Crouzet

■ Renewable energies

■ Water treatment

■ Industrial machines

www.millenium3.crouzet.com

Millenium3 Standard & Custom

# The right solution - whatever the application!

CST
CUSTOM SENSORS & TECHNOLOGIES

Millenium3

## With Millenium 3...
# The right solution - whatever the application!

■ Millenium 3 Standard
"Compact range"

■ Millenium 3 Standard
"Expandable range"

■ Millenium 3 Standard
"Communication range"

■ New features
"Millenium 3 Standard"

■ New features
"Millenium 3 Custom"

## Our company at a glance

Always one step ahead of market trends and customer requirements, Crouzet is continually developing its range of both standard and customised automation components and solutions to cover all the latest commercial and industrial applications and meet the needs expressed by manufacturers of automated equipment and machinery.

Headquartered in Moorpark, California-USA, Custom Sensors & Technologies (CST) is made up of the leading brands of Crouzet, Kavlico and Crydom, as well as the former divisions of BEI Technologies, including Newall and Systron Donner. CST provides sensors, controls, and actuation products to the transportation, industrial, and aerospace & defense markets. This new organization means even better service and technical solutions for our customers.

With Micro-control, Crouzet is a specialist provider of complete solutions tailored to meet your needs in terms of:
- Time management
- Management of physical and electrical values
- Counting

The entire range is marketed through a global distribution network working hand in hand with local sales forces dedicated to Micro-control applications.

## 3rd generation of logic controllers at the core of your industry.

With the new Millenium 3, you can take advantage of all the most recent developments in the latest generation of logic controllers. An innovative product, developed, industrialised and marketed by Crouzet, Millenium 3 is the successful synthesis of our expertise in automation systems acquired over a period of more than 40 years.

With the aim of matching your applications even more closely, Crouzet is expanding its **Millenium 3 Standard** logic controller offer which was originally launched in 2006:
- New software functions (sunrise/sunset, etc.)
- New accessories (pressure control solution, levels, flow, broader range of power supplies, remote display/keypad, improved communication extension performance, etc.)

In addition to its **Millenium 3 Standard** logic controllers for today's automation needs, Crouzet is also able to offer its **Millenium 3 Custom** logic controllers for specific applications (water treatment, geothermal systems, etc.), or for use in severe environments.
Whatever the application, Crouzet is able to offer you bespoke products that work in complete harmony with your equipment.

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# Contents

## ■ Fountain

Pump control with variable flow for different water jet and mood effects, regulation of water neutrality (pH) and disinfecting of water in fountain (ORP).

## ■ Field irrigation

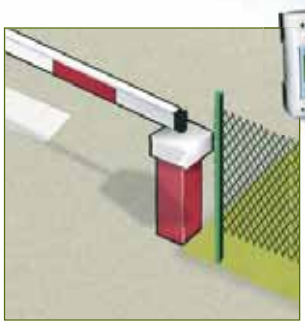
Irrigation control based on temperature, humidity, and day/night cycle.

## ■ Hydraulic solar heating

Automation of operation and heating regulation plus remote management of the installation via GSM modem.

## ■ Opening control for industrial sectional doors

Opening control for doors and associated security devices for restricting access. Synchronisation between the various doors.



## ■ Automatic barrier

Opening control of barriers with automatic vehicle detection and function for selecting opening times/days.

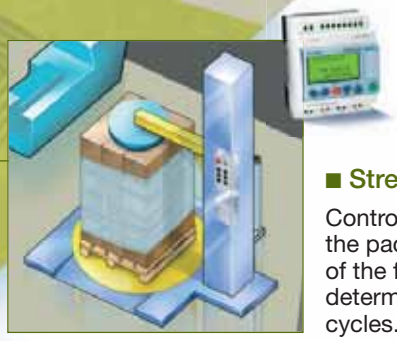
# What is **a logic controller** used for?

The Millenium 3 logic controller can be used to automate small devices requiring between 10 and 50 I/O. Millenium 3's logic functions can be used in numerous applications, including packing, access control, vending, irrigation, pump management and HVAC control.

Millenium 3 is available in a "Compact" version for simple automation systems or an "Expandable" version for enhanced performance. There are also "Resin" or "Bare board" versions available for special applications.

## ■ Public lighting

Control of public lighting to coincide with sunrise/sunset in order to save energy whilst ensuring optimum security levels.



## ■ Stretch wrapping machine

Controls the motor that unrolls the packing film, controls cutting of the film after heat sealing, and determines the duration of the motor cycles.

## ■ Automation of industrial on-board grass-cutter

Control of machine automation and cutting unit operating conditions: control of reverse flow fan (filter cleaning function), control of solenoid valves for locking rear wheels in a straight line, control of cylinders/start function/lights/horn.

# More possibilities

■ Supplying power

■ Sensing

■ Operator dialogue

■ Communicating

■ Actuating

## PROCESSING

### Millenium 3 functions

- **Timing:** 5 types of timer
- **Counting:** 3 types of counter
- **Regulating:** Hysteresis cycle, PID, etc.
- **Archiving/saving:** 10-year data backup function, even after a power failure
- **Calculating:** Maths functions
- **Logic operations:** AND, OR, NAND, NOR, XOR, NOT, etc.
- **Creating sequential programs:** Grafcet, cam timer, etc.
- **Triggering events:** Year, month, day, hour, minute, etc.

## Sensing

The inputs (digital, potentiometer or 10-bit analogue) of the Millenium 3 logic controller are compatible with most sensors on the market: temperature sensors, pressure transmitters, level detectors, flow sensors, etc.

## Supplying power

12 and 24 V DC voltages available.
Several power supply ranges from 7.5 to 240 W.


## Operator dialogue

To make it easier for the operator during parameter setting or operation, Millenium 3 has a built-in, backlit screen (4 lines of 18 characters, drop-down screen, bar chart).

It is equally possible to use the remote LED screen (via Modbus extension XN06) or the LCD screen.

**NEW** Backlit LCD screen/keypad with 4 lines of 18 characters and featuring 6 keys or 10 keys with 4 LEDs (direct communication with the Millenium 3 via the programming port).

# What is **a logic controller** used for?

### Adjusting

There are several options for adjusting setpoints, including an external control potentiometer on the analogue inputs and internal setpoints modifiable via the display.

### Converting

Analogue extensions are used to acquire or provide current, voltage or temperature values and convert them to the digital signals needed by the logic controller.


### Actuating

Millenium 3 can be used to drive devices such as brushless motors, solenoid valves and pumps (relay, solid state or PWM outputs).

### Communicating

Millenium 3 offers the option of supervising and connecting your devices (PC, remote screens/ keyboards, etc.) by linking the logic controllers to fieldbuses (Modbus, Ethernet) or via a modem: STN or GSM.

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# The benefits of the new range

■ Modularity

■ Optimised wiring time

■ Ergonomic display

■ Mounting on
DIN rail or using screws

■ Networked offer

## Millenium 3 “Compact” range

■ With display

CD12 CD20

■ Without display

CB12 CB20

## Millenium 3 “Expandable” range

■ With display

XD10 XD26

■ Without display NEW

XB10 XB26

## Millenium 3 communication solutions

■ Plug & Play solutions for modem communication


■ Communication extensions for 24 V DC expandable controller

XN03
4-word
Modbus
extension

XN05
Ethernet
extension

XN06
8-word
Modbus
extension
NEW

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# **Product offer** overview



"Compact range" starter kits with display

■ **Digital "Sandwich" extension**

XE10

■ **Digital extensions**

XR06 XR10 XR14

■ **Analogue extension**

XA04

"Expandable range" starter kits with display

**See page 76 for other analogue "application" extensions.**

**If you have specific needs, see page 62.**

**"Millenium 3 is a very rational range,** offering a high degree of consistency and true continuity over time. It's particularly useful when you have equipment life cycles lasting several years."

*Mickaël, Technical Director*

# More configuration options

## Find the best solution to meet your needs,

### Overview **of Millenium 3 Combinations**

**You need:** Logic controller | Network communication | More digital I/O | More analogue I/O

| Millenium 3 logic controller | Millenium 3 "Sandwich" extensions | | Millenium 3 termination extensions | |
|---|---|---|---|---|
| CD12 or CD20 | - | - | - | - |
| CB12 or CB20 | - | - | - | - |
| XD10 or XD26 | * | * | * | * |
| XD10/XB10 or XD26/XB26 | Communication: Modbus / Ethernet<br>XN03/XN06 or XN05 | Digital<br>XE10 | * | * |
| XD10/XB10 or XD26/XB26 | * | * | Digital<br>XR06 or XR10 or XR14 | Analogue<br>XA04 |
| XD10/XB10 or XD26/XB26 | Communication: Modbus / Ethernet<br>XN03/XN06 or XN05 | Digital<br>XE10 | Digital<br>XR06 or XR10 or XR14 | Analogue<br>XA04 |

■ Example Millenium 3 combination: XD26 + XE10 + XR14

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# Product offer overview

## all thanks to the modularity of Millenium 3.



**Modem communication**

**Plug & Play solutions for modem communication**

**Compatible with M3MOD + GSM/STN modem**

| Number of I/O available | | | | | | | |
|---|---|---|---|---|---|---|---|
| CD12 only | | | or | CD20 only | | | |
| 12 | | | | 20 | | | |
| CB12 only | | | or | CB20 only | | | |
| 12 | | | | 20 | | | |
| XD10/XB10 only | | | or | XD26/XB26 only | | | |
| 10 | | | | 26 | | | |
| XD10/XB10 with | | | | XD26/XB26 with | | | |
| XE10 | XN03 | XN05 | XN06 | XE10 | XN03 | XN05 | XN06 |
| 20 | 10 | 10 | 10 | 36 | 26 | 26 | 26 |
| XD10/XB10 with | | | | XD26/XB26 with | | | |
| XR06 | XR10 | XR14 | XA04 | XR06 | XR10 | XR14 | XA04 |
| 16 | 20 | 24 | 14 | 32 | 36 | 40 | 30 |
| XD10/XB10 with | | | | XD26/XB26 with | | | |
| XN, XE, XR or XA | | | | XN, XE, XR or XA | | | |
| 20 to 34 | | | | 36 to 50 | | | |

NB: For voltage selection, see pages 26-27 and 30-31.

- : Extension not compatible

✱ : Not used

**“With Millenium 3, I buy what I actually need!”**

No matter what specification the technical team draws up in terms of I/O or supply voltage for example, I can find the right product in the Millenium 3 range.
As a result, thanks to this modularity, I always get the best cost-effectiveness ratio.

*Catherine, Automation Component Purchasing Manager*

# For greater efficiency

■ Sprinklers

■ Drink vending machines

■ Telemaintenance for a pumping station

■ Sliding gate

## Plug & Play solutions for modem communication

## With the networked logic controller, you can control your installations remotely.

Using the M3MOD communication interface, you can monitor and control your installations remotely while reducing your maintenance costs:

- Perform pre-diagnostics.
- Avoid pointless visits.
- Define priorities before responding.

**The M3MOD interface** can be used with two 2 modems - the **STN** modem for wired networks or the **GSM** modem for wireless communication.

### On site with a mobile phone:

- Receive SMS alerts containing up to 160 characters and able to include a digital and/or analogue value:
  if one mobile phone is unavailable, the alarm is automatically redirected to another mobile phone.
- Send commands to a remote Millenium 3 logic controller (you control Millenium 3 outputs remotely).
- Interrogate the status of application components and remotely modify the digital and/or analogue value of a program component.

### In the office with the M3 ALARM software:

- Take advantage of the same functions as on your mobile phone with all the comfort of a PC environment.
- Manage the composition of your maintenance teams.
- Organise your alarms easily so that you can file, archive, sort or export them.

■ **GSM modem communication solution**

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## Overview of other Millenium 3 communication solutions

■ Millenium Web Server

■ Communication extensions

■ Programming accessories

# Easy-to-use, high-performance tools able to communicate with new forms of technology

### Millenium Web Server, the Embedded Web SCADA solution:

(Part no.: 88950124)

- Remote supervision and monitoring from any system with an Internet browser (PC, mobile telephone, PDA, etc.)
- Intuitive programming of supervision pages without the need for prior knowledge of programming languages
- Automatic generation of supervision web pages (up to 20 pages)
- Automatic alerts by e-mail/SMS/fax regarding any change in monitored status
- Fieldbus management (Modbus master)
- Analogue (temperatures, etc.) or digital (alarms, etc.) data archiving, with text-based data evaluation using spreadsheets

*For more information on this Embedded Web supervision solution, please visit the dedicated website: www.webserver.crouzet.com*

### Other communication options:

- Ethernet (Modbus TCP protocol) and Modbus slave extensions with up to:
  - 8 input data words (read/write)
  - 8 output data words (read)
- Programming via serial cable, USB, Bluetooth interface, memory card or modem

**“In the case of extremely remote equipment,** the fact that we can access the Millenium 3 controller remotely means we can optimise our response times.
And the wireless link is a real bonus when it comes to controlling the automatic gates we have installed!”

*Roberto, Operations Maintenance Manager*

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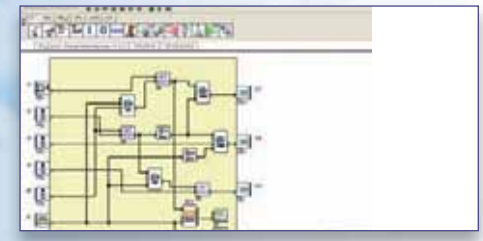
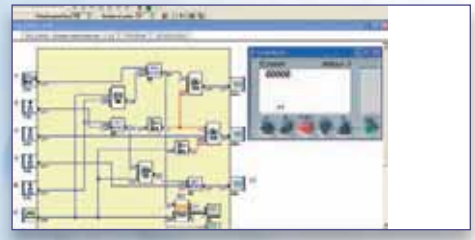
## 6 steps to greater simplicity

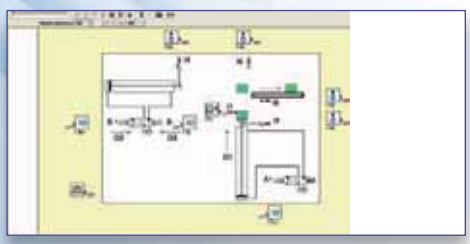
### Example of programming in FBD/Grafcet SFC



■ Creating



■ Simulating



■ Supervising

## Two programming languages

### With Millenium 3, programming mirrors how you work.

Whether you are an electrical engineer or a control systems engineer, you can select the programming language you prefer. With **Ladder or FBD/Grafcet language**, everything is intuitive, quick and safe.

Millenium 3 is capable of reading and converting programs created on the Millenium 2 logic controller.

For quick, simple programming, the Millenium 3 software prioritises **dedicated application-specific functions** such as pump switching, PID control, movement, pressure, level and flow.

All the basic functions, such as counting, timing, comparison and display, are also available.

The **M3 SOFT** programming software incorporates error checking, so that when the slightest data entry error is made, it flags the incorrect item in red.

The **M3 SOFT** software is multilingual, offering English, French, Italian, German and Spanish.

**■ Programming**

You can choose between two different languages: **Ladder and FBD/Grafcet**.

**■ Creation**

You can select the physical or internal I/O and the **preprogrammed functions** you need for your application.

**■ Simulation**

You can test the result of your programming in real time.

**■ Downloading**

You can transfer your programs directly to the controllers using local wired or wireless (**Bluetooth**) equipment or transfer them remotely using **modem solutions**.

**■ Supervision**

You can view the status of your application, locally or remotely, thanks to the communication solutions.

**■ Development**

You can develop your program to keep pace with modifications to your installation.

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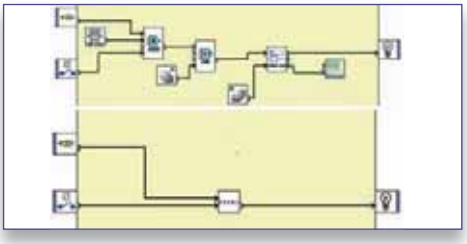
# Introduction to **programming** software



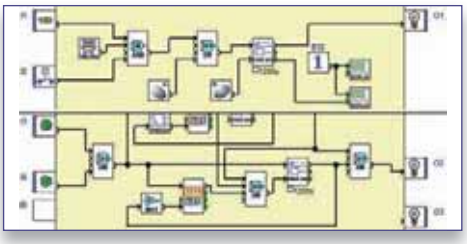
## **Software innovations** for easier programming



■ Macro function

### ■ Macro function

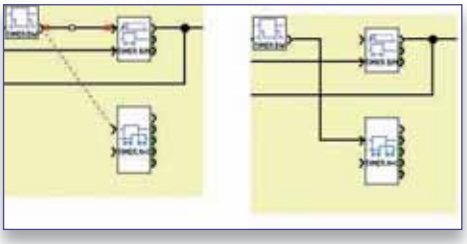
Integrating your repetitive functions into dedicated macro functions saves time and makes your life easier, as it enables you to reuse your expertise directly within your programs. You can access and modify the content of your macro functions, or choose to protect them with a password.



■ Division of screen

### ■ Division of the wiring sheet into several edit windows

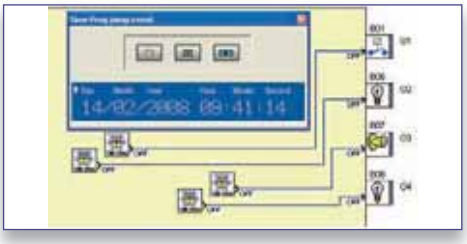
This kind of division makes it possible to display two different sections of the wiring sheet on the same screen. This makes it easier to carry out debugging and wiring for your program.



■ Moveable links

### ■ Easy moving of links

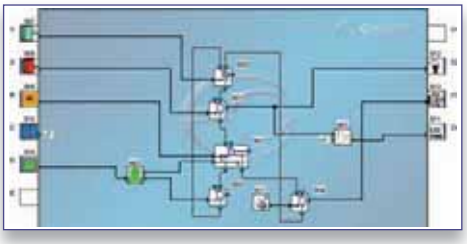
The fact that you can move the links means you can develop your program by replacing function blocks but without losing your existing links.



■ Time simulator

### ■ Simulating program timing

The “Next event” key enables the user to set the time of the time simulator to the start of next timed event that has been programmed.

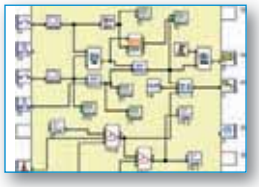


■ Visual customisation

### ■ Customising your program with your own images

The software enables you to import images into your program so you can customise your wiring sheet, your input/output icons and your macro functions.

# Programming that is even more natural



## FBD/Grafcet SFC language

With the M3 SOFT CD-ROM, you can take advantage of unrivalled programming flexibility and a huge processing capacity (up to 700 function blocks).

## ■ 27 preprogrammed FBD functions

### ■ Timing/clock

**TIMERS**
**A/C function:** Delay on and off
**BW function:** Pulse on a rising or falling edge
**B/H function:** Adjustable pulsed signal
**Li/L function:** Pulse generator (ON/OFF setting)
**Totalizer function**
When these functions have preset parameters, they can be adjusted in real time from an external setpoint.

**PRESET H-METER**
Preset hour counter (preselection of hour, minute).

**TIME PROG**
Daily, weekly, monthly and yearly time programmer.

### ■ Counting

**UP/DOWN COUNT**
External preset up/down counter.

**PRESET COUNT**
Preset up/down counter.

### ■ Logic processing

**BISTABLE**
Impulse relay function.

**SET – RESET**
Bistable memory - Priority assigned to either SET or RESET.

**BOOLEAN**
Creation of logic equations between connected inputs.

**CAM TIMER**
Controls a group of 8 integral cam wheels.

### ■ Digital processing

**ADD-SUB**
Simple operations on integers: Addition and/or Subtraction.

**MUL-DIV**
Simple operations on integers: Multiplication and/or Division.

**GAIN**
Used to convert an analogue value by changing the scale and offset.

**DEC/BIN**
Breaks down an integer type input (16 bits) into 16 bit type outputs.

**BIN/DEC**
Makes up an integer type output (16 bits) from 16 bit type inputs.

**ARCHIVE**
Used to save two values simultaneously with the information relating to their time-stamping.

**MUX**
Multiplexing function on 2 analogue values.

### ■ Detection

**COMPARE IN ZONE**
Used to compare a value between two setpoints (the MIN and MAX values determine the zone).

**COMPARE**
Used to compare two analogue values using the =, >, <, ≥, ≤, ≠ operators.

**SCHMITT TRIGGER**
Used to monitor an analogue value in relation to two thresholds.

**MIN MAX**
Used to save the minimum and maximum values of a variable signal.

**STATUS**
Allows the user to access the controller states and modify the behaviour of its FBD and/or SFC program depending on these states.

### ■ Display

**DISPLAY ON THE LCD SCREEN**
Display of digital and analogue data, date, time, messages for human-machine interface (Bar chart function available).

**TEXT**
Display of a page of text and/or numerical values (current value, preset value, etc.) on the LCD display.

**STANDARD MACRO**
Used to obtain examples of preprogrammed macros for scrolling 4 or 15 “DISPLAYS”. These examples can be modified and configured with different parameters.

# Introduction to **programming** software



## ■ Communication

**SLIN (SERIAL LINK INPUT)**
Writing via serial link of data stored in the controller's fixed addresses.

**SLOUT (SERIAL LINK OUTPUT)**
Reading via programming port of data stored in the controller's fixed addresses.

**MESSAGE**
When activated, the Message function block can be used to:
• send alarm messages to mobile phones, to the Millenium 3 Alarm tool or to e-mail addresses via the M3MOD communication interface.
• provide remote access to a digital variable and/or a numerical variable, in order to read or modify them.

## ■ 20 specific preprogrammed FBDC functions

**In addition to the basic function blocks, Crouzet's M3 SOFT CD-ROM (Part no. 88970111) also contains a library with specific functions adapted to your requirements and your application (water management, HVAC, etc.).**

## ■ Timing/clock

**NEW HOUR/MINUTE**
Provides the time from the controller (hour and minutes).

**NEW TIMER SET RESET SWITCHING**
Triggers operation of a particular device at a fixed time for a period set by the user.

**NEW SUNRISE/SUNSET TIME**
Calculates the sunrise and sunset time in relation to the latitude and longitude read on the function block inputs. It is used to generate high levels on these "Morning Pulse" and "Evening Pulse" outputs according to the user parameters.

## ■ Counting

**FAST COUNT**
Counts the pulses arriving at the input at rates in excess of one pulse every 10 ms.

**HIGH SPEED COUNT**
Counts the pulses arriving at the inputs of a controller powered by a DC supply at rates in excess of one pulse every 6 ms.

## ■ Digital processing

**ARCHIVE**
Saves a value between -32768 and 32767.

**STORE**
Storage of data values with an average value.

**DEM (DEMULTIPLEXER)**
Demultiplexing of integers. Used to direct the value of the input to one of the 4 OUTPUTS.

**MUX (MULTIPLEXER)**
Multiplexing WORD inputs. Used to direct the value of one of the selected inputs to a predefined output.

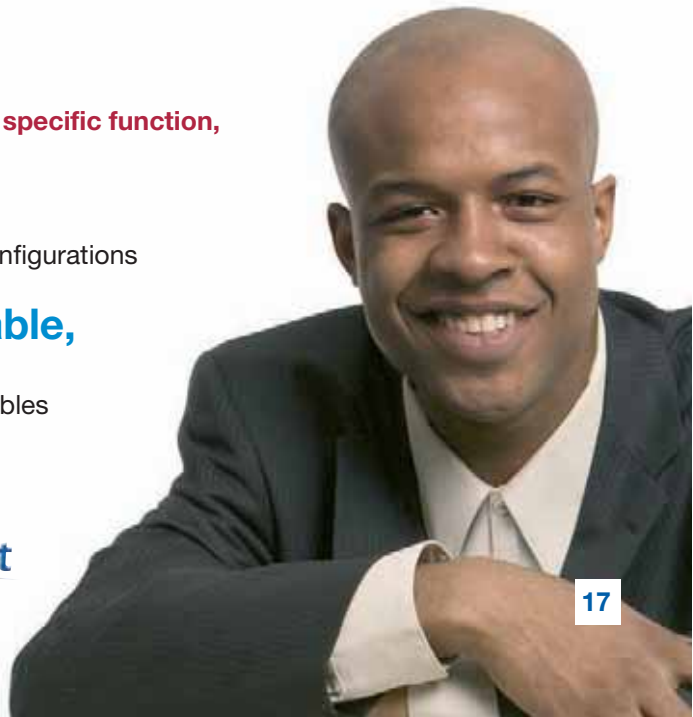
## ■ Logic processing

**BOOLEAN (SIX INPUTS/TWO OUTPUTS)**
Management of two Boolean equations.

**For details of any other specific function, see pages 66-67.**

"We constantly need to update the various automation configurations according to the environment in which our equipment is used. With **more than 50 function blocks available, Millenium 3** gives us this flexibility. What's more, I can connect up to 700 function blocks in the same program. This enables me to devise highly complex applications."

