

1.3 An Overview of Drive Controllers and Auxiliary Components

An Overview of Communications Interfaces

Interface	Device type								
	DKC11.3*	DKC01.3	DKC21.3	DKC02.3	DKC22.3	DKC03.3	DKC04.3	DKC05.3	DKC06.3
RS232 / RS485*	X	X	X	X	X	X	X	X	X
Analog Interface	X	X	X	X	X	X	X	X	X
Parallel Interface		X							
Parallel Interface 2			X						
Stepper Interface		X							
SERCOS interface				X					
SERCOS interface 2					X				
Profibus-DP Interface						X			
InterBus Interface							X		
CANopen Interface								X	
DeviceNet Interface									X

* The DKC11.3 device type resp. the RS485 interface does not exist for the DKC**.3-016-7-FW drive controllers.

Fig. 1-3: An overview of interfaces

Type Code for Drive Controller DKC

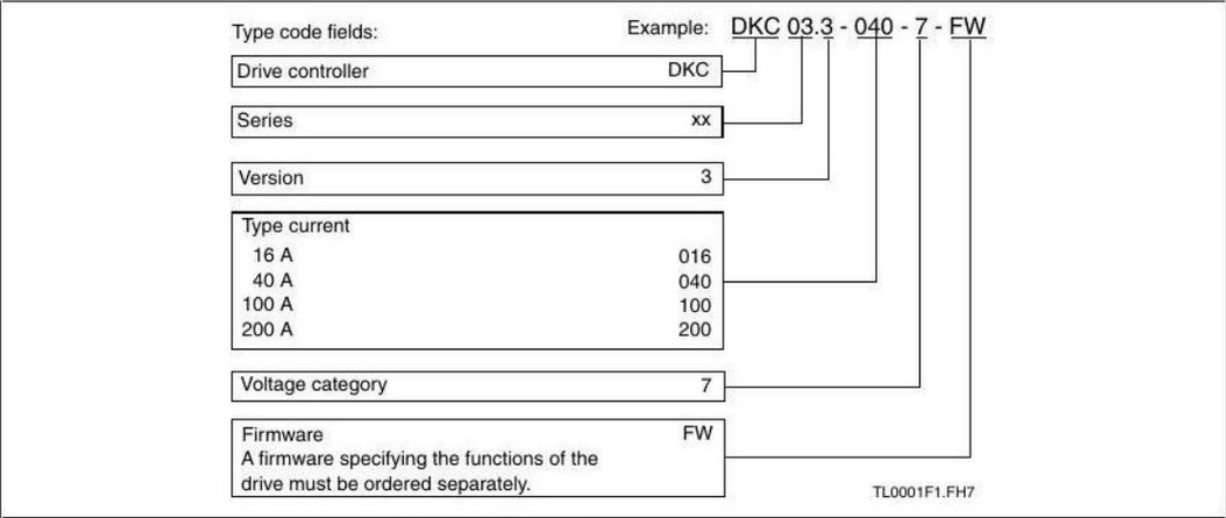


Fig. 1-5: Type code

Note: The above illustrates how the type codes are put together. Your sales representative will help with the current status of available versions.

