Emotron DSV35 AC drive

3.0kW - 37kW

Mounting and switch on instruction

Valid from software version 06.00

emotron

DEDICATED DRIVE

A CG Product

Contents

1 General Information

1.1 Read first, then start

⚠WARNING!

Read this documentation thoroughly before carrying out the installation and commissioning.

▶ Please observe the safety instructions!

Information and tools with regard to the Emotron products can be found on the Internet:
http://www.emotron.com

1.2 Notations and conventions

Product code Emotron, examples:
DSV35-40-7P2-20
DSV35-40-016-20

DSV	35	40	7P3	20
Series	3-phase	400V	Rated current 7.3A	IP20
DSV	35	40	016	20
Series	3-phase	400V	Rated current 16A	IP20

2 Safety instructions

2.1 Basic safety measures

Disregarding the following basic safety measures may lead to severe personal injury and damage to material assets!

The product

- must only be used as directed.
- must never be commissioned if they display signs of damage.
- must never be technically modified.
- must never be commissioned if they are not fully mounted.
- must never be operated without required covers.

Connect/disconnect all pluggable terminals only in deenergised condition.
Only remove the product from the installation in the deenergised state.
Insulation resistance tests between 24V control potential and PE: According to EN 61800−5−1, the maximum test voltage must not exceed 110 V DC.

Observe all specifications of the corresponding documentation supplied. This is the precondition for safe and trouble-free operation and for obtaining the product features specified.

The procedural notes and circuit details described in this document are only proposals. It is up to the user to check whether they can be adapted to the particular applications. Emotron does not take any responsibility for the suitability of the procedures and circuit proposals described.

The product must only be used by qualified personnel.
IEC 60364 or CENELEC HD 384 define the skills of these persons:

- They are familiar with installing, mounting, commissioning, and operating the product.
- They have the corresponding qualifications for their work.
- They know and can apply all regulations for the prevention of accidents, directives, and laws applicable at the place of use.

Observe the specific notes in the other chapters!

2.2 Residual hazards

The user must take the residual hazards mentioned into consideration in the risk assessment for his/her machine/system.

If the above is disregarded, this can lead to severe injuries to persons and damage to material assets!

Product

Observe the warning labels on the product!

Icon	Description
	**Electrostatic sensitive devices:** Before working on the inverter, the staff must ensure to be free of electrostatic charge!
	**Dangerous electrical voltage** Before working on the inverter, check whether all power connections are dead! After mains OFF, power connections X100 and X105 carry a dangerous electrical voltage for the time specified on the inverter!
	**High leakage current:** Carry out fixed installation and PE connection in compliance with EN 61800−5−1 or EN 60204−1!
	**Hot surface:** Use personal protective equipment or wait until devices have cooled down!

Motor

If there is a short circuit of two power transistors, a residual movement of up to 180°/number of pole pairs can occur at the motor! (For 4-pole motor: residual movement max. 180°/2 = 90°).

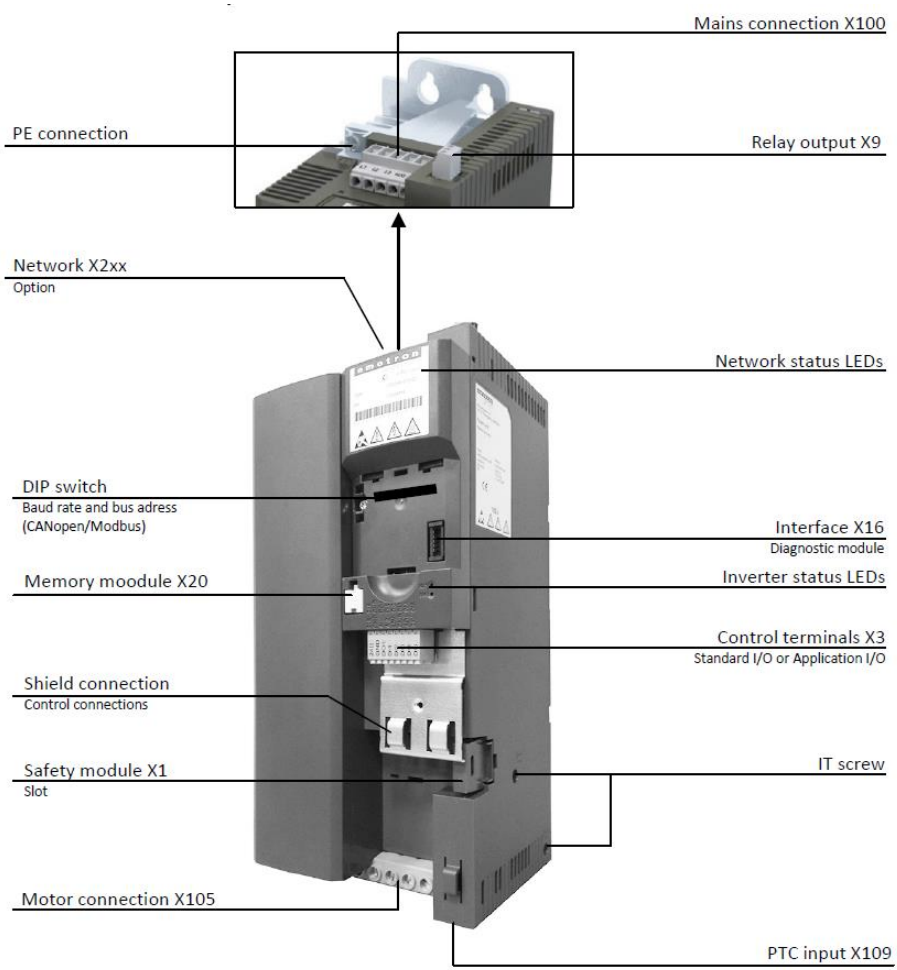
This residual movement must be taken into consideration by the user for his/her risk assessment.

2.3 Application as directed

- The product must only be operated under the operating conditions prescribed in this documentation.
- The product meets the protection requirements of 2014/35/EU: Low-Voltage Directive.
- The product is not a machine in terms of 2006/42/EC: Machinery Directive.
- Commissioning or starting the operation as directed of a machine with the product is not permitted until it has been ensured that the machine meets the regulations of the EC Directive 2006/42/EC: Machinery Directive; observe EN 60204−1.
- Commissioning or starting the operation as directed is only allowed when there is compliance with the EMC Directive 2014/30/EU.
- The harmonised standard EN 61800−5−1 is used for the inverters.
- The product is not a household appliance, but is only designed as component for commercial or professional use in terms of EN 61000−3−2.
- In accordance with EN 61800−3, the product can be used in drive systems that have to comply with the categories given in the technical data.

In residential areas, the product may cause EMC interferences. The operator is responsible for taking interference suppression measures.

3 Product description



4 Mounting

4.1 Important notes

⚠ DANGER!

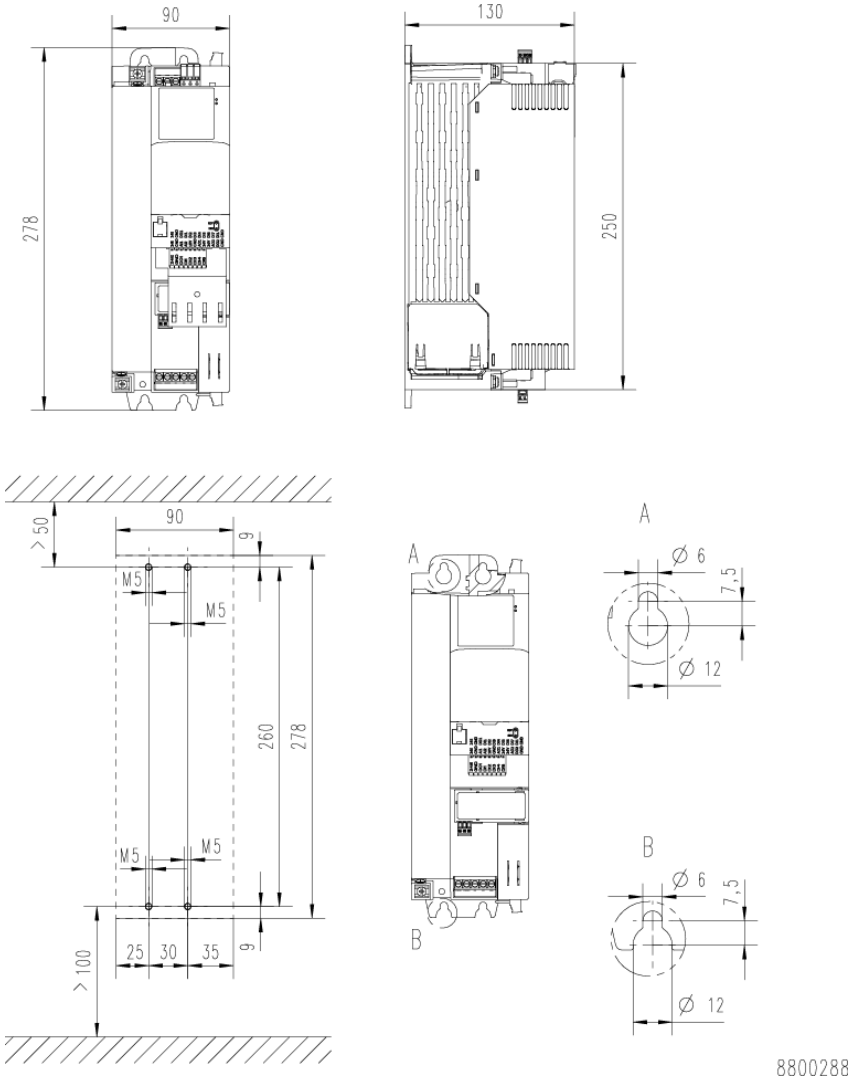
Dangerous electrical voltage

Possible consequence: death or severe injuries

- All works on the inverter must only be carried out in the deenergised state.
- After switching off the mains voltage, wait for at least 3 minutes before you start working.

