



Inverter

For Electric Motors



A dynamic, strong and ambitious Group

Orange1 Holding is an international renown Group, one of the most important European manufacturers of single-phase and three-phase asynchronous electric motors. It has an annual capacity of more than 1 million motors and 5 million electric stators with an annual turnover of approx 235 million euro and more than 1600 workers in 15 production facilities. The group, established in 1971 by Leone Donazzan, chaired today by his son Armando Donazzan, is strongly focused on technological innovation, performance and customization to meet individual clients requirements.



TURNING PARTS

ELECTRIC MOTORS

DIE CASTING

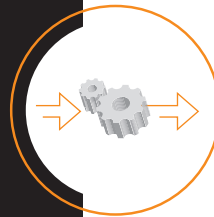
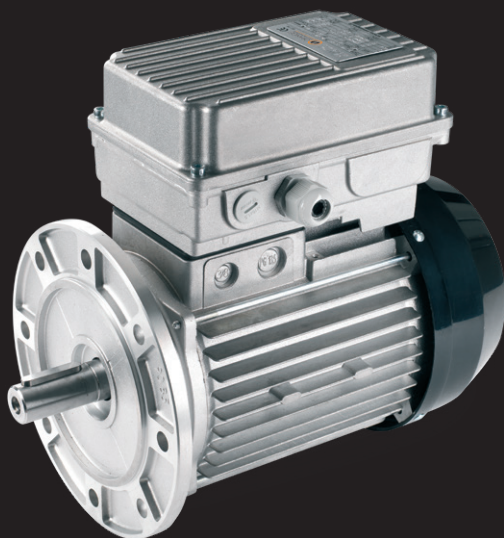
Drives for **AC** motors

The AC Drive is an electronic device designed to convert direct current DC power input into alternating current output.

This device is mainly used for two reasons:

1. to change the frequency of the asynchronous electric motors in industrial application. Without the VFD these motors will run with constant speed as they get a constant frequency (50 Hz in Europe)

2. to convert the direct current of renewable energy systems to alternating current output to be sold to the National electricity network. This is a typical domestic application.



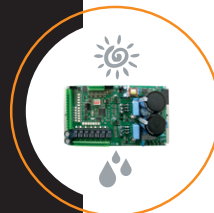
VFD with plc integrated



VFD integrated into the motor



VFD with PFC



VFD for industrial Photovoltaic



VFD low voltage



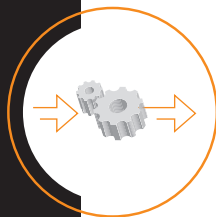
Combi VFD

Drives for **PM** motors

PM Drive is an electronic device having AC Drive functions with higher performance on firmware and hardware.

The Pm motors have mainly three advantages:

1. Smaller dimensions
2. It's a synchronous motor, it accomplishes strictly the orders of the drive in terms of torque, acceleration and deceleration according to the application.
3. Top efficiency makes it perfect to meet the efficiency norms.



VFD with plc integrated



VFD integrated into the motor



VFD with PFC



VFD low voltage



Inverter codification

X 01 07 2 0 1 02 000

DIVISION	
X	Emotion In Motion

INVERTER TYPE	
01	EM01-Plus
02	EM02
03	EM03LV - EM03
04	EM04
06	EM06
08	EM08
09	EM09
11	EM11
21	EM21
22	EM22
32	EM32
33	EM33

POWER	
04	0,4 kW
06	0,6 kW
07	0,75 kW
08	0,8 kW
11	1,1 kW
15	1,5 kW
22	2,2 kW
30	3,0 kW
37	3,7 kW
55	5,5 kW
75	7,5 kW
A1	11 kW
A5	15 kW
A8	18 kW
B2	22 kW
C0	30 kW
Z1	0,4 + 2,2 kW
Z2	0,7 + 2,2 kW
Z3	1,1 + 2,2 kW
Z4	1,5 + 2,2 kW
Z5	0,4 + 0,7 kW
Z6	0,4 + 1,5 kW
Z7	0,7 + 1,5 kW
Z8	0,7 + 2,2 kW

INPUT VOLTAGE (Vin)	
0	Vin < 110V
1	110 single phase 50/60Hz
2	230 single phase 50/60Hz
3	230 three phase 50/60Hz
4	400 three phase 50/60Hz

CUSTOMIZATION	
n,n,n	SW and/or HW customization

OPTIONS	
00	
E0	EIM000
01	MBM207A
02	MART238
03	MART223
05	F105
06	F110
07	F310
08	MBM38S
09	MBM184
10	MBM186A
11	MART185A
12	B1
13	B3
15	HMI-G
16	P1
17	S1
18	HMI7S
19	HMI7S-P1
20	S1-P1
21

EXECUTION	
0	IP00
1	IP00 with heat-sink
2	IP20
4	IP54
5	IP55
6	IP65

CONTROL METHOD	
0	V/F
1	Vectorial sensorless
2	Vectorial sensed-type encoder
4	Vectorial sensed-type tachimeter
5	Permanent magnet
6	Brushless sensorless
7	Brushless with encoder
8	Brushless with Hall probe
9	V/F or Vectorial sensorless

Synoptic table

	Description	Products												
		EM01 Plus	EM02	EM03LV	EM03	EM04	EM06	EM08	EM09	EM11	EM21	EM22	EM32	EM33
Motor	Inverter for three phase asynchronous motor	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
	Drive for Brushless motor-PM motor							✓	✓					
Power supply	Power supply: Input 230V single phase Output 230V three phase	✓		✓		✓	✓		✓	✓	✓			
	Power supply: Input 400V three phase Output 400V three phase		✓		✓			✓				✓	✓	
Standard configuration	3 digital input NPN (multifunctional optoinsulated); 1 serial TTL (proprietary protocol)	✓	✓	✓	✓	✓	✓	✓	✓					
	4 Digital Input PNP or NPN (12V) or self-powered; Keyboard + Potentiometer									✓				
	6 Digital Input PNP; 4 Output Digital PNP; 1 Analog Input 0-5Vdc or 4-20mA or 0-10Vdc; 2 serial RS485										✓	✓		
	3 digital input NPN; serial TTL and RS485- Multi												✓	
	3 Input Digital NPN; serial RS485; RS485-Multi													✓