4 ECDRIVE03 DKC**.040, DKC**.100, DKC**.200

4.1 Technical Data

Dimensions

Drive Controller DKC**.3-040-7-FW

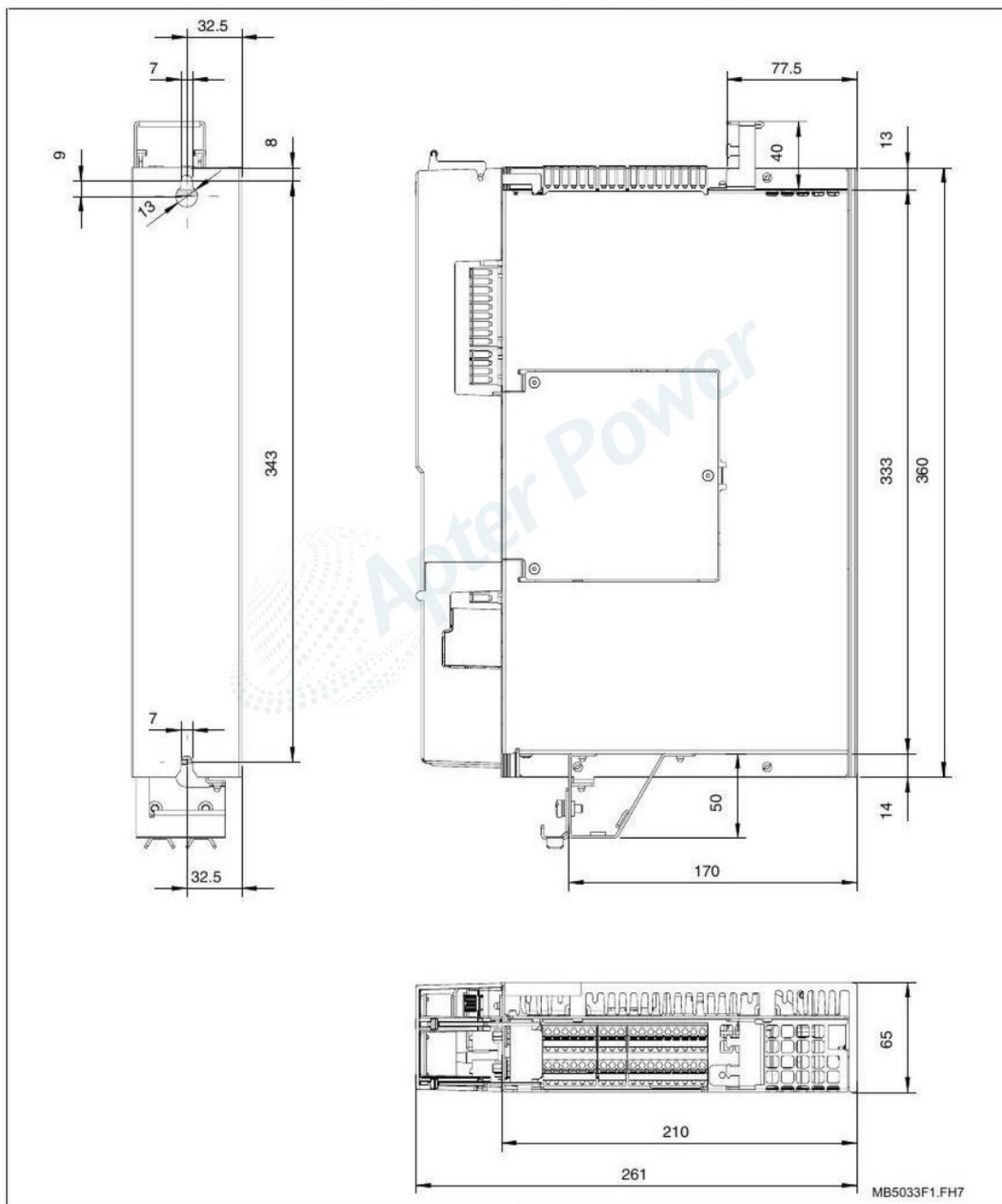


Fig. 4-1: Drive Controller DKC**.3-040-7-FW

Ambient and operating conditions

Note: ECODRIVE03 drive control devices and its auxiliary components are designed for control cabinet mounting.

Ambient temperature and installation altitude

Selection lists are specified for each motor/drive combination.

The selection lists apply to motors and drives within the specified ambient and operating conditions (see "Fig. 4-5: Ambient and operating conditions").

Differing conditions reduce the performance specifications

- of the drive:
 - allowed DC bus continuous output
 - continuous bleeder output
 - continuous current
- of the motor:
 - output
 - continuous torque at standstill
 - S1 continuous torque
 - Short-time operating torque M_{KB}

according to the diagrams (see "Fig. 4-4: Degree of utilization as a value dependent on ambient temperature and installation altitude"). If deviating ambient temperatures and higher installation altitudes occur simultaneously, both utilization factors must be multiplied. The installation altitude must only be taken into account once. Deviating ambient temperatures must be taken into account separately for motor and drive controller.

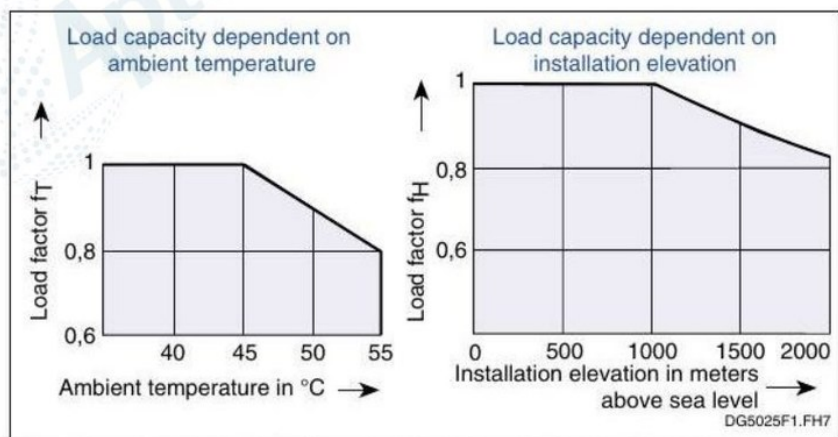


Fig. 4-4: Degree of utilization as a value dependent on ambient temperature and installation altitude