*Steve, Moulding Press Manufacturer*



## ■ 20 specific preprogrammed FBDC functions (continued)

### ■ SFC

**WAIT SFC STEP**
Sets up a wait phase or step for a PLC or a device.

**MOVE SFC STEP**
Sets up a move step for a motor controlled by the PLC to a position specified on the TARGET input.

**MOTOR MULTIPLEXER**
Combines the motor control signals produced by two linked MOVE SFC steps.

### ■ Sensor

**NEW GAIN**
Acts as the interface between the Crouzet pressure transmitters and the Millenium 3 logic controller.

**NEW LEVEL**
Calculates the level of liquid in an open or closed tank, with or without constant density, using pressure sensors.

**NEW FLOW**
Calculates the flow of a liquid in a pipe using a differential pressure element or by measuring the dynamic pressure.

**NEW 5 THRESHOLDS**
This function compares a value against 5 thresholds.

### ■ Regulation

**ANALOGUE PID**
Temperature control (pressure or other) with analogue output.

**PID PWM**
Temperature control (pressure or other) with digital output.

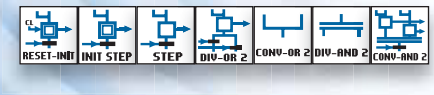
### ■ Application

**PUMP MANAGEMENT**
Pump rotation function

**For details of any other specific function, see pages 66-67.**

## ■ 7 Grafcet SFC functions

For sequential automation systems (Sequential Function Chart).




## ■ 6 logic functions

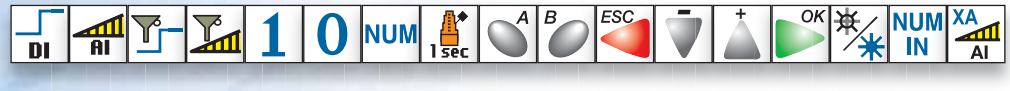
AND, OR, NAND, NOR, XOR, NOT.


## ■ 5 output functions

Physical outputs (relay, solid state or PWM) and internal outputs (backlighting).


## ■ 17 input functions

Physical inputs (digital, potentiometer or 10-bit analogue) and internal inputs (buttons, constants).



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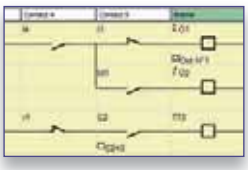
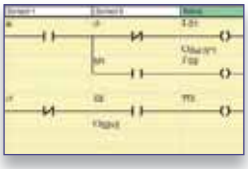
# Introduction to **programming** software





■ Electrical symbols



■ Ladder symbols

## **Ladder** language

The M3 SOFT CD-ROM contains all the symbols used in Ladder language. You can choose between two types of graphic representation: Ladder or electrical symbols.

## ■ 13 Ladder functions

### ■ Inputs

**DIGITAL INPUTS**
This contact represents the state of the controller input connected to a sensor (pushbutton, switch, detector, etc).

**A/B BUTTONS**
The A and B buttons behave exactly like physical inputs. They correspond to the grey A and B buttons on the front of the controller.

**SUMMER WINTER**
This function output is in the OFF state for the whole of wintertime and changes to the ON state for the whole of summertime.

### ■ Outputs

**DIGITAL OUTPUTS**
The digital outputs correspond to the controller output relay coils (connected to the actuators).

**AUXILIARY RELAYS**
The auxiliary relays, marked M, behave exactly like digital outputs, but do not have an output electrical contact. They can be used as internal variables.

### ■ Timer/clock

**TIMERS**
The TIMERS function block provides access to the following functions: delaying or prolonging actions for a predefined time, management of flashing cycles, creating pulses, etc.

**CLOCKS**
The Clocks or Time Prog function is used to enable time slots during which it will be possible to execute actions.

### ■ Counter

**COUNTERS**
Upcounts or downcounts pulses.

**HIGH-SPEED COUNTER**
Counts pulses up to a frequency of 1 kHz.

**COUNTER COMPARATORS**
Compares the current counter value of two counters or of one counter and a constant value.

### ■ Display

**LCD BACKLIGHTING**
The screen Backlighting output is used to control the LCD display lighting via the program.

**TEXT BLOCKS**
The Text automation function is used to display text and/or numerical values (current value, preset value, etc.) on the LCD display rather than on the INPUTS-OUTPUTS screen.

### ■ Communication

**MESSAGE**
When activated, the Message function block can be used to:
• send alarm messages to mobile phones, to the M3 Alarm tool or to e-mail addresses via the M3MOD communication interface.
• provide remote access to a digital variable and/or a numerical variable, in order to read or modify them.

“I wasn’t really into programming at first. Here at least, **I can choose the language that suits me best**. As I am an electrical engineer by training, with Ladder language, it’s what I understand!”

*Olivier, Electrical Installer*

Millenium 3

## Whatever your activity

■ Building Management Systems

■ Industry

■ Advertising hoardings

■ Water treatment

■ Renewable energies

## Millenium 3 offers the most suitable solution for your application.

### Building Management Systems

- Lighting control systems
- Air conditioning and heating systems
- Lifts, hoists and escalators
- Automatic doors and barriers

### Industry

- Packing machines
- Woodworking machines
- Conveyors
- Moulding machines

### Commercial equipment

- Automatic washing equipment
- Vending machines
- Advertising hoardings
- Toll barriers

### Water treatment/Agriculture

- Farm machinery
- Irrigation/sprinkler systems
- Pump management

### Renewable energies

- Solar panels
- Wind turbines
- Heat pumps

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# Applications



## Focus on the **“compressor” application**

## Pressure transmitter: Easily avoid breakdowns!

- The pressure transmitter measures the compressor’s **supply and outlet pressures** to control the motor according to the required displayed pressure, thereby ensuring maximum efficiency.
- **Ready-to-use**, the pressure transmitter’s reference and specifications are preset in the Millenium 3 logic controller, allowing **safe, speedy and effective installation**, using dedicated function blocks**.**

## Millenium 3: The logic controller at the heart of your equipment!

- The Millenium 3 logic controller has everything you need to **control your compressors effectively:** easy to operate, preset applications, adapted function blocks.
- The Millenium 3 gathers and processes data such as relative **humidity, temperature and pressure** to co-ordinate operation of one or more compressors.
- A dedicated function ensures simultaneous **management of 4 or more compressors,** in order to extend their working life.

“By opting for a Millenium 3 automation solution, **I get the benefit of perfect synchronisation** between logic controller, probes, sensors, control relays, timers and, defrost relays.

This is a real plus for us! We are able to derive significant benefits in terms of design, integration and installation.

*Edith, Quality Manager*
*for compressor manufacture*”

Crouzet

# General characteristics

- Millenium 3 Compact Range
- Millenium 3 Expandable Range
- Millenium 3 Communication Options

Millenium 3 range

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

| | |
|---|---|
| **Certifications** ● | UL, CSA<br>GL: except for 88 970 32x (pending) |
| **Conformity with the low voltage directive** | In accordance with 73/23/EEC:<br>EN (IEC) 61131-2 (Open equipment) |
| **Conformity with the EMC directive** ● | In accordance with 89/336/EEC:<br>EN (IEC) 61131-2 (Zone B)<br>EN (IEC) 61000-6-2,<br>EN (IEC) 61000-6-3 (*)<br>EN (IEC) 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: using in metallic cabinet) |
| **Earthing** | None |
| **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 |
| **Maximum utilisation altitude** | Operation: 2000 m<br>Transport: 3.048 m |
| **Mechanical resistance** ● | Immunity to vibrations IEC/EN 60068-2-6, Fc test<br>Immunity to shock IEC/EN 60068-2-27, Fa test |
| **Resistance to electrostatic discharge** | Immunity to ESD 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 (~)<br>IEC/EN 61000-4-11<br>Immunity to damped oscillatory waves<br>IEC/EN 61000-4-12 |
| **Conducted and radiated emissions**<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 metallic cabinet) | Class B (*) in accordance with EN 55022/11 group 1 |
| **Operating temperature** | -20 → +55°C (+40°C in a non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2 |
| **Storage temperature** | -40 → +70°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 profile, 35 x 7.5 mm and 35 mm x 15 or panel (2 x 4 mm Ø) |
| **Screw terminals connection capacity** | **Flexible wire with ferrule =**<br>1 conductor: 0.25 to 2.5 mm² (AWG 24...AWG 14)<br>2 conductors 0.25 to 0.75 mm² (AWG 24...AWG 18)<br>**Semi-rigid wire =**<br>1 conductor: 0.2 to 2.5 mm² (AWG 25...AWG 14)<br>**Rigid wire =**<br>1 conductor: 0.2 to 2.5 mm² (AWG 25...AWG 14)<br>2 conductors 0.2 to 1.5 mm² (AWG 25...AWG 16)<br>**Tightening torque =**<br>0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm) |

● : For adapted products, see page page 64-65

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

| | |
|---|---|
| **LCD display** | CD, XD: Display with 4 lines of 18 characters |
| **Programming method** | Ladder or function blocks/SFC (Grafcet) |
| **Program size** | Ladder: 120 lines<br>Function blocks:<br>CB, CD: typically 350 blocks<br>XB, XD: typically 700 blocks |
| **Program memory** | Flash EEPROM |
| **Removable memory** | EEPROM |
| **Data memory** | 368 bits/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** | Ladder: typically 20 ms<br>Function blocks: 6 → 90 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** | **24 V ∿<br>(88970..4)** | **100 → 240 V ∿<br>(88970..3)** |
|---|---|---|
| **Nominal voltage** ● | 24 V ∿ | 100 → 240 V ∿ |
| **Operating limits** ● | -15% / +20%<br>or 20.4 V∿ → 28.8 V∿ | -15% / +10%<br>or 85 V∿ → 264 V∿ |
| **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 with extension - 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-XD26-XB26: 12 VA<br>XD26-XB26 with extension: 17 VA |
| **Isolation voltage** | 1780 V ∿ | 1780 V ∿ |
| **Inputs** | **24 V ∿<br>(88970..4)** | **100 → 240 V ∿<br>(88970..3)** |
| **Input voltage** ● | 24 V ∿ (-15% / +20%) | 100 → 240 V ∿ (-15% / +10%) |
| **Input current** ● | 4.4 mA @ 20.4 V ∿<br>5.2 mA @ 24.0 V ∿<br>6.3 mA @ 28.8 V ∿ | 0.24 mA @ 85 V ∿<br>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 LADDER programming** | 50 ms - State 0 → 1 (50/60 Hz) | 50 ms - 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) :<br>1/ ( (2 x Tc) + Tr) | In accordance with cycle time (Tc) and input response time (Tr) :<br>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 ⎓<br>24 → 250 V ∿ |
| **Breaking current** ● | CB-CD-XB10-XD10-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 |
| **Max. Output Common Current** | 12A for O8,O9,OA |

● : For adapted products, see page page 64-65

| | |
|---|---|
| **Electrical durability for 500 000 operating cycles** | Usage category DC-12: 24 V, 1.5 A<br>Usage category DC-13: 24 V (L/R = 10 ms), 0.6 A<br>Usage category AC-12: 230 V, 1.5 A<br>Usage 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 |
| **Mechanical life** | 10.000.000 operations (cycles) |
| **Voltage for withstanding shocks** | In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV |
| **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 |

## Characteristics of product with DC power supplied

| **Supply** | **12 V ⎓ (88970..5 & 88970814 & 88970840)** | **24 V ⎓ (88970..1 & 88970..2)** |
|---|---|---|
| **Nominal voltage** ● | 12 V ⎓ | 24 V ⎓ |
| **Operating limits** ● | -13% / +20%<br>or 10.4 V ⎓ < 14.4 V ⎓ (including ripple) | -20% / +25%<br>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<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-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)** | **12 V ⎓ (88970..5 & 88970814 & 88970840)** | **24 V ⎓ (88970..1 & 88970..2)** |
| **Input voltage** ● | 12 V ⎓ (-13% / +20%) | 24 V ⎓ (-20% / +25%) |
| **Input current** ● | 3.9 mA @ 10.44 V ⎓<br>4.4 mA @ 12.0 V ⎓<br>5.3 mA @ 14.4 V⎓ | 2.6 mA @ 19.2 V ⎓<br>3.2 mA @ 24 V ⎓<br>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 | 1 → 2 cycle times |
| **Maximum counting frequency** | I1 & I2: Ladder (1 kHz) & FBD (Up to 6 kHz)<br>I3 to IA & IH to IY: in accordance with cycle time (Tc) and input response time (Tr) :<br>1/ ( (2 x Tc) + Tr) | I1 & I2: Ladder (1 kHz) & FBD (Up to 6 kHz)<br>I3 to IA & IH to IY: in accordance with cycle time (Tc) and input response time (Tr) :<br>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)** | **12 V ⎓ (88970..5 & 88970814 & 88970840)** | **24 V ⎓ (88970..1 & 88970..2)** |
| **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 inputs** | | |
| **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 ⎓ max | 30 V ⎓ max |
| **Value of LSB** ● | 14 mV, 4 mA | 29 mV, 4 mA |
| **Input type** | Common mode | Common mode |
| **Resolution** | 10 bit at maximum input voltage | 10 bit at maximum 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 |

● :For adapted products, see page page 64-65

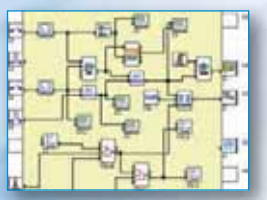
| | | |
|---|---|---|
| **Potentiometer control** | 2.2 kΩ/0.5 W (recommended)<br>10 kΩ max. | 2.2 kΩ/0.5 W (recommended)<br>10 kΩ max. |
| **Inputs used as digital inputs** | | |
| **Input voltage** ● | 12 V ⎓ (-13% / +20%) | 24 V ⎓ (-20% / +25%) |
| **Input current** ● | 0.7 mA @ 10.44 V⎓<br>0.9 mA @ 12.0 V⎓<br>1.0 mA @ 14.4V⎓ | 1.6 mA @ 19.2 V⎓<br>2.0 mA @ 24.0 V ⎓<br>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 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 ⎓<br>24 → 250 V ∿ | |
| **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 | |
| **Max. Output Common Current** | 12A for O8,O9,OA | |
| **Electrical durability for 500 000 operating cycles** | Usage category DC-12: 24 V, 1.5 A<br>Usage category DC-13: 24 V (L/R = 10 ms), 0.6 A<br>Usage category AC-12: 230 V, 1.5 A<br>Usage 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 (cycles) | |
| **Voltage for withstanding shocks** | In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV | |
| **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** | **12-24 V ⎓<br>(88970814 & 88970840)** | **24 V ⎓<br>(88970..2)** |
| **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 | | |
| **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<br>Release ≤ 1 ms | Make ≤ 1 ms<br>Release ≤ 1 ms |
| **Built-in protections** | Against overloads and short-circuits: Yes<br>Against overvoltages (*) : Yes<br>Against inversions of power supply: Yes | Against overloads and short-circuits: Yes<br>Against overvoltages (*) : Yes<br>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 | 1 mA |
| **Maximum incandescent load** | 0.2 A / 12 V ⎓<br>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 for XA) | 0 → 100% (256 steps for CD, XD and 1024 for XA) |
| **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 |

● :For adapted products, see page page 64-65

## Millenium 3 logic controllers

| Type | Part number | Power supply | Inputs | Outputs |
|---|---|---|---|---|
| **With display** | | | | |
|  CD12 | 88970041 | 24 V ⎓ | 8 digital (of which 4 are analogue) | 4 x 8 A relays |
| | 88970042 | 24 V ⎓ | 8 digital (of which 4 are analogue) | 4 solid state 0.5 A (of which 1 is PWM) |
| | 88970043 | 100 → 240 V ∿ | 8 digital | 4 x 8 A relays |
| | 88970044 | 24 V ∿ | 8 digital | 4 x 8 A relays |
| | 88970045 | 12 V ⎓ | 8 digital (of which 4 are analogue) | 4 x 8 A relays |
|  CD20 | 88970051 | 24 V ⎓ | 12 digital (of which 6 are analogue) | 8 x 8 A relays |
| | 88970052 | 24 V ⎓ | 12 digital (of which 6 are analogue) | 8 solid state 0.5 A (of which 4 are PWM) |
| | 88970053 | 100 → 240 V ∿ | 12 digital | 8 x 8 A relays |
| | 88970054 | 24 V ∿ | 12 digital | 8 x 8 A relays |
| | 88970055 | 12 V ⎓ | 12 digital (of which 6 are analogue) | 8 x 8 A relays |
| **Without display** | | | | |
|  CB12 | 88970021 | 24 V ⎓ | 8 digital (of which 4 are analogue) | 4 x 8 A relays |
| | 88970023 | 100 → 240 V ∿ | 8 digital | 4 x 8 A relays |
| | 88970024 | 24 V ∿ | 8 digital | 4 x 8 A relays |
| | 88970840 **NEW** | 12 V ⎓ | 8 digital (of which 4 are analogue) | 4 solid state 0.5 A (of which 1 is PWM) |
|  CB20 | 88970031 | 24 V ⎓ | 12 digital (of which 6 are analogue) | 8 x 8 A relays |
| | 88970033 | 100 → 240 V ∿ | 12 digital | 8 x 8 A relays |
| | 88970034 | 24 V ∿ | 12 digital | 8 x 8 A relays |

■ Ergonomic display



■ Optimum memory capacity

**Millenium 3 logic controllers operate with the following software:**

■ M3 SOFT
Multilingual programming software (CD-ROM) including a library of specific functions.
Part no.: 88970111

■ M3 ALARM
Alarm management software (CD-ROM)
Part no.: 88970116
This software is used alongside the M3MOD communication interface (part no.: 88970117).

**For all details of hardware adaptation, see pages 64-65.**

Crouzet

www.millenium3.crouzet.com

# “Compact” range selection guide



| Modem communication solutions | | | Modular power supplies (1) | | | | | Starter kits and demo case |
|---|---|---|---|---|---|---|---|---|
| M3MOD | STN | GSM | 12 V DC - 24 W | 24 V DC - 7.5 W | 24 V DC - 15 W | 24 V DC - 30 W | 24 V DC - 60 W | |
| | | | NEW | NEW | NEW | NEW | | |
| 88970117 | 88970118 | 88970119 | 88950306 | 88950303 | 88950304 | 88950307 | 88950302 | Standard |
| | | | | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | 88970080 |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | 88970106 (case) |
| ■ | □ | □ | | | | | | 88970081 |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | ■ | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | 88970082 |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | | | | | 88970083 |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | ■ | | | | | |
| | | | | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | ■ | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | | | | | | |

■ *Compatible*
□ *Mounted with the M3MOD:*
*- STN modem,*
*- or GSM modem*

(1) *Find the whole “Power Supplies” offer on pages 58-59.*

**The 4 starter kits each contain:**

■ 1 CD12 or CD20 logic controller + 1 USB link cable +
1 M3 SOFT programming software application (CD-ROM)
including a library of specific functions.
Part no.: 88970080 / 88970081 / 88970082 / 88970083

**The demonstration case contains:**

■ 1 CD12 logic controller + 1 USB link cable +
1 M3 SOFT programming software application (CD-ROM)
including the library of specific functions + 1 voltage adaptor +
1 I/O simulation card.
Part no.: 88970106

# ➜ "Compact" range with display

- **Budget solution with display**
- **Memory: 120 lines in LADDER language and up to 350 "typical" blocks in FBD language**
- **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**
- **Analogue inputs 0-10 V⎓ or 0-20 mA/Pt 100 with converters (see page 50)**

CD12

CD20

## Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| CD12 | 8 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88970041 |
| | 8 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | 88970042 |
| | 8 digital | 4 relays 8 A | 100 → 240 V ∿ | 88970043 |
| | 8 digital | 4 relays 8 A | 24 V ∿ | 88970044 |
| | 8 digital (including 4 analogue) | 4 relays 8 A | 12 V ⎓ | 88970045 |
| CD20 | 12 digital (including 6 analogue) | 8 relays 8 A | 24 V ⎓ | 88970051 |
| | 12 digital (including 6 analogue) | 8 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | 88970052 |
| | 12 digital | 8 relays 8 A | 100 → 240 V ∿ | 88970053 |
| | 12 digital | 8 relays 8 A | 24 V ∿ | 88970054 |
| | 12 digital (including 6 analogue) | 8 relays 8 A | 12 V ⎓ | 88970055 |

## Accessories

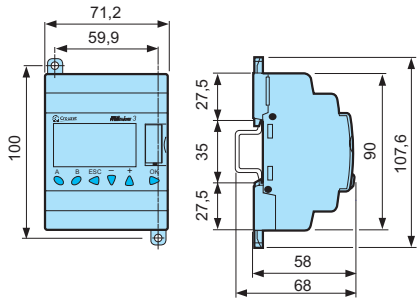
| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |
| PA | EEPROM memory cartridge | 88970108 |
| | 3 m serial link cable: PC → Millenium 3 | 88970102 |
| | 3 m USB link cable: PC → Millenium 3 | 88970109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

## Starter kits (see page 27 for details)

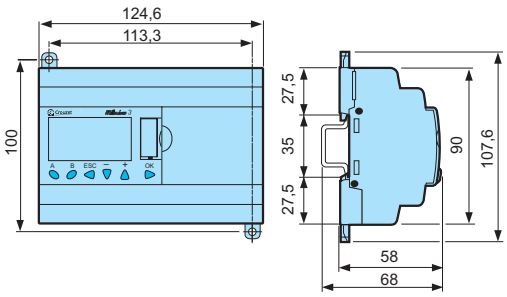
| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| Kit 12 | 8 digital (including 4 analogue) | 4 relays | 24 V ⎓ | 88970080 |
| | 8 digital | 4 relays | 100 → 240 V ∿ | 88970081 |
| Kit 20 | 12 digital (including 6 analogue) | 8 relays | 24 V ⎓ | 88970082 |
| | 12 digital | 8 relays | 100 → 240 V ∿ | 88970083 |

## Dimensions (mm)

**CD12**




**CD20**




## Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page page 64-65

# "Compact" range without display

- **Simply a control system solution inside a modular casing**
- **Memory: 120 lines in LADDER language and up to 350 "typical" blocks in FBD language**
- **No display or parameter-setting buttons to avoid tampering by unauthorised users**
- **Analogue inputs 0-10 V⎓ or 0-20 mA/Pt 100 with converters (see page 50)**

CB12

CB20

## Part numbers

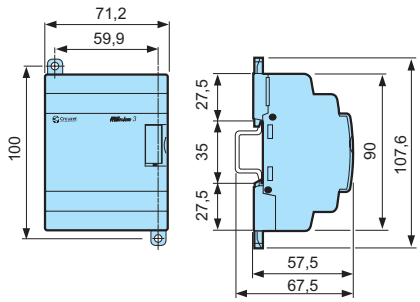
| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| CB12 | 8 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88970021 |
| | 8 digital | 4 relays 8 A | 100 → 240 V ∿ | 88970023 |
| | 8 digital | 4 relays 8 A | 24 V ∿ | 88970024 |
| | 8 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 12 V ⎓ | 88970840 |
| CB20 | 12 digital (including 6 analogue) | 8 relays 8 A | 24 V ⎓ | 88970031 |
| | 12 digital | 8 relays 8 A | 100 → 240 V ∿ | 88970033 |
| | 12 digital | 8 relays 8 A | 24 V ∿ | 88970034 |

## Accessories

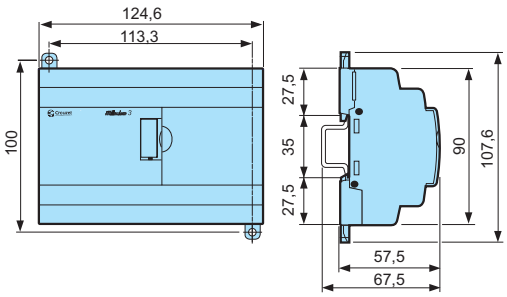
| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |
| PA | EEPROM memory cartridge | 88970108 |
| | 3 m serial link cable: PC → Millenium 3 | 88970102 |
| | 3 m USB link cable: PC → Millenium 3 | 88970109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

## Dimensions (mm)

**CB12**




**CB20**




## Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page page 64-65

## Millenium 3 logic controllers

| Type | Part number | | Power supply | Inputs | Outputs |
|---|---|---|---|---|---|
| | With XD10/ XD26 display | Without display XB10/XB26 | | | |
|  | 88970141 | 88970131 NEW | 24 V ⎓ | 6 digital (of which 4 are analogue) | 4 x 8 A relays |
| | 88970142 | 88970132 NEW | 24 V ⎓ | 6 digital (of which 4 are analogue) | 4 solid state 0.5 A (of which 1 is PWM) |
| | 88970143 | 88970133 NEW | 100 → 240 V ∿ | 6 digital | 4 x 8 A relays |
| | 88970144 | 88970134 NEW | 24 V ∿ | 6 digital | 4 x 8 A relays |
|  | 88970161 | 88970151 NEW | 24 V ⎓ | 16 digital (of which 6 are analogue) | 10 relays, of which 8 are 8 A and 2 are 5 A |
| | 88970162 | 88970152 NEW | 24 V ⎓ | 16 digital (of which 6 are analogue) | 10 solid state 0.5 A (of which 4 are PWM) |
| | 88970163 | 88970153 NEW | 100 → 240 V ∿ | 16 digital | 10 relays, of which 8 are 8 A and 2 are 5 A |
| | 88970164 | 88970154 NEW | 24 V ∿ | 16 digital | 10 relays, of which 8 are 8 A and 2 are 5 A |
| | 88970165 | 88970155 NEW | 12 V ⎓ | 16 digital (of which 6 are analogue) | 10 relays, of which 8 are 8 A and 2 are 5 A |
| | 88970814 NEW | - | 12 V ⎓ | 16 digital (of which 6 are analogue) | 10 solid state 0.5 A (of which 4 are PWM) |

## Extensions "Sandwich"

| Type | | Part number | Power supply | Inputs | Outputs |
|---|---|---|---|---|---|
| TOR | | | | | |
|  | XE10 | 88970321 | Via the 24 V ⎓ controller | 6 digital | 4 x 5 A relays, 1 of which is a changeover relay |
| | | 88970323 | 100 → 240 V ∿ | 6 digital | 4 x 5 A relays, 1 of which is a changeover relay |
| | | 88970324 | 24 V ∿ | 6 digital | 4 x 5 A relays, 1 of which is a changeover relay |
| **Type** | | **Part number** | **Power supply** | **Mains** | **Characteristics of exchanges (words)** |
| Communication | | | | | |
|  | XN05 | 88970270 | Via the 24 V ⎓ controller | Modbus TCP Ethernet protocol | Read: 8 - Read/Write: 8<br>Clock: 4 - Status: 1 |
| | XN03 | 88970250 | Via the 24 V ⎓ controller | Modbus RS-485 (slave) | Read: 8 - Read/Write: 8<br>Clock: 4 - Status: 1 |
| | XN06 | 88972250 NEW | Via the 24 V ⎓ controller | Modbus RS-485 (slave) | Read: 8 - Read/Write: 8<br>Clock: 4 - Status: 1 |

**Millenium 3 logic controllers operate with the following software:**

### ■ M3 SOFT

Multilingual programming software (CD-ROM) including the library of specific functions.
Part no.: 88970111

### ■ M3 ALARM

Alarm management software (CD-ROM)
Part no.: 88970116
This software is used alongside the M3MOD communication interface (part no.: 88970117).