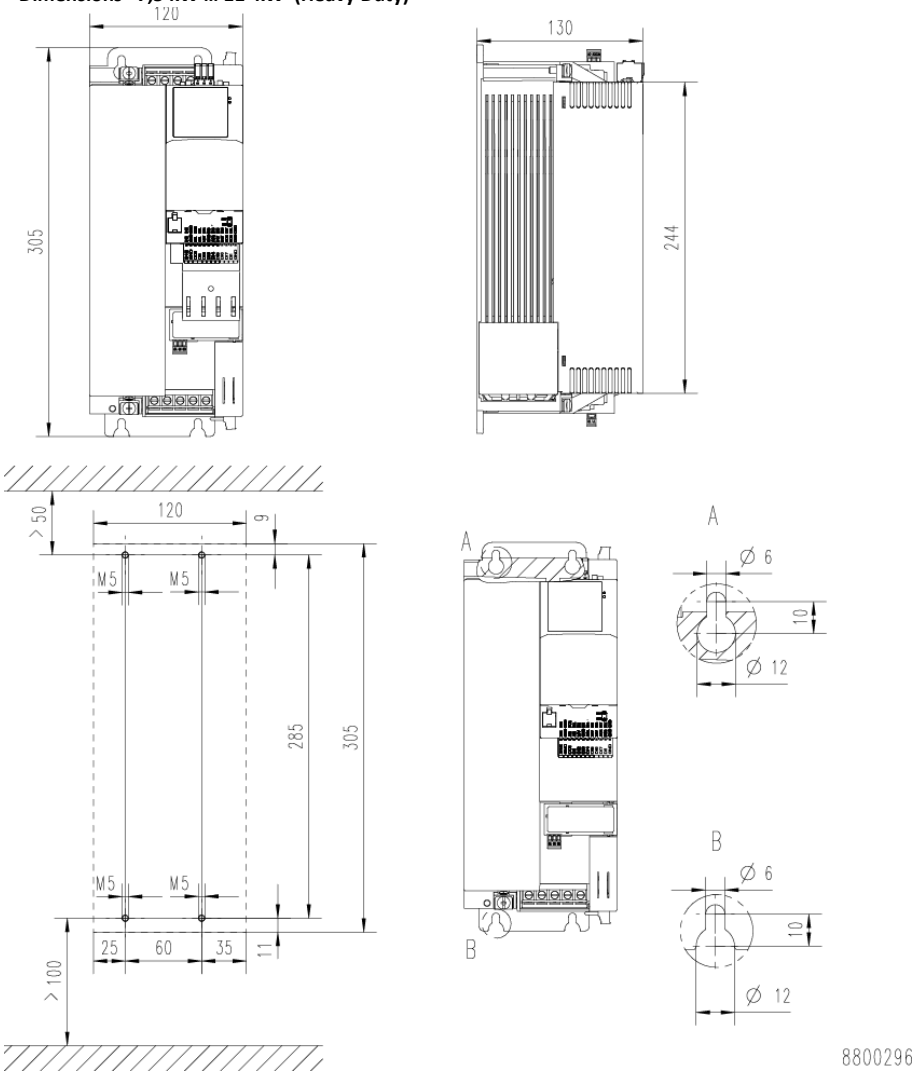
4.2 Mechanical installation

Dimensions 3 kW ... 5,5 kW (Heavy Duty)



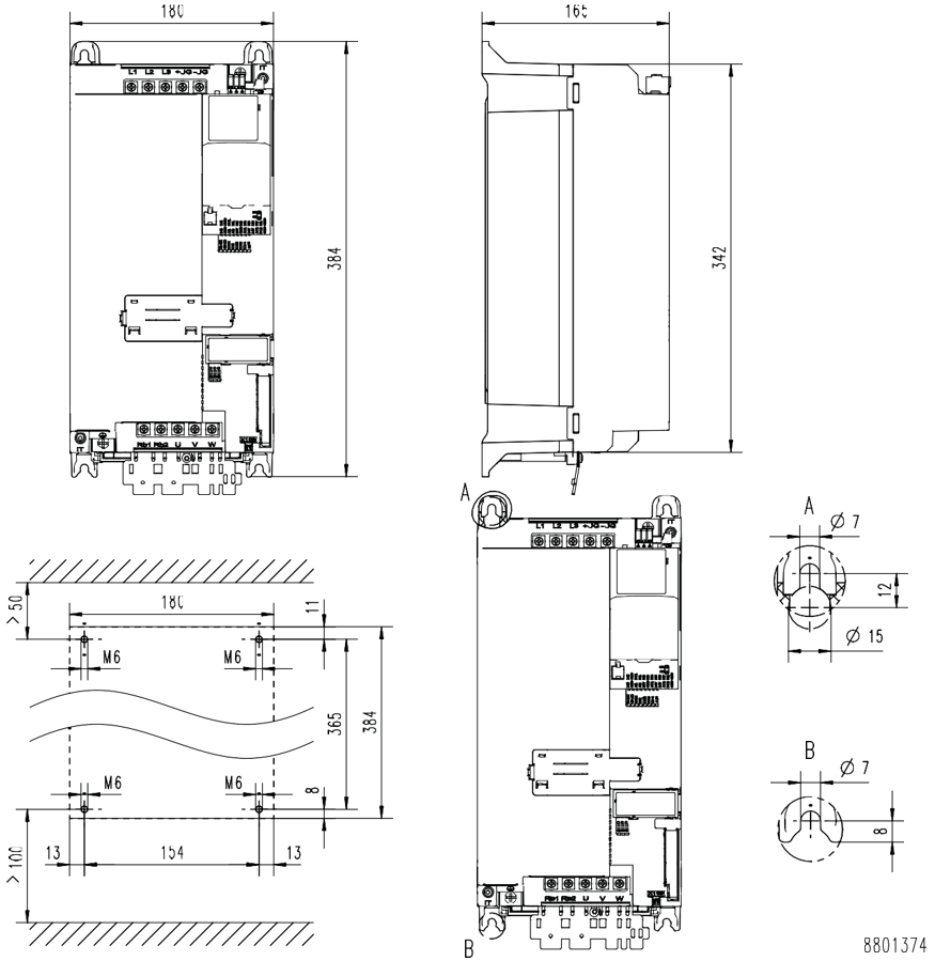
All Dimensions in mm

Dimensions 7,5 kW … 11 kW (Heavy Duty)



All Dimensions in mm

Dimensions 15 kW ... 30 kW (Heavy Duty)