Designation	Symbol	Unit	DKC**.3-***-7-FW
Permissible ambient and air inlet temperature for the output ratings	T _A	°C	+5 ... +45
Max. permissible ambient and air inlet temperature for reduced output ratings	T _A	°C	The values specified in the selection lists for output and torque are reduced in the range +45...+55 °C by 2% per °C temperature increase
Storage and shipping temperatures	T _L	°C	-30 ... +85
Max. allowed installation altitude for the output ratings		m	1000
Max. allowed installation altitude		m	2000
Max. permissible relative humidity		%	95
Max. permissible absolute humidity		g/m³	25
Allowable degree of contamination	2, according to EN 50178 fine dust no allowed, no condensation		
Type of protection	IP20, according to EN 60529 = DIN VDE 0470-1-1992 (ICE 529-1989)		
Vibration sinus in operation according to EN 60068-2-6			
Amplitude and Frequency			0.3 mm (peak-to-peak) at 5 ... 57 Hz 2 g at 57 ... 500 Hz
Tolerance		%	± 15
Vibration distortion (Random) in operation according to IEC 68-2-36			
Frequency		Hz	20 ... 500
Spectral acceleration density amplitude		g²/Hz	0.01
Tolerance		dB	± 3
Virtual value (r.m.s.) of the total acceleration		g	2.2
Shock check not in operation according to EN 60068-2-27			
Halve sine in 3 axis			15 g / 11 ms

Fig. 4-5: Ambient and operating conditions

Note: The user must check that the ambient conditions are maintained, especially the control cabinet temperature, by calculating the thermal performance of the control cabinet.

Electric Data of the Individual DKC**.3 Components

Mains connections, Power section DKC**.3-040-7-FW and DKC**.3-100-7-FW

Designation	Symbol	Unit	DKC**.3-040-7-FW		DKC**.3-100-7-FW	
Operating mode at the mains			single phase	three phase	single phase	three phase
Mains input voltage	U_{N1}	V	1 x AC (200 ... 480) ± 10%	3 x AC	1 x AC (200 ... 480) ± 10%	3 x AC
Mains frequency	f_{N1}	Hz	(50 ... 60) ± 2			
Rotary field			clockwise or counter-clockwise			
Connected load	S_{N1}	kVA	see page 11-1: "Mains Connections"			
Nominal charging current (dependent on mains input voltage)	I_{EIN1}	A	5 ... 12		12 ... 28	
Soft-start resistor	$R_{Softstart}$	Ohm	60		24	
Continuous power soft-start resistor	$P_{Softstart}$	kW	0.15 ²⁾		0.5 ³⁾	
Switching frequency (selectable)	f_S	kHz	4 or 8			
Type current = peak current 1	I_{PEAK1}	A	40 ¹⁾		100 ¹⁾	
Peak current 2 for $f_S = 4$ kHz	$I_{PEAK2(4kHz)}$	A	16 ¹⁾		40 ¹⁾	
Peak current 2 for $f_S = 8$ kHz	$I_{PEAK2(8kHz)}$	A	12.5 ¹⁾		32 ¹⁾	
Continuous current 1 for $f_S = 4$ kHz	$I_{CONT1(4kHz)}$	A	13 ¹⁾		32 ¹⁾	
Continuous current 2 for $f_S = 4$ kHz	$I_{CONT2(4kHz)}$	A	16 ¹⁾		40 ¹⁾	
Continuous current 1 for $f_S = 8$ kHz	$I_{CONT1(8kHz)}$	A	9 ¹⁾		21 ¹⁾	
Continuous current 2 for $f_S = 8$ kHz	$I_{CONT2(8kHz)}$	A	12.5 ¹⁾		32 ¹⁾	
Max. output frequency at $f_S=4$ kHz	f_{out}	Hz	400		400	
Max. output frequency at $f_S=8$ kHz	f_{out}	Hz	800		800	
Device power dissipation without internal continuous bleeder power for I_{CONT2}	P_V	W	180 (see page 12-1: "Power dissipation")		420	
Peak bleeder power DKC when $U_{ZW} = 850$ V for permissible load cycle	P_{BS}	kW	10 0.5 s on, 33 s off		120 0.25 s on, 60 s off	
Continuous bleeder power DKC when $T_a \leq 45$ °C under max. temperature range with distance	P_{BD} ΔT_d	kW K mm	0.15 28 80		0.5 150 80	
Max. energy dissipation	$W_{R,MAX}$	kWs	5.0		31	
Max. DC bus charge	W_{MAX}	kWs	5.0		31	
Internal DC bus dynamic brake (ZKS)			not present		present	
Resistor for ZKS	R_{ZKS}	Ohm	not present		6	
Storable energy of the DC bus capacitors	W_{ZW}	Ws	see diagrams page 4-17: "Storable energy in the bus"			
Nominal DC bus capacitance DKC	C_{ZW}	mF	0.27 ±20%		0.675 ±20%	
DC bus voltage (dependent on mains input voltage)	U_{ZW}	V	DC 300 ... 800			
DC bus continuous power (dependent on mains input voltage)	P_{ZWD}		see diagrams page 4-28 "Allowed DC bus continuous power"			