**For all details of hardware adaptation, see pages 64-65.**

Crouzet

# “Expandable” range selection guide



| Modem communication solutions | | | Modular power supplies [1] | | | | | Starter kits |
|---|---|---|---|---|---|---|---|---|
| M3MOD | STN | GSM | 12 V DC - 24 W | 24 V DC - 7.5 W | 24 V DC - 15 W | 24 V DC - 30 W | 24 V DC - 60 W | |
|  |  |  |  NEW |  NEW |  NEW |  NEW |  |  |
| 88970117 | 88970118 | 88970119 | 88950306 | 88950303 | 88950304 | 88950307 | 88950302 | Expandable |
| | | | | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | 88970084 |
| ■ | □ | □ | | ■ | ■ | ■ | ■ | |
| ■ | □ | □ | | | | | | 88970085 |
| ■ | □ | □ | | | | | | |
| ■ | □ | □ | ■ | | | | | |
| ■ | □ | □ | ■ | | | | | |

■ *Compatible*
□ *Mounted with the M3MOD:*
*- STN modem,*
*- or GSM modem*

*[1] Find the whole “Power Supplies” offer on pages 58-59.*

## Termination extensions

| Type | | Part number | Power supply | Inputs | Outputs |
|---|---|---|---|---|---|
| **Digital** | | | | | |
|  | XR06 | 88970211 | Via the 24 V ⎓ controller | 4 digital | 2 x 8 A relays |
| | | 88970213 | Via the 100 ➙ 240 V ∿ controller | 4 digital | 2 x 8 A relays |
| | | 88970214 | Via the 24 V ∿ controller | 4 digital | 2 x 8 A relays |
| | | 88970215 | Via the 12 V ⎓ controller | 4 digital | 2 x 8 A relays |
|  | XR10 | 88970221 | Via the 24 V ⎓ controller | 6 digital | 4 x 8 A relays |
| | | 88970223 | Via the 100 ➙ 240 V ∿ controller | 6 digital | 4 x 8 A relays |
| | | 88970224 | Via the 24 V ∿ controller | 6 digital | 4 x 8 A relays |
| | | 88970225 | Via the 12 V ⎓ controller | 6 digital | 4 x 8 A relays |
|  | XR14 | 88970231 | Via the 24 V ⎓ controller | 8 digital | 6 relays, of which 4 are 8 A and 2 are 5 A |
| | | 88970233 | Via the 100 ➙ 240 V ∿ controller | 8 digital | 6 relays, of which 4 are 8 A and 2 are 5 A |
| | | 88970234 | Via the 24 V ∿ controller | 8 digital | 6 relays, of which 4 are 8 A and 2 are 5 A |
| | | 88970235 | Via the 12 V ⎓ controller | 8 digital | 6 relays, of which 4 are 8 A and 2 are 5 A |
| **Analogue** | | | | | |
|  | XA04 | 88970241 | Via the 24 V ⎓ controller | 1 analogue (0-10 V/0-20 mA),<br>1 analogue (0-10 V/0-20 mA/Pt100) | 2 analogue (0-10 V)/PWM |

**The 2 starter kits each contain:**

■ 1 XD26 logic controller + 1 USB link cable +
1 M3 SOFT programming software application (CD-ROM) including a library of specific functions.
Part no.: 88970084 / 88970085

## "Expandable" range with display

- "High-performance" expandable solution with display
- Extended memory: 120 lines in LADDER language and up to 700 "typical" blocks in FBD language
- 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
- Analogue inputs 0-10 V ⎓ or 0-20 mA/Pt 100 with converters (see page 50)
- Open to XN network communication extensions and digital I/O or analogue extensions

XD10

XD26

### Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XD10 | 6 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88970141 |
| | 6 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | 88970142 |
| | 6 digital | 4 relays 8 A | 100 → 240 V ∿ | 88970143 |
| | 6 digital | 4 relays 8 A | 24 V ∿ | 88970144 |
| XD26 | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ⎓ | 88970161 |
| | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | 88970162 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 100 → 240 V ∿ | 88970163 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ∿ | 88970164 |
| | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 12 V ⎓ | 88970165 |
| | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 12 V ⎓ | 88970814 |

### Accessories

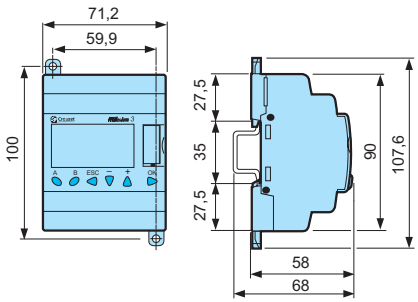
| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |
| PA | EEPROM memory cartridge | 88970108 |
| | 3 m serial link cable: PC → Millenium 3 | 88970102 |
| | 3 m USB link cable: PC → Millenium 3 | 88970109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

### Starter kits (see page 31 for details)

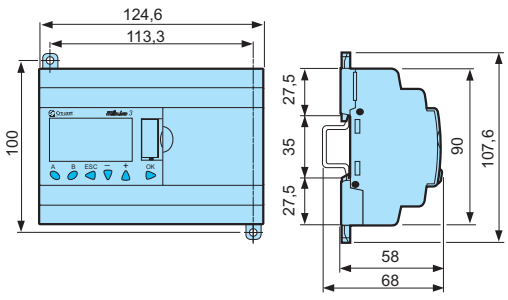
| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| Kit 26 | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ⎓ | 88970084 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 100 → 240 V ∿ | 88970085 |

### Dimensions (mm)

**XD10**




**XD26**




### Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page page 64-65

## ➜ "Expandable" range without display

- **"High-performance" expandable solution without display**
- **Extended memory: 120 lines in LADDER language and up to 700 "typical" blocks in FBD language**
- **No display or parameter-setting buttons to avoid tampering by unauthorised users**
- **Analogue inputs 0-10 V ⎓ or 0-20 mA/Pt 100 with converters (see page 50)**
- **Open to XN network communication extensions and digital I/O or analogue extensions**

**XB10**

**XB26**

### Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XB10 | 6 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | **88970131*** |
| | 6 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | **88970132** |
| | 6 digital | 4 relays 8 A | 100 → 240 V ∿ | **88970133*** |
| | 6 digital | 4 relays 8 A | 24 V ∿ | **88970134** |
| XB26 | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ⎓ | **88970151** |
| | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | **88970152** |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 100 → 240 V ∿ | **88970153** |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ∿ | **88970154** |
| | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 12 V ⎓ | **88970155** |

*Available 2nd quarter of 2008

### General characteristics

**See page 22, except:**

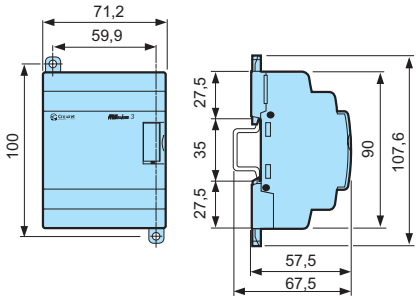
| | |
|---|---|
| Certifications | UL, CSA |

### Accessories

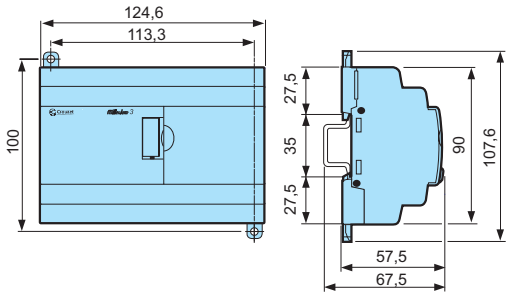
| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | **88970111** |
| PA | EEPROM memory cartridge | **88970108** |
| PA | 3 m serial link cable: PC → Millenium 3 | **88970102** |
| PA | 3 m USB link cable: PC → Millenium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

### Dimensions (mm)

**XB10**




**XB26**




### Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page 64-65

# ➜ Sandwich communication extensions for XD10/XB10 & XD26/XB26

- **Exchange of input/output state or of internal values via communication networks**
- **Power supply via the controller**


XN03


XN06


XN05

## Part numbers

| Type | Description | Supply | Code |
|---|---|---|---|
| XN03 | Modbus RS-485 slave communication extension 4 words | Via the 24 V ⎓ controller | **88970250** |
| XN06 | Modbus RS-485 slave communication extension 8 words | Via the 24 V ⎓ controller | **88972250** |
| XN05 | Ethernet protocol TCP Modbus extension | Via the 24 V ⎓ controller | **88970270** |

## Characteristics of communication extensions

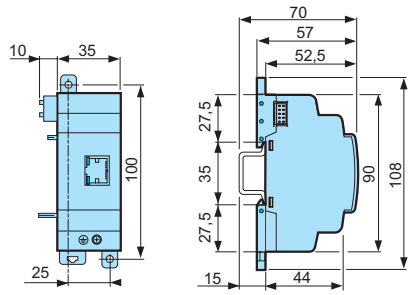
| General characteristics | 88970250 & 88972250 | 88970270 |
|---|---|---|
| **See page 22, except:** | | |
| Certifications | UL, CSA, GL (UL, CSA: 88972250) | UL, CSA<br>GL pending |
| Earthing | Yes, refer to the quick reference guide supplied with the product | Yes, refer to the quick reference guide supplied with the product |
| Operating temperature | -20 ➞ +55°C (+40°C in a non-ventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2 | 0 ➞ +55°C (+40°C in a non-ventilated enclosure) in accordance with IEC 60068-2-1 and IEC 60068-2-2 |
| Cable length | Maximum length of the network: 1000 m (9600 Baud max, AWG26) | Maximum length between 2 controllers: 100 m |

| Communication parameters | 88970250 & 88972250 | 88970270 |
|---|---|---|
| Type of link | 2 or 4-wire; RTU or ASCII | - |
| Transmission rate (Bauds) | 1200, 2400, 4800, 9600, 19200, 28800, 38400, 57600 | - |
| Parity | None; even; odd | - |
| Addressing | 1 ➞ 247 | Static or dynamic |

| Characteristics of exchanges | 88970250 | 88972250 | 88970270 |
|---|---|---|---|
| **Programming with Ladder language** | | | |
| Image of smart relay I/O | 4 | 4 | - |
| Status | 1 | 1 | - |
| **Programming with FBD language** | | | |
| Read | 4 | 8 | 8 |
| Read/Write | 4 | 8 | 8 |
| Clock words | 4 | 12 | 4 |
| Status words | 1 | 1 | 1 |

## Dimensions (mm)

**XN03 - XN05 - XN06**




For adapted products, see page 64-65

# ➜ Digital sandwich extension for XD10/XB10 and XD26/XB26

- **Can be used to reach up to 50 inputs/outputs in conjunction with XR14 termination extensions**
- **Relay outputs one of which is a changeover relay**

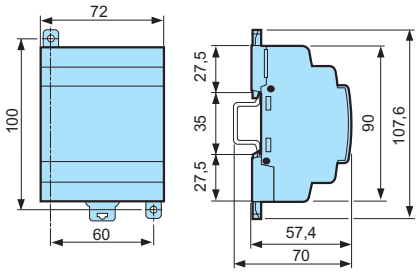
**XE10**

## Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XE10 | 6 digital | 4 relays 5 A (1 of which is a changeover relay) | Via the 24 V ⎓ controller | **88970321** |
| | 6 digital | 4 relays 5 A (1 of which is a changeover relay) | 100 → 240 V ∿ | **88970323** |
| | 6 digital | 4 relays 5 A (1 of which is a changeover relay) | 24 V ∿ | **88970324** |

## Dimensions (mm)

**XE10**




## Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page page 64-65

# ➜ Digital extension for XD10/XB10 and XD26/XB26

- **Power supply via the controller at the same voltage as the inputs**
- **Number of inputs/outputs can be configured in accordance with your requirements**


XR06


XR10

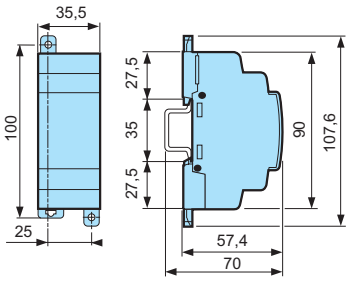

XR14

## Part numbers

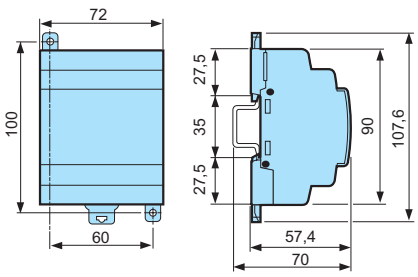
| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XR06 | 4 digital | 2 relays 8 A | Via the 24 V ⎓ controller | 88970211 |
| | 4 digital | 2 relays 8 A | Via the 100 → 240 V ∿ controller | 88970213 |
| | 4 digital | 2 relays 8 A | Via the 24 V ∿ controller | 88970214 |
| | 4 digital | 2 relays 8 A | Via the 12 V ⎓ controller | 88970215 |
| XR10 | 6 digital | 4 relays 8 A | Via the 24 V ⎓ controller | 88970221 |
| | 6 digital | 4 relays 8 A | Via the 100 → 240 V ∿ controller | 88970223 |
| | 6 digital | 4 relays 8 A | Via the 24 V ∿ controller | 88970224 |
| | 6 digital | 4 relays 8 A | Via the 12 V ⎓ controller | 88970225 |
| XR14 | 8 digital | 6 relays (4 x 8 A relay and 2 x 5 A relay) | Via the 24 V ⎓ controller | 88970231 |
| | 8 digital | 6 relays (4 x 8 A relay and 2 x 5 A relay) | Via the 100 → 240 V ∿ controller | 88970233 |
| | 8 digital | 6 relays (4 x 8 A relay and 2 x 5 A relay) | Via the 24 V ∿ controller | 88970234 |
| | 8 digital | 6 relays (4 x 8 A relay and 2 x 5 A relay) | Via the 12 V ⎓ controller | 88970235 |

## Dimensions (mm)

**XR06**




**XR10 - XR14**




## Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

# ➜ Analogue extension for XD10/XB10 and XD26/XB26

- **Direct connection of analogue 0-10 V or 0-20 mA or Pt 100 inputs (10 bits) can be configured using the M3 SOFT**
- **2 analogue 0-10 V or PWM outputs (10 bits) can be configured using the M3 SOFT software**
- **Ramp can be parameterised for outputs used as 0-10 V outputs**
- **Power supply via the controller**


XA04

## Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XA04 | 1 analogue (0-10 V / 0-20 mA),<br>1 analogue (0-10 V / 0-20 mA / Pt100) | 2 analogue (0-10 V) / PWM | Via the 24 V ⎓ controller | 88970241 |

For adapted products, see page page 64-65

# Characteristics of analogue extension 88970241

## General characteristics of analogue extension 88970241

**See page 22, except:**

| | |
|---|---|
| Certifications | UL, CSA<br>GL (pending) |
| Earthing | Yes, refer to the quick reference guide supplied with the product |

## Analogue inputs

| | | | |
|---|---|---|---|
| Inputs used as analogue inputs | 0-10 V | 0-20 mA | Pt 100 |
| Input | IP and IQ | IP and IQ | IQ |
| Input range | 0 → 10 V ⎓ | 0 → 20 mA | -25 → 125°C |
| Input impedance | ≥ 18 kΩ | 246 Ω | - |
| Maximum non destructive current/voltage | 30 V | 30 mA | - |
| Value of LSB | 9.8 mV | 20 µA | 0.15°C |
| Input type | Common mode | Common mode | Pt 100 probe - IEC 751 - 3-wire |
| Resolution | 10 bits | 10 bits | 10 bits |
| Conversion time | Module cycle time | Module cycle time | Module cycle time |
| Accuracy at 25°C | ± 1% | ± 1% | ±1.5°C |
| Accuracy at 55°C | ± 1% | ± 1% | ±1.5°C |
| Isolation between analogue channel and power supply | None | None | None |
| Longueur câble | 10 m maximum, with shielded cable (sensor not isolated) | 10 m maximum, with shielded cable (sensor not isolated) | 10 m maximum, with shielded cable (sensor not isolated) |
| Protection against polarity inversions | Command ignored | Command ignored | Command ignored |

## Analogue outputs

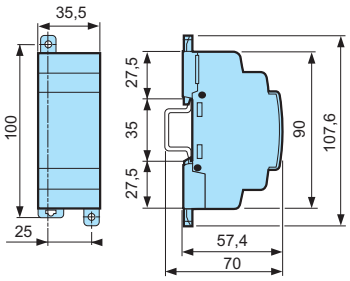
| | |
|---|---|
| Range output | 0 → 10 V |
| Input type | Resistive |
| Max. load | 10 mA |
| Value of LSB | 10 mV |
| Resolution | 10 bits |
| Conversion time | Controller cycle time |
| Accuracy at 25°C | ±1% of full scale |
| Accuracy at 55°C | ±1% of full scale |
| Repeat accuracy at 55 °C | ± 1% |
| Isolation between analogue channel and power supply | None |
| Cable length | 10 metres maximum, with shielded cable (sensor not isolated) |
| Protection against polarity inversions | Yes |

## PWM

| | |
|---|---|
| Range output | V power supply |
| Max. load | ≥ 1.2 kΩ (I ≤ 20 mA) |
| PWM cyclic ratio | 1024 steps |
| Frequency | 78 Hz, 312.5 Hz, 666.6 Hz, 1000 Hz, 1250 Hz, 1428 Hz, 1666 Hz, 2000 Hz |
| Accuracy | 1% across the entire temperature range for PWM ratios from 5% to 95% |
| Built-in protections | Against overvoltages: Yes |

# Dimensions (mm)

**XA04**




# Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

For adapted products, see page page 64-65

# ➜ Modem communication plug and play solutions

- **For remote control of your application**
- **Automatic notification of alarms via SMS (GSM Modem) / email or on a PC with M3 ALARM software.**
- **Millenium 3 program can be downloaded, modified and sent**
- **Input and output states, as well as all program values, can be polled and controlled remotely**
- **2 types of pre-configured ready-to-use modem:**
  - **STN modem for wired transmission networks**
  - **GSM modem for wireless communication**

**M3MOD**

**STN**


**GSM**

## Part numbers

| Type | Description | Supply | Code |
|---|---|---|---|
| M3MOD | Modem communication interface | 12-24 V ⎓ | **88970117** |
| STN | STN modem | 12-24 V ⎓ | **88970118** |
| GSM | GSM modem 850/900/1800/1900 MHz | 12-24 V ⎓ | **88970119** |

## Accessories

| Type | Description | Code |
|---|---|---|
| PA | 1.80 m serial link cable: DB9/DB9 | **88970123** |
| M3 ALARM | Alarm management software (CD-ROM) | **88970116** |

## Characteristics of the communication Modem system

| General characteristics of the modem communication | 88970117 | 88970118 | 88970119 |
|---|---|---|---|
| **See page 22, except:** | | | |
| Certifications | UL, CSA | UL, CSA | UL, CSA, CE, FCC, IC, PTCRB, R&TTE |

| Power supply | 88970117 | 88970118 | 88970119 |
|---|---|---|---|
| Nominal voltage (V) | 12 → 24 V ⎓ | 12 → 24 V ⎓ | 12 → 24 V ⎓ |
| Operating limits | -13% / + 20% or 10 → 28.8 V ⎓ | -13% / + 5% or 10 → 30 V ⎓ | -54% / + 33% or 5.5 → 32 V ⎓ |
| Ripple | 5% max. | - | - |
| Nominal current under 12 V DC | 30 mA | 140 mA | 165 mA |
| Nominal current under 24 V DC | 30 mA | 70 mA | 87 mA |
| Peak current on energisation | 550 mA | 9600 mA | 2100 mA at 5.5 V |
| Max. absorbed power | 1.1 W | - | 2.1 W |
| Immunity from micro power cuts | 1 ms, repetition 20 times | No | - |
| Protection against polarity inversions | Yes | - | No |
| Fuse protection | 1 A fuse | - | With fuse 2.5 A |

| Characteristics of the "COM-M3" link with the controller | |
|---|---|
| Type of connector | Specific Millenium |
| Type of link | Specific Millenium communication protocol |
| Compatibility | Only with Millenium controllers version ≥ V2.1 |
| Isolation of "Com-M3" connector from the "Com-M" connector | Via optocoupler ∿ 1780 V |
| Isolation of "Com-M3" connector from the ± supply terminals | Via optocoupler ∿ 1780 V |

| Characteristics of the "COM-M3" link with the modem | |
|---|---|
| Type of connector | Specific Millenium |
| Type of link with Modem connector cable | RS 232 serial (supplied with the communication interface) |
| Compatibility | Only with Millenium controllers version ≥ V2.1 |
| Analogue RTC modem compatibility | AT commands |
| GSM modem compatibility | AT commands |
| Isolation of "Com-M" connector from the Modem | Via link cable to Modem (supplied) |
| Isolation of "Com-M" connector from the ± supply terminals | Via link cable to Modem (supplied) |

## Data characteristics

| | |
|---|---|
| Data saved by the interface | Up to 28 messages<br>1 to 10 recipients (telephone numbers and/or e-mail addresses) per message<br>Time-stamping of messages to be sent (date and time)<br>Saving of values on triggering of the message activation condition (digital and numerical values) |
| Backup of data to be sent | Flash memory |

## Functions available depending on the hardware architecture and/or type of SIM card

| Functions | Remote station device | | | | |
|---|---|---|---|---|---|
| | Analogue PSTN modem | GSM modem | | | |
| | | Type of SIM card | | | |
| | | Data | Data voice | | Voice |
| | | | Data n° | Voice n° | |
| Send alarm/receive instructions with GSM telephone | | | | | |
| Send alarm/receive instructions with PC running "M3 Alarm" software (1) | | | | | |
| Transfer program Update firmware Monitoring (1) | | | | | |
| Send alarm to e-mail address | | | | | |

Functions available  Functions not available

**Nota:** *Instructions can not be transmitted by e-mail*

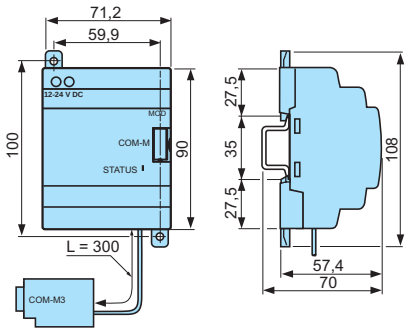
(1) When using a GSM Modem on the PC side, the SIM card must have a DATA number.

