Millenium 3 Essential

➜ Essential range: powerful but cost effective

CROUZET AUTOMATION

- Industrial temperature range (-20 °C → +55 °C)
- Analog inputs 0-10 VDC, Potentiometer (0-20 mA/Pt100 with converters)
- Display versions:
  - Green LCD with 4 lines of 18 characters and configurable backlighting
  - Selective parameter setting: you can choose the parameters that can be adjusted on the front panel
- Expandable versions: open to XN network communication extensions and digital I/O or analog extensions

CD12/XD10

CD20/XD26

CB12/XB10

CB20/XB26

Part numbers

Essential "compact" range

Type	Input	Output	Supply	Code
CD12	8 digital (including 4 analog)	4 relays 8 A	24 V ⎓	88970041
	8 digital (including 4 analog)	4 solid state 0.5 A (including 1 PWM)	24 V ⎓	88970042
	8 digital (including 4 analog)	4 relays 8 A	12 V ⎓	88970045
	8 digital (including 4 analog)	4 solid state 0.5 A (including 1 PWM)	12 V ⎓	88970865
CD20	12 digital (including 6 analog)	8 relays 8 A	24 V ⎓	88970051
	12 digital (including 6 analog)	8 solid state 0.5 A (including 4 PWM)	24 V ⎓	88970052
	12 digital (including 6 analog)	8 relays 8 A	12 V ⎓	88970055
CB12	8 digital (including 4 analog)	4 relays 8 A	24 V ⎓	88970021
	8 digital (including 4 analog)	4 solid state 0.5 A (including 1 PWM)	12 V ⎓	88970840
CB20	12 digital (including 6 analog)	8 relays 8 A	24 V ⎓	88970031
	12 digital (including 6 analog)	8 solid state 0.5 A (including 4 PWM)	24 V ⎓	88970806

Essential "expandable" range

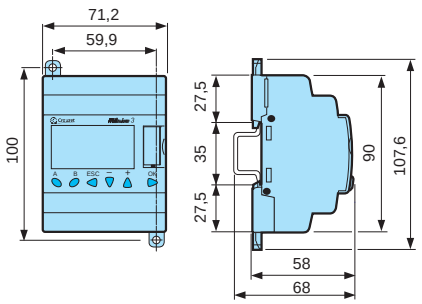
Type	Input	Output	Supply	Code
XD10	6 digital (including 4 analog)	4 relays 8 A	24 V ⎓	88970141
	6 digital (including 4 analog)	4 solid state 0.5 A (including 1 PWM)	24 V ⎓	88970142
XD26	16 digital (including 6 analog)	10 relays (8 x 8 A relay and 2 x 5 A relay)	24 V ⎓	88970161
	16 digital (including 6 analog)	10 solid state 0.5 A (including 4 PWM)	24 V ⎓	88970162
	16 digital (including 6 analog)	10 relays (8 x 8 A relay and 2 x 5 A relay)	12 V ⎓	88970165
	16 digital (including 6 analog)	10 solid state 0.5 A (including 4 PWM)	12 V ⎓	88970814
XB10	6 digital (including 4 analog)	4 relays 8 A	24 V ⎓	88970131
	6 digital (including 4 analog)	4 solid state 0.5 A (including 1 PWM)	24 V ⎓	88970132
XB26	16 digital (including 6 analog)	10 relays (8 x 8 A relay and 2 x 5 A relay)	24 V ⎓	88970151
	16 digital (including 6 analog)	10 solid state 0.5 A (including 4 PWM)	24 V ⎓	88970152
	16 digital (including 6 analog)	10 relays (8 x 8 A relay and 2 x 5 A relay)	12 V ⎓	88970155

Accessories

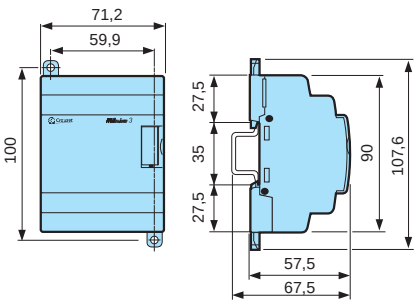
Type	Description	Code
M3 Soft	Multilingual programming software containing specific library functions (CD-ROM)	88970111
PA	EEPROM memory cartridge	88970108
PA	3 m serial link cable: PC → Millenium 3	88970102
PA	USB cable 3 m: PC → Millenium 3	88970109
PA	Millenium 3 interface → Bluetooth® (class A 10 m)	88974104