Designation	Symbol	Unit	DKC**.3-040-7-FW	DKC**.3-100-7-FW
max. DC bus continuous power for a single source supply where $U_{N1} = 3 \times \text{AC } 400\text{V}$, at $T_a \leq 45^\circ\text{C}$	P_{ZWD}	kW	1.3	3.3
max. DC bus continuous power for a single source supply where $U_{N1} = 3 \times \text{AC } 480\text{V}$, when $T_a \leq 45^\circ\text{C}$	P_{ZWD}	kW	1.5	4
max. DC bus continuous power for a single source supply where $U_{N1} = 3 \times \text{AC } 400\text{V}$, CZM01.3, when $T_a \leq 45^\circ\text{C}$	P_{ZWD}	kW	1.3	10.5
max. DC bus continuous power for a single source supply where $U_{N1} = 3 \times \text{AC } 480\text{V}$, CZM01.3, when $T_a \leq 45^\circ\text{C}$	P_{ZWD}	kW	1.5	12
DC bus peak power	P_{ZWS}		see diagrams on page 4-27 "DC bus peak power"	
Power section cooling			with internal blower	
Cooling the bleeder resistor			with internal blower via heatsink and back wall of unit	with internal blower
Cooling air flow			together for bleeder and power section	
Volumetric capacity of the forced cooling		m ³ /h	approx. 24	approx. 48
Insulation resistance at DC500V	R_{is}	MΩ	> 8	> 8
Coupling capacitance power section against housing	C_{Kop}	nF	200	200

Fig. 4-6: Technical Data Mains connection and Power section

Block diagram of the DKC**.3-040-7-FW power section

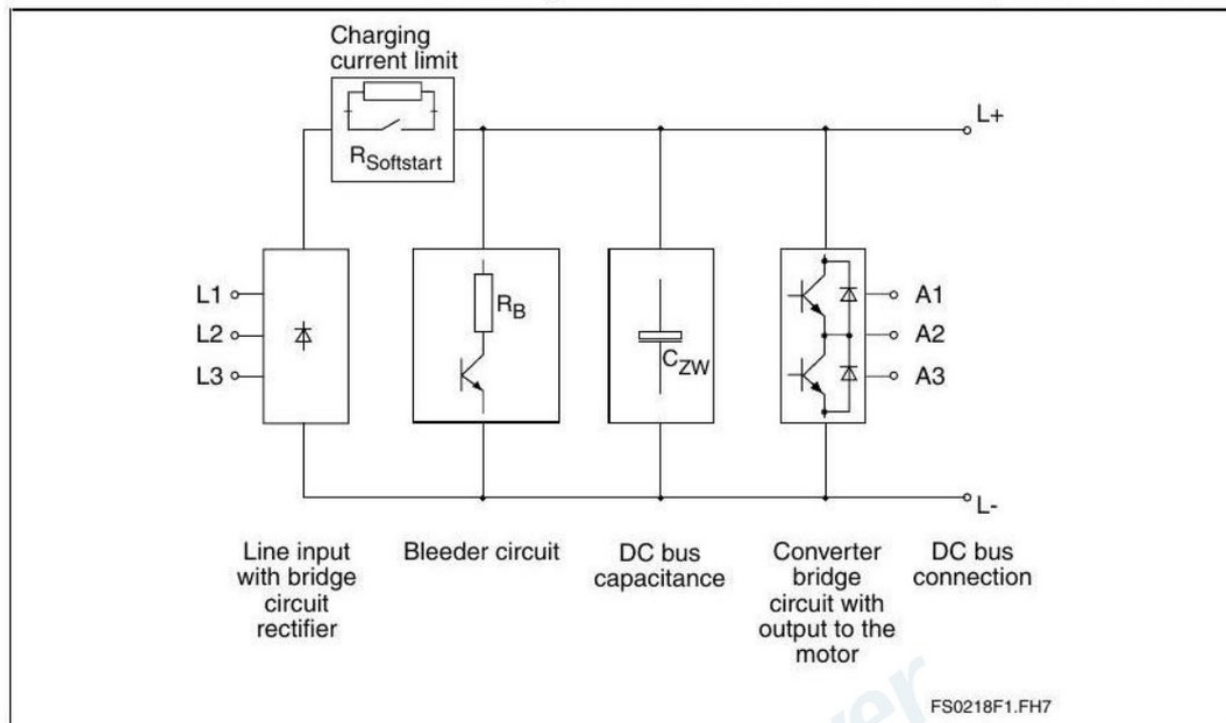


Fig. 4-8: Block diagram of the DKC**.3-040-7-FW power section

Control voltage connection for DKC

(Data applies to ambient temperature of 25 °C)

