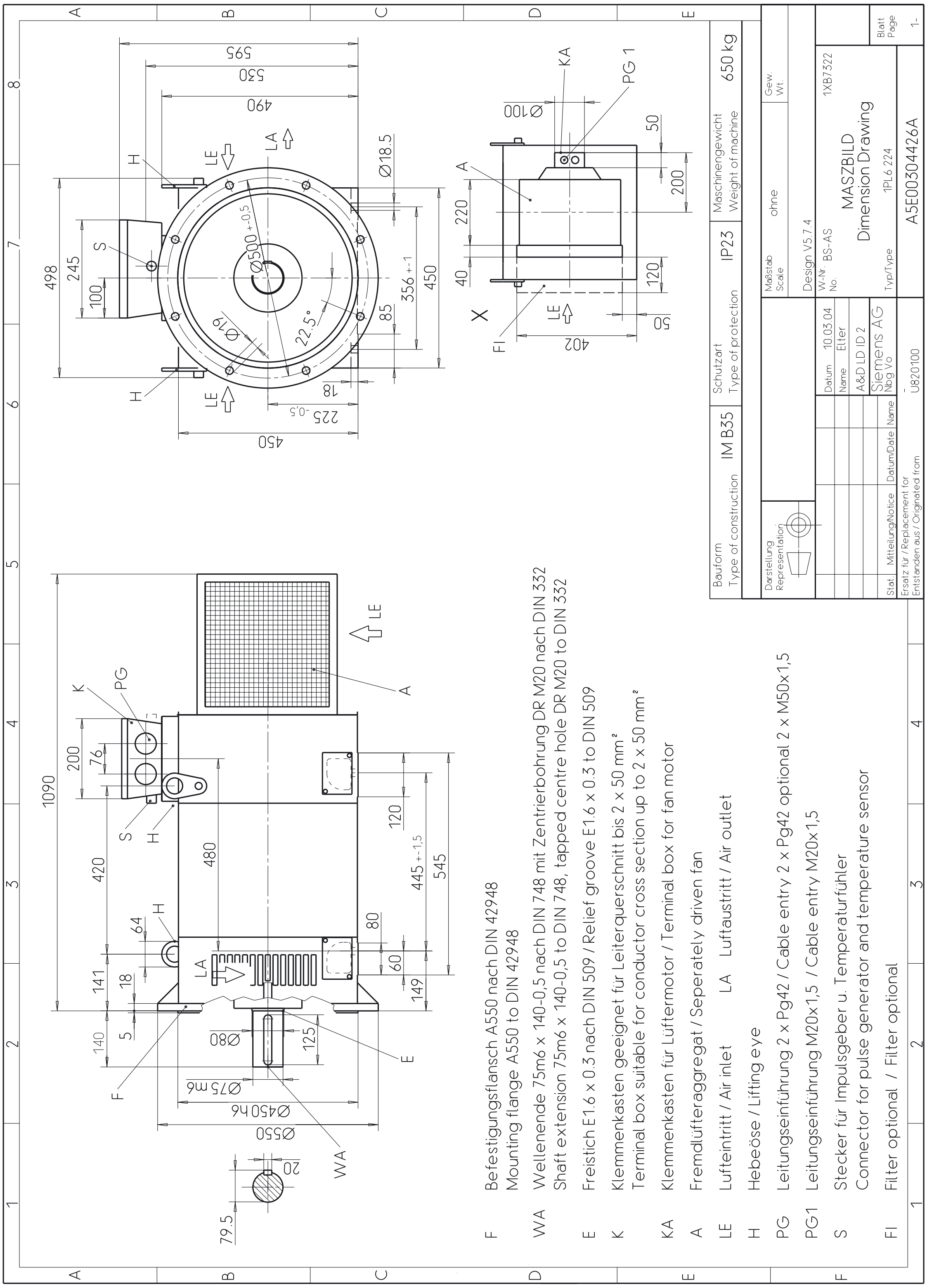


Figure 5-51 1PL6224-B, air flow direction NDE→DE, A5E00304426A

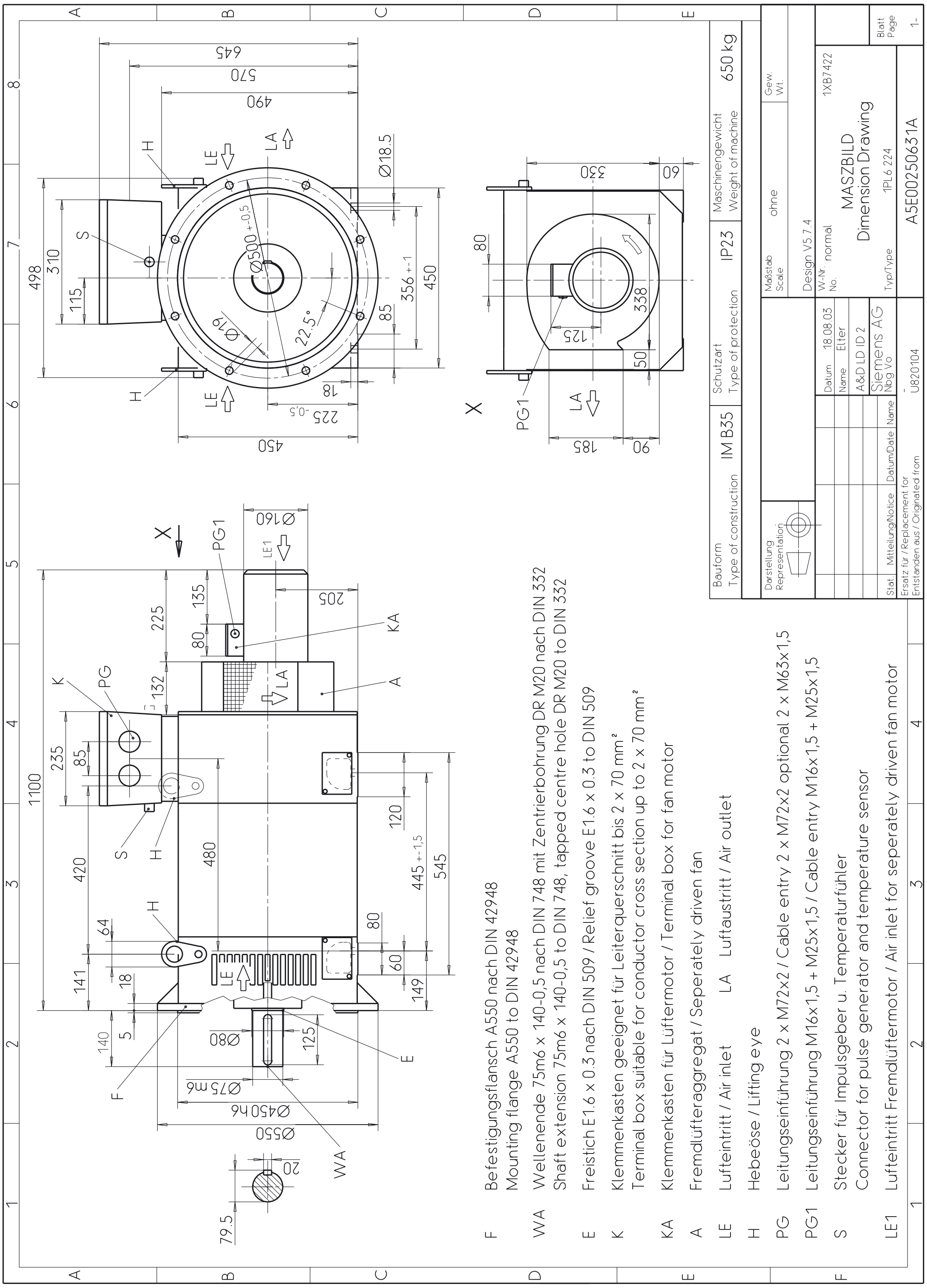


Figure 5-52 1PL6224-D, air flow direction DE→NDE, A5E00250631A

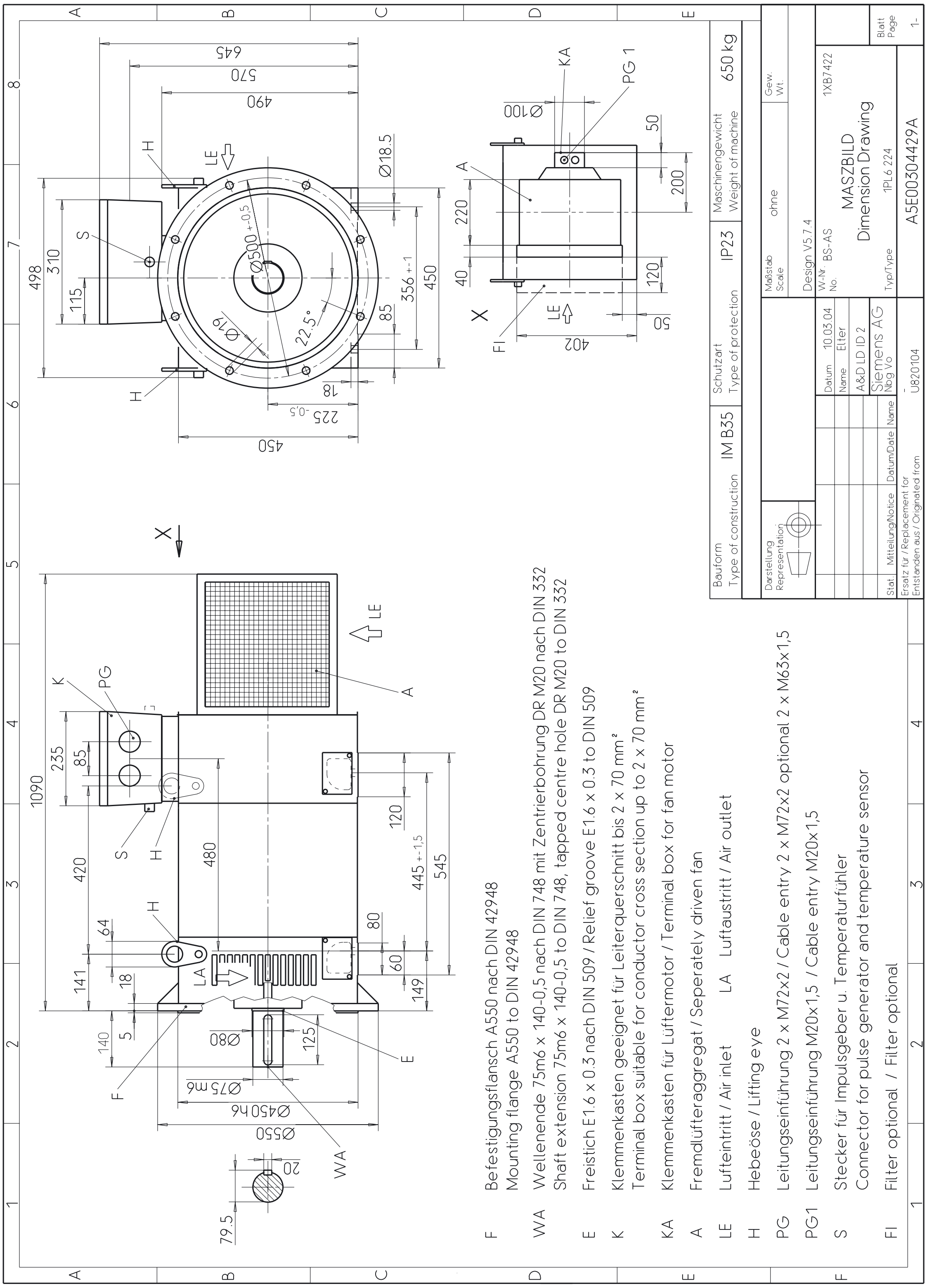


Figure 5-53 1PL6224-D, air flow direction NDE→DE, A5E00304429A

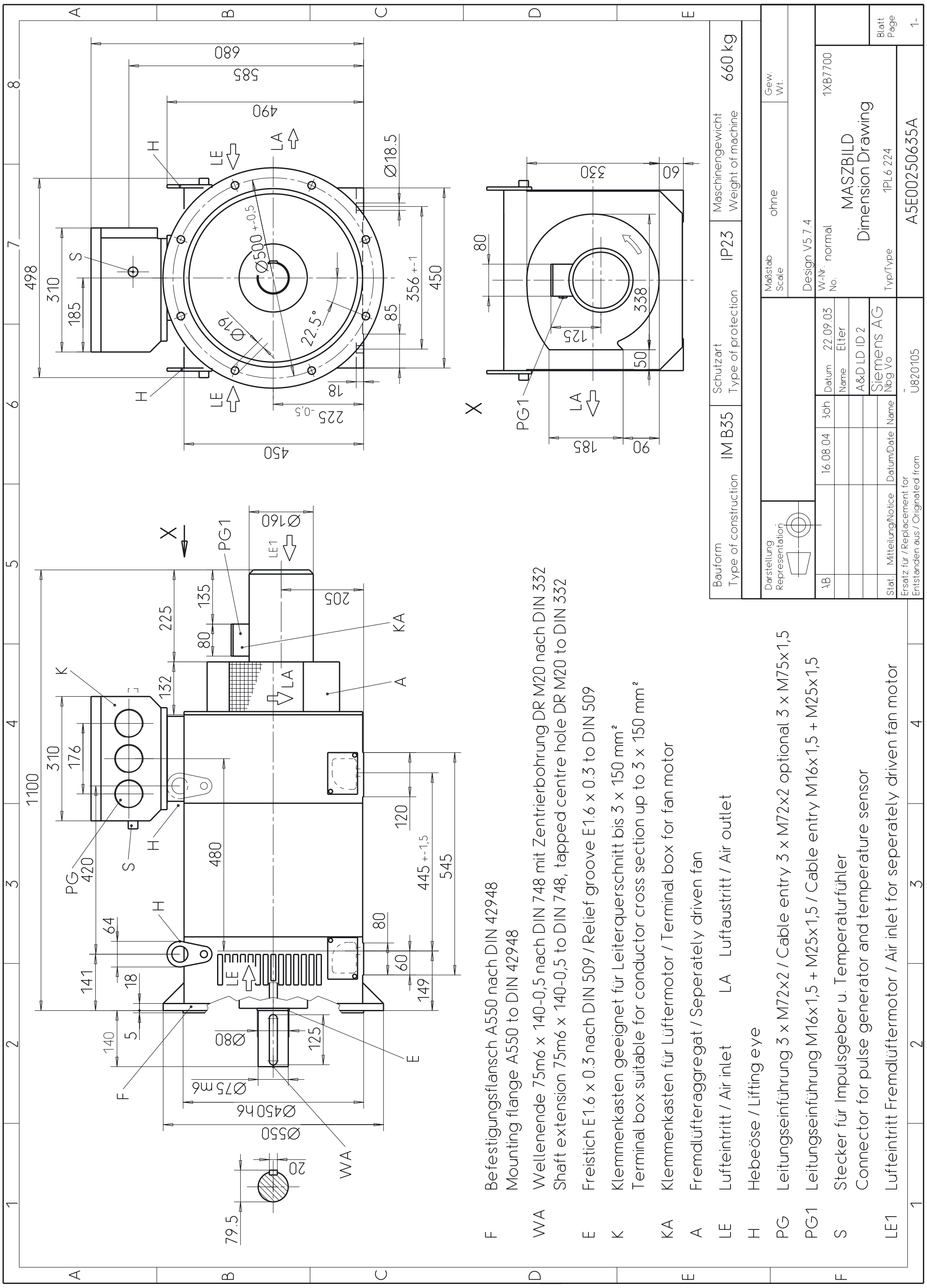
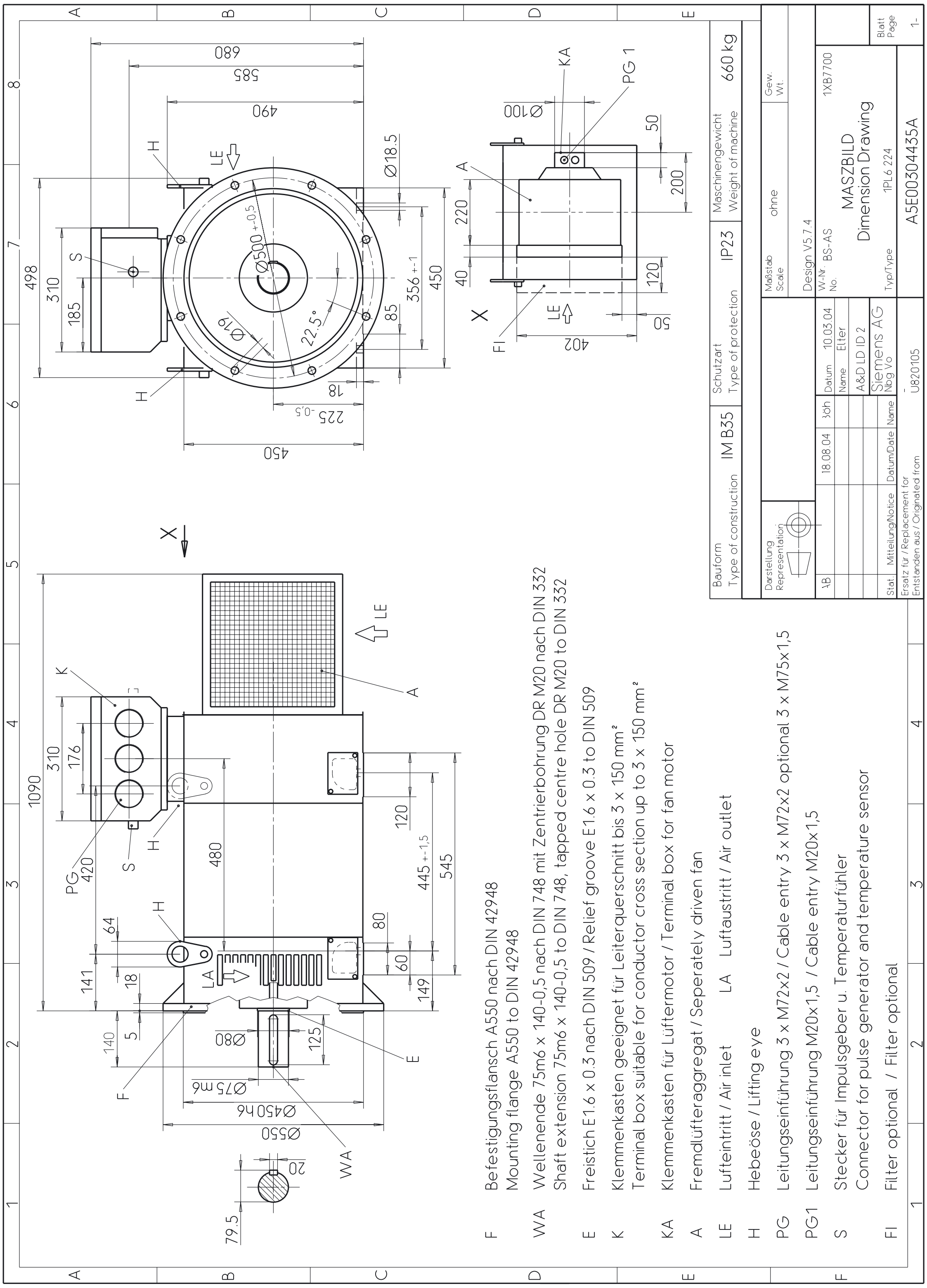
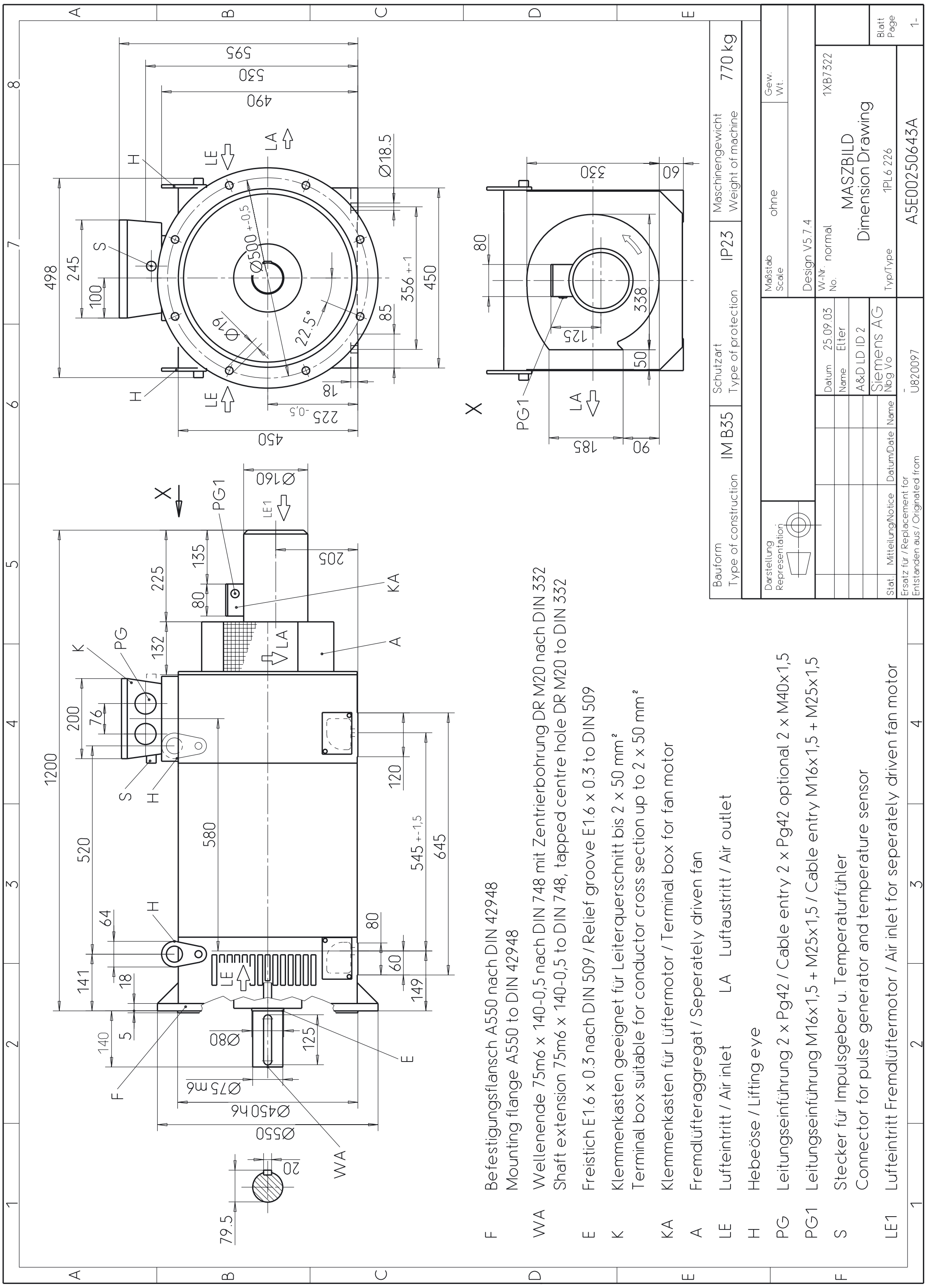


Figure 5-54 1PL6224-F-L, air flow direction DE→NDE, A5E00250635A



F	Befestigungsflansch A550 nach DIN 42948 Mounting flange A550 to DIN 42948
WA	Wellenende 75m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 75m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 3 x 150 mm² Terminal box suitable for conductor cross section up to 3 x 150 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 3 x M72x2 / Cable entry 3 x M72x2 optional 3 x M75x1,5
PG1	Leitungseinführung M20x1,5 / Cable entry M20x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
FI	Filter optional / Filter optional

