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CROUZET AUTOMATION

# Smart "Compact" range without display CB20 Smart Part number 88974034

- Efficient and economical version, without display or keys setting
- Allow the use of the entire library of specific functions blocs of the software workshop
- Extended temperature range (-30 °C →+70 °C)
- Analogue inputs 0-10 VDC, Potentiometer, NTC, LDR (0-20 mA/Pt100 with converters)

## Part numbers

| | Type | Inputs | Outputs | Supply |
|---|---|---|---|---|
| 88974034 | CB20 Smart | 12 digital | 8 relays 8 A | 24 V AC |

## Specifications

### 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)<br>IEC/EN 61131-2 (Zone B)<br>IEC/EN 61000-6-2,<br>IEC/EN 61000-6-3 (*)<br>IEC/EN 61000-6-4<br>(*) 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 :<br>IP40 on front panel<br>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<br>Transport : 3048 m |
| Mechanical resistance | Immunity to vibrations IEC/EN 60068-2-6, test Fc<br>Immunity to shock IEC/EN 60068-2-27, test Ea |
| Resistance to electrostatic discharge | Immunity to ESD<br>IEC/EN 61000-4-2, level 3 |
| Resistance to HF interference | Immunity to radiated electrostatic fields<br>IEC/EN 61000-4-3<br>Immunity to fast transients (burst immunity)<br>IEC/EN 61000-4-4, level 3<br>Immunity to shock waves<br>IEC/EN 61000-4-5<br>Radio frequency in common mode<br>IEC/EN 61000-4-6, level 3<br>Voltage dips and breaks (AC)<br>IEC/EN 61000-4-11<br>Immunity to damped oscillatory waves<br>IEC/EN 61000-4-12 |
| Conducted and radiated emissions | Class B (*) in accordance with EN 55022, EN 55011 (CISPR22, CISPR11) group 1<br>(*) Except configuration (88 970 1.1 or 88 970 1.2) +<br>(88 970 250 or 88 970 270) + 88 970 241 class A (class B in a metal enclosure) |
| Operating temperature | -20 →+70 °C<br>except CB and XB versions in VDC : -30 →+70 °C (+40 °C in a non-ventilated enclosure)<br>in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-22 |
| Storage temperature | -40 →+80 °C in accordance with IEC/EN 60068-2-1 and<br>IEC/EN 60068-2-2 |
| Relative humidity | 95 % max. (no condensation or dripping water) in accordance with<br>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 =<br>1 conductor : 0.25 to 2.5 $mm^2$ (AWG 24...AWG 14)<br>2 conductors 0.25 to 0.75 $mm^2$ (AWG 24...AWG 18)<br>Semi-rigid wire =<br>1 conductor : 0.2 to 2.5 $mm^2$ (AWG 25...AWG 14)<br>Rigid wire =<br>1 conductor : 0.2 to 2.5 $mm^2$ (AWG 25...AWG 14)<br>2 conductors 0.2 to 1.5 $mm^2$ (AWG 25...AWG 16)<br>Tightening torque =<br>0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm)<br>Also valid for spring cage connectors (ref 88 970 313 and 88 970 317 for the RBT range) |

### General characteristics

| | |
|---|---|
| Operating temperature | -30 →+70 °C (DC) ; -20 →+70 °C (AC) |

*Unless otherwise specified, the characteristics given are applicable to all or part of the product range selected*

| | |
|---|---|
| Operating factor | 100 % (6 A relays)<br>66 % (8 A relays) |
| Storage temperature | -40 →+80 °C |

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

| | |
|---|---|
| LCD display | CD, XD : Display with 4 lines of 18 characters |
| Programming method | Function blocks / SCF (Grafcet) or Ladder |
| Program size | 8 Kb : 350 typical blocks, 64 macros maximum, 256 blocks maximum per macro<br>or<br>120 lines in 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<br>Program and settings in the plug-in memory : 10 years<br>Data memory : 10 years |
| Cycle time | FBD : 6 →90 ms (typically 20 ms)<br>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)<br>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

| | | |
|---|---|---|
| Nominal voltage | 24 V AC | 100 →240 V AC |
| Operating limits | -15 % / +20 %<br>or 20.4 V AC→28.8 V AC | -15 % / +10 %<br>or 85 V AC→264 V AC |
| Supply frequency range | 50/60 Hz (+4 % / -6 %)<br>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<br>CB20-CD20 : 6 VA<br>XD10-XB10 with extension : 7.5 VA<br>XD26-XB26 : 7.5 VA<br>XD26-XB26 with extension : 10 VA | CB12-CD12-XD10-XB10 : 7 VA<br>CB20-CD20 : 11 VA<br>XD10-XB10 with extension : 12 VA<br>XD26-XB26 : 12 VA<br>XD26-XB26 with extension : 17 VA |
| Isolation voltage | 1780 V AC | 1780 V AC |