Designation	Symbol	Unit	DKC**.3-040-7-FW	DKC**.3-100-7-FW
Control voltage	U_{N3}	V	DC (19.2 ... 28.8) V	
max. ripple effect	w		may not exceed input voltage range	
max. allowed overvoltage	U_{N3max}	V	45 V for 1 ms, non repetitive *)	
max. charging current	I_{EIN3}	A	4.0 (see diagram on page 4-16 "Output current characteristic curves for servo applications")	
max. pulse duration of I_{EIN3}	t_{N3Lade}	ms	12 (see diagram on page 4-16 "Output current characteristic curves for servo applications")	
max. input capacitance	C_{N3}	mF	0.9 * 1.2	0.9 * 1.2
Power consumption (X1)	dependent on type of unit, without external load at control outputs and encoder interface 2			
	DKC01.3	P_{N3}	W	19
	DKC02.3	P_{N3}	W	19
	DKC03.3	P_{N3}	W	20
	DKC04.3	P_{N3}	W	21
	DKC05.3	P_{N3}	W	20
	DKC06.3	P_{N3}	W	20
	DKC11.3	P_{N3}	W	18
	DKC21.3	P_{N3}	W	20
	DKC22.3	P_{N3}	W	20

Fig. 4-11: Control voltage connection for DKC

Amplitude of the DKC control voltage charging current at startup, to selecting power source

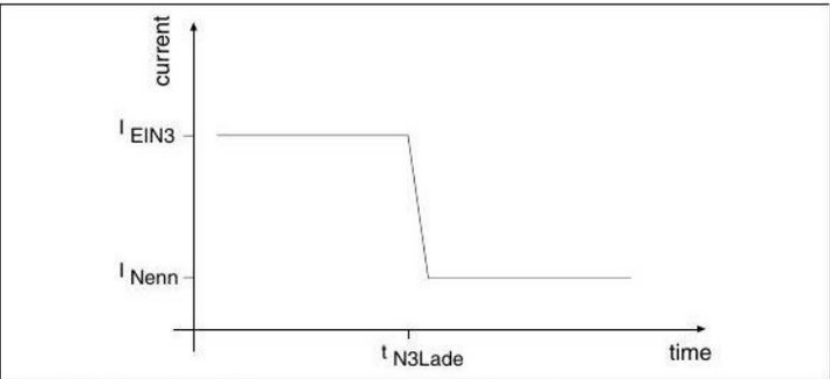


Fig. 4-13: Example of charging current inrush of control voltage

Note: For n parallel-switched inputs the charging current inrush is n-fold.

Voltage connection for holding brake

Designation	Symbol	Unit	DKC**.3-040-7-FW	DKC**.3-100-7-FW	DKC**.3-200-7-FW
Input voltage	U_{HB}	V	depends on motor type, listed in motor project planning manual (see also page 4-67 X6, Motor temperature monitoring and holding brakes)		
Ripple content	w	%			
Current consumption	I_{HB}	A			

Fig. 4-14: Voltage connection for holding brake

Materials used, Mass

Designation	Symbol	Unit	DKC**.3-040-7-FW	DKC**.3-100-7-FW	DKC**.3-200-7-FW
Mass	m	kg	5.7	9.7	19.5
materials used			Free of asbestos and silicone		