Dimensions (mm)

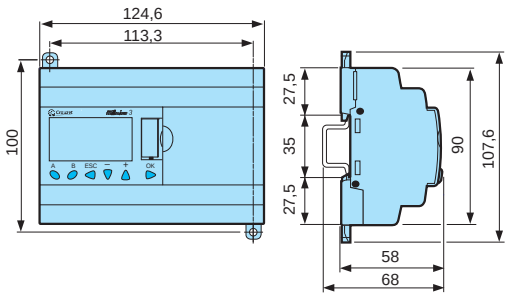
CD12



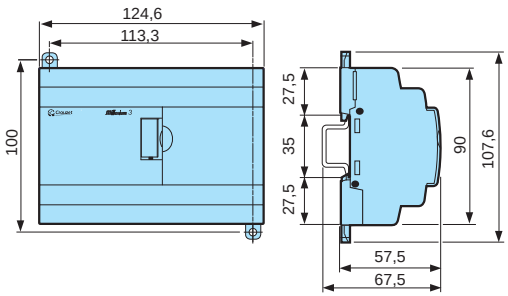
CB12



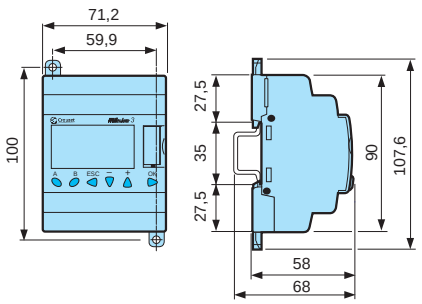
CD20



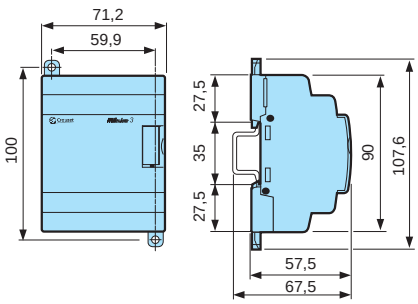
CB20



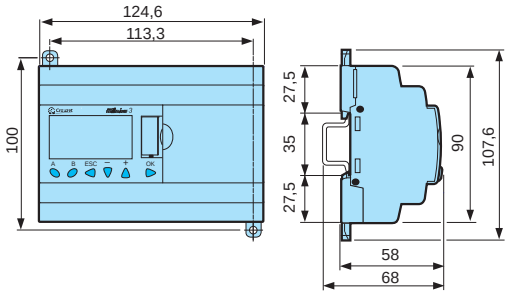
XD10



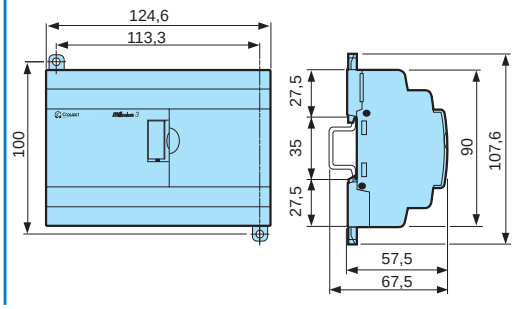
XB10



XD26



XB26



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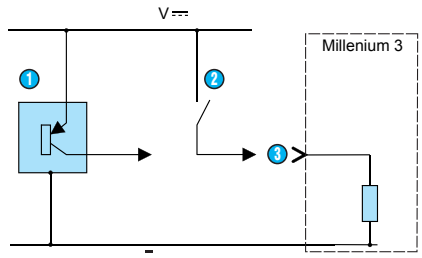
I/O wiring

CROUZET AUTOMATION

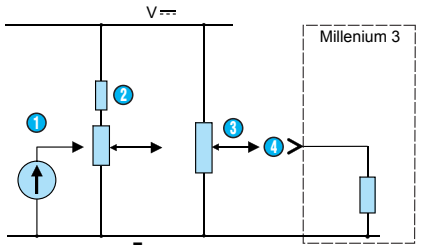
Inputs 12 V ⎓, 24 V ⎓

Bases: CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26
Extensions: XE10, XR06, XR10, XR14



