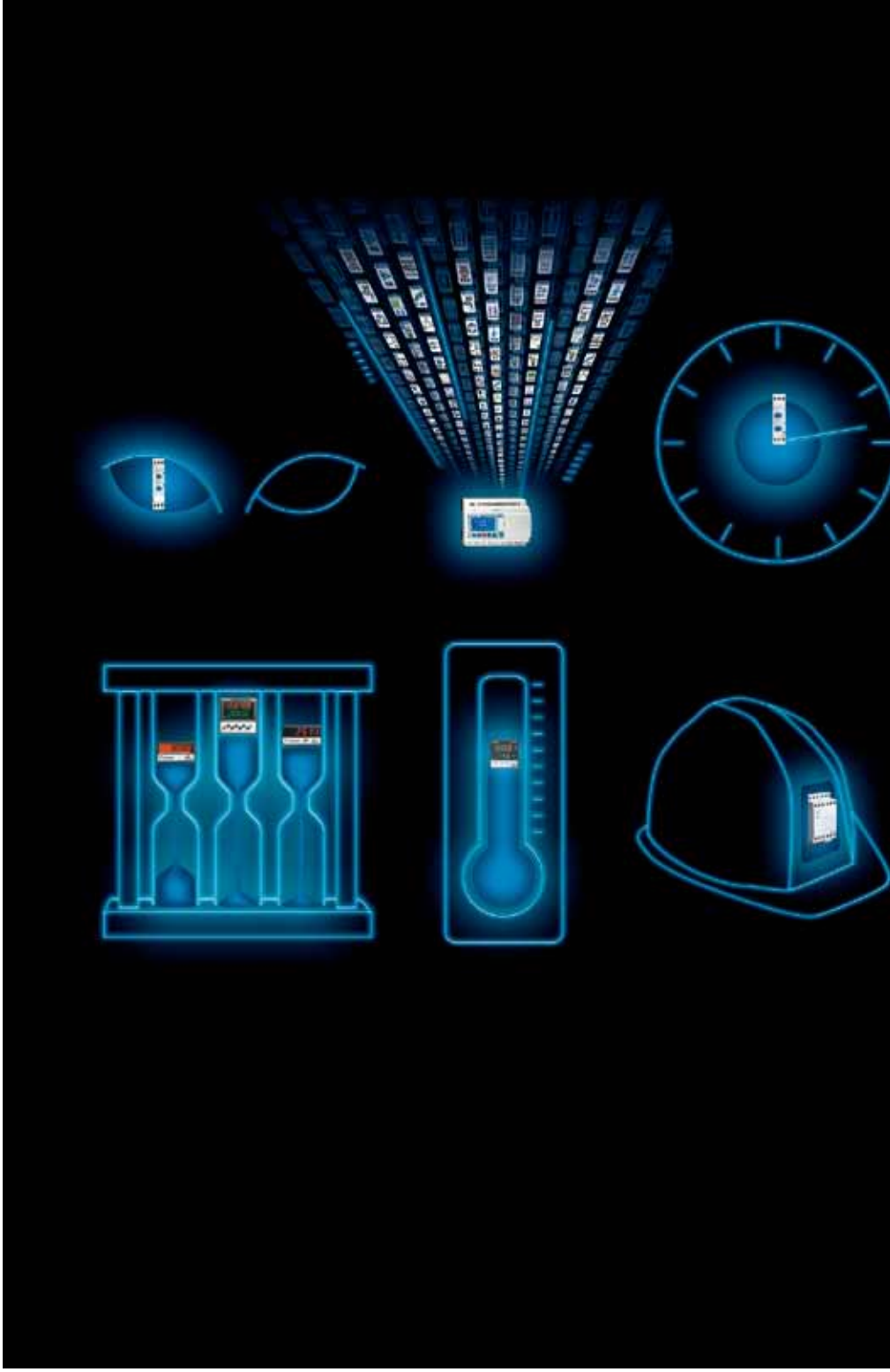
Crouzet

- Logic controllers
- Timers
- Control relays
- Counters and Ratemeters
- Temperature controllers
- Safety relays



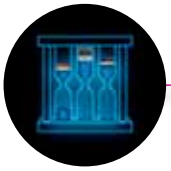
Micro-control overview

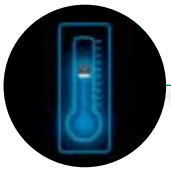
Behind every project, technologies and expertise

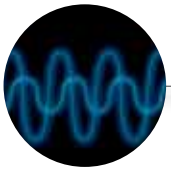
www.crouzet.com

A brand of CST
CUSTOM SENSORS & TECHNOLOGIES

Contents







To order:
Customer Service
Control Technologies
Tel. +44 (0) 1256 318 900
info@crouzet.co.uk

Presentation

Crouzet Control Technologies

Widely recognised for over 50 years as the specialist in electromechanical, electronic technology and software engineering, Crouzet Control Technologies' experience in time management, physical and mechanical values has resulted in an extensive automation components offer that includes logic controllers, timers, control relays, counters, ratemeters, machine safety equipment, and temperature controllers.

Simple to use, Crouzet products are easy to program and install.

With operations around the globe, Crouzet is constantly monitoring its customers' needs. Its sales teams, technicians and designers combine all their skills to adapt products to customer specifications, both in terms of the application and cost.

Crouzet also ensures that its products are manufactured in compliance with quality and environmental standards (factories certified ISO 9001, 14001 and OHSAS 18001, eco-design).

With its industrial and logistic flexibility Crouzet is able to deliver products, whether small-scale or mass production items, in the best possible timescale.

In this new Microcontrol Panorama,
Crouzet Control Technologies presents:

More than 120 new counter part numbers, all redesigned for improved integration in equipment, especially in the very small formats.

New features of the Millenium 3 Smart family:

- Very easy to read blue screens.
- A new version of the M3 Soft workshop, the Millenium 3 software.
- Compatibility of M3 Soft software with Windows 7.
- Numerous functions to save time and optimise applications.

Extensive ranges of timers and control relays available both in DIN rail and panel mount format, in all voltages.

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.

Custom Sensors & Technologies (CST)

is a specialist in sensors, controllers and actuators

Through its BEI Kimco, BEI Sensors, BEI PSSC, Crouzet, Crydom, Kavlico, Newall and Systron Donner brands, CST offers **reliable, adaptable, high-performance components** to meet the needs of critical systems in the industrial, aerospace and transport markets.

The CST group, with more than **4000 employees worldwide** and **sales of 530 M USD in 2009**, is committed to excellence. It is a trusted partner that can meet the challenges of customers' most stringent requirements, based on a real premium value offering.

The Control Technologies team worldwide.

Expertise

The Crouzet Control Technologies process

In addition to high-performance products, high-performance advice and support in order to produce tailor-made solutions.

Specific products

Adapted products

Analysis of customer requirements

Expertise:

- UNDERSTANDING how applications work.
- INTEGRATING environmental constraints and quality requirements.
- PROPOSING technical and economic solutions which fully meet the needs of customers.

Customer Adaptation Centre and Design Office

Expertise:

- CAPITALISING on the expertise of Crouzet engineers in mechanical, electrical and electronic engineering, software engineering and networks.
- ADAPTING products to ensure innovation and differentiation.
- DEVELOPING AND INDUSTRIALISING custom products.

A multi-skilled team

- Application-based marketing
- Electronic and software design
- Prototyping
- Mechanical engineering
- Production
- EMC tests and approvals
- Sales and logistics follow-up

Standard products

Products with added value

Production

Expertise:

- MEETING all needs, standard or specific, small-scale or mass production, thanks to the industrial flexibility of Crouzet's factories.
- GUARANTEEING the quality and reliability of products: all Crouzet's production sites are certified ISO 9001 and ISO 14001, and use quality tools such as 6 SIGMA.
- INTEGRATING eco-design into manufacturing processes to MINIMISE the environmental impact of products throughout their life cycle.

Logistics and After-Sales Service

Expertise:

- PROVIDING an optimum level of service and GUARANTEEING a prompt delivery schedule, whatever the type of order: small-scale or mass production, standard or adapted products.
- TRACKING all orders in real time on www.crouzet.com

Crouzet Control Technologies

Behind every project, technologies and expertise

- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
- Certifications: **ISO 9001, ISO 14001, OHSAS 18001**.
- Products which **comply with international standards** (UL, CSA, EC).
- A **dynamic R&D department**.

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.

Crouzet

Logic controllers

Concentrated performance

Millenium 3 *Smart & Essential*

A logic controller
How can it be defined in simple terms?

A logic controller is a programmable module which is used to control small automation systems or small installations. It is an electronic device which combines all of Crouzet's historic expertise.

The logic controller is a **plural solution** in a control system since it contains solutions that can replace a number of products: timers, counters, control relays, temperature controllers, impulse relays, etc.

The logic controller operates as the **brain of applications**. It is capable of retrieving information and triggering actions; it can be adapted to suit the needs of customer applications.

A logic controller
To execute which actions?

Controlling

The logic controller **controls** and automates a set of actuators according to the state of the sensors, the passing of time and the program created using the M3 Soft software.

Measuring, Operator dialogue

The logic controller integrates a local screen, a true operator interface, where the user can view the **measured** values. The buttons on the front panel are configurable and can be used in programs. The M3 Soft software can be used to design an installation easily, test it using simulation mode and **communicate** with the application with monitoring mode.

Managing

The logic controller easily performs and **manages** complex control system sequences, by means of integrated functions.

Communicating, Triggering

The logic controller can be used to **communicate** remotely with PCs or mobile phones via SMS across a network.
It also incorporates a calendar to ensure the setting and **triggering** of actions.

