



Dynamic drives for small AC motors

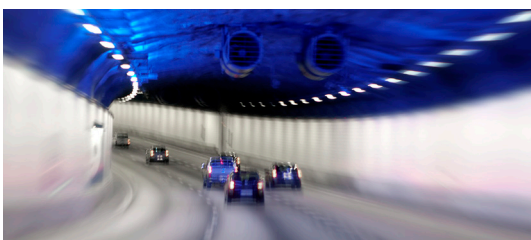
Emotron FDU and VFX

0.75 kW to 18.5 kW / 1 Hp to 24Hp
IP20



Save energy with AC drives

Energy savings upto 50%



Small drive – big functionality

Speed control with Emotron drives can give significant energy savings in your application.

Our Expertise

CG Drives & Automation has developed, manufactured and delivered efficient and reliable motor control equipment for 35 years. We offer standard products and complete drive solutions that ensure the safe and cost-efficient operation of demanding industrial applications. We provide smart solutions to users, operators, system integrators and OEMs around the world. Wherever there are demanding applications.

Our drives are reliable and productive with exceptional motor performance as you would expect from Emotron series drives.

These AC drives are as standard equipped with built in Brake chopper and connection for DC+/DC-.
Coated boards as standard. EMC filter class C3 is built in as standard.

Electrical specifications

Emotron FDU AC drives – 3 phase, 230–480V

Model	Frame size	Max output current	Normal load (120% , 1 min, every 10 min)		Heavy load (150% , 1 min, every 10 min)	
			Motor power @ 400 V	Rated current	Motor power @ 400 V	Rated current
			A	kW	A	kW
FDU48-2p5	A3	3.0	0.75	2.5	0.55	2.0
FDU48-3p4		4.1	1.1	3.4	0.75	2.7
FDU48-4p1		4.9	1.5	4.1	1.1	3.3
FDU48-5p6		6.7	2.2	5.6	1.5	4.5
FDU48-7p2		8.6	3.0	7.2	2.2	5.8
FDU48-9p5		11.4	4.0	9.5	3.0	7.6
FDU48-012	B3	14.4	5.5	12	4.0	9.6
FDU48-016		19.2	7.5	16	5.5	12.8
FDU48-023		27.6	11	23	7.5	18.4
FDU48-032	C3	37.2	15	31	11	24.8
FDU48-038		45.6	18.5	38	15	30.4

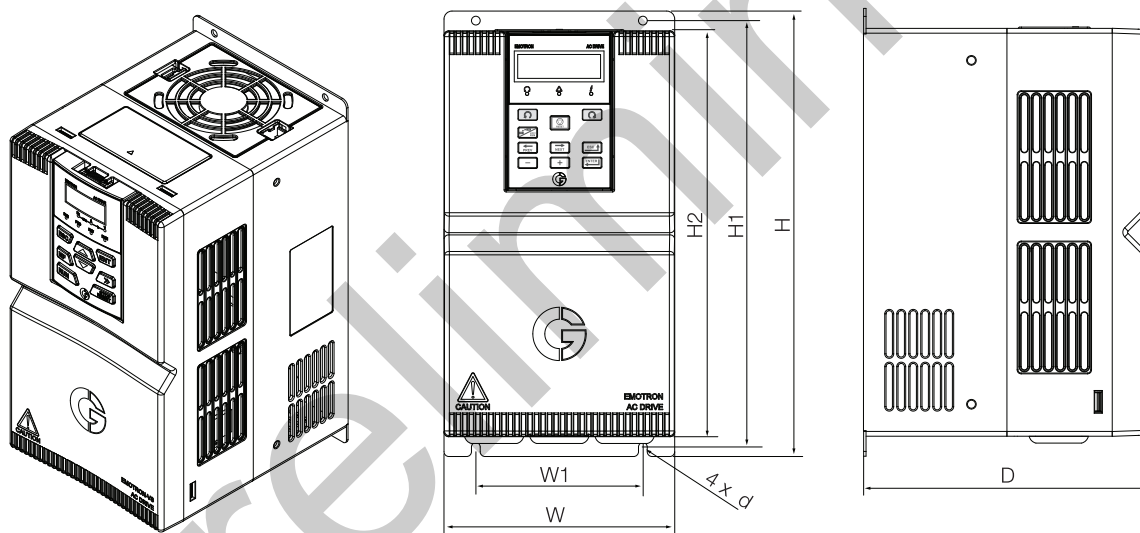
Emotron VFX AC drives – 3 phase, 230–480V

