Dynamic drives for low power AC motors

Emotron VFX/FDU 2.0 - 2Y

0.75 kW to 15 kW / 1 Hp to 20 Hp
IP20

emotron
DEDICATED DRIVE
A CG Product

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.

Electrical specifications

Emotron VFX 2.0 - 2Y AC drives – 3 phase, 230–480V, typical motor power at 400 V and 460 V

Model	Frame size	Max output current	Normal duty load (120% , 1 min, every 10 min)			Heavy duty load (150% , 1 min, every 10 min)		
			Motor power @ 400 V	Motor power @ 460 V	**Rated current**	Motor power @ 400 V	Motor power @ 460 V	Rated current
		A	kW	Hp	**A**	kW	Hp	A
VFX48-2P5-2Y	A3	3.8	0.75	1	**2.5**	0.55	0.75	2.0
VFX48-3P4-2Y		5.1	1.1	1.5	**3.4**	0.75	1	2.7
VFX48-4P1-2Y		6.2	1.5	2	**4.1**	1.1	1.5	3.3
VFX48-5P6-2Y		8.4	2.2	3	**5.6**	1.5	2	4.5
VFX48-7P2-2Y		10.8	3.0	4	**7.2**	2.2	3	5.8
VFX48-9P5-2Y		14.3	4.0	5	**9.5**	3.0	4	7.6
VFX48-012-2Y		18.0	5.5	7.5	**12**	4.0	5	9.6
VFX48-016-2Y	B3	24	7.5	10	**16**	5.5	7.5	12.8
VFX48-023-2Y		34.5	11	15	**23**	7.5	10	18.4
VFX48-032-2Y	C3	46.5	15	20	**31**	11	15	24.8

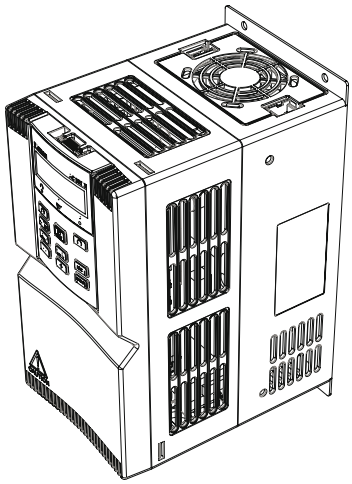
Emotron FDU 2.0 - 2Y AC drives – 3 phase, 230–480V, typical motor power at 400 V and 460 V

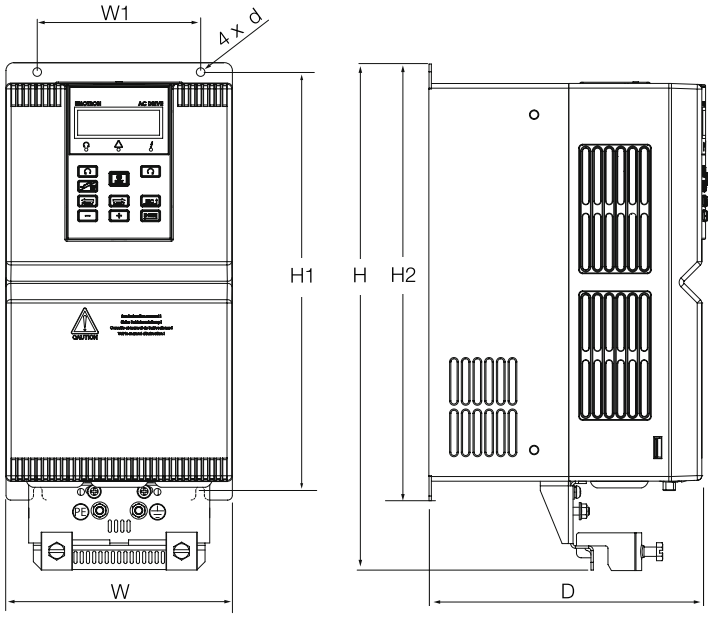
Model	Frame size	Max output current	Normal duty load (120% , 1 min, every 10 min)			Heavy duty load (150% , 1 min, every 10 min)		
			Motor power @ 400 V	Motor power @ 460 V	**Rated current**	Motor power @ 400 V	Motor power @ 460 V	Rated current
		A	kW	Hp	**A**	kW	Hp	A
FDU48-2P5-2Y	A3	3.0	0.75	1	**2.5**	0.55	0.75	2.0
FDU48-3P4-2Y		4.1	1.1	1.5	**3.4**	0.75	1	2.7
FDU48-4P1-2Y		4.9	1.5	2	**4.1**	1.1	1.5	3.3
FDU48-5P6-2Y		6.7	2.2	3	**5.6**	1.5	2	4.5
FDU48-7P2-2Y		8.6	3.0	4	**7.2**	2.2	3	5.8
FDU48-9P5-2Y		11.4	4.0	5	**9.5**	3.0	4	7.6
FDU48-012-2Y		14.4	5.5	7.5	**12**	4.0	5	9.6
FDU48-016-2Y	B3	19.2	7.5	10	**16**	5.5	7.5	12.8
FDU48-023-2Y		27.6	11	15	**23**	7.5	10	18.4
FDU48-032-2Y	C3	37.2	15	20	**31**	11	15	24.8