Controlling

Measuring

Operator dialogue

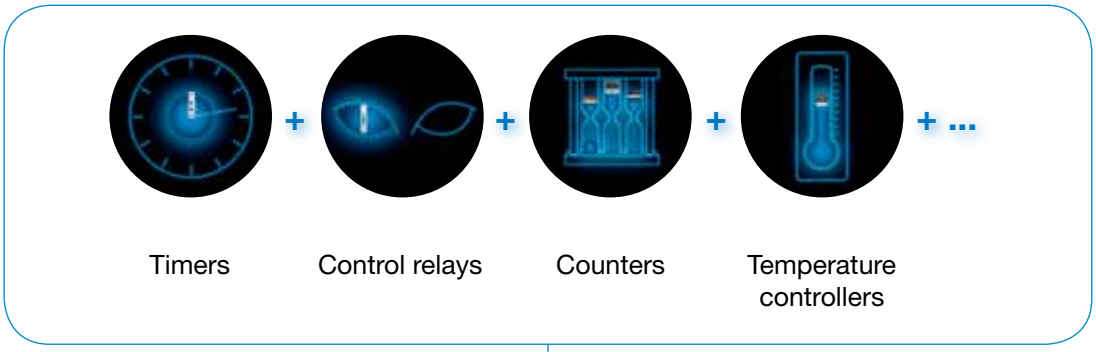
Managing

Communicating

Triggering

Crouzet logic controllers

Millenium 3, concentrated performance



XD26 Smart

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.

Crouzet logic controllers

The Millenium 3 Smart range

Features of Millenium 3 Smart:

- An integrated backlit LCD **blue screen**
- Up to **50 I/O**
- Possibility of creating a **network** enabling communication between up to **six Millenium 3** units
- Operating temperature up to **70°C**
- Modbus communication: **2 x 8 words** with read/write access

XD26 Smart
Millenium 3 Smart

XN07
Sandwich extensions

XR10
Termination extensions

8 models available

- Compact or expandable
- With or without display
- Supply voltage
  12 V ⎓ to 230 V ∿
- Digital and/or
  analogue I/O

Display

- 4 lines of 18 characters
- Drop-down screen
- Bar chart

Memory

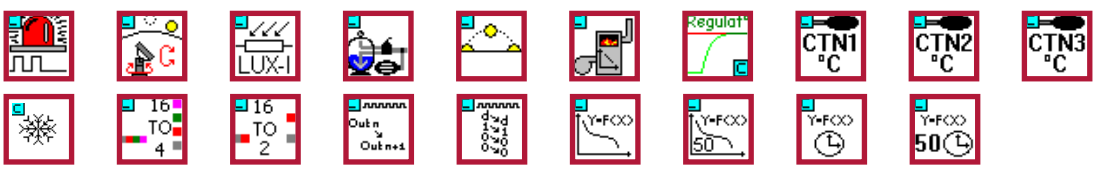
- 700 blocks

Communication extension

XN07 communication "Plug and Play" extension for Millenium 3 Smart, enabling ***communication between up to six Millenium 3 units*** (equipped with the XN06 extension).

Exclusive Millenium 3 Smart function blocks:

Of a library of 120 function blocks, 19 are exclusive to Millenium 3 Smart and are dedicated to industry-specific applications, communication and complex calculations.



Expandable versions

XD26 XB26

XD10 XB10

Expandable kit

Compact versions

CD20 CB20

CD12 CB12

Compact kit

Crouzet logic controllers
Their features:

User-friendly and ergonomic

- Panel mounted, **DIN rail mounted** or in a consumer unit to **simplify** installation.
- A wide range of accessories: remote displays, **touch panels**, sensors, power supplies to meet the specific needs of each application.
- A blue screen for **improved legibility**.
- A **wide** operating temperature range from -20°C to +70°C to cope with the operating constraints in severe environments.

Low-cost

- Wiring time **reduced** by programming with M3 Soft.
- **Several automation functions** contained in a single product.

Communication and expansion

- **Communication** products, to enable remote supervision or to send alarms or data.
- Products that are **100%** oriented towards the specific applications (water treatment, solar panels, etc.) to simplify implementation.
- **Expandable** products to ensure future project development can be maintained.

Simple

- **Ease of programming** using function blocks/ Grafcet SFC or in Ladder language.
- **Simplicity** of use so that complex automation systems can easily be created.
- **Adaptation** is possible, in terms of software and/or hardware, for perfect integration into any application.

Crouzet logic controllers

Accessories:

Sensors, power supplies, converters, remote screens and communication accessories offer solutions to control your automation systems with the greatest of ease.

Crouzet logic controllers

Adaptations:

Resin board version
Solution which can resist harsh environments (vibrations, shocks, damp or confined environments, non-ventilated equipment, etc). Extended temperature withstand: -30°C to +70°C.

Bare board version
Easily integrated into an existing casing or system (mother/daughter boards).

Customisation
Can feature your company logo.

Crouzet logic controllers

The Millenium 3 Essential range

XD26 Essential
Millenium 3 Essential

XN06
Sandwich extensions

XR10
Termination extensions

- Exists in compact and expandable versions
- Backlit LCD green screen
- Operating temperature up to 55°C
- Supply voltage: 12 and 24 V ⎓
- Memory: 350 blocks for the compact version, 700 blocks for the expandable version

M3 Soft software

Crouzet logic controllers

Millenium 3 and its M3 Soft software

M3 Soft is a **high-performance** software workshop which is used to program the Millenium 3 logic controller and **optimise** design times.

Free

The Millenium 3 programming software (M3 Soft) can be **downloaded free of charge** from the website **www.crouzet.com**

M3 Soft software

Its features

Simple

- Quick, **simple programming**.
- **Intuitive** programming requires no specialist knowledge.
- Self-teaching made easier thanks to a **user-friendly** online help and programming examples.
- A **simulation mode that faithfully represents** controller operation.

Powerful

- A complete **range** of generic **functions** : counting, timing, comparison, display, logic, gain, sin / cos, etc are also available.
- A wide range of **dedicated functions**: pump rotation, PID regulation, movement, pressure, level, water ratio, solar tracking, and flow.

User-friendly and ergonomic

- Menus available in **5 languages**: English, French, Italian, German and Spanish.
- Function block programming is **fun** and **very visual** (possibility of using Ladder language).
- Blocks **organised simply** by function for quick access.
- Possibility of organising **6 additional tabs**.
- **Help** associated with each function block **accessible** at the click of a button.

User-definable and effective

- Possibility of creating and saving **custom macros** in the macro tab to simplify programs and save the user's expertise.
- Possibility of protecting macros by locking them with a password for greater **confidentiality**.

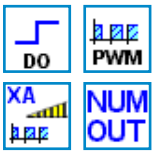
Overview of function blocks

A library of more than 120 function blocks for the Millenium 3 logic controller, some of which are **exclusive to the Millenium 3 Smart, outlined in red:**

IN/OUT INPUT/OUTPUT

Inputs

From the simple logic input to 10 or 12-bit analogue inputs, Crouzet's Millenium 3 can meet every automation requirement.



Outputs

With 8 A relays, Crouzet's Millenium 3 can control the actuators directly. 10-bit PWM and analogue outputs can control automation systems directly.

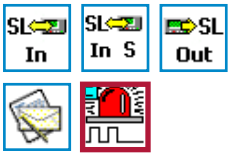
CTRL CONTROL

Counters, timers, comparators, trigger, etc, "control" function blocks offer the most commonly used functions when designing automation systems.

HMI/COM HMI / COMMUNICATION

HMI

Its panel-mounted screen and the possibility of using all the buttons in programs transform the Millenium 3 into a true human-machine interface.



Communication

Remote screens, supervision and communication via STN or GSM modem (alarm, SMS and/or e-mail on PC) make it easy to communicate with automation systems.

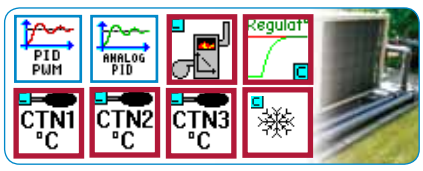
APP APPLICATIONS

Solar panels

Light sensor

Water treatment

Position of the sun



HVAC

Cam timers

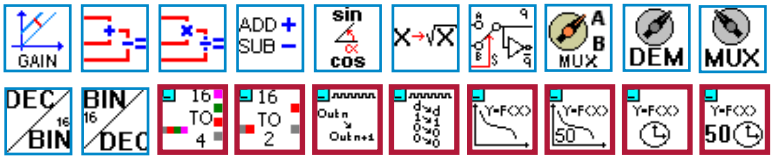
Dedicated function blocks specific to applications such as water treatment, solar panels, etc.

Glossary of function blocks available on the internet: **www.crouzet.com**

PROG PROGRAMMING

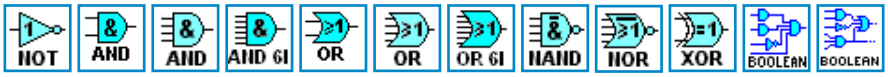
The Millenium 3 logic controller provides numerical, digital and time-based values (hour, minute) which can be used in any program. It offers latching and simple conversion functions for analogue values. Other function blocks can be used to retrieve information on the state of the Millenium 3.

CALC CALCUL



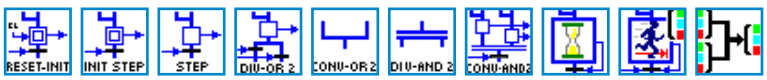
The Millenium 3 has simple and complex mathematical functions: sin, cos, square root of x, etc. This provides it with huge calculation and conversion power: binary to decimal conversion and vice versa, breaking down a 16-bit word into 4 words of 16 bits, multiplexing - demultiplexing.

LOGIC LOGIC



The Millenium 3 can handle binary data in Boolean logic. Boolean write function blocks can process an equation with up to 6 inputs and 2 outputs and even more by combining them.