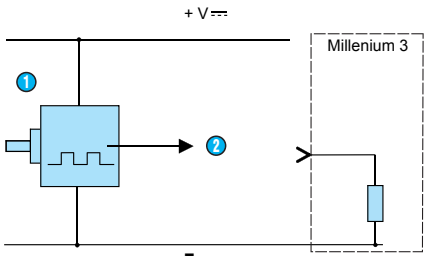
1. 3-wire PNP sensor
2. Contact
3. Digital input

Bases: CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26



1. 0-10 V (input set to 0-10 V)
2. Potentiometer type mounting (input set to 0-10 V)
3. Potentiometer (input set as a potentiometer)
4. Analog input

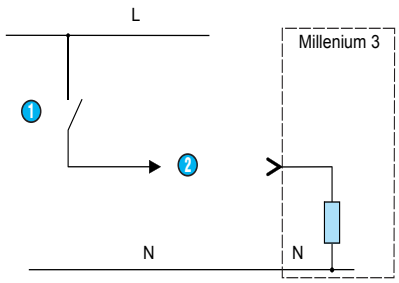
Bases: CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26



1. Encoder
2. High-speed digital input

Inputs 100-240 V ∿, 24 V ∿

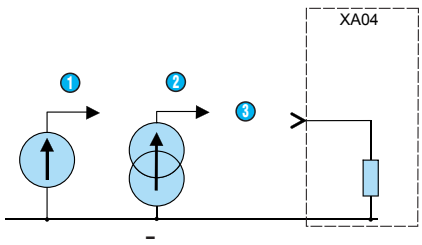
Bases: CD12, CD20, CB12, CB20, XD10, XD26
XB10, XB26
Extensions: XE10, XR06, XR10, XR14



1. Contact
2. Digital input

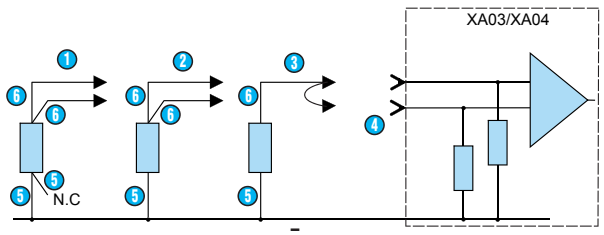
Analog inputs

Extension: XA04



1. 0-10 V
2. 0-20 mA
3. Analog input

Extensions: XA03, XA04



1. Pt100 4-wire
2. Pt100 3-wire
3. Pt100 2-wire
4. Analog inputs
5. White
6. Red

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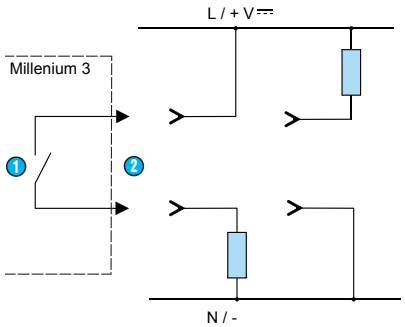
Millenium 3 Smart and Essential

Relay outputs

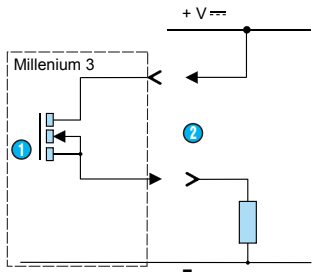
Bases: CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26
Extensions: XE10, XR06, XR10, XR14



1 Contact
2 Digital output

Solid state outputs

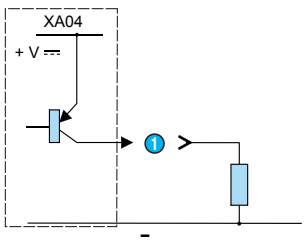
Bases: CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26
Extension: XA04



1 MOS transistor
2 Digital/PWM output

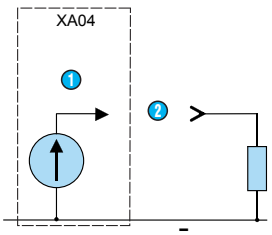
Analog outputs

Extension: XA04



1 PWM output

Extension: XA04



1 0-10 V
2 Analog output

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➜ Input/output installations: Bases