Option	Description	Products													
												ON DEMAND			
		EM01 Plus	EM02	EM03LV	EM03	EM04	EM06	EM08	EM09	EM11	EM21	EM22	EM32	EM33	
Option Boards	MBM207A	✓	✓	✓	✓	✓	✓	✓	✓					✓	
	MART238		✓	✓	✓	✓		✓	✓					✓	
	MART223		✓	✓	✓	✓		✓	✓				✓	✓	
	MBM38										✓				
	MBM38F										✓				
	MBM38S										✓				
	MBM184									✓					
	MBM186A									✓					
	MART185A									✓					
EIM000	Encoder: push-pull or NPN or open collector						✓	✓							
EIM010	Mulpy I/O and Encoder-Position monitor 3 Fast Digital inputs (active Low): GND common (+5V or +12V, 50mA available) Encoder: push-pull (24Vmax) or NPN open collector 2 Analog inputs: GND common (+5V, 50mA available); 0-5V or 0-10V or 4/20mA 6 Digital outputs: Out1 Relay NA-NC 5A-230V Out2-5 NPN open collector (sink 100mA, max24V)	✓	✓*	✓*	✓*	✓		✓*	✓						
F105	Internal filter; C2 Category-upto 1,1kW- 230V Single Phase; up to 5A	✓				✓			✓						
F110	Internal filter; C2 Category- upto 2,2kW- 230V Single Phase; up to 10A	✓		✓		✓			✓						
F310	Internal filter; C2 Category- upto 3,7kW- 400V Three Phase; up to 10A		✓		✓			✓							
B1	Brake (230V): external resistance and/or DC electrical brake			✓		✓			✓						
B3	Brake (400V): external resistance and/or DC electrical brake		✓		✓			✓							
P1	Potentiometer - 10kOhm (must apply expansion card with Analog Input)	✓	✓	✓	✓	✓	✓	✓	✓						
S1	Toggle Switch	✓	✓	✓	✓	✓	✓	✓	✓						
P1-S1	Potentiometer 10kOhm; Toggle Switch (must apply expansion card with Analog Input)	✓	✓	✓	✓	✓									
HMI7S	Display 7 segments; 4 buttons for comands and setting	✓	✓			✓		✓	✓						
HMI7S-P1	Display 7 segments; 4 buttons for comands and setting; Potentiometer-10kOhm (must apply expansion card with Analog Input)	✓	✓			✓		✓	✓						
HMI-8LCD	Display LCD-8 buttons										✓	✓			
HMI-G	LCD grafico (64x128 dot) with Eeprom and clock circuit												✓		

*Available only in IP00 and inputs board with connectors (no terminal block)

EM01-Plus

All in One - 230Vac VFD
Asynchronous motor
Protection IP55



STANDARD	CODE (PARTIAL)		X0104...	X0107 ...	X0111...	X0115...	X0122...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,9	3,0	4,8	6,1	8,1
		Operatations mode		S1	S1	S1	S1	S2/S3
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFORMANCE DATA	Switching mode		PWM- V/F linear and V/F quadratic				
		Switching Frequency	kHz	10				
		Frequency Resolution	Hz	0,1				
		Range voltage of Boost	%	0 ÷ 90				
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)				
		Connections		1 serial TTL (proprietary protocol and Modbus RTU)				
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9				
		Deceleration time	s	0,1 ÷ 99,9				
		Alarm		Over voltage –Under voltage - Over current- Overload (I ² xt) –Over temperature				
		Overload range	%	100 ÷ 150 (200% for 1s)				
		Brake Energy Management		Direct input CC only ramp				
	GENERAL DATA	Box type (see drawings)		A	A	A	B	B
		Cooling system		Natural				
		Working temperature	°C	-5 / 45				
		Storage temperature	°C	-15 / +80				
		Relative humidity	%	20 ÷ 85 (No condensation)				
		EMC rate		Class A ; category C3				

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle switch
		HMI7S	Display 7 segments; 4 buttons for comands and setting
		HMI7S-P1 (Option board with Analog Input is required)	Display 7 segments; 4 buttons for comands and setting; Potentiometer-10kOhm ; status led
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm ; Toggle switch ; status led
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F105	Internal filter; C2 Category-upto 1,1kW- 230V Single Phase; up to 5A
		F110	Internal filter; C2 Category- upto 2,2kW- 230V Single Phase; up to 10A

EM02

All in One - 400Vac VFD
Asynchronous motor
Protection IP55



full options

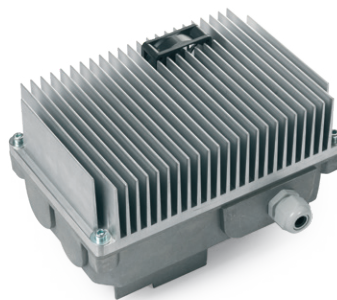
STANDARD	CODE (PARTIAL)		X0207...	X0215...	X0222...	X0230...	
	INPUT ELECTRICAL DATA	Vin- type		Three phase			
		Voltage input (Vin)	V	400 ± 15%			
		Frequency input	Hz	47 ÷ 63			
		Input protection		None			
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,75	1,5	2,2	3
		Output Current	(A)	1,8	3,75	5,5	7,5
		Opertations mode		S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin			
		Output Voltage		Three phase			
		Frequency Output	Hz	0 ÷ 200 Hz			
	PERFORMANCE DATA	Switching mode		PWM-V/F linear or Vectorial sensorless			
		Switching Frequency	KHz	4(default)÷ 14 (V/F) / 4(default)÷8 (Vectorial)			
		Frequency Resolution	Hz	0,1			
		Range voltage of Boost	%	0 ÷ 20			
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)			
		Connections		1 serial TTL (proprietary protocol)			
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9			
		Deceleration time	s	0,1 ÷ 99,9			
		Protections		Over voltage –Under voltage - Over current- Overload (I ² xt) –Over temperature			
		Overload range	%	100 ÷ 150 (200% for 1s)			
		Brake Energy Management		Direct input CC only ramp			
	GENERAL DATA	Box type (see drawings)		B	B	B	B
		Cooling system		Natural			
		Working temperature	°C	-5 / 45			
		Storage temperature	°C	-15 / +80			
		Relative humidity	%	20 ÷ 85 (No condensation)			
		EMC rate		Class A ; category C3			