SFC SEQUENTIAL FUNCTION CHARTS



The M3 Soft software allows programming in SFC language and use of steps, transitions and actions. There are also specific function blocks for controlling Brushless motors.

MACRO MACROS

After creating a program or subroutine it can be transformed into a proprietary macro and saved in a tab on the Menu bar for re-use at a later date.

Applications

Crouzet logic controllers

Where are they found?

In electrical cabinets associated with other automation functions in the following markets:

- Industrial automation
- Access control
- Renewable energies
- Residential equipment and buildings
- HVAC
- Lifting
- Handling
- Medical
- Pumps
- Transport

Public lighting

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

LEVER COUCHER

SUNRISE AND SUNSET TIME
Calculate the sunrise and sunset times

Automatic barrier

Control of barrier opening with automatic detection of vehicles. Function for selecting opening times / days.

1234 PRESET COUNT

TIME PROG

UP / DOWN COUNTER
Up / Down counter with external preset

Opening control for doors

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

BOOLEAN

BOOLEAN OR LOGIC
Create logic equations between the connected inputs

Stretch wrapping machine

Control of the motor that unrolls the packing film. Controls cutting of the film after heat sealing and monitors the duration of the motor cycles.

STEP

TIMERS

GRAFCET SFC FUNCTIONS
For sequential automation systems (Sequential Function Chart)

TIMERS
A/C function - BW function - B/H function - Li/L function

Ride-on lawnmower

Safety control of the cutting unit, presence of person on the seat, control of the diesel pump, of cutting blade rotation, of the engine temperature.

TEMPERATURE INPUT
HIGH-SPEED COUNTER/RATEMETER
with external preset

Solar water heating

Automation of operation and heating regulation, remote management of the installation.

TEMPERATURE CONTROL
(pressure or other)

Heat pump

Management of various parameters such as heating, cooling, fluid temperatures, operation, calendar-based function, frost protection mode, alarm management, etc.

WATER RATIO
Water temperature control

CLOCK
Weekly and yearly time programmer

Swimming pool, fountain, spas

Managing circulation pumps, monitoring levels, temperature and conductivity of the water.

FILTRATION
Definition of filtration duration depending on the water temperature

Tracking solar panels

Analysis and control of solar panel motorisation, communication between panels via Modbus or Ethernet network.

DUAL-AXIS SOLAR TRACKING
Optimisation of solar panel positioning for maximum efficiency by mathematical calculation

Irrigation / Sprinklers

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

PUMP MANAGEMENT
Pump rotation function

Selection guide

Starter kits, Millenium 3 Smart

M3 Smart kits

Kit contents	Number of I / O	Output
 Millenium 3 Smart M3 Soft software USB programming cable	12 (Compact)	Relay
	20 (Compact)	Relay
	26 (Expandable)	Relay

Logic controllers, Millenium 3 Smart

Compact version

Display	Number of I / O	Output
 Backlit blue	12	Relay
		Solid state
 Backlit blue	20	Solid state
		Relay
No display	12	Relay
 No display	20	Relay

Expandable version

Display	Number of I / O	Output
 Backlit blue	10	Relay
		Solid state
 Backlit blue	26	Solid state
		Relay
 No display	10	Relay
		Solid state
 No display	26	Solid state
		Relay

	Number of outputs	Number of inputs	Supply	Part number	Type
	4 x 8 A	8 (4 configurable as analogue)	24 V ⎓	88 974 080	Smart kit 12
		8	100 ⇨ 240 V ∿	88 974 081	Smart kit 12
	8 x 8 A	12 (6 configurable as analogue)	24 V ⎓	88 974 082	Smart kit 20
		12	100 ⇨ 240 V ∿	88 974 083	Smart kit 20
	8 x 8 A and 2 x 5 A	16 (6 configurable as analogue)	24 V ⎓	88 974 084	Smart kit 26
		16	100 ⇨ 240 V ∿	88 974 085	Smart kit 26

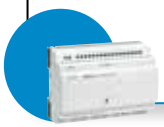
	Number of outputs	Number of inputs	Supply	Part number	Type
	4 x 8 A	8 (4 configurable as analogue)	24 V ⎓	88 974 041	CD12 Smart
		8	100 ⇨ 240 V ∿	88 974 043	CD12 Smart
			24 V ∿	88 974 044	CD12 Smart
		8 (4 configurable as analogue)	12 V ⎓	88 974 045	CD12 Smart
	4 x 0.5 A (1 PWM)	8 (4 configurable as analogue)	24 V ⎓	88 974 042	CD12 Smart
		8 (4 configurable as analogue)	12 V ⎓	88 974 046	CD12 Smart
	8 x 0.5 A (4 PWM)	12 (6 configurable as analogue)	24 V ⎓	88 974 052	CD20 Smart
	8 x 8 A		24 V ⎓	88 974 051	CD20 Smart
		12	100 ⇨ 240 V ∿	88 974 053	CD20 Smart
			24 V ∿	88 974 054	CD20 Smart
		12 (6 configurable as analogue)	12 V ⎓	88 974 055	CD20 Smart
	4 x 8 A	8 (4 configurable as analogue)	24 V ⎓	88 974 021	CB12 Smart
		8	100 ⇨ 240 V ∿	88 974 023	CB12 Smart
			24 V ∿	88 974 024	CB12 Smart
	8 x 8 A	12 (6 configurable as analogue)	24 V ⎓	88 974 031	CB20 Smart
		12	100 ⇨ 240 V ∿	88 974 033	CB20 Smart
			24 V ∿	88 974 034	CB20 Smart

	Number of outputs	Number of inputs	Supply	Part number	Type
	4 x 8 A	6 (4 configurable as analogue)	24 V ⎓	88 974 141	XD10 Smart
		6	100 ⇨ 240 V ∿	88 974 143	XD10 Smart
			24 V ∿	88 974 144	XD10 Smart
	4 x 0.5 A (1 PWM)	6 (4 configurable as analogue)	24 V ⎓	88 974 142	XD10 Smart
	10 x 0.5 A (4 PWM)	16 (6 configurable as analogue)	24 V ⎓	88 974 162	XD26 Smart
	8 x 8 A 2 x 5 A	16 (6 configurable as analogue)	24 V ⎓	88 974 161	XD26 Smart
		16	100 ⇨ 240 V ∿	88 974 163	XD26 Smart
			24 V ∿	88 974 164	XD26 Smart
		16 (6 configurable as analogue)	12 V ⎓	88 974 165	XD26 Smart
	4 x 8 A	6 (4 configurable as analogue)	24 V ⎓	88 974 131	XB10 Smart
		6	100 ⇨ 240 V ∿	88 974 133	XB10 Smart
			24 V ∿	88 974 134	XB10 Smart
	4 x 0.5 A (1 PWM)	6 (4 configurable as analogue)	24 V ⎓	88 974 132	XB10 Smart
	10 x 0.5 A (4 PWM)	16 (6 configurable as analogue)	24 V ⎓	88 974 152	XB26 Smart
	8 x 8 A 2 x 5 A	16 (6 configurable as analogue)	24 V ⎓	88 974 151	XB26 Smart
		16	100 ⇨ 240 V ∿	88 974 153	XB26 Smart
			24 V ∿	88 974 154	XB26 Smart
		16 (6 configurable as analogue)	12 V ⎓	88 974 155	XB26 Smart

Selection guide

Logic controllers, Millenium 3 Essential

Compact version

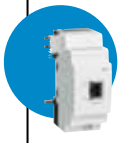
Display	Number of I / O	Output
 Backlit green	12	Relay
		Solid state
	20	Solid state
		Relay
 No display	12	Relay
		Solid state
	20	Relay
		Solid state

Expandable version

Display	Number of I / O	Output
 Backlit green	10	Relay
		Solid state
	26	Solid state
		Relay
		Solid state
 No display	10	Relay
		Solid state
	26	Solid state
		Relay

Logic controllers, Sandwich extensions

Communication

Compatibility	Network
 M3 Smart and M3 Essential XD/XB - 24 V ⎓	Ethernet Protocol Modbus TCP (slave)
	Modbus RS485 Protocol (slave)
 M3 Smart XD/XB - 24 V ⎓	RS485 exchange unit to XN06

Digital

Compatibility	Number of I / O	Output
 M3 Smart and M3 Essential XD/XB - 24 V ⎓	10	Relay
M3 Smart XD/XB 100 ⇨ 240 V ∿		
M3 Smart XD/XB - 24 V ∿		

Number of outputs	Number of inputs	Supply	Part number	Type
4 x 8 A	8 (4 configurable as analogue)	24 V ⎓	88 970 041	CD12 Essential
		12 V ⎓	88 970 045	CD12 Essential
4 x 0.5 A (1 PWM)		24 V ⎓	88 970 042	CD12 Essential
8 x 0.5 A (4 PWM)	12 (6 configurable as analogue)	24 V ⎓	88 970 052	CD20 Essential
8 x 8 A		24 V ⎓	88 970 051	CD20 Essential
		12 V ⎓	88 970 055	CD20 Essential
4 x 8 A	8 (4 configurable as analogue)	24 V ⎓	88 970 021	CB12 Essential
4 x 0.5 A (1 PWM)		12 V ⎓	88 970 840	CB12 Essential
8 x 8 A	12 (6 configurable as analogue)	24 V ⎓	88 970 031	CB20 Essential
8 x 0.5 A (4 PWM)		24 V ⎓	88 970 806	CB20 Essential

