



AC Motor Drives VF series



Lovato
electric

100% electricity

New-Generation High-Performance AC Motor Drives

0.2 TO 630KW

A host of available functions along with the constructive features allow to use the new **VF motor drives** in the most diversified applications: cement, paper, chemical, petrochemical plants, waterworks and gas ducts and many others.

Careful design of the front control panel and menu configuration warrant flexible selections along with easy and clear installation and set-up of the motor drive.

- Built-in EMC filter
- Built-in DC reactor for 18.5 up to 630kW types
- Configurable type of motor control: linear V/F, vector control, energy saving
- Special functions for pump and fan control using PID algorithm
- Programming and supervision software
- IP54 versions available on request
- Versions available up to 600VAC on request
- HVAC versions, compliant with IEC/EN 61000-3-12 standards, available on request
- Certifications obtained: UL for USA and Canada, CSA, C-Tick
Compliant with standards: EN 50178 and IEC/EN 61800-3.

AC motor drive type	VFNC3	VFS11	VFPS1
Single-phase supply	●	–	–
Three-phase supply	–	●	●
For three-phase motor	0.2-2.2kW (230VAC)	0.4-15kW (400VAC)	18.5-630kW (400VAC)
Max output frequency	400Hz	500Hz	500Hz



VFPS1
18.5-630kW
THREE-PHASE

VF-PS1 3PH-380/480V
18.5kW/25HP

危険
付が、感電、火災のおそれがあります。
・取扱説明書の注意事項を必ず読むこと。
・電源中及び電源遮断後15分以内は
・端子カバーを開けないこと。
・接地に接続をおこなうこと。

DANGER
Risk of injury, electric shock or fire.
- Read the instruction manual.
- Do not open the cover while power is on
or 15 minutes after power has been removed.
- Ensure proper earth connection.

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VFNC3
0.2-2.2kW
SINGLE-PHASE



VFS11
0.4-15kW
THREE-PHASE

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AC motor drives V

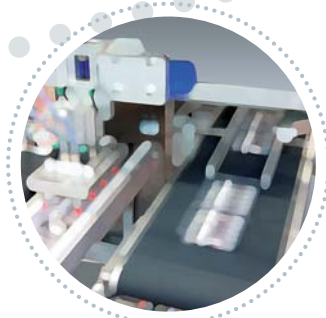
EXAMPLES OF APPLICATION

VF series motor drives can be used in a variety of applications in diversified industrial and civil fields.



Food processing industry

Machinery for bread, bakery and fresh pasta, confectionary equipment, mixers and blenders, flour and liquid dispensing equipment, etc.



Conveyance machinery

Product conveyor belts for warehouses, trade businesses, etc.



Pumps

Fans, dryers, water purification systems, waterworks, etc.

ENERGY SAVING

The new supervision of energy saving provides to optimise the output efficiency for the utility (pumps, fans), even with low frequency value usage.

The effect of this function can be monitored by the built-in panel or by communication via protocol. See Fig. 1.

HIGH FREQUENCY NOISE AND HARMONIC DISTORTION

The entire line up to 630kW has a built-in EMC filter, compliant with IEC/EN 61800-3 standards, first environment category 1, and makes it ideal for applications where there is a need to give very particular attention to irradiated disturbances towards peripheral equipment. See Fig. 2.

DC REACTOR

Built in the 18.5 to 75kW models and to be externally installed for the 90kW model and over. It allows to drastically reduce harmonics produced by the motor drive and to improve the power factor. The DC reactor also permits to limit the current drawn by the motor drive to a maximum value of 110% of its rated current. See Fig. 3.