All Dimensions in mm

4.3 Electrical installation

4.3.1 3-phase mains connection 400 V

The wiring diagram is valid DSV 35 inverters

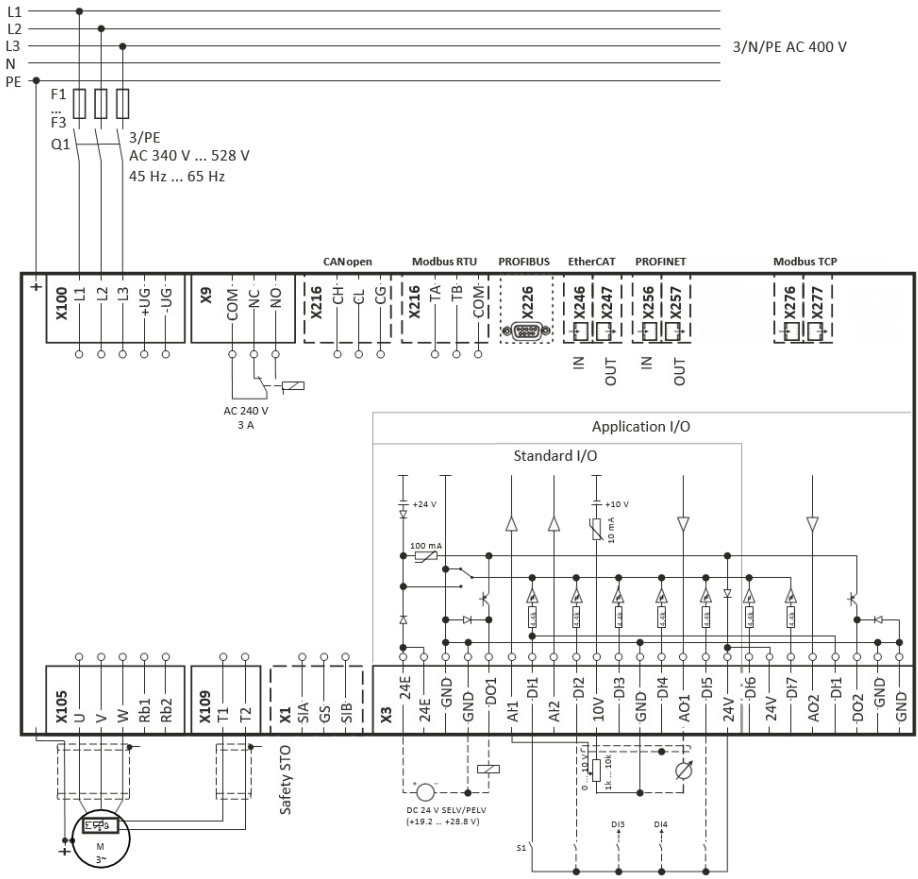


Fig.1: Wiring example

S1	Run/Stop	Q1	Mains contactor
Fx	Fuses	---	Dashed lines = options

4.3.2 3-phase mains connection 480 V

The wiring diagram is valid DSV 35 inverters

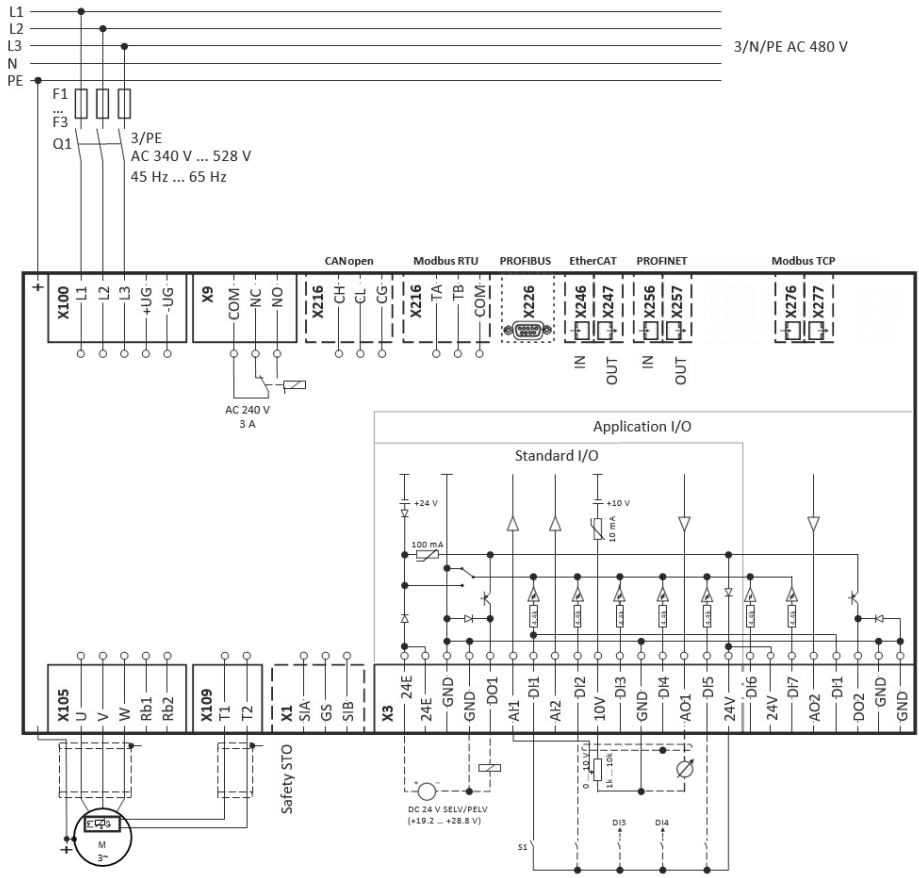


Fig.2: Wiring example

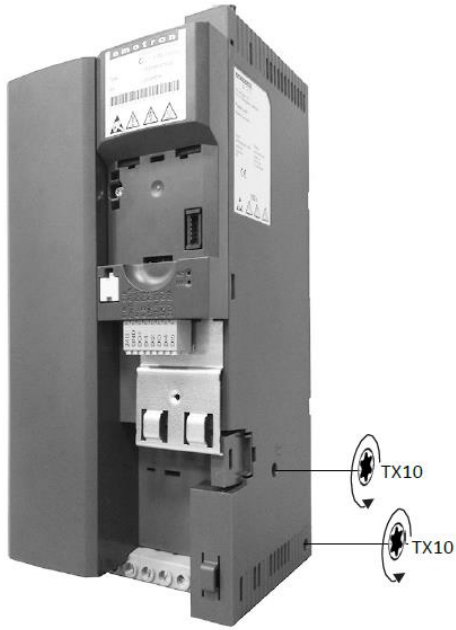
S1	Run/Stop	Q1	Mains contactor
Fx	Fuses	---	Dashed lines = options

4.3.3 Connection to the IT system

NOTICE!

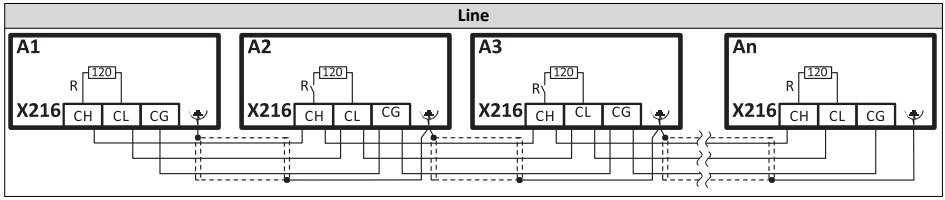
Internal components have earth/ground potential if the IT screws are not removed.
Consequence: the monitoring functions of the IT system respond.

▶ Before connection to an IT system be absolutely sure to remove the IT screws.



4.3.4 CANopen

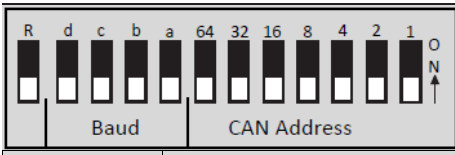
Typical topologies



Terminal description		CANopen
Connection		X216
Connection type		Spring terminal
Min. cable cross-section	mm²	0.5
Max. cable cross-section	mm²	2.5
Stripping length	mm	10
Tightening torque	Nm	-
Required tool		0.4 x 2.5

Basic network settings

Use the DIP switch to set the node address and baud rate and to activate the integrated bus terminating resistor.



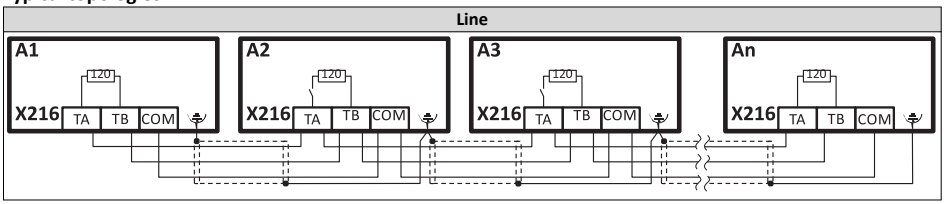
Bus termination	Baud rate					CAN node address						
R	**d**	**c**	**b**	**a**		**64**	**32**	**16**	**8**	**4**	**2**	**1**
OFF	OFF	ON	OFF	ON	20 kbps	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
Inactive	OFF	OFF	ON	ON	50 kbps	Value from parameter						
ON	OFF	OFF	ON	OFF	125 kbps	Node address - example:						
Active	OFF	OFF	OFF	ON	250 kbps	OFF	OFF	ON	OFF	ON	ON	ON
	OFF	**OFF**	**OFF**	**OFF**	Value from parameter (**500 kbps**)	Node address = 16 + 4 + 2 + 1 = 23						
	OFF	ON	OFF	OFF	1 Mbps							
	All other combinations				Value from parameter (**500 kbps**)							

Printed in bold =Factory setting

The network must be terminated with a 120 Ω resistor at the physically first and last node.
Set the "R" switch to ON at these nodes.

4.3.5 Modbus

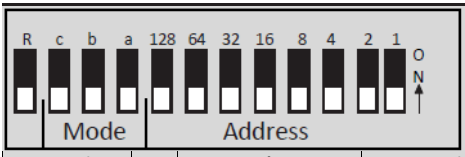
Typical topologies



Terminal description		Modbus
Connection		X216
Connection type		Spring terminal
Min. cable cross-section	mm²	0.5
Max. cable cross-section	mm²	2.5
Stripping length	mm	10
Tightening torque	Nm	-
Required tool		0.4 x 2.5

Basic network settings

Use the DIP switch to set the node address and baud rate and to activate the integrated bus terminating resistor.



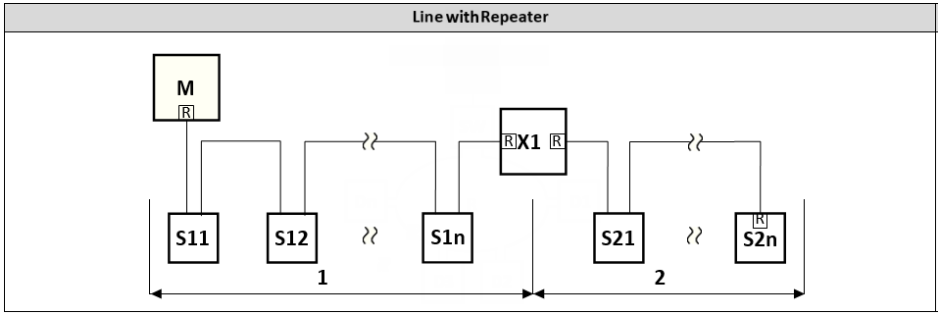
Bus termination		Baud rate	Parity	Modbus node address							
R	**c**	**b**	**a**	**128**	**64**	**32**	**16**	**8**	**4**	**2**	**1**
OFF	n.c.	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
Inactive		Automatic detection	Automatic detection	Value from parameter							
ON		ON	ON	Node address - example:							
Active		Value from parameter	Value from parameter	OFF	OFF	OFF	ON	OFF	ON	ON	ON
				Node address = 16 + 4 + 2 + 1 = 23 Node address > 247: value from parameter							

Printed in bold = Factory setting

The network must be terminated with a 120 Ω resistor at the physically first and last node.
Set the "R" switch to ON at these nodes.