Number of outputs	Number of inputs	Supply	Part number	Type
4 x 8 A	6 (4 configurable as analogue)	24 V ⎓	88 970 141	XD10 Essential
4 x 0.5 A (1 PWM)			88 970 142	XD10 Essential
10 x 0.5 A (4 PWM)	16 (6 configurable as analogue)	24 V ⎓	88 970 162	XD26 Essential
8 x 8 A			88 970 161	XD26 Essential
2 x 5 A		12 V ⎓	88 970 165	XD26 Essential
10 x 0.5 A (4 PWM)			88 970 814	XD26 Essential
4 x 8 A	6 (4 configurable as analogue)	24 V ⎓	88 970 131	XB10 Essential
4 x 0.5 A (1 PWM)			88 970 132	XB10 Essential
10 x 0.5 A (4 PWM)	16 (6 configurable as analogue)	24 V ⎓	88 970 152	XB26 Essential
8 x 8 A			88 970 151	XB26 Essential
2 x 5 A		12 V ⎓	88 970 155	XB26 Essential

Exchange via words	Power supply via the controller	Part number	Type
read/write 8 Clock 4 Status 1	24 V ⎓	88 970 270	XN05
read/write 8 Clock 12 Status 1	24 V ⎓	88 972 250	XN06
read/write 1 to 6 depending on the number of slaves Status 1	24 V ⎓	88 974 250	XN07

Number of outputs	Number of inputs	Supply	Part number	Type
4 x 5 A including 1 changeover	6	24 V ⎓ (via the controller)	88 970 321	XE10
		100 ⇨ 240 V ∿	88 970 323	XE10
		24 V ∿	88 970 324	XE10

Selection guide

Logic controllers, Termination extensions

Compatibility	Number of I / O	Output
 M3 Smart and M3 Essential XD/XB - 24 V ⎓	4	Analogue
	6	Relay
	10	
	14	
 M3 Smart XD/XB 100 ⇨ 240 V ∿	6	Relay
	10	
	14	
M3 Smart XD/XB - 24 V ∿	6	Relay
	10	
	14	
 M3 Smart and M3 Essential XD/XB - 12 V ⎓	6	Relay
	10	
	14	
M3 Smart XD/XB - 24 V ⎓	3	No

Logic controllers, Accessories

Remote screens

Compatibility	Name	Technology
	MTP05C kit	Colour touch panel
	MTP05 kit	Touch panel Backlighting (green / orange / red)
 Direct link between M3 Smart and M3 Essential 24 V ⎓	MTP01 kit	Touch panel Backlighting (green / orange / red)
	RT511 kit	Touch panel + Keypad Backlighting (green / orange / red)
	N401 kit	Alphanumerical Backlighting (green / orange / red)
	HMI kit	Output to M3 HMI LCD with 6 keys
	HMI2 kit	Output to M3 HMI LCD with 6 keys + 4 function keys
 Link via XN06 extension (Modbus) between M3 Smart and Essential 24 V ⎓	RT511 kit Modbus	Touch panel + Keypad Backlighting (green / orange / red)
	N401 kit Modbus	Alphanumerical Backlighting (green/ orange / red)

Communication solutions

Compatibility	Output
 M3 Smart and M3 Essential 12 or 24 V ⎓	Modem communication interface
M3 Smart and M3 Essential via M3 MOD interface	GSM modem
	STN modem

Number of outputs	Number of inputs	Part number	Type
2 x 0/10 V or PWM	1 x 0/10 V or 0/20 mA 1 x 0/10 V or 0/20 mA or Pt100	**88 970 241**	**XA04**
2 x 8 A	4 Digital	**88 970 211**	**XR06**
4 x 8 A	6 Digital	**88 970 221**	**XR10**
4 x 8 A 2 x 5 A	8 Digital	**88 970 231**	**XR14**
2 x 8 A	4 Digital	**88 970 213**	**XR06**
4 x 8 A	6 Digital	**88 970 223**	**XR10**
4 x 8 A 2 x 5 A	8 Digital	**88 970 233**	**XR14**
2 x 8 A	4 Digital	**88 970 214**	**XR06**
4 x 8 A	6 Digital	**88 970 224**	**XR10**
4 x 8 A 2 x 5 A	8 Digital	**88 970 234**	**XR14**
2 x 8 A	4 Digital	**88 970 215**	**XR06**
4 x 8 A	6 Digital	**88 970 225**	**XR10**
4 x 8 A 2 x 5 A	8 Digital	**88 970 235**	**XR14**
None	3 x Pt100 (-25 ⇨ +125°C)	**88 970 800**	**XA03**

Screen size / resolution	Description	Software	Supply	Part number
3.5" / 320x240 pix. 4096 colours	User kit (MTP05C+connector+ MTP<->M3 cable)	MTPWIN (Programming kit Part no. 88 970 434)	24 V ⎓	**88 970 433**
3.5" / 320x240 pix.	User kit (MTP05+connector+ MTP<->M3 cable)	MTPWIN (Programming kit Part no. 88 970 434)		**88 970 432**
3" / 128x64 pix.	User kit (MTP01+connector+ MTP<->M3 cable)	MTPWIN (Programming kit Part no. 88 970 454)	24 V ⎓	**88 970 452**
10 lines 33 char./180x80 pix.	User kit (RT+RT<->M3 cable)	VIJEO Designer Light (Programming kit Part no. 88 970 483)	24 V ⎓	**88 970 482**
4 lines 20 char./122x32 pix.	User kit (N401+N401<->M3 cable)	VIJEO Designer Light (Programming kit Part no. 88 970 473)	24 V ⎓	**88 970 472**
Same as M3 screen	User kit (HMI+HMI<->M3 cable)	None	24 V ⎓	**88 970 412**
Same as M3 screen	User kit (HMI2+HMI<->M3 cable)	None	24 V ⎓	**88 970 413**
10 lines 33 char./180x80 pix.	User kit (RT+RT<->XN06 cable)	VIJEO Designer Light (Programming kit Part no. 88 970 483)	24 V ⎓	**88 970 484**
4 lines 20 char./122x32 pix.	User kit (N401+N401<->XN06 cable)	VIJEO Designer Light (Programming kit Part no. 88 970 473)	24 V ⎓	**88 970 474**

Name	Supply	Part number
M3 MOD	12 ⇨ 24 V ⎓	**88 970 117**
M3 GSM	12 ⇨ 24 V ⎓	**88 970 119**
M3 RTC		**88 970 118**

Selection guide

Power supplies in modular casings ≤ 60 W and DC/DC converters

Output voltage	Nominal power
24 V ⎓	7.5 W
	15 W
	30 W
	60 W
	6 ⇨ 10 W
12 V ⎓	24 W
	10 W
5 V ⎓	20 W

Power supplies in metal casing > 60 W

Output voltage	Nominal power
24 V ⎓	100 W
	150 W
	240 W
12 V ⎓	100 W

Accessories for mounting power supply in metal casing

Description	Part number
Snap-on plate for 35 mm DIN rail	26 450 100
Mounting bracket	26 450 101

Signal converters

Description	Supply	Inputs	Outputs	Part number
0 ⇨ 20 mA/0 ⇨ 10 V input converter	No	4	4	88 950 108
PWM/0 ⇨ 10 V output converter	24 V ⎓	1	1	88 950 112

Temperature converters

Description	Supply	Inputs	Outputs	Part number
Temperature converter Input - 20°C ⇨ + 150°C	24 V ⎓	1 x 3-wire Pt1000	1 x 0 ⇨ 10 V	88 950 150
Temperature converter Input - 40°C ⇨ + 40°C		1 x 3-wire Pt100		88 950 151
Temperature converter Input 0°C ⇨ + 100°C				88 950 152
Temperature converter Input 0°C ⇨ + 250°C				88 950 153
Temperature converter Input 0°C ⇨ + 300°C		1 x Thermocouple J		88 950 154
Temperature converter Input 0°C ⇨ + 600°C		1 x Thermocouple K		88 950 155

For more details on Thermocouple and Pt100 probes, see the website www.crouzet.com

Temperature sensors and accessories

Description	Part number
Ambient temperature sensor (0-10 V), -10 ⇨ +40°C 24 V ⎓ power supply	89 750 150
Ventilation duct (0-10 V output), -10 ⇨ +60°C 24 V ⎓ power supply	89 750 151
Outdoor sensor (0-10 V output), -10 ⇨ +40°C 24 V ⎓ power supply	89 750 152
Remote/submersible probe (0-10 V output), -10 ⇨ +150°C 24 V ⎓ power supply	89 750 153
Heat transfer compound	18 373 112
Copper protective sleeve	89 750 146
316 stainless steel protective sleeve	89 750 147

Output current	Input voltage	Casing width (mm)	Part number
0.3 A	100 ⇨ 240 V ∿	36	88 950 303
0.6 A			88 950 304
1.2 A		54	88 950 307
2.5 A		72	88 950 302
0.4 A	9,2 ⇨ 36 V ⎓	36	88 950 321
2 A	100 ⇨ 240 V ∿	54	88 950 306
0.8 A	9,2 ⇨ 18 V ⎓	36	88 950 320
4 A	100 ⇨ 240 V ∿	54	88 950 305

Output current	Input voltage	Dimensions (mm)	Part number
4.2 A	100 ⇨ 240 V ∿	200 x 38 x 98	89 450 222
6.2 A	115/230 V ∿	200 x 50 x 98	89 450 232
10 A		201 x 65 x 98	89 450 242
8.3 A	100 ⇨ 240 V ∿	200 x 38 x 98	89 450 122

Smart range of sensors

Description	Part number
NTC2 PVC probe, -25°C ⇨ +85°C	89 750 174
NTC1 Elastomer probe, -25°C ⇨ +85°C (pack of 10)	89 750 180
NTC2 probe 305 stainless steel -35°C ⇨ +120°C	89 750 182
NTC2 probe POM -20°C ⇨ +105°C (pack of 25)	89 750 185
LDR1 light sensor 10°C ⇨ 3000 Lux	89 750 183