Fig. 1

Effect of advanced energy-saving mode

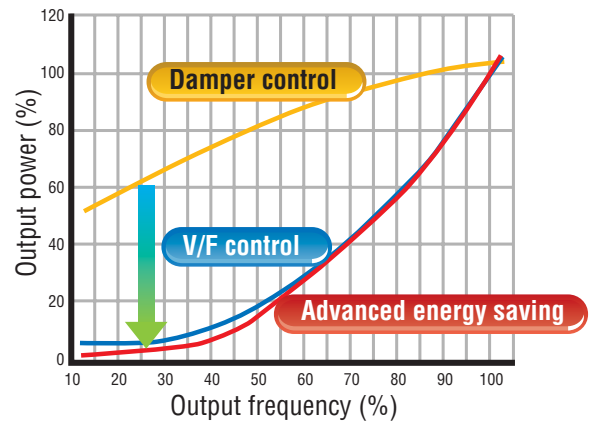


Fig. 2

Effect of built-in filter

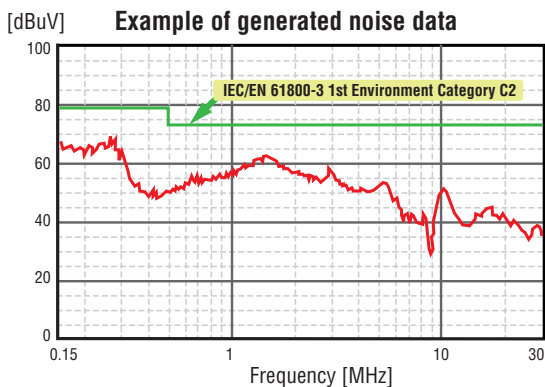
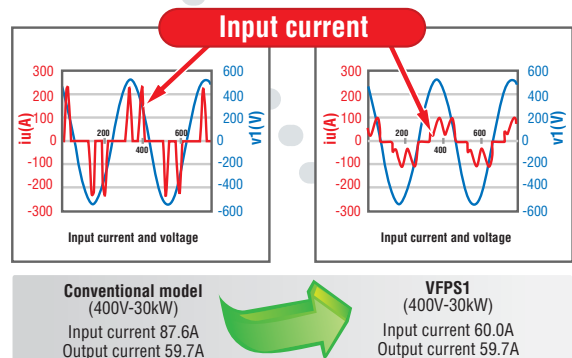


Fig. 3

Effect of built-in reactor



F series



Medical and fitness equipment

Equipment for fitness centres and for healthcare.



Vehicle washing machines

Automatic car washing equipment.



Commercial ironing equipment

Automatic machines used in numerous public stores and service industries.



Packaging

Automatic and semi-automatic packaging machines in cartons, plastic bags or cases or with cellophane, etc.

LESS INSTALLATION SPACE



Side by Side installation
All AC motor drives can be installed without side clearance for space saving.

Traditional installation with side clearance between AC motor drives.

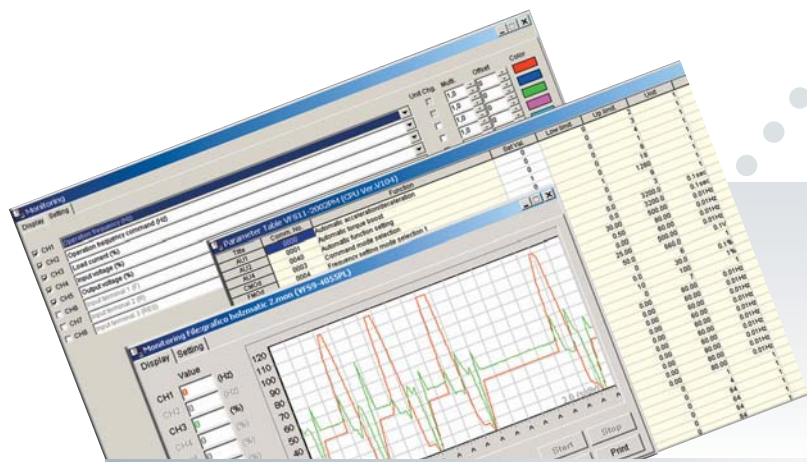
EASY KEY

The EASY key, on the control keypad of the VFNC3S... and VFPS1... models, permits to obtain a simplified access to different functions, such as:



Local/Remote: to switch between the motor and remote controls connected to the digital/analog inputs of the local commands available on board the motor drive.

Quick Mode: to create a customisable menu with only specific parameters for one's own application and to lock out the modification of all the others.



software

For the VF motor drive and PC communications (Microsoft® Windows®98, 2000 and XP), a software is available and permits to:

- Modify parameters
- Supervise the motor drive and the motor
- Create trend graphs
- Print parameter changes.