General specifications

General	
Mains voltage Mains frequency Input total power factor Output voltage Output frequency Output switching frequency Efficiency at nominal load	3-phase, 230 - 480 V +10%/-15% (-10% at 230 V) 45 to 65 Hz 0.7 - 0.8 0–Mains supply voltage: 0–400 Hz Emotron VFX: 3 kHz Emotron FDU:3 kHz adjustable 1.5-6 kHz 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 (14 - 122 °F), Derate output 1% for every degree °C (-0.55%/ degree °F) when ambient temperature is above +40 °C (104 °F) .
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 (0 - 6562 ft) De-rate 1% for every 100 m (328 ft) when the altitude is above 1000 m (3280 ft)

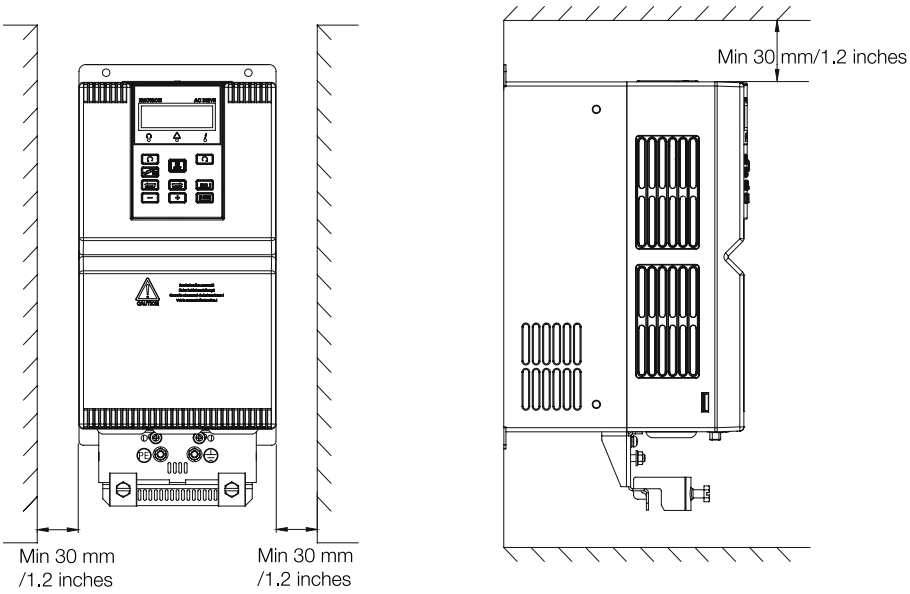
Dimensional data





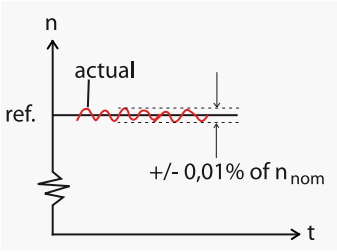
Model	Frame size	External and Installation dimensions (mm / inches)							Minimum Airflow required in cabinet m³/hour	Weight Kg/Lbs
		W	H	D	W1	H1	H2	d		
-2P5-2Y	A3	120/4.7	287/11.3	169/6.7	80/3.2	233/9.2	245/9.6	5.5/0.20	39	2.6/5.7
-3P4-2Y										
-4P1-2Y										
-5P6-2Y										
-7P2-2Y										
-9P5-2Y										
-012-2Y										
-016-2Y	B3	145/5.7	325/12.8	179/7	105/4.1	268/10.6	280/11	5.5/0.20	89	3.9/8.6
-023-2Y										
-032-2Y	C3	190/7.5	407/16.0	187/7.4	120/4.7	353/13.9	365/14.4	6/0.24	177	5/11

Minimum mounting clearances between units to ensure heat dissipation.