Faceplate adaptors

Description	Part number
IP40 faceplate adaptor - 4 modules	88 970 809
IP40 faceplate adaptor - 7 modules	88 970 810
IP67 sealed faceplate adaptor - 4 modules	89 750 160
IP67 sealed faceplate adaptor - 8 modules	89 750 161
IP67 sealed faceplate adaptor - 13 modules	89 750 162

2 modules = XA04, XN00, XR06/4 modules = XE10, XR10, XR14, CD12, XD10/7 modules = CD20, XD26

Programming tools and software

Description	Part number
Multilingual programming software including the library of specific functions (CD-ROM) - M3 Soft for M3 Smart and M3 Essential	88 970 111
Alarm management software (CD-ROM) - M3 Alarm	88 970 116
EEPROM memory cartridge	88 970 108

Removable connectors

Description	Part number
Removable kit with 12 I / O	88 970 310
Removable kit with 20 I / O	88 970 311
Removable kit with 26 I / O	88 970 312

Connection accessories, display, potentiometer

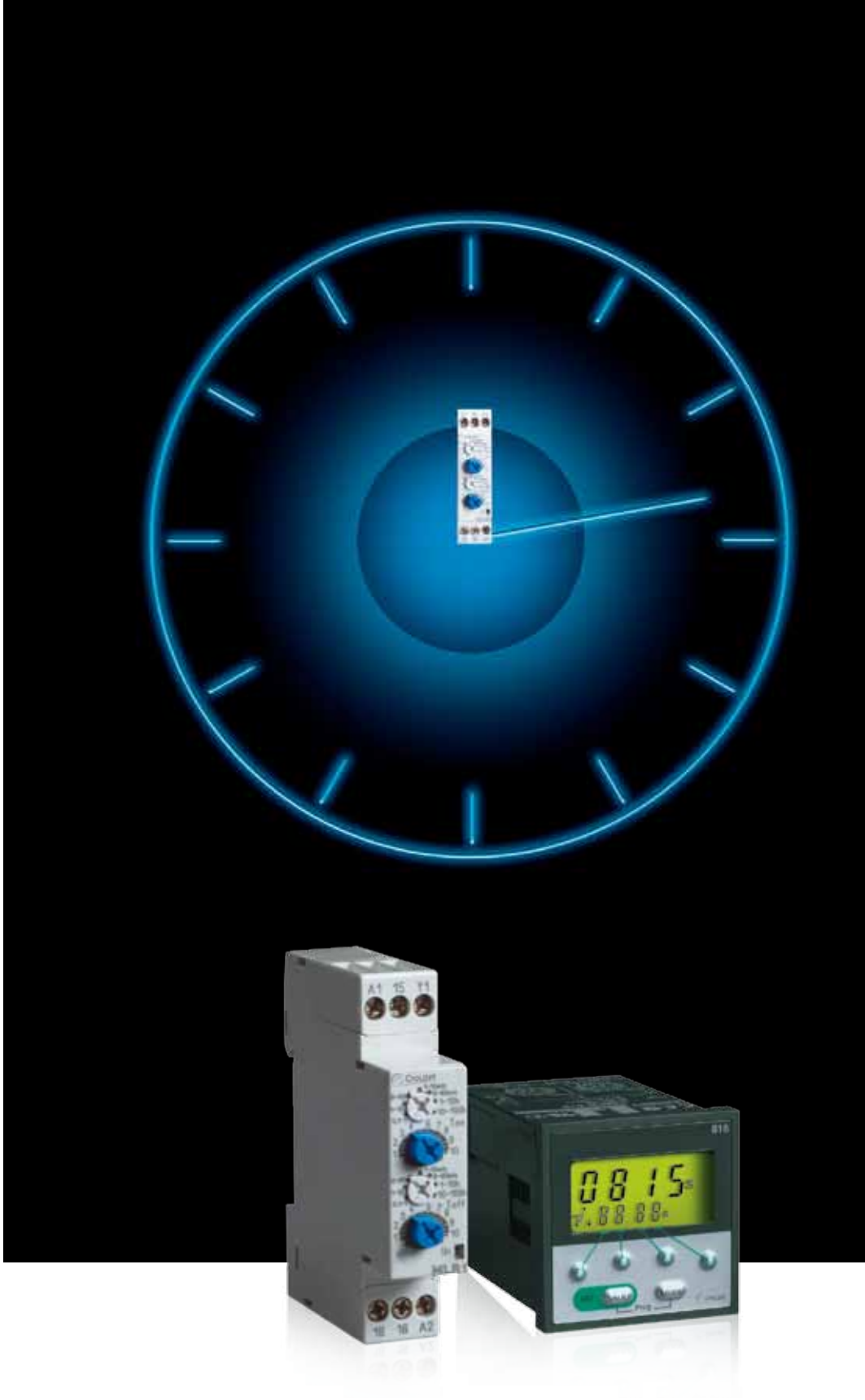
Description	Part number
3 m serial link cable: PC ⇨ Millenium 3	88 970 102
Millenium 3 ⇨ Bluetooth interface (class A 10 m)	88 970 104
3 m USB link cable: USB ⇨ DB9 (RS232)	88 950 105
3 m USB link cable: PC ⇨ Millenium 3	88 970 109
1.80 m serial link cable: DB9/DB9	88 970 123
Display with 4 x 14 mm red digits - 24 V ⎓	88 950 400
External potentiometer for adjusting values (4700 Ω) - 30 V ⎓ max	88 950 109

Crouzet Control Technologies

Behind every project, technologies and expertise

- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
- Certifications: **ISO 9001, ISO 14001, OHSAS 18001**.
- Products which **comply with international standards** (UL, CSA, EC).
- A **dynamic R&D department**.

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.



Timers

Time management

A timer
How can it be defined in simple terms?

A timer is a simple automation component which is used to manage actions over a period of time or control how long actions last.The timer is a control device which triggers an action according to a time and a function. After a predefined time has elapsed, the timer closes or opens one or more contacts.
Timing cycles, whether single shot or repetitive, are started by latching inputs or pulsed inputs, allowing a wide variety of functions to be created.

A timer
To execute which actions?

Triggering, Actuating

A timer can be used to **trigger** an action according to a predefined time.
It can also be used to stagger **actions** over a period of time.

Delaying, Flashing

In any time-related application, the timer can play a role and can be used to:
- Run installations according to times that can be adjusted by the user.
- Calibrate a machine running time.
- Allow or prevent an action.
- **Delay** an action.
- Manage stopping/starting of a motor, pump, etc. (star delta).
- Make an LED **flash**.

Triggering

Actuating

Delaying

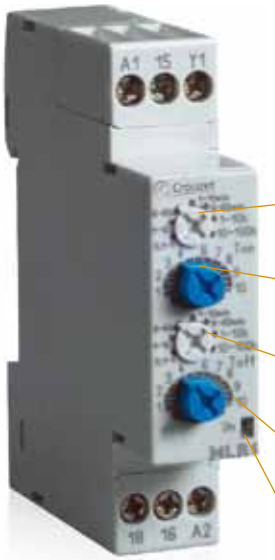
Flashing

In addition to this catalogue, the **www.crouzet.com** website offers technical data sheets and installation manuals for each product, available as free downloads.

Crouzet timers

A panel mounted range and a DIN rail mounted range

815 timer



MLR1

Crouzet timers

Their features:

- Available in **mono-** or **multifunction** versions (analogue or digital, with or without latching), to meet the specific needs of each application.
- **A timing range** of up to 9,999 hrs to cope with prolonged processing operations.
- A **range of power supplies** from 12 to 240 V in one unit for optimised stocks.
- Recognised **quality** and **reliability** ensures the correct operation of equipment.

Applications

Crouzet timers

Where are they found?

In electrical cabinets associated with other automation functions for the following markets:

- Food industry
- Industrial automation systems
- Lighting
- Building equipment
- HVAC
- Small or large industrial machines

Packaging

Controlling heat sealing times on blister packs, packaging bags, etc.

TIMER
MUR1, MXR1

Illuminated signs

Managing flashing on illuminated signs.

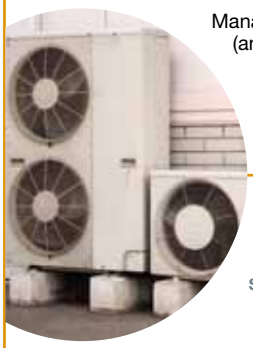
TIMER
TMR48L

Fan

Time management for delayed fan start-up.

TIMER
(S-SERIES, TMR48, TIMER 81X)

Heat pump



Managing compressor start-up (anti-short cycle).

S-SERIES TIMER

Ice maker

Managing the duration of refrigeration.

TIMER
TUR1

Drink vending machine

Timed management of delivery of drinks.

TIMER
TMR48, TIMER 81X

Lighting for mobile homes

Managing the duration of outdoor lighting of a mobile home if the light switch is left switched on.

TIMED IMPULSE RELAY
MXR

Machine tools

Control of maintenance periods.

TIMER
TMR48, TIMER 81X

Sensing on assembly line

Managing the operation of a conveyor belt based on the time interval between products on the belt.

TIMER
MCR1

Remote machinery

Managing maintenance of the power supply in the event of a mains power failure, switching on an external backup power source for a given time.