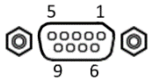
4.3.6 PROFIBUS

Typical topologies



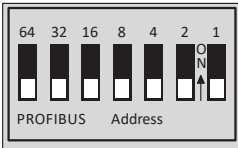
M	Master	X1	Repeater
Sxx	Slaves	R	Activated bus terminating resistor

Sub D socket 9-pin - X226

View	Pin	Assignment	Description Line with Repeater
	1	Shield	Additional shield connection
	2	n.c.	
	3	RxD/TxD-P	Data line-B (received data/transmitted data+)
	4	RTS	Request To Send (received /transmitted data, no differential signal)
	5	M5V2	Reference potential (bus terminating resistor-)
	6	P5V2	5 V DC / 30 mA (bus terminating resistor +, OLM, OLP)
	7	n.c.	
	8	RxD/TxD-N	Data line-A (received data/transmitted data-)
	9	n.c.	

Basic network settings

Use the DIP switch to set the station address. The baud rate is detected automatically.



PROFIBUS station address						
64	**32**	**16**	**8**	**4**	**2**	**1**
OFF	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**
Value from parameter						
Station address - example:						
OFF	OFF	ON	OFF	ON	ON	ON
Station address = 16 + 4 + 2 + 1 = 23 Do not set station address = 126 and station address = 127. These station addresses are invalid.						

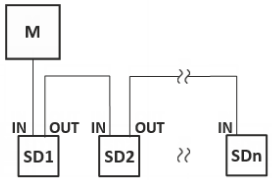
Printed in bold = Factory setting

The network must be terminated with a resistor at the physically first and last node.
Activate the bus terminating resistor at these nodes in the bus connection plug.

4.3.7 EtherCAT

Typical topologies

Line



M – Master SD - Slave Device

Bus-related information		
Name		EtherCAT
Communication medium		Ethernet 100 Mbps, full duplex
Use		Connection of the inverter to an EtherCAT network
Connection system		RJ45
Status display		2 LEDs
Connection designation		In: X246 Out: X247

Basic network settings

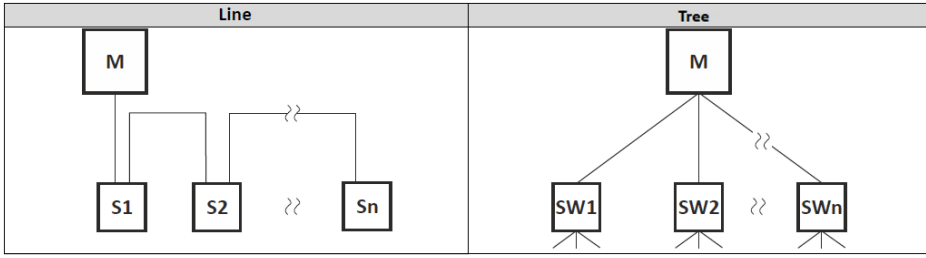
The rotary encoder switch allows you to set an EtherCAT identifier.

x 16 x 1

Setting	Identifier
0x00	Value from parameter
0x01 ... 0xFF	Switch position

4.3.8 Modbus TCP

Typical topologies



M – Master S - Slave SW - Switch

Bus-related information		
Name		Modbus TCP
Communication medium		Ethernet 10 Mbps, 100 Mbps, half duplex, full duplex
Use		Connection of the inverter to a Modbus TCP network
Connection system		RJ45
Status display		2 LEDs
Connection designation		X276, X277

Status displays at the RJ45 sockets

The LEDs at the RJ45 sockets indicate the connection status to the network:

LED "Link" (green)	Status/meaning
off	No connection to the network.
on	A physical connection to the network is available

LED "Activity" (yellow)	Status/meaning
off	No data transfer
on or flicker	Data is exchanged via the network.

Basic network settings

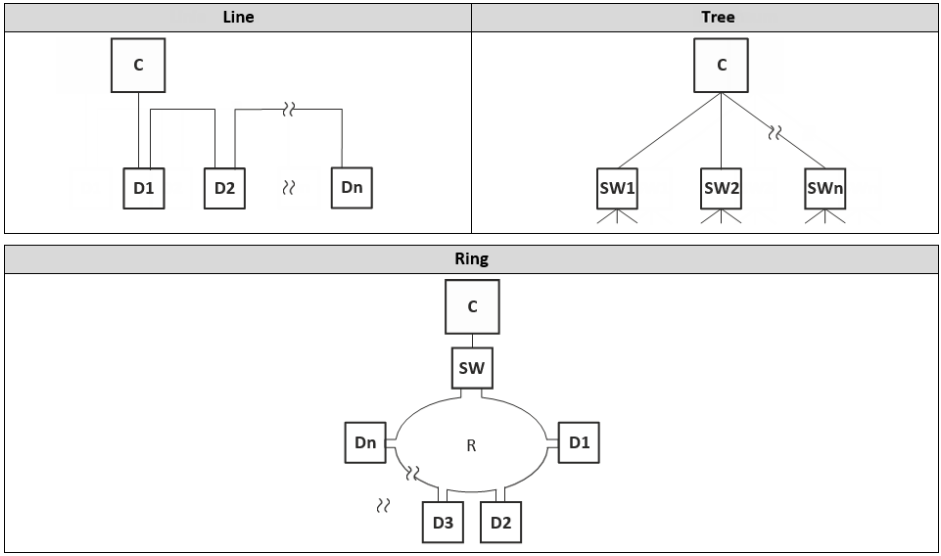
The rotary encoder switch allows you to set the last byte of the IP address.

x 16 x 1

Setting	Value of last byte	Resulting IP address
0x00	Value from parameter	Value from parameter
0x01 ... 0xFE	Switch position	192.168.124.<switch position>
0xFF	Default setting	192.168.124.16

4.3.9 PROFINET

Typical topologies



C	I/O controller	SW	Switch SCALANCE (MRP capable)
D	I/O device	R	Redundant domain

Bus-related information		
Name		PROFINET RT
Communication medium		Ethernet 100 Mbps, full duplex
Use		Connection of the inverter to a PROFINET network
Connection system		RJ45
Status display		2 LEDs
Connection designation		X256, X257

The rotary encoder switch has no function.

4.3.10 Connection of the safety module

4.3.11 Important notes

⚠ DANGER!

Improper installation of the safety engineering system can cause an uncontrolled starting action of the drives. Possible consequences: Death or severe injuries

- Safety engineering systems may only be installed and commissioned by qualified and skilled personnel.
- All control components (switches, relays, PLC, ...) and the control cabinet must comply with the requirements of the EN ISO 13849−1 and the EN ISO 13849−2.
- Switches, relays with at least IP54 enclosure.
- Control cabinet with at least IP54 enclosure.
- It is essential to use insulated wire end ferrules for wiring.
- All safety relevant cables outside the control cabinet must be protected, e.g. by means of a cable duct
- Ensure that no short circuits can occur according to the specifications of the EN ISO 13849−2.
- All further requirements and measures can be obtained from the EN ISO 13849−1 and the EN ISO 13849−2.
- If an external force acts upon the drive axes, additional brakes are required.
  Please observe that hanging loads are subject to the force of gravity!
- The user has to ensure that the inverter will only be used in its intended application within the specified environmental conditions. This is the only way to comply with the declared safety-related characteristics.

⚠ DANGER!

With the "Safe torque off" (STO) function, no "emergency stop" in terms -EN 60204−1 can be exe cuted without additional measures. There is no isolation between the motor and inverter, no service switch or maintenance switch!

Possible consequence: death or severe injuries

- "Emergency stop" requires electrical isolation, e.g. by a central mains contactor.

⚠ DANGER!

Automatic restart if the request of the safety function is deactivated. Possible consequences: Death or severe injuries

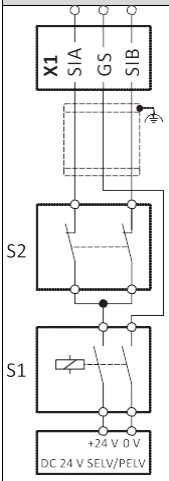
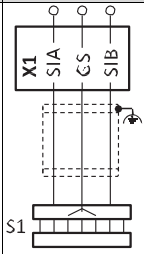
- You must provide external measures according to EN ISO 13849−1 which ensure that the drive only restarts after a confirmation.

i NOTICE!

Overvoltage Destruction of the safety component

- The maximum voltage (maximum rated) at the safety inputs is 32 V DC. The user must make provisions to avoid that this voltage is exceeded.

4.3.12 Connection plan

Passive sensors	Active sensors
	
S1 safety switching device S2 passive sensor	S1 active sensor - example lightgrid

4.3.13 Terminal data

Terminal description		Safety STO
Connection		X1
Connection type		Screw terminal
Min. cable cross-section	mm²	0.5
Max. cable cross-section	mm²	1.5
Stripping length	mm	6
Tightening torque	Nm	0.2
Required tool		0.4 x 2.5

X1	Specification	Unit	min.	typ.	max.
SIA, SIB	LOW signal	V	-3	0	+5
	HIGH signal	V	+15	+24	+30
	Running time	ms		3	
	Input current SIA	mA		10	14
	Input current SIB	mA		7	12
	Input peak current	mA		100	
	Tolerated test pulse	ms			1
	Switch-off time	ms		50	
	Permissible distance of the test pulses	ms	10		
GS	Reference potential for SIA and SIB				

5 Commissioning

5.1 Important notes

⚠WARNING!

Incorrect settings during commissioning may cause unexpected and dangerous motor and system movements.

Possible consequence: death, severe injuries or damage to property

- ▶ Clear hazardous area.
- ▶ Observe safety instructions and safety clearances.

5.2 Before initial switch-on

Prevent injury to persons and damage to property.
Check the following before switching on the mains voltage:

- Is the wiring complete and correct?
- Are there no short circuits and earth faults?
- Is the motor circuit configuration (star/delta) adapted to the output voltage of the inverter?
- Is the motor connected in-phase (direction of rotation)?
- Does the "emergency stop" function of the entire plant operate correctly?