Figure 5-55 1PL6224-F-L, air flow direction NDE→DE, A5E00304435A



F	Befestigungsflansch A550 nach DIN 42948 Mounting flange A550 to DIN 42948
WA	Wellenende 75m6 x 140-0,5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332 Shaft extension 75m6 x 140-0,5 to DIN 748, tapped centre hole DR M20 to DIN 332
E	Freistich E1.6 x 0.3 nach DIN 509 / Relief groove E1.6 x 0.3 to DIN 509
K	Klemmenkasten geeignet für Leiterquerschnitt bis 2 x 50 mm² Terminal box suitable for conductor cross section up to 2 x 50 mm²
KA	Klemmenkasten für Lüftermotor / Terminal box for fan motor
A	Fremdlüfteraggregat / Seperately driven fan
LE	Lufteintritt / Air inlet LA Luftaustritt / Air outlet
H	Hebeöse / Lifting eye
PG	Leitungseinführung 2 x Pg42 / Cable entry 2 x Pg42 optional 2 x M40x1,5
PG1	Leitungseinführung M16x1,5 + M25x1,5 / Cable entry M16x1,5 + M25x1,5
S	Stecker für Impulsgeber u. Temperaturfühler Connector for pulse generator and temperature sensor
LE1	Lufteintritt Fremdlüftermotor / Air inlet for seperately driven fan motor