Single-phase 0.2 to 2.2kW

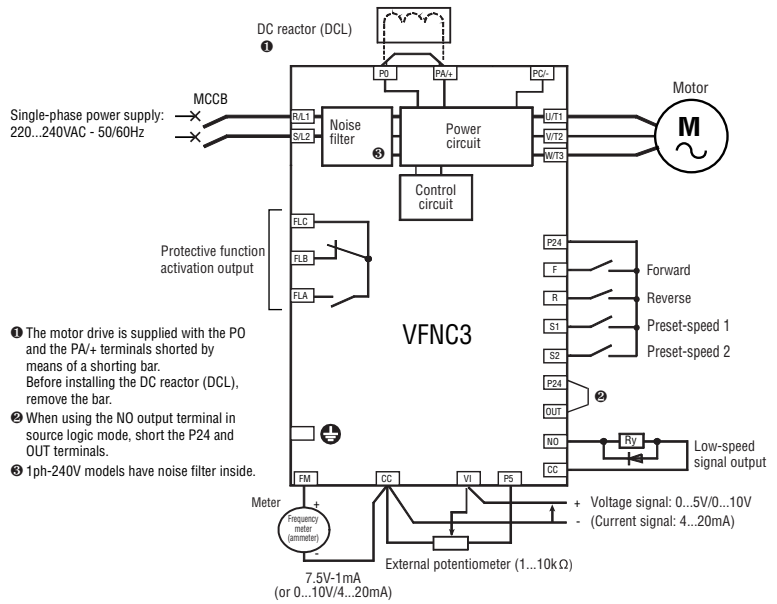
VFNC3... TYPE

- 200-240VAC single-phase supply
- EMC suppressor built in for noise immunity (IEC/EN 61800-3, 1° environment cat. C1, class B).



JOG DIAL

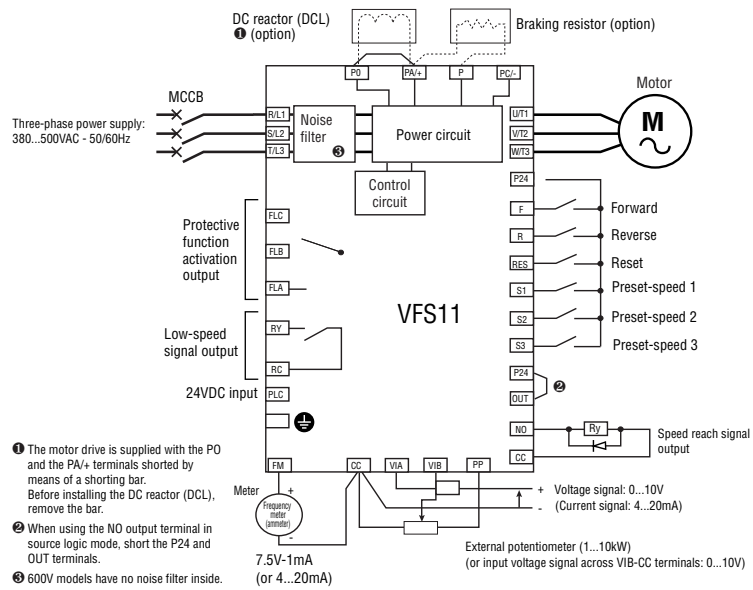
It simplifies the programming and control process of the VFNC3S through an intuitive and congenial use. It also can be used as an on-board potentiometer to change the motor frequency.



Three-phase 0.4 to 15kW

VFS11... TYPE

- 380-500VAC three-phase supply
- EMC suppressor built in for noise immunity (IEC/EN 61800-3, 1° environment cat. C2 or 2° environment cat. C3, class A)
- Integrated dynamic braking circuit.



Three-phase 18.5 to 630kW

VFPS1... TYPE

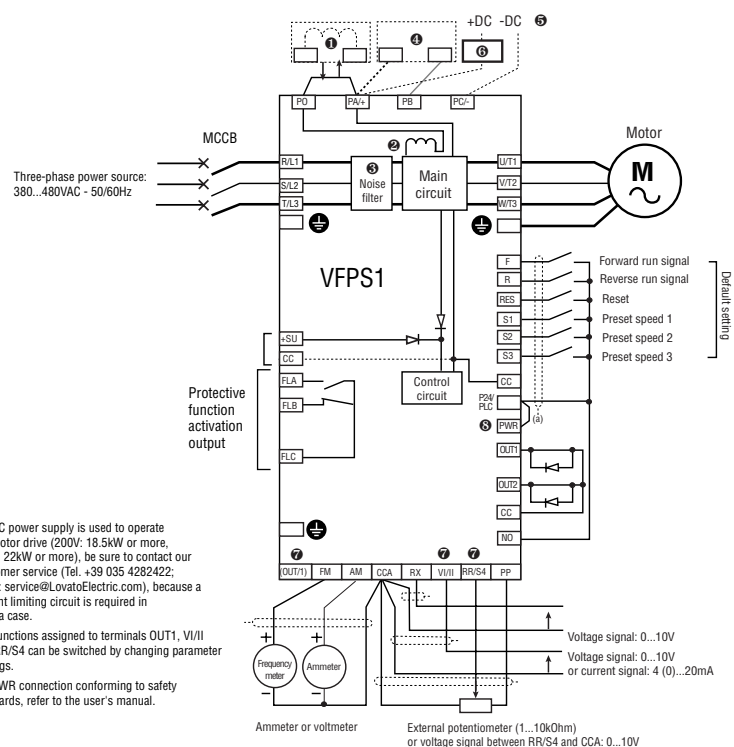
- 380-480VAC three-phase supply
- EMC suppressor built in for noise immunity (IEC/EN 61800-3, 1° environment cat. C2 or 2° environment cat. C3, class A)
- Integrated dynamic braking circuit up to 220kW
- Integrated DC reactor.

