› Millenium 3 PLC
Smart Compact CD12/CB12
With/without display

› **Highly visible blue LCD display with 4 lines of 18 characters, with controllable backlighting**

› **Compatible with the whole of the specific function blocks library of the software workshop**

› **Extended temperature range (-20 °C → +70 °C)**

› **Analogue inputs 0-10 V$\overline{}$, potentiometer, NTC, (0-20mA/Pt100 with adapters)**

› **Selectable parameter setting: option to choose the parameters settable from the front panel**

CD12 with display   *CB12 without display*

Selection guide

Power supply	Inputs	Outputs	CD12	CB12
12 V$\overline{}$	8 digital of which 4 analogue	4 relays 8A	**88974045**	**-**
12 V$\overline{}$	8 digital of which 4 analogue	4 solid state 0.5A of which 1 is PWM	**88974046**	**88974026**
24 V$\overline{}$	8 digital of which 4 analogue	4 relays 8A	**88974041**	**88974021**
24 V$\overline{}$	8 digital of which 4 analogue	4 solid state 0.5A of which 1 is PWM	**88974042**	**-**
24 V$\sim$	8 digital	4 relays 8A	**88974044**	**88974024**
100 → 240 V$\sim$	8 digital	4 relays 8A	**88974043**	**88974023**

Accessories

Type	Description	Code
M3 Soft	Multilingual programming software with the specific functions library	**88970111**
PA	EEPROM memory cartridge	**88970108**
PA	3m serial cable: PC → Millenium 3	**88970102**
PA	3m USB cable: PC → Millenium 3	**88970109**
PA	Milenium 3 → Bluetooth® interface (class A 10m)	**88970104**

	12 V$\overline{}$	24 V$\overline{}$	24 V$\sim$	100 → 240 V$\sim$
General characteristics				
Product certifications (according to IEC/EN 60529)	UL, CSA, GL (*) (*) GL: except for 88 970 xxx			
Conforms to the Low Voltage directive (according to 73/23/EEC)	EN (IEC) 61131-2 (Open equipment)			
Conforms to the EMC directive (according to 89/336/EEC)	EN (IEC) 61131-2 (Zone B) EN (IEC) 61000-6-2, EN (IEC) 61000-6-3 (*), EN (IEC) 61000-6-4 (*) Except for configurations (88 970 1x1 or 88 970 1x2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B: work in progress)			
Grounding	None			
Degree of protection (according to IEC/EN 60529)	IP 40 for front panel IP 20 for terminal block			
Over-voltage category (according to IEC/EN 60664-1)	3			

CROUZET

	12 V⎓	24 V⎓	24 V∿	100 → 240 V∿
Degree of interference (according to IEC/EN 61131-2)	2			
Maximum allowable altitude	For operation: 2000m For transport: 3048m			
Mechanical strength	Vibration resistance IEC/EN 60068-2-6, test Fc Shock resistance IEC/EN 60068-2-27, test Ea			
Electrostatic discharge withstand	Electrostatic discharge immunity IEC/EN 61000-4-2, level3			
HF interference withstand (immunity)	Radiated electromagnetic field immunity IEC/EN 61000-4-3, level 3 Fast transient/burst immunity IEC/EN 61000-4-4, level 3 Surge immunity IEC/EN 61000-4-5 Common mode radio frequency IEC/EN 61000-4-6, level 3 Voltage dips and interruptions (~) IEC/EN 61000-4-11 Damped oscillatory wave immunity IEC/EN 61000-4-18			
Conducted and radiated interference (according to EN 55022/11 group 1)	Class B(*) (*) Except for configurations (88 970 1x1 or 88 970 1x2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B: work in progress)			
Operating temperature	-20 → +70 °C (+40 °C in unventilated cabinet) according to IEC/EN 60068-2-1 and IEC 60068-2-2 Duty cycle 100% (6A relay) Duty cycle 66% (8A relay)			
Storage temperature	-40 → +80 °C			
Relative humidity	95 % max. (non-condensing)			
Connection capacity to screw terminal (Tightened by screwdriver of 3.5mm diameter)	Flexible wire with single conductor terminal end: Semi-rigid single conductor wire: Rigid single conductor wire: Tightening torque	0.25 to 2.5 mm² 2 conductors 0.25 to 0.75 mm² 0.2 to 2.5 mm² 0.2 to 2.5 mm² 2 conductors 0.2 to 1.5 mm² 0.5 Nm		

Processing characteristics

LCD display	CD: display with 4 lines of 18 characters
Programming method	Ladder or function blocks / SFC (Grafcet)
Ladder program size	Ladder: 120 lines Function blocks: 350 typical blocks
Program memory	Flash EEPROM
Removable memory	EEPROM
Data memory	368 bits / 200 words
Backup time (in the event of a power failure)	Program and settings in PLC 10 years Program and settings on removable memory 10 years Data memory 10 years
Cycle time	Ladder: 20 ms typically Function blocks: 6 to 90 ms
Response time	Input data acquisition time + 1 to 2 cycles
Clock running time	10 years (lithium battery) at 25 °C
Clock drift	Drift < 12 min/year (at 25 °C) 6 s/month (at 25 °C and calibrated)
Accuracy of delay blocks	1% +- 2 cycles