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle Switch
		HMI7S	Display 7 segments; 4 buttons for comands and setting
		HMI7S-P1 (Option board with Analog Input is required)	Display 7 segments; 4 buttons for comands and setting; Potentiometer-10kOhm
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm ; Toggle switch
	BRAKE SYSTEM	B3 (400V)	Brake (400V): external resistance and/or DC electrical brake
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F310	Internal filter; C2 Category- 400V Three Phase; up to 10A

EM03LV

All in One
230Vac High Power VFD
Asynchronous motor
Protection IP55



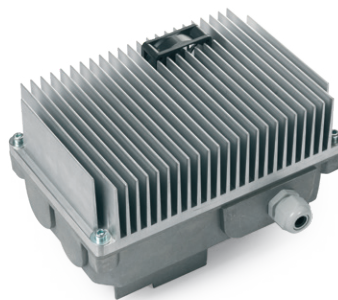
STANDARD	CODE (PARTIAL)			X0315...	X0322...
	INPUT ELECTRICAL DATA	Vin- type		Single-phase	
		Voltage input (Vin)	V	230 ± 15%	
		Frequency input	Hz	47 ÷ 63	
		Input protection		None	
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	1,5	2,2
		Output Current	(A)	6,5	9,5
		Operations mode		S1	S1
		Output Voltage	V	0 ÷ Vin	
		Output Voltage		Three phase	
		Frequency Output	Hz	0 ÷ 200 Hz	
	PERFORMANCE DATA	Switching mode		PWM-V/F linear or Vectorial sensorless or	
		Switching Frequency	KHz	4(default) ÷ 14 (V/F); 4(default) ÷ 8 (Vectorial)	
		Frequency Resolution	Hz	0,1	
		Range voltage of Boost	%	0 ÷ 20	
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)	
		Connections		1 serial TTL (proprietary protocol)	
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9	
		Deceleration time	s	0,1 ÷ 99,9	
		Protections		Over voltage – Under voltage – Over current- Overload (I ² xt) – Over temperature	
		Overload range	%	100 ÷ 150 (200% for 1s)	
		Brake Energy Management		Direct input CC only ramp	
		Brake Energy Management Hight Inertia		None	
	GENERAL DATA	Box type (see drawings)		C	C
		Cooling system		NATURAL	
		Working temperature	°C	-5 / 45	
		Storage temperature	°C	-15 / +80	
		Relative humidity	%	20 ÷ 85 (No condensation)	
		EMC rate		Class A ; category C3	

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	BUILT IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle switch
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm ; Toggle switch ; status led
	BRAKE SYSTEM	B1 (230V)	Brake (230): external resistance and/or DC electrical brake
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F110	Internal filter; C2 Category- upto 2,2kW- 230V Single Phase; up to 10A

EM03

All in One
400Vac High Power VFD
Asynchronous motor
Protection IP55



STANDARD	CODE (PARTIAL)		X0337...	X0355...	X0375	
	INPUT ELECTRICAL DATA	Vin- type		Three phase		
		Voltage input (Vin)	V	400 ± 15%		
		Frequency input	Hz	47 ÷ 63		
		Input protection		None		
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	3,7	5,5	7,5
		Output Current	(A)	9,2	13,7	18,7
		Opertations mode		S1	S1	S2/S3
		Output Voltage	V	0 ÷ Vin		
		Output Voltage		Three phase		
		Frequency Output	Hz	0 ÷ 200 Hz		
	PERFORMANCE DATA	Switching mode		PWM-V/F linear or Vectorial sensorless or		
		Switching Frequency	KHz	4(default)÷ 14 (V/F); 4(default)÷8 (Vectorial)		
		Frequency Resolution	Hz	0,1		
		Range voltage of Boost	%	0 ÷ 20		
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)		
		Connections		1 serial TTL (proprietary protocol)		
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9		
		Deceleration time	s	0,1 ÷ 99,9		
		Protections		Over voltage –Under voltage - Over current- Overload (I ² xt) –Over temperature		
		Overload range	%	100 ÷ 150 (200% for 1s)		
		Brake Energy Management		Direct input CC only ramp		
		Brake Energy Management Hight Inertia		None		
	GENERAL DATA	Box type (see drawings)		C	C	C
		Cooling system		NATURAL		FORCED
		Working temperature	°C	-5 / 45		
		Storage temperature	°C	-15 / +80		
		Relative humidity	%	20 ÷ 85 (No condensation)		
		EMC rate		Class A ; category C3		

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	BUILT IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle switch
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm ; Toggle switch ; status led
	BRAKE SYSTEM	B3 (400V)	Brake (400V): external resistance and/or DC electrical brake
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F310	Internal filter; C2 Category- 400V Three Phase; up to 10A