MY FUNCTION

It is a function with which small programs can be made with logic operations using the motor drive parameters.

My Function features:

- Number of lines: 7
- Number of instructions per line: 4
- Number of total instructions: 28
- Internal relays: 8
- Internal counters: 2
- Logic functions: ST, STN, AND, ANDN, OR, ORN, SET, RSET, HOLD, ON/OFF delay timer
- Comparators: EQ (equal to), NE (not equal to), GT (greater than), GE (greater than or equal to), LT (less than), LE (less than or equal to) and ASUB (absolute value).



Order code

AC motor drives



Order code	Current ① [A]	3-phase motor power		Dimensions			Q.ty per pkg [n°]	Weight [kg]
		[kW]	[HP]	A	B	C		

VFNC3

SINGLE-PHASE SUPPLY 200-240VAC 50/60HZ

VFNC3S 2002PL W	1.4	0.20	0.25	72	143	102	1	0.900
VFNC3S 2004PL W	2.4	0.40	0.54	72	143	121	1	1.000
VFNC3S 2007PL W	4.2	0.75	1	72	143	131	1	1.300
VFNC3S 2015PL W	7.5	1.50	2	117	142	156	1	2.000
VFNC3S 2022PL W	10.0	2.20	3	117	142	156	1	2.000

VFS11

THREE-PHASE SUPPLY 380-500VAC 50/60HZ ②

VFS11 4004PL WP	1.5	0.4	0.54	105	130	150	1	2.100
VFS11 4007PL WP	2.3	0.75	1	105	130	150	1	2.100
VFS11 4015PL WP	4.1	1.5	2	105	130	150	1	2.200
VFS11 4022PL WP	5.5	2.2	3	140	170	150	1	3.100
VFS11 4037PL WP	9.5	4.0	5	140	170	150	1	3.200
VFS11 4055PL WP	14.3	5.5	7.5	180	220	170	1	5.900
VFS11 4075PL WP	17	7.5	10	180	220	170	1	6.700
VFS11 4110PL WP	27.7	11	15	245	310	190	1	11.000
VFS11 4150PL WP	33	15	20	245	310	190	1	11.500

VFPS1

THREE-PHASE SUPPLY 380-480VAC 50/60HZ ③

VFPS1 4185PL WP	41	18.5	25	230	409	191	1	22.200
VFPS1 4220PL WP	48	22	30	240	420	212	1	23.700
VFPS1 4300PL WP	66	30	40	240	550	242	1	32.500
VFPS1 4370PL WP	79	37	50	240	550	242	1	32.800
VFPS1 4450PL WP	94	45	60	320	630	290	1	54.000
VFPS1 4450PL WP	116	55	75	320	630	290	1	54.000
VFPS1 4750PL WP	160	75	100	320	630	290	1	54.000
VFPS1 4900PC WP	179	90	125	310	680	375	1	100.000
VFPS1 4110KPC WP	215	110	150	310	680	375	1	100.000

THREE-PHASE SUPPLY 380-440VAC 50HZ / 380-480VAC 60HZ ④

VFPS1 4132KPC WP	259	132	200	350	782	375	1	108.000
VFPS1 4160KPC WP	314	160	250	330	950	377	1	118.000
VFPS1 4220KPC WP	427	220	350	430	950	377	1	161.000
VFPS1 4250KPC WP	481	250	400	585	950	377	1	194.000
VFPS1 4280KPC WP	550	280	450	585	950	377	1	204.000
VFPS1 4315KPC WP	616	315	500	585	950	377	1	204.000
VFPS1 4400KPC WP	759	400	600	880	1150	377	1	302.000
VFPS1 4500KPC WP	941	500	700	880	1150	377	1	320.000
VFPS1 4630KPC WP	1181	630	1000	1108	1150	377	1	462.000

① Operation up to 50°C without derating.