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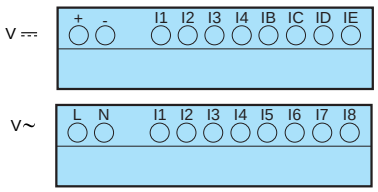
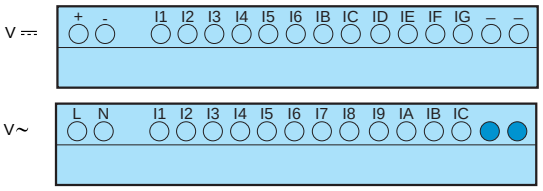
"Compact" range: CD12, CD20, CB12, CB20

Inputs

CD12, CB12

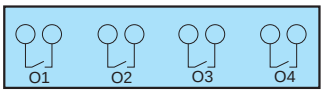


CD20, CB20

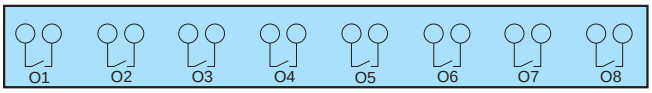


Relay outputs

CD12, CB12

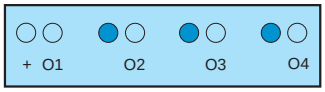


CD20, CB20

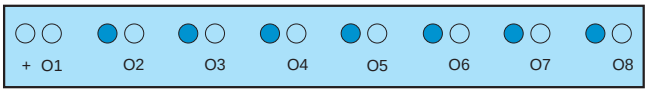


Solid state outputs

CD12, CB12



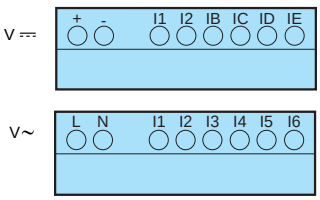
CD20



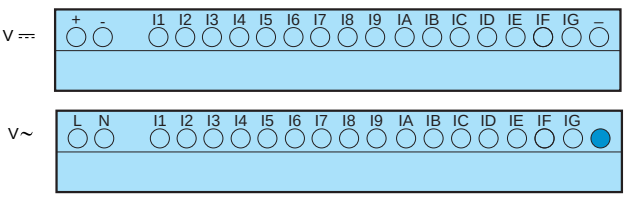
"Expandable" range: XD10, XD26, XB10, XB26

Inputs

XD10, XB10

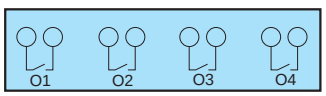


XD26, XB26

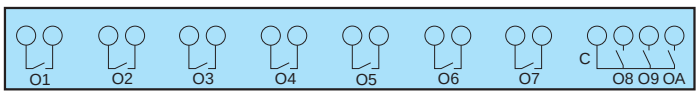


Relay outputs

XD10, XB10

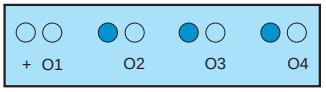


XD26, XB26

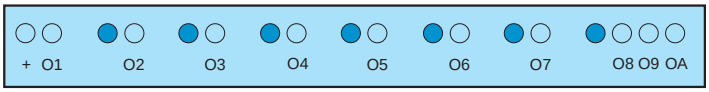


Solid state outputs

XD10



XD26



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Millenium 3 Smart and Essential

➜ General characteristics

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- Millenium 3 compact range
- Millenium 3 expandable range