EM04

All in One
230Vac vectorial sensorless VFD
Asynchronous motor
Protection IP55



full options

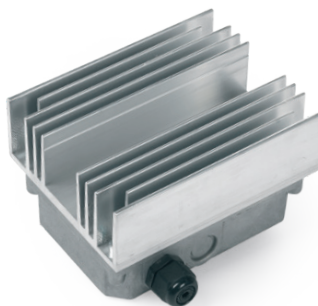
STANDARD	CODE (PARTIAL)			X0404...	X0407 ...	X0411...	X0415...	X0422...
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,8	3,4	5	6,8	10
		Opertations mode		S1	S1	S1	S2/S3	S2/S3
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFORMANCE DATA	Switching mode		PWM-V/F linear or Vectorial sensorless				
		Switching Frequency	KHz	4(default)÷ 14 (V/F); 4(default)÷8 (Vectorial)				
		Frequency Resolution	Hz	0,1				
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)				
		Range voltage of Boost	%	0 ÷ 20				
SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)					
	Connections		1 serial TTL (proprietary protocol)					
SETTING DATA	Acceleration time	s	0,1 ÷ 99,9					
	Deceleration time	s	0,1 ÷ 99,9					
	Protections		Over voltage –Under voltage - Over current- Overload (I²xt) –Over temperature					
	Overload range	%	100 ÷ 150 (200% for 1s)					
	Brake Energy Management		Direct input CC only ramp					
GENERAL DATA	Box type (see drawings)		A*	A*	A*	B	B	
	Cooling system		Natural					
	Working temperature	°C	-5 / 45					
	Storage temperature	°C	-15 / +80					
	Relative humidity	%	20 ÷ 85 (No condensation)					
	EMC rate		Class A ; category C3					

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle Switch
		HMI7S	Display 7 segments; 4 buttons for comands and setting
		HMI7S-P1 (Option board with Analog Input is required)	Display 7 segments; 4 buttons for comands and setting; Potentiometer-10kOhm
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm; Toggle Switch
	BRAKE SYSTEM	B1 (230V)	Brake (230): external resistance and/or DC electrical brake
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F105	Internal filter; C2 Category-upto 1,1kW- 230V Single Phase; up to 5A
		F110	Internal filter; C2 Category- upto 2,2kW- 230V Single Phase; up to 10A

EM06

SmAll in One
Tiny 230Vac vectorial sensorless VFD
Asynchronous motor
Protection IP55



STANDARD	CODE (PARTIAL)		X0604...	X0607 ...	X0611...	X0615...	X0622...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,8	3,4	5	6,8	10
		Operations mode		S1	S1	S1	S2/S3	S2/S3
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFORMANCE DATA	Switching mode		PWM-V/F linear or Vectorial sensorless				
		Switching Frequency	KHz	4(default)÷14 (V/F); 4(default)÷8 (Vectorial)				
		Frequency Resolution	Hz	0,1				
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)				
		Range voltage of Boost	%	0 ÷ 20				
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)				
		Connections		1 serial TTL (proprietary protocol)				
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9				
		Deceleration time	s	0,1 ÷ 99,9				
		Protections		Over voltage –Under voltage - Over current- Overload (I²xt) –Over temperature				
		Overload range	%	100 ÷ 150 (200% for 1s)				
		Brake Energy Management		Direct input CC only ramp				
	GENERAL DATA	Box type (see drawings)		D	E	E	F	F
		Cooling system		Natural				
		Working temperature	°C	-5 / 45				
		Storage temperature	°C	-15 / +80				
		Relative humidity	%	20 ÷ 85 (No condensation)				
		EMC rate		Class A ; category C3				

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle Switch
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting

EM08

Brushless drive
Sensorless or sensed 400Vac
Protection IP55



full options

STANDARD	CODE (PARTIAL)		X0807...	X0815...	X0822...	X0830...	
	INPUT ELECTRICAL DATA	Vin- type		Three phase			
		Voltage input (Vin)	V	400 ± 15%			
		Frequency input	Hz	47 ÷ 63			
		Input protection		None			
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,75	1,5	2,2	3
		Output Current	(A)	1,8	3,75	5,5	7,5
		Opertations mode		S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin			
		Output Voltage		Three phase			
		Frequency Output	Hz	0 ÷ 200 Hz			
	PERFORMANCE DATA	Switching mode		AC Brushless: sensorless or sensed			
		Switching Frequency	KHz	10(default) ÷ 16			
		Frequency Resolution	Hz	0,1			
	SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)			
		Connections		1 serial TTL (proprietary protocol)			
		Type trasducer only Brushless mode		Encoder: Push-Pull or open collector			
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9			
		Deceleration time	s	0,1 ÷ 99,9			
		Protections		Over voltage – Under voltage - Over current- Overload (I ² xt) –Over temperature			
		Overload range	%	100 ÷ 150 (200% for 1s)			
		Brake Energy Management		Direct input CC only ramp			
		B3 (400V)		Brake: external resistance and/or DC electrical brake			
	GENERAL DATA	Box type (see drawings)		B	B	B	B
		Working temperature	°C	-5 / 45			
		Storage temperature	°C	-15 / +80			
		Relative humidity	%	20 ÷ 85 (No condensation)			
		Cooling system		Natural			
		EMC rate		Class A ; category C3			

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
		B1	Braking external system
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle Switch
		HMI7S	Display 7 segments; 4 buttons for comands and setting
		HMI7S-P1 (Option board with Analog Input is required)	Display 7 segments; 4 buttons for comands and setting; Potentiometer- 10kOhm
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm; Toggle Switch
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F310	Internal filter; C2 Category- 400V Three Phase; up to 10A

EM09

Brushless drive
Sensorless or sensed 230Vac
Protection IP55



STANDARD	CODE (PARTIAL)		X0904...	X0907 ...	X0911...	X0915...	X0922...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,8	3,4	5	6,8	10
		Operations mode		S1	S1	S1	S2/S3	S2/S3
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFORMANCE DATA	Switching mode		AC Brushless: sensorless or sensed				
		Switching Frequency	kHz	10(default)÷ 16				
		Frequency Resolution	Hz	0,1				
SIGNALS DATA	Signals: input		3 digital input NPN (multifunctional optoinsulated)					
	Connections		1 serial TTL (proprietary protocol)					
SETTING DATA	Acceleration time	s	0,1 ÷ 99,9					
	Deceleration time	s	0,1 ÷ 99,9					
	Protections		Over voltage –Under voltage - Over current- Overload (I²xt) –Over temperature					
	Overload range	%	100 ÷ 150 (200% for 1s)					
	Brake Energy Management		Direct input CC only ramp					
GENERAL DATA	Box type (see drawings)		A*	A*	A*	B	B	
	Cooling system		Natural					
	Working temperature	°C	-5 / 45					
	Storage temperature	°C	-15 / +80					
	Relative humidity	%	20 ÷ 85 (No condensation)					
	EMC rate		Class A ; category C3					