② 240VAC and 600VAC three-phase available on request.

③ 240VAC (VFPS1 4110KPC WP excluded) and 600VAC three-phase available on request.

④ 600VAC three-phase available on request.



Other starters for electri



Direct-on-line starters



Reversing and changeover contactors



Star-delta starters

Accessories



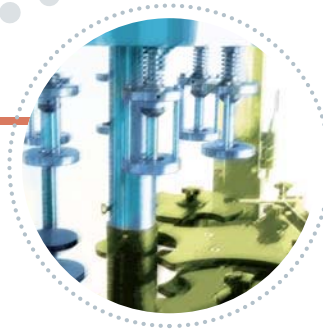
Order code	Description	Qty per pkg [n°]	Weight [kg]
3-phase inductances. For motor drive rating			
IND2020	0.75-4kW	1	2.200
IND2030	5.5-11kW	1	2.600
IND3040	15-22kW	1	5.500
IND4040	30-45kW	1	17.000
IND4075	55-75kW	1	24.000
IND4090	90-110kW	1	30.000
IND5060	132-160kW	1	45.000
IND5080	200-220kW	1	56.000
IND7070	280-315kW	1	91.000
Braking resistors. Power capacity			
ROF20100	200W 100K for 1.5-2.2kW types	1	0.220
ROF20150	200W 150K for 0.4-0.75kW types	1	0.220
ROF35060	350W 60K for 4-5.5kW types	1	0.510
ROF50035	500W 35K for 7.5kW type	1	0.620
ROF80030	800W 30K for 11-15kW types	1	1.400
ROPPE11430	1300W 30K for 18.5kW type	1	4.000
ROPPE12515	2200W 15K for 22-30kW types	1	5.000
ROPPE14008	4000W 8K for 37 to 75kW types	1	7.000
ROPPE24003	8000W 3K for 90 to 220kW types	1	11.000
Accessories for VF types.			
MITOSVT6	Remote control panel with functions: motor running, inverse rotation, speed adjustment and quantities control. IP65. Cable excluded ❶	1	0.154
RKP002Z	Remote control panel with functions: motor running, speed adjustment, quantities control and parameter setting. IP20. Cable excluded ❶	1	0.070
USB001Z	Motor drive programming module ❶❷❸	1	0.260
RJ45SH05000	Connecting cable RJ45 for MITOSVT6, RKP002Z or USB001Z to motor drive. 5m long.	1	0.142
51 PT25H101K	1kOhm potentiometer 10 turns, complete with operating knob	1	0.100
51 PT35H11K	1kOhm potentiometer 1 turn, complete with operating knob	1	0.052
Accessories for VFS11 and VFPS1 types only.			
MITOSVT6ECO	Remote control panel for quantities retention and control of a system (PID: pressure, temperature, etc). IP65. Cable excluded ❶	1	0.134

❶ RJ45 cable to be purchased separately; order code RJ45SH05000.

❷ For USB001Z module → PC USB port connection, use a normal USB cable, USB1.1/2.0 compatible, type A-B connection, maximum recommendable length 1m only.

❸ Contact our Customer Service (Tel. +39 0354282422; email: service@LovatoElectric.com) to request the motor drive remote control software.

c motors



Soft starters

General characteristics



VFNC3

VFS11

VFPS1

Main characteristics

	Class B	Class A	Class A
Built-in surge suppressor	Class B	Class A	Class A
Built-in DC reactor	–	–	•
Instantaneous overload	200% (0.5s)	200% (0.5s)	135% (2s)
Overload for 60 seconds	150%	150%	120%
Low speed torque	150% 1Hz	150% 1Hz	130% 1Hz
Integrated dynamic braking circuit	–	•	(18.5-220kW)
Capacitor pre-charge circuit	•	•	•
DC-bus access	•	•	•
Maximum output frequency	400Hz	500Hz	500Hz