Figure 5-56 1PL6226-B, air flow direction DE→NDE, A5E00250643A

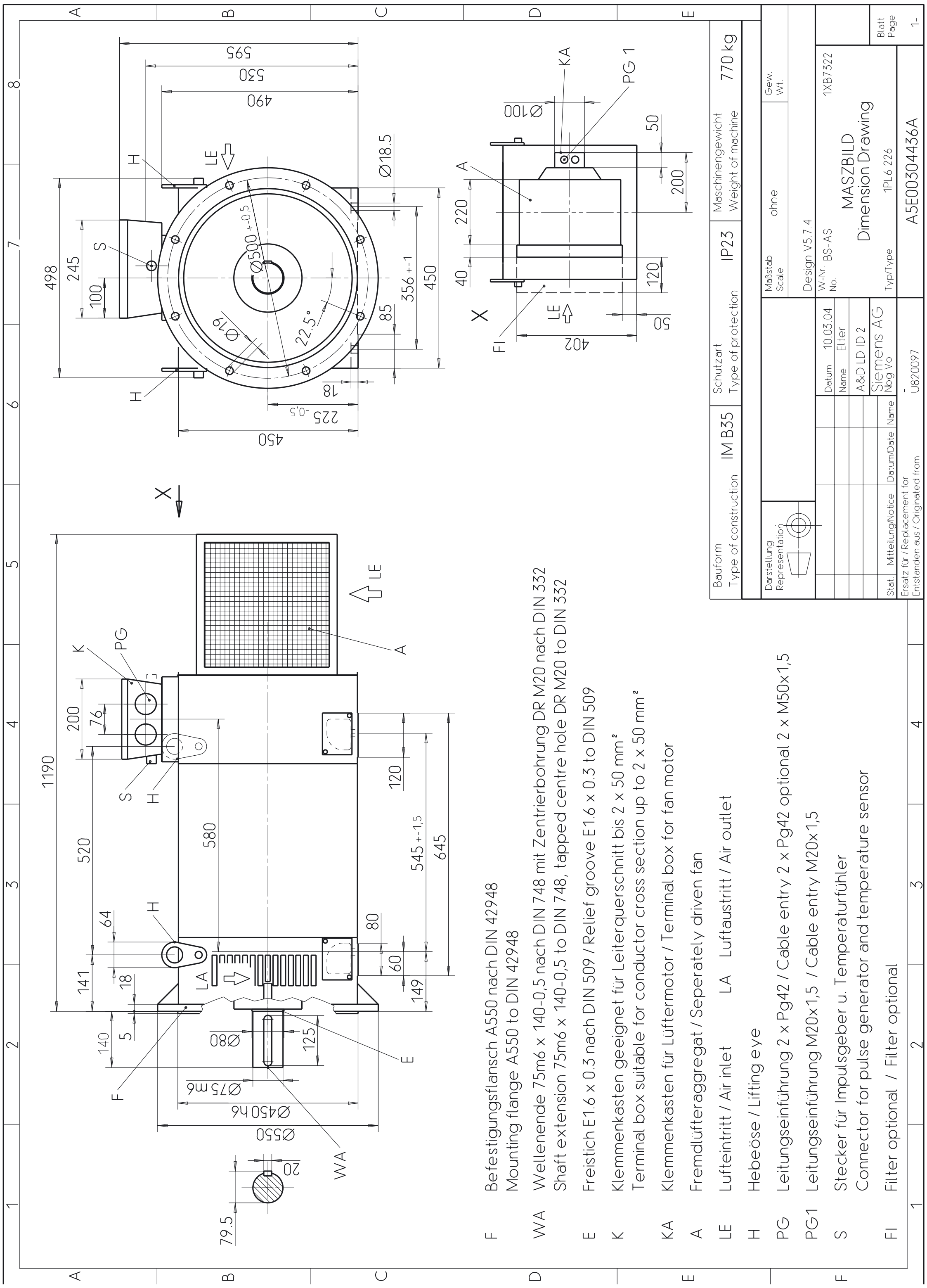


Figure 5-57 1PL6226-B, air flow direction NDE→DE, A5E00304436A

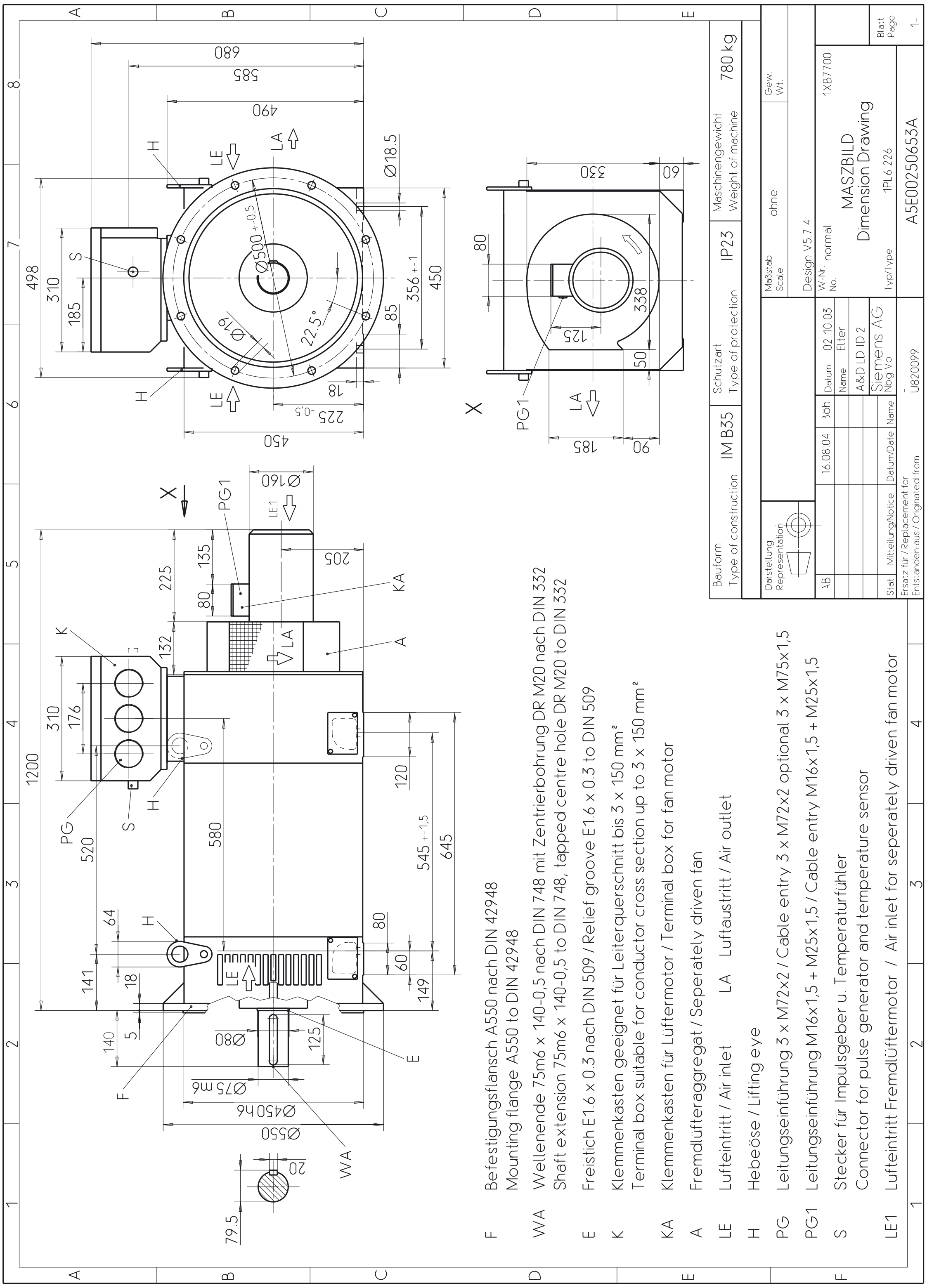


Figure 5-58 1PL6226-D-L, air flow direction DE→NDE, A5E00250653A

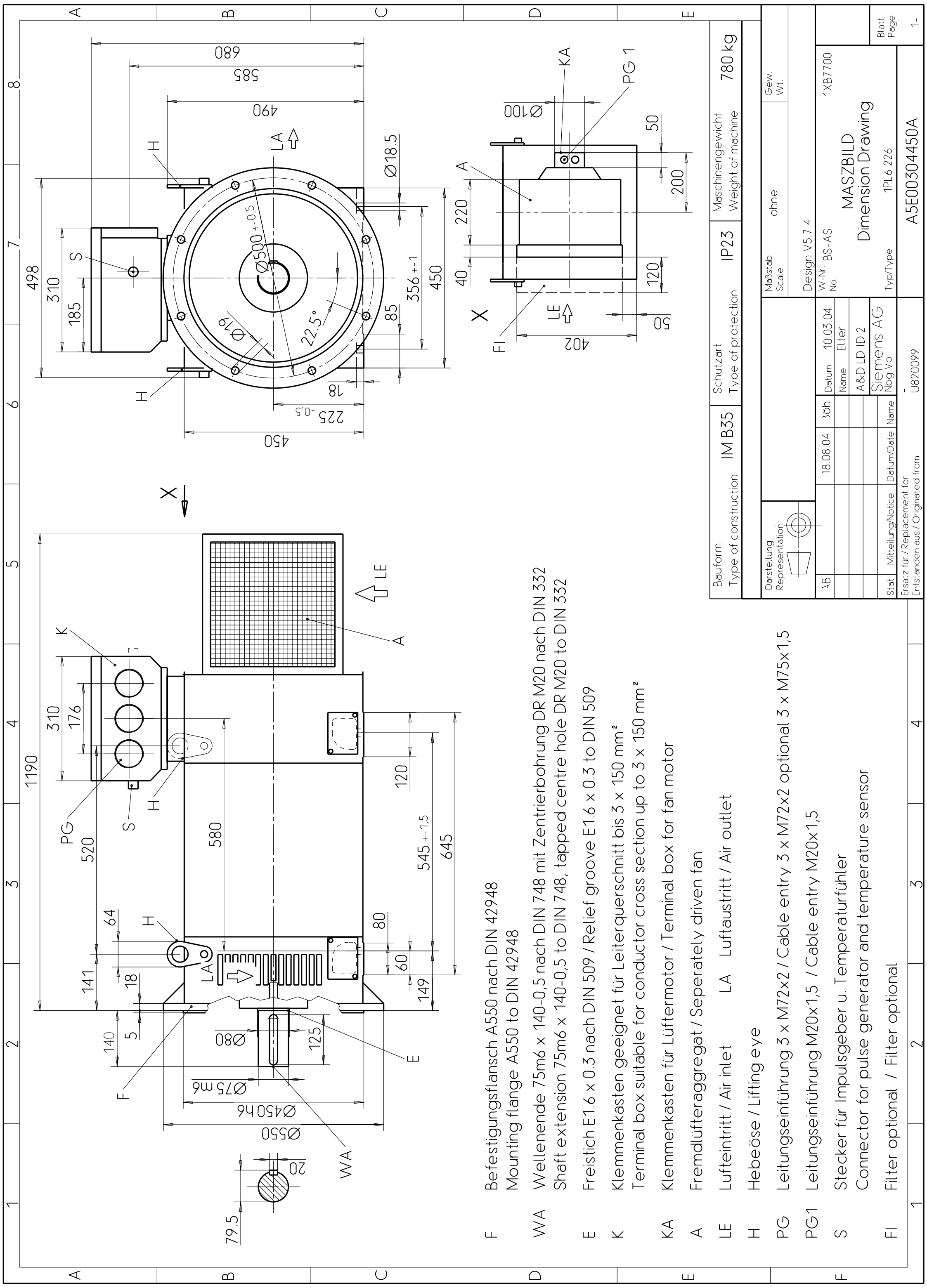


Figure 5-59 1PL6226-D-L, air flow direction NDE→DE, A5E00304450A

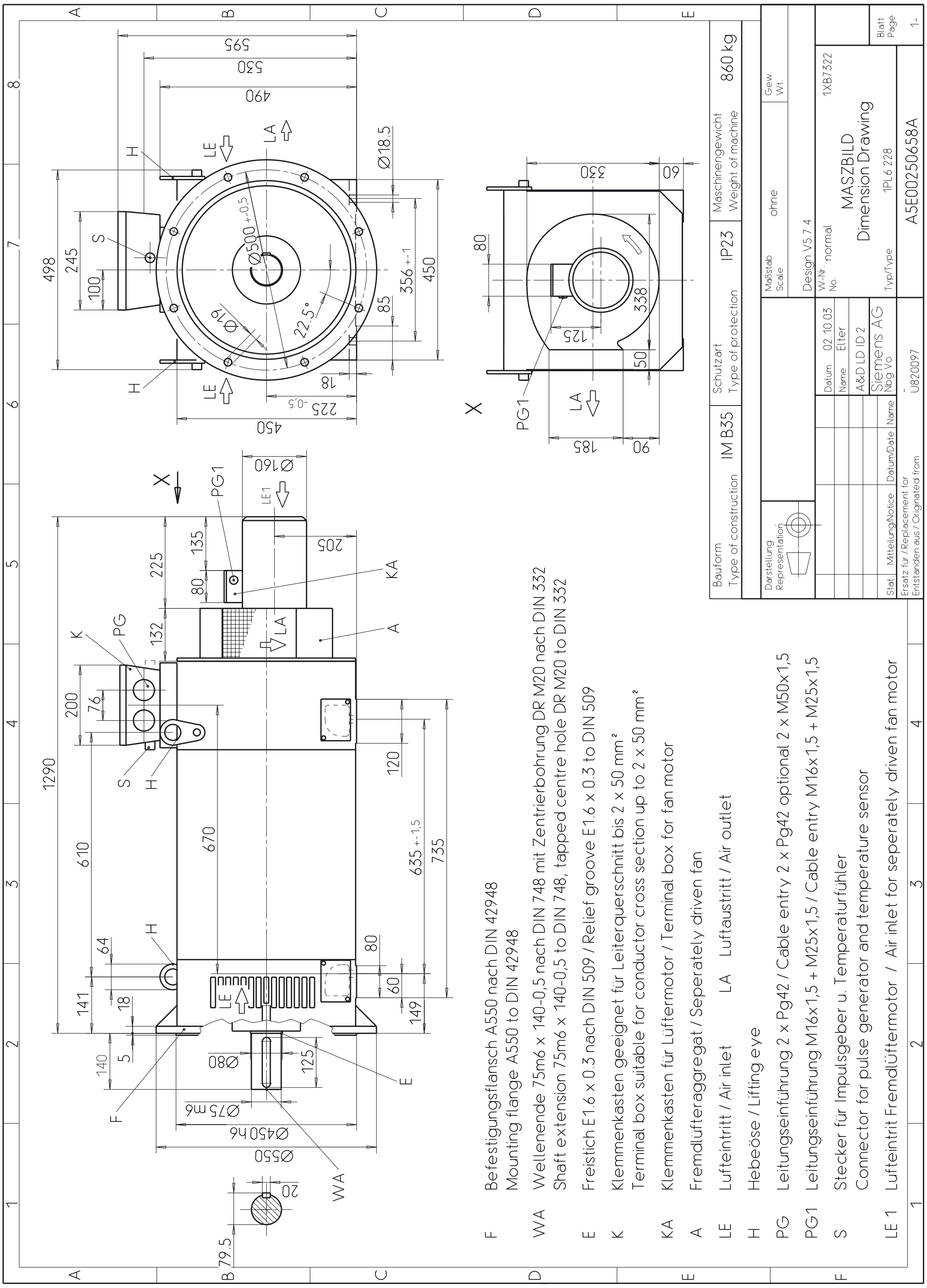


Figure 5-60 1PL6228-B, air flow direction DE→NDE, A5E00250658A

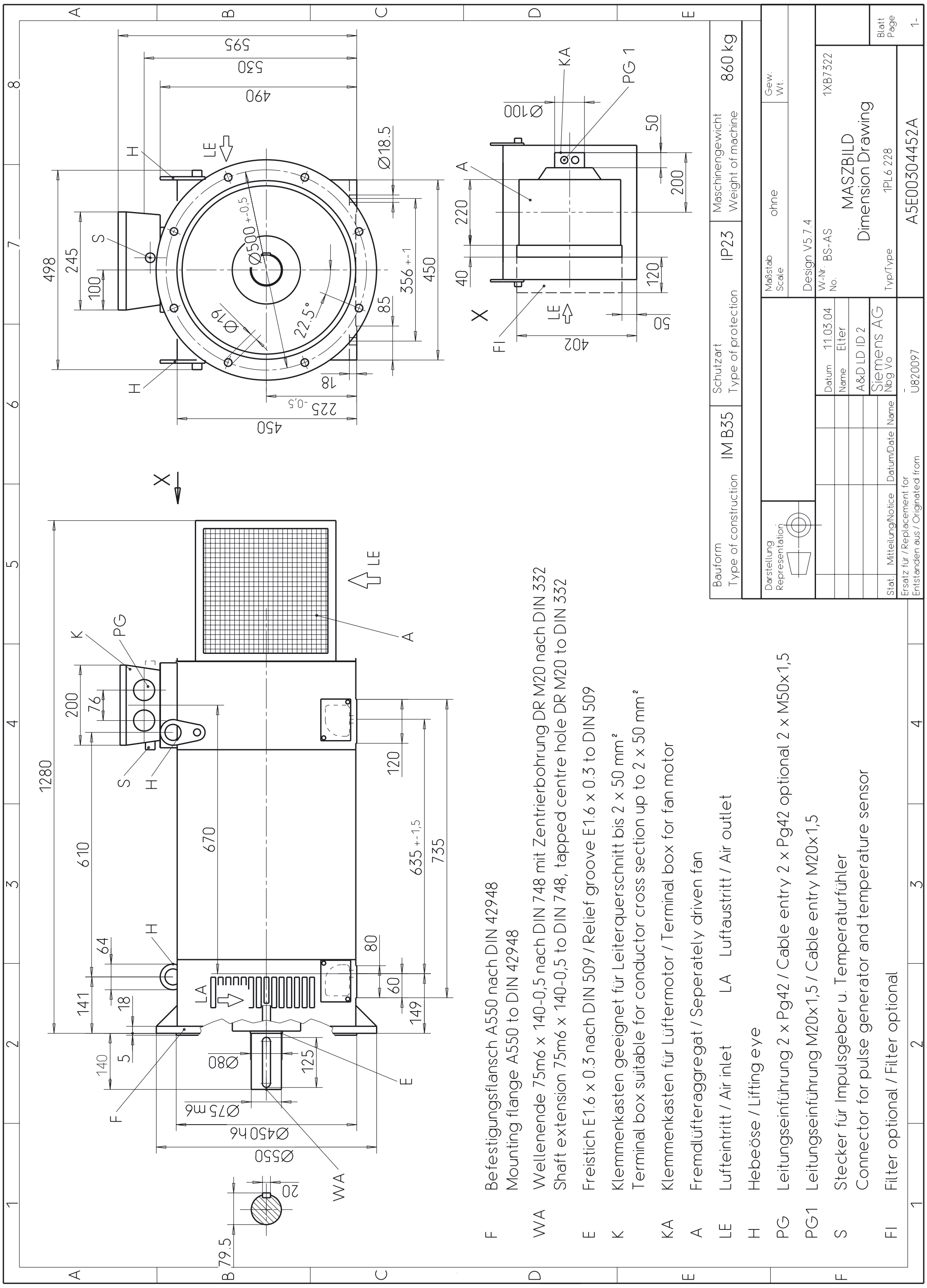


Figure 5-61 1PL6228-B, air flow direction NDE→DE, A5E00304452A

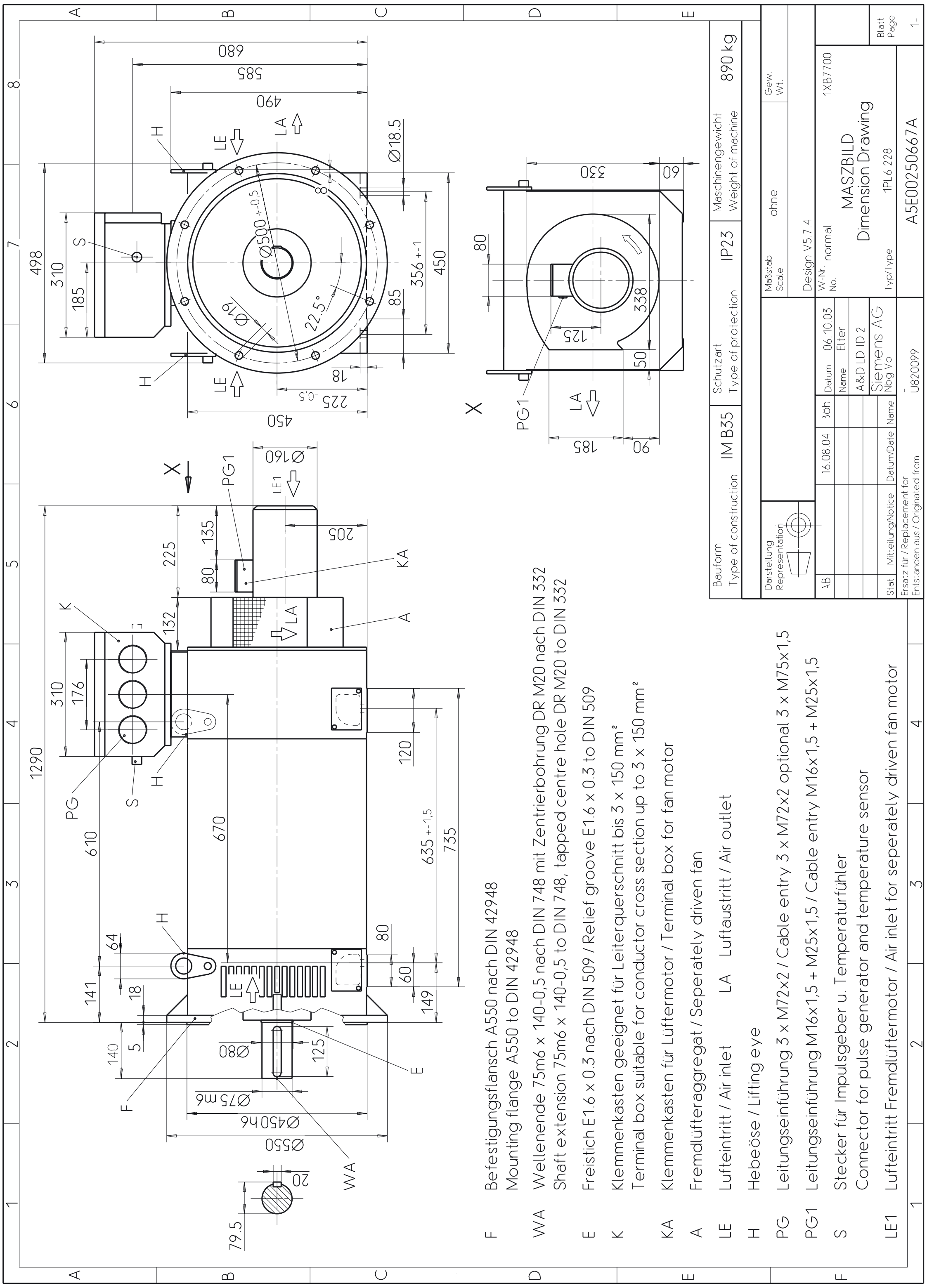


Figure 5-62 1PL6228-D-L, air flow direction DE→NDE, A5E00250667A

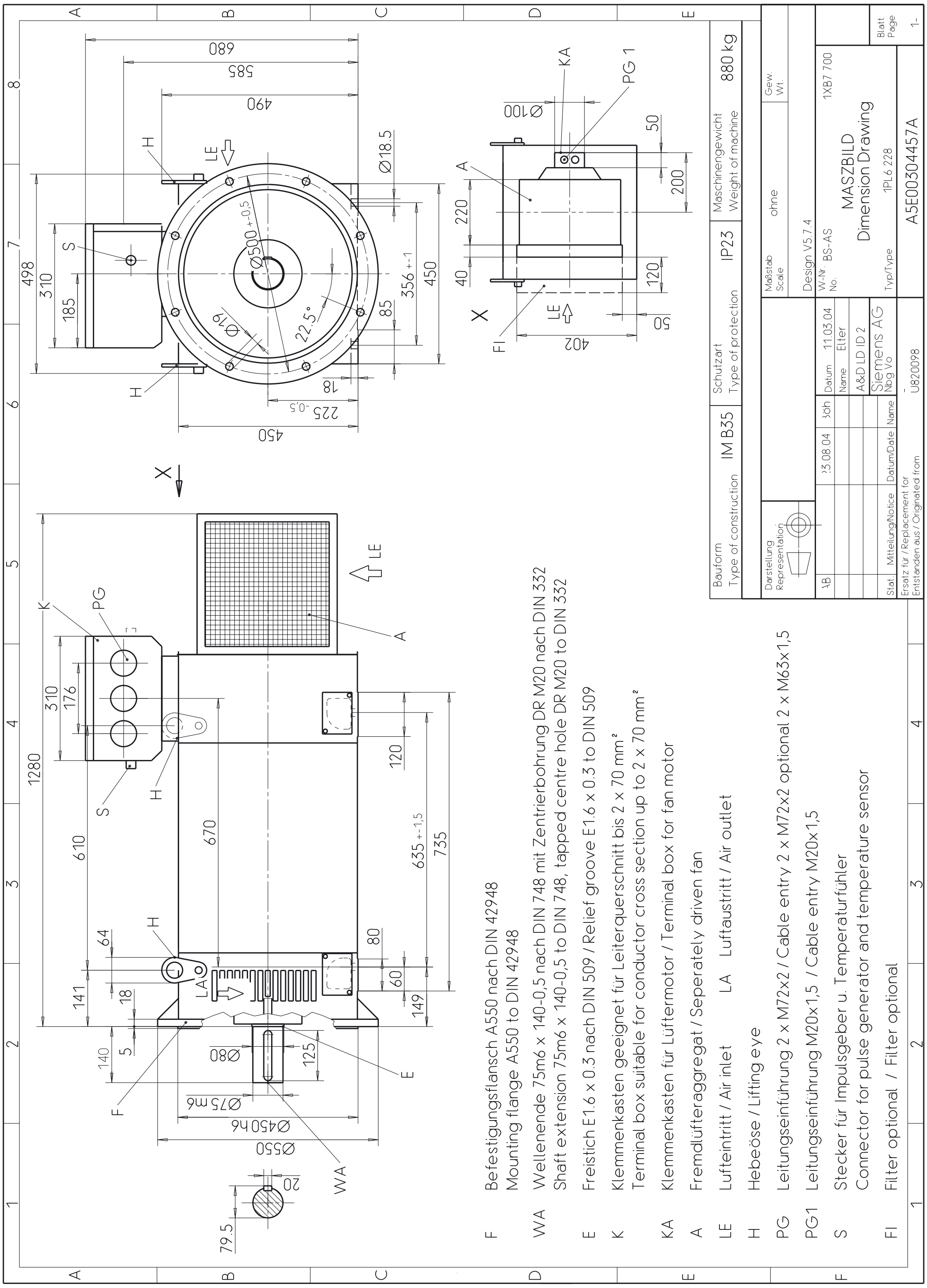
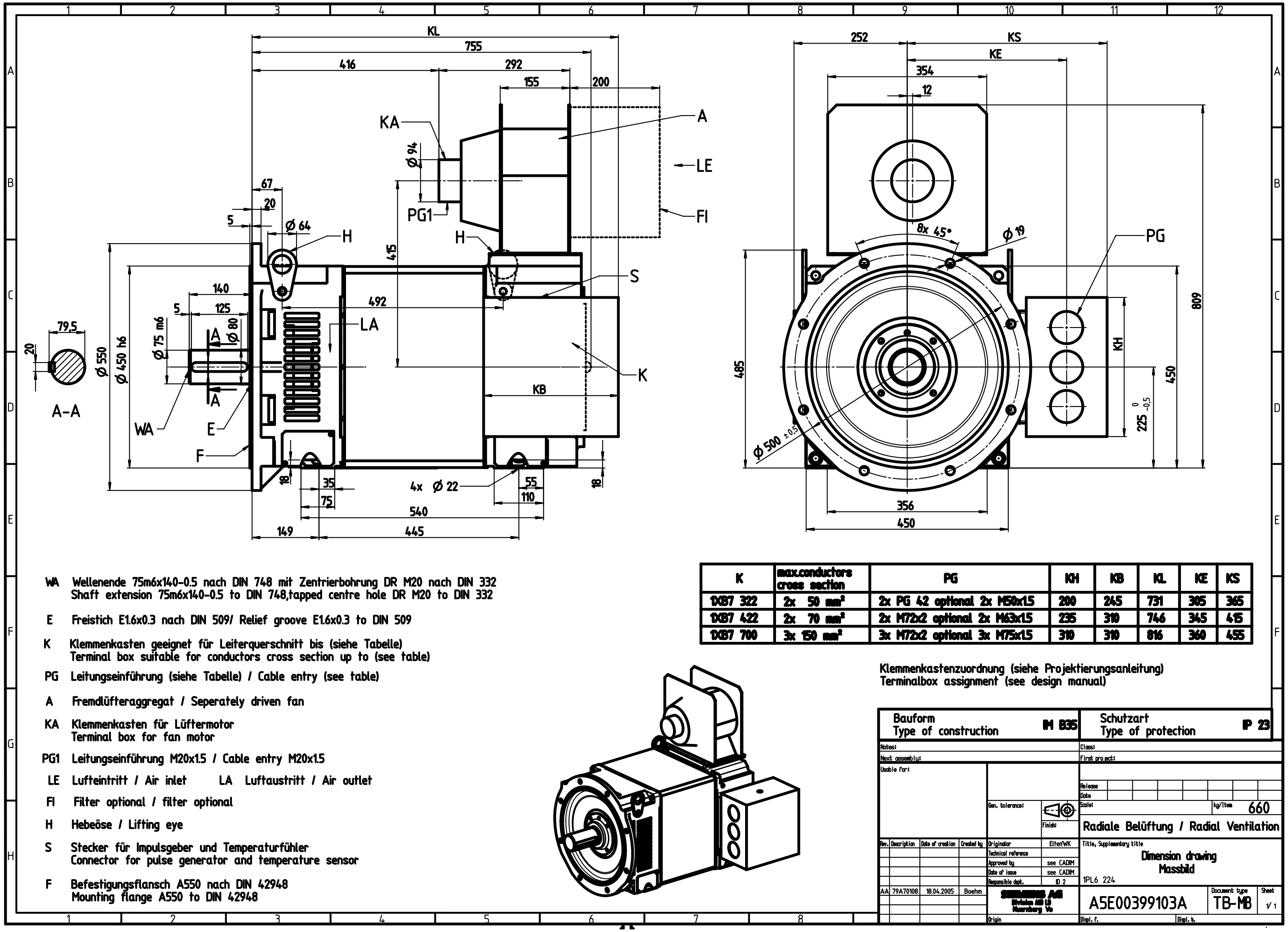


Figure 5-63 1PL6228-D-L, air flow direction NDE→DE, A5E00304457A



K	max.conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	731	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	746	345	415