## Comments

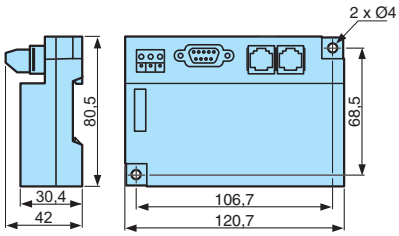
88970117 : supplied with connecting cable between M3MOD and Modem (Millenium 3 connector to sub DB9)
88970118 : supplied with configuaration CD-ROM and telephone cable
88970119 : supplied with an antenna, a power cable, and DIN Rail mounting kit

## Dimensions (mm)

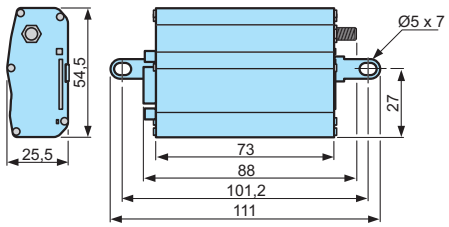
**Modem communication interface M3MOD**



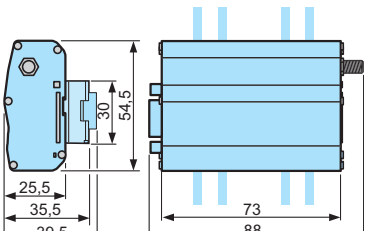

**STN**




**GSM Mounting screws**




**GSM Mounting profile**



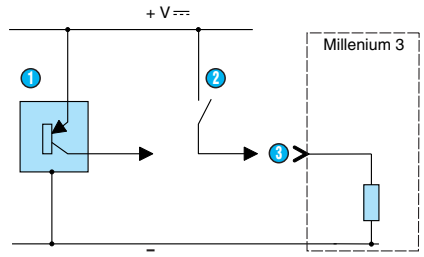

## Input / Output Connections

To find instruction sheets please visit: www.millenium3.crouzet.com in "Download"

# I/O wiring

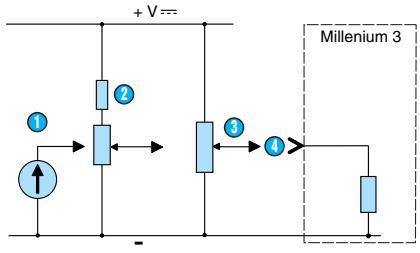
## Inputs 12 V ⎓, 24 V ⎓

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



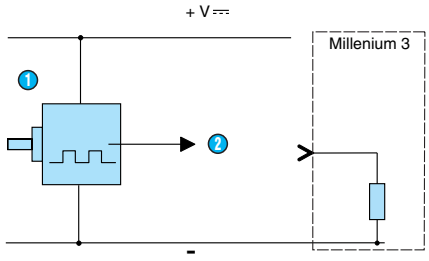

1. 3-wire PNP sensor
2. Contact
3. Digital input

**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. Analogue input

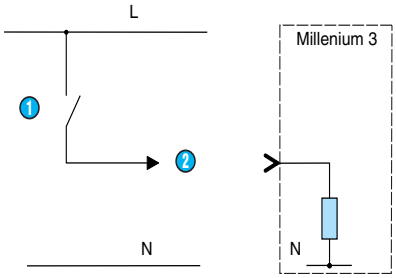
**Bases :** CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26




1. Encoder
2. High-speed digital input

## Inputs 100-240 V ∿, 24 V ∿

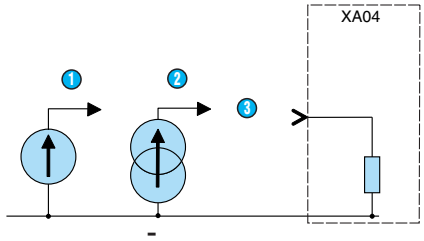
**Bases :** CD12, CD20, CB12, CB20, XD10, XD26
XB10, XB26
**Extensions :** XE10, XR06, XR10, XR14




1. Contact
2. Digital input

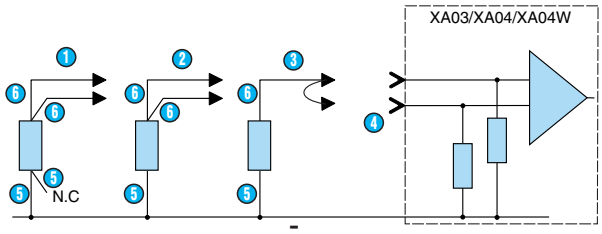
## Analogue inputs

**Extension :** XA04




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

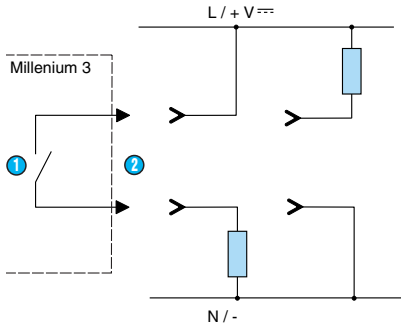
**Extension :** XA04




1. Pt100 4-wire
2. Pt100 3-wire
3. Pt100 2-wire
4. Analogue input
5. White
6. Red

## Relay outputs

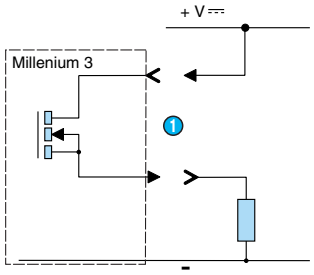
**Bases :** CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26
**Extensions :** XE10, XR06, XR10, XR14




1 Contact
2 Digital output

## Solid state outputs

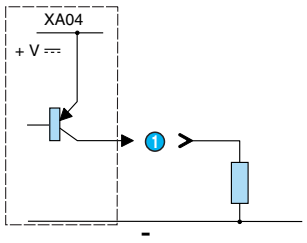
**Bases :** CD12, CD20, CB12, CB20, XD10, XD26, XB10, XB26
**Extensions :** XA04




1 MOS transistor
2 Digital/PWM output

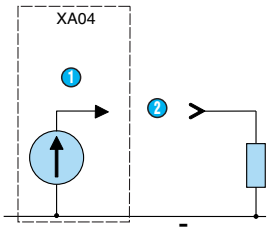
## Analogue outputs

**Extension :** XA04




1 PWM output

**Extension :** XA04



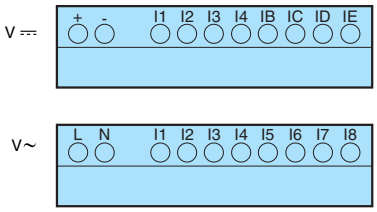

1 0-10 V
2 Analogue output

# ➜ Input/output installations: Bases

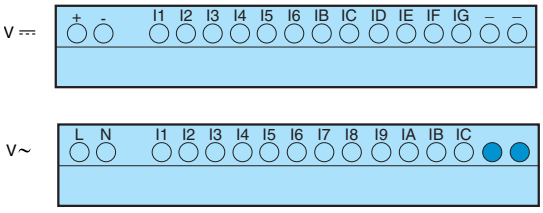
## "Compact" range : CD12, CD20, CB12, CB20

### Inputs

**CD12, CB12**

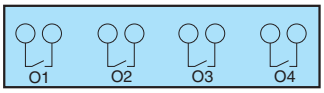



**CD20, CB20**

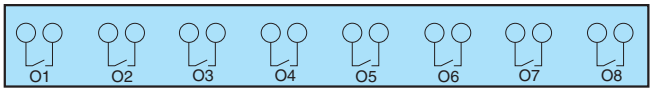



### Relay outputs

**CD12, CB12**

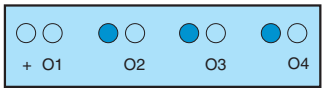



**CD20, CB20**

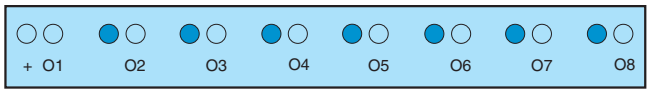



### Solid state outputs

**CD12, CB12**



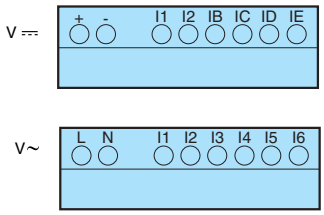

**CD20**



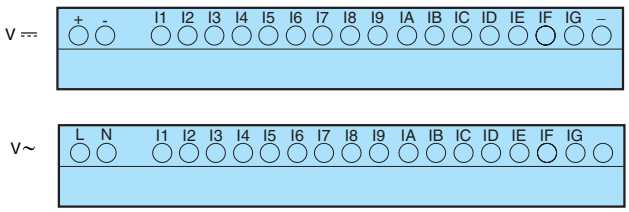

## "Expandable" range : XD10, XD26, XB10, XB26

### Inputs

**XD10, XB10**

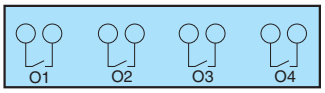



**XD26, XB26**

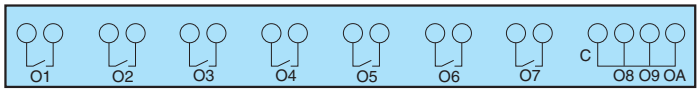



### Relay outputs

**XD10, XB10**

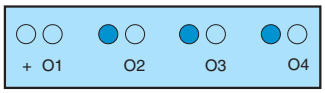



**XD26, XB26**

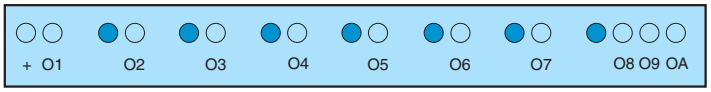



### Solid state outputs

**XD10**



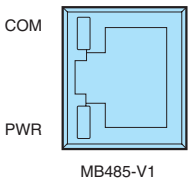

**XD26**



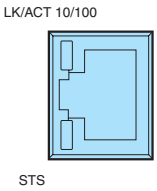
# ➜ Input/output installations: Extensions

## "Sandwich" communication extensions : XN03, XN05, XN06

**XN03, XN06**

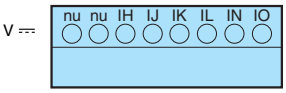


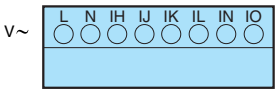

**XN05**



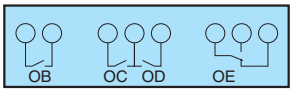

## Digital "Sandwich" extensions : XE10

### Inputs



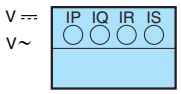

### Relay outputs



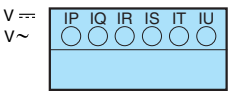

## Digital termination extensions : XR06, XR10, XR14

### Inputs

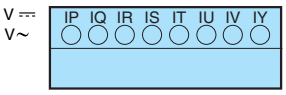
**XR06**




**XR10**

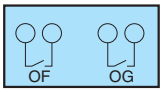



**XR14**

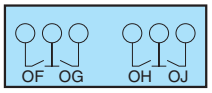



### Relay outputs

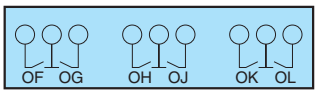
**XR06**




**XR10**

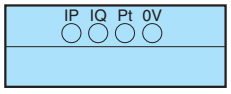



**XR14**

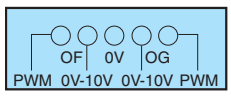



## Analogue termination extension : XA04

### Inputs




### Outputs



# Millenium 3 accessories

## Programming tools and software

- **Millenium 3 software: multilingual software, intuitive operation**
- **Memory card for loading the application and updating the on-board software (firmware)**

**Millenium 3 Software**

**Memory cartridge**

### Part numbers

| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | **88970111*** |
| M3 ALARM | Alarm management software (CD-ROM) | **88970116**** |
| PA | EEPROM memory cartridge | **88970108** |

### Comments

* Compatible with Windows 2000, NT 4.0 SP5, XP 300 MHz Pentium (Pentium II 600 MHz recommended) 128 MB RAM (256 MB recommended)
** Used with the modem communication interface (M3MOD)

## Connection accessories

- **Direct connection to all types of PC: serial, USB**
- **Wireless "Bluetooth" connection for applications that are complex in terms of access**

**Serial cable**

**USB cable**

**Bluetooth interface**

### Part numbers

| Type | Description | Code |
|---|---|---|
| PA | 3 m serial link cable: PC → Millenium 3 | **88970102** |
| | 3 m USB link cable: PC → Millenium 3 | **88970109** |
| | Millenium 3 → Bluetooth interface (class A 10 m) | **88970104** |
| | Bluetooth → USB adaptor (class A 10 m) | **88970110** |
| | 1.80 m serial link cable: DB9/DB9 | **88970123** |

## Removable connectors

- **Millenium 3 can be removed for speedy replacement of the controller**
- **Cable connection memory to exclude the risk of errors on reconnection**

**Removable connector kit**

### Part numbers

| Type | Description | Code |
|---|---|---|
| MA | Removable kit for CD12 or CB12 | **88970310** |
| | Removable kit for CD20 or CB20 | **88970311** |
| | Removable kit for XD26 or XB26 | **88970312** |

### General characteristics

| | |
|---|---|
| Screw terminals connection capacity | Cable diameter 0.14 → 2.5 mm² AWG 22 - 12 |
| Max. current | 12 A |

## Faceplates

- **IP67: sealing on front panel, Panel-mounting of the Millenium 3 .**
- **IP40: Direct access to the front of the controller, Possibility of Labelling (marking laser)**

IP67

IP40

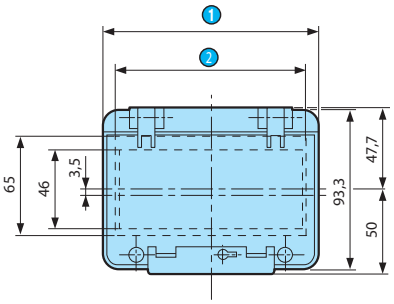


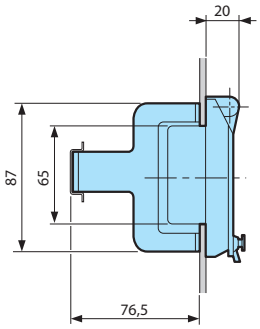
## Part numbers

| Type | Description | Code |
|---|---|---|
| MA | IP67 sealed faceplate for the following products:<br>- XD10 or CD12 | 89750160 |
| | IP67 sealed faceplate for the following products:<br>- XD10 + XR06 or XN03 or XN05 or XA04<br>- CD20 or XD26<br>- XD10 + XN03 or XN05 + XR06 or XA04<br>- XD10 + XR10 or 14 | 89750161 |
| | IP67 sealed faceplate for the following products:<br>- XD26 + XR06 or XN03 or XN05 or XA04<br>- XD10 + XN03 or XA04 + XR10 or 14<br>- XD10 + XE10 + XR06 or XA04<br>- XD26 + XN03 or XN05 + XR06 or XA04<br>- XD26 + XR10 or 14<br>- XD10 + XE10 + XR10 or 14<br>- XD26 + XE10 + XR06 or XA04<br>- XD26 + XN03 or XN05 + XR10 or 14 | 89750162 |
| | IP40 faceplate: CD12 or XD10 | 88970809 |
| | IP40 faceplate: CD20 or XD26 | 88970810 |

## Dimensions (mm)

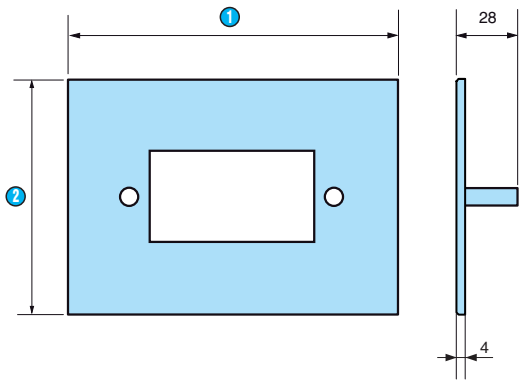
**IP67**



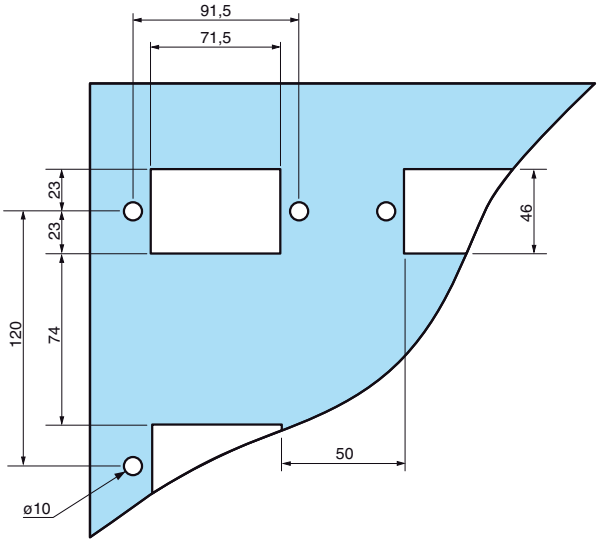




1 88750160 = 91
88750161 = 162
88750162 = 257.4
2 88750160 = 76.5
88750161 = 147.5
88750162 = 248.5

**IP40**




1 88750160 = 91
88750161 = 162
88750162 = 257.4
2 88750160 = 76.5
88750161 = 147.5
88750162 = 248.5



# ➜ Remote LCD alphanumeric displays (Modbus communication)

- **Set and parameterise your application data in advance**
- **Backlit LCD screen (72 x 20 mm) with 4 lines of 20 characters and keypad with 8 keys, 4 of which can be renamed**
  - **Three-colour screen: 3 colours green/orange/red**
  - **Monochrome screen: Monochrome green**
- **Size of characters can be configured to optimise readability**
- **Communicates with the Millenium 3 via Modbus extension XN06 or XN03**
- **The Runtime kit includes:**
  - **1 three-colour or monochrome LCD screen**
  - **1 Modbus extension XN06**
  - **1 RS485 cable**
- **The Programming kit includes:**
  - **1 three-colour or monochrome LCD screen**
  - **1 Modbus extension XN06**
  - **1 RS485 cable**
  - **1 programming software package for the display with a compatible RS232 cable (88950105)**
- **Display is used as a Master (or can be configured as a Slave)**

**Three-colour screen**

**Monochrome screen**

## Part numbers

| Type | Designation | Code |
|---|---|---|
| RD | Runtime kit with three-colour screen | **88970421** |
| | Runtime kit with monochrome screen | **88970422** |
| | Programming kit with monochrome screen | **88970844** |
| | Programming kit with three-colour screen | **88970849** |

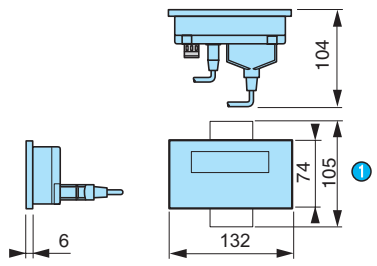
## General characteristics

| | |
|---|---|
| **Environmental characteristics** | |
| Certifications | UL, CSA |
| Conformity to standards | IEC 61131-2, IEC 60068-2-6, IEC 60068-2-27, CSA n°14 |
| Operating temperature | 0 → +55°C |
| Storage temperature | -20 → +60°C |
| Relative humidity no condensation acc. to IEC 60068-2-3 | 95% max. |
| Protection rating | In accordance with IEC/EN60529<br>IP65 on front panel (UL type 4, 4X)<br>IP20 on rear panel |
| Dimensions (l x h x p) | 132 x 74 x 31 mm |
| Panel cut-out | 119.4 x 63 mm |
| **Electrical characteristics** | |
| Supply voltage | 24 V ⎓ |
| Voltage limits | 18 → 30 V ⎓ |
| Ripple | 5% max. |
| Consumption | 200 mA max. |
| **Mechanical characteristics** | |
| Mounting | Flush-mounted, fixed with 2 spring clips supplied pressure-mounted for panel thicknesses from 1.5 to 6 mm |
| Display protection | Polyester |
| Keyboard material | Polyester autotex UV |
| Connection | Removable 3-pin screw terminal |
| Connection capacity | 1.5 $mm^2$ |
| Connection | Serial via 25-pin female SUB D connector |
| **Display characteristics** | |
| Description | Backlit LCD<br>4 lines of 20 characters to 1 line of 5 characters (configurable)<br>Communication status indicated by LED (three-colour screen)<br>Alarm indicators and function keys (three-colour screen)<br>Master mode display or Slave mode |

**Comments**

These kits are used in conjunction with expandable Millenium 3 products (XD10 and XD26) 24 V ⎓. To be ordered separately.
The XN06 exchanges more words (8) than the XN03 (4) but with different addresses

## Dimensions (mm)




1 Dimensions (mm) including spring clips



Crouzet

# ➜ Remote LCD displays/keypads

- Direct link with Millenium 3 via cable
- Set and parameterise your application data in advance
- Backlit LCD screen with 4 lines of 18 characters and keypad with 6 keys or 10 keys and 4 LEDs
- Direct communication with the Millenium 3 via the programming port
- Plug and play: No additional software (the function keys and LEDs are controlled by the Millenium 3 SOFT Slin/Slout FBD functions)
- Check bit for controlling communication
- Universal screen compatible with any Millenium 3 logic controller (standard, budget, expandable, bare board, resin board)

**Remote LCD screen / keypad**

**Remote LCD screen / keypad + 4 function buttons + 4 LEDs**

## Part numbers

| Type | Designation | Code |
|---|---|---|
| RD | Remote LCD screen/keypad | 88970410 |
| | Kit with remote LCD screen/keypad + 3 m cable (88970102) | 88970412 |
| | Remote LCD screen/keypad + 4 function keys + 4 LEDs | 88970411 |
| | Kit with remote LCD screen/keypad + 4 function keys + 4 LEDs + 3 m cable (88970102) | 88970413 |

## Accessories

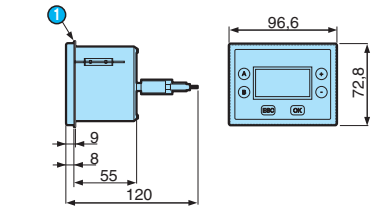
| Type | Description | Code |
|---|---|---|
| MA | IP65 protective membrane (in accordance with DIN 40050 and EN60529) | 88970414 |
| PA | 3 m serial link cable: PC → Millenium 3 | 88970102 |
| PA | 1.80 m serial link cable: DB9/DB9 | 88970123 |

## General characteristics

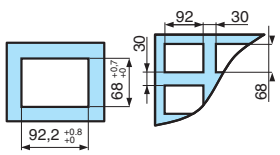
**See page 22, except for the characteristics below:**

| | |
|---|---|
| **Environmental characteristics** | |
| Certifications | UL, CSA (pending) |
| Dimensions (l x h x p) | 96.6 x 72.8 x 63 mm |
| Panel cut-out | 92 x 68 mm |
| Protection rating | IP54 on front panel<br>IP20 on rear panel |
| **Electrical characteristics** | |
| Supply voltage | 24 V ⎓ |
| Voltage limits | - 20%/+ 25% or 19.2 → 30 V ⎓ (including ripple) |
| Consumption | 1.5 W (88970410)<br>2 W (88970411) |
| Protection against polarity inversions | Without effect |
| **Mechanical characteristics** | |
| Mounting | Flush-mounted, fixed with 2 clips (supplied) |
| Display protection | Polyester |
| Keyboard material | Polyester |
| Housing material | Self-extinguishing UL94V1 |
| Connection | Removable 2-pin terminal |
| Connection | Serial via 9-pin male SUB D connector |
| Cable length | 3 m maximum |
| **Display characteristics** | |
| Cycle time | 20 ms + 2 Millenium 3 Controller cycles (88970410 and 88970412)<br>50 ms + 10 Millenium 3 Controller cycles (88970411 and 88970413) |
| **Comments** | |
| | If using a remote display/keypad with a Millenium 3 resin board version, order the DB9/DB9 serial link cable separately (Part no. 88970123) |

## Dimensions (mm)




1 Seal



# ➜ Remote LED display - Input 0-10 V

- Set your application data in advance
- Display (36 x 72) with 4 x 14 mm red digits
- Configurable display range
- 0-10 V input
- IP65 degree of protection on front panel

