› Nano-PLC
em4 Ethernet & em4 Local

- › Up to 46 I/Os - Base 16 DI (4 HighSpeed/ 12 AI), 8 DO + 2 Solid State Relays
- › Analog Inputs 4-20 mA, 0-10 Vdc and 0-Vdc 12 bits
- › Ethernet Modbus TCP/IP (Client/Server) and Modbus RTU RS485 via interface (Master/Slave)
- › Event management & datalog via mail or FTP server
- › PLC performance with the shape and ease of use of a logic controller

EM4B26-ET
Base 26 I/O Ethernet

EM4B26
Base 26 I/O Local

Product selection	
Type	**Part number**
EM4B26-ET	**88 981 133**
EM4B26	**88 981 103**

Accesories & Kit Selection	
Description Kit	**Part number**
USB interface	**88 980 110**
USB cable 3m B type	**88 980 170**
Description Accesories	**Part number**
Starter Kit em4 Ethernet, Nano-PLC with embedded Ethernet, Ethernet cable, USB key with programming soft	**88 981 136**
Starter Kit em4 local, Nano-PLC standalone, USB interface & cable, USB key with programming soft	**88 981 106**
KIT em4 Ethernet , Nano-PLC with embedded Ethernet, Crouzet Touch CTP107-E Performance, Ethernet cable, USB key with Crouzet Touch Soft	**88 970 567**
KIT em4 Ethernet , Nano-PLC with embedded Ethernet, Crouzet Touch CTP110-E Performance, Ethernet cable, USB key with Crouzet Touch Soft	**88 970 577**

	EM4B26-ET	EM4B26
General features		
Ethernet Modbus TCP/IP (Client///Server)	Yes (16 IP range /// 24 words + 16 bits)	-
Modbus RTU (Master///Slave)	Yes via interface (16 IP range /// 24 words + 16 bits)	
Datalog via mail or FTP	Yes (24 data channel; 68 000 recordings)	-
Event mangement via mail	Yes (24 events)	-
Bluetooth	Yes via interface	
Specific characteristics		
Part number	**88 981 133**	**88 981 103**
Finish	Glossy black	
On front panel color	Black RAL 9011	
On terminal block color	Blue RAL 5017	
Protection rating (in accordance with IEC/EN 60529)	IP 40 on front panel IP 20 on terminal block	
Weight	Without packing: 345 g With packing: 395 g	Without packing: 310 g With packing: 355 g
Dimensions	Without packing: 124.6 x 90 x 60.6 mm / 4.91 x 3.54 x 2.38 inch With packing: 148 x 103 x 65 mm / 5.83 x 4.06 x 2.56 inch	Without packing: 124.6 x 90 x 60.4 mm / 4.91 x 3.54 x 2.38 inch With packing: 148 x 103 x 65 mm / 5.83 x 4.06 x 2.56 inch
Programming / exploitation	USB & Ethernet port / Ethernet port	-

