

Emotron CDU/CDX 2.0 Compact Drive



Data Sheet
English

Emotron CDU/CDX 2.0 Variable speed drives for Compact Drives

Electrical specifications related to model

Table 1 Typical motor power at mains voltage 400 V

Model	Max. output current [A]*		Normal duty (120 %, 1 min every 10 min)		Heavy duty (150 %, 1 min every 10 min)		Frame size
	CDU	CDX	Power @ 400 V [kW]	Rated current [A]	Power @ 400 V [kW]	Rated current [A]	
CDU/CDX 48-008	9.0	11.3	3	7.5	2.2	6.0	B
CDU/CDX 48-010	11.4	14.3	4	9.5	3	7.6	
CDU/CDX 48-013	15.6	19.5	5.5	13.0	4	10.4	
CDU/CDX 48-018	21.6	27.0	7.5	18.0	5.5	14.4	
CDU/CDX 48-026	31	39	11	26	7.5	21	C
CDU/CDX 48-031	37	46	15	31	11	25	
CDU/CDX 48-037	44	55	18.5	37	15	29.6	
CDU/CDX 48-046	55	69	22	46	18.5	37	

Table 2 Typical motor power at mains voltage 460 V

Model	Max. output current [A]*		Normal duty (120 %, 1 min every 10 min)		Heavy duty (150 %, 1 min every 10 min)		Frame size
	CDU	CDX	Power @ 460 V [hp]	Rated current [A]	Power @ 460 V [hp]	Rated current [A]	
CDU/CDX 48-008	9.0	11.3	3	7.5	3	6.0	B
CDU/CDX 48-010	11.4	14.3	5	9.5	3	7.6	
CDU/CDX 48-013	15.6	19.5	7.5	13.0	5	10.4	
CDU/CDX 48-018	21.6	27.0	10	18.0	7.5	14.4	
CDU/CDX 48-026	31	39	15	26	10	21	C
CDU/CDX 48-031	37	46	20	31	15	25	
CDU/CDX 48-037	44	55	25	37	20	29.6	
CDU/CDX 48-046	55	69	30	46	25	37	

Table 3 Typical motor power at mains voltage 525 V

Model	Max. output current [A]*		Normal duty (120 %, 1 min every 10 min)		Heavy duty (150 %, 1 min every 10 min)		Frame size
	CDU	CDX	Power @ 525 V [kW]	Rated current [A]	Power @ 525 V [kW]	Rated current [A]	
CDU/CDX 52-008	9.0	11.3	4	7.5	3	6.0	B
CDU/CDX 52-010	11.4	14.3	5.5	9.5	4	7.6	
CDU/CDX 52-013	15.6	19.5	7.5	13.0	5.5	10.4	
CDU/CDX 52-018	21.6	27.0	11	18.0	7.5	14.4	
CDU/CDX 52-026	31	39	15	26	11	21	C
CDU/CDX 52-031	37	46	18.5	31	15	25	
CDU/CDX 52-037	44	55	22	37	18.5	29.6	
CDU/CDX 52-046	55	69	30	46	22	37	

* Available for a limited time and as long as drive temperature permits.

Dimensions and Weights

The table below gives an overview of the dimensions and weights. Protection class IP55 is according to the EN 60529 standard.

Table 4 Mechanical specifications

Models	Frame size	Dim. H x W x D [mm]	Weight [kg]*
008 to 018	B	351 x 203 x 200	12.5
026 to 046	C	445 x 290 x 188	24

* Weight is without motor and adapter plate.