1XB7 700	3x 150 mm²	3x M72x2 optional 3x M75x1.5	310	310	816	360	455

Klemmenkastenzuordnung (siehe Projektierungsanleitung)
Terminalbox assignment (see design manual)

WA Wellenende 75m6x140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 75m6x140-0.5 to DIN 748,tapped centre hole DR M20 to DIN 332

E Freistich E1.6x0.3 nach DIN 509/ Relief groove E1.6x0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis (siehe Tabelle)
Terminal box suitable for conductors cross section up to (see table)

PG Leitungseinführung (siehe Tabelle) / Cable entry (see table)

A Fremdlüfteraggregat / Seperately driven fan

KA Klemmenkasten für Lüftermotor
Terminal box for fan motor

PG1 Leitungseinführung M20x1.5 / Cable entry M20x1.5

LE Lufteintritt / Air inlet LA Luftaustritt / Air outlet

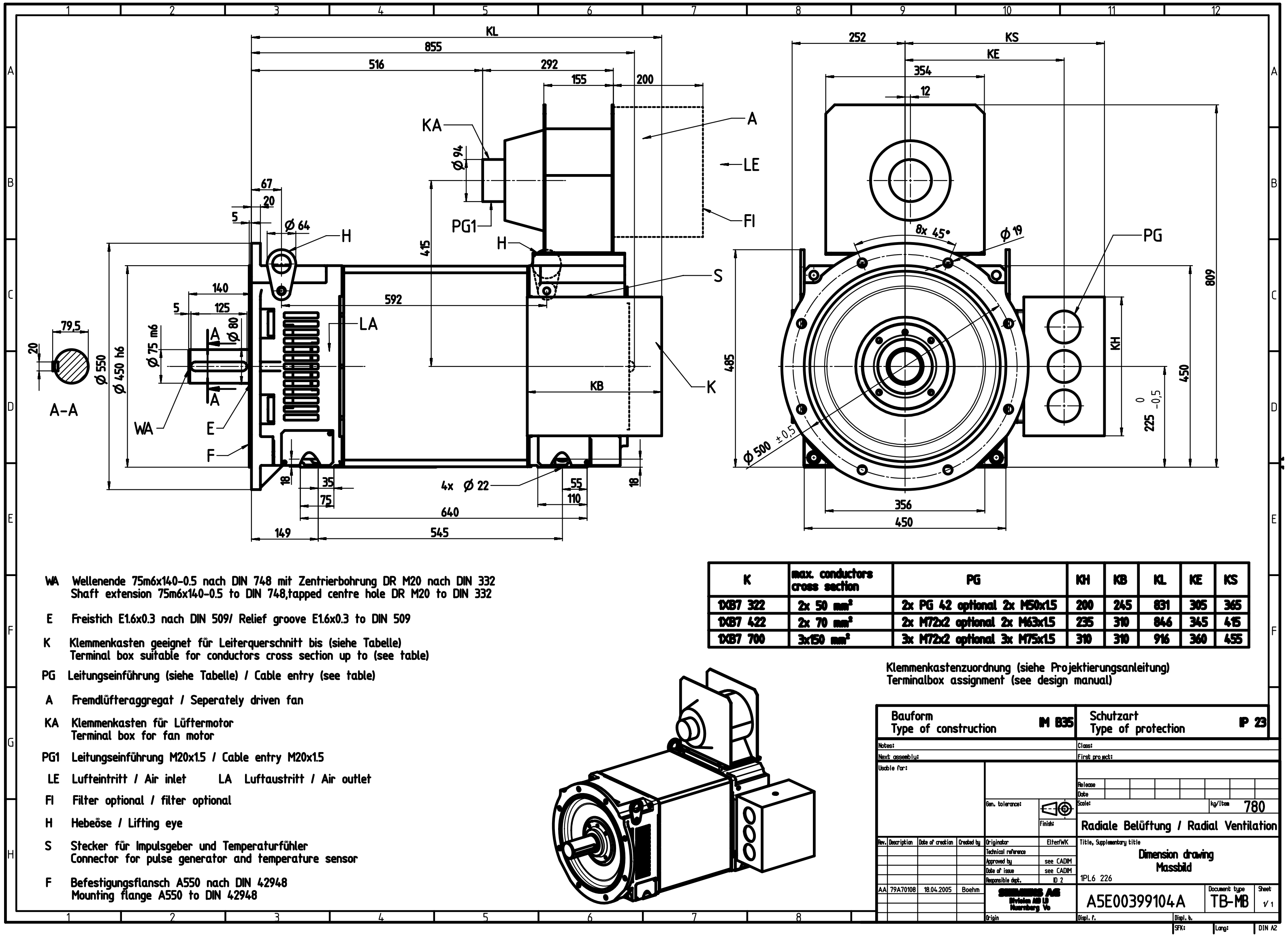
FI Filter optional / filter optional

H Hebeöse / Lifting eye

S Stecker für Impulsgeber und Temperaturfühler
Connector for pulse generator and temperature sensor