	EM4B26-ET	EM4B26
Ethernet connection	Type RJ45, 10/100 Mbit/s, MDI/MDIX	-
Adressage	Static or dynamic (DHCP server / Auto IP)	-
Protocols	Modbus TCP (client / server), Discovery, UDP, TCP, FTP, SMTP (SSL/TLS), Workshop communication via Ethernet (SSL/TLS)	-
Cable length	Maximun length between 2 devices: 100 m / 3937 inch	-
Ethernet earthing	Yes, refer to the quick reference guide supplied with the product	-
General characteristics		
Products certification	CE, cULus Listed	
Conformity with the low voltage directive (in accordance with 2014/35/EU)	IEC/EN 61131-2 (Open equipment)	
Conformity with the EMC directive (in accordance with 2014/30/EU)	IEC/EN 61000-6-1 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-2 (Industrial) IEC/EN 61000-6-3 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-4 (Industrial)	
Power supply earthing	None	
Overvoltage category	3 in accordance with IEC/EN 60664-1	
Pollution	Degree: 2 in accordance with IEC/EN 61131-2	
Maximum utilization altitude	Operation: 2000 m Transport: 3000 m	
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test	
Resistance to electrostatic discharge	Immunity to ESD IEC/EN 61000-4-2, level 3	
Resistance to HF interference (Immunity)	Immunity to radiated electrostatic fields IEC/EN 61000-4-3, level 3 Immunity to fast transients (burst immunity) IEC/EN 61000-4-4, level 3 Immunity to shock waves IEC/EN 61000-4-5 Radio frequency in common mode IEC/EN 61000-4-6, level 3	
Conducted and radiated emissions (in accordance with EN 55022/11 group 1)	Class B	
Operation temperature	-20 (-4 °F) → +60 °C (140 °F) (+40 °C (104 °F) in a non-ventilated enclosure)	
Storage temperature	-40 (-40 °F) → +80 °C (176 °F)	
Relative humidity	95% max. (no condensation or dripping water)	
Screw terminals connection capacity	Flexible wire with ferrule: 1 conductor: 0.2 to 2.5 mm2 (AWG 24-14) Flexible wire with ferrule: 2 conductors: 0.2 to 0.75 mm2 (AWG 24-18) Rigid wire: 1 conductor: 0.2 to 2.5 mm2 (AWG 24-14) Rigid wire: 2 conductors: 0.2 to 0.75 mm2 (AWG 24-18) Tightening torque: 0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm) Stripping length: 6 mm	
Material	Lexan, UL94V0	
Environnement	Reach, RoHS, Halogen free 1272/2008/CE	
Processing characteristics		
LCD display	Display with 4 lines of 18 characters, white characters on a black background, reverse display function	
Programming method	FBD (Function Block Diagram), including SFC (Sequential Function Chart) (Grafcet)	
Program size	Function blocks: typically 1000 blocks Macro blocks: 127 max. (255 blocks per macro)	
Program memory	Flash	
Removable memory	N.A	
Data memory	2 k octets	
Back-up time (in the event of power failure)	Program and settings in the controller: 10 years Data memory: 10 years	
Data back-up	Data backup in the flash memory is guaranteed if the product is powered on more than 10 seconds	

	EM4B26-ET	EM4B26
Cycle time	From 2 ms* to 90 ms, default value: 10 ms *: Depending on configuration	From 2 ms to 90 ms, default value: 10 ms
Clock data retention	10 years (lithium battery) at 25 °C (77 °F)	
Clock drift	Drift < 12 min/year (at 25 °C (77 °F)) 6 s / month (at 25 °C (77 °F) with user-definable correction of drift). Synchronizable by network	
Timer block accuracy	0.5 % ± 2 cycle time	
Start up time on power up	< 10 s base alone, < 5 s base + 2 expansions + 1 accessory (RS485)	< 3 s base alone, < 1.5 s base + 2 expansions + 1 accessory (USB, RS485…)
Self test	Test firmware integrity (checksum memory) Stability of the internal power supply Check the conformity of the em4 device configuration with the configuration in the application program.	
Supply		
Nominal voltage	24 V⎓ (-15% / +20%)	
Operating limits	20.4 - 28.8 V⎓	
Immunity from micro power cuts	≤ 1 ms (repetition 20 times)	
Max. absorbed power	5W @ 24 V⎓, 6.5 W @ 28.8 V⎓, - 0.3 W backlight OFF 1.5W @ 24 V⎓ (I/O + backlight) = 0	4W @ 24 V⎓, 5.3 W @ 28.8 V, - 0.3 W backlight OFF
Protection against polarity inversions	Yes	
Power monitoring	Yes and value available through the application "FB Status", 1/10V, 5%.	
Inputs		
Digital and high speed digital inputs 24 V⎓ - 4 inputs from I1 to I4		
Input used as digital input		
Input voltage	24 V⎓ (-15% / +20%)	
Input current	1.8 mA @ 20.4 V 2.1 mA @ 24 V 2.5 mA @ 28.8 V	
Input impedance	11.6 kΩ	
Logic 1 voltage threshold	≥ 15 V⎓	
Making current at logic state 1	≥ 1.3 mA	
Logic 0 voltage threshold	≤ 10 V⎓	
Release current at logic state 0	≤ 0.8 mA	
Response time	1 to 2 cycle times	
Sensor type	Contact or 3-wire PNP	
Conforming to IEC/EN 61131-2	Type 1	
Input type	Resistive	
Isolation between power supply and inputs	None	
Isolation between inputs	None	
Protection against polarity inversions	Yes	
Status indicator	On LCD screen	
Cable length	≤ 100 m	
Input used as high speed digital input		
Maximum counting frequency	3 channels encoder (I1, I2, I3): 20 kHz* 2 independent counters (I1, I2) (I3, I4) (Cumul, IND, DIR): 2 channels: 40 kHz*, 4 channels: 20 kHz*, 2 independent counters (I1, I2) (I3, I4) (PH, PH2): 2/4 channels: 20 kHz* 4 independent counters (I1, I2, I3, I4) (Up/Down): 1 channel: 60 kHz*, 2 channels: 40 kHz*, > 2 channels: 20 kHz* * with a time cycle ≤ 10 ms and a ton / toff = 50% ± 5%, level 0 < 2V and level 1 > 20.4V	
Other functions	4 chronometers (I1, I2, I3, I4) 4 tachometers (I1, I2, I3, I4)	
Cable length	≤ 3 m with shielded twisted cable	