Model	Frame size	Max output current	Normal load (120% , 1 min, every 10 min)		Heavy load (150% , 1 min, every 10 min)	
			Motor power @ 400 V	Rated current	Motor power @ 400 V	Rated current
			A	kW	A	kW
VFX48-2p5	A3	3.8	0.75	2.5	0.55	2.0
VFX48-3p4		5.1	1.1	3.4	0.75	2.7
VFX48-4p1		6.2	1.5	4.1	1.1	3.3
VFX48-5p6		8.4	2.2	5.6	1.5	4.5
VFX48-7p2		10.8	3.0	7.2	2.2	5.8
VFX48-9p5		14.3	4.0	9.5	3.0	7.6
VFX48-012	B3	18.0	5.5	12	4.0	9.6
VFX48-016		24	7.5	16	5.5	12.8
VFX48-023		34.5	11	23	7.5	18.4
VFX48-032	C3	46.5	15	31	11	24.8
VFX48-038		57	18.5	38	15	30.4

General specifications

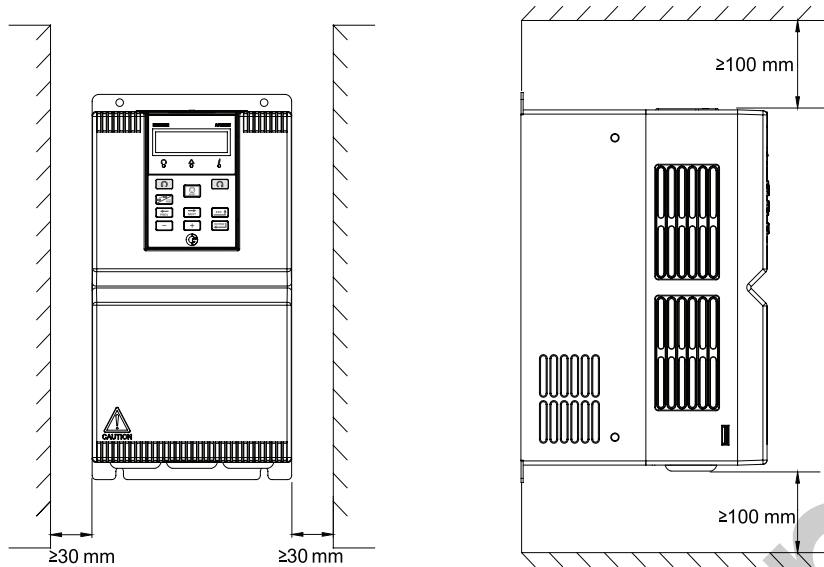
General	
Mains voltage	3-phase, 230 - 480 V +10%/-15% (-10% at 230 V)
Mains frequency	45 to 65 Hz
Input total power factor	0.7 - 0.8
Output voltage	0-Mains supply voltage:
Output frequency	0-400 Hz
Output switching frequency	Emotron VFX: 3 kHz Emotron FDU: adjustable 1.5-6 kHz)
Efficiency at nominal load	Frame size A3-B3 ≥ 93% Frame size C3 ≥ 95%
Mains Voltage imbalance	max. ± 3%. of nominal phase to phase input voltage
Control mode	
Emotron VFX - Direct torque control / Emotron FDU - V/f control	
Nominal ambient temperature, operation	
- 10°C to +50°C, Derate output 1% for every degree °C when ambient temperature is above +40 °C.	
Relative humidity , according to IEC 60721-3-3	
Class 3K4, 5...95% and no condensing	
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 3C3. Solid particles, class 3S2. Coated boards as standard.	
Altitude	
0-2000 m De-rate 1% for every 100 m when the altitude is above 1000 m	

Dimensional data



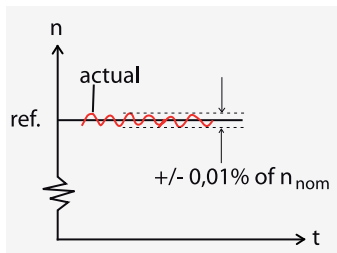
Model	Frame size	External and Installation dimensions (mm)							Weight Kg
		W	H	D	W1	H1	H2	d	
-2p5	A3	120	245	169	80	233	220	5.5	2.6
-3p4									
-4p1									
-5p6									
-7p2									
-9p5									
-012	B3	145	280	179	105	268	255	5.5	3.9
-016									
-023									
-032	C3	190	365	187	120	353	335	6	5
-038									

Minimum mounting clearances between units to ensure heat dissipation.