General environment characteristics for CB, CD, XD, XB, XR and XE product types

Certifications	CE, UL, CSA, GL
Conformity to standards (with the low voltage directive and EMC directive)	IEC/EN 61131-2 (Open equipment) IEC/EN 61131-2 (Zone B) IEC/EN 61000-6-2 IEC/EN 61000-6-3 (*) IEC/EN 61000-6-4 (*) Except configuration (88 970 1.1 or 88 970 1.2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B in a metal enclosure)
Earthing	Not included
Protection rating	In accordance with IEC/EN 60529: IP40 on front panel IP20 on terminal block
Overvoltage category	3 in accordance with IEC/EN 60664-1
Pollution	Degree: 2 in accordance with IEC/EN 61131-2
Max operating Altitude	Operation: 2000 m Transport: 3048 m
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, test Fc Immunity to shock IEC/EN 60068-2-27, test Ea
Resistance to electrostatic discharge	Immunity to ESD IEC/EN 61000-4-2, level 3
Resistance to HF interference	Immunity to radiated electrostatic fields IEC/EN 61000-4-3 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 Voltage dips and breaks (⏦) IEC/EN 61000-4-11 Immunity to damped oscillatory waves IEC/EN 61000-4-12
Conducted and radiated emissions	Class B (*) in accordance with EN 55022, EN 55011 (CISPR22, CISPR11) group 1 (*) Except configuration (88 970 1.1 or 88 970 1.2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B in a metal enclosure)
Operating temperature Millenium 3 Essential and extensions	-20 ➞ +55 °C (+40 °C in a non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
Operating temperature Millenium 3 Smart	-20 ➞ +70 °C except CB and XB versions in V ⎓ : -30 ➞ +70 °C (+40 °C in a non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
Storage temperature Millenium 3 Essential and extensions	-40 ➞ +70 °C in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
Storage temperature Millenium 3 Smart	-40 ➞ +80 °C in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
Relative humidity	95 % max. (no condensation or dripping water) in accordance with IEC/EN 60068-2-30
Mounting	On symmetrical DIN rail, 35 x 7.5 mm and 35 x 15 mm, or on panel (2 x Ø 4 mm)
Screw terminals connection capacity	Flexible wire with ferrule = 1 conductor: 0.25 to 2.5 mm^2 (AWG 24 ➞ AWG 14) 2 conductors 0.25 to 0.75 mm^2 (AWG 24 ➞ AWG 18) Semi-rigid wire = 1 conductor: 0.2 to 2.5 mm^2 (AWG 25 ➞ AWG 14) Rigid wire = 1 conductor: 0.2 to 2.5 mm^2 (AWG 25 ➞ AWG 14) 2 conductors 0.2 to 1.5 mm^2 (AWG 25 ➞ AWG 16) Tightening torque = 0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm)

Processing characteristics of CB, CD, XD & XB product types

	Millenium 3 Smart and Essential versions XD, XB	Millenium 3 Essential versions CB, CD
Program size function blocks (FBD)	350 typical blocks 64 macros maximum 256 blocks maximum per macro	180 typical blocks 64 macros maximum 256 blocks maximum per macro
Memory size function blocks (FBD)	8 K	4 K
Number of lines in Ladder	120 lines	120 lines
LCD display	CD, XD: Display with 4 lines of 18 characters	
Programming method	Function blocks / SCF (Grafcet) or Ladder	
Program memory	Flash EEPROM	
Removable memory	EEPROM	
Data memory	368 bit/200 words	
Back-up time in the event of power failure	Program and settings in the controller: 10 years Program and settings in the plug-in memory: 10 years Data memory: 10 years	
Cycle time	FBD: 6 → 90 ms (typically 20 ms) Ladder: typically 20 ms	
Response time	Input acquisition time: + 1 to 2 cycle times	
Clock data retention	10 years (lithium battery) at 25 °C	
Clock drift	Drift < 12 min/year (at 25 °C) 6 s/month (at 25 °C with user-definable correction of drift)	
Timer block accuracy	1 % ± 2 cycle times	
Start up time on power up	< 1.2 s	

Characteristics of products with AC power supplied

Supply	**24 V ∿**	**100 → 240 V ∿**
Nominal voltage	24 V ∿	100 → 240 V ∿
Operating limits	-15 % / +20 % or 20.4 V ∿ → 28.8 V ∿	-15 % / +10 % or 85 V ∿ → 264 V ∿
Supply frequency range	50/60 Hz (+4 % / -6 %) or 47→53 Hz / 57 → 63 Hz	50/60 Hz (+4 % / -6 %) or 47 → 53 Hz / 57 → 63 Hz
Immunity from micro power cuts	10 ms (repetition 20 times)	10 ms (repetition 20 times)
Max. absorbed power	CB12-CD12-XD10-XB10: 4 VA CB20-CD20: 6 VA XD10-XB10 with extension: 7.5 VA XD26-XB26: 7.5 VA XD26-XB26 with extension: 10 VA	CB12-CD12-XD10-XB10: 7 VA CB20-CD20: 11 VA XD10-XB10 with extension: 12 VA XD26-XB26: 12 VA XD26-XB26 with extension: 17 VA
Isolation voltage	1780 V ∿	1780 V ∿