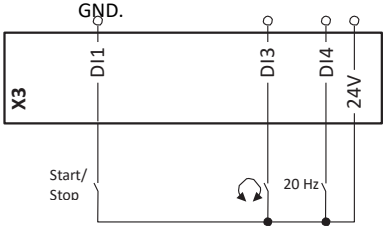
5.3 Initial switch-on / functional test with terminal control

Target: achieve rotation of the motor connected to the inverter as quickly as possible. Requirements:

- The connected motor matches the inverter in terms of power.
- The parameter settings comply with the delivery status (Emotron setting).

1. Preparation:

1. Wiring of power terminals. (Chapter *4.3 Electrical installation*)
2. Wire digital inputs X3/DI1 (start/stop), X3/DI3 (reversal of rotation direction), and X3/DI4 (preset fre- quency setpoint 20 Hz).
3. Do not connect terminal X3/AI1 (analog setpoint selection) or connect it to GND.



2. **Switch on mains and check readiness for operation:**

1. Switch on mains voltage.
2. Observe LED status displays "RDY" and "ERR" on the front of the inverter:
   a) If the blue "RDY" LED is blinking and the red "ERR" LED is off, the inverter is ready for operation. The controller is inhibited.
   You can now start the drive.
   b) If the red "ERR" LED is lit permanently, a fault is pending.
   Eliminate the fault before you carry on with the functional test.

LED status displays

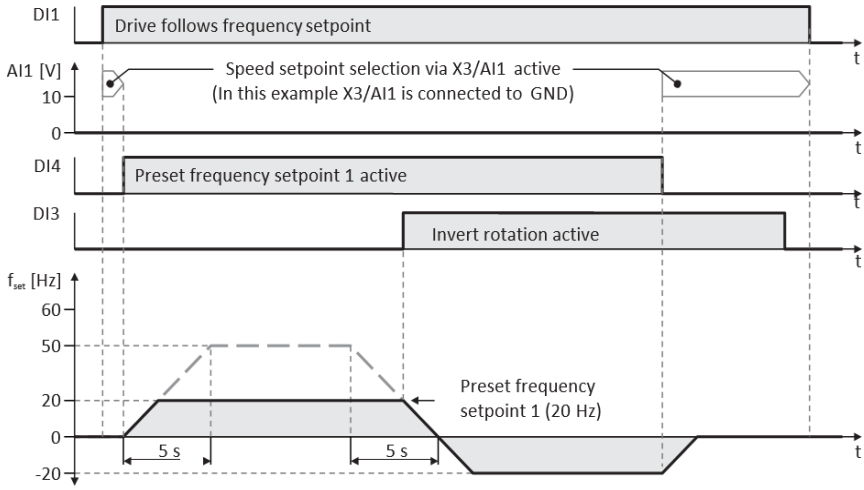
"RDY" LED (blue)	"ERR" LED (red)	Status/meaning	
off	off	No supply voltage.	
blinking (1 Hz)	off	Safe torque off (STO) active.	
	blinking fast (4 Hz)	Safe torque off (STO) active. Warning active.	
blinking (2 Hz)	off	Inverter inhibited.	
	lit every 1.5 s for a short time	Inverter inhibited, no DC-bus voltage.	
	blinking fast (4 Hz)	Inverter inhibited, warning active.	
	on	Inverter inhibited, fault active.	
on	off	Inverter enabled.	The drive rotates according to the setpoint specified.
	blinking fast (4 Hz)	Inverter enabled, warning active.	
	blinking (1 Hz)	Inverter enabled, quick stop as response to a fault active.	

5.4 Carrying out the functional test

1. **Start drive:**

1. Start inverter: X3/DI1 = HIGH.
   a) If the inverter is equipped with an integrated safety system: X1/SIA = HIGH and X1/SIB = HIGH.
2. Activate preset frequency setpoint 1 (20 Hz) as speed setpoint: X3/DI4 = HIGH.
   The drive rotates with 20 Hz.
3. Optional: activate the function for the reversal of rotation direction.
   a) X3/DI3 = HIGH.
   The drive rotates with 20 Hz in the opposite direction.
   b) Deactivate the function for the reversal of rotation direction again: X3/DI3 = LOW.

Speed characteristic (example)



2. Stop drive:

1. Deactivate preset frequency setpoint 1 again: X3/DI4 = LOW.
2. Stop inverter again: X3/DI1 = LOW.

The functional test is completed.

The commissioning process of the drive solution is described in a separate commissioning instruc tion which can be found on the Internet in our download area:
http:// www.emotron.com

6 Technical data

6.1 Standards and operating conditions

Conformities		
CE	2014/35/EU	Low-Voltage Directive
	2014/30/EU	EMC Directive (reference: CE-typical drive system)
EAC	TR TC 004/2011	Eurasian conformity: safety of low voltage equipment
	TP TC 020/2011	Eurasian conformity: electromagnetic compatibility of technical means
RoHS 2	2011/65/EU	Restrictions for the use of specific hazardous materials in electric and electronic devices
Approvals		
UL	UL 61800-5-1	for USA and Canada (requirements of the CSA 22.2 No. 274)
		0.25 kW ... 22 kW (30 kW ... 45 kW in preparation)
Energy efficiency		
Class IE2	EN 50598-2	Reference: Emotron setting (switching frequency 8 kHz variable)
Degree of protection		
IP20	EN 60529	
Type 1	NEMA 250	Protection against contact
Open type		only in UL-approved systems
Insulation resistance		
Overvoltage category III	EN 61800-5-1	0 ... 2000 m a.m.s.l.
Overvoltage category II		above 2000 m a.m.s.l.
Control circuit isolation		
Safe mains isolation by double/ reinforced insulation	EN 61800-5-1	
Protective measures against		
Short circuit		
Earth fault		Earth fault strength depends on the operating status
Overvoltage		
Motor stalling		
Motor overtemperature		PTC or thermal contact, I^2xt monitoring
Leakage current		
> 3.5 mA AC, > 10 mA DC	EN 61800-5-1	Observe regulations and safety instructions!
Mains switching		
3-time mains switching in 1 min		Cyclic, without any restrictions
Starting current		
≤ 3 x rated mains current		
Mains systems		
TT		Voltage to earth/ground: max. 300 V
TN		
IT		Apply the measures described for IT systems!
		IT systems are not relevant for UL-approved systems
Operation on public supply systems		
Implement measures to limit the radio interference to be expected:		The machine or plant manufacturer is responsible for compliance with the requirements for the machine/ plant!
< 1 kW: with mains choke	EN 61000-3-2	
> 1 kW at mains current ≤ 16 A: without additional measures		

Mains current > 16 A: with mains choke or mains filter, with dimensioning for rated power. Rsce ≥ 120 is to be met.	EN 61000-3-12	RSCE: short-circuit power ratio at the connection point of the machine/plant to the public network.
Requirements to the shielded motor cable		
Capacitance per unit length		
C-core-core/C-core-shield < 75/150 pF/m		≤ 2.5 mm² / AWG 14
C-core-core/C-core-shield < 150/300 pF/m		≥ 4 mm² / AWG 12
Electric strength		
Uo/U = 0.6/1.0 kV		Uo = r.m.s. value external conductor to PE
		U = r.m.s. value external conductor/external conductor
U ≥ 600 V	UL	
Climate		
1K3 (-25 ... +60 °C)	EN 60721-3-1	Storage
2K3 (-25 ... +70 °C)	EN 60721-3-2	Transport
3K3 (-10 ... +55 °C)	EN 60721-3-3	Operation
		Operation at a switching frequency of 2 or 4 kHz: above +45°C, reduce rated output current by 2.5 %/°C
		Operation at a switching frequency of 8 or 16 kHz: above +40°C, reduce rated output current by 2.5 %/°C
Site altitude		
0 … 1000 m a.m.s.l.		
1000 … 4000 m a.m.s.l.		Reduce rated output current by 5 %/1000 m
Pollution		
Degree of pollution 2	EN 61800-5-1	
Vibration resistance		
Transport		
2M2 (sine, shock)	EN 60721-3-2	
Operation		
Amplitude 1 mm	Germanischer Lloyd	5 ... 13.2 Hz
Acceleration resistant up to 0.7 g		13.2 ... 100 Hz
Amplitude 0.075 mm	EN 61800-5-1	10 ... 57 Hz
Acceleration resistant up to 1 g		57 ... 150 Hz
Noise emission		
Category C1	EN 61800-3	Type-dependent, for motor cable lengths see rated data
Category C2		
Noise immunity		
Meets requirement in compliance with	EN 61800-3	

6.2 3-phase mains connection 400 V / Heavy duty

The output currents apply to these operating conditions:
- At a switching frequency of 2 kHz or 4 kHz: Max. ambient temperature 45°C
- At a switching frequency of 8 kHz or 16 kHz: Max. ambient temperature 40°C