Drawings CDU and CDX

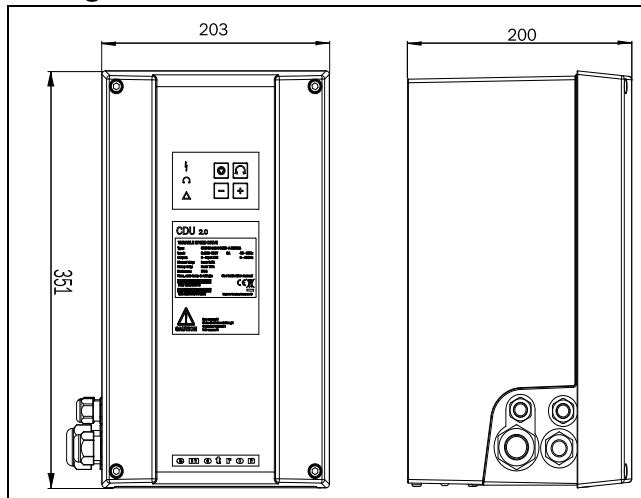


Fig. 1 CDU/CDX 48/52: Model 008 – 018 (B) *

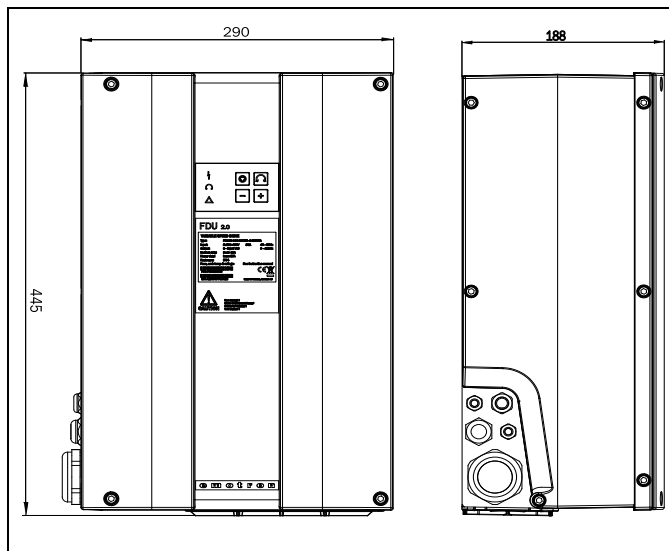


Fig. 2 CDU/CDX 48/52: Model 026 – 046 (C) *

As an option, both sizes are available with cable entry from the short side, see example in Fig. 3.

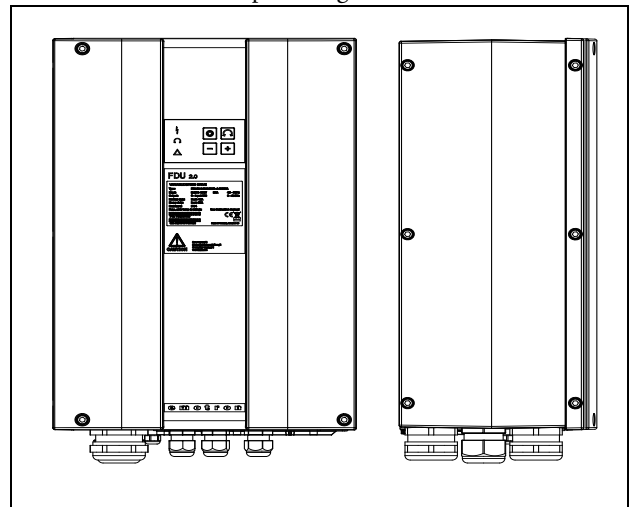


Fig. 3 CDU/CDX 48/52: Model 026 – 046 (C) with cable entry from the short side. *

* Note! Cable glands are optional.

General electrical specifications

Table 5 General electrical specifications

General

Mains voltage:	380-480 V +10%/-15%
CDU and CDX 48	440-525 V +10%/-15%
CDU and CDX 52	45 to 65 Hz
Mains frequency	0.95
Input power factor	0-Mains supply voltage
Output voltage	0-400 Hz
Output frequency	3 kHz (CDU is adjustable 1,5-6 kHz)
Output switching frequency	97% for models 008 to 018
Efficiency at nominal load	98% for models 026 to 046

Control signal inputs

Analogue (differential)