Interface

	4+1 ①	6+2 ①	6+1 ①
Digital inputs	4+1 ①	6+2 ①	6+1 ①
Digital outputs	1	2	1
Static relay outputs	1	1	2
Analog inputs 0-10VDC/4-20mA	1	2 ①	2+1 ①
Analog outputs 0-10VDC/4-20mA	1	1	2
I/O logic PNP or NPN switchable	–	•	•
Serial port	RS485	TTL	RS485 (n° 2)

Front keyboard

Display	•	•	•
Operation keys	•	•	•
START/STOP keys	•	•	•
Speed adjustment keys	•	•	•
Potentiometer	•	•	–

Protections

Over-current	•	•	•
Over-voltage	•	•	•
IN/OUT phase failure	•	•	•
Motor overload	•	•	•
Drive overload	•	•	•
Dynamic braking resistor overload	–	•	•
Drive over-heating	•	•	•
Over-torque	•	•	•
Output short circuit and earth leakage protection	•	•	•

Functions

Constant motor torque control V/f	•	•	•
Variable motor torque control	•	•	•
Automatic motor torque boost control	•	•	•
Sensorless vector (speed) control	•	•	•
Closed loop motor control	–	–	•
Preset speed operation	15	15	15
PID function	•	•	•
Regenerative energy control	•	•	•
DC injection braking	•	•	•
Auto-tuning	•	•	•
Auto-restart and speed adjustment	•	•	•
Frequency potentiometer (speed adjustment via 2 external pushbuttons)	•	•	•
Different motor controls with ind. sets of parameter	2	2	4
Automatic fast speed search and detection	•	•	•
Communication protocol	Toshiba-Modbus	Toshiba-Modbus	Toshiba-Modbus
Override function	–	•	–
Automatic stopping after continuous running at minimum frequency (Sleep function)	•	•	•
PTC input	–	Optional board	Integrated
Speed maintained operation during alarm conditions (Fire control functions)	–	•	•

① Input configurable as analog or digital.

new
2009



Switch disconnectors
16 to 1250A



Contactors



Signal towers and beacons



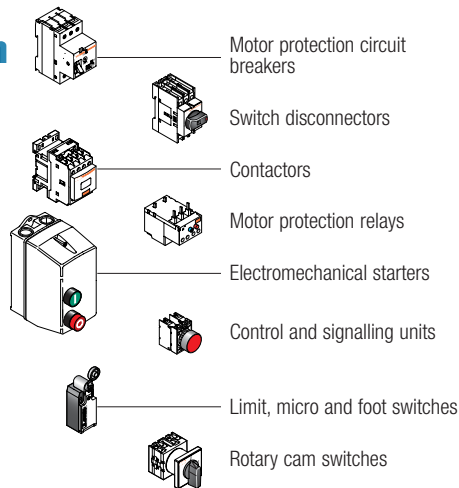
Digital multimeters and
power analyzers DMG series



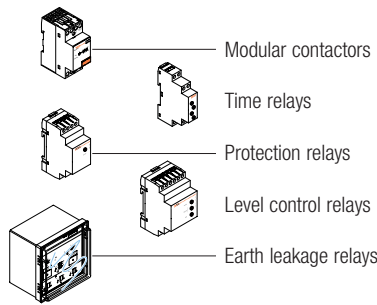
Switching power supplies

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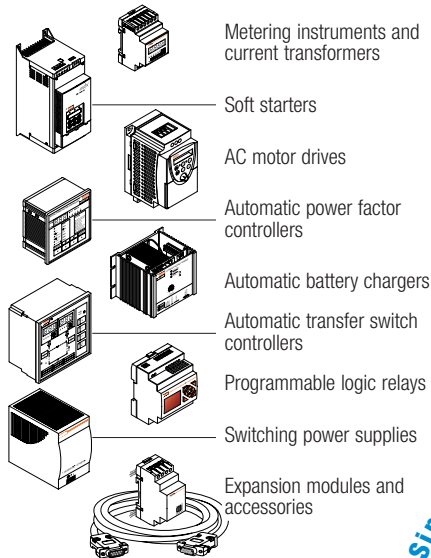
PLANET Switch



PLANET Din



PLANET Logic



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Present in over 80 countries

The products described in this publication are subject to be revised or improved at any moment. Catalogue descriptions and details, such as technical and operational data, drawings, diagrams and instructions, etc., do not have any contractual value. In addition, products should be installed and used by qualified personnel and in compliance with the regulations in force for electrical systems in order to avoid damages and safety hazards.

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