6.2.1 Rated data

Inverter			**DSV35407P2**	**DSV35409P4**	**DSV3540013**	**DSV3540016**
Rated power	**kW**	**PN**	**3**	**4**	**5.5**	**7.5**
	hp	**PN**	**4**	**5**	**7.5**	**10**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz			
Output Voltage			3 AC 0-400/480 V			
Rated mains current						
without mains choke	A	I_N	9.6	12.5	17.2	20
with mains choke	A	I_N	6.9	9.0	12.4	15.7
Apparent output power	KVA		4.9	6.4	8.7	11
Output current						
2 kHz	A	I_{out}	7.3	9.5	13	16.5
4 kHz	A	I_{out}	7.3	9.5	13	16.5
8 kHz	A	I_{out}	7.3	9.5	13	16.5
16 kHz	A	I_{out}	4.9	6.3	8.7	11
Power loss	W					
2 kHz	W		79	102	137	166
4 kHz	W		85	110	145	172
8 kHz	W		110	140	190	183
16 kHz	W		109	140	189	183
With controller lock			6	6	6	6
Overcurrent cycle 180 s						
Max. output current	A	I_{max}	11	14.3	19.5	25
Overload time	s	t_{ol}	60	60	60	60
Recovery time	s	t_{re}	120	120	120	120
Max. output current during the recovery time	A		5.48	7.13	9.75	12.4
Overcurrent cycle 15 s						
Max. output current	A	I_{max}	14.6	19	26	33
Overload time	s	t_{ol}	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12
Max. output current during the recovery time	A		5.5	7.1	9.8	12.4
Cyclical mains switching			3-times per minute			
Brake chopper						
Max. output current	A	I_{max}	8.8	15.4	15.4	27
Min. brake resistance	Ω	R_{min}	82	47	47	27
Motor cable length						
shielded, without EMC	m		100			
Category C1 (2 kHz, 4 kHz, 8 kHz)	m		-	-	-	-
Category C2 (2 kHz, 4 kHz, 8 kHz)	m		20	20	20	20
Category C3 (2 kHz, 4 kHz, 8 kHz)	m		35	35	35	50
Weight	kg		2.3		3.7	

Inverter			DSV3540023	DSV3540031	DSV3540039	DSV3540046	DSV3540061
Rated power	**kW**	**P_N**	**11**	**15**	**18.5**	**22**	**30**
	hp	**P_N**	**15**	**20**	**25**	**30**	**40**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz				
Output Voltage			3 AC 0-400/480 V				
Rated mains current							
without mains choke	A	I_N	28.4	38.7	48.4	5	-
with mains choke	A	I_N	22.3	28.8	36	42	54.
Apparent output power	KVA		16	22	27	32	41
Output current							
2 kHz	A	I_{out}	23.5	32	40	47	61
4 kHz	A	I_{out}	23.5	32	40	47	61
8 kHz	A	I_{out}	23.5	32	40	47	61
16 kHz	A	I_{out}	15.7	21.3	26.6	31.3	40.6
Power loss							
2 kHz	W		235	317	395	463	599
4 kHz	W		242	328	408	479	620
8 kHz	W		258	349	435	510	661
16 kHz	W		258	349	435	510	661
With controller lock			6	18	18	18	18
Overcurrent cycle 180 s							
Max. output current	A	I_{max}	35	48	60	71	92
Overload time	s	t_{ol}	60	60	60	60	60
Recovery time	s	t_{re}	120	120	120	120	120
Max. output current during the recovery	A		17.6	24	46	57	46
Overcurrent cycle 15 s							
Max. output current	A	I_{max}	47	64	80	94	122
Overload time	s	t_{ol}	3	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12	12
Max. output current during the recovery	A		17.6	24	30	35	46
Cyclical mains switching			3-times per minute				
Brake chopper							
Max. output current	A	I_{max}	27	43	48	52	97
Min. brake resistance	Ω	R_{min}	27	18	15	15	7.5
Motor cable length							
shielded, without EMC	m		100				
Category C1	m		-				
Category C2	m		20				
Category C3	m		50	35			
Weight	kg		3.7	8.0			

6.2.2 Fusing and terminal data

Inverter		DSV35-40-7P2	DSV35-40-9P4	DSV35-40-013	DSV35-40-016 DSV35-40-023
Cable installation in compliance with		EN 60204-1			
Laying system		B2			
Operation		without mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Operation		with mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Earth-leakage circuitreaker					
Mains connection		≥ 300 mA, type B			
Connection		X100			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	4		6	16
Stripping length	mm	9		9	11
Tightening torque	Nm	0.5		0.5	1.2
Required tool		0.5 x 3.0		0.6 x 3.5	0.8 x 4.0
Motor connection					
Connection		X105			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	2.5		6	16
Stripping length	mm	8		9	11
Tightening torque	Nm	0.3		0.5	1.2
Required tool		0.5 x 3.0		0.6 x 3.5	0.8 x 4.0
PE connection					
Connection		PE			
Connection type		PE screw			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6		6	16
Stripping length	mm	10		10	11
Tightening torque	Nm	2		2	3.4
Required tool		Torx 20		Torx 20	PZ2

Fusing data				
Inverter		**DSV35-40-031 DSV35-40-039**	**DSV35-40-046**	**DSV35-40-061**
Cable installation in compliance with		EN 60204-1		
Laying system		B2		
Operation		without mains choke		
Fuse				
Characteristic		gG/gL or gRL	gG/gL or gRL	-
Max. rated current	A	63	63	-
Circuit breaker				
Characteristic		B	B	-
Max. rated current	A	63	63	-
Operation		with mains choke		
Fuse				
Characteristic		gG/gL or gRL		
Max. rated current	A	63	63	80
Circuit breaker				
Characteristic		B		
Max. rated current	A	63	63	80
Earth-leakage circuit-breaker				
3-phase Mains connection		≥ 300 mA, Type B		
Mains connection				
Connection		X100		
Connection type		Screw terminal		
Min. cable cross-section	mm²	1.5		
Max. cable cross-section	mm²	35		
Stripping length	mm	18		
Tightening torque	Nm	3.8		
Required tool		0.8 x 5.5		
Motor connection				
Connection		X105		
Connection type		Screw terminal		
Min. cable cross-section	mm²	1.5		
Max. cable cross-section	mm²	35		
Stripping length	mm	18		
Tightening torque	Nm	3.8		
Required tool		0.8 x 5.5		
PE connection				
Connection		PE		
Connection type		PE-screw		
Min. cable cross-section	mm²	1.5		
Max. cable cross-section	mm²	25		
Stripping length	mm	16		
Tightening torque	Nm	4		
Required tool		PZ2		

6.2.3 RFI filters / Mains filters

Maximum motor cable lengths and FI operation

Mains connection			**3-phase, 400 V/480 V**		
Inverter			**DSV35-40-7P2** **DSV35-40-9P4**	**DSV35-40-013** **DSV35-40-016** **DSV35-40-023**	**DSV35-40-031** **DSV35-40-039** **DSV35-40-046** **DSV35-40-061**
Without RFI filter					
Without EMC-Category Thermal Limmitation	Max. Motorcable-length shielded	m	50	100	100
	Max. Motorcable-length unshielded	m	200	200	200
Mit integriertem Funkentstörfilter					
Category C1	Max. Motorcable-length shielded	m	-	-	-
Category C2		m	20	20	20
	Earth-leakage circuit breaker	mA	300	300	300

6.3 3-phase mains connection 400 V /Normal duty

The output currents apply to these operating conditions:

- At a switching frequency of 2 kHz or 4 kHz: Ambient temperature above 40 °C with a rated output current reduced by 2.5 %/°C.
- If the load characteristic "Normal Duty" and the switching frequencies 8 kHz or 16 kHz are selected, only the values of the load characteristic "Heavy Duty" are reached..

6.3.1 Rated data

Inverter			DSV35407P2	DSV35409P4	DSV3540013	DSV3540016
Rated power	**kW**	**P_N**	**4**	**5.5**	**7.5**	**11**
	hp	**P_N**	**5**	**7.5**	**10**	**15**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz			
Output voltage			3 AC 0-400/480 V			
Rated mains current						
without mains choke	A		10.3	14	18.3	28
with mains choke	A		8.2	11	14.5	22
Apparent output power	kVA		5.9	8	10.5	15
Rated Output current						
2 kHz	A		8.8	11.9	15.6	23
4 kHz	A		8.8	11.9	15.6	23
8 kHz	A		-	-	-	-
16 kHz	A		-	-	-	-
Power loss	W					
2 kHz	W		94	125	163	235
4 kHz	W		100	133	173	242
8 kHz	W		-	-	-	-
16 kHz	W		-	-	-	-
At inverter disablecontroller			6	6	6	6
Overcurrent cycle 180 s						
Max. output current	A	I_{max}	11	14.3	19.5	23.6
Overload time	s	t_{ol}	60	60	60	60
Recovery time	s	t_{re}	120	120	120	120
Max. output current during the recovery time	A		5.5	7.1	9.8	12.4
Overcurrent cycle 15 s						
Max. output current	A	I_{max}	14.6	19	26	33
Overload time	s	t_{ol}	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12
Max. output current during the recovery time	A		5.5	7.1	9.8	12.4
Cyclical mains switching			3-time per Minute			
Brake chopper						
Max. output current	A	I_{max}	8.8	15.4	15.4	27
Min. brake resistance	Ω	R_{min}	82	47	47	27
Motor cable length shielded						
Without EMC category	m		100			
Category C1(2 kHz, 4 kHz, 8 kHz)	m		-	-	-	-
Category C2(2 kHz, 4 kHz, 8 kHz)	m		20	20	20	20
Category C3(2 kHz, 4 kHz, 8 kHz)	m		35	35	35	50
Weight	kg		2.3			3.7