Power supply

	12 V⎓	24 V⎓	24 V∿	100 - 240 V∿
Nominal voltage	12 V⎓	24 V⎓	24 V∿	100 - 240 V∿
Operating limits	(-13 % / +20 %) 10.4 → 14.4 V⎓	(-20 % / +25 %) 19.2 → 30 V⎓	(-15 % / +20 %) 20.4 V∿ → 28.8 V∿	(-15 % / +10 %) 85 - 264 V∿
Operating frequency	N/A		50/60 Hz (+4 %/-6 %) 47 to 53 Hz / 57 to 63 Hz	
Startup time from power on	< 1.2s			
Micro-break immunity	≤ 1 ms (repeated 20 times)		10 ms (repeated 20 times)	

	12 V⎓	24 V⎓	24 V∿	100 → 240 V∿
Maximum power draw	CD12 - CB12: 1.5 W CD12 - CB12 with solid state output: 1.5 W	CD12 - CB12: 4 W CD12 - CB12 with solid state output - 3 W	CD12 - CB12: 4 VA	CD12 - CB12: 7 VA
Inverted polarity protection	Yes		N/A	
Effective insulation voltage	N/A		1780 V (50-60 Hz)	

Digital inputs				
Position of the inputs	4 inputs from I1 to I4		8 inputs from I1 to IE	
Input voltage	12 V⎓ (-13 % / +20 %)	24 V⎓ (-20 % / +25 %)	24 V∿ (-15% / +20 %)	100 → 240 V∿ (-15 % / +10 %)
Input current	3.9 mA @ 10.44 V⎓ 4.4 mA @ 12.0 V⎓ 5.3 mA @ 14.4 V⎓	2.6 mA @ 19.2 V⎓ 3.2 mA @ 24.0 V⎓ 4.0 mA @ 30.0 V⎓	4.4 mA @ 20.4 V∿ 5.2 mA @ 24.0 V∿ 6.3 mA @ 28.8 V∿	0.24 mA @ 85 V∿ 0.75 mA @ 264 V∿
Input impedance	6.45 kΩ	7.4 kΩ	4.6 kΩ	350 kΩ
Logic state 1 triggering voltage	≥ 7 V⎓	≥ 15 V⎓	≥ 14 V∿	≥ 79 V∿
Logic state 1 triggering current	≥ 2 mA	≥2.2 mA	> 2 mA	> 0.17 mA
Logic state 0 triggering voltage	≤ 3 V⎓	≤ 5 V⎓	≤ 5 V∿	≤ 40 V∿
Logic state 0 triggering current	< 0.9 mA	< 0.75 mA	< 0.5 mA	
Response time	1 → 2 cycles + 6 ms		50 ms	
Sensor type	Contact or 3 wire PNP			
Galvanic isolation	No			
Status indication	On the LCD screen for CD and XD			

Analogue or digital inputs				
Inputs used in analogue mode				
Position of the inputs	4 inputs from IB to IE		-	
Measurement range	(0 → 10 V) or (0 → Vsupply)	0 → 10 V or 0 → Vsupply	N/A	
Input impedance	14 kΩ	12 kΩ	N/A	
Maximum input voltage	14.4 V⎓	30 V⎓	N/A	
LSB value	14 mV	29 mV	N/A	
Input type	Common mode		N/A	
Resolution	10 bits		N/A	
Conversion time	PLC cycle time		N/A	
Precision at 25 °C	± 5 %		N/A	
Precision at 55 °C	± 6.2 %		N/A	
Repeatability at 55 °C	± 2 %		N/A	
Analogue channel to power supply isolation	None		N/A	
Cabling distance	10 m maximum, with shielded cable (sensor not isolated)		N/A	
Inverted polarity protection	Yes		N/A	
Potentiometer control	2.2 kΩ / 0.5 W (Preset) 10 kΩ max.		N/A	

Inputs in digital mode				
Position of the inputs	4 inputs from IB to IE		-	
Input voltage	12 V⎓ (-13 % / +20 %)	24 V⎓ (-20 % / +25 %)	N/A	
Input current	0.7 mA @ 10.44 V⎓ 0.9 mA @ 12.0 V⎓ 1.0 mA @ 14.4 V⎓	1.6 mA @ 19.2 V⎓ 2.0 mA @ 24.0 V⎓ 2.5 mA @ 30.0 V⎓	N/A	
Input impedance	14 kΩ	7.4 kΩ	N/A	
Logic state 1 triggering voltage	≥ 7 V⎓	≥ 15 V⎓	N/A	
Logic state 0 triggering voltage	≤ 3 V⎓	≤ 5 V⎓	N/A	