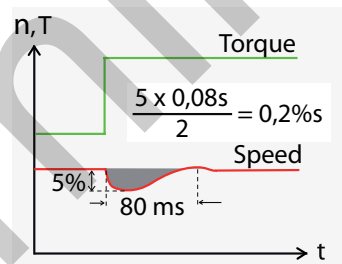
Control performance for Emotron VFX 2.0 (Speed)

Speed control static accuracy
(Linearity):



Open loop = 0.1 % of n_{nom}

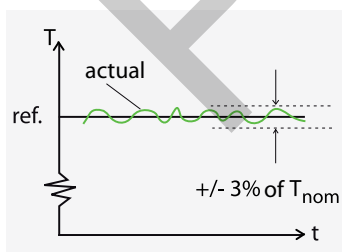
Speed control dynamic accuracy
(Impact drop):



Open loop = 0.1 %sec (100 % load step)

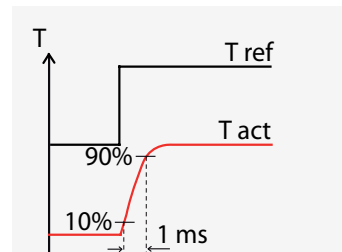
Control performance for Emotron VFX 2.0 (Torque)

Torque control static accuracy
(Linearity):



Open loop = <3 % for speeds 10 - 100% of rated, and <10% at zero speed (% of n_{nom}).

Torque control dynamic accuracy:



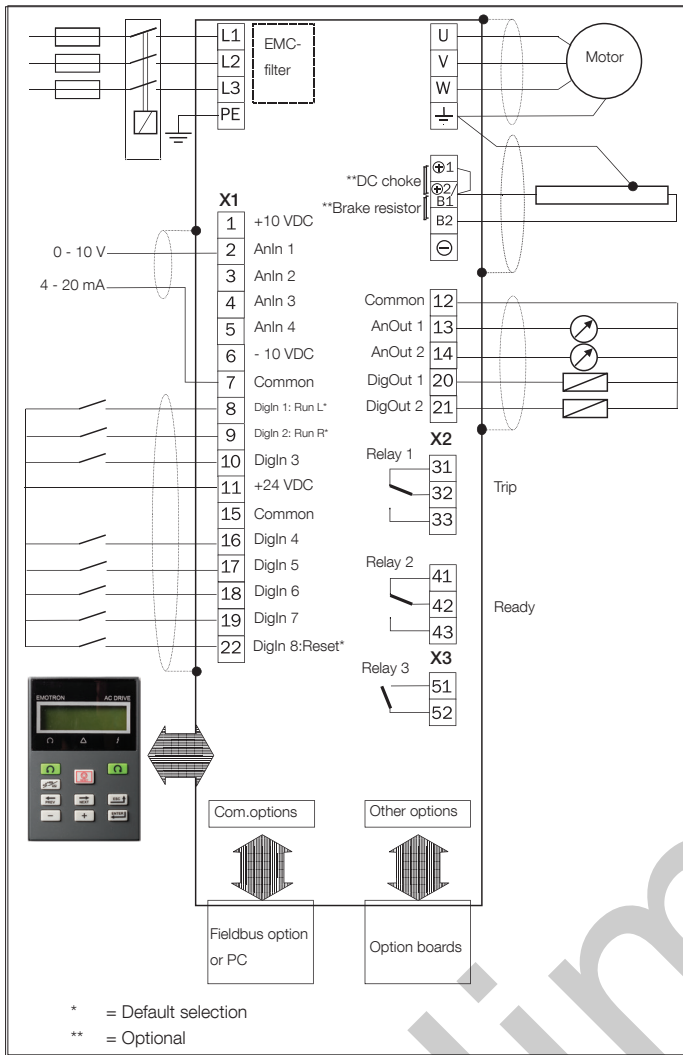
Open loop: = 100 % torque step rise time = 1 ms.

Control performance for Emotron FDU 2.0 (V/Hz)

Speed control accuracy = approximately 1 % of n_{nom} (slip frequency).

Torque accuracy = approximately 5 % of T_{nom} (20 - 100 % speed).