	EM4B26-ET	EM4B26
Digital 24 V⎓ and analog inputs 12 bits / 28.8 V - potentiometer - 8 inputs from I5 to IC		
Input used as digital input		
Input voltage	24 V⎓ (-15% / +20%)	
Input current	1.8 mA @ 20.4 V 2.1 mA @ 24 V 2.5 mA @ 28.8 V	
Input impedance	11.6 kΩ	
Logic 1 voltage threshold	≥ 11 V⎓	
Making current at logic state 1	≥ 1 mA	
Logic 0 voltage threshold	≤ 9 V⎓	
Release current at logic state 0	≤ 0.7 mA	
Response time	1 to 2 cycle times	
Sensor type	Contact or 3-wire PNP	
Conforming to IEC/EN 61131-2	Type 1	
Input type	Resistive	
Isolation between power supply and inputs	None	
Isolation between inputs	None	
Protection against polarity inversions	Yes	
Status indicator	On LCD screen	
Cable length	≤ 100 m	
Input used as analog input		
Measuring range	0 → 10 V, 0 → V power supply or Voltmeter	0 → 10 V or 0 → V power supply
Input impedance	11.6 kΩ	
Maximum value without destruction	28.8 V⎓ max	
Input type	Common mode	
Resolution	12 bit at maximum input voltage (10 bit at 10V)	12 bit at maximum input voltage (10.5 bit at 10V)
Value of LSB	7.03 mV	
Conversion time	Controller cycle time	
Maximum error in 0-10V mode	± 1.1 % of full scale at 25 °C (77 °F) ± 1.6 % of full scale at 55 °C (131 °F)	
Maximum error in 0-V power supply mode	± 2 % of full scale at 25 °C (77 °F) ± 3 % of full scale at 55 °C (131 °F)	
Repeat accuracy at 55 °C (131 °F)	± 0.5 %	
Voltmeter	from 0 to 30.5 V, 5%	
Isolation between analogue channel and power supply	None	
Protection against polarity inversions	Yes	
Potentiometer control	2.2 kΩ / 0.5 W (recommended), 10 KΩ max.	
Cable length	≤ 10 m with shielded twisted cable (sensor not isolated)	
Digital 24 V⎓ and analog inputs 12 bits / 10 V & 11 bits / 0-20 mA - 4 inputs from ID to IG		
Input used as digital input (power off state)		
Input voltage	24 V⎓ (-15% / +20%)	
Input current	1.5 mA @ 20.4 V 1.7 mA @ 24 V 2.1 mA @ 28.8 V	
Input impedance	13.9 kΩ	
Logic 1 voltage threshold	≥ 11 V⎓	
Making current at logic state 1	≥ 0.8 mA	
Logic 0 voltage threshold	≤ 8 V⎓	
Release current at logic state 0	≤ 0.5 mA	