|	12 V⎓	24 V⎓	24 V∿	100 → 240 V∿
Response time	1 → 2 cycles + 6 ms		N/A	
Sensor type	Contact or 3 wire PNP		N/A	
Galvanic isolation	No		N/A	
Status indication	On the LCD screen for CD and XD		N/A	
Relay outputs				
Maximum breaking voltage	5 to 150 V⎓ 24 to 250 V∿			
Cut-off current / thermal	CB-CD: 8 A			
Electrical lifetime of 500.000 operations	Usage category DC-12: 24 V, 1.5 A Usage category DC-13: 24 V (L/R = 10 ms), 0.6 A Usage category AC-12: 230 V, 1.5 A Usage category AC-15: 230 V, 0.9 A			
Minimum switching current (with minimum voltage of 12 V)	10 mA			
Contact reliability at low levels	12 V, 10 mA			
Maximum operating frequency	Unloaded: 10 Hz At rated current: 0.1 Hz			
Mechanical lifetime	10 000 000 operating cycles			
Rated impulse withstand voltage (according to IEC/EN 60947-1 and et IEC/EN 60664-1)	4 kV			
Response time	Make 10 ms Break 5 ms			
Built-in protections	Against short-circuits: None Against over-voltages and over-currents: None			
Status indication	On the LCD screen for CD and XD			
Solid state digital/PWM outputs (Only on VDC model)				
Solid state PWM outputs	O4		-	
Cut-off voltage / operating limit	19.2-30 V⎓		-	
Nominal voltage	24 V⎓		-	
Nominal current	0.5 A		-	
Maximum breaking current	0.625 A		-	
State 1 output voltage drop	≤ 2 V at I = 0.5 A		-	
Response time	Make ≤ 1 ms Break ≤ 1 ms		-	
Frequency	1 Hz maximum for inductive load		-	
Built-in protections	Against over-voltages and short-circuits: Yes Against over-voltages (*): Yes Against power supply reversal: Yes		-	
Minimum load	0.1 A		-	
Maximum incandescent load	0.1 mA / 24 V⎓		-	
Galvanic isolation	No		-	
PWM frequency	14.11 Hz 56.45 Hz 112.90 Hz 225.80 Hz 451.59 Hz 1.806.37 Hz		-	
PWM duty cycle	0 → 100 % (256 steps for CD,XD and 1024 steps for XA)		-	

	12 V⎓	24 V⎓	24 V∿	100 → 240 V∿
PWM accuracy at 120 Hz	< 5% (from 20 % → 80 %) load at 10 mA		-	
PWM accuracy at 500 Hz	< 10% (from 20 % → 80 %) load at 10 mA		-	
PWM maximum breaking current	50mA	50 mA	-	
Maximum cable length for PWM	20 m		-	
Status indication	On the LCD screen for CD and XD		-	

Schematics

Footprint

Version

CD12
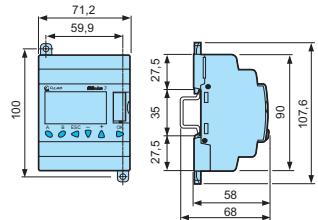
CB12
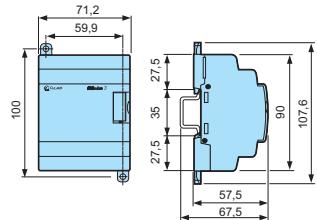
Input/output wiring

Inputs 12 V⎓, 24 V⎓
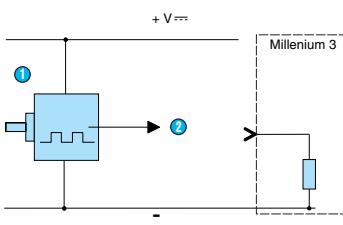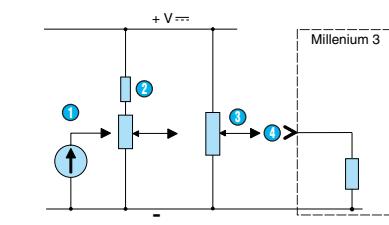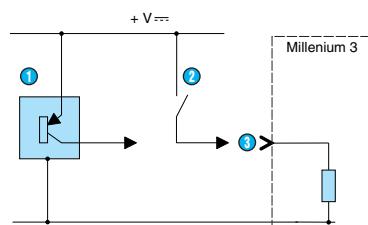
①	3 wire PNP detector	0-10 V (input set to 0-10 V)		Encoder	
②	Contact	Potentiometer attachment (input set to 0-10 V)		FAST digital input FAST digital input	
③	Digital input	Potentiometer (input set to potentiometer)		-	
④	-	Analogue input		-	

Inputs 100-240 V∿, 24 V∿
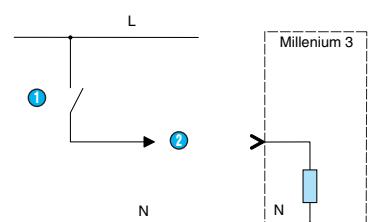
①	Contact
②	Digital input