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	BUILT-IN CONTROL	P1 (Option board with Analog Input is required)	Potentiometer - 10kOhm
		S1	Toggle Switch
		HMI7S	Display 7 segments; 4 buttons for comands and setting
		HMI7S-P1 (Option board with Analog Input is required)	Display 7 segments; 4 buttons for comands and setting; Potentiometer-10kOhm
		P1-S1 (Option board with Analog Input is required)	Potentiometer-10kOhm; Toggle Switch
	BRAKE SYSTEM	B1 (230V)	Brake (230): external resistance and/or DC electrical brake
	REMOTE CONTROL SYSTEM	HMI7S-Box	Display 7 segments; 4 buttons for comands and setting
	EMC LINE FILTER	F105	Internal filter; C2 Category- upto 1,1kW- 230V Single Phase; up to 5A
		F110	Internal filter; C2 Category- upto 2,2kW- 230V Single Phase; up to 10A

EM11



All in One
230Vac vectorial sensorless VFD
Asynchronous motor
Protection IP55

STANDARD	CODE (PARTIAL)		X1107 ...	X1111...	X1115...	X1122...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase			
		Voltage input (Vin)	V	230 ± 15%			
		Frequency input	Hz	47 ÷ 63			
		Input protection		None			
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,75	1,1	1,5	2,2
		Output Current	(A)	3,2	4,7	6,5	9,5
		Opertations mode		S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin			
		Output Voltage		Three phase			
		Frequency Output	Hz	0 ÷ 200 Hz			
	PERFORMANCE DATA	Switching mode		Vectorial sensorless			
		Switching Frequency	kHz	5			
		Max Torque/Rated Torque	%	150 (200-1s)			
		Frequency Resolution	Hz	0,1			
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)			
		Range voltage of Boost	%	0 ÷ 20			
	SIGNALS DATA	Signals: input		4 Digital Input PNP or NPN (12V) or self-powered			
		HMI7S		Display 7 segments; 4 buttons for comands and setting			
		P1		Potentiometer - 10kOhm			
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9			
Deceleration time		s	0,1 ÷ 99,9				
Protections			Over voltage –Under voltage - Over current- Overload (I ² xt) –Over temperature				
Overload range		%	100 ÷ 150 (200% for 1s)				
Brake Energy Management			Direct input CC only ramp				
GENERAL DATA	Box type (see drawings)		A	A	B	B	
	Cooling system		Natural				
	Working temperature	°C	-5 / 45				
	Storage temperature	°C	-15 / +80				
	Relative humidity	%	20 ÷ 85 (No condensation)				
	EMC rate		Class A ; category C2				

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM184	1relè 230V-3A; 1 Analog Input (0-5Vdc or 4-20mA, or 0-10Vdc); 1 Analog Output
		MBM186A	1 serial RS485 (proprietary protocol-Modbus compatible)
		MART185A	1 serial Can Bus (Proprietary protocol)

EM21



Stand-alone V/F 230Vac VFD
Asynchronous motor
Protection IP00 with heat sink

STANDARD	CODE (PARTIAL)		X2104...	X2107 ...	X2111...	X2115...	X2122...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,7	3,2	4,7	6,5	9,5
		Opertations mode		S1	S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFORMANCE DATA	Switching mode		PWM-V/F linear				
		Switching Frequency	kHz	4				
		Frequency Resolution	Hz	0,1				
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)				
		Range voltage of Boost	%	0 ÷ 20				
SIGNALS DATA	Signals: input		6 Digital Input PNP					
	Signals: output		1 Analog Input 0-5Vdc or 4-20mA or 0-10Vdc;					
	Connections		4 Digital Output PNP;					
SETTING DATA	Acceleration time	s	0,1 ÷ 99,9					
	Deceleration time	s	0,1 ÷ 99,9					
	Protections		Over voltage – Under voltage - Over current- Overload (I²xt) –Over temperature					
	Overload range	%	100 ÷ 150 (200% for 1s)					
	Brake Energy Management		Direct input CC only ramp					
GENERAL DATA	Dimension	mm	176x84x95			192x84x116		
	Cooling system		Natural	Natural	Natural	Forced	Forced	
	Working temperature	°C	-5 / 45					
	Storage temperature	°C	-15 / +80					
	Relative humidity	%	20 ÷ 85 (No condensation)					
	EMC rate		Class A ; category C3					

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM38	6 digital Input; 4 digital output	
		MBM38F	6 digital Input; 4 digital output; 2 step motors (0,5A e 2,5A)	
		MBM38S	1 step motors (2,5A)	
	REMOTE CONTROL SYSTEM	HMI-8LCD	Display LCD-8 buttons	

EM22



Stand-alone V/F linear 230Vac VFD
Asynchronous motor
Protection IP20

STANDARD	CODE (PARTIAL)		X2204...	X2207 ...	X2211...	X2215...	X2222...	
	INPUT ELECTRICAL DATA	Vin- type		Single phase				
		Voltage input (Vin)	V	230 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	0,4	0,75	1,1	1,5	2,2
		Output Current	(A)	1,7	3,2	4,7	6,5	9,5
		Opertations mode		S1	S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFOMANCE DATA	Switching mode		PWM- V/F linear				
		Switching Frequency	kHz	4				
		Frequency Resolution	Hz	0,1				
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)				
		Range voltage of Boost	%	0 ÷ 20				
		SIGNALS DATA	Signals: input		6 Digital Input PNP; 1 Analog Input 0-5Vdc or 4-20mA or 0-10Vdc;			
	Signals: output			4 Digital Output PNP;				
	Connections			2 serial RS485 (Modbus compatible)				
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9				
Deceleration time		s	0,1 ÷ 99,9					
Protections			Over voltage –Under voltage - Over current- Overload (I ² xt) –Over temperature					
Overload range		%	100 ÷ 150 (200% for 1s)					
Brake Energy Management			Direct input CC only ramp					
GENERAL DATA	Box type	mm	Steel - 192x84xh116mm					
	Cooling system		Natural	Natural	Natural	Forced	Forced	
	Working temperature	°C	-5 / 45					
	Storage temperature	°C	-15 / +80					
	Relative humidity	%	20 ÷ 85 (No condensation)					
	EMC rate		Class A ; category C3					