Inputs	**24 V ∿**	**100 → 240 V ∿**
Input voltage	24 V ∿ (-15 % / +20 %)	100 → 240 V ∿ (-15 % / +10 %)
Input current	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	4.6 kΩ	350 kΩ
Logic 1 voltage threshold	≥ 14 V ∿	≥ 79 V ∿
Making current at logic state 1	> 2 mA	> 0.17 mA
Logic 0 voltage threshold	≤ 5 V ∿	≤ 20 V ∿ (≤ 28 V ∿ : XE10, XR06, XR10, XR14)
Release current at logic state 0	< 0.5 mA	< 0.5 mA
Response time with function blocks programming	Configurable in increments of 10 ms 50 ms min. up to 255 ms State 0 → 1 (50/60 Hz)	Configurable in increments of 10 ms 50 ms min. up to 255 ms State 0 → 1 (50/60 Hz)
Response time with Ladder programming	50 ms State 0 → 1 (50/60 Hz)	50 ms State 0 → 1 (50/60 Hz)
Maximum counting frequency	In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)	In accordance with cycle time (Tc) and input response time (Tr): 1 / ((2 x Tc) + Tr)
Sensor type	Contact or 3-wire PNP	Contact or 3-wire PNP
Input type	Resistive	Resistive
Isolation between power supply and inputs	None	None
Isolation between inputs	None	None
Protection against polarity inversions	Yes	Yes
Status indicator	On LCD screen for CD and XD	On LCD screen for CD and XD

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Characteristics of relay outputs common to the entire range

Max. breaking voltage	5 ⇒ 30 V ⎓ 24 ⇒ 250 V ∿
Breaking current	CB-CD-XD10-XB10-XR06-XR10: 8 A XD26-XB26: 8 x 8 A relay, 2 x 5 A relay XE10: 4 x 5 A relay XR14: 4 x 8 A relay, 2 x 5 A relay
Electrical durability for 500 000 operating cycles	Utilization category DC-12: 24 V, 1.5 A Utilization category DC-13: 24 V (L/R = 10 ms), 0.6 A Utilization category AC-12: 230 V, 1.5 A Utilization category AC-15: 230 V, 0.9 A
Max. Output Common Current	12 A for O8, O9, OA
Minimum switching capacity	10 mA (at minimum voltage of 12 V)
Minimum load	12 V, 10 mA
Maximum rate	Off load: 10 Hz At operating current: 0.1 Hz
Mechanical life	10.000.000 (operations)
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV
Response time	Make 10 ms Release 5 ms
Built-in protections	Against short-circuits: None Against overvoltages and overloads: None
Status indicator	On LCD screen for CD and XD

Characteristics of product with DC power supplied

Supply	**12 V ⎓**	**24 V ⎓**
Nominal voltage	12 V ⎓	24 V ⎓
Operating limits	-13 % / +20 % or 10.4 V ⎓ ⇒ 14.4 V ⎓ (including ripple)	-20 % / +25 % or 19.2 V ⎓ ⇒ 30 V ⎓ (including ripple)
Immunity from micro power cuts	≤ 1 ms (repetition 20 times)	≤ 1 ms (repetition 20 times)
Max. absorbed power	CB12 with solid state outputs: 1.5 W CD12: 1.5 W CD20: 2.5 W XD26-XB26: 3 W XD26-XB26 with extension: 5 W XD26 with solid state outputs: 2.5 W	CB12-CD12-CD20 with solid state outputs - XD10-XB10 with solid state outputs: 3 W XD10-XB10 with relay outputs: 4 W XD26-XB26 with solid state outputs: 5 W CB20-CD20 with relay outputs: 6 W XD26 with relay outputs: 6 W XD10-XB10 with extension: 8 W XD26-XB26 with extension: 10 W
Protection against polarity inversions	Yes	Yes