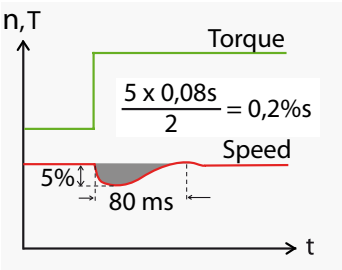


Control performance for Emotron VFX 2.0 - 2Y (Speed)

Speed control static accuracy (Linearity):	Speed control dynamic accuracy (Impact drop):



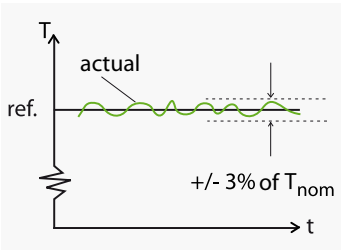
Open loop = 0.1 % of n_{nom}



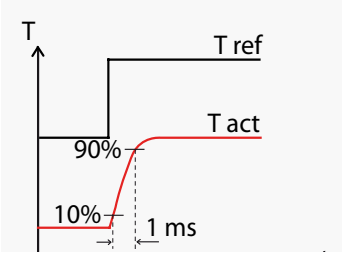
Open loop = 0.1 %sec (100 % load step)

Control performance for Emotron VFX 2.0 - 2Y (Torque)

Torquecontrol static accuracy (Linearity):	Torque control dynamic accuracy:



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

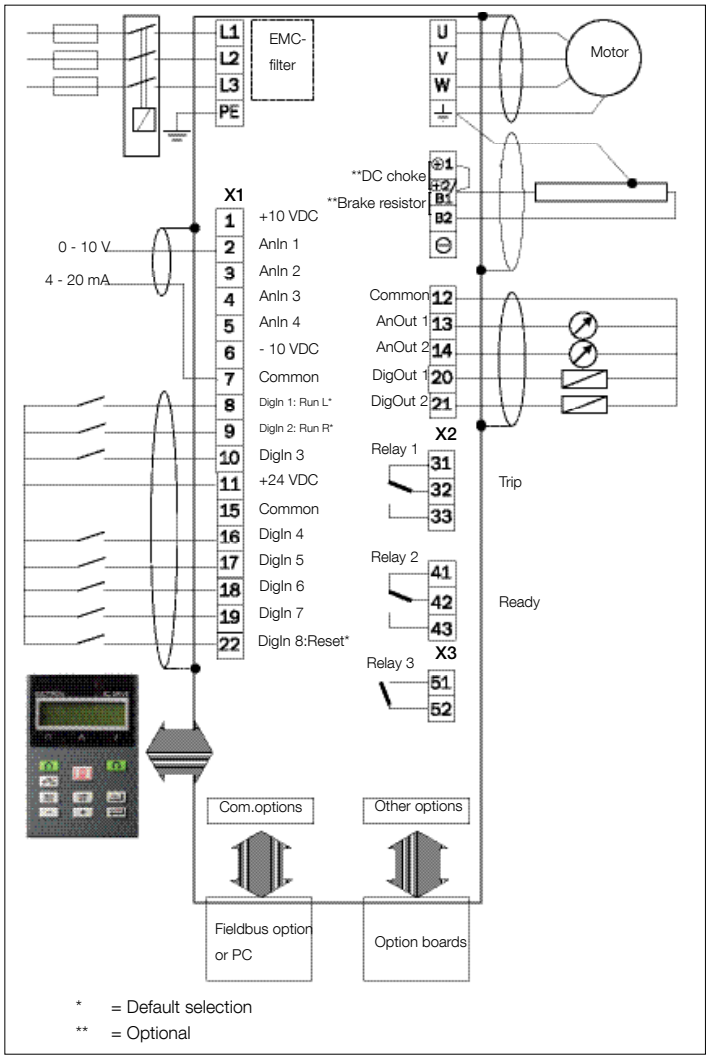


Open loop: = 100 % torque step rise time = 1 ms.

Control performance for Emotron FDU 2.0-2Y (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/0to20 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 impe-dance 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 0ptions	
PTC	Isolated motor PTC input conforming to DIN44081/44082.
Safe Stop	Extra built-in inputs and outputs for emergency stop circuit (Safe Torque Off), 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).
RS232/485 isolated	Isolated RS232/485 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 modules 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 and100 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. Also RS485 and Modbus/TCP connections supported. EmoSoftCom PC software makes it possible to perform signal recordings and save/load parameter backup data, for example during service & maintenance.

Brake resistor

Minimum required brake resistor values.
The brake resistor must be mounted outside the AC drive.

Model	Required brake resistor values	
	380 - 415 V	440 - 480 V
	Ohm(min)	Ohm(min)
VFX/FDU48-2P5-2Y	120	150
-3P4-2Y		
-4P1-2Y		
-5P6-2Y	91	120
-7P2-2Y		
-9P5-2Y	68	91
-012-2Y	51	68
-016-2Y	36	51
-023-2Y	27	33
-032-2Y	18	24

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 01-5667-01, 2015-06

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