* Recommended motor power (IE2 efficiency level)

ONS	REMOTE CONTROL SYSTEM	HMI-8LCD	Display LCD-8 buttons

EM32



Pump application- Stand-alone 400Vac VFD
Asynchronous motor
Protection IP00 with heat sink

STANDARD	CODE (PARTIAL)		X3204...	X3207 ...	X3211...	X3215...	X3222...	
	INPUT ELECTRICAL DATA	Vin- type		Three phase				
		Voltage input (Vin)	V	400 ± 15%				
		Frequency input	Hz	47 ÷ 63				
		Input protection		None				
	OUTPUT ELECTRICAL DATA	Output Power	kW	1,5	2,2	3,7	5,5	7,5
		Output Current	(A)	3,75	5,5	9,25	13,75	18,75
		Opertations mode		S1	S1	S1	S1	S1
		Output Voltage	V	0 ÷ Vin				
		Output Voltage		Three phase				
		Frequency Output	Hz	0 ÷ 200 Hz				
	PERFOMANCE DATA	Switching mode		PWM-V/F linear				
		Switching Frequency	kHz	4				
		Frequency Resolution	Hz	0,1				
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)				
		Range voltage of Boost	%	0 ÷ 20				
	SIGNALS DATA	Signals: input		3 digital input NPN;				
		Connections		1 serial TTL ; 1 serial RS485- bridge other devices				
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9				
		Deceleration time	s	0,1 ÷ 99,9				
		Protections		Over voltage –Under voltage - Over current- Overload (I²xt) –Over temperature				
		Over Voltage range	%	100 ÷ 150 (200% for 1s)				
		Brake Energy Management		Direct input CC only ramp				
	GENERAL DATA	Dimension	mm	173x200x145				
		Cooling system		Forced				
		Working temperature	°C	-5 / 45				
		Storage temperature	°C	-15 / +80				
		Relative humidity	%	20 ÷ 85 (No condensation)				
		EMC rate		Class A ; category C2				

OPTIONS	PERFORMANCE	MART223	4 Digital Output; 2 Analog Input
	REMOTE CONTROL SYSTEM	HMI-G	LCD grafic (64x128 dot) with Eeprom and clock circuit

EM33



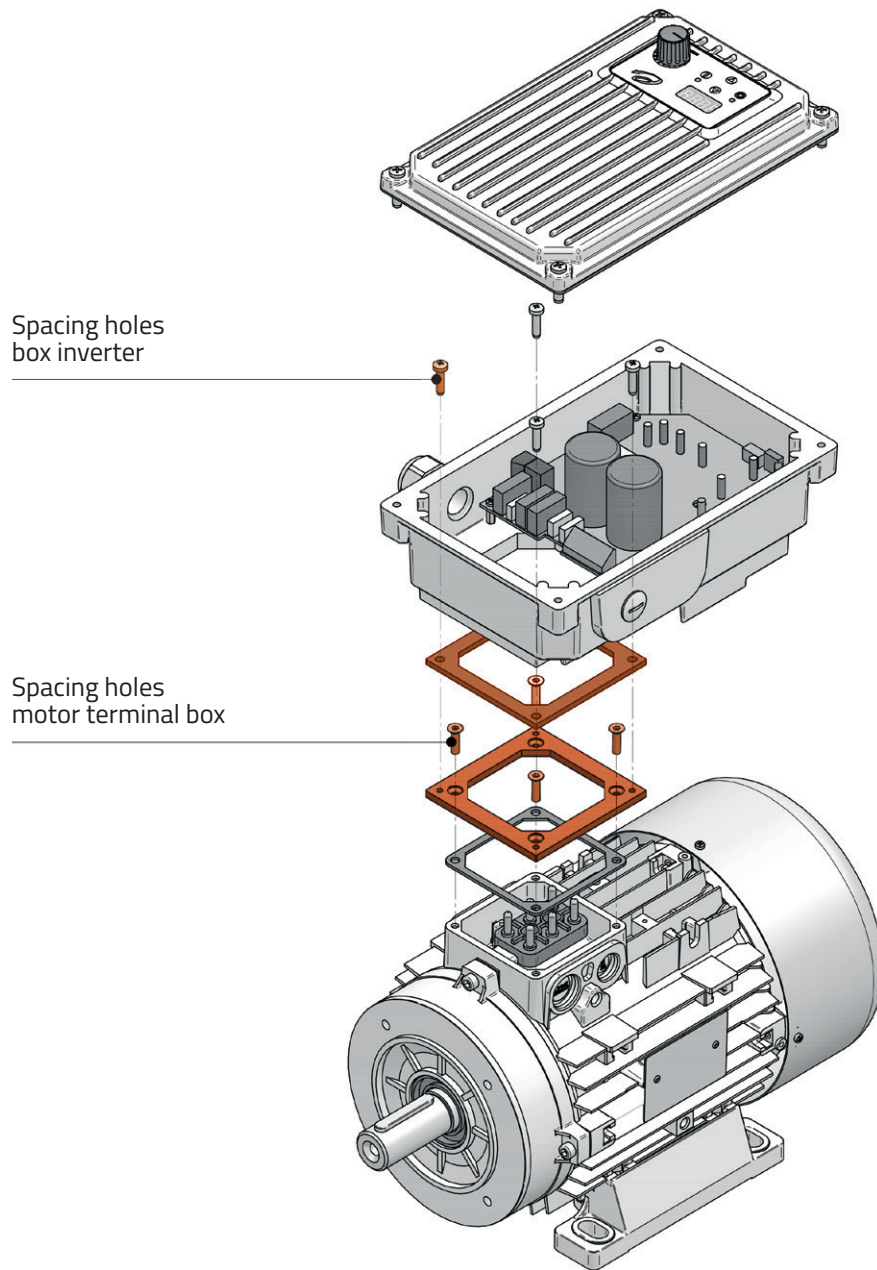
Photovoltaic energy without power module input
Stand-alone 400Vac High Power VFD
Asynchronous motor
Protection IP00 with heat sink