F Befestigungsflansch A550 nach DIN 42948
Mounting flange A550 to DIN 42948

Figure 5-64 1PL6224-F-L, air flow direction NDE→DE radial, A5E00399103A



WA Wellenende 75m6x140-0.5 nach DIN 748 mit Zentrierbohrung DR M20 nach DIN 332
Shaft extension 75m6x140-0.5 to DIN 748,tapped centre hole DR M20 to DIN 332

E Freistich E1.6x0.3 nach DIN 509/ Relief groove E1.6x0.3 to DIN 509

K Klemmenkasten geeignet für Leiterquerschnitt bis (siehe Tabelle)
Terminal box suitable for conductors cross section up to (see table)

PG Leitungseinführung (siehe Tabelle) / Cable entry (see table)

A Fremdlüfteraggregat / Seperately driven fan

KA Klemmenkasten für Lüftermotor
Terminal box for fan motor

PG1 Leitungseinführung M20x1.5 / Cable entry M20x1.5

LE Lufteintritt / Air inlet **LA** Luftaustritt / Air outlet

FI Filter optional / filter optional

H Hebeöse / Lifting eye

S Stecker für Impulsgeber und Temperaturfühler
Connector for pulse generator and temperature sensor

F Befestigungsflansch A550 nach DIN 42948
Mounting flange A550 to DIN 42948

K	max. conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	831	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	846	345	415
1XB7 700	3x150 mm²	3x M72x2 optional 3x M75x1.5	310	310	916	360	455

Klemmenkastenzuordnung (siehe Projektierungsanleitung)
Terminalbox assignment (see design manual)

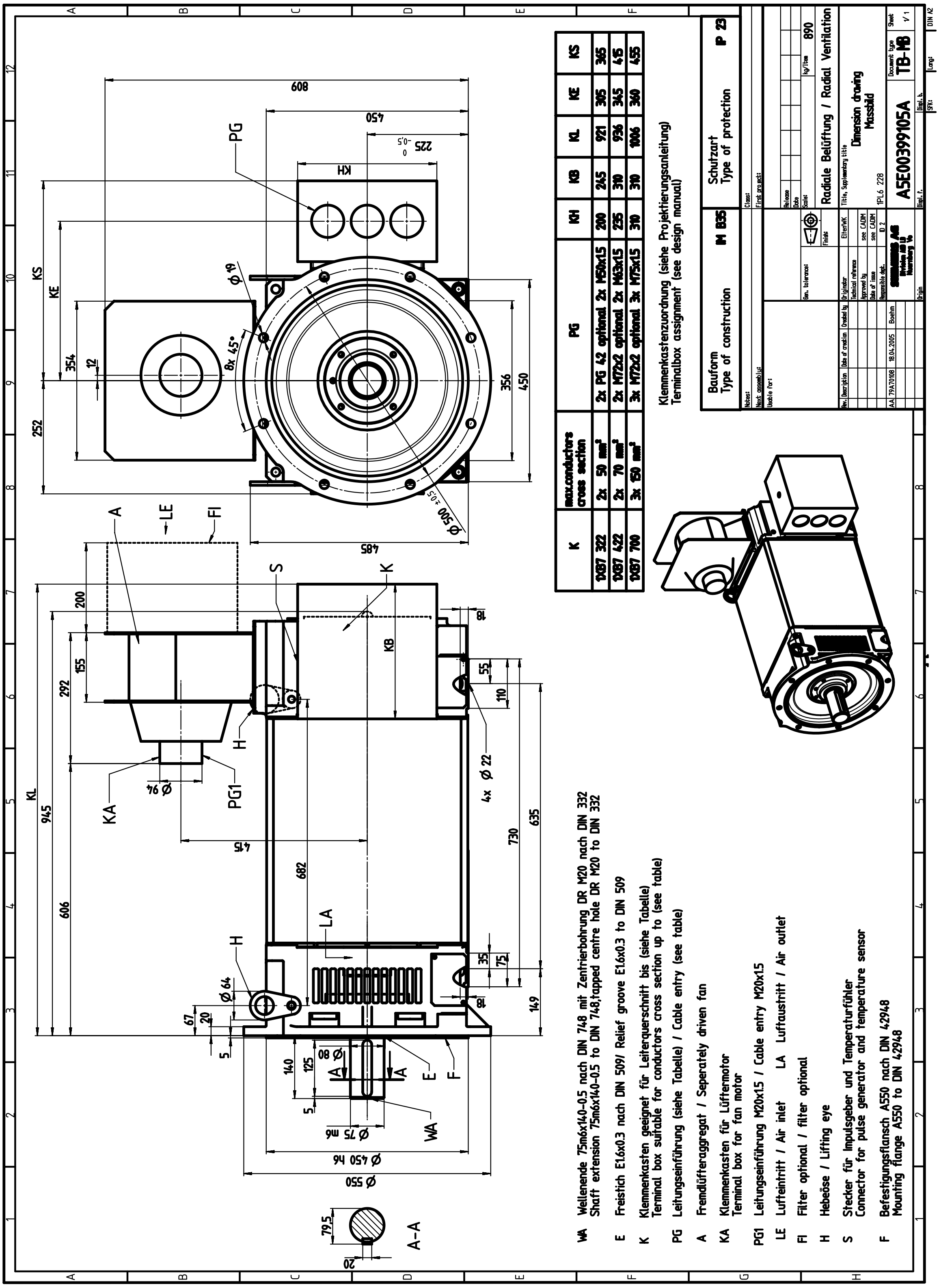
Bauform
Type of construction IM B35
Schutzart
Type of protection IP 23
Notes:
Class:
Next assembly:
First project:
Usable for:
Release
Date
Gen. tolerance:
Finish:
Scale:
kg/Item 780
Radiale Belüftung / Radial Ventilation

Rev.	Description	Date of creation	Created by
AA	79A70108	18.04.2005	Boehm

Originator	Elten/WK
Technical reference	
Approved by	see CADIM
Date of issue	see CADIM
Responsible dept.	ID 2

SIEMENS AG
Division A&D LD
Nuernberg Vo
Origin
Title, Supplementary title
Dimension drawing
Massbild
1PL6 226
A5E00399104A
Document type TB-MB
Sheet 1/1
Displ. f.
Displ. b.
SFK:
Lang:
DIN A2

Figure 5-65 1PL6226-D-L, air flow direction NDE→DE radial, A5E00399104A



K	max.conductors cross section	PG	KH	KB	KL	KE	KS
1XB7 322	2x 50 mm²	2x PG 42 optional 2x M50x1.5	200	245	921	305	365
1XB7 422	2x 70 mm²	2x M72x2 optional 2x M63x1.5	235	310	936	345	415
1XB7 700	3x 150 mm²	3x M72x2 optional 3x M75x1.5	310	310	1006	360	455