Analogue Voltage/current	0 - ±10 V/0-20 mA via software setting
Max. input voltage	+30 V/30 mA
Input impedance	20 kΩ (voltage) 250 Ω (current)
Resolution	11 bits + sign
Hardware accuracy	1% type + 1 ½ LSB fsd
Non-linearity	1½ LSB

Digital

Input voltage	High>9 VDC Low<4 VDC
Max. input voltage	+30 VDC
Input impedance	<3.3 VDC: 4.7 kΩ ≥3.3 VDC: 3.6 kΩ
Signal delay	≤8 ms

Control signal outputs

Analogue

Output voltage/current	0-10 V/0-20 mA via software setting
Max. output voltage	+15 V @5 mA cont.
Short-circuit current (∞)	+15 mA (voltage) +140 mA (current)
Output impedance	10 Ω (voltage)
Resolution	10 bit
Maximum load impedance for current	500 Ω
Hardware accuracy	1.9 % type fsd (voltage), 2.4 % type fsd (current)
Offset	3 LSB
Non-linearity	2 LSB

Digital

Output voltage	High>20 VDC @50 mA, >23 VDC open
Shortcircuit current(∞)	Low<1 VDC @50 mA 100 mA max (together with +24 VDC)

Relays

Contacts	0,1 - 2 A/U _{max} 250 VAC or 42 VDC
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References

+10VDC	+10 VDC @ 10 mA Shortcircuit current +30 mA max
-10VDC	-10 VDC @ 10 mA
+24VDC	+24 VDC Short-circuit current +100 mA max (together with Digital Outputs)

Operation at higher temperatures

Most Emotron variable speed drives are designed for operation at maximum of 40°C ambient temperature. However it is possible to use the VSD at higher temperatures with little loss in performance.

Table 6 shows ambient temperature as well as derating for higher temperatures.

Table 6 Ambient temperature and derating for 400 – 525V types

Model	IP55	
	Max temp.	Derating: possible
CDU/CDX 48/52 008 to - 046	40 °C	-2.5%/°C to max +10°C (50 C)

Example

In this example we have a motor with the following data that we want to run at the ambient temperature of 45°C:

Voltage 400 V
Current 29 A
Power 15 kW

Select variable speed drive

The ambient temperature is 5 °C higher than the maximum ambient temperature. The following calculation is made to select the correct VSD model.

Derating is possible with loss in current capacity of 2.5%/°C.

Derating will be: $5 \times 2.5\% = 12.5\%$

Calculation for model CDU/CDX 48-031:

$31 \text{ A} - (12.5\% \times 31) = 27.1 \text{ A}$; this is not enough.

Calculation for model CDU/CDX 48-037

$37 \text{ A} - (12.5\% \times 37) = 32.4 \text{ A}$

In this example we select the CDU/CDX 48-037.

Operation at higher switching frequency

Only valid for CDU.

Table 7 shows the switching frequency for the different VSD models. With the possibility of running at higher switching frequency you can reduce the noise level from the motor.

Table 7 Switching frequency

Models	Standard Switching frequency	Range
CDU/CDX 48/52 008 to - 046	3 kHz	1,5 – 6 kHz

Note!

For switching Frequency >3 kHz contact Emotron AB

Environmental conditions

Table 8 Operation

Parameter	Normal operation
Nominal ambient temperature	0°C–40°C See table, see Table 6 for different conditions
Atmospheric pressure	86–106 kPa
Relative humidity, non-condensing	0–90%
Contamination, according to IEC 60721-3-3	No electrically conductive dust allowed. Cooling air must be clean and free from corrosive materials. Chemical gases, class 3C2. Solid particles, class 3S2.
Vibrations	According to IEC-EN 60721-3-3 , Class 3 M7, Sinusoidal vibrations: 2<f<9 Hz, 10 mm 9<f<200 Hz, 3g
Altitude	0–1000 m, with 1%/100 m derating of rated output current for 1000 - 4000 m.