STANDARD	CODE (PARTIAL)		X33A5...	X33A8 ...	X33B2...	
	INPUT ELECTRICAL DATA	Vin- type		Three phase		
		Voltage input (Vin)	V	400 ± 15%		
		Frequency input	Hz	47 ÷ 63		
		Input protection		None		
	OUTPUT ELECTRICAL DATA	Output Motor Power*	kW	15	18	22
		Output Current	(A)	25	30	36
		Opertations mode		S1	S1	S1
		Output Voltage	V	400		
		Output Voltage		Three phase		
		Frequency Output	Hz	0 ÷ 200 Hz		
	PERFORMANCE DATA	Switching mode		PWM-V/F linear		
		Switching Frequency	kHz	2,5		
		Frequency Resolution	Hz	0,1		
		Frequency Precision	%	0,1 (digital)- 0,1 (analog)		
	SIGNALS DATA	Signals: input		3 digital input NPN;		
		Connections		TTL serial; 1 serial RS485; 1 serial RS485 for Bridge other devices		
	SETTING DATA	Acceleration time	s	0,1 ÷ 99,9		
		Deceleration time	s	0,1 ÷ 99,9		
		Protections		Over voltage – Under voltage - Over current- Overload (I ² t) –Over temperature		
		Overload range	%	100 ÷ 150 (200% for 1s)		
		Brake Energy Management		Direct input CC only ramp		
	GENERAL DATA	Dimension	mm	300X345XH160		
		Cooling system		Forced		
		Working temperature	°C	-5 / 45		
		Storage temperature	°C	-15 / +80		
		Relative humidity	%	20 ÷ 85 (No condensation)		
		EMC rate		To be provided in the electrical cabinet		

* Recommended motor power (IE2 efficiency level)

OPTIONS	PERFORMANCE	MBM207A	2 Analog Input (setting 0÷5Vdc/0÷10Vdc/0÷20mA ; 1 Relay (dry contact) 24V-3A
		MART238	1 Analog input 0÷5Vdc; 1 Digital Output (relay 24V-3A); 1 Analog output; Serial RS485
		MART223	4 Digital Output; 2 Analog Input
	REMOTE CONTROL SYSTEM	HMI-G	LCD grafic (64x128 dot) with Eeprom and clock circuit

Mechanical Interface between motor and VFD



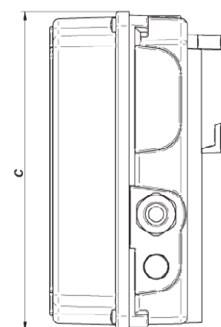
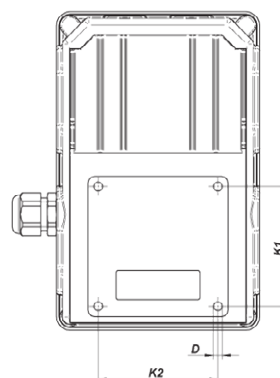
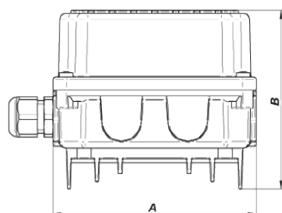
CASE		IEC63÷71 - 60x60mm (Spacing terminal box) Code	IEC80÷112 - 73x73mm (Spacing terminal box) Code	IEC132 - 82x82mm (Spacing terminal box) Code
TYPE	SPACING			
A (EM01-Plus, EM11)	73x73	X316.000P16000009	-	NOT AVAILABLE
A* (EM04, EM09)	97,5x71	X316.000P16000005	X316.000P16000006	NOT AVAILABLE
B	87x87	NOT AVAILABLE	X316.000P16000007	X316.000P16000008
C	87x87	NOT AVAILABLE	X316.000P16000007	X316.000P16000008
D	73x73	X316.000P16000009	-	NOT AVAILABLE
E	73x73	X316.000P16000009	-	NOT AVAILABLE
F	73x73	X316.000P16000009	-	NOT AVAILABLE
G	87x87	NOT AVAILABLE	X316.000P16000007	X316.000P16000008

* Must use the mechanical interface

Box-dimensions (mm)

Type A-A*

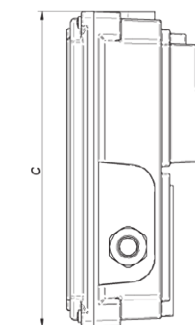
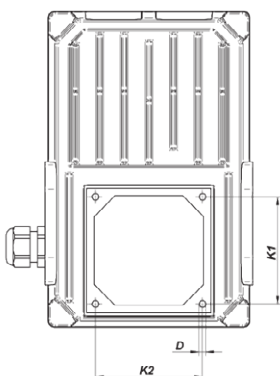
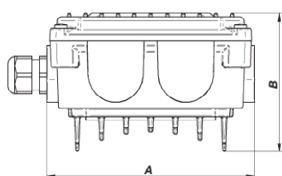
Dimension	A	A*
A	124	124
B	109	109
C	194	194
D	5,5	5,5
K1	73	97,5
K2	73	71