	EM4B26-ET	EM4B26
Response time	1 to 2 cycle times	
Sensor type	Contact or 3-wire PNP	
Conforming to IEC/EN 61131-2	Type 1	
Input type	Resistive	
Isolation between power supply and inputs	None	
Isolation between inputs	None	
Protection against polarity inversions	No	
Status indicator	On LCD screen	
Cable length	≤ 100 m	
Input used as 0-10 V analog input		
Measuring range	0 → 10 V	
Input impedance	13.9 kΩ	
Maximum value without destruction	28.8 V⎓ max	
Input type	Common mode	
Resolution	12 bit / 10V	
Value of LSB	2.45 mV	
Conversion time	Controller cycle time	
Maximum error at 25 °C (77 °F)	± 0.8 % of full scale	
Maximum error at 55 °C (131 °F)	± 1.2 % of full scale	
Repeat accuracy at 55 °C (131 °F)	± 0.5 %	
Isolation between analogue channel and power supply	None	
Protection against polarity inversions	Yes for voltage ≤ 10 V	
Potentiometer control	2.2 kΩ / 0.5 W (recommended), 10 KΩ max.	
Cable length	≤ 10 m with shielded twisted cable (sensor not isolated)	
Input used as 0-20 mA analog input		
Measuring range	0 → 20 mA (4 → 20 mA by the application)	
Input impedance	245 Ω	
Maximum value without destruction	30 mA max	
Input type	Common mode	
Resolution	11 bit (normalized at 0 - 2000) / 20 mA	
Value of LSB	10 µA	
Conversion time	Controller cycle time	
Maximum error at 25 °C (77 °F)	± 1.2 % of full scale	
Maximum error at 55 °C (131 °F)	± 1.7 % of full scale	
Repeat accuracy at 55 °C (131 °F)	± 0.5 %	
Isolation between analogue channel and power supply	None	
Protection against polarity inversions	Yes	
Overvoltage protection	Yes If the input voltage is > 7 V, this one is automatically switched on 0-10V configuration.	
Cable length	≤ 30 m with shielded twisted cable (sensor not isolated)	
Outputs		
Digital / PWM solid state output - 2 solid state outputs from O1 to O2		
Output used as digital output		
Breaking voltage	10 → 28.8 V⎓	
Nominal voltage	12 / 24 V⎓	
Nominal current	0.5 A on resistive load @ 25 °C (77 °F)	
Max. breaking current	0.625 A	
Non repetitive overload current	1 A	
Maximum breaking current in the common	1 A	

	EM4B26-ET	EM4B26
Voltage drop	< 1 V for I = 0.5 A	
Response time	Make = 1 cycle time + 30 µs typical Release = 1 cycle time + 40 µs typical	
Built-in protections	Against overloads and short-circuits: Yes Against over voltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a volt-free contact between the output of the logic controller and the load	
Min. load	1 mA	
Galvanic isolation	No	
Cable length	≤ 10 m	

Truth table of the default

	Command	Output	Fault
Normal condition	0	0	No
	1	1	No
Overheating	0	0	No
	1	0	Yes
Underpowered	0	0	X
	1	0	X
Short circuit (current limit)	0	0	No
	1	0	Yes

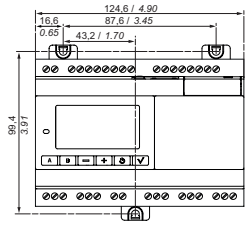
Output used as PWM output		
PWM frequency	14.11 Hz; 56.45 Hz; 112.90 Hz; 225.80 Hz; 451.59 Hz; 1758.24 Hz	
PWM cyclic ratio	0 → 100 % 100 steps	
PWM Max. error	≤ 2 % (from 10 % → 90 %)	
Status indicator	On LCD screen	
Cable length	≤ 10 m with shielded twisted cable	
Distance between the power source and the static outputs	≤ 30 m	
6 A relay output - 2 outputs from O3 to O4		
Breaking voltage	250 V~ max	
Breaking current	6 A Derating: UL: ≥ 45 °C (113 °F): 4A max	6A
Maximum breaking current in the common	IEC @ 25 °C (77 °F): 12 A IEC @ 60 °C (140 °F) or UL: 10 A	
Mechanical life	5 000 000 operations (cycles)	
Electrical durability for 50 000 operating cycles	24 V⎓ tau = 0 ms: 6 A, tau = 7 ms: 3 A, tau = 15 ms: 1.8 A Usage category DC-12: 24 V, 6 A Usage category DC-14: 24 V, 1.8 A 250 V~ cos phi = 1: 6 A, cos phi = 0.7: 5 A, cos phi = 0.4: 2.5 A Usage category AC-12: 250 V, 6 A Usage category AC-13: 250 V, 5 A Usage category AC-15: 250 V, 2 A	
Minimum switching capacity	100 mA (at minimum voltage of 12V)	
Maximum operating rate	Off load: 10 Hz At operating current: 0.1 Hz	
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV	
Response time	Make = 1 cycle time + 8 ms typical Release = 1 cycle time + 4 ms typical	
Built-in protections	Against short-circuits: None Against over voltages and overload: None	
Status indicator	On LCD screen	
Cable length	≤ 30 m	