Figure 5-66 1PL6228-D-L, air flow direction NDE→DE radial, A5E0399105A

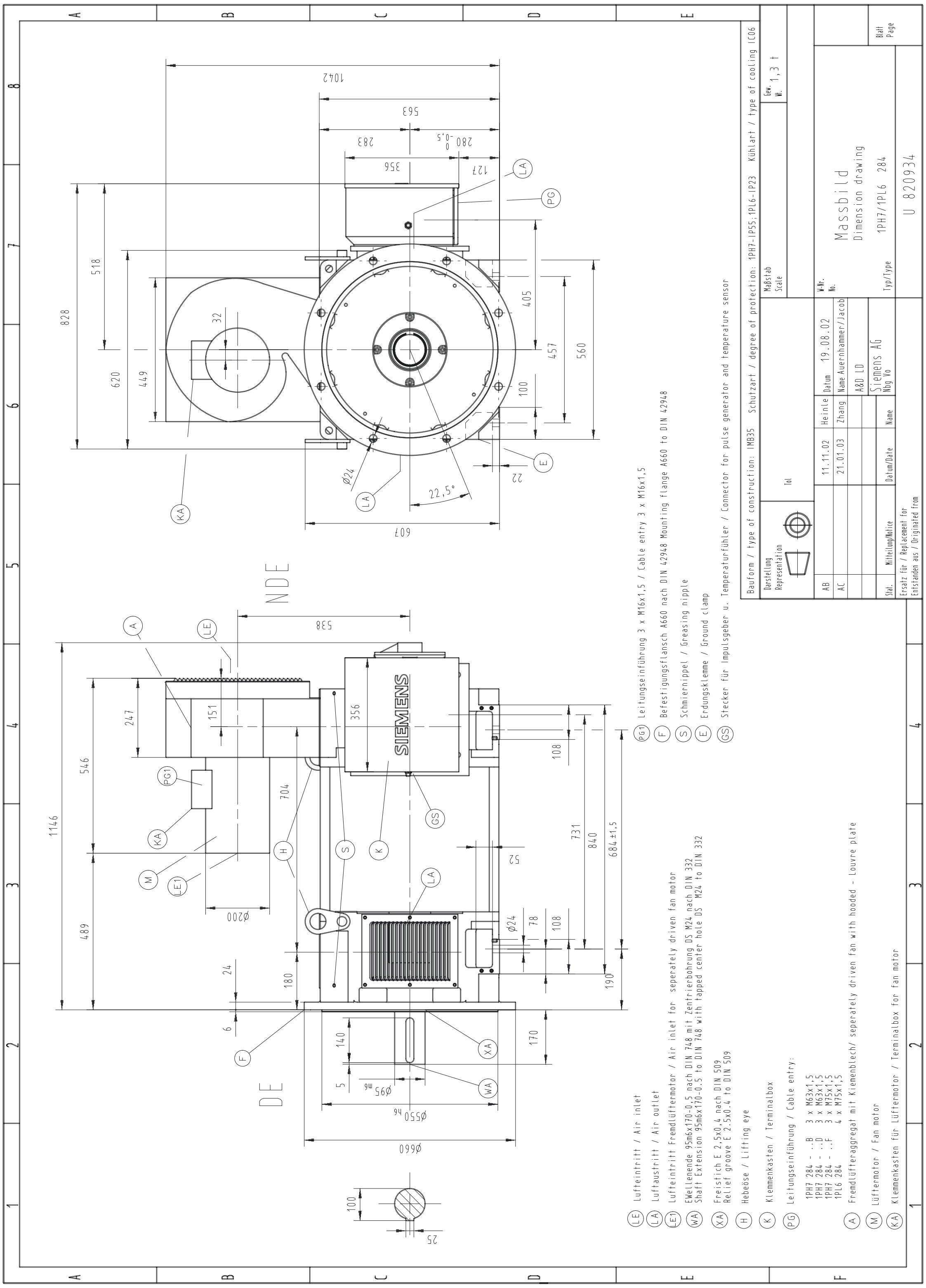


Figure 5-67 1PL6284, air flow direction NDE→DE, U820934

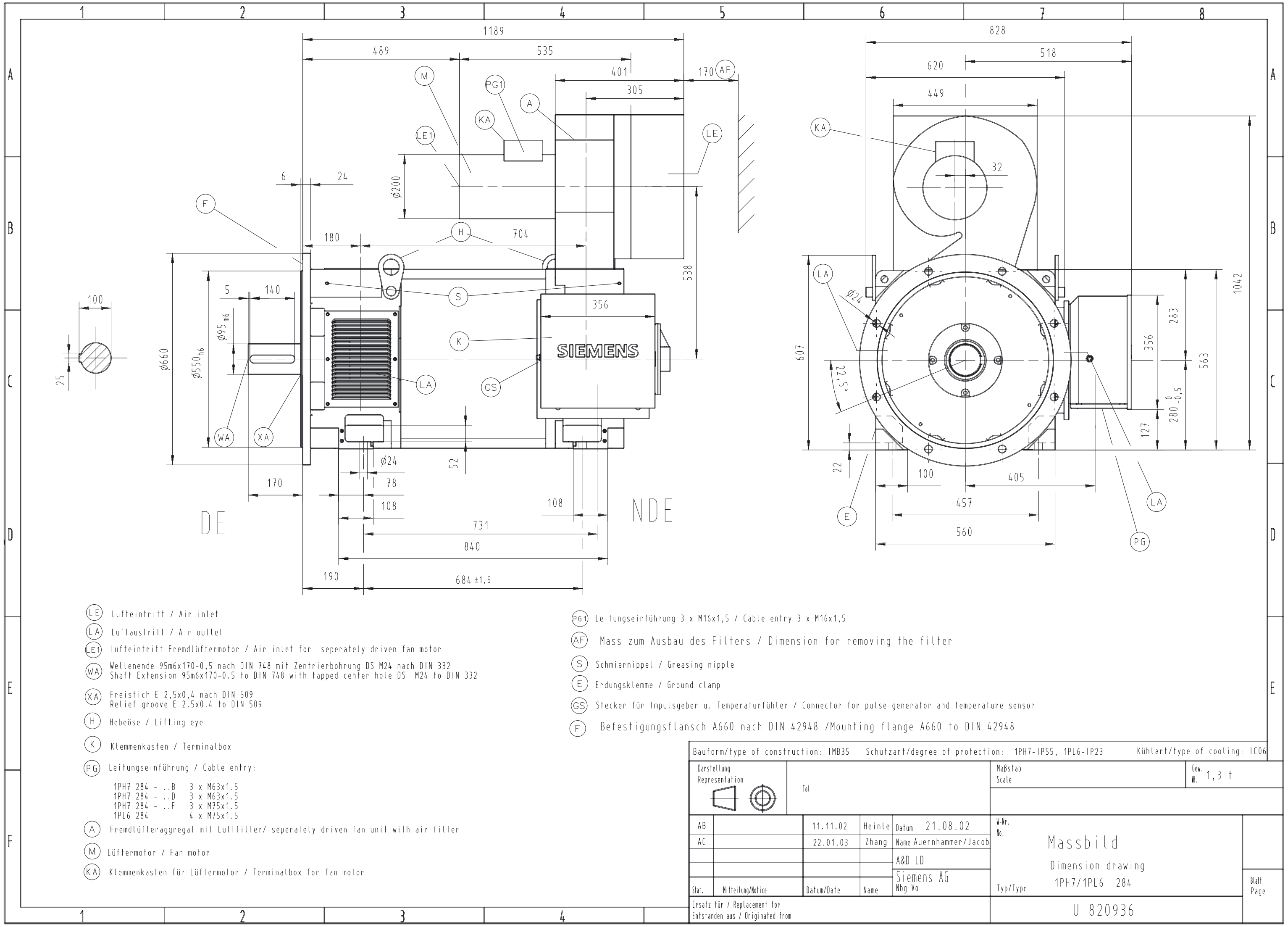


Figure 5-68 1PL6284, air flow direction NDE→DE, filter, U820936

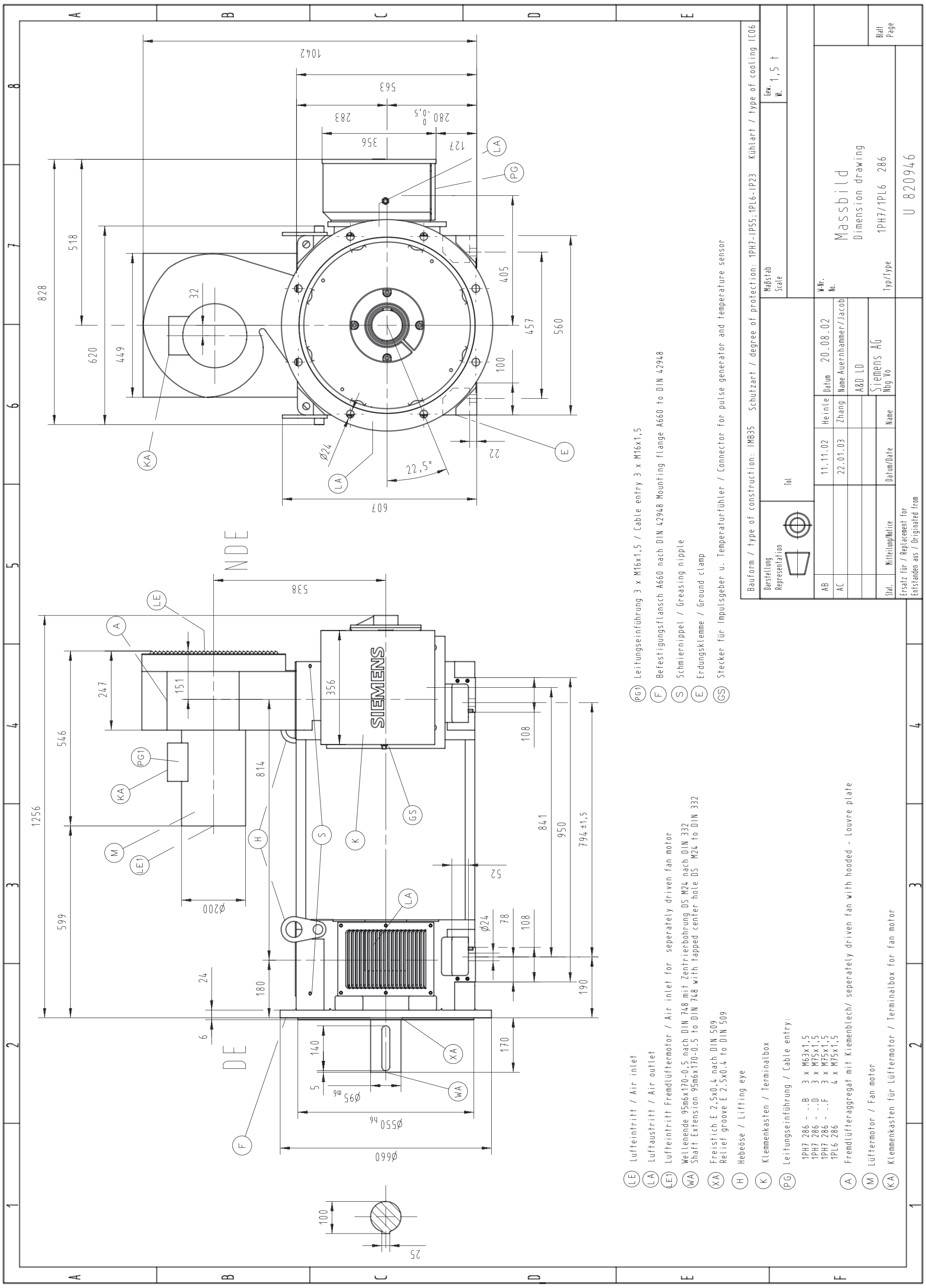


Figure 5-69 1PL6286, air flow direction NDE→DE, U820946

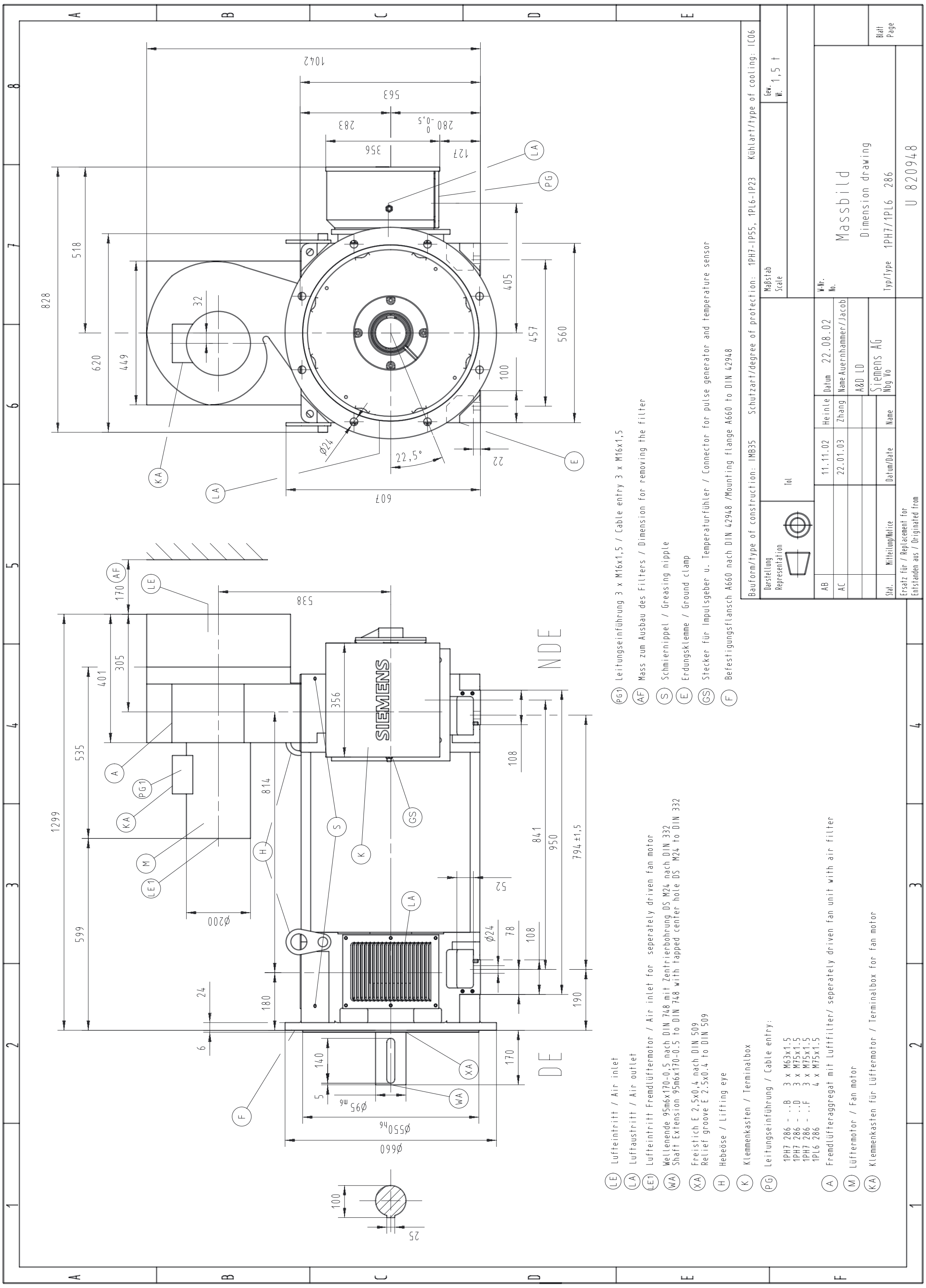


Figure 5-70 1PL6286, air flow direction NDE→DE, filter, U820948

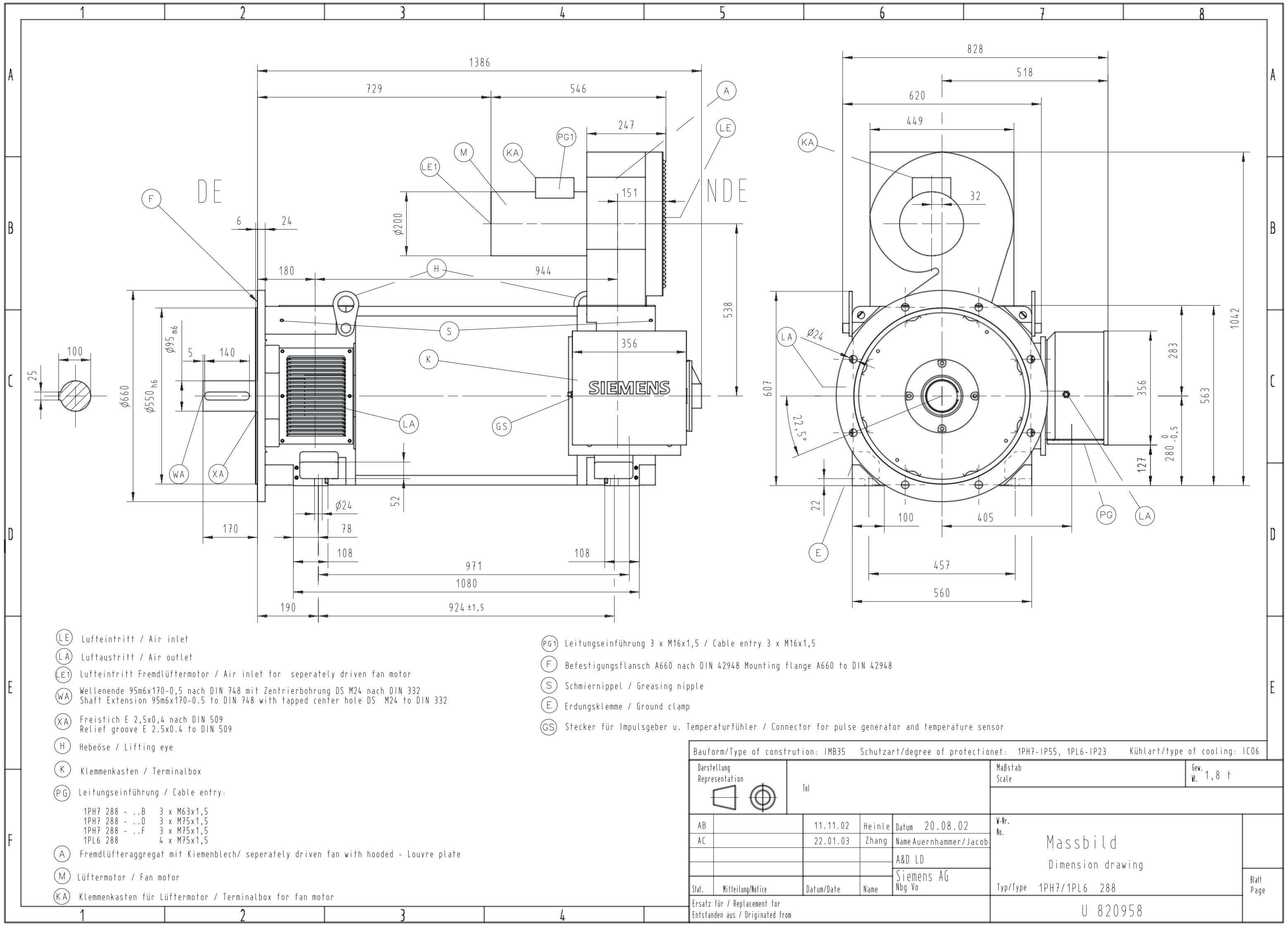


Figure 5-71 1PL6288, air flow direction NDE→DE, U820958

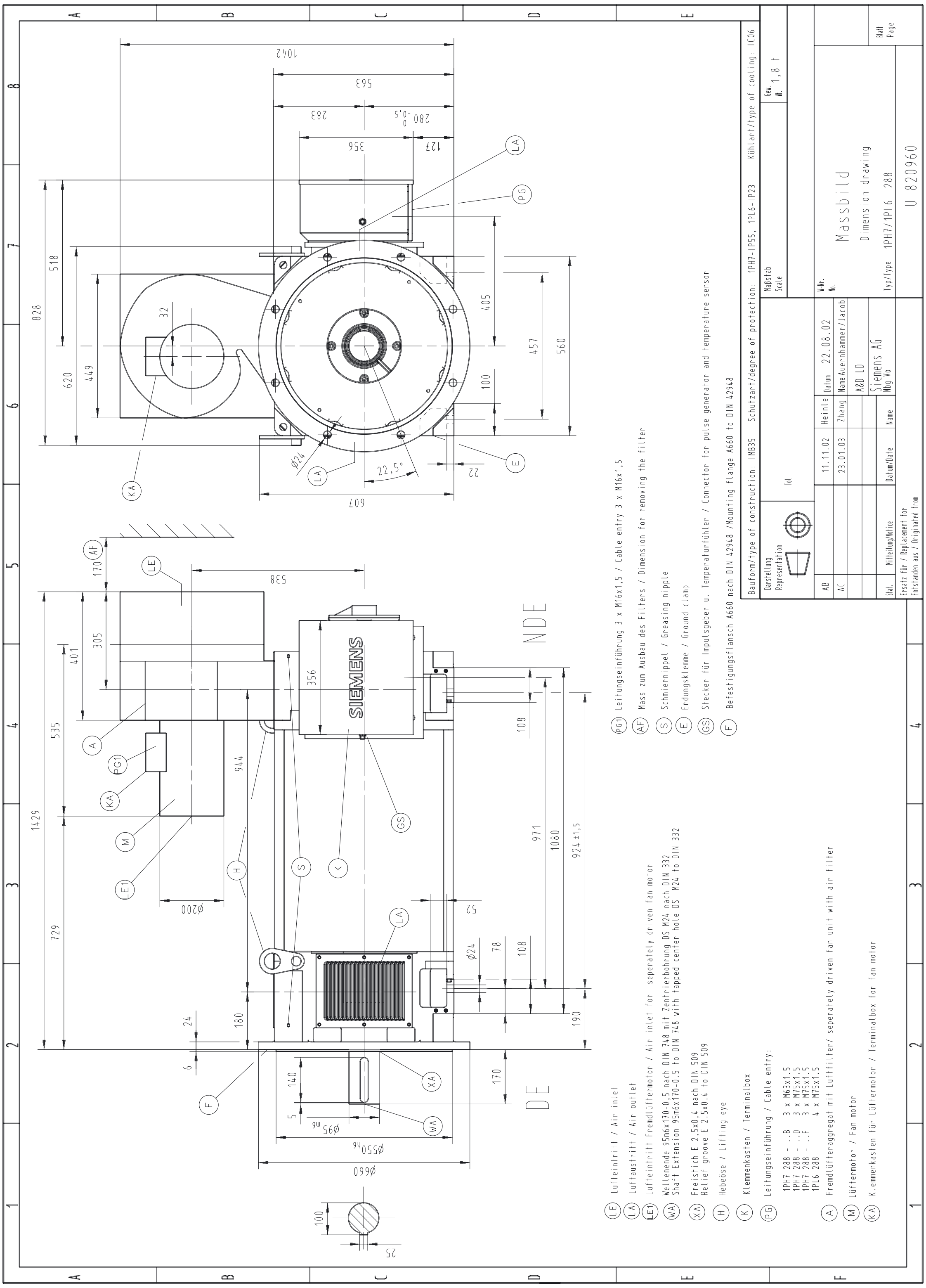


Figure 5-72 1PL6288, air flow direction NDE→DE, filter, U820960

5.5 Type of construction IM B35 with second shaft end (SH 280)

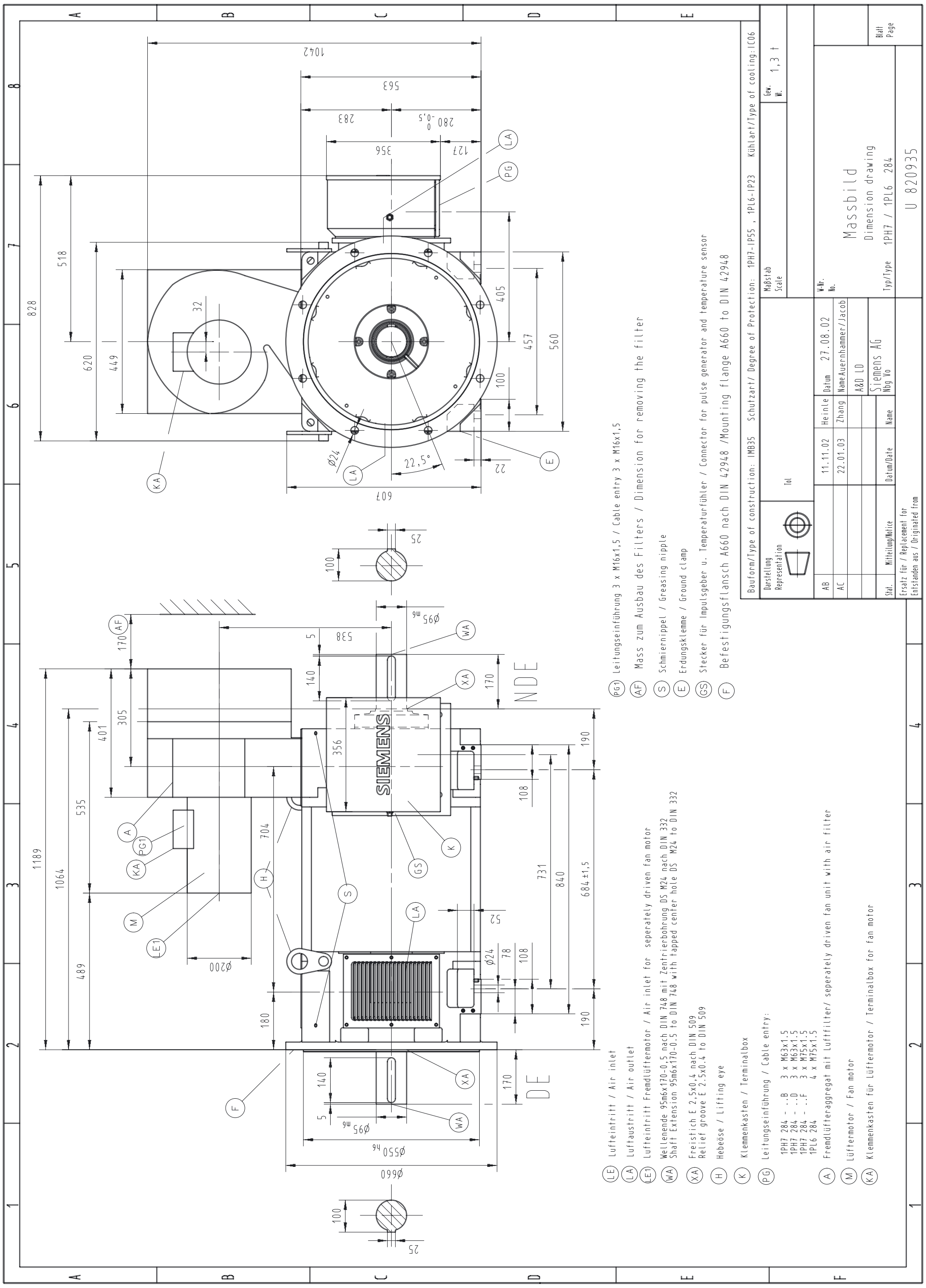


Figure 5-73 1PL6284, air flow direction NDE→DE, filter, U820935

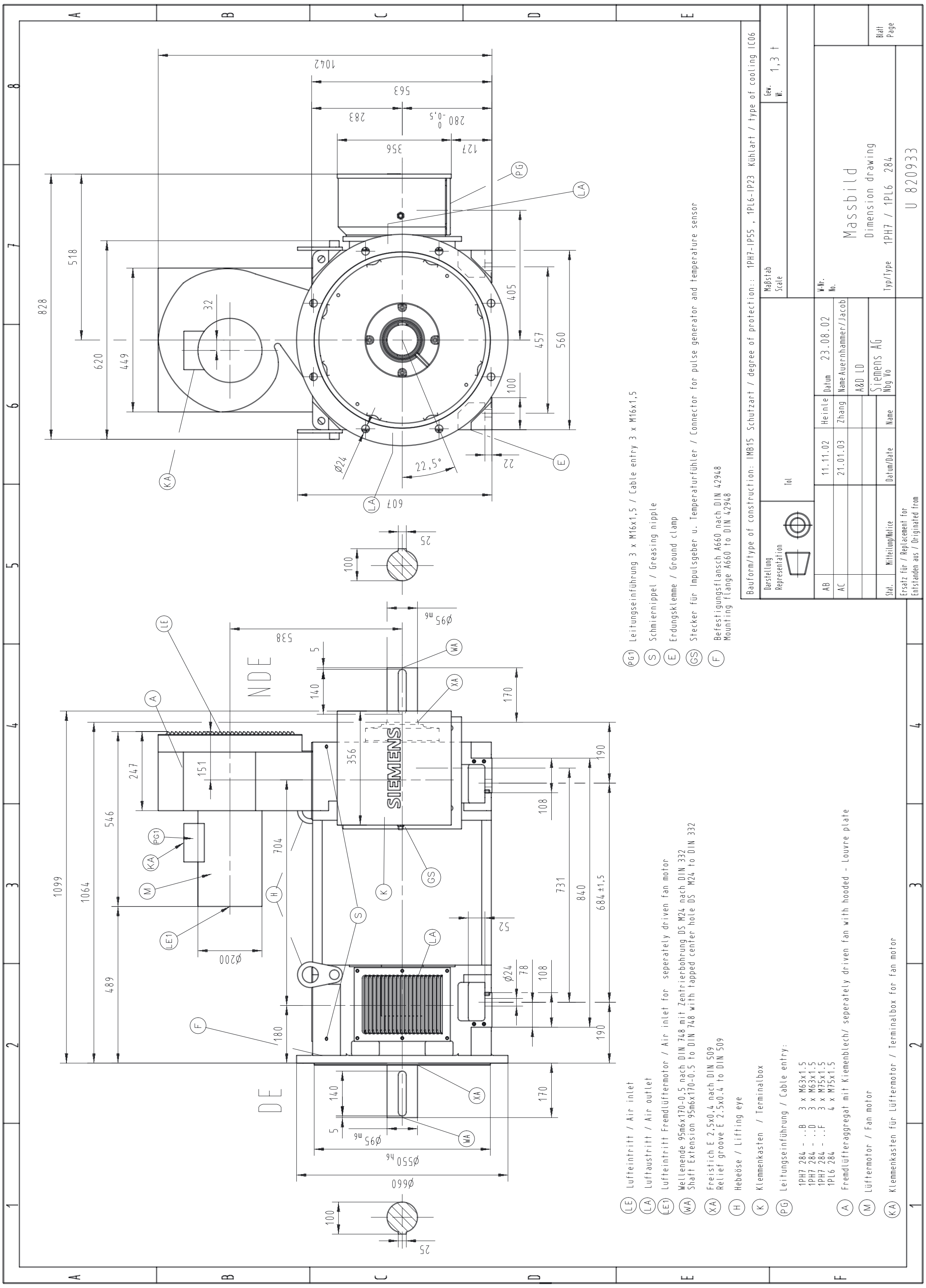


Figure 5-74 1PL6284, air flow direction NDE→DE, U820933

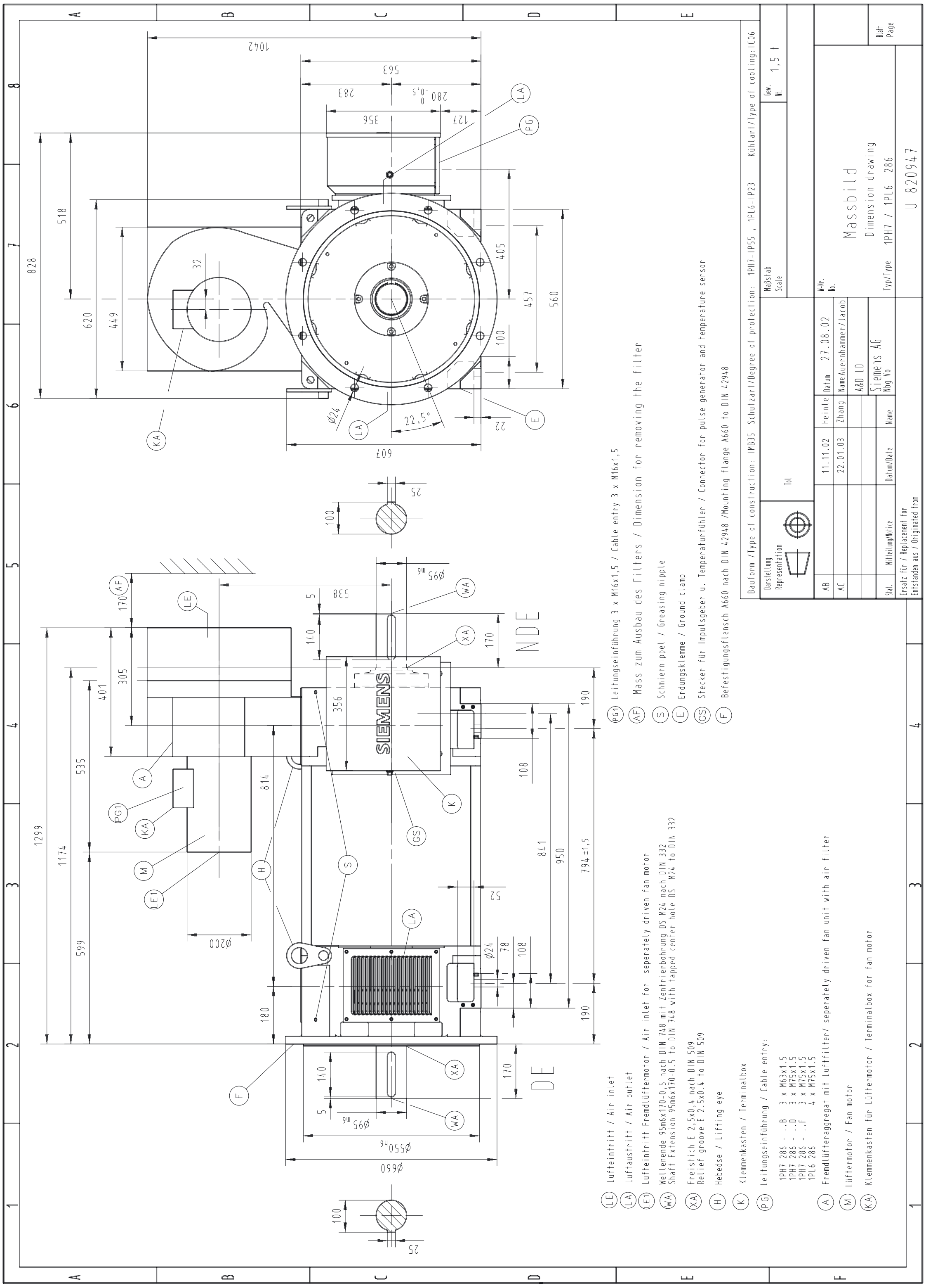


Figure 5-75 1PL6286, air flow direction NDE→DE, filter, U820947

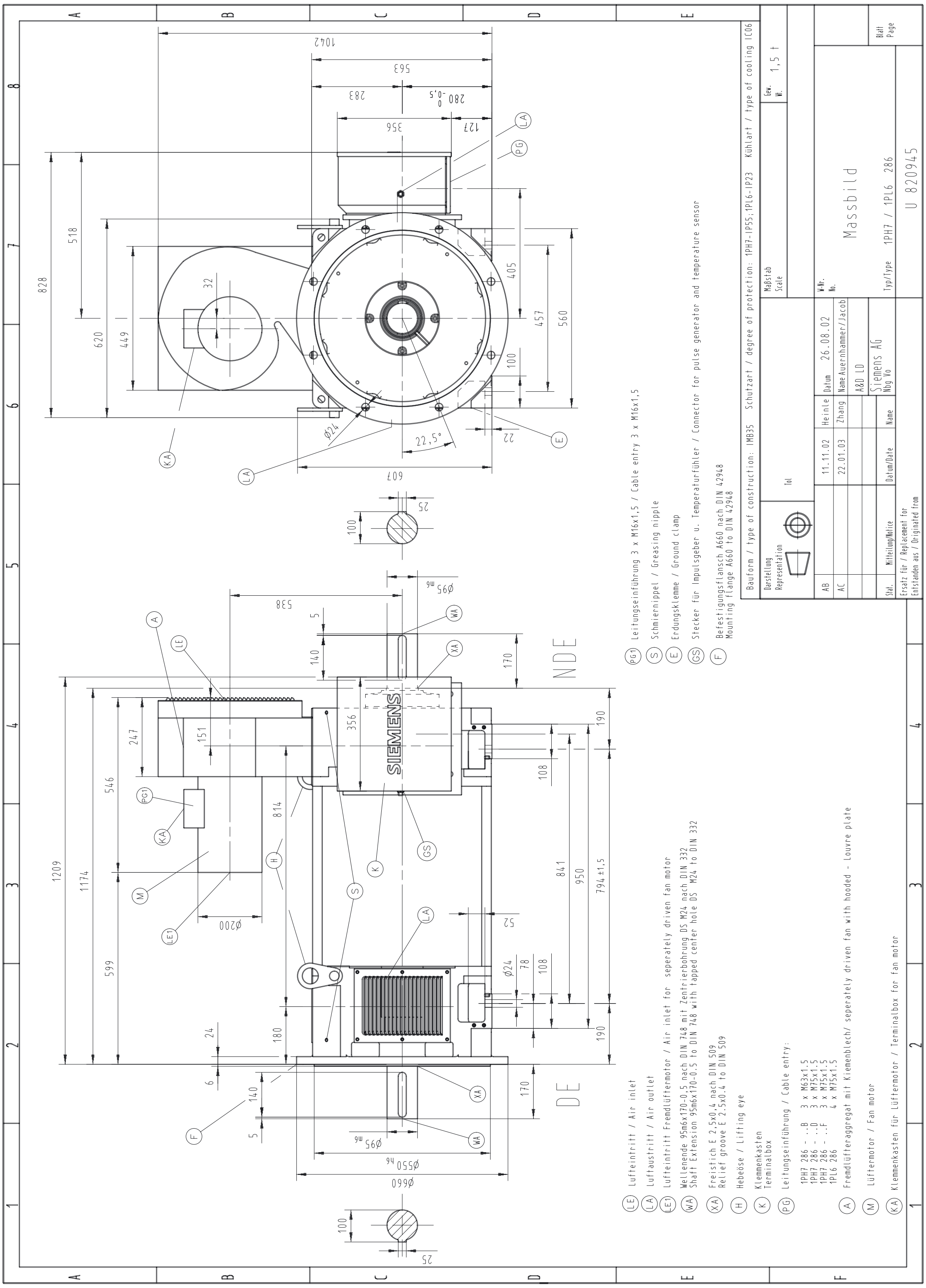


Figure 5-76 1PL6286, air flow direction NDE→DE, U820945

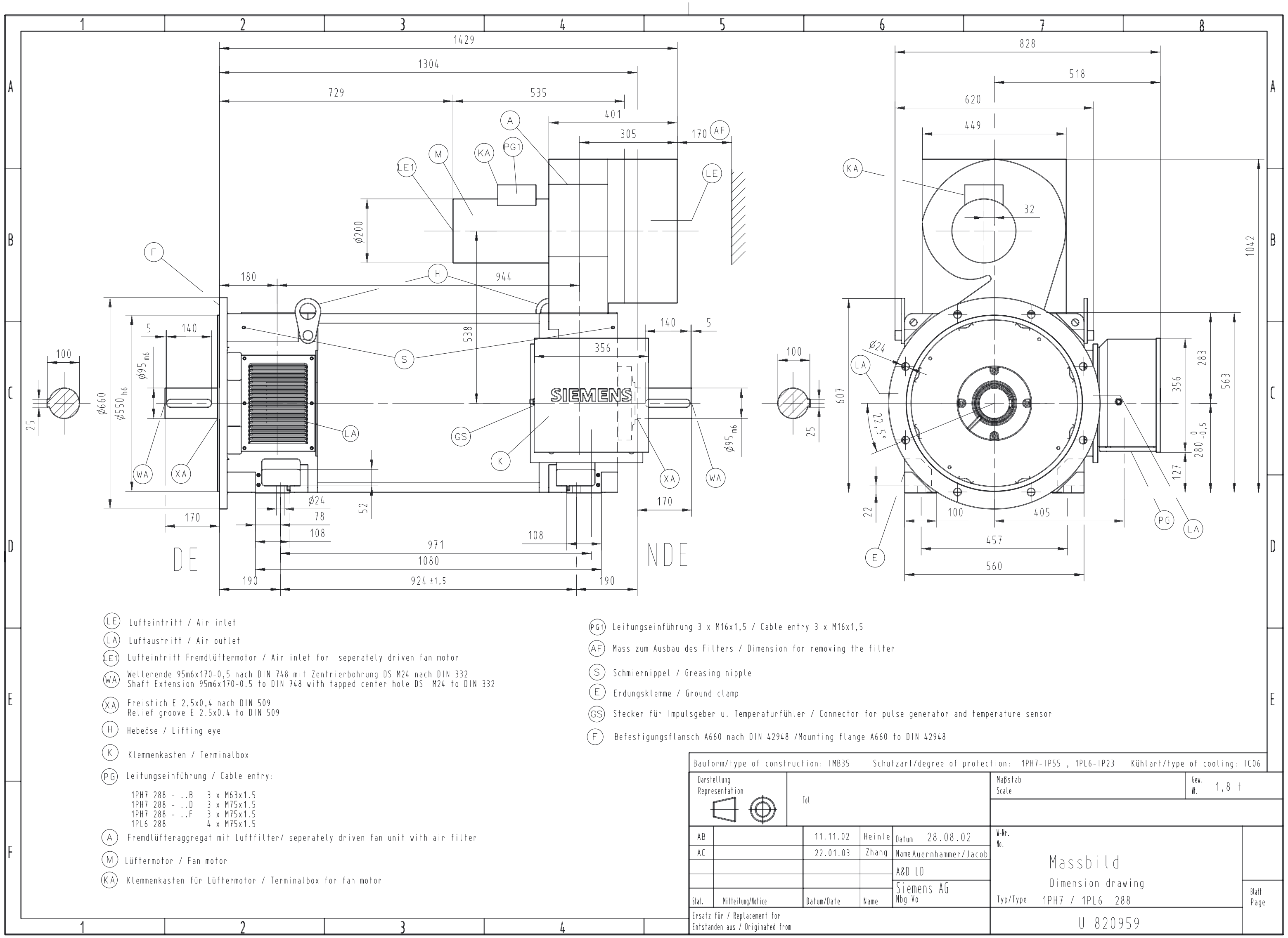


Figure 5-77 1PL6288, air flow direction NDE-DE, filter, U820959

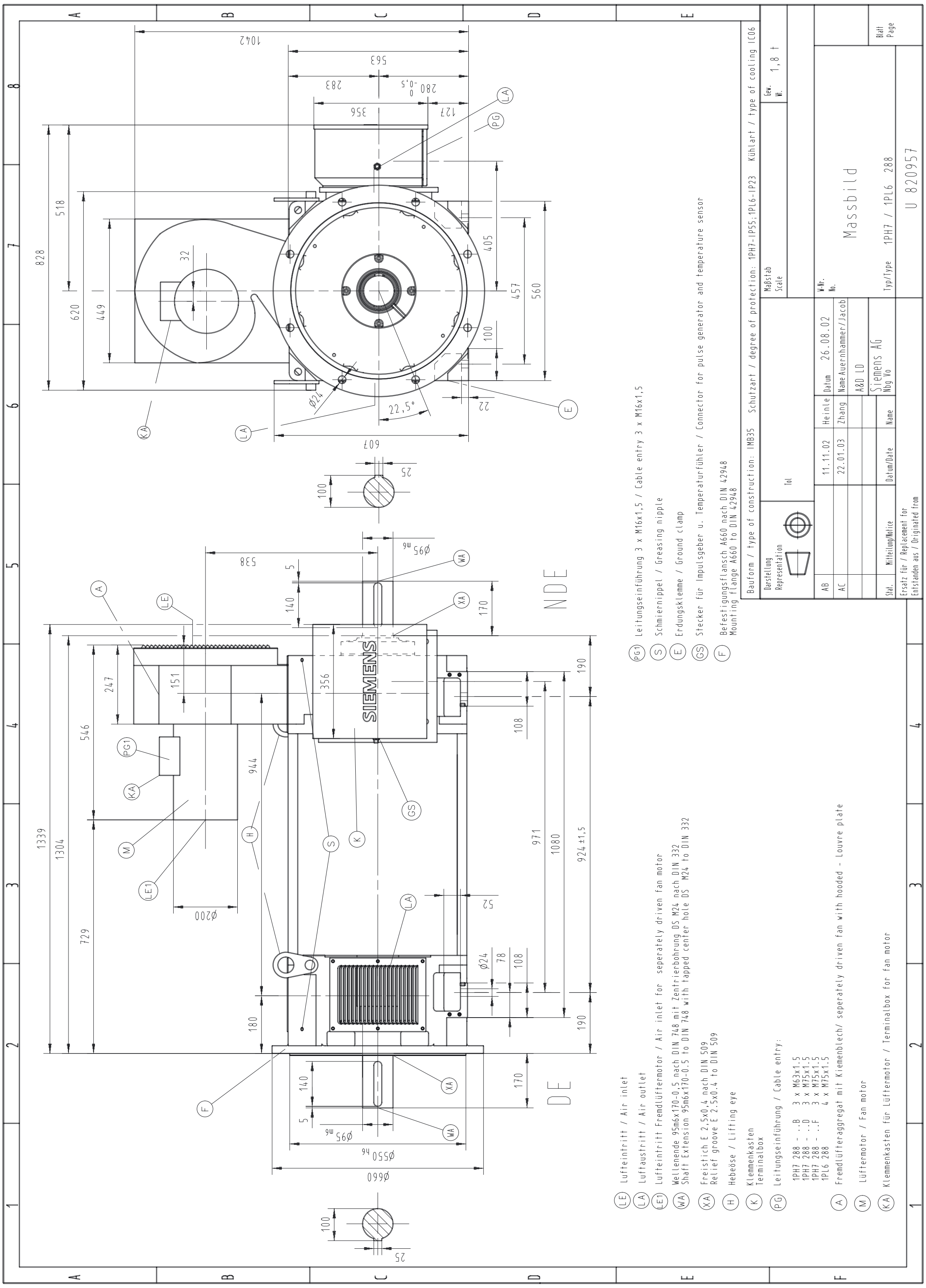


Figure 5-78 1PL6288, air flow direction NDE-DE, U820957

Appendix A

A.1 References

An overview of publications that is updated monthly is provided in a number of languages in the Internet at:

<http://www.siemens.com/motioncontrol>
through "Support", "Technical Documentation", "Documentation Overview"