With A* must use the mechanical interface

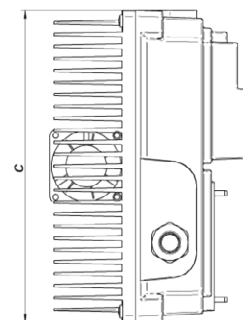
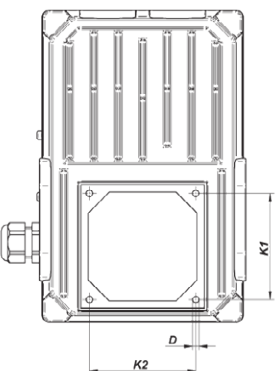
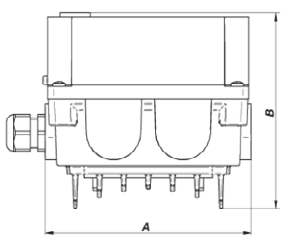
Type B

A	169
B	112
C	256
D	5,5
K1	87
K2	87



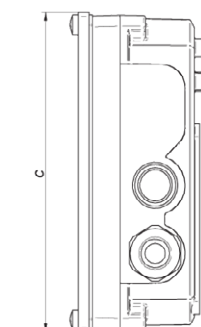
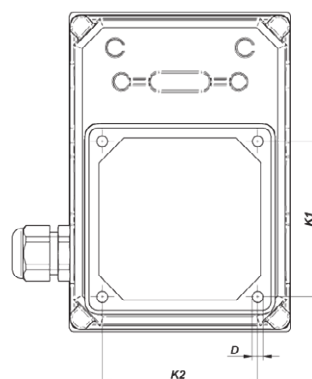
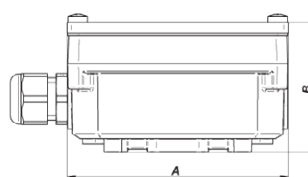
Type C

A	169
B	161
C	256
D	5,5
K1	87
K2	87



Type D

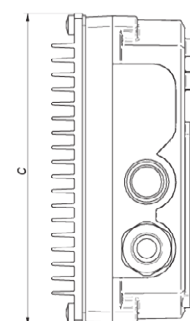
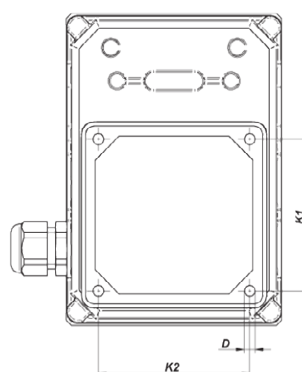
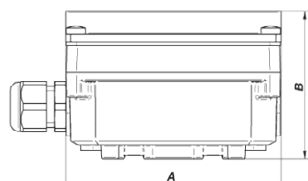
A	104
B	61
C	150
D	5,2
K1	73
K2	73



Box-dimensions (mm)

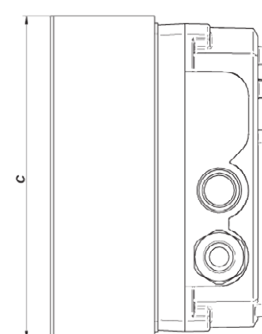
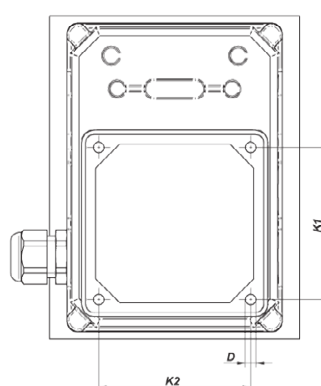
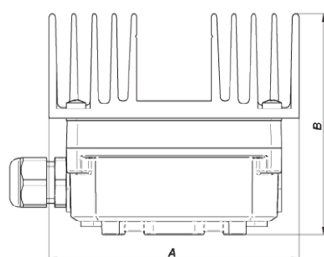
Type E

A	104
B	71
C	150
D	5,2
K1	73
K2	73



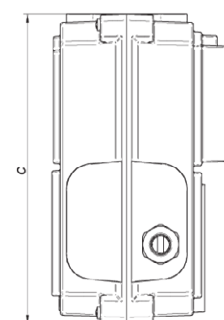
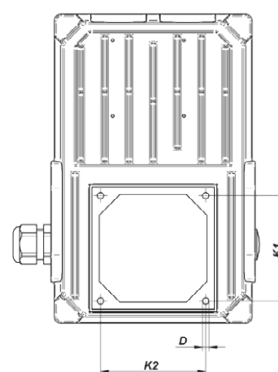
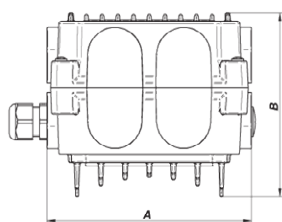
Type F

A	120
B	106
C	155
D	5,2
K1	73
K2	73



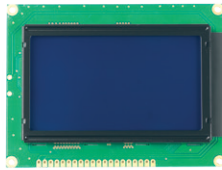




Type G

A	169
B	152
C	256
D	5,5
K1	87
K2	87



Accessories

HUMAN INTERFACE TYPE		HMI7S-BOX	HMI-8LCD	HMI-G
				
		Included cable with connector; lenght 0,7m		
SIZES	IP GRADE Dimensions (mm)	IP20 67x67xP30	IP00 94x84xP45	IP00 90x100xP30
POWER SUPPLY	Voltage Vin	5Vdc	5Vdc	5Vdc
DISPLAY	Typology	4 modules, 7 segments	1 LCD 2 lines for 16 characters	64x128 dot
	Colour	Red	Green	Blue
	Backlight	no	Yes white	Yes white
	Vin 2 voltage backlight	-	24Vdc	-
BUTTONS	Quantity	4	8	6
	Type	Mechanical inner	Mechanical inner	External membrane
COMMUNICATION	Serial	TTL o RS485	RS485	TTL o RS485
ADDITIONAL FEATURES	Optional	-	-	EEPROM 1M And date clock circuit

	CODE	DESCRIPTION
	X205.MTOP10000027	USB-TTL cable (1m); connection between PC (parameters software) and inverter
	X205.MTOP17000021	USB-RS485 (connector AMP) Use with protocol ModBus-RTU and expansion card MART238

Note

[illegible]

Note

[illegible]



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HOLDING

ORANGE1
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