Remote LED display

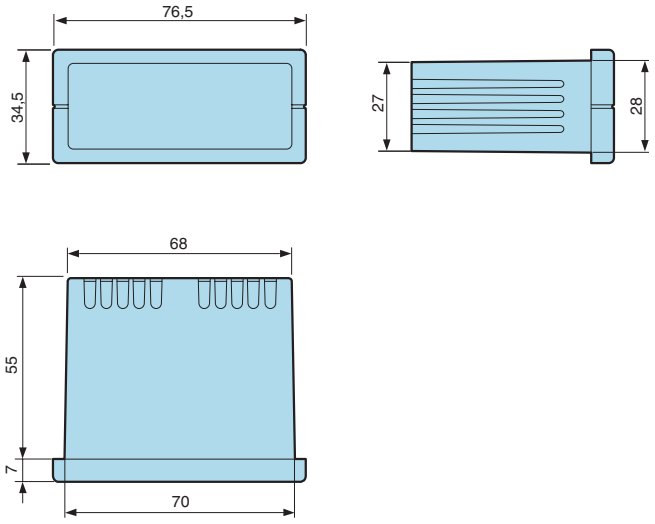
## Part numbers

| Type | Description | Supply | Code |
|---|---|---|---|
| RD | Display with 4 x 14 mm red digits | 24 V ⎓ | 88950400 |

## General characteristics

| | |
|---|---|
| **Environmental characteristics** | |
| Certifications | UL |
| Conformity with the EMC directive | EN 61000-6-4, EN 61010-1 |
| Protection rating | In accordance with IEC/EN 60529:<br>IP65 on front panel<br>IP20 on rear |
| Operating temperature | -10 → +55°C |
| Dimensions (l x h x p) | 36 x 72 x 61 mm |
| Panel cut-out | 71 x 29 mm |
| **Electrical characteristics** | |
| Supply | 24 V ⎓ |
| Tolerance | ± 10% |
| Consumption | <1 W |
| Input voltage | 0 → 10 V ⎓ |
| **Mechanical characteristics** | |
| Mounting | Flush-mounted |
| Connection | Terminal block |
| **Display characteristics** | |
| Height of digits | 14 mm |
| Number of digits | 4 |
| Colour | Red |
| Range | -1999...5999 with selectable decimal point |
| Device accuracy (full scale) | ≤ ± 0.3% of interval |
| **Comments** | |
| * Can be connected directly to an analogue output or via a PWM/0-10 V converter | |

## Dimensions (mm)



# ➜ Potentiometer Ø 22 mm

- **Direct-read potentiometer (controlled externally) Ø 22 mm**
- **IP65 degree of protection on front panel**
- **Directly compatible with the "Potentiometer" parameter of an analogue input on the Millenium 3**

**Potentiometer**

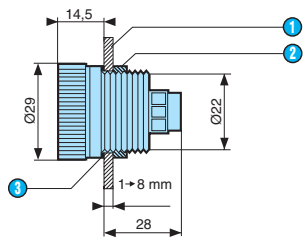
## Part numbers

| Type | Description | Alimentation | Supply |
|---|---|---|---|
| EP | External potentiometer for value adjustment | 30 V ⎓ max | **88950109** |

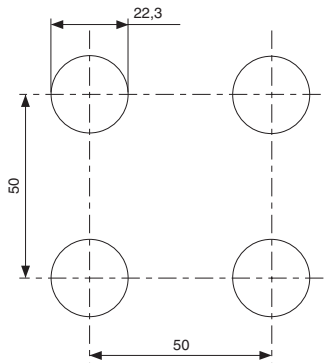
## General characteristics

| | |
|---|---|
| **Environmental characteristics** | |
| Protection rating | In accordance with IEC/EN 60529:<br>IP65 on front panel<br>IP10 on terminal block |
| Operating temperature | -20 → +60°C |
| Storage temperature | -20 → +70°C |
| **Electrical characteristics** | |
| Ohmic value | 4700 Ω |
| Tolerance | ± 20% |
| Power | 150 mW |
| **Mechanical characteristics** | |
| Screw terminals connection capacity | 1 x 4 mm² rigid<br>1 x 2.5 mm² flexible |

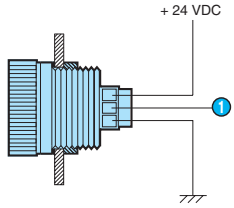
## Dimensions (mm)




1 Panel
2 Nut
3 Seal




## Connections




1 Analogue input

# ➜ Signal converters

- **Current/voltage conversion of Millenium 3 input signals**
- **PWM/voltage conversion of Millenium 3 output signals**

**Current/voltage converter**

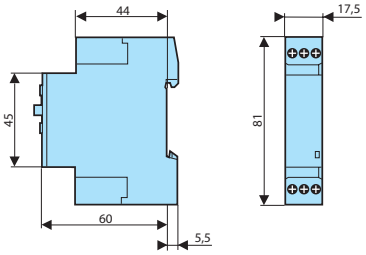
## Part numbers

| Type | Description | Input | Output | Code |
|---|---|---|---|---|
| AC | 0-20 mA/0-10 V input converter | 4 | 4 | **88950108** |
| | PWM/0-10 V output converter | 1 | 1 | **88950112** |

## General characteristics

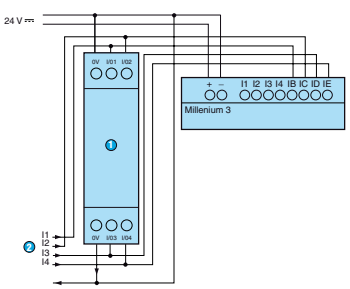
| | 88950108 | 88950112 |
|---|---|---|
| **Environmental characteristics** | | |
| Certifications | UL | UL |
| Protection rating | In accordance with IEC/EN 60529:<br>IP20 terminal block<br>IP50 casing | In accordance with IEC/EN 60529:<br>IP20 |
| Operating temperature | -20° → +85°C | -20° → +55°C |
| Storage temperature | -40° → +85°C | -25° → +70°C |
| **Electrical characteristics** | | |
| Supply | - | 24 V ⎓ (+10% / -15%) |
| Input current | 0-20 mA | - |
| Output voltage | 0-10 V ± 5% | 0-10 V ± 5% |
| Impedance | 500 Ω (input) | 250 Ω (maximum load) |
| Max. current | 40 mA | 40 mA (output) |
| Input PWM | - | 24 V ⎓ (+20% / - 15%, 120 Hz) |
| Short-circuit protection | - | Yes |
| Protection against polarity inversions | - | Yes (>10 s) |
| Absorbed power | 0.8 W | 1.3 W |
| Conversion time | - | 440 ms (max) :<br>0 → 100% & 100% → 0 |
| **Mechanical characteristics** | | |
| Cable length | - | < 10 m with shielded cable |

## Dimensions (mm)



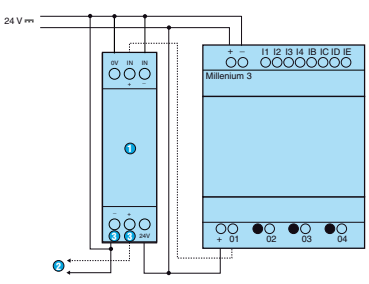

## Connections

**0-20 mA/0-10 V input converter**




1. Converter 0-20 mA
2. Input 0-20 mA

**PWM/0-10 V output converter**




1. Converter PWM/0-10 V
2. Analog output 0-10 V

# ➜ Temperature converters

- **Compatible with Millenium 3 analogue inputs**
- **Can be used to diversify the type of sensors for analogue inputs (See page 54-55)**

**Temperature converter**

## Part numbers

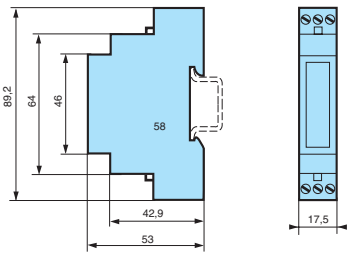
| Type | Description | Input | Input range | Output | Code |
|---|---|---|---|---|---|
| AC | Converter | Pt 1000 3-wire | -20 ➞ +150°C | 0-10 V | **88950150** |
| | Converter | Pt 100 3-wire | -40 ➞ +40°C | 0-10 V | **88950151** |
| | Converter | Pt 100 3-wire | 0 ➞ +100°C | 0-10 V | **88950152** |
| | Converter | Pt 100 3-wire | 0 ➞ +250°C | 0-10 V | **88950153** |
| | Converter | Thermocouple J | 0 ➞ +300°C | 0-10 V | **88950154** |
| | Converter | Thermocouple K | 0 ➞ +600°C | 0-10 V | **88950155** |

## General characteristics

| | |
|---|---|
| **Environmental characteristics** | |
| Certifications | UL |
| Protection rating | In accordance with IEC/EN 60529:<br>IP40 on front panel<br>IP20 on terminal block |
| Operating temperature | -10 ➞ +55°C |
| **Electrical characteristics** | |
| Supply | 24 V ⎓ |
| Operating limits | ± 10% or 21.6 ⎓ ➞ 26.4 V ⎓ |
| Max. Output power | < 1 W |
| Output voltage | 0 ➞ 10 V ⎓ |
| Device accuracy (full scale) | ± 1% |

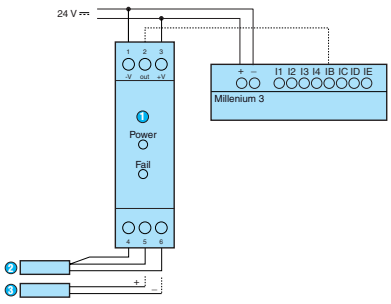
## Dimensions (mm)

**Temperature converter**




## Connections

**Temperature converter**




1. Temperature converter: Pt100/Pt1000 TC J/K
2. Pt100 3-wire
3. Thermocouple

# Analogue pressure transmitters 4-20 mA

- Dry, robust pressure transmitter
- Ceramic variable capacitance sensing element
- Withstands high static and dynamic overload pressures
- Standard Ranges between 0.25 bar and 100 bar (Abs / Rel)
- Fully Factory Calibrated & Temperature Compensated
- Viton Media Ring most suitable for all generic process media
- Wide Temperature Range (-40°C / 125 °C)
- 4 dedicated function blocks (Pressure gain, Flow, Level, HL Switch) included in the M3 SOFT

Pressure tramsmitter

## Part numbers

| Measurement range | Gauge* | Absolute** |
|---|---|---|
| 0 → 0.25 bar | 89210001 | |
| 0 → 1 bar | 89210002 | 89210007 |
| 0 → 2.5 bar | 89210003 | 89210008 |
| 0 → 10 bar | 89210004 | 89210009 |
| 0 → 25 bar | 89210005 | 89210010 |
| 0 → 60 bar | 89210006 | |
| 0 → 100 bar | | 89210011 |

*in relation to atmospheric pressure
**in relation to the vacuum

## Accessories

| Type | Designation | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |

## Comments

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Adjustment range (bar) | 0 → 0.25 | 0 → 1 | 0 → 2.5 | 0 → 10 | 0 → 25 | 0 → 60 | 0 → 100 |
| Acceptable overpressure (bar) | 1.25 | 5 | 12.5 | 30 | 75 | 90 | 150 |
| Burst pressure (bar) | 2.5 | 10 | 25 | 50 | 125 | 180 | 300 |
| Pressure Port & outer housing | Inox 1.4305 | | | | | | |
| Connection of pressure | G 1/4 M Manometer DIN 16288 | | | | | | |
| Connector Housing | Polyamide (PA) | | | | | | |
| Standard Internal Primary Media Ring Material | Viton -17°C → 125°C | | | | | | |
| Electrical connections | L-Connector DIN 43650, PG11, IP65 | | | | | | |
| Conformity to standards | 89/336/EWG interference emission and immunity see EN 61 326 | | | | | | |

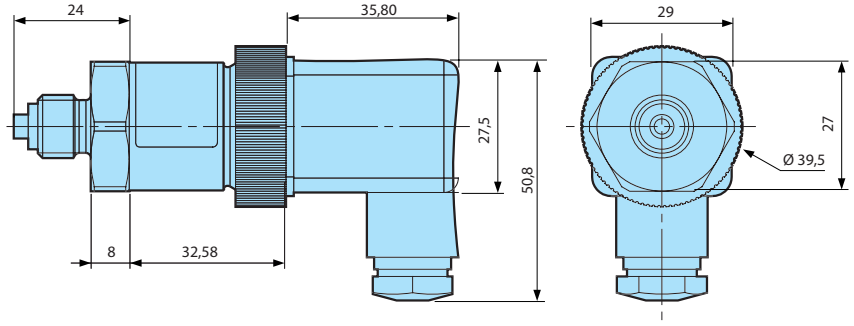
## General characteristics

| | |
|---|---|
| Supply | 12 → 32 V ⎓ |
| Output signal | 4 → 20 mA / 2 wire |
| Maximum loop resistance | 50 → 1000 Ω - Rmax = (V power supply - 12) / 0.02 A |
| Response time | < 5 ms, 63% of full scale |

## Electrical characteristics

| | | | |
|---|---|---|---|
| Operating temperature | -30 → 20 °C | 20 → 80 °C | 80 → 100 °C |
| Linearity | ± 0.2% of full scale | ± 0.1% of full scale | ± 0.2% of full scale |
| Stability | < 1% / year | ± 0.2% / year | < 1% / year |
| Total Error Band (including Repeat Hysteresis) | ± 2% max. | ± 1% max. | ± 2% max. |

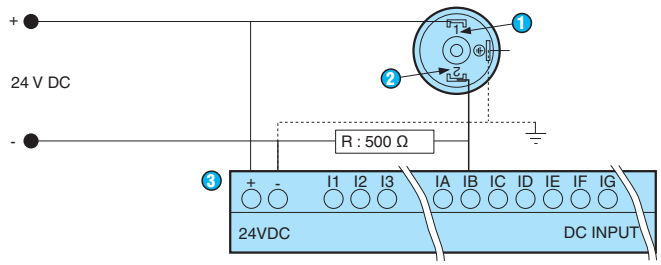
## Dimensions (mm)




Nb: To envisage a disc in agreement with the type of connection of pressure

## Connections

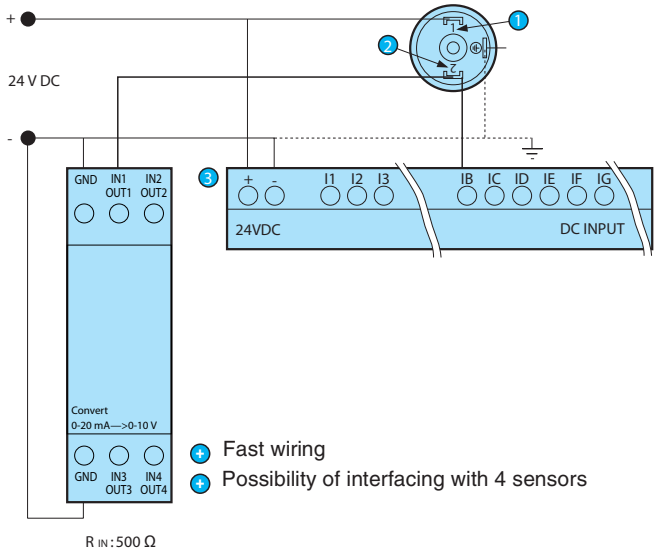
**With resistor (500 Ω recommended)**




⊕ Simple & economic solution

1 Terminal +
2 Terminal -
3 M3 - 24 V ⎓

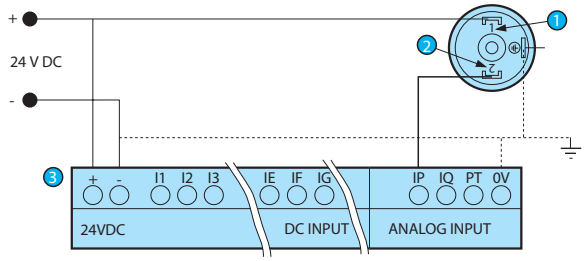
**With converter 88950108**




⊕ Fast wiring
⊕ Possibility of interfacing with 4 sensors

1 Terminal +
2 Terminal -
3 M3 - 24 V ⎓

**With analog extension XA04 88970241**



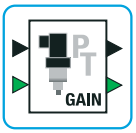

⊕ High resolution
⊕ Fast wiring

1 Terminal +
2 Terminal -
3 M3 - 24 V ⎓ Extendable versions

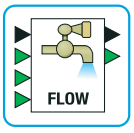
## Product adaptations

- **Internal Primary Media Seal Ring Material**
- **Other Pressure Range**

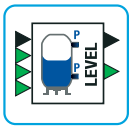
## Dedicated function blocks



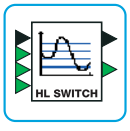

**Pressure gain:**
This function provides for interfacing between the sensors and the M3




**Flow:**
This function makes it possible to calculate the flow of a fluid in a conduit using a pressure reducing orifice or or for measuring a dynamic pressure



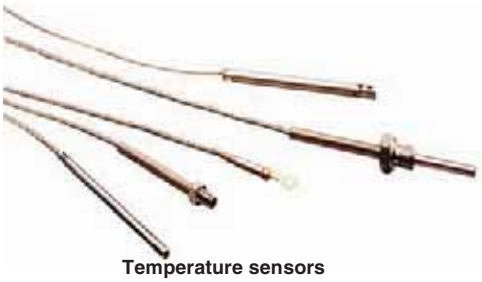

**Level:**
This function provides for calculating the level of the liquid in a tank,whether open or closed, and whether the liquid's density is constant or not,using pressure sensors.




**HL Switch:**
This function compares the value measured against 5 thresholds

# ➜ Temperature sensors: Pt 100 & Thermocouple

- **Thermocouple J:**
  - **Nickel-plated brass eyelet**
  - **Stainless steel casing**
  - **Stainless steel sheath**
- **Thermocouple K**
- **Pt 100 Class B:**
  - **Stainless steel sheath**
  - **Aluminium vee**
- **Connection / Sub-base / Flange**
- **Pt100 for use with XA04 extension (See pages 40-41)**
- **Thermocouple for use with temperature converter (see page 51)**



**Temperature sensors**

## Part numbers

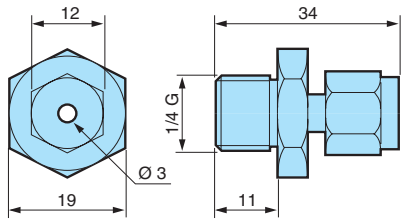
| Type | Description | Temperature | Characteristics | Code |
|---|---|---|---|---|
| Thermocouple / Pt100 | Thermocouple probe J | max: 400 °C | Thermocouple probe J with nickel-plated brass eyelet - Ø 6.5 mm, connection sleeve - Ø 5 x 30 mm in stainless steel 316 L. - Glass filament cable with stainless steel braid: 2 m long - Hot junction isolated from earth | **79696030** |
| | Thermocouple probe J | max: 600 °C | Thermocouple probe J with casing - St. steel 304 L Ø 3 mm: 500 mm long PVC cable: 2 m long - Junction cannot be removed - Junction isolated from earth | **79696031** |
| | Thermocouple probe J | max: 400 °C | Thermocouple probe J with sheath - ST steel 316 L Ø 5 mm: 30 mm long Glass filament cable with stainless steel braid: 2 m long - Junction isolated from earth | **79696033** |
| | Thermocouple probe J | max: 400 °C | Thermocouple probe J with sheath - St. steel 16 L Ø 6 mm: 200 mm long Glass filament cable with stailess steel braid: 2 m long - Junction isolated from earth | **79696032** |
| | Thermocouple probe K | max: 1100 °C | Thermocouple probe K with casing - St. steel 304 L Ø 3 mm: 500 mm long PVC cable: 2 m long - Junction isolated from earth | **79696034** |
| | Pt100 probe Class B | max: 200 °C | Pt100 probe Class B with sheath - St. steel 316 L Ø 6 mm: 200 mm long Silicon teflon cable: 2 m long - 3-wire assembly | **79696035** |
| | Pt100 probe Class B | max: 200 °C | Pt100 probe Class B - Aluminium vee: 50 mm long - Silicom teflon cable: 2 m long - 3-wire assembly - Supplied with fixing clamp | **79696037** |
| | Pt100 probe Class B | max: 400 °C | Pt100 probe Class B with sheath - St. steel 316 L Ø 6 mm: 30 mm long Glass filament cable with stainless steel braid: 2 m long - 2-wire assembly | **79696036** |

## Accessories

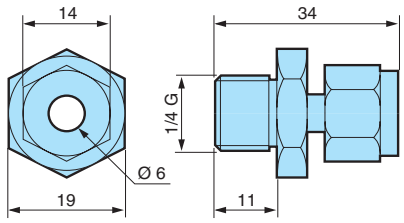
| Accessories | Characteristics | Code |
|---|---|---|
| Connection | Sliding connection 1/4 " BSP CYL. St. steel 316 L Ø 3 mm | **79696038** |
| | Sliding connection 1/4 " BSP CYL. St. steel 316 L Ø 6 mm | **79696039** |
| | Sliding connection 1/2 " BSP CYL. St. steel 316 L Ø 6 mm | **79696040** |
| Sub-base | Sliding connection 1/4 " BSP CYL Ø 12 mm Nickel-plated steel | **79696041** |
| Flange | Inox flange Ø 6 mm | **79696042** |

## Dimensions (mm)

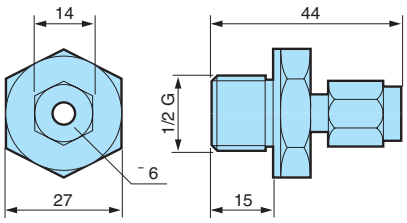
**Connection: 79696038**




**Connection: 79696039**

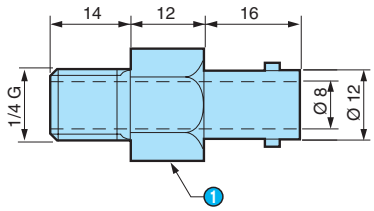



**Connection: 79696040**



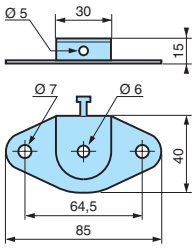
## Dimensions (mm)

**Sub-base: 79696041**

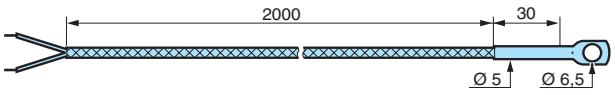



1 17 across flat

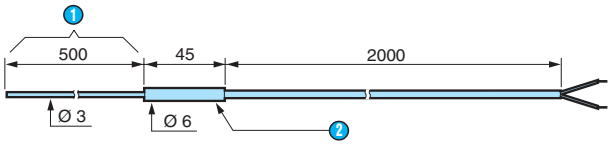
**Flange: 79696042**




**Thermocouple probe J : 79696030**

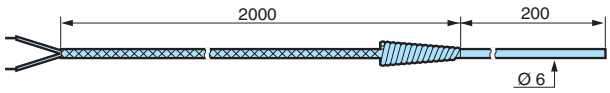



**Thermocouple probe J : 79696031**

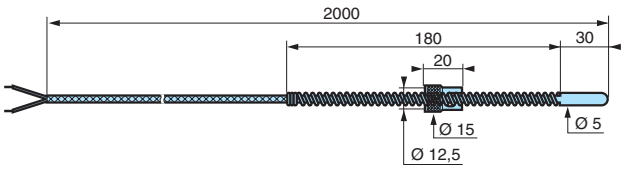



1 Flexible
2 Stainless steel sleeve

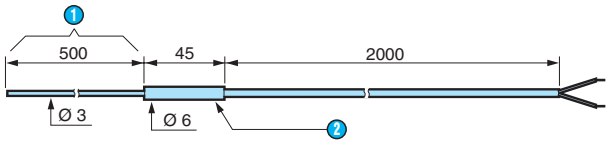
**Thermocouple probe J : 79696032**




**Thermocouple probe J : 79696033**

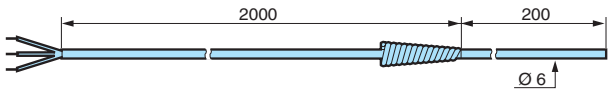



**Thermocouple probe K : 79696034**

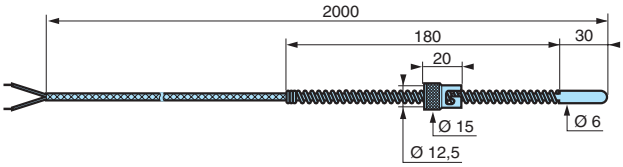



1 Flexible
2 Stainless steel sleeve

**Pt100 probe Classe B : 79696035**




**Pt100 probe Classe B : 79696036**




**Pt100 probe Classe B : 79696037**


1 Aluminium vee (This part is removable)

# ➜ Temperature sensors

■ **Integrated converter: 0-10 V ⎓ output for direct connection to the Millenium 3 analogue inputs**

Space/Zone Sensor

Ventilation duct

External Sensor

## Part numbers

| Type | Description | Range | Accuracy | Supply | Protection casing | Protection probe | Code |
|---|---|---|---|---|---|---|---|
| AS | Zone/space | -10 → +40°C | -0.2 °C + 1.2°C | 24 V ⎓ | IP30 | | **89750150** |
| | Ventilation duct | -10 → +60°C | -0.2 °C +1.9°C | 24 V ⎓ | IP65 | IP30 | **89750151** |
| | External | -10 → +40°C | -0.2 °C +1.2°C | 24 V ⎓ | IP65 | | **89750152** |
| | Remote/submersible probe | -10 → +150°C | -0.2 °C +1.2°C | 24 V ⎓ | IP65 | IP67 | **89750153** |
| | Remote/submersible probe | -40 → +20°C | -0.2°C +1.9°C | 24 V ⎓ | IP65 | IP67 | **89750155** |