General Documentation

/D 21.2/	**SINAMICS S120 Catalog** SINAMICS S120 Servo Control Drive System
/D 21.1/	**SINAMICS S120 Catalog** SINAMICS S120 Vector Control Drive System
/NC 60/	**SINUMERIK and SIMODRIVE Catalog** Automation Systems for Machine Tools
/NC 61/	**SINUMERIK and SINAMICS Catalog** Automation Systems for Machine Tools
/DA65.3/	**SIMOVERT MASTERDRIVES Catalog** Synchronous and Induction Motors for SIMOVERT MASTERDRIVES

Electronic Documentation

/CD1/	**DOC ON CD** The SINUMERIK System (includes all SINUMERIK 840D/810D and SIMODRIVE 611D)

/CD2/	**DOC ON CD** The SINAMICS System

Manufacturer/Service Documentation

/PJAL/	**Configuration Manual, Synchronous Motors** SIMODRIVE 611, SIMOVERT MASTERDRIVES MC Synchronous Motors General Section
/PFK7S/	**Configuration Manual, Synchronous Motors** SINAMICS S120 1FK7 Synchronous Motors
/PFT6S/	**Configuration Manual, Synchronous Motors** SINAMICS S120 1FT6 Synchronous Motors
/PMH2/	**Configuration Manual, Hollow-Shaft Measuring System** SINAMICS S120, SIMODRIVE 611, SIMOVERT MASTERDRIVES, SIMAG H2 Hollow-Shaft Measuring System
/PFK7/	**Configuration Manual, Synchronous Motors** SIMODRIVE 611, SIMOVERT MASTERDRIVES 1FK7 Synchronous Motors
/PFT6/	**Configuration Manual, Synchronous Motors** SIMODRIVE 611, SIMOVERT MASTERDRIVES 1FT6 Synchronous Motors
/PFK6/	**Configuration Manual, Synchronous Motors** SIMODRIVE 611, SIMOVERT MASTERDRIVES 1FK6 Synchronous Motors

/PFS6/ **Configuration Manual, Synchronous Motors**
SIMOVERT MASTERDRIVES
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/PFU/ **Configuration Manual, Synchronous Motors**