Table 9 Storage

Parameter	Storage condition
Temperature	-20 to +60 °C
Atmospheric pressure	86–106 kPa
Relative humidity, non-condensing	0–90%

Fuses, cable cross-sections and glands

Use mains fuses of the type gL/gG conforming to IEC 269 or installation cut-outs with similar characteristics. Check the equipment first before installing the glands.

Max. Fuse = maximum fuse value that still protects the VSD and upholds warranty.

NOTE: The dimensions of fuse and cable cross-section are dependent on the application and must be determined in accordance with local regulations.

Table 10 Fuses, cable cross-sections and glands

Model	Nominal input current [A]	Maximum value fuse [A]	Cable cross section connector range [mm ²] for			Cable glands opening [mm]	
			mains	Brake *	PE	mains	Brake *
CDU/CDX ##- 008 CDU/CDX##- 010	6.9 8.7	8 10	0.5–10	0.5–10	1.5–16	M32	M25
CDU/CDX ##- 013 CDU/CDX ##- 018	11.3 15.6	12 20					
CDU/CDX ##- 026	22	25	2.5 - 16	2.5 - 16	6 - 35	M40	M25
CDU/CDX ##- 031	26	35					
CDU/CDX ##- 037	31	35					
CDU/CDX ##- 046	38	50					M32

* Brake output only available if the VSD is ordered with cable entry/exit at short end.

Note: Cable glands are optional.

Control signals

Table 11

Terminal X1	Name	Function (Default)	Signal	Type
1	+10 V	+10 VDC Supply voltage	+10 VDC, max 10 mA	output
2	AnIn1	Process reference	0 -10 VDC or 0/4-20 mA bipolar: -10 - +10 VDC or -20 - +20 mA	analogue input
3	AnIn2	Off	0 -10 VDC or 0/4-20 mA bipolar: -10 - +10 VDC or -20 - +20 mA	analogue input
4	AnIn3	Off	0 -10 VDC or 0/4-20 mA bipolar: -10 - +10 VDC or -20 - +20 mA	analogue input
5	AnIn4	Off	0 -10 VDC or 0/4-20 mA bipolar: -10 - +10 VDC or -20 - +20 mA	analogue input
6	-10 V	-10VDC Supply voltage	-10 VDC, max 10 mA	output
7	Common	Signal ground	0V	output
8	DigIn 1	RunL	0-8/24 VDC	digital input
9	DigIn 2	RunR	0-8/24 VDC	digital input
10	DigIn 3	Off	0-8/24 VDC	digital input
11	+24 V	+24VDC Supply voltage	+24 VDC, 100 mA, see note	output
12	Common	Signal ground	0 V	output
13	AnOut 1	Speed	0 ±10 VDC or 0/4- +20 mA	analogue output
14	AnOut 2	Torque	0 ±10 VDC or 0/4- +20 mA	analogue output
15	Common	Signal ground	0 V	output
16	DigIn 4	Off	0-8/24 VDC	digital input
17	DigIn 5	Off	0-8/24 VDC	digital input
18	DigIn 6	Off	0-8/24 VDC	digital input
19	DigIn 7	Off	0-8/24 VDC	digital input
20	DigOut 1	Ready	24 VDC, 100 mA	digital output
21	DigOut 2	No Trip	24 VDC, 100 mA	digital output
22	DigIn 8	RESET	0-8/24 VDC	digital input
Terminal X2				
31	N/C 1	Relay 1 output Trip, active when the VSD is in a TRIP condition N/C is opened when the relay is active (valid for all relays) N/O is closed when the relay is active (valid for all relays)	potential free change over 0.1 - 2 A/U _{max} 250 VAC or 42 VDC	relay output
32	COM 1			
33	N/O 1			
41	N/C 2	Relay 2 Output Run, active when the VSD is ready to start	potential free change over 0.1 - 2 A/U _{max} 250 VAC or 42 VDC	relay output
42	COM 2			
43	N/O 2			
Terminal X3				
51	COM 3	Relay 3 Output Off	potential free change over 0.1 - 2 A/U _{max} 250 VAC or 42 VDC	relay output
52	N/O 3			

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