Digital inputs (I1 to IA and IH to IY)	**12 V ⎓**	**24 V ⎓**
Input voltage	12 V ⎓ (-13 % / +20 %)	24 V ⎓ (-20 % / +25 %)
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 V ⎓ 4.0 mA @ 30.0 V⎓
Input impedance	2.7 kΩ	7.4 kΩ
Logic 1 voltage threshold	≥ 7 V ⎓	≥ 15 V ⎓
Making current at logic state 1	≥ 2 mA	≥ 2.2 mA
Logic 0 voltage threshold	≤ 3 V ⎓	≤ 5 V ⎓
Release current at logic state 0	< 0.9 mA	< 0.75 mA
Response time	1 ⇒ 2 cycle times + 6 ms	1 ⇒ 2 cycle times + 6 ms
Maximum counting frequency	- Inputs I1 & I2: FBD (up to 6 kHz) & Ladder (1 kHz) - Inputs I3 to IA & IH to IY: In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)	- Inputs I1 & I2: FBD (up to 6 kHz) & Ladder (1 kHz) - Inputs I3 to IA & IH to IY: In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)
Sensor type	Contact or 3-wire PNP	Contact or 3-wire PNP
Conforming to IEC/EN 61131-2	Type 1	Type 1
Input type	Resistive	Resistive
Isolation between power supply and inputs	None	None
Isolation between inputs	None	None
Protection against polarity inversions	Yes	Yes
Status indicator	On LCD screen for CD and XD	On LCD screen for CD and XD

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Analog or digital inputs (IB to IG)	12 V ⎓	24 V ⎓
CB12-CD12-XD10-XB10	4 inputs IB → IE	4 inputs IB → IE
CB20-CD20-XB26-XD26	6 inputs IB → IG	6 inputs IB → IG
Inputs used as analog inputs only in FBD		
Measurement range	(0 → 10 V) or (0 → V power supply)	(0 → 10 V) ou (0 → V power supply)
Input impedance	14 kΩ	12 kΩ
Input voltage	14.4 V ⎓ max.	30 V ⎓ max.
Value of LSB	14 mV	29 mV
Input type	Common mode	Common mode
Resolution	10 bit at max. input voltage	10 bit at max. input voltage
Conversion time	Controller cycle time	Controller cycle time
Accuracy at 25 °C	± 5 %	± 5 %
Accuracy at 55 °C	± 6.2 %	± 6.2 %
Repeat accuracy at 55 °C	± 2 %	± 2 %
Isolation between analog channel and power supply	None	None
Cable length	10 m maximum, with shielded cable (sensor not isolated)	10 m maximum, with shielded cable (sensor not isolated)
Protection against polarity inversions	Yes	Yes
Potentiometer control	2.2 kΩ / 0.5 W (recommended) 10 kΩ max.	2.2 kΩ / 0.5 W (recommended) 10 kΩ max.
Inputs used as digital inputs		
Input voltage	12 V ⎓ (-13 % / +20 %)	24 V ⎓ (-20 % / +25 %)
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⎓
Input impedance	14 kΩ	12 kΩ
Logic 1 voltage threshold	≥ 7 V ⎓	≥ 15 V⎓
Making current at logic state 1	≥ 0.5 mA	≥ 1.2 mA
Logic 0 voltage threshold	≤ 3 V ⎓	≤ 5 V ⎓
Release current at logic state 0	≤ 0.2 mA	≤ 0.5 mA
Response time	1 → 2 cycle times	1 → 2 cycle times
Maximum counting frequency in FBD	In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)	In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)
Sensor type	Contact or 3-wire PNP	Contact or 3-wire PNP
Conforming to IEC/EN 61131-2	Type 1	Type 1
Input type	Resistive	Resistive
Isolation between power supply and inputs	None	None
Isolation between inputs	None	None
Protection against polarity inversions	Yes	Yes
Status indicator	On LCD screen for CD and XD	On LCD screen for CD and XD