### Inputs

| | | |
|---|---|---|
| Input voltage | 24 V AC (-15 % / +20 %) | 100 →240 V AC (-15 % / +10 %) |
| Input current | 4.4 mA @ 20.4 V AC<br>5.2 mA @ 24.0 V AC<br>6.3 mA @ 28.8 V AC | 0.24 mA @ 85 V AC<br>0.75 mA @ 264 V AC |
| Input impedance | 4.6 kΩ | 350 kΩ |
| Logic 1 voltage threshold | ≥ 14 V AC | ≥ 79 V AC |
| Making current at logic state 1 | > 2 mA | > 0.17 mA |
| Logic 0 voltage threshold | ≤ 5 V AC | ≤ 20 V AC (≤ 28 V AC : XE10, XR06, XR10, XR14) |
| Release current at logic state 0 | < 0.5 mA | < 0.5 mA |
| Response time with LADDER programming | 50 ms<br>State 0 →1 (50/60 Hz) | 50 ms<br>State 0 →1 (50/60 Hz) |
| Response time with function blocks programming | Configurable in increments of 10 ms<br>50 ms min. up to 255 ms<br>State 0 →1 (50/60 Hz) | Configurable in increments of 10 ms<br>50 ms min. up to 255 ms<br>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 |

## Characteristics of relay outputs common to the entire range

| | |
|---|---|
| Max. breaking voltage | 5 →30 V DC<br>24 →250 V AC |
| Breaking current | CB-CD-XD10-XB10-XR06-XR10 : 8 A<br>XD26-XB26 : 8 x 8 A relays, 2 x 5 A relays<br>XE10 : 4 x 5 A relays<br>XR14 : 4 x 8 A relays, 2 x 5 A relays<br>RBT (Removable Terminal Blocks) versions : verify the maximum current according to the type of connection used |
| Electrical durability for 500 000 operating cycles | Utilization category DC-12 : 24 V, 1.5 A<br>Utilization category DC-13 : 24 V (L/R = 10 ms), 0.6 A<br>Utilization category AC-12 : 230 V, 1.5 A<br>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<br>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<br>Release 5 ms |

*Unless otherwise specified, the characteristics given are applicable to all or part of the product range selected*

| | | |
|---|---|---|
| Built-in protections | Against short-circuits : None<br>Against overvoltages and overloads : None | |
| Status indicator | On LCD screen for CD and XD | |

## Characteristics of product with DC power supplied

### Supply

| | | |
|---|---|---|
| Nominal voltage | 12 V DC | 24 V DC |
| Operating limits | -13 % / +20 %<br>or 10.4 V DC→14.4 V DC (including ripple) | -20 % / +25 %<br>or 19.2 V DC→30 V DC (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<br>CD12 : 1.5 W<br>CD20 : 2.5 W<br>XD26-XB26 : 3 W<br>XD26-XB26 with extension : 5 W<br>XD26 with solid state outputs : 2.5 W | CB12-CD12-CD20 with solid state outputs - XD10-XB10 with solid state outputs : 3 W<br>XD10-XB10 with relay outputs : 4 W<br>XD26-XB26 with solid state outputs : 5 W<br>CB20-CD20 with relay outputs : 6 W<br>XD26 with relay outputs : 6 W<br>XD10-XB10 with extension : 8 W<br>XD26-XB26 with extension : 10 W |
| Protection against polarity inversions | Yes | Yes |

### Digital inputs (I1 to IA and IH to IY)

| | | |
|---|---|---|
| Input voltage | 12 V DC (-13 % / +20 %) | 24 V DC (-20 % / +25 %) |
| Input current | 3.9 mA @ 10.44 V DC<br>4.4 mA @ 12.0 V DC<br>5.3 mA @ 14.4 VDC | 2.6 mA @ 19.2 V DC<br>3.2 mA @ 24 V DC<br>4.0 mA @ 30.0 VDC |
| Input impedance | 2.7 kΩ | 7.4 kΩ |
| Logic 1 voltage threshold | ≥ 7 V DC | ≥ 15 V DC |
| Making current at logic state 1 | ≥ 2 mA | ≥ 2.2 mA |
| Logic 0 voltage threshold | ≤ 3 V DC | ≤ 5 V DC |
| 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 k Hz) & Ladder (1 k Hz)<br>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 k Hz) & Ladder (1 k Hz)<br>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 |

### Analogue or digital inputs (IB to IG)

| | | |
|---|---|---|
| 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 analogue inputsonly in FBD

| | | |
|---|---|---|
| Measurement range | (0 →10 V) or (0 →V power supply) | (0 →10 V) or (0 →V power supply) |
| Input impedance | 14 kΩ | 12 kΩ |
| Input voltage | 14.4 V DC max. | 30 V DC 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 analogue 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)<br>10 kΩ max. | 2.2 kΩ/0.5 W (recommended)<br>10 kΩ max. |