TIMER
TK2R1

Selection guide

Timers, "DIN rail mounted"

DIN rail modular casings

Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
 17.5	Screw terminals	A / / At / B / C / H / Ht Di / D / Ac / Bw
		A / At
		B
		C
		H / Ht
		L / Li
 17.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw
	Spring terminals	
	Screw terminals	Ad / Ah / N / O / P Pt / TL / Tt / W
 17.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw
		A
		H / Ht
		L / Li
 17.5	Screw terminals	A
		A / At / B / C / H / Ht Di / D / W / Pe

DIN rail industrial casings

Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
 22.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw
		A / At
		B
		C
		H / Ht
		L / Li
		Q
		K
 22.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw
		A / At
	Spring terminals	A / At / B / C / H / Ht Di / D / Ac / Bw
 22.5	Screw terminals	Ad / Ah / N / O / P Pt / TL / Tt / W
		Q
		A / At / B / C / H / Ht Di / D / Ac / Bw

Type of output	Output(s)	Timing	Supply	Part number	Type
Relay	1 x 8 A changeover	0.1 s ⇨ 100 hrs	24 V ⎓ / 24 ⇨ 240 V ∿	88 826 105	MUR1
				88 826 115	MAR1
				88 826 125	MBR1
				88 826 135	MCR1
				88 826 145	MHR1
				88 826 155	MLR1
Relay	1 x 8 A changeover	0.1 s ⇨ 100 hrs	12 V ≂	88 826 100	MUR4
			12 ⇨ 240 V ≂	88 826 103	MUR3
				88 826 503	MURc3
			24 V ⎓ / 24 ⇨ 240 V ∿	88 826 185	MXR1
Solid state	0.7 A	0.1 s ⇨ 100 hrs	24 ⇨ 240 V ∿	88 826 004	MUS2
			24 ⇨ 240 V ≂	88 826 014	MAS5
			24 ⇨ 240 V ∿	88 826 044	MHS2
				88 826 054	MLS2
Relay	1 x 5 A changeover	0.1 s ⇨ 20 hrs	24 V ≂	88 829 119	EMAR7
			240 V ∿	88 829 117	EMAR9
			12 ⇨ 240 V ⎓ / 24 ⇨ 240 V ∿	88 829 198	EMER8

Type of output	Output(s)	Timing	Supply	Part number	Type
Relay	1 x 8 A changeover	0.1 s ⇨ 100 hrs	24 ⇨ 240 V ∿	88 865 105	TUR1
				88 865 115	TAR1
				88 865 125	TBR1
				88 865 135	TCR1
				88 865 145	THR1
				88 865 155	TLR1
				88 865 175	TQR1
	2 x 8 A changeover	0.1 s ⇨ 160 s		88 865 265	TK2R1
Relay	1 x 8 A changeover 1 inst. or timed 8 A	0.1 s ⇨ 100 hrs	12 V ≂	88 865 300	TU2R4
	1 x 8 A changeover			88 865 100	TUR4
	2 x 8 A changeover		24 ⇨ 240 V ∿	88 865 215	TA2R1
	1 x 8 A changeover		12 ⇨ 240 V ≂	88 865 103	TUR3
				88 865 503	TURc3
Relay	1 x 8 A changeover 1 inst. or timed 8 A	0.1 s ⇨ 100 hrs	24 V ⎓ / 24 ⇨ 240 V ∿	88 865 385	TX2R1
	1 x 8 A changeover			88 865 185	TXR1
			230 ⇨ 400 V ∿	88 865 176	TQR6
	1 x 8 A changeover 1 inst. or timed 8 A		12 ⇨ 240 V ≂	88 865 303	TU2R3
			24 V ⎓ / 24 ⇨ 240 V ∿	88 865 305	TU2R1

The timer accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Selection guide

Removable industrial casings

	Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
	35	Removable 8-pin base	A / At / B / C / H / Ht Di / D / Ac / Bw
			A
			C
			L / Li
			A / At / B / C / H / Ht Di / D / Ac / Bw
	35	Removable 11-pin base	A / At / B / C / H / Ht Di / D / Ac / Bw
			A
			C
			L / Li
			A / At / B / C / H / Ht Di / D / Ac / Bw
	21	Removable 8-pin base	A
		Removable 11-pin base	

Timers, "Panel mounted"

Analogue - TMR48 series

	Dimensions	Connections	Functions (Detail on pages 42 to 45)
	48 x 48	Removable 11-pin base	L / Li - G / Gi
			A, B, C, W, G, Ac, Bw
		Removable 8-pin base	A
			A1, A2, H1, H2, Q1, Q2, D-Di

Digital

	Dimensions	Connections	Functions (Detail on pages 42 to 45)
	48 x 48	Removable 8-pin base	A
			A, B, C, D, Di, H
	48 x 48	Removable 11-pin base	A, B, C, D, Di, H
			A1, A2, AM, AMt
	48 x 48	Removable 11-pin base	A1, A1C, A2, A2C, AM, AMt, B, BM, C, CM, D, Di, DiM, Dpause, H, HM, T,TM, W, WM
	48 x 48	Removable 8-pin base	A, B, C, D, Di, H
		Removable 11-pin base	

Type of output	Output(s)	Timing	Supply	Part number	Type
Relay	1 x 8 A changeover	0.1 s ⇨ 100 hrs	24 V ⎓ / 24 ⇨ 240 V ∿	88 867 105	OUR1
	2 x 8 A changeover			88 867 215	OA2R1
	1 x 8 A changeover			88 867 135	OCR1
				88 867 155	OLR1
			12 V ⎓	88 867 100	OUR4
			12 ⇨ 240 V ⎓	88 867 103	OUR3
Relay	1 x 8 A changeover 1 inst. or timed 8 A	0.1 s ⇨ 100 hrs	24 V ⎓ / 24 ⇨ 240 V ∿	88 867 305	PU2R1
	2 x 8 A changeover			88 867 415	PA2R1
				88 867 435	PC2R1
				88 867 455	PL2R1
	1 x 8 A changeover 1 inst. or timed 8 A		12 V ⎓	88 867 300	PU2R4
			12 ⇨ 240 V ⎓	88 867 303	PU2R3
Relay	2 x 5 A changeover	0.1 s ⇨ 100 hrs	12 V ⎓	88 895 201	RTMA2
			24 V ⎓	88 895 202	RTMA2
			24 V ∿	88 895 203	RTMA2
			110 V ∿	88 895 206	RTMA2
			230 V ∿	88 895 207	RTMA2
	4 x 5 A changeover		12 V ⎓	88 896 201	RTMA4
			24 V ⎓	88 896 202	RTMA4
			24 V ∿	88 896 203	RTMA4
			110 V ∿	88 896 206	RTMA4
			230 V ∿	88 896 207	RTMA4

Type of output	Output(s)	Supply	Part number	Type
Relay	2 timed changeover 2 x 5 A	12 ⇨ 240 V ⎓ 24 ⇨ 240 V ∿	88 886 516	TMR 48 L
			88 886 016	TMR 48 U
			88 886 106	TMR 48 A
	2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)		88 886 116	TMR 48 X

Type of output	Output(s)	Supply	Part number	Type
Relay	2 timed changeover 2 x 5 A	24 V ⎓	88 857 409	812 timer
		110 V ∿	88 857 406	812 timer
		220 ⇨ 240 V ∿	88 857 400	812 timer
	1 x 8 A timed changeover	12 V ⎓/24 ⇨ 48 V ⎓	88 857 003	814 timer
		24 V ⎓/110 ⇨ 240 V ∿	88 857 005	814 timer
Relays	1 x 8 A timed changeover	12 V ⎓/24 ⇨ 48 V ⎓	88 857 103	814 timer
		24 V ⎓/110 ⇨ 240 V ∿	88 857 105	814 timer
	2 timed changeover or 1 timed and 1 instantaneous (2 x 8 A)	12 V ⎓/42 ⇨ 48 V ⎓	88 857 302	815 timer
		24 V ⎓/110 V ∿	88 857 307	815 timer
		24 V ⎓/220 ⇨ 240 V ∿	88 857 301	815 timer
Relay	2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)	12-24 V ⎓/100⇨240 V ∿	88 857 311	815E timer
Relay	1 x 8 A timed changeover	24 V ⎓/48 V ⎓	88 857 604	816 timer
		24 V ⎓/110 V ∿	88 857 607	816 timer
		24 V ⎓/220 ⇨ 240 V ∿	88 857 601	816 timer
		24 V ⎓/48 V ⎓	88 857 704	816 timer
		24 V ⎓/110 V ∿	88 857 707	816 timer
		24 V ⎓/220 ⇨ 240 V ∿	88 857 701	816 timer

The timer accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Selection guide

MBA series

	Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
	22 (diameter)	Screw terminals	A
	22 (diameter)	Screw terminals	A

Electromechanical - Top 2000 range

	Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
	48 x 48	Screw terminals Removable 8-pin base	2-3-4
	48 x 48	Screw terminals Removable 8-pin base	2-3-4

Manual reset

	Casing width (mm)	Connections	Functions (Detail on pages 42 to 45)
	55	Faston connectors 6.35 mm	A
	55	Faston connectors 6.35 mm	A
	55	Faston connectors 6.35 mm	A

	Output	Output	Timing	Supply	Part number	Type
	Solid state	400 mA	0.1 s ⇨ 1 s	100 ⇨ 240 V ⎓	88 901 308	MBA2F
			0.5 s ⇨ 10 s		88 901 328	MBA2F
			3 s ⇨ 60 s		88 901 348	MBA2F
			0.5 min ⇨ 10 min		88 901 378	MBA2F
			3 min ⇨ 60 min		88 901 398	MBA2F
	Solid state	200 mA	0.1 s ⇨ 1 s	24 V ⎓	88 901 302	MBA3F
			0.5 s ⇨ 10 s		88 901 322	MBA3F
			3 s ⇨ 60 s		88 901 342	MBA3F
			0.5 min ⇨ 10 min		88 901 372	MBA3F
			3 min ⇨ 60 min		88 901 392	MBA3F