Characteristics of relay outputs common to the entire range	
Max. breaking voltage	5 → 30 V ⎓ 24 → 250 V ∿
Max. Output Common Current	12 A (10 A UL) for O8, O9, OA
Breaking current	CB-CD-XD10-XB10-XR06-XR10: 8 A XD26-XB26: 8 x 8 A relay, 2 x 5 A relay XE10: 4 x 5 A relay XR14: 4 x 8 A relay, 2 x 5 A relay
Electrical durability for 500 000 operating cycles	Utilization category DC-12: 24 V, 1.5 A Utilization category DC-13: 24 V (L/R = 10 ms), 0.6 A Utilization category AC-12: 230 V, 1.5 A Utilization category AC-15: 230 V, 0.9 A
Minimum switching capacity	10 mA (at minimum voltage of 12 V)
Minimum load	12 V, 10 mA
Maximum rate	Off load: 10 Hz At operating current: 0.1 Hz
Mechanical life	10.000.000 (operations)
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV
Off-cycle response time	Make 10 ms Release 5 ms
Built-in protections	Against short-circuits: None Against overvoltages and overloads: None
Status indicator	On LCD screen for CD and XD

Digital / PWM solid state outputs	12 V ⎓	24 V ⎓
PWM solid state outputs*	CB12: O4 XD26: O4 → O7	CD12-XD10-XB10: O4 CD20-XD26-XB26: O4 → O7
*** Only available with "FBD" programming language**		
Breaking voltage	10.4 → 30 V ⎓	19.2 → 30 V ⎓
Nominal voltage	12-24 V ⎓	24 V ⎓
Nominal current	0.5 A	0.5 A
Max. breaking current	0.625 A	0.625 A
Voltage drop	≤ 2 V for I = 0.5 A (at state 1)	≤ 2 V for I = 0.5 A (at state 1)
Response time	Make ≤ 1 ms Release ≤ 1 ms	Make ≤ 1 ms Release ≤ 1 ms
Frequency (Hz)	1 Maximum on inductive load	1 Maximum on inductive load
Built-in protections	Against overloads and short-circuits: Yes Against overvoltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a voltfree contact between the logic controller output and the load	Against overloads and short-circuits: Yes Against overvoltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a voltfree contact between the logic controller output and the load
Min. load	1 mA	1 mA
Maximum incandescent load	0.2 A / 12 V ⎓ 0.1 A / 24 V ⎓	0.1 A / 24 V ⎓
Galvanic isolation	No	No
PWM frequency	14.11 Hz 56.45 Hz 112.90 Hz 225.80 Hz 451.59 Hz 1806.37 Hz	14.11 Hz 56.45 Hz 112.90 Hz 225.80 Hz 451.59 Hz 1806.37 Hz
PWM cyclic ratio	0 → 100 % (256 steps for CD, XD and 1024 steps for XA)	0 → 100 % (256 steps for CD, XD and 1024 steps for XA)
PWM accuracy at 120 Hz	< 5 % (20 % → 80 %) load at 10 mA	< 5 % (20 % → 80 %) load at 10 mA
Max. Breaking current PWM	50 mA	50 mA
Max. cable length PWM	20 m	20 m
PWM accuracy at 500 Hz	< 10 % (20 % → 80 %) load at 10 mA	< 10 % (20 % → 80 %) load at 10 mA
Status indicator	On LCD screen for CD and XD	On LCD screen for CD and XD

Differences between Millenium 3 Smart and Millenium 3 Essential




	Millenium 3 Smart	Millenium 3 Essential
Display	Blue, backlit with white text	Green, backlit with black text
Supply versions	24 V ⎓, 12 V ⎓, 100 → 240 V ∿, 24 V ∿	24 V ⎓, 12 V ⎓
Operating Temperature	-20 → +70 °C/-4 → +158 °F (+40 °C/104 °F in non-ventilated enclosure), except CB, XB in ⎓: -30 → +70 °C/-22 → +158 °F (+40 °C/104 °F in non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	-20 → +55 °C/-4 → +131 °F (+40 °C/104 °F in non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
Storage temperature	-40 → +80 °C (-40 → +176 °F) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	-40 → +70 °C (-40 → +158 °F) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2
More extensions	- XN07 extension for inter-Millenium 3 communication (up to 7 Millenium) - XA03 extension (3 analog inputs for Pt100 temperature probes)	
More sensors	Direct connection of NTC temperature probes and LDR luminosity sensors	
More functions	Additional application specific functions: Autotuning PID, Astronomical clock, Transfer function y=f(x), 2 axis solar tracking, …	
Number of function blocks in the library	125	105