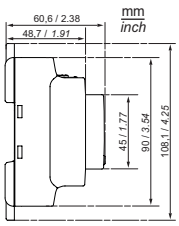
	EM4B26-ET	EM4B26
8 A relay output - 6 outputs from O5 to OA		
Breaking voltage	250 V~ max	
Breaking current	8 A Derating: CEI ≥ 55 °C (131 °F) or UL: ≥ 45 °C (113 °F): 6A max	8 A, ≥ 55 °C: 6 A
Maximum breaking current in the common	IEC @ 25 °C (77 °F): C3, C6: 8A; C4, C5: 16 A IEC @ 60 °C (140 °F) or UL: C3, C6: 8 A; C4, C5: 10 A	
Mechanical life	20 000 000 operations (cycles)	
Electrical durability for 50 000 operating cycles	24 V⎓ tau = 0 ms: 8 A, tau = 7 ms: 3 A, tau = 15 ms: 1.5 A Usage category DC-12: 24 V, 8 A Usage category DC-14: 24 V, 1.5 A 250 V~ cos phi = 1: 8 A, cos phi = 0.7: 4.75 A, cos phi = 0.4: 3 A Usage category AC-12: 250 V, 8 A Usage category AC-13: 250 V, 4.3 A Usage category AC-15: 250 V, 1.5 A	
Minimum switching capacity	100 mA (at minimum voltage of 12V)	
Maximum operating rate	Off load: 10 Hz At operating current: 0.1 Hz	
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV	
Response time	Make = 1 cycle time + 10 ms typical Release = 1 cycle time + 5 ms typical	
Built-in protections	Against short-circuits: None Against over voltages and overload: None	
Status indicator	On LCD screen	
Cable length	≤ 30 m	