	Output	Output(s)	Timing	Supply	Part number	Type
	Relay	1 x 5 A timed changeover and 1 instantaneous	6 s ⇨ 12 min	24 V ∿	88 226 013	Top 2000
				42 ⇨ 48 V ∿	88 226 019	Top 2000
				110 ⇨ 127 V ∿	88 226 012	Top 2000
				220 ⇨ 240 V ∿	88 226 011	Top 2000
				24 V ∿	88 226 501	Top 2000
				42 ⇨ 48 V ∿	88 226 502	Top 2000
				110 ⇨ 127 V ∿	88 226 503	Top 2000
				220 ⇨ 240 V ∿	88 226 504	Top 2000
	Relay	1 x 5 A timed changeover and 1 instantaneous	6 min ⇨ 12 hrs	24 V ∿	88 226 016	Top 2000
				24 V ∿	88 226 505	Top 2000
				42 ⇨ 48 V ∿	88 226 017	Top 2000
				42 ⇨ 48 V ∿	88 226 506	Top 2000
				110 ⇨ 127 V ∿	88 226 015	Top 2000
				110 ⇨ 127 V ∿	88 226 507	Top 2000
				220 ⇨ 240 V ∿	88 226 014	Top 2000
				220 ⇨ 240 V ∿	88 226 508	Top 2000

	Output	Output(s)	Timing	Supply	Part number	Type
	Relay	1 x 16 A timed	5 min (max. display time: 4 min 40 s)	127/230 V ∿ 50 Hz	88 256 401	88 256 4
			15 min (max. display time: 14 min)		88 256 402	88 256 4
			30 min (max. display time: 28 min)		88 256 403	88 256 4
			60 min (max. display time: 56 min)		88 256 404	88 256 4
			120 min (max. display time: 1 hr 53 min)		88 256 405	88 256 4
			5 hrs (max. display time: 4 hrs 43 min)		88 256 406	88 256 4
			15 hrs (max. display time: 14 hrs 10 min)		88 256 407	88 256 4
			30 hrs (max. display time: 28 hrs 20 min)		88 256 408	88 256 4
	Relay	2 x 16 A timed	5 min (max. display time: 4 min 40 s)	127/230 V ∿ 50 Hz	88 256 506	88 256 5
			15 min (max. display time: 14 min)		88 256 507	88 256 5
			30 min (max. display time: 28 min)		88 256 508	88 256 5
			60 min (max. display time: 56 min)		88 256 509	88 256 5
			120 min (max. display time: 1 hr 53 min)		88 256 510	88 256 5
			5 hrs (max. display time: 4 hrs 43 min)		88 256 511	88 256 5
			15 hrs (max. display time: 14 hrs 10 min)		88 256 512	88 256 5
			30 hrs (max. display time: 28 hrs 20 min)		88 256 513	88 256 5
	Relay	3 x 16 A timed	5 min (max. display time: 4 min 40 s)	127/230 V ∿ 50 Hz	88 256 906	88 256 9
			15 min (max. display time: 14 min)		88 256 907	88 256 9
			30 min (max. display time: 28 min)		88 256 908	88 256 9
			60 min (max. display time: 56 min)		88 256 909	88 256 9
			120 min (max. display time: 1 hr 53 min)		88 256 910	88 256 9
			5 hrs (max. display time: 4 hrs 43 min)		88 256 911	88 256 9
			15 hrs (max. display time: 14 hrs 10 min)		88 256 912	88 256 9
			30 hrs (max. display time: 28 hrs 20 min)		88 256 913	88 256 9

The timer accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

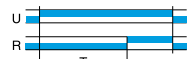
Function diagrams

Generic functions

U : Supply
R : Output relay or load
T : Timing
∞ : Infinity
C (Y1) : Command

• A function: Delay on energisation

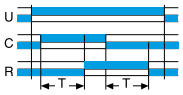
1 relay



Single shot timing which starts on energisation.

• Ac function: Timing after closing and opening of control contact

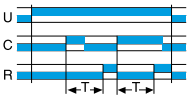
1 relay



After energisation, closing of the control contact results in starting of the time delay T.
Output relay "R" (or the load) changes state at the end of this time delay. After opening of contact C (Y1), relay "R" drops out after a second time delay T.

• Ad function: Delay on energisation (cannot be reset)

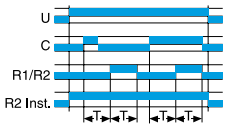
1 relay



After energisation, a control pulse or latching contact starts timing. At the end of timing, the output is excited. The output will be reset when a new control pulse or latching contact occurs.

• Ah function: Single shot flip-flop (cannot be reset)

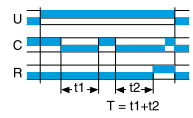
2 timers or
2 relays including
1 instantaneous



After energisation, a control pulse or latching contact starts timing. At the end of timing, the output is excited. The time delay is then reset. At the end of this new time delay, the output reverts to its initial value.

• Atfunction: Timing on energisation with memory

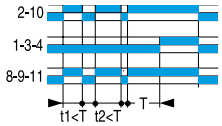
1 relay



Adds up the opening time of a contact.

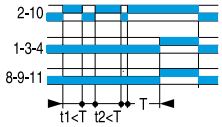
Output relay "R" (or the load) changes state at the end of timing.

• A1 function: Delay on energisation



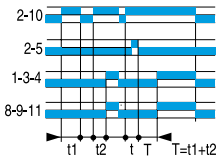
1 timer
1 instantaneous relay

• A2 function: Delay on energisation



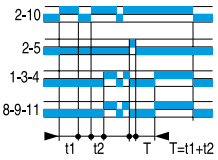
2 timers.

• AM function: Delay on energisation



Latching during the time delay.

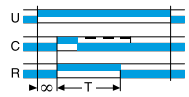
• AMt function: Delay on energisation



Latching during and after the time delay.

• B function: Timing on impulse (one shot) - Shaping (cannot be reset)

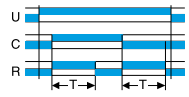
1 relay



After energisation, an impulse (≥ 50 ms) or a latching contact causes a change in state of the output relay "R" (or the load) which drops out at the end of timing.

• Bw function: Pulse output (adjustable)

1 relay



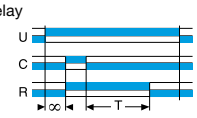
On closing and opening of the control contact C (Y1), the output relay "R" (or the load) changes state for as long as the time delay lasts.

2 timers or
2 relays including 1 instantaneous

• C function: Timing after impulse True delay off

(without auxiliary power supply)

1 relay

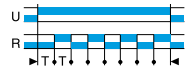


After energisation, closing of the control contact C (Y1) results in the change of state of output relay "R" (or the load).
Timing will only start when this contact opens.

• D or Di functions: Symmetrical flashing

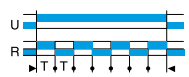
Repetitive cycle which alternately sets the output relay "R" (or the load) to operating and rest position for equal periods of time.

1 relay



D function:
The cycle starts with relay "R" in rest position.

1 relay

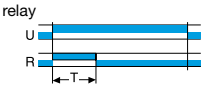


Di function:
The cycle starts with relay "R" in operating position.

U : Supply
R : Output relay or load
T : Timing
∞ : Infinity
C (Y1) : Command

• H function: Timing on energisation - Pulse output (adjustable)

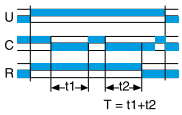
1 relay



On energisation, the output relay "R" (or the load) changes state, and stays there for the whole duration of the time delay and drops out at the end of the single shot cycle.

• Ht function: Delay on energisation with memory

1 relay

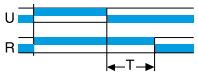


Adds up the total opening time of a contact.
On energisation, the output relay "R" (or the load) changes state, and stays there for the whole duration of the time delay and drops out at the end of the single shot cycle.

• K function: Delay on de-energisation True delay off

(without auxiliary power supply)

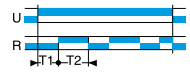
1 relay



On energisation, the output relay "R" (or the load) changes state.
On de-energisation timing starts and the relay "R" will only drop out at the end of this time delay.

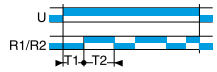
• L function: Asymmetrical flashing

1 relay



Repetitive cycle with two times which can be set independently. Each time delay alternates with a different state of the output relay "R" (or the load).

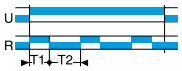
2 timers or
2 relays including
1 instantaneous



Note: The cycle starts with the relay "R"in the rest position.

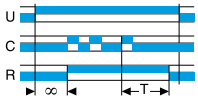
• Li function: Asymmetrical flashing

1 relay



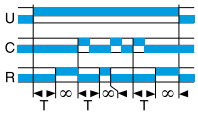
Repetitive cycle with two times which can be set independently.

• N function: "Safe-guard"



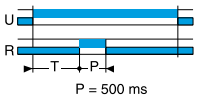
On the first control pulse, the output is excited.
If the interval between two impulses is longer than the timing value, this occurs normally and the output relay "R" (or the load) will change state at the end of timing. Otherwise, relay "R" stays in its original state until the condition is fulfilled.

• O function: "Delayed safe-guard"

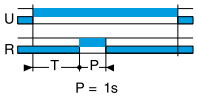


On energisation, a first timer runs and the output relay "R" (or the load) changes state.
On the appearance of a control pulse, relay "R" returns to its initial position and stays there as long as the time interval between 2 impulses is less than the timing value. Otherwise, relay "R" will change state at the end of timing.

• P and Pe functions: Impulse counter (delay on)

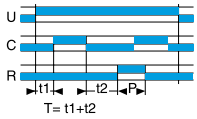


P function:
Timing starts on energisation.
At the end of timing, the output relay "R" (or the load) changes state for approximately 500 ms.



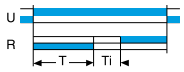
Pe function:
On energisation.
At the end of timing, the output relay "R" (or the load) changes state for approximately 1 s.