Inverter			DSV3540023	DSV3540031	DSV3540039	DSV3540046	DSV3540061
Rated power	**kW**	**P_N**	**15**	**18.5**	**22**	**30**	**37**
Rated power	**hp**	**P_N**	**20**	**25**	**30**	**40**	**50**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz				
Output voltage			3 AC 0-400/480 V				
Rated mains current							
without mains choke	A		-	48	54.5	64	-
with mains choke	A		27.1	36	43	55	69
Apparent output power	kVA		19	26	32	38	49
Output current							
2 kHz	A		28.2	38.4	48	56.4	73.2
4 kHz	A		28.2	38.4	48	56.4	73.2
8 kHz	A		-	-	-	-	
16 kHz	A		-	-	-	-	
Power loss	W						
2 kHz	W		329	395	463	599	761
4 kHz	W		340	408	479	620	810
8 kHz	W		-	-	-	-	-
16 kHz	W		-	-	-	-	-
With controller lock	W		6	18	18	18	18
Overcurrent cycle 180 s							
Max. output current	A	I_{max}	35	48	60	71	92
Overload time	s	t_{ol}	60	60	60	60	60
Recovery time	s	t_{re}	120	120	120	120	120
Max. output current during the recovery time	A		17.6	24	30	35	46
Overcurrent cycle 15 s							
Max. output current	A	$I_{max.}$	47	64	80	94	122
Overload time	s	t_{ol}	3	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12	12
Max. output current during the recovery time	A		17.6	24	30	35	46
Cyclic mains switching			3-times per minute				
Brake chopper							
Max. output current	A	I_{max-1}	27	43	48	52	97
Min. brake resistance	Ω	R_{min}	27	18	15	15	7.5
Max Motor cable length							
Shielded, without EMC	m		100				
Category C1(2 kHz, 4 kHz, 8	m		-	-	-	-	-
Category C2((2 kHz, 4 kHz, 8 kHz)	m		20	20	20	20	20
Category C3((2 kHz, 4 kHz, 8 kHz)	m		50	35	35	35	35
Weight	kg		3,7	8.0			

6.3.2 Fusing and terminal data

Inverter		DSV35-40-7P2	DSV35-40-9P4	DSV35-40-013	DSV35-40-016
Cable installation in compliance with		EN 60204-1			
Laying system		B2			
Operation		without mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Operation		with mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Earth-leakage circuit breaker					
Mains connection		≥ 300 mA, type B			
Connection		X100			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	9			11
Tightening torque	Nm	0.5			1.2
Required tool		0.6 x 3.5			0.8 x 4.0
Motor connection					
Connection		X105			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	9			11
Tightening torque	Nm	0.5			1.2
Required tool		0.6 x 3.5			0.8 x 4.0
PE connection					
Connection		PE			
Connection type		PE-screw			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	10			11
Tightening torque	Nm	1.2			3.4
Required tool		0.8 x 5.5			PZ2

Fusing data						
Inverter		**DSV35-40-023**	**DSV35-40-031**	**DSV35-40-039**	**DSV35-40-046**	**DSV35-40-061**
Cable installation in compliance with		EN 60204-1				
Laying system		**B2**				
Operation		without mains choke				
Fuse						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Circuit breaker						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Operation		with mains choke				
Fuse						
Characteristic		gG/gL or gRL				
Max. rated current	A	32	63	63	63	80
Circuit breaker						
Characteristic		B				
Max. rated current	A	32	63	63	63	80
Earth-leakage circuit breaker						
Mains connection		≥ 300 mA, type B				
Connection		X100				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5				
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
Motor connection						
Connection		X105				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5	1.5			
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
PE connection						
Connection		PE				
Connection type		PE-screw				
Min. cable cross-section	mm²	1.5	s			
Max. cable cross-section	mm²	16	25			
Stripping length	mm	11	16			
Tightening torque	Nm	3.4	4			
Required tool		PZ2				

6.3.3 RFI filters / Mains filters

Maximum motor cable lengths and FI operation

Mains connection			**3-phase, 400 V/480 V**		
Inverter			**DSV35-40-7P2** **DSV35-40-9P4** **DSV35-40-013**	**DSV35-40-016** **DSV35-40-023**	**DSV35-40-031** **DSV35-40-039** **DSV35-40-046** **DSV35-40-061**
Without RFI filter					
Without EMC-Category Thermal Limmitation	Max. Motorcable-length shielded	m	100	100	100
	Max. Motorcable-length unshielded	m	200	200	200
Mit integriertem Funkentstörfilter					
Category C1	Max. Motorcable-length shielded	m	-	-	-
Category C2		m	20	20	20
	Earth-leakage circuit breaker	mA	300	300	300

6.4 3-phase mains connection 480 V / Heavy duty

The output currents apply to these operating conditions:
- At a switching frequency of 2 kHz or 4 kHz: Max. ambient temperature 45°C.
- At a switching frequency of 8 kHz or 16 kHz: Max. ambient temperature 40°C

6.4.1 Rated data

Inverter			**DSV35-40-7P2**	**DSV35-40-9P4**	**DSV3540013**	**DSV3540016**
Rated power	**kW**	**P_N**	**3**	**4**	**5.5**	**7.5**
	hp	**P_N**	**4**	**5**	**7.5**	**10**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz			
Output voltage			3 AC 0-400/480 V			
Rated mains current						
without mains choke	A	I_N	8	10.5	14.3	16.6
with mains choke	A	I_N	5.8	7.5	10.3	13.1
Apparent output power	KVA		4.9	6.4	8.7	11
Output current						
2 kHz	A	I_{out}	6.3	8.2	11	14
4 kHz	A	I_{out}	6.3	8.2	11	14
8 kHz	A	I_{out}	6.3	8.2	11	14
16 kHz	A	I_{out}	4.2	5.5	7.3	9.3
Power loss						
2 kHz	W		79	102	137	172
4 kHz	W		85	110	145	185
8 kHz	W		110	140	190	240
16 kHz	W		109	140	189	238
With controller lock	W		6	6	6	6
Overcurrent cycle 180 s						
Max. output current	A	I_{max}	9.5	12.3	16.5	21
Overload time	s	t_{ol}	60	60	60	60
Recovery time	s	t_{re}	120	120	120	120
Max. output current during the recovery time	A		4.8	6.15	8.25	10.5
Overcurrent cycle 15 s						
Max. output current	A	I_{max}	12.6	16.4	22	28
Overload time	s	t_{ol}	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12
Max. output current during the recovery time	A		4.7	6.15	8.25	10.5
Cyclical mains switching			3 times per minute			
Brake chopper						
Max. output current	A	I_{max}	9.51	16.6	16.6	28.89
Min. brake resistance	Ω	R_{min}	82	47	47	27
Max Motor cable length shielded						
Without EMC category	m		100	100	100	
Category C1 (2 kHz, 4 kHz, 8 kHz)	m		-	-	-	-
Category C2 (2 kHz, 4 kHz, 8 kHz)	m		20	20	20	20
Category C3 (2 kHz, 4 kHz, 8 kHz)	m		35	50	35	50
Weight	kg		2.3	3.7		

Inverter			DSV3540023	DSV3540031	DSV3540039	DSV3540046	DSV3540061
Rated power	**kW**	P_N	**11**	**15**	**18.5**	**22**	**30**
Rated power	**hp**	P_N	**15**	**20**	**25**	**30**	**40**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz				
Output voltage			3 AC 0-400/480 V				
Rated mains current							
without mains choke	A	$I_{N,AC}$	23.7	32.3	40.3	44.2	61.5
with mains choke	A	$I_{N,AC}$	18.6	2	3	35.3	45.7
Apparent output power	KVA	A_{AN}	16	2	2	32	41
Output current							
2 kHz	A	I_{out}	21	27	34	40.4	52
4 kHz	A	I_{out}	21	27	34	40.4	52
8 kHz	A	I_{out}	21	27	34	40.4	52
16 kHz	A	I_{out}	14	18	22.6	26.9	34.6
Power loss							
2 kHz	W		242	340	420	491	599
4 kHz	W		260	360	450	520	620
8 kHz	W		340	460	570	670	661
16 kHz	W		337	469	581	680	661
With controller lock	W		6	18	18	18	18
Overcurrent cycle 180 s							
Max. output current	A		31.5	40.5	51	61	78
Overload time	s		60	60	60	60	50
Recovery time	s		120	120	120	120	120
Max. output current during the recovery time	A		8.3	10.5	25.5	30	39
Overcurrent cycle 15 s							
Max. output current	A	$I_{max,out}$	22	28	68	81	104
Overload time	s	t_{ol}	3	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12	12
Max. output current during the recovery time	A		8.3	10.5	25.5	30	39
Cyclical mains switching			3 times per minute				
Brake chopper							
Max. output current	A	$I_{max,1}$	16.6	29	52	52	97
Min. brake resistance	Ω	R_{min}	47	27	15	15	7.5
Max Motor cable length shielded							
Without EMC category	m		100	100	100	100	100
Category C1 (2 kHz, 4 kHz, 8 kHz)	m		-	-	-	-	-
Category C2 (2 kHz, 4 kHz, 8 kHz)	m		20	20	20	20	20
Category C3 (2 kHz, 4 kHz, 8 kHz)	m		50	35	35	35	35
Weight	kg		3.7	8.0			

6.4.2 Fusing and terminal data

Inverter		DSV35-40-7P2	DSV35-40-9P4	DSV35-40-013	DSV35-40-016
Cable installation in compliance with		EN 60204-1			
Laying system		B2			
Operation		without mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Operation		with mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Earth-leakage circuit breaker					
Mains connection		≥ 300 mA, type B			
Connection		X100			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	9			11
Tightening torque	Nm	0.5			1.2
Required tool		0.6 x 3.5			0.8 x 4.0
Motor connection					
Connection		X105			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	9			11
Tightening torque	Nm	0.5			1.2
Required tool		0.6 x 3.5			0.8 x 4.0
PE connection					
Connection		PE			
Connection type		PE screw			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	10			11
Tightening torque	Nm	1.2			3.4
Required tool		0.8 x 5.5			PZ2