Schemes

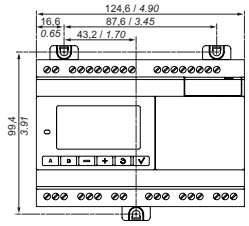
Dimensions

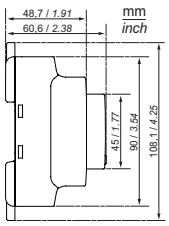
Ethernet





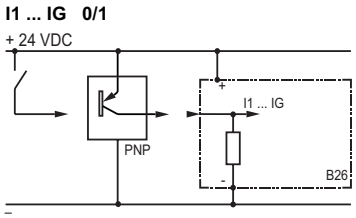
Local

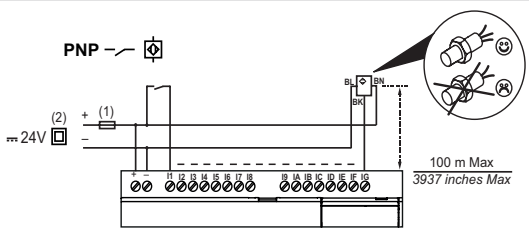




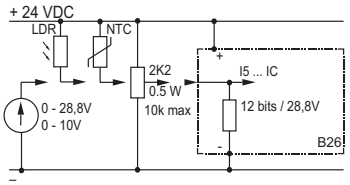
Connections

INPUTS

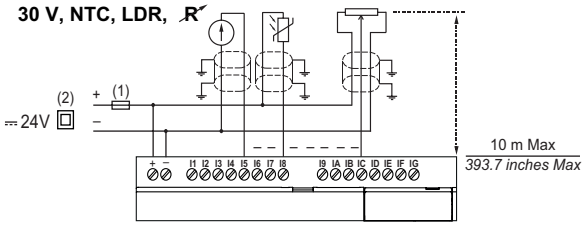




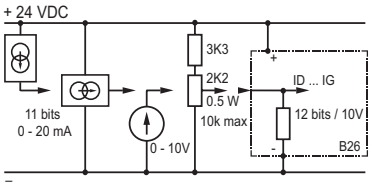
I5 ... IC U



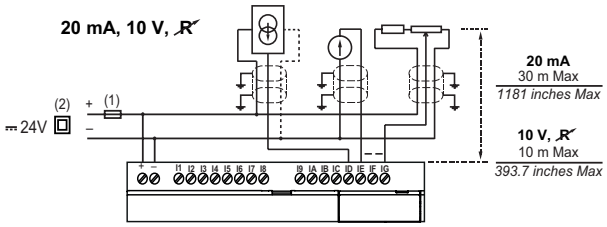
30 V, NTC, LDR,



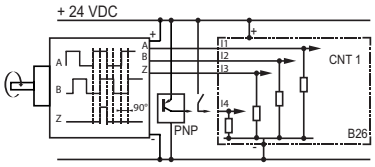
ID ... IG U / I



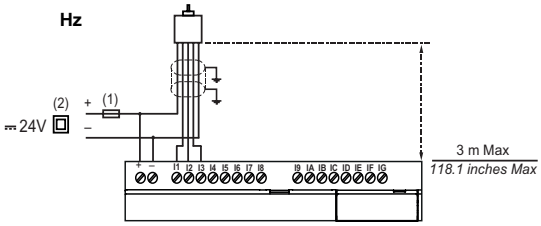
20 mA, 10 V,



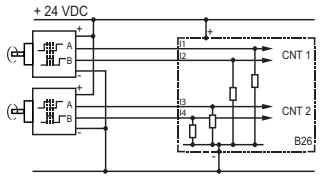
I1 ... I4 **2604**



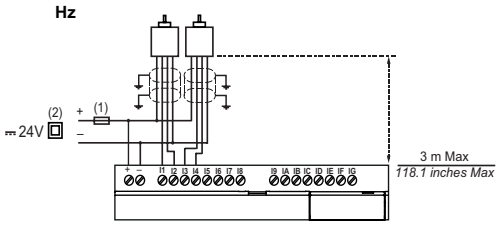
Hz



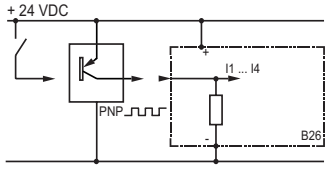
I1 ... I4 **2604**



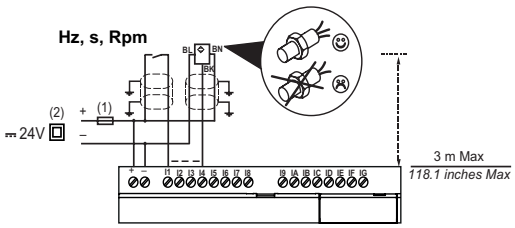
Hz



I1 ... I4 **2604**



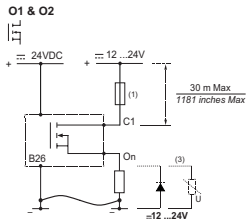
Hz, s, Rpm



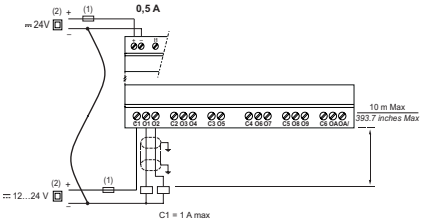
(1)	1 A (UL248) quick-blowing fuse, circuit-breaker or circuit protector (US)
(2)	Isolating source

OUTPUTS

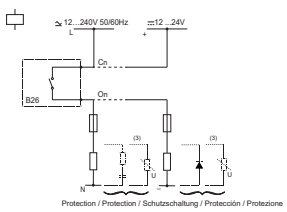
O1 & O2



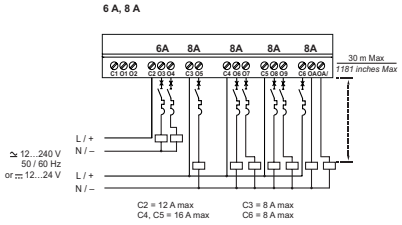
0,5 A



O3 ... OA



6 A, 8 A



(3)	Inductive load

I/O Installations