## Accessories

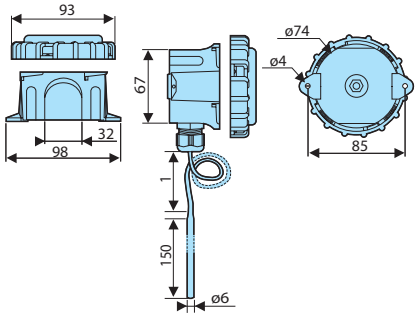
| Accessories | Operating temperature | Operating pressure | Code |
|---|---|---|---|
| Copper protective sleeve | -20 → +100°C | 10 bar | **89750146** |
| 316 stainless steel protective sleeve | -20 → +400°C | 16 bar | **89750147** |
| Heat transfer compound | - | - | **18373112** |

## General characteristics

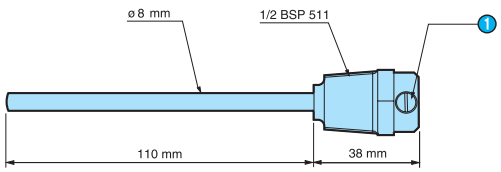
| | |
|---|---|
| **Environmental characteristics** | |
| Ambient temperature | -10 → +60°C |
| Ambient humidity | 5 → 95% RH |
| Housing material | Self-extinguishing |
| **Electrical characteristics** | |
| Supply voltage | 24 V ⎓ (± 10%) |
| Output | 0 → 10 V ⎓ |
| Temperature coefficients Derating | 0.01%/°C of full scale |
| Temperature coefficients Offset | 1.5 mV / °C |

## Dimensions (mm)

**89750153 and 89750155**

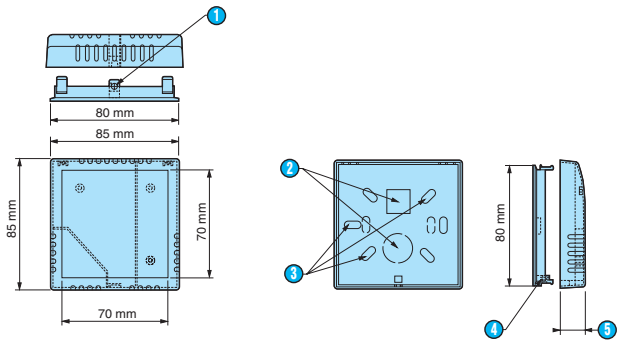



**Accessory for 89750153 and 89750155**



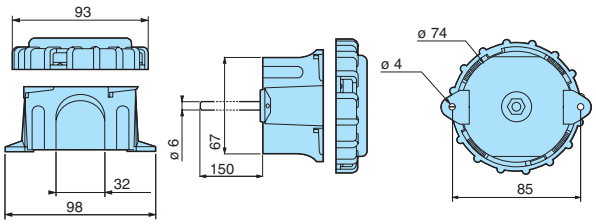

1 M4 screw

**89750150**

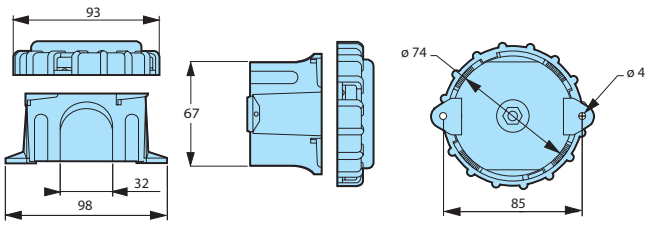



1. Ø3 mm for M3 x 8 screw
2. Cut-outs made prior to delivery
3. Fixing holes
4. Indentation for M3 square nut
5. Total depth 26 mm

**89750151**




**89750152**



# ➜ DC/DC converters

- **Power supplies for extended power ranges**
- **Provide your devices with a constant supply voltage**
- **Primary/secondary isolation**

**Output convertor 12 V ⎓**

**Output convertor 24 V ⎓**

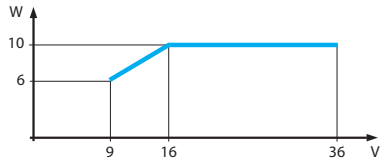
## Part numbers

| Type | Input | Output | Nominal power | Code |
|---|---|---|---|---|
| PS | 9-18 V ⎓ | 12 V ⎓ | 10 W | **88950320** |
| | 9-36 V ⎓ | 24 V ⎓ | 6 ➞ 10 W | **88950321** |

## General characteristics

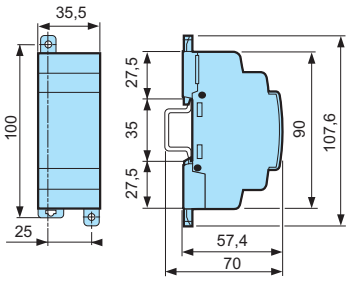
| | 88950320 | 88950321 |
|---|---|---|
| **See page 20, except:** | | |
| Certifications | UL & CSA pending | UL & CSA pending |
| Output voltage | 12 V ⎓ ± 5% | 24 V ⎓ ± 5% |
| Overvoltage | 20 V ⎓ max. | 40 V ⎓ max. |
| Input limits | 9 ➞ 18 V ⎓ (10 W available) | 16 ➞ 36 V ⎓ (10 W available)<br>9 ➞ 16 V ⎓ (see graph) |
| Immunity from micro power cuts | A 10 W:<br>> 1 ms for 9 V < U < 12V<br>5 ms for U ≥ 12 V<br>A 6 W:<br>> 5 ms for all voltage range | A 10 W: > 1 ms for 16 V < U < 18 V<br>5 ms for U ≥ 18 V<br>A 6 W: > 1 ms for U < 12 V<br>> 5 ms for 12 V ≤ U < 18 V<br>> 10 ms for U ≥ 18 V |
| Isolation primary / secondary | 1500 V ⎓ | 1500 V ⎓ |
| Operating temperature | -30 ➞ +70° C | -30 ➞ +70° C |
| Storage temperature | -40 ➞ +80° C | -40 ➞ +80° C |

## Curves




(Input limits)

## Dimensions (mm)



# ➜ Millenium power supply

- **With a switch mode power supply, regulated and protected against overloads and short-circuits, these new power supply units are easily integrated in switchboards and enclosures.**
- **The potentiometer can be used to set the output voltage between 100 and 120% (24 V⎓ versions) to compensate for any voltage drops on the line.**
- **The LED continuously signals the presence of voltage at the output and, when flashing, triggering of the self-protection.**
- **Broad range of supply voltage**

**PS24 - 7,5 W**

**PS24 - 20 W**

**PS24 - 60 W**

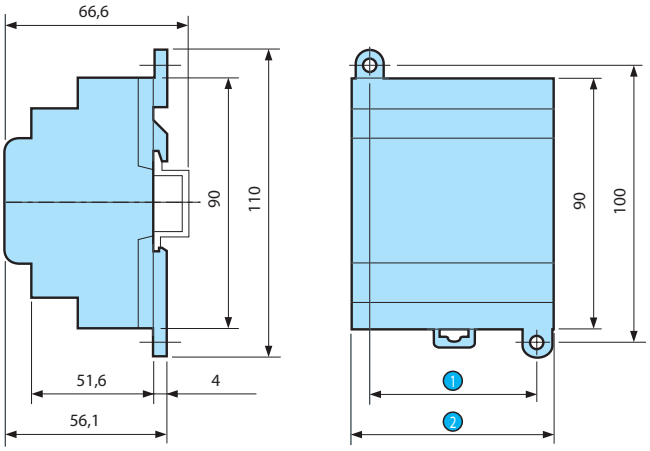
## Part numbers

| Type | Nominal output voltage | Nominal power | Nominal output current | Code |
|---|---|---|---|---|
| PS | 5 V ⎓ (4.75 V → 6.25 V) | 20 W | 4 A | **88950305** |
| | 12 V ⎓ (11.4 V → 15 V) | 25 W | 2.1 A | **88950306** |
| | 24 V ⎓ (22.8 V → 28.8 V) | 7.5 W | 0.3 A | **88950303** |
| | 24 V ⎓ (22.8 V → 28.8 V) | 15 W | 0.6 A | **88950304** |
| | 24 V ⎓ (22.8 V → 28.8 V) | 30 W | 1.2 A | **88950307** |
| | 24 V ⎓ (22.8 V → 28.8 V) | 60 W | 2.5 A | **88950302** |

## General characteristics

| | |
|---|---|
| **Environmental characteristics** | |
| Conformity to standards | IEC/EN 60950-1<br>IEC/EN 61000-6-2<br>IEC/EN 61000-6-3<br>IEC/EN 61204-3<br>IEC/EN 55022 class B<br>IEC/EN 60364-4-41 |
| Certifications | cULus 508; cCSAus (CSA22.2 n950-1) ; TUV EN 60950-1; CE |
| Emission | Harmonic: IEC / EN 61000-3-2 |
| Operating temperature | -25 → +55°C |
| Storage temperature | -40 → +70°C |
| Protection class | According to VDE0106 1: Class 2 (Double insulation) |
| **Electrical characteristics** | |
| Input voltage | 100 → 240 V ∿ single-phase |
| Supply frequency range | 50/60 Hz (+4% / -6%)<br>or 47→ 53 Hz/57 → 63 Hz |
| Output voltage | Adjustable from 100 → 120% |
| Peak current on energisation | < 20 A (Except for 88950302: 90A during 1 ms) |
| Regulation of line and load | ± 3% |
| Immunity from micro power cuts | < 10 ms (100 V ∿)<br>< 150 ms (230 V ∿) |
| Thermal protection | Yes |
| Technology | Primary switch mode electronic power supplies |
| Short-circuit protection | Yes |
| Overload protection | Yes |
| Primary protection | Fuse gG 2 A or circuit breaker 2A curve D for 88950303, 88950304, 88950305, 88950306, 88950307<br>Fuse gG 3 A or circuit breaker 3A curve D for 88950302 |
| Reset after overload | Automatic |
| Status indication | LED at the output |
| Dielectric strength | Input / output 3000VAC / 50Hz / 1mn |
| **Mechanical characteristics** | |
| Mounting | On section, 35 x 7, 5 mm and 35 x 15 mm or on panel (2 x Ø4 mm) |
| Screw terminals connection capacity | Input connection 2 x 0.14 < 2.5 mm² (AWG26...AWG14)<br>Output connection 1 x 0.14 < 2.5 mm² (AWG26...AWG14) |

## Dimensions (mm)

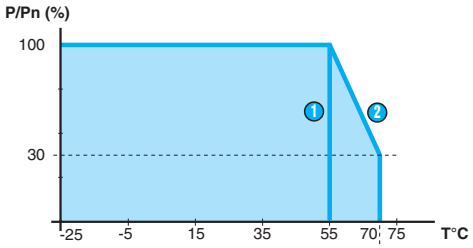



| | ① | ② |
|---|---|---|
| 88950305 | 42 | 54 |
| 88950306 | 42 | 54 |
| 88950303 | 24 | 36 |
| 88950304 | 24 | 36 |
| 88950307 | 42 | 54 |
| 88950302 | 60 | 72 |

## Curves

**Derating**

The ambient operating temperature of the Millennium power supplies is 55°C. Above this, a derating is needed upto a maximum operating temperature of 70°C.
The chart below shows the power (compared to the nominal power) that can be permanently supplied by the Millenium power supplies, depending on the operating temperature.




① 88950302
② 8895030x

# "Millenium Supply" switch mode power supply

- Electronic and regulated
- 85 to 264 VAC input
- Conforms to global standards
- Incorporated thermal protection
- PFC filter option

89450

## Part numbers

| Type | Input voltage (V) | Output voltage (V) | Nominal power | Nominal current | Reset on protection | Conforms to EN 61000-3-2 | Weight (kg) | Code |
|---|---|---|---|---|---|---|---|---|
| 89450 without PFC | 100 → 240 V ∿ | 12 V ⎓ | 60 W | 5 A | Automatic | No | 0.44 | **89450110** |
| | 100 → 240 V ∿ | 24 V ⎓ | 60 W | 2.5 A | Automatic | No | 0.44 | **89450210** |
| | 100 → 240 V ∿ | 24 V ⎓ | 100 W | 4.2 A | Automatic | No | 0.64 | **89450221** |
| | 115 / 230 V ∿ | 24 V ⎓ | 150 W | 6.2 A | Automatic | No | 0.73 | **89450231** |
| | 115 / 230 V ∿ | 24 V ⎓ | 240 W | 10 A | Automatic | No | 1.23 | **89450241** |
| 89450 with PFC | 100 → 240 V ∿ | 12 V ⎓ | 100 W | 8.3 A | Automatic | Yes | 0.64 | **89450122** |
| | 100 → 240 V ∿ | 24 V ⎓ | 100 W | 4.2 A | Automatic | Yes | 0.64 | **89450222** |
| | 115 / 230 V ∿ | 24 V ⎓ | 150 W | 6.2 A | Automatic | Yes | 0.97 | **89450232** |
| | 115 / 230 V ∿ | 24 V ⎓ | 240 W | 10 A | Automatic | Yes | 1.23 | **89450242** |

## Accessories

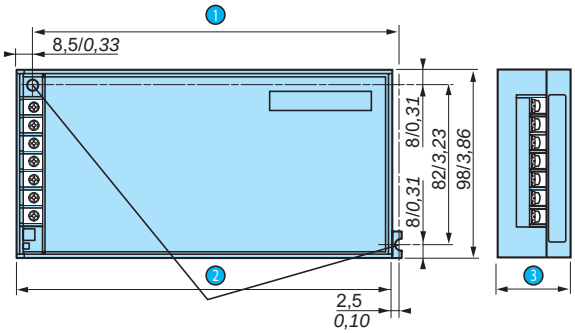
| Description | Weight (kg) | Code |
|---|---|---|
| Mounting bracket | 0.085 | **26450100** |
| Snap-on plate for 35 mm DIN rail | 0.035 | **26450101** |

## General characteristics

| | |
|---|---|
| Certifications | UL, cCSAus |
| Conformity to standards | Generic: UL 508, CSA 22.2 no. 60950<br>Safety: IEC/EN 60950-1<br>EMC: EN 61000-6-3, EN 61000-6-2<br>LF harmonic currents: EN 61000-3-2 |
| **Output circuit** | |
| Status indication | Green LED |
| Operating voltage | 12 V ⎓ - 24 V ⎓ |
| Nominal output current | 5 - 8.3 A at 12 V and 2.5 - 4.2 - 6.2 - 10 A at 24 V |
| Output voltage accuracy | ± 10% |
| Line and load regulation | ± 3% |
| Residual ripple | < 200 mV |
| Protection against short circuits | Continuous, automatic restart |
| Protection against voltage surges | U > 1, 2U out |
| Thermal protection | Yes |
| **Input circuit** | |
| Nominal voltage | 100→240 V∿ (60 and 100W), 115/230 V∿ (150 and 240W) |
| Current consumption | Ue = 240 2 A (60W) - 0.7 A (100W) - 2.5 A (150W) - 3 A (240W)<br>Ue = 100 2 A (60W) - 1.4 A (100W) - 5 A (150W) - 6 A (240W) |
| **Operating characteristics** | |
| Connection capacity | Input: 2 x 4 mm² + earth<br>Output: 2 x 4 mm² (60W) ; doubled for 100, 150 and 240W |
| Ambient storage temperature | -25→+85 |
| Relative humidity | 20→90% RH |
| Vibrations | Conforming to EN 61131-2 |
| Temperature Use | See graph |
| MTBF | >100.000 hr at 100% load (at 40°) |
| Generic immunities | Conforming to IEC 61000-6-2 |
| Immunity to electrostatic discharges | Conforming to IEC 61000-4-2 level 3 (4 kV contact/8 kV air) |
| Immunity to electromagnetic discharges | Conforming to IEC 61000-4-3 level 3 (10V/m) |
| Immunity to conducted disturbances | Conforming to IEC 61000-4-4 level 3 (2 kV), EN 61000-4-5, EN 61000-4-6 level 3, EN 61000-4-8 level 4, IEC/EN 61000-4-12 level 3 |
| Immunity to mains supply disturbances | Conforming to IEC/EN 61000-4-11 (voltage dips and interruptions) |
| Incorporated input fuse | Yes |
| Emission | Generic: conforming to EN 61000-6-3 |
| Connections | Conducted/radiated: conforming to EN 55011, EN 55022 c1B |
| Dielectric strength | Input/output: 3000∿ 50/60 Hz 1 min<br>Input/earth: 1500∿ 50/60 Hz 1 min<br>Output/earth: 500∿ 50/60 Hz 1 min |

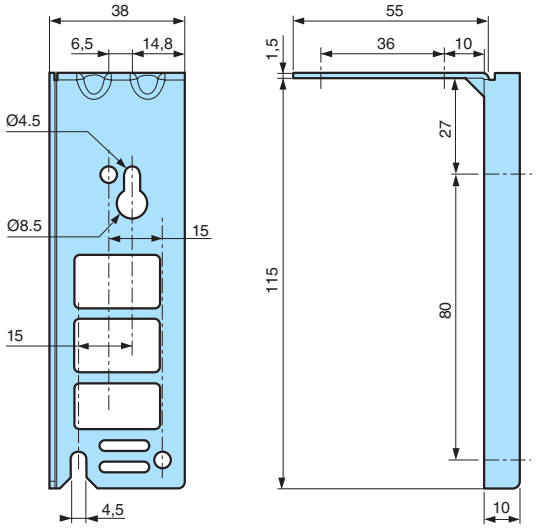
## Dimensions (mm)

### 89450 power supplies

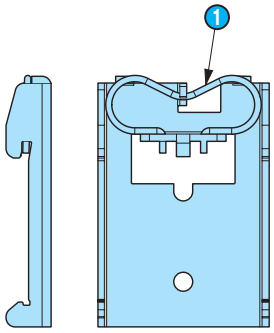



1 89450110-210 : 144 mm
89450221-231-241 : 194 mm
89450122-222-232-242 : 194 mm
2 89450110-210 : 150 mm
89450221-231-241 : 200 mm
89450122-222-232-242 : 200 mm
3 89450110-122-210-221 : 38 mm
89450231-232 : 50 mm
89450241-242 : 65 mm

### Mounting bracket



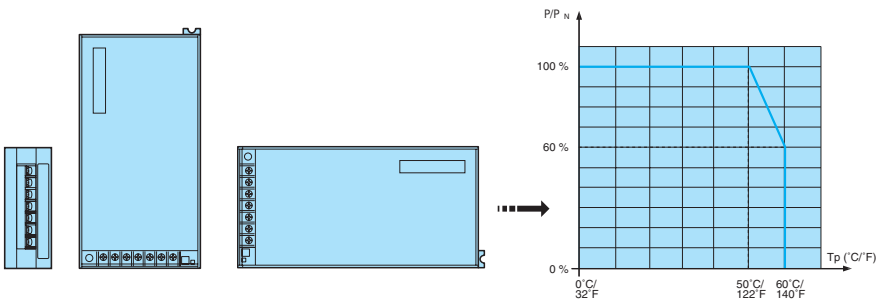

### Snap-on plate




1 Din Rail mounting bracket

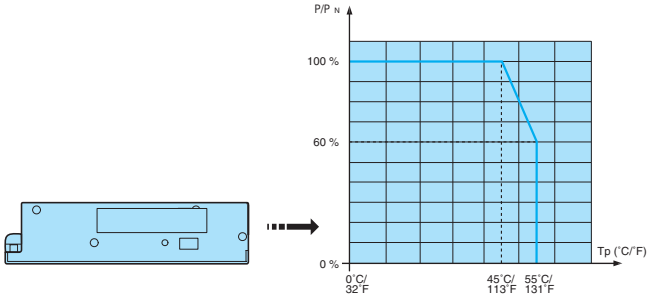
## Curves

### Derating
### Vertical mounting




1 Rated Power
2 Temperature

### Derating




1 Rated Power
2 Temperature





# For even greater customisation

■ Application-based marketing

■ Software adaptations

■ Hardware adaptations

■ Enhanced EMC tests

■ Optimised prototype tests

## A catalogue offer: **adapted products**

In addition to its **Millenium 3 Standard** logic controllers for today's automation needs, Crouzet can also offer **Millenium 3 Custom** logic controllers for specific applications such as renewable energies, water treatment, on-board products and severe environments.

This means that Crouzet can offer a **Millenium 3 Custom** "Catalogue" range of "hardened or specific" products: **"Modular"** versions designed for Custom application-specific functions, "**Bare boards**", "**Resin boards**" and **"application-specific" extensions**.

This expandable offer is subject to ongoing research in order to keep pace with the demands associated with new applications (renewable energies, networked products, etc.).

## A customisation policy: **specific products**

Crouzet can also provide **Millenium 3 Custom** solutions adapted as required to meet any specification, offering, for example, a greater number of I/O, specific extensions, dedicated connections, product groups (e.g. Millenium 3 + temperature probes), customised laser marking and "Customer" software functions.

To this end, Crouzet has set up a **Customer Adaptation Technical Service (STAC)** with expertise in the various skills required to respond to all your equipment's automation needs:

- Application-based marketing
- Electronics and software design
- Manufacture of customised products
- Prototyping
- Mechanics & connections
- EMC tests & approvals
- Sales & logistics follow-up

Whether for software adaptations, custom functions, adaptations of Millenium 3's operating or physical characteristics, Crouzet has developed extensive expertise in making specific adaptations for each project. Just take a look at the **adaptation wheel** to discover the different levels of customisation offered by Crouzet's Customer Adaptation Technical Service.

Crouzet

# Adaptation, **the practical solution!**

## Specific products

All our design and industrialisation expertise in control and automation systems at your service, to **design and create specific products** dedicated to your application.

## Standard components

A complete range of **logic controllers** available immediately to create your automation application.

Millenium 3
expanded bare board
with 16 relay outputs

Millenium 3 XD10

Millenium 3 adapted
application-specific kit

Millenium 3
Resin board

## Adapted products

Defined jointly with our technical sales teams, these **adapted products** offer the exact performance and functions you need for your application.

## Components with added value

Standard products complemented by **factory-mounted auxiliaries or accessories** (connectors, wire outputs, cables, etc.) in order to assist integration into your equipment, simplify your logistics and maximise the reliability of your installation.

# For more adaptations

■ "Modular" versions

■ "Bare board" versions

■ "Resin board" versions

■ Application-specific extensions

## Adapted products

Crouzet offers a **Millenium 3 Custom "Catalogue" range based on the Millenium 3 Standard range** whereby characteristics have been expanded or reinforced for use with "specific" applications:

■ **NEW "Modular" versions** designed for Custom application-specific functions and "application-specific" extensions.
(Part no.: 88974xxx)

- Possible to use dedicated software functions in an industrial environment.

■ **"Bare board" versions** with 12 or 20 I/O on pedestals
(Part no.: 8897000x & 8897001x)

- Ease of integration into an existing casing or system (mother/daughter boards).
- Optimised cost for integration by OEMs.

■ **"Resin board" versions** for severe environments (vibration/shock/bump resistance and extended temperature range) with an optional removable connectors kit including a foolproofing system.
(Part no.: 88973xxx)

- Resistance to damp or confined conditions (non-ventilated equipment).
- Vibration/shock/bump resistance.

■ **NEW "Application-specific" analogue extensions** (XA03 & XA04W).
(Part no.: 889728xx)

- **XA03**: direct control of 3 Pt 100 probes without the need for an external converter.
- **XA04W**: builds on the core expertise of the Millenium 3 (physical control of pumps and filtration) by using an extension which measures the parameters required for good water quality: pH, ORP, conductivity.

■ **Applications**
- **XA03**: temperature regulation (3 Pt100)
- **XA04W**: water quality control for swimming pools, ponds and fountains.