Fig. 4-15: Materials used, mass

4.2 Electrical connections - independent of the drive controller type

A look at the drive controller and connector designations

Front view

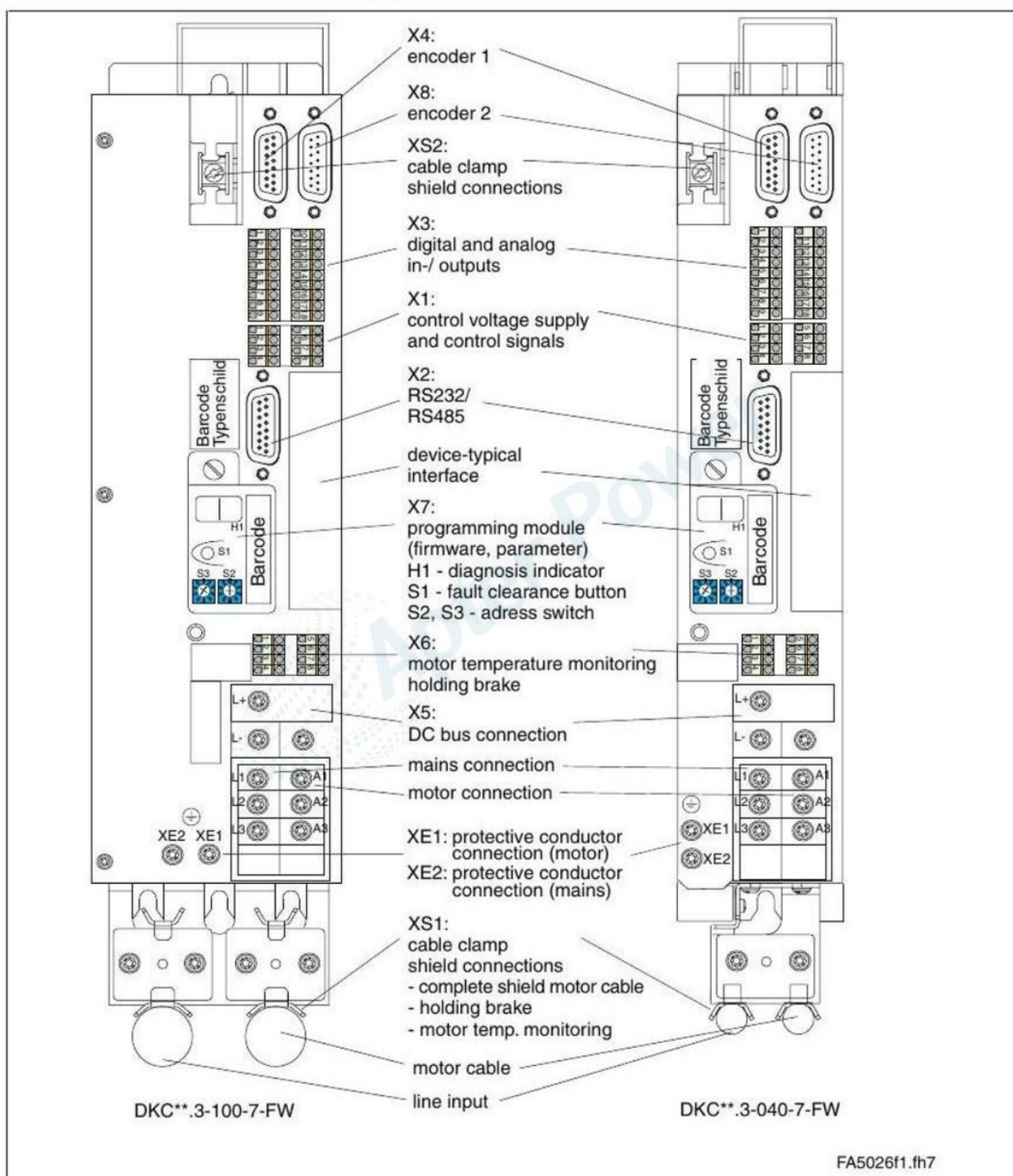


Fig. 4-43: Front view DKC**.3-040-7-FW and DKC**.3-100-7-FW with Connectors

Connections on top of the drive controller

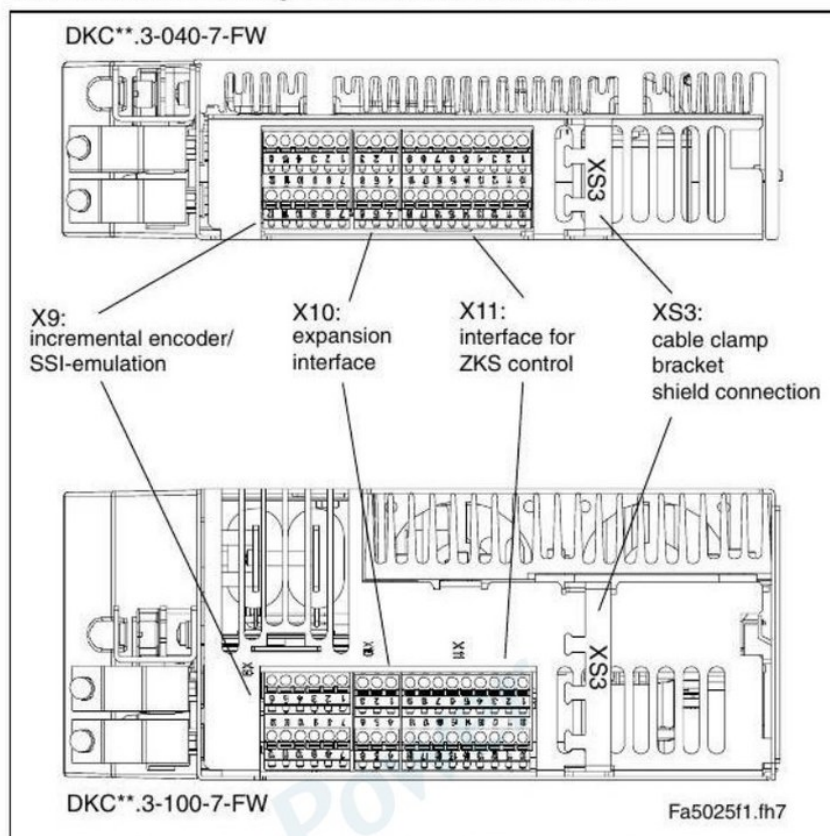


Fig. 4-45: Connections on top of unit for DKC**.3-040-7-FW and DKC**.3-100-7-FW

DKC 02.3-***-7-FW – SERCOS interface

View of command communication interface

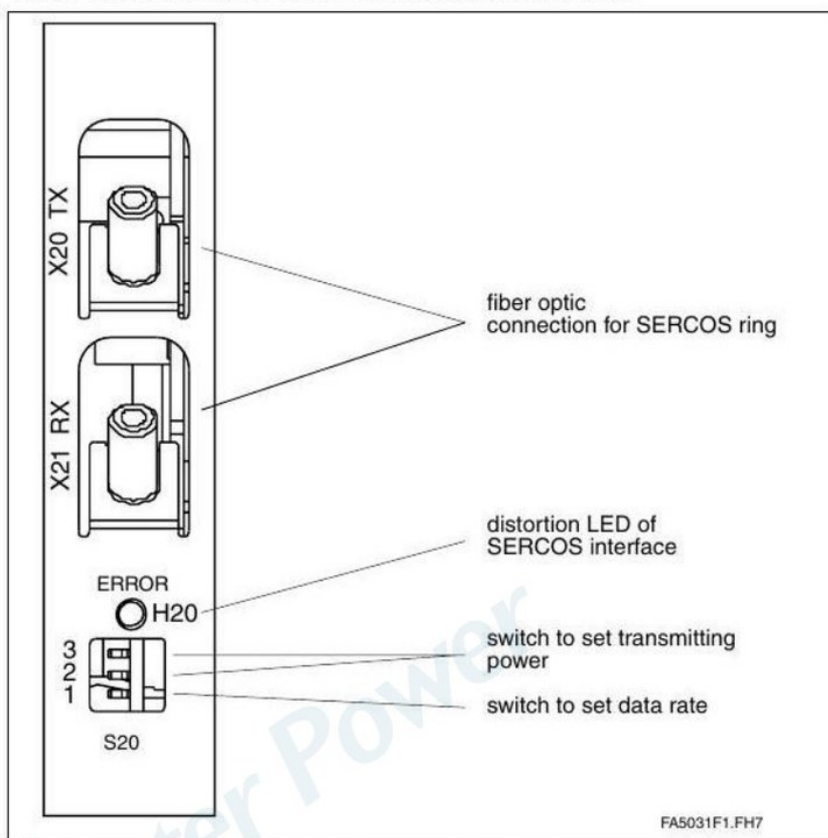


Fig. 4-175: View of command communication interface

Connection diagram for SERCOS interface

Connection
SERCOS interface:

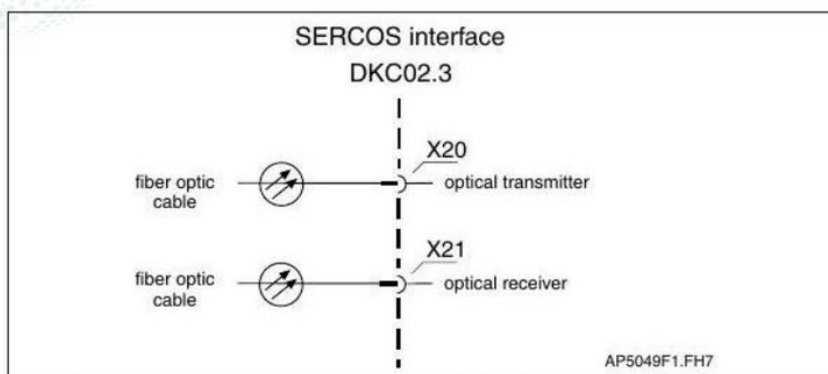


Fig. 4-176: I/O connection allocations for DKC02.3

13.4 Ordering

Unit Types Available

DKC01.3-016-7	DKC01.3-040-7	DKC01.3-100-7	DKC01.3-200-7
DKC02.3-016-7	DKC02.3-040-7	DKC02.3-100-7	DKC02.3-200-7
DKC03.3-016-7	DKC03.3-040-7	DKC03.3-100-7	DKC03.3-200-7
DKC04.3-016-7	DKC04.3-040-7	DKC04.3-100-7	DKC04.3-200-7
DKC05.3-016-7	DKC05.3-040-7	DKC05.3-100-7	DKC05.3-200-7
DKC06.3-016-7	DKC06.3-040-7	DKC06.3-100-7	DKC06.3-200-7
-	DKC11.3-040-7	DKC11.3-100-7	DKC11.3-200-7
DKC21.3-016-7	DKC21.3-040-7	DKC21.3-100-7	DKC21.3-200-7

Note: List of available types is constantly being expanded, please request current status from a sales office of Rexroth Indramat GmbH.