User interface data



Control signal inputs: Analogue (differential, 4 channels)	
Analogue voltage/current	0 to ±10 V/0 to 20 mA via switch
Max. input voltage	+30 V
Input impedance	20 kOhm (voltage) 250 Ohm (current)
Resolution	11 bits + sign
Hardware accuracy	1% type + 1 ½ LSB fsd
Digital: 8 channels	
Input voltage	High > 9 V _{DC} , Low < 4 V _{DC}
Max. input voltage	+30 V _{DC}
Input impedance	< 3.3 V _{DC} : 4.7 kOhm, ≥ 3.3 V _{DC} : 3.6 kOhm
Signal delay	≤ 8 ms
Control signal outputs: Analogue, 2 channels	
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 Ohm (voltage)
Resolution	10 bit
Maximum load impedance for current	500 Ohm
Hardware accuracy	1.9% type fsd (voltage), 2.4% type fsd (current)
Digital, 2 channels	
Output voltage	High > 20 V _{DC} @ 50 mA, > 23 V _{DC} open Low < 1 V _{DC} @ 50 mA
Short-circuit current (∞)	100 mA max (together with +24 V _{DC})
Relays, 3 pcs	
Contacts	0.1 – 2 A/Umax 250 V _{AC} or 42 V _{DC}
Reference voltage	
+10V _{DC}	+10 V _{DC} @ 10 mA short-circuit current +30 mA max
-10V _{DC}	-10 V _{DC} @ 10 mA
+24V _{DC}	+24 V _{DC} short-circuit current +100 mA max (together with Digital Outputs)

Control panel



A detachable multi-language control panel is included as standard. Following languages are supported in the control panel: English, Swedish, Dutch, German, French, Spanish, Russian, Italian, Czech and Turkish.

Standard features

These AC drives are as standard equipped with built in Brake chopper and connection for DC+/DC-. EMC filter class C3 is built in as standard. For other features see list of available options below.

Options

Available Options	
PTC	Isolated motor PTC input conforming to DIN44081/44082.
Safe Stop	Extra built-in inputs and outputs for emergency stop circuit, conforming with the norms EN-IEC 62061:2005 SIL2 and EN-ISO 13849-1:2006.
Fieldbus - Profibus	Fieldbus option module for Profibus DP or DP V1 communication. Use 9-pin D-sub connector. Baud rates: 9.6 kbits/s - 12 Mbits/s supported. Typical drive response time = 10 ms (not including any fieldbus delays).
RS232/RS485 isolated	Isolated RS232/RS485 serial communication board. For Modbus/RTU communication protocol. Baud rates: 2400 - 38400 bits/s supported. Typical drive response time = 10 ms (not including any bus delays).
Fieldbus - DeviceNet	Fieldbus option module for DeviceNet communication. Baud rates: 125 - 500 kbits/s supported. Typical drive response time = 10 ms (not including any fieldbus delays).
Ethernet - Modbus/TCP	Industrial Ethernet option module for Modbus/TCP protocol. RJ45 type connector. Baud rates: 10 or 100 Mbits/s supported. Typical drive response time = 10 ms (not including any ethernet delays).
Ethernet - EtherCAT®	Industrial Ethernet option module for EtherCAT protocol. 2 x RJ45 type connectors (IN and OUT). Baud rate: 100 Mbits/s. Typical drive response time = 10 ms (not including any ethernet delays).
Ethernet - Profinet IO	Industrial Ethernet option module for Profinet IO (RT) protocol. 1 or 2 port RJ45 type connector. Baud rate: 100 Mbits/s. Typical drive response time = 10 ms (not including any ethernet delays).
Ethernet - EtherNet IP	Industrial Ethernet option module for EtherNet IP protocol. 2 port RJ45 type connector. Baud rate: 10 and 100 Mbits/s. Typical drive response time = 10 ms (not including any ethernet delays).
EmoSoftCom	Connect a PC with a standard RS232 cable under the control panel on the front. EmoSoftCom PC software makes it possible to perform signal recordings and save/load parameter backup data, for example during service & maintenance.

We put all our energy
into saving yours

Commitment and positive attitude are always included. At CG Drives & Automation we use our know-how to create the technical solutions, and our personal commitment to make them work according to your requirements. Simplicity and reliability are keywords applying to our products as well as our people.

This will save you energy in all senses of the word!

CG Drives & Automation, former Emotron, has for 35 years developed, manufactured and delivered efficient and reliable motor control equipment. Since June 2011 CG Drives & Automation is a part of Crompton Greaves (CG). CG is a global pioneering leader in the management and application of electrical energy.

With more than 15,000 employees across its operations in around 85 countries, CG provides electrical products, systems and services for utilities, power generation, industries, and consumers.

CG Drives & Automation Sweden AB retains the right to change specifications and illustrations in the text, without prior notification.

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