**For details of the characteristics and part numbers of the Millenium 3 Custom range, see pages 70-81.**

Crouzet

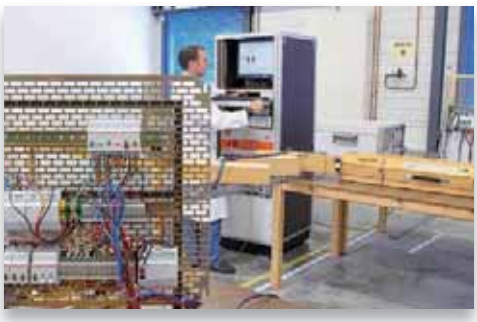

# **Hardware** adaptation capability

## **Specific** products

Crouzet can also provide **Millenium 3 Custom solutions adapted as required** to meet any specification:

### Toughening

- Resistance to mechanical stresses: making the Millenium impervious to mechanical demands (shocks/vibrations/bumps and falls).
  *For example: other military standards.*
- Resistance to climatic conditions and severe environments: making the Millenium impervious to damp and dripping water, climatic conditions and severe environments (liquids and gases).
  *For example: adapting resin type to make it resistant to acidic atmospheres (HCl, H2SO4).*
- Compliance with electrical and standard-related constraints: voltage, EMC, etc.
  *For example: increasing radiated electromagnetic immunity (conducted) in the onboard equipment (standard = 10 V/m, adaptation = 20 V/m).*



■ Specific EMC tests

### Customisation

- Dedicated connections and fixings to provide you with a complete electrical function that can easily be installed in your environment.
  *For example: connecting inputs and outputs on the same terminal block (industrial and agricultural vehicles, professional grass-cutting equipment).*
- Direct lead outputs on resin versions by terminal.
- Combine dedicated sensors with the configured extension.
  *For example: pH/ORP probes.*
- Customised laser marking.
  *For example: integration of customer logo and name on the product.*

■ Electronics adaptation

### Specific configuration

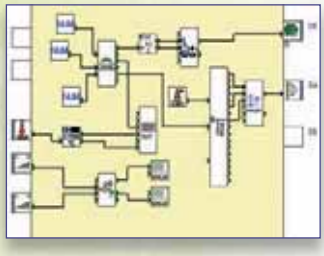
- Changing the number of I/O.
- Updating the I/O characteristics (input voltage, PNP/NPN polarity type).
- Updating power supply.
- Developing specific extensions.
- Ability to measure and control other physical values.
- Fixed parameters.
- “Modular” versions (88974xx) with removable integrated connectors enabling prewiring work to be performed and improved parts replacement for maintenance purposes.

■ Changing the number of I/O

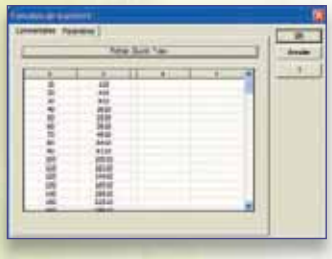
**For any special applications, please contact our Micro-control sales and technical experts.**

Crouzet

# For more adaptations



■ Example of program using Custom functions



■ Example of a y=f(x) transfer function from a spreadsheet

■ **Morning Pulse:**
Start: 1 h 10 m before sunrise
End: 09.00

■ **Evening Pulse:**
Start: 16:00
End: 2 h 30 m after sunset

## **Custom** functions

Crouzet has developed a number of application-specific functions to supplement the the library of specific functions:
**Custom functions**.

These functions can only be used with products from the Millenium 3 Custom range (Resin, Bare board versions and application specific analogue extensions ).

### Enhancement of standard automation functions

■ **ALARM** (coded alarm for modem):
- Controls 10 alarm levels on one modem digital input.

■ **SHIFT REGISTER:**
- Shifts information by saving it to the memory (shifting of bits in a 16-bit word on each rising edge of the clock).


■ **SPLIT BY 4** (input 1 x 16-bit word, output 4 x 4-bit words):
- Splits a 16-bit word into 4 x 16-bit words (in groups of 4 bits).


■ **SPLIT BY 2** (input 1 x 16 bit word, output 2 x 8 bit words):
- Splits a 16-bit word into 2 x 16-bit words (in groups of 8 bits).


■ **SLIN S** (serial link protected input):
- Transmits data via a programming port to memory space in the controller's fixed addresses.
Data is protected in the event of disconnection of the controller power supply.

### Function for a specific temperature control application in HVAC


■ **NTC1** - Function for use in conjunction with the **NTC probe** accessory (see page 79):
- The application-specific function converts the resistive values measured by the probe into temperature values in degrees Celsius (preliminary entry as part of the application-specific function of all measurements taken by a given NTC probe).


# **Software** adaptation capability

## Functions **on request**

■ Developing dedicated functions

■ Function for compressor

■ Function for solar panels

**Crouzet is also able to adapt existing functions in both Standard and Custom ranges.**

- Adaptation of high-speed counting function.
- Adaptation of the NTC1 function on other types of NTC probe.

**On request, Crouzet can also develop advanced application-specific functions, dedicated to your process.**

- **Motor wear calculation:** controls the service life of pumps for more effective pump equipment maintenance.
- **Special functions for compressor/booster compressor:** Anti-short cycle (reduces pump wear during start-up and switches pump starting sequences for greater efficiency): function controlling compressor switching in accordance with changes at the analogue input for pressure, expressed in bars.
- **Zero speed:** system which makes it possible to detect conveyor belt interruptions on packaging machines.
- **Special software protection functions.**

These custom functions simplify your application, protect your expertise and therefore guarantee you total protection.

- **Mathematical function for mobile solar panels:** Crouzet has developed a program which **determines the exact position of the sun, 365 days a year, 24 hours a day.** Having first recorded the latitude and longitude of the installation, Millenium 3 analyses and returns information for the exact **position of the panels** in relation to the sun.

**“To help me design my solar panels,** Crouzet were able to offer me an application-specific function. Millenium 3 turns the panels towards the sun and checks its actual position by means of encoders. If the difference is more than a few degrees, motors move them horizontally and vertically.
In addition, a wind sensor measures its speed and the panel adopts a “park” position in the event of a storm.”

*Juan Alberto, Solar Panel Manufacturer*

Crouzet

# For more adaptations

**Application: Controlling water quality in a swimming pool.**

- Control systems located in machine rooms.
- Manufacturers of swimming pools, OEM wholesalers of swimming pools.

## Description of customer needs:

- Control physical filtration of water (using a filter).
- Set filtering time in relation to the temperature of the bathing water.
- Control the neutrality of the water (pH).
- Control the level of water disinfection (Redox: chlorine-based disinfectant).

- Private swimming pool

## Application **Water treatment**

### How the application works:

Water needs to be filtered regularly to remove solid particles (sand, plant matter, insects, suntan oil, hair, etc.) and keep it clear. The higher the temperature, the longer it takes to filter.

**Water quality** is essential for swimming pool applications. Regular checks should be carried out in respect of:
- Neutrality of the water (should be 7.2 < pH < 7.5)
- Level of water disinfection (optimum level of chlorine in water for destroying bacteria)

Both **pH** and **Redox** are measured using probes submerged in pipes, a buffer container, or an analysis chamber. These probes analyse the presence of hydrogen (H+) and chlorine (Cl) ions capable of oxidising an electrochemical couple within the probe. This oxidation generates an electrical voltage, expressed in mV, which is forwarded to the PLC. After a calibration process, the PLC converts this into values for the pH and Redox.

### Crouzet solution:

- Millenium 3 XD10 24 V DC logic controller.
- 100 - 240 V AC/24 V DC power supply.
- XA04W “application-specific” analogue extension: Measuring extension card in modular casing.
- pH probe, ORP (Redox) probe and Pt100 probe.
- As an option: Modem communication solution with GSM for sending alarms.

### The benefits of the Crouzet solution:

- **“All-in-one”:** the same PLC controls the physical filtration and chemical treatment functions.
- Simple, straight-forward programming.
- Additional Millenium 3 functions available to control other application requirements (lighting control, vacuum pumps for pool cleaning brushes).
- The most compact extension on the market (72 mm).
- Optional SMS alerts via integrated Millenium 3 modem solution.
- Crouzet also has expertise in the **area of position sensors and micromotors,** and is able to offer motorisation solutions (swimming-pool covers using winders or curtains).


# Dedicated product application

## Application **Heat pumps**

**Application: Heat pump control.**

### Description of customer needs:

- Make the best use of nature's energy (air, water, earth) to heat or cool (reversible system) a heating circuit or a hot water system in either an industrial, domestic or commercial setting.
- The choice of solution may be determined by financial considerations (energy costs).

- Control of heating and hot water system: Heat pump

### How the application works:

The heat from the warm fluid (air blown by a fan, or water provided by a heat-exchanging source or coolant) is captured by a refrigerating liquid which is compressed to give it a pressure of 40 bar and a temperature 140°C. In a heat exchanger, this refrigerating liquid then transfers its heat to water (cold source) for a hot water system (underfloor heating) or a hot water tank (water for a hot water system or swimming pool).

Once this thermal exchange has taken place, the fluid which has lost both temperature and pressure has its pressure further reduced by a solenoid valve which drastically reduces its temperature even more.
This fluid is then able to receive the heat from the hot source, and the cycle is ready to begin again.

### Crouzet solution:

- Millenium 3 logic controller.
- Millenium 3 accessories:
  - **NTC**: temperature (°C) probe – probe providing resistance as a function of the temperature. Connects directly to the analogue inputs (0-10 V). A dedicated function block enables resistance to be converted into temperature.
  - **Pt100**: temperature probe with a converter on the analogue inputs or directly linked to extensions XA03, XA04W.
- Compressor start-up control/anti-short cycle.

### The benefits of the Crouzet solution:

- User-friendly software and ease of programming.
- Front-panel parameter setting for temperature instructions.
- Functions include clock, vacations, frost protection.
- Full/half-load function.
- Analogue inputs: NTC probes.
- Adaptations possible (development of "water law" or "heating curve" functions).

## "Application-specific" and grouping adapted kits

- **Discover just what Millenium 3 can do for you - its complete kits provide everything you need for your application**
- **Product groups: in order to facilitate logistics, we can supply groups of products**

### Part numbers

| Type | Description | Code |
|---|---|---|
| Kit 16 | XD10 - 24 V ⎓ (Ref. 88970141) + XN05 (Ref. 88970270) + 1 Power supply PS24-30 W (Ref. 88950307) | **88970825** |
| Kit 20 | CD20 - 24 V ⎓ (Ref. 88970051) + 1 Power supply PS24-60 W (Ref. 88950302) | **88970808** |
| Kit 26 | XD26 Custom - 24 V ⎓ (Ref. 88974161) + M3 SOFT (Ref. 88970111) + Power supply PS24-30W (Ref. 88950307) + USB link cable (Ref. 88970109) | **88970094** |
| Kit 32 | XD26 - 24 V ⎓ (Ref. 88970161) + XR06 (Ref. 88970211) + 1 Power supply PS24-60 W (Ref. 88950302) | **88970813** |

# ➜ Bare board version

- **For easy and discreet integration into your applications**
- **For mass-production applications**
- **Memory: 120 lines in LADDER language and up to 350 "typical" blocks in FBD language**
- **Compact Dimensions**
- **Range of controllers for use with application specific functions**

**NB 12**

**NB 20**

## Part numbers

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| NB12 | 8 digital (of which 4 are analogue) | 4 relays | 24 V ⎓ | **88970001** |
| | 8 digital | 4 relays | 100 → 240 V∿ | **88970003** |
| | 8 digital (of which 4 are analogue) | 4 relays | 12 V ⎓ | **88970005** |
| NB20 | 12 digital (of which 6 are analogue) | 8 relays | 24 V ⎓ | **88970011** |
| | 12 digital | 8 relays | 100 → 240 V∿ | **88970013** |
| NBxx | In accordance with your requirements | In accordance with your requirements | In accordance with your requirements | ● |

## Accessories

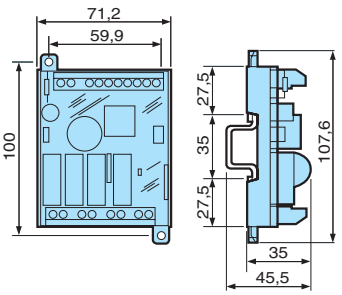
| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | **88970111** |
| PA | EEPROM memory cartridge | **88970108** |
| | 3 m serial link cable: PC → Millenium 3 | **88970102** |
| | 3 m USB link cable: PC → Millenium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

## General characteristics

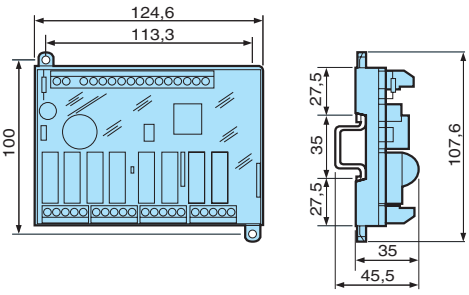
| **See page 22, except:** | |
|---|---|
| Protection rating | IP00 |
| Certifications | UL, CSA |

## Dimensions (mm)

**NB12**




**NB20**




## Input / Output Connections

See Page 80-81 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

## Product adaptations

- **Tropicalisation**
- **Spring connectors or removable connectors**
- **Changing the number of I/O**
- **Updating power supply**

# ➜ Modular version

- "Modular" versions designed for Custom application specific functions and "application-specific" extensions (XA03, XA04W) for expandable range.
- Open to "standard" extensions (XN,XR,XE,XA)
- LCD with 4 lines of 18 characters and configurable backlighting or no display or parameter-setting buttons to avoid tampering by unauthorised users

CB12 Custom

XD10 Custom

## Part numbers

### Custom Compact Range

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| CD12 | 8 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88974041 |
| | 8 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | 88974042 |
| | 8 digital | 4 relays 8 A | 100 → 240 V ∿ | 88974043 |
| | 8 digital | 4 relays 8 A | 24 V ∿ | 88974044 |
| | 8 digital (including 4 analogue) | 4 relays 8 A | 12 V ⎓ | 88974045 |
| CD20 | 12 digital (including 6 analogue) | 8 relays 8 A | 24 V ⎓ | 88974051 |
| | 12 digital (including 6 analogue) | 8 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | 88974052 |
| | 12 digital | 8 relays 8 A | 100 → 240 V ∿ | 88974053 |
| | 12 digital | 8 relays 8 A | 24 V ∿ | 88974054 |
| | 12 digital (including 6 analogue) | 8 relays 8 A | 12 V ⎓ | 88974055 |
| CB12 | 8 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88974021 |
| | 8 digital | 4 relays 8 A | 100 → 240 V ∿ | 88974023 |
| | 8 digital | 4 relays 8 A | 24 V ∿ | 88974024 |
| CB20 | 12 digital (including 6 analogue) | 8 relays 8 A | 24 V ⎓ | 88974031 |
| | 12 digital | 8 relays 8 A | 100 → 240 V ∿ | 88974033 |
| | 12 digital | 8 relays 8 A | 24 V ∿ | 88974034 |

## Part numbers

### Custom Expandable Range

| Type | Input | Output | Supply | Code |
|---|---|---|---|---|
| XD10 | 6 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88974141 |
| | 6 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | 88974142 |
| | 6 digital | 4 relays 8 A | 100 → 240 V ∿ | 88974143 |
| | 6 digital | 4 relays 8 A | 24 V ∿ | 88974144 |
| XD26 | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ⎓ | 88974161 |
| | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | 88974162 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 100 → 240 V ∿ | 88974163 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ∿ | 88974164 |
| | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 12 V ⎓ | 88974165 |
| XB10 | 6 digital (including 4 analogue) | 4 relays 8 A | 24 V ⎓ | 88974131 |
| | 6 digital (including 4 analogue) | 4 solid state 0.5 A (including 1 PWM) | 24 V ⎓ | 88974132 |
| | 6 digital | 4 relays 8 A | 100 → 240 V ∿ | 88974133 |
| | 6 digital | 4 relays 8 A | 24 V ∿ | 88974134 |
| XB26 | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ⎓ | 88974151 |
| | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | 88974152 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 100 → 240 V ∿ | 88974153 |
| | 16 digital | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 24 V ∿ | 88974154 |
| | 16 digital (including 6 analogue) | 10 relays (8 x 8 A relay and 2 x 5 A relay) | 12 V ⎓ | 88974155 |

## General characteristics

| | |
|---|---|
| **See page 22, except:** | |
| Certifications | UL, CSA |
| Operating temperature* | -30 → +70°C (⎓) ; -20 → +70° C (∿) ;<br>Operating temperature @ 100% (Relays 6A)<br>Operating temperature @ 66% (Relays 8A) |
| Storage temperature* | -30 → +80°C |
| LCD display | Display with 4 lines of 18 characters, white characters on a blue background |

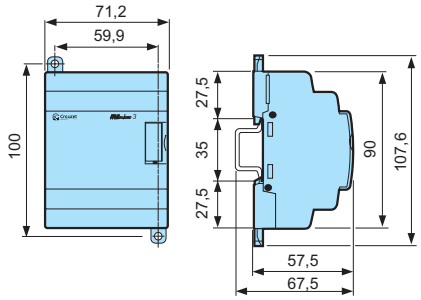
* : Available last quarter of 2008

## Accessories

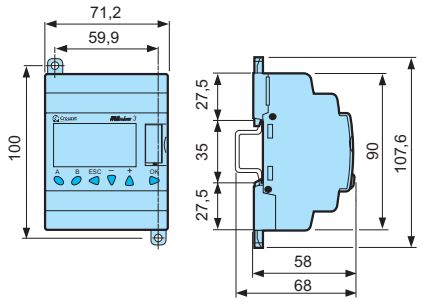
| Type | Designation | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | 88970111 |
| PA | EEPROM memory cartridge | 88970108 |
| | 3 m serial link cable: PC → Millenium 3 | 88970102 |
| | 3 m USB link cable: PC → Millenium 3 | 88970109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

## Dimensions (mm)

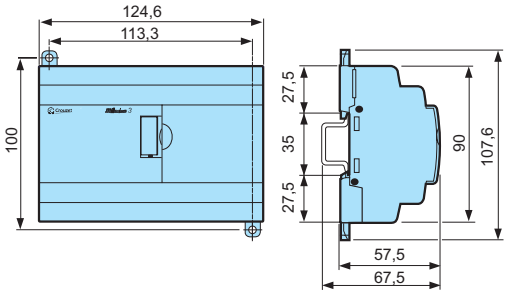
**CB12/XB10 Custom**



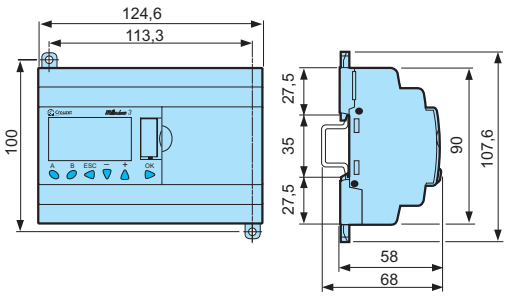

**CD12/XD10 Custom**




**CB20/XB26 Custom**




**CD20/XD26 Custom**




## Input / Output Connections

See Page 40-43 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

# ➜ Resin board version

- **Vibration resistance**
- **Extended temperature range**
- **Outputs via removable connectors**
- **IP50 seal (connectors)**
- **DB 9-pin programming port via standard RS 232 cable**
- **Designed for Custom application-specific functions**
- **Supplied without connectors. Connectors available (Ref. 88970313, 88970314, 88970315, 88970316)**


NBR12


NBR26


NBR32

## Part numbers

| Type | Designation | Input | Output | Supply | Code |
|---|---|---|---|---|---|
| NBR12 | Relay outputs with connectors | 8 digital (including 4 analogue) | 4 relays | 24 V ⎓ | **88973001** |
| | Relay outputs with connectors | 8 digital (including 4 analogue) | 4 solid state (including 1 PWM) | 24 V ⎓ | **88973002** |
| NBR26 | Relay outputs with connectors | 16 digital (including 6 analogue) | 10 relays | 24 V ⎓ | **88973061** |
| | Relay outputs with connectors | 16 digital (including 6 analogue) | 10 solid state 0.5 A (including 4 PWM) | 24 V ⎓ | **88973062** |
| | Relay outputs with connectors | 16 digital | 10 relays | 100 → 240 V ∿ | **88973063** |
| NBR32 | Relay outputs with connectors | 20 digital (including 6 analogue) | 12 relays | 24 V ⎓ | **88973211** |
| NBR40 | Relay outputs with connectors | 24 digital (including 6 analogue) | 16 relays | 24 V ⎓ | **88973231** |
| NBRxx | Relay or solid state outputs, connectors or wires | In accordance with your requirements | In accordance with your requirements | In accordance with your requirements | • |

## Accessories

| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | **88970111** |
| PA | 1.80 m serial link cable: DB9/DB9 | **88970123** |
| | Programming cable USB | **88950105** |
| MA | Removable connector kit for NBR12 | **88970313** |
| | Removable connector kit for NBR26 | **88970314** |
| | Removable connector kit for NBR32 | **88970315** |
| | Removable connector kit for NBR40 | **88970316** |

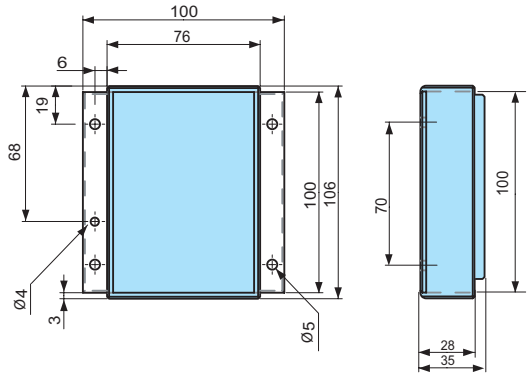
## General characteristics

**See page 22, except:**

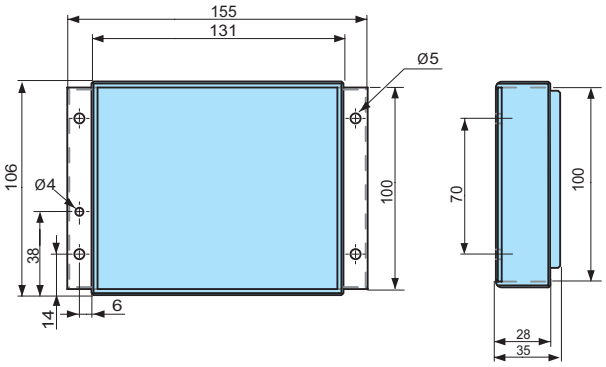
| | |
|---|---|
| Certifications | CE |
| Protection index | IP50 connectors |
| Mechanical resistance IEC 61373 | Railway applications - Rolling stock<br>Category 1 class B stock mounted on car<br>Vibration resistance: 5-150 Hz<br>Random sampling: 10 minutes in each direction (X, Y, Z)<br>Sinusoidal sampling: 5 hours in each direction (X, Y, Z)<br>Shock resistance: 3 shocks 3 g/30 ms per direction<br>Dropping: Total of 26 drops on all sides from a height of 1 metre |
| Mechanical resistance GAM EG 13 | Terrestrial military vehicles<br>Vibration resistance 5-500 Hz 50 $m/s^2$<br>Sinusoidal sampling 5 hours in each direction (X, Y, Z)<br>Shock resistance:<br>Acceleration: 150 $m/s^2$, duration: 11 ms, 3 shocks per shaft<br>Acceleration: 300 $m/s^2$, duration: 11 ms, 3 shocks per shaft<br>Bumps: 1000 half wave sine mechanical bumps 25 g/6 ms per shaft |
| Operating temperature | -30 → +70°C (⎓), -20 → +70°C (∿) |
| Storage temperature | -40 → +80°C |
| Housing | Self-extinguishing UL94V2 |
| Resin | UL approved<br>Self-extinguishing UL94V0<br>Semi-rigid polyurethane resin<br>Solid black appearance<br>Breakdown voltage: 25 kV/mm<br>Water absorption: 0.2% (24 hours at 23°C)<br>Shore D hardness: 50 ±5<br>Smoke category: F0 |
| Outputs | Removable connectors |
| Breaking current | 6 A relay output |

## Dimensions (mm)

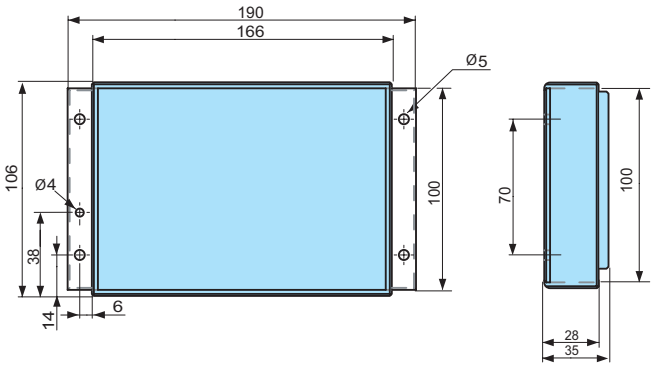
**NBR12**



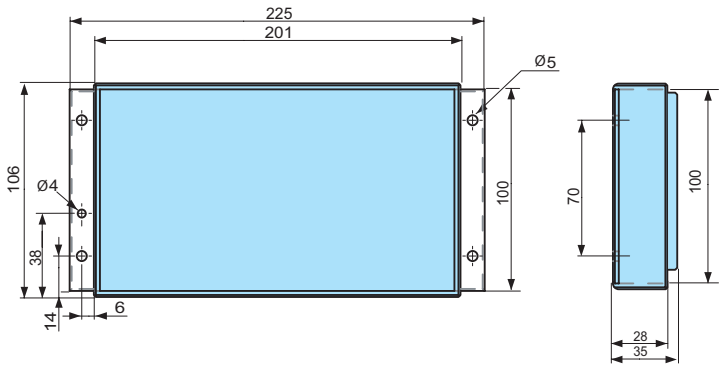

**NBR26**




**NBR32**




**NBR40**




## Input / Output Connections

See Page 80-81 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

## Product adaptations

- **40 cm wire**
- **Extended power supply range (9 → 18 V⎓), (16 → 36 V⎓), (85 → 264 V ∿)**
- **Remote polyester keyboard**
- **UL, CSA, GL certification**
- **Integration of all available electrical functions in the catalogue (e.g.: Bluetooth module, Pt 100 input, 0-20 mA input, 0-10 V power output, etc.**
- **Changing the number of I/O.**