Replacement Parts

- Contact protection
- Connecting and mounting accessories SUP-M**-DKC**.3-040
- Connecting and mounting accessories SUP-M**-DKC**.3-100
- Connecting and mounting accessories SUP-M**-DKC**.3-200
- Connecting and mounting accessories SUP-E01-DKC**.3
- Connecting and mounting accessories SUP-E02-DKC**.3
- Firmware module ESM 2.* (not for DKC**.3-016-7-FW)

Additional Accessories

- Standard interface cables IKB0005/length four different lengths for RS232 (2 m, 5 m, 10 m or 15 m)
- Interface cable RS485 INK0572/ length (not for DKC**.3-016-7-FW)

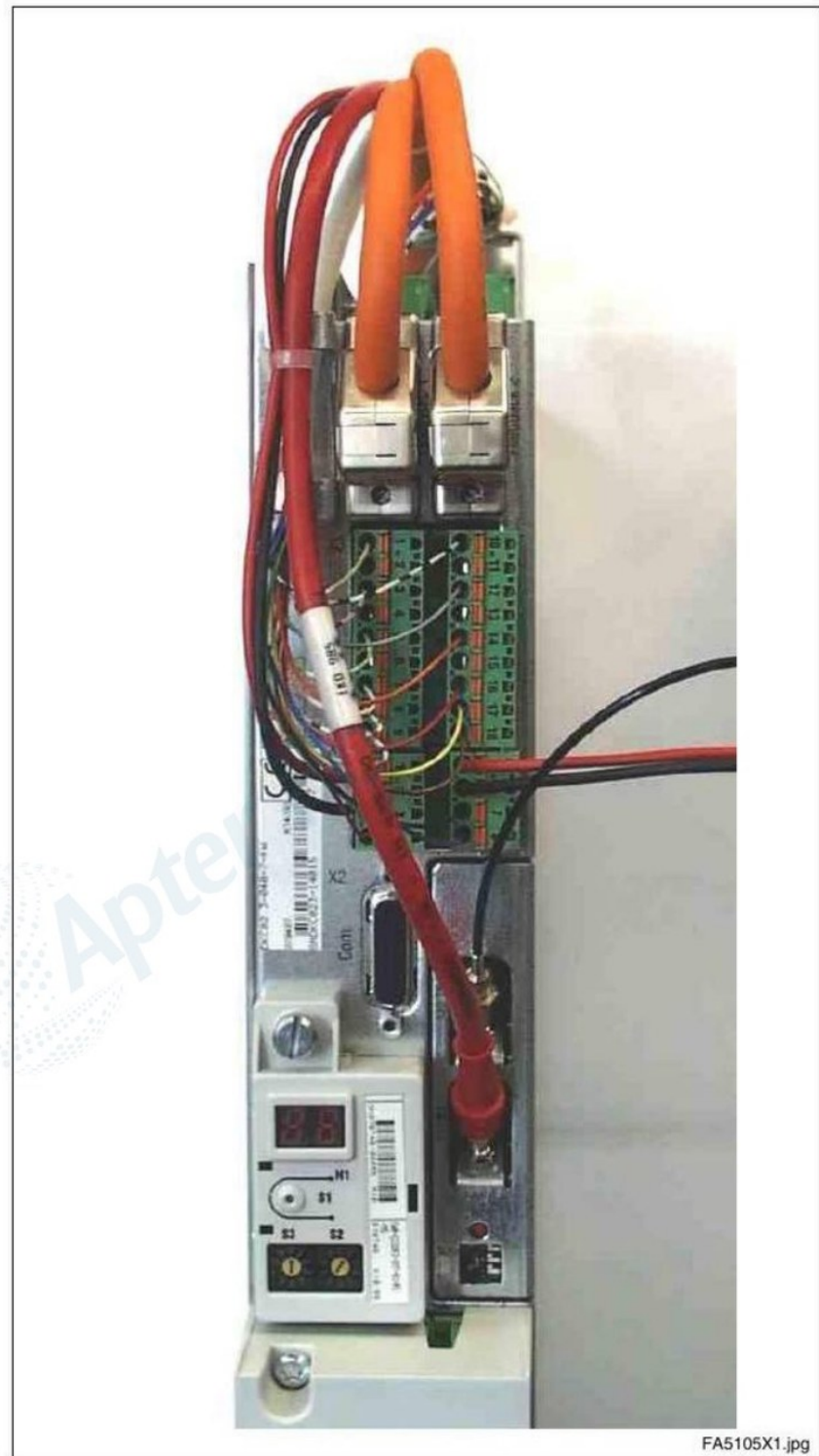
Mounting Accessories

- A Torx screw driver TX30 with a 400 mm long blade is available.
- Torx screw driver TX30 M6 400 lg (MN00282391)

Commissioning Aids

- Command value box (not for DKC**.3-016-7-FW)
- DriveTop (Software for start-up)

View of DKC02.3-040-7



FA5105X1.jpg

Fig. 16-22: View with SERCOS interface