SINAMICS S120, SIMOVERT MASTERDRIVES, MICROMASTER
SIEMOSYN Synchronous Motors 1FU8

/ASAL/ **Configuration Manual, Induction Motors**
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Induction Motors General Section

/APH2/ **Configuration Manual, Induction Motors**
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1PH2 Induction Motors

/APH4/ **Configuration Manual, Induction Motors**
SIMODRIVE 611
1PH4 Induction Motors

/APH7/ **Configuration Manual, Induction Motors**
SIMODRIVE 611
1PH7 Induction Motors

/PPM/ **Configuration Manual, Hollow-Shaft Motors**
SIMODRIVE 611
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/PJFE/ **Configuration Manual, Synchronous Build-in Motors**
SIMODRIVE 611
Synchronous Motors for Main Spindle Drives
1FE1 Synchronous Build-in Motors

/PJTM/ **Configuration Manual, Build-in Torque Motors**
SIMODRIVE 611
1FW6 Build-in Torque Motors

/PJLM/ **Configuration Manual, Linear Motors**
SIMODRIVE 611
1FN1 and 1FN3 Linear Motors

/PMS/ **Configuration Manual, ECO Motor Spindle**
SIMODRIVE 611
2SP1 ECO Motor Spindle

/APL6/ **Configuration Manual, Induction Motors**
SIMOVERT MASTERDRIVES VC/MC
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/APH7M/ **Configuration Manual, Induction Motors**
SIMOVERT MASTERDRIVES VC/MC
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/PKTM/ **Configuration Manual, Complete Torque Motors**
SIMOVERT MASTERDRIVES
1FW3 Complete Torque Motors

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Suggestions

Corrections

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