### Inputs used as digital inputs

| | | |
|---|---|---|
| Input voltage | 12 V DC (-13 % / +20 %) | 24 V DC (-20 % / +25 %) |
| Input current | 0.7 mA @ 10.44 VDC<br>0.9 mA @ 12.0 VDC<br>1.0 mA @ 14.4VDC | 1.6 mA @ 19.2 VDC<br>2.0 mA @ 24.0 V DC<br>2.5 mA @ 30.0 VDC |
| Input impedance | 14 kΩ | 12 kΩ |
| Logic 1 voltage threshold | ≥ 7 V DC | ≥ 15 VDC |
| Making current at logic state 1 | ≥ 0.5 mA | ≥ 1.2 mA |
| Logic 0 voltage threshold | ≤ 3 V DC | ≤ 5 V DC |
| 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 DC<br>24 →250 V AC |
| Max. Output Common Current | 12A (10A UL) for O8, O9, OA |
| Breaking current | CB-CD-XD10-XB10-XR06-XR10 : 8 A<br>XD26-XB26 : 8 x 8 A relays, 2 x 5 A relays<br>XE10 : 4 x 5 A relays<br>XR14 : 4 x 8 A relays, 2 x 5 A relays |
| Electrical durability for 500 000 operating cycles | Utilization category DC-12 : 24 V, 1.5 A<br>Utilization category DC-13 : 24 V (L/R = 10 ms), 0.6 A<br>Utilization category AC-12 : 230 V, 1.5 A<br>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<br>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<br>Release 5 ms |
| Built-in protections | Against short-circuits : None<br>Against overvoltages and overloads : None |
| Status indicator | On LCD screen for CD and XD |

## Digital / PWM solid state output

| | | |
|---|---|---|
| PWM solid state output* | CB12 : O4<br>XD26 : O4 →O7 | CD12-XD10-XB10 : O4<br>CD20-XD26-XB26 : O4 →O7 |
| * Only available with "FBD" programming language | * Only available with "FBD" programming language | |
| Breaking voltage | 10.4 →30 V DC | 19.2 →30 V DC |
| Nominal voltage | 12-24 VDC | 24 V DC |
| 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<br>Release ≤ 1 ms | Make ≤ 1 ms<br>Release ≤ 1 ms |
| Operating frequency | 1 Maximum on inductive load | 1 Maximum on inductive load |
| Built-in protections | Against overloads and short-circuits : Yes<br>Against overvoltages (*) : Yes<br>Against inversions of power supply : Yes<br>(*) In the absence of a volt-free contact between the logic controller output and the load | Against overloads and short-circuits : Yes<br>Against overvoltages (*) : Yes<br>Against inversions of power supply : Yes<br>(*) In the absence of a volt-free contact between the logic controller output and the load |
| Min. load | 1 mA | 1 mA |
| Maximum incandescent load | 0,2 A / 12 V DC<br>0,1 A / 24 V DC | 0,1 A / 24 V DC |
| Galvanic isolation | No | No |
| PWM frequency | 14.11 Hz<br>56.45 Hz<br>112.90 Hz<br>225.80 Hz<br>451.59 Hz<br>1806.37 Hz | 14.11 Hz<br>56.45 Hz<br>112.90 Hz<br>225.80 Hz<br>451.59 Hz<br>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) |
| Max. Breaking current PWM | 50 mA | 50 mA |
| Max. cable length PWM | 20 m | 20 m |
| PWM accuracy at 120 Hz | < 5 % (20 % →80 %) load at 10 mA | < 5 % (20 % →80 %) load at 10 mA |
| 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 XD | On LCD screen for CD and XD |

## Accessories

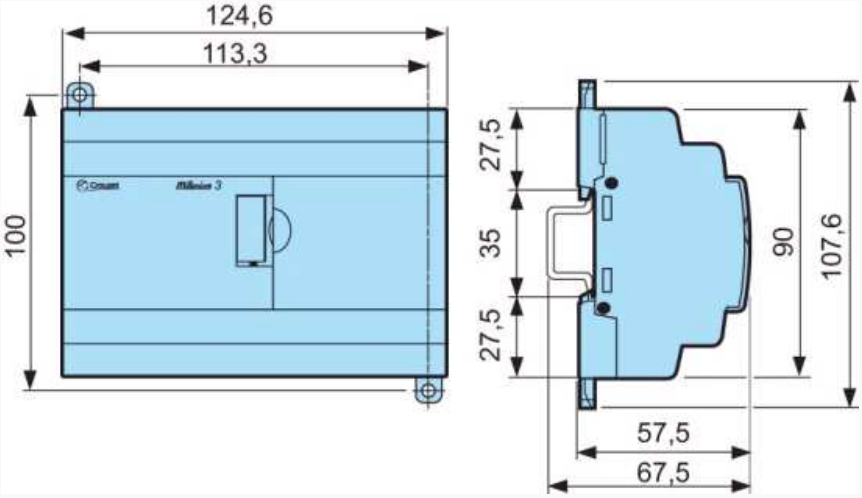
| Type | Description | Code |
|---|---|---|
| M3 Soft | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |
| PA | EEPROM memory cartridge | 88970108 |
| PA | 3 m serial link cable : PC →Millenium 3 | 88970102 |
| PA | USB cable 3 m : PC →Millenium 3 | 88970109 |
| PA | Millenium 3 interface →Bluetooth® (class A 10 m) | 88970104 |

## Comments

* to be marketed 1st quarter 2006

## Dimensions (mm)

**CB20 Smart**


124,6
113,3
100
27,5
35
27,5
90
107,6
57,5
67,5