• Pt function: Impulse counter (delay on)



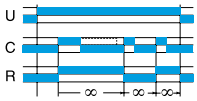
Adds up the total opening time of a contact.
At the end of timing, the output is excited for approximately 500 ms.

• Q function: "Star-delta" starting



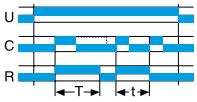
On energisation, the "star" contact closes instantaneously and timing starts.
At the end of timing the Ti "star" contact opens. After a pause of 40 to 100 ms the "delta" contact closes.

• TL function: Impulse relay



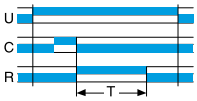
After energisation, a control pulse or latching contact closes the relay. A second control pulse opens the relay.

• Tt function: Timed impulse relay



After energisation, a control pulse or latching contact closes the relay and starts timing.
The relay opens at the end of timing or on a second control pulse.

• W function: Timing after pulse on control contact



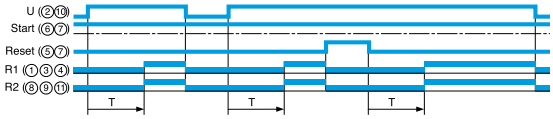
After energisation, opening of the control contact results in a change in the state of output "R" (or the load) and timing starting.

Function diagrams

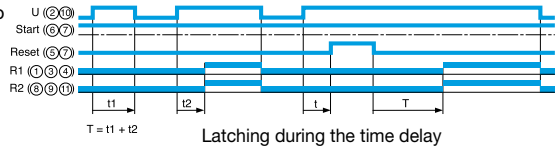
815E dedicated functions

U : Supply
R : Output relay or load
T : Timing
∞ : Infinity
C (Y1) : Command
Start : Start timing
Reset : Reset to zero

• A2 function: Delay on energisation

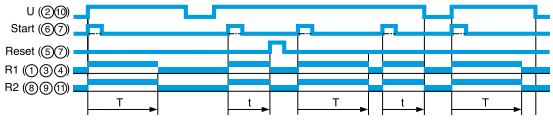


• AM function: Delay on energisation

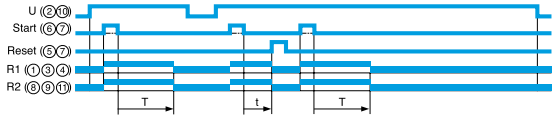


Latching during the time delay

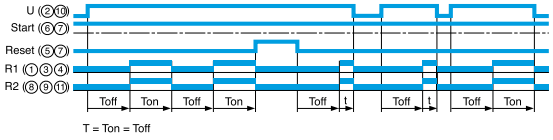
• B function: Timing on impulse (one shot)



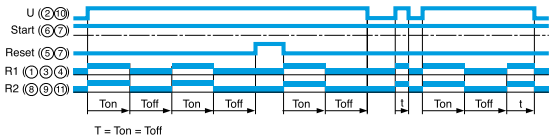
• C function: Timing after impulse



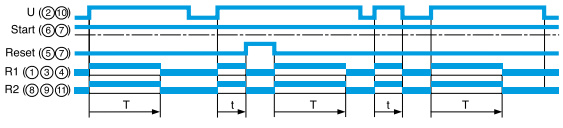
• D function: Flip-flop



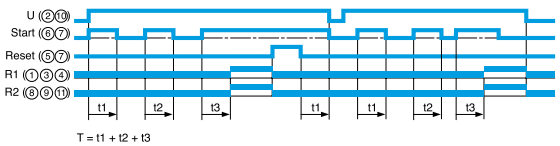
• Di function with latching: Flip-flop



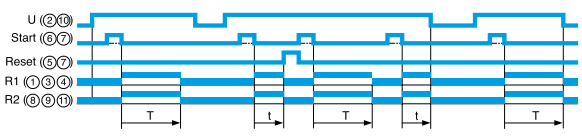
• H function: Timing on energisation



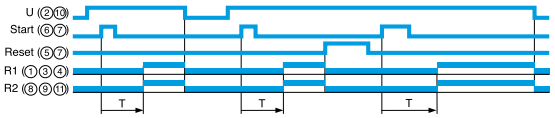
• T function: Timing on energisation



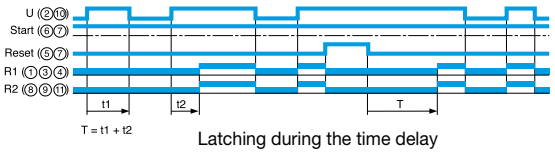
• W function: Off-delay



• A2c function: Delay on energisation

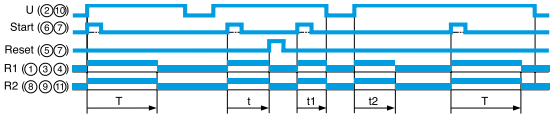


• AMt function: Delay on energisation

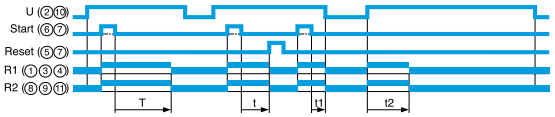


Latching during the time delay

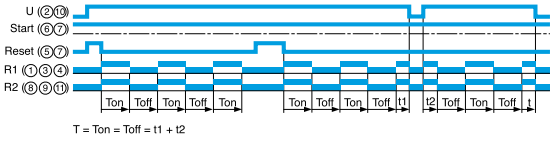
• B function with latching: Timing on impulse (one shot)



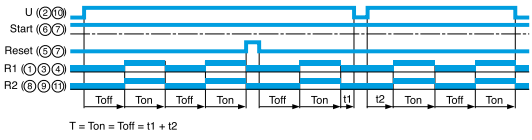
• C function with latching: Timing after impulse



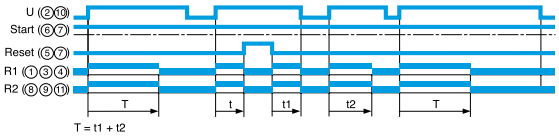
• Di function: Flip-flop



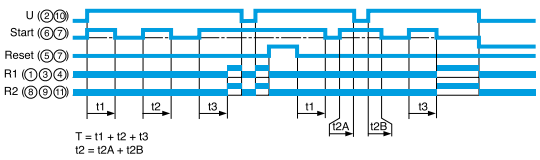
• D pause function: Flip-flop



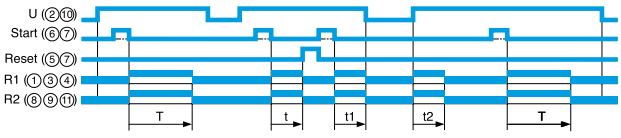
• H function with latching: Timing on energisation



• T function with latching: Timing on energisation



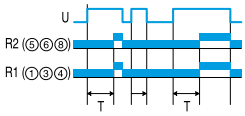
• W function with latching: Off-delay timer



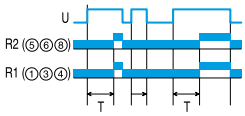
TMR48 dedicated functions

U : Supply
R : Output relay or load
T : Timing
∞ : Infinity
C (Y1) : Command

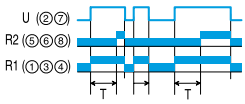
• TMR48 A A function: Delay on energisation



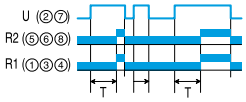
• TMR48 U A function: On-delay



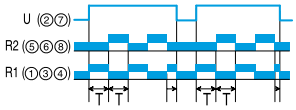
• A1 function: Delay on energisation



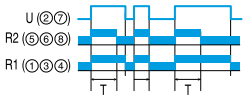
• A2 function: Delay on energisation



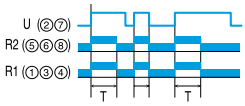
• D-Di function: Symmetrical flashing



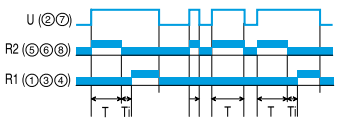
• H1 function: Timing on energisation



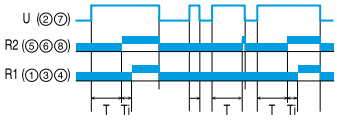
• H2 function: Timing on energisation



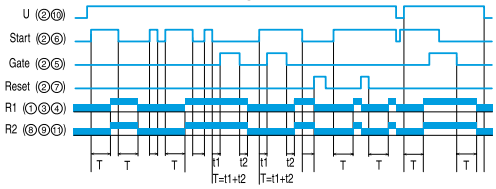
• Q1 function: Star-delta "starting"



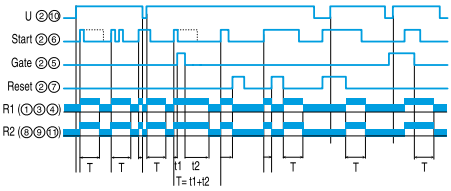
• Q2 function: "Star-delta 2" starting



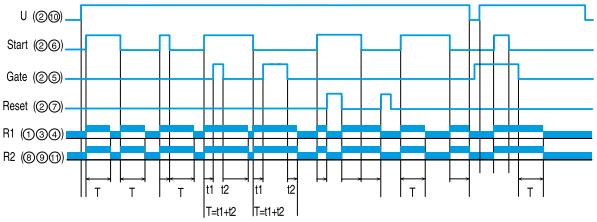
• Ac function: Timing after closing and opening of control contact



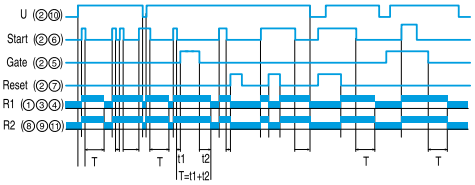
• B function: Timing on impulse (one shot)