Fusing data						
Inverter		**DSV35-40-023**	**DSV35-40-031**	**DSV35-40-039**	**DSV35-40-046**	**DSV35-40-061**
Cable installation in compliance with		EN 60204-1				
Laying system		B2				
Operation		without mains choke				
Fuse						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Circuit breaker						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Operation		with mains choke				
Fuse						
Characteristic		gG/gL or gRL				
Max. rated current	A	32	63	63	63	80
Circuit breaker						
Characteristic		B				
Max. rated current	A	32	63	63	63	80
Earth-leakage circuit breaker						
Mains connection		≥ 300 mA, type B				
Connection		X100				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5				
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
Motor connection						
Connection		X105				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5	1.5			
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
PE connection						
Connection		PE				
Connection type		PE-screw				
Min. cable cross-section	mm²	1.5	1.5			
Max. cable cross-section	mm²	16	25			
Stripping length	mm	11	16			
Tightening torque	Nm	3.4	4			
Required tool		PZ2				

6.4.3 RFI filters / Mains filters

Maximum motor cable lengths and FI operation

Mains connection			**3-phase, 400 V/480 V**		
Inverter			**DSV35-40-7P2** **DSV35-40-9P4** **DSV35-40-013**	**DSV35-40-016** **DSV35-40-023**	**DSV35-40-031** **DSV35-40-039** **DSV35-40-046** **DSV35-40-061**
Without RFI filter					
Without EMC-Category Thermal Limmitation	Max. Motorcable-length shielded	m	100	100	100
	Max. Motorcable-length unshielded	m	200	200	200
Mit integriertem Funkentstörfilter					
Category C1	Max. Motorcable-length shielded	m	-	-	-
Category C2		m	20	20	20
	Earth-leakage circuit breaker	mA	300	300	300

6.5 3-phase mains connection 480 V / Normal duty

The output currents apply to these operating conditions:

• At a switching frequency of 2 kHz or 4 kHz: Ambient temperature above 40 °C with a rated output current reduced by 2.5 %/°C.

• If the load characteristic "Normal duty" and the switching frequencies 8 kHz or 16 kHz are selected, only the values of the load characteristic "Heavy duty" are reached..

6.5.1 Rated data

Inverter			**DSV35-40-7P2**	**DSV35-40-9P4**	**DSV3540013**	**DSV3540016**
Rated power	**kW**	**P_N**	**4**	**5.5**	**7.5**	**11**
	hp	**P_N**	**5**	**7.5**	**10**	**15**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz			
Output voltage			3 AC 0-400/480 V			
Rated mains current						
without mains choke	A	$I_{N,AC}$	8.6	11.2	15.3	22
with mains choke	A	$I_{N,AC}$	6.8	8.8	12.1	17.2
Apparent output power	KVA	A_{AN}	5.9	8	10.5	15
Output current						
2 kHz	A	I_{out}	7.6	9.8	13.2	18.3
4 kHz	A	I_{out}	7.6	9.8	13.2	18.3
8 kHz	A		-	-	-	-
16 kHz	A		-	-	-	-
Power loss						
2 kHz	W		94	125	163	238
4 kHz	W		100	133	173	253
8 kHz	W		-	-	-	-
16 kHz	W		-	-	-	-
With controller lock	W		6	6	6	6
Overcurrent cycle 180 s						
Max. output current	A		9.5	12.3	16.5	21
Overload time	s		60	60	60	60
Recovery time	s		120	120	120	120
Max. output current during the recovery time	A		4.8	6.2	8.3	10.5
Overcurrent cycle 15 s						
Max. output current	A	$I_{max,o}$	12.6	16.4	22	28
Overload time	s	t_{ol}	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12
Max. output current during the recovery time	A		4.7	6.2	8.3	10.5
Cyclical mains switching			3-times per minute			
Brake chopper						
Max. output current	A	$I_{max,1}$	9.5	16.6	16.6	29
Min. brake resistance	Ω	R_{min}	82	47	47	27
Max Motor cable length						
Without EMC category	m		100			
Category C1 (2 kHz, 4 kHz, 8 kHz)	m		-			
Category C2 (2 kHz, 4 kHz, 8 kHz)	m		20			
Category C3 (2 kHz, 4 kHz, 8 kHz)	m		35			50
Weight	kg		2.3			3.7

Inverter			DSV3540023	DSV3540031	DSV3540039	DSV3540046	DSV3540061
Rated power	**kW**	**P_N**	**15**	**18.5**	**22**	**30**	**37**
	hp	**P_N**	**20**	**25**	**30**	**40**	**50**
Mains voltage range			3/PE AC 340 V ... 528 V, 45 Hz ... 65 Hz				
Output voltage			3 AC 0-400/480 V				
Rated mains current							
without mains choke	A	$I_{N,AC}$	-	40	46,3	55	-
with mains choke	A	$I_{N,AC}$	22.6	30	38	46	59
Apparent output power	KVA	A_{AN}	19	26	32	38	49
Output current							
2 kHz	A	I_{out}	25.2	32.4	40.8	48.5	62.4
4 kHz	A	I_{out}	25.2	32.4	40.8	48.5	62.4
8 kHz			-	-	-	-	
16 kHz			-	-	-	-	
Power loss							
2 kHz	W		329	395	463	589	761
4 kHz	W		340	408	479	620	810
8 kHz			-	-	-	-	-
16 kHz			-	-	-	-	-
With controller lock	W		6	18	18	18	18
Overcurrent cycle 180 s							
Max. output current	A		31.5	40.5	51	61	78
Overload time	s		60	60	60	60	60
Recovery time	s		120	120	120	120	120
Max. output current during the recovery time	A		15.8	20.3	25.5	30	39
Overcurrent cycle 15 s							
Max. output current	A	$I_{max,o}$	42	54	68	81	104
Overload time	s	t_{ol}	3	3	3	3	3
Recovery time	s	t_{re}	12	12	12	12	12
Max. output current during the recovery time	A		15.8	20.3	25.5	30	30
Cyclical mains switching			3-times per minute				
Brake chopper							
Max. output current	A	$I_{max,1}$	29	48	52	52	97
Min. brake resistance	Ω	R_{min}	27	18	15	15	7.5
Max Motor cable length							
Without EMC category	m		100				
Category C1 (2 kHz, 4 kHz, 8 kHz)	m		-				
Category C2 (2 kHz, 4 kHz, 8 kHz)	m		20				
Category C3 (2 kHz, 4 kHz, 8 kHz)	m		50	35			
Weight	kg		3.7	8			

6.5.2 Fusing and terminal data

Inverter		DSV35-40-7P2	DSV35-40-9P4	DSV35-40-013	DSV35-40-016
Cable installation in compliance with		EN 60204-1			
Laying system		B2			
Operation		without mains choke			
Fuse					
Characteristic		gG/gL oder gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Operation		with mains choke			
Fuse					
Characteristic		gG/gL or gRL			
Max. rated current	A	25	25	25	32
Circuit breaker					
Characteristic		B			
Max. rated current	A	25	25	25	32
Earth-leakage circuit breaker					
Mains connection		≥ 300 mA, type B			
Connection		X100			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6	6	6	16
Stripping length	mm	9	9	9	11
Tightening torque	Nm	0.5	0.5	0.5	1.2
Required tool		0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.8 x 4.0
Motor connection					
Connection		X105			
Connection type		Screw terminal			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	9			11
Tightening torque	Nm	0.5			1.2
Required tool		0.6 x 3.5			0.8 x 4.0
PE connection					
Connection		PE			
Connection type		PE-screw			
Min. cable cross-section	mm²	1.5			
Max. cable cross-section	mm²	6			16
Stripping length	mm	10			11
Tightening torque	Nm	2			3.4
Required tool		Torx 20			PZ2

Fusing data						
Inverter		**DSV35-40-023**	**DSV35-40-031**	**DSV35-40-039**	**DSV35-40-046**	**DSV35-40-061**
Cable installation in compliance with		EN 60204-1				
Laying system		B2				
Operation		without mains choke				
Fuse						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Circuit breaker						
Characteristic		-	B	-	-	-
Max. rated current	A	-	63	-	-	-
Operation		with mains choke				
Fuse						
Characteristic		gG/gL or gRL				
Max. rated current	A	32	63	63	63	80
Circuit breaker						
Characteristic		B				
Max. rated current	A	32	63	63	63	80
Earth-leakage circuit breaker						
Mains connection		≥ 300 mA, type B				
Connection		X100				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5				
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
Motor connection						
Connection		X105				
Connection type		Screw terminal				
Min. cable cross-section	mm²	1.5	1.5			
Max. cable cross-section	mm²	16	35			
Stripping length	mm	11	18			
Tightening torque	Nm	1.2	3.8			
Required tool		0.8 x 4.0	0.8 x 5.5			
PE connection						
Connection		PE				
Connection type		PE-screw				
Min. cable cross-section	mm²	1.5	1.5			
Max. cable cross-section	mm²	16	25			
Stripping length	mm	11	16			
Tightening torque	Nm	3.4	4			
Required tool		PZ2				

6.5.3 RFI filters / Mains filters

Maximum motor cable lengths and FI operation

Mains connection			**3-phase, 400 V/480 V**		
Inverter			**DSV35-40-7P2** **DSV35-40-9P4** **DSV35-40-013**	**DSV35-40-016** **DSV35-40-023**	**DSV35-40-031** **DSV35-40-039** **DSV35-40-046** **DSV35-40-061**
Without RFI filter					
Without EMC-Category Thermal Limmitation	Max. Motorcable-length shielded	m	100	100	100
	Max. Motorcable-length unshielded	m	200	200	200
Mit integriertem Funkentstörfilter					
Category C1	Max. Motorcable-length shielded	m	-	-	-
Category C2		m	20	20	20
	Earth-leakage circuit breaker	mA	300	300	300

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