# ➜ "Application-specific" analogue extensions for XD10/XB10 and XD26/XB26

- **XA04W: Mix of inputs in the same casing: Pt 100, pH, ORP (Redox), Current (4 - 20 mA)**
- **XA03: 3 Pt 100 temperature inputs in the same casing**
- **"Application-specific" examples:**
  **- Regulation and measurement of (XA03)**
  **- pH and Redox sensors for treating water in swimming pools and fountains (XA04W)**
- **Extensions compatible with any Millenium 3 Custom expandable logic controller**
- **For Pt100 probes, see page 54.**
- **For pH and ORP probes, see page 78. The probes are directly connected to the XA04W extension**

XA03

XA04W

## Part numbers

| Type | Input | Supply | Code |
|---|---|---|---|
| XA03 | 3 Pt 100 (-25 ➞ +125°C) | Via the 24 V ⎓ controller | **88970800** |
| XA04W | 1 Pt 100 (0-50°C), 1 pH (0-14), 1 ORP (0-1000mV), 1 current (4-20 mA) | Via the 24 V ⎓ controller (1 dedicated output 24 V ⎓ ± 5% 0.6 W to supply the 4-20 mA sensor) | **88972805** |

## Accessories

| Type | Description | Code |
|---|---|---|
| M3 SOFT | Multilingual programming software containing specific library functions (CD-ROM) | **88970111** |

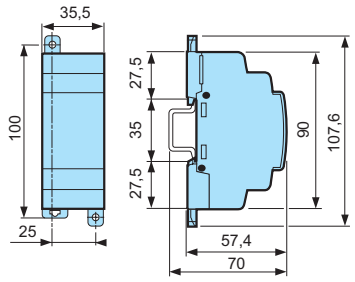
## General characteristics

**See General characteristics for the XA04 analogue extension on page 36, except for the adapted characteristics below:**

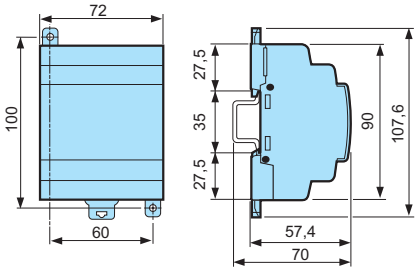
| | 88970800 | 88972805 | | | |
|---|---|---|---|---|---|
| Certifications | UL, CSA, | UL & CSA | | | |
| Conformity with the EMC directive | In accordance with 89/336/EEC: EN (IEC) 61131-2 (Zone B) EN (IEC) 61000-6-2, EN (IEC) 61000-6-3, EN (IEC) 61000-6-4 | In accordance with 89/336/EEC: EN (IEC) 61000-6-1 EN (IEC) 61000-6-3 | | | |
| Inputs | Pt 100 (IP, IQ, IR) | Pt 100 (IP) | pH (IQ) | ORP (IR) | 4-20 mA (IS) |
| Operating range | -25°C, + 125°C | 0-50°C | 0 - 14 | 0 - 1000 mV | 0 - 20 mA |
| Input impedance | - | - | > $10^{12}\Omega$ | > $10^{12}\Omega$ | 10 Ω |
| Maximum non destructive current/voltage | - | - | - | - | 30 mA |
| Resolution | 10 bits | 12 bits | 12 bits | 12 bits | 12 bits |
| Value of LSB | 0.15°C | 0.012°C | 0.0034 pH | 0.24 mV | 4.9 µA |
| Input type | Pt 100 probe IEC 751 3-wire | Pt 100 probe IEC 751 3-wire | pH probe | ORP probe | Common mode |
| Conversion time | Module cycle time | Module cycle time | Module cycle time | Module cycle time | Module cycle time |
| Sampling time | <1s | 4s | 4s | 4s | 4s |
| Accuracy at 25°C ambient temperature | ± 1°C | ± 0.8°C | ± 0.05 pH | ± 5 mV | ± 0.1 mA |
| Accuracy at 55°C ambient temperature | ± 1°C | ± 0.8°C | ± 0.05 pH | ± 5 mV | ± 0.1 mA |
| Temperature compensation | - | - | No Drift of 0.03 pH from15 to 25°C Drift of 0.15 pH from 0 to 50°C | - | - |
| Isolation between analogue channel and power supply | None | None | Isolated | Isolated | Isolated |
| Dedicated isolated 24 V DC output for 4-20 mA sensor | - | - | - | - | 24 V ⎓ |
| Cable length | 10 m max. with shielded cable | 3 m max. with shielded cable | 3 m max. with shielded cable | 3 m max. with shielded cable | 3 m max. with shielded cable |
| Protection against polarity inversions | - | - | - | - | Yes |

## Dimensions (mm)

**XA03**




**XA04W**




## Input / Output Connections

See Page 80-81 for details or to find instruction sheets visit: www.millenium3.crouzet.com in "Download"

## Product adaptations

- **2 or 3-wire Pt 1000 inputs**
- **Adjustable temperature range**
- **Option to select/limit the number of temperature, Pt100 and Pt1000 inputs (up to 3)**
- **Option to mix and/or choose inputs (Pt100, pH, ORP, 4-20 mA, 0-10 V)**
- **Modified resolution (10 bits, 12 bits)**
- **Bare board version**
- **Resin casing version**
- **Customer labelling**

# ➜ pH & ORP probes for XA04W

- **High quality measurement electrode**
- **2 types of ferrule**
- **Fields of application:**
  - **Swimming pools**
  - **Monitoring and treatment of drinking water**
  - **Freshwater or seawater aquariums**
  - **Waste water, process water and low-pollution domestic water, rainwater, pond water and surface water**
  - **Greenhouses**

**Sensor pH**

**Sensor ORP**

## Part numbers

| Type | Description | Code |
|---|---|---|
| pH | pH probe with BNC connector 3 m | **89750170** |
| | pH probe with ferrules 3 m | **89750171** |
| ORP | ORP probe with BNC connector 3 m | **89750172** |
| | ORP probe with ferrules 3 m | **89750173** |

## General characteristics

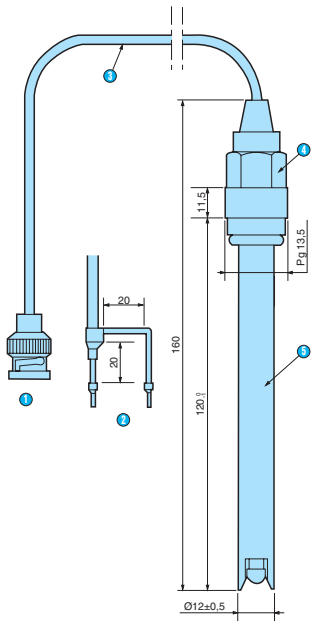
| Type | pH | ORP (Redox) |
|---|---|---|
| Operating range | 2 - 12 | ± 2000 mV |
| Pressure | 0-6 bar | 0-6 bar |
| Electrode | Combination electrode with protected glass bulb | Combination electrode |
| Length | 120 mm | 120 mm |
| Diaphragm | None | None |
| Operating temperature | 0 → +60°C | 0 → +60°C |
| Electrolyte | 3.5 mol saturated KCl gel | 3.5 mol saturated KCl gel |
| Concentration | < 50 gr/l | < 50 gr/l |
| Chlorinated water | < 5 ppm (max. non repetitive 15/20 ppm) | < 5 ppm (max. non repetitive 15/20 ppm) |
| Installation angle | 360°, recommended ± 45° from vertical | 360°, recommended ± 45° from vertical |
| Cable length | Shielded cable, 3 m | Shielded cable, 3 m |
| Protection against polarity inversions | Incorrect reading | Incorrect reading |

## Comments

The probes are delivered with a cap containing a preservative. Ensure this cap is removed just before inserting the probe. Minimise the storage time and always check that this preservative is present (KCl refill). The probe must be stored horizontally.

## Dimensions (mm)

**pH-ORP probes**




1. BNC
2. Ferrule
3. Coaxial cable, black, Ø 3 mm
4. Connecting head
   Head with Pg 13.5 thread and fixed cable
5. Plunger made of black PPO

# ➜ NTC probe

- **Direct connection with no converter on analogue input**
- **Low-cost temperature control solution**
- **Fields of application:**
  - **HVAC**
  - **Compressors**
  - **Geothermal systems**

**Sensor NTC**

## Part numbers

| Type | Description | Ohmic value | Measurement range | Code |
|---|---|---|---|---|
| AS | NTC probe (batch of 10) for Millenium 3 (24 V ⎓, ± 10%) | 10 kΩ @ 25°C | -25 → +85° C | **89750180** |
| | NTC probe (batch of 100) for Millenium 3 (24 V ⎓, ± 10%) | 10 kΩ @ 25°C | -25 → +85° C | **89750181** |

## Accessories

| Accessories | Operating temperature | Operating pressure | Code |
|---|---|---|---|
| Copper protective sleeve | -20 → +100°C | 10 bar | **89750146** |
| 316 stainless steel protective sleeve | -20 → +400°C | 16 bar | **89750147** |

## General characteristics

### Environmental characteristics

| | |
|---|---|
| Operating temperature | -25 → +85°C |
| Storage temperature | -30 → +100°C |
| Accuracy | -25 °C → +40 °C: = ± 0.8 °C (Repeat accuracy ≤ ± 0.5 °C)<br>+40 °C → +50 °C: = ± 1.2 °C (Repeat accuracy ≤ ± 1 °C)<br>+50 °C → +60 °C: = ± 1.4 °C (Repeat accuracy ≤ ± 1.4 °C)<br>+60 °C → +70 °C: = ± 2 °C (Repeat accuracy ≤ ± 2 °C)<br>+70 °C → +85 °C: = ± 3 °C (Repeat accuracy ≤ ± 2 °C) |

### Mechanical characteristics

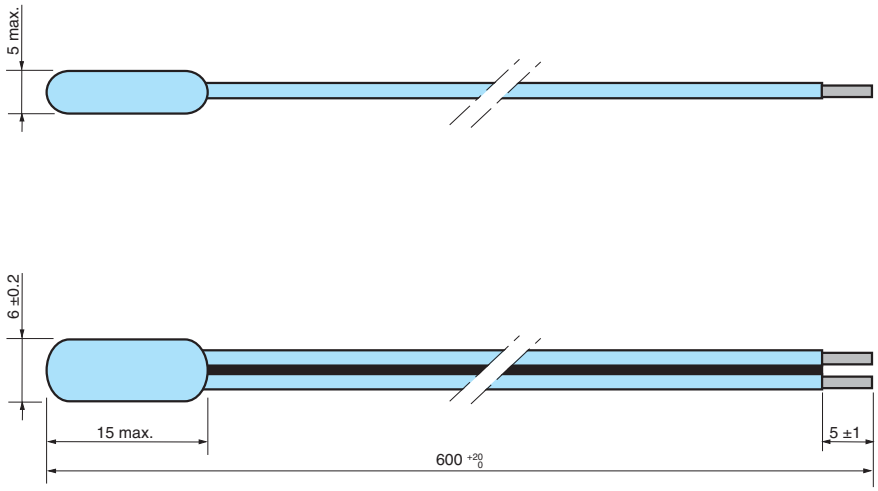
| | |
|---|---|
| Cable | -30 → +100°C, 2 identical colour wires |
| Cable length | 60 cm |

### Comments

Analogue input configured as potentiometer via the Custom function (NTC1, in M3 SOFT software part no.: 88970111).
Probes only available on the Custom range (88974XXX, NB, NBR)

## Dimensions (mm)

**89750180**



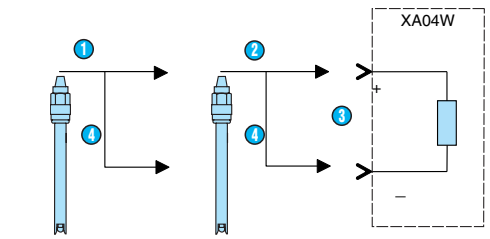
# I/O wiring

## Inputs/Outputs: NB & NBR

**See pages 40 to 41** (same as CD, CB, XD, XB)

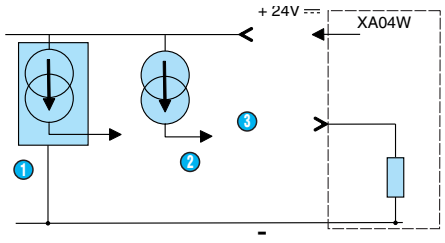
## Analogue inputs: XA03 & XA04W

**Extension :** XA04W



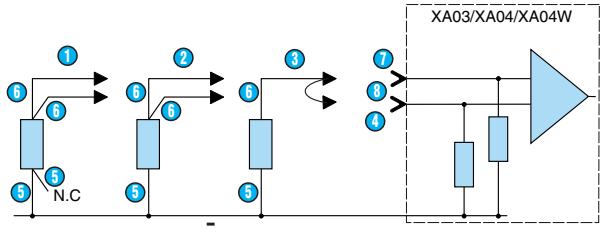

1. pH
2. ORP/Redox
3. Analogue input
4. Screening

**Extension :** XA04W




1. 0-20 mA 3-wire
2. 0-20 mA 2-wire
3. Analogue input

**Extensions :** XA03, XA04W



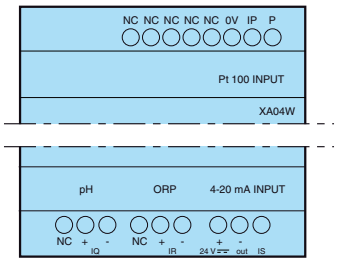

1. Pt100 4-wire
2. Pt100 3-wire
3. Pt100 2-wire
4. Analogue inputs (e.g. IP & P)
5. White
6. Red

# Input/output installations

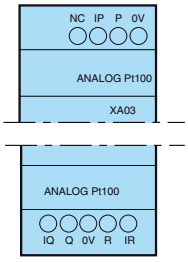
## Extensions XA04W & XA03

### Inputs

**XA04W**




**XA03**

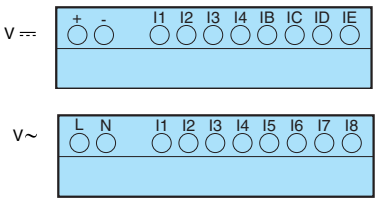


# ➜ Input/output installations

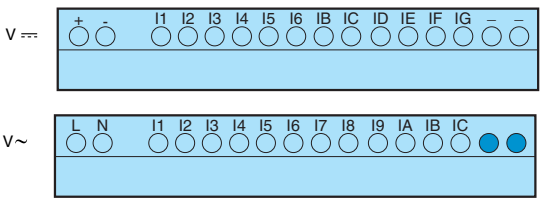
## Bare boards (NB12, NB20) & resin boards (NBR12, NBR26, NBR32, NBR40)

### Inputs

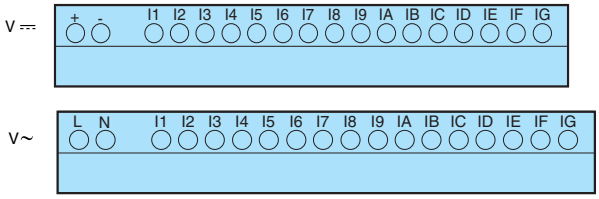
**NB12, NBR12**



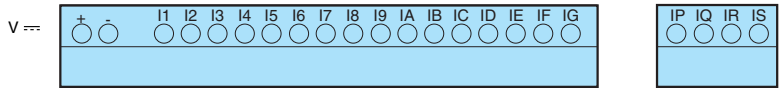

**NB20**



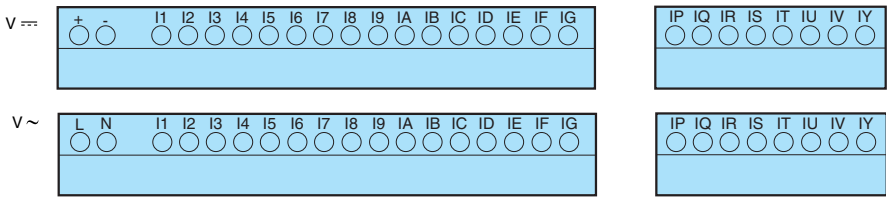

**NBR26**




**NBR32**

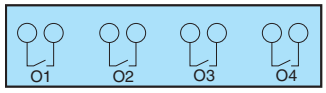



**NBR40**

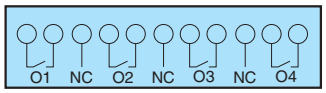



### Sorties relais

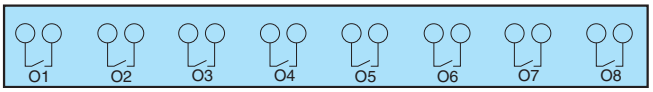
**NB12**



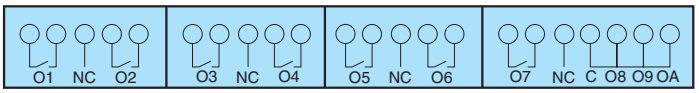

**NBR12**



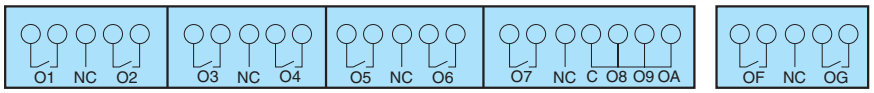

**NB20**



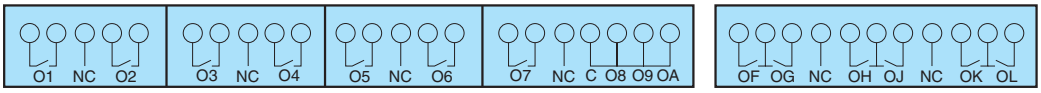

**NBR26**




**NBR32**

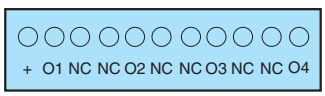



**NBR40**

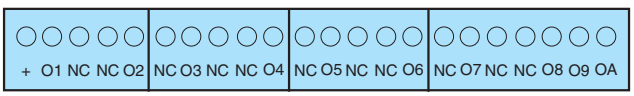



### Solid state outputs

**NBR12**




**NBR26**

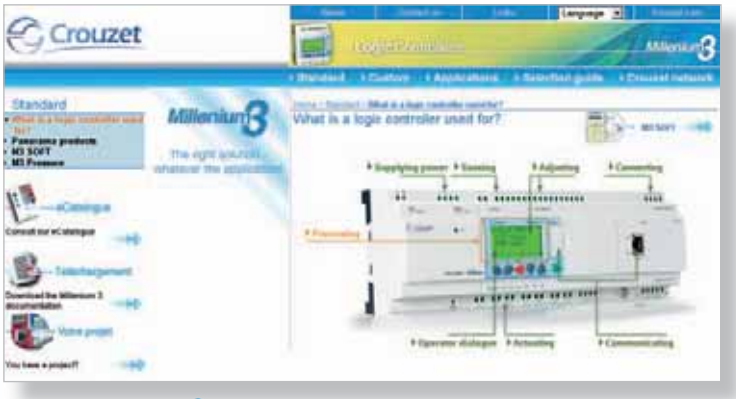


# Millenium 3

## More information is available on our site:

**www.millenium3.crouzet.com**

- What is a logic controller used for?
- Advantages of Millenium 3
- Product overview
- Introduction to the software
- Millenium 3 pressure solution




■ Millenium 3 Standard: Product and software offer

- Adaptation wheel
- Adapted products
- Hardware adaptations
- Custom functions
- Software adaptations


■ Millenium 3 Custom: Product and software offer

- HVAC
- Water treatment
- Renewable energies
- Industrial machines


■ Millenium 3 applications

# **Web** pages

- Compact range selection guide
- Expandable range selection guide
- Starter kits
- Communication solutions
- Accessories


■ Selection guide

- Download PDF documents:
- ☐ Technical documents
- ☐ Promotional material
- ☐ Installation manuals
- ☐ Demo software
- ☐ Media gallery


■ Downloading

- Search by part number facility
- Technical data
- Diagrams:
- ☐ Wiring
- ☐ Dimensions
- Catalogue pages PDF


■ eCatalogue: www.catalog.crouzet.com

Crouzet

# FAX

From:
Department:
Tel.: Fax:
E-mail:
Date:
Reference:
Number of pages (including this one):

Internet: www.millenium.crouzet.com

To: **CROUZET**

**Fax:** See 4th covering page

Re: Project

## DESCRIPTION OF YOUR PROJECT

Name of your application

Estimated quantity:

Why do you need a logic controller?

Application

☐ Before project ☐ Project to be finalised by (date) ☐ Substitution

Estimated quantity:

## DETAILS OF YOUR POWER SUPPLY

**Direct current**
- ❑ 12 V DC
- ❑ 24 V DC

**Alternating current**
- ❑ 24 V AC
- ❑ 100-240 V AC
- ❑ Frequency .....

**Maximum power supply limits:** .....

## YOUR SENSORS TO BE CONNECTED

**❑ Digital**

**❑ Analogue**
- ❑ 0-10 V
- ❑ 0-20 mA
- ❑ Potentiometer
- ❑ pH
- ❑ ORP
- ❑ Temperature
  - ❑ NTC
  - ❑ Thermocouple
  - ❑ Pt100
  - ❑ Pt1000

**❑ Encoder**

**❑ Other**

## YOUR EQUIPMENT LOCATED AT THE OUTPUT

**❑ Digital outputs**
- ❑ Relays
- ❑ Solid state
  - AC
  - DC

**❑ PWM outputs**

**❑ Analogue outputs**
- ❑ 0-10 V

## YOUR ENVIRONMENT

Vibrations: .....
Operating temperature: .....
Damp: .....
Degree of protection: .....

## YOUR STANDARD-RELATED CONSTRAINTS

## YOUR WIRING CONSTRAINTS

**Cable length:**
- ❑ 3 m
- ❑ 10 m

**Connection using connector:**
- ❑ Yes
- ❑ No

**Connect using wires:**
- ❑ Yes
- ❑ No

## YOUR COMMUNICATION NEEDS

**❑ Network**
- ❑ Modbus
- ❑ Ethernet - TCP/IP

**❑ Modem**
- ❑ GSM
- ❑ STN

## YOUR DISPLAY NEEDS

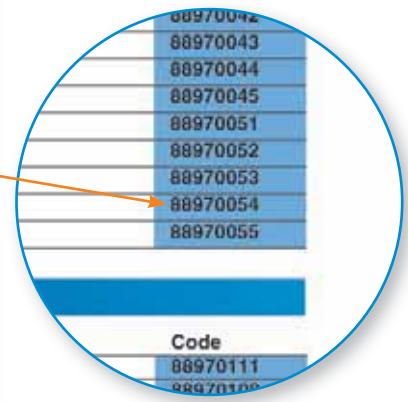
**❑ Remote display**

**❑ Local display (on the product)** .....

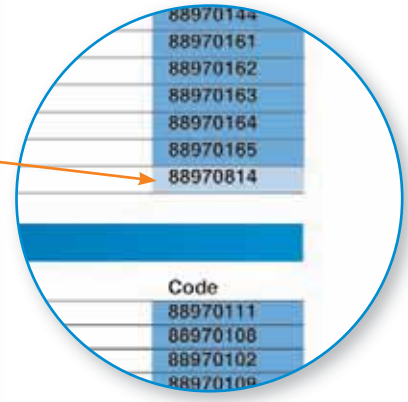
**Specific request**
- ❑ Customised marking
- ❑ Other.....

## How to order

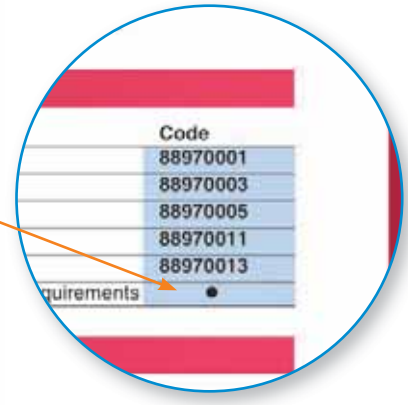
■ Millenium 3 standard products held in stock




■ Millenium 3 standard products that can be ordered




■ Millenium 3 products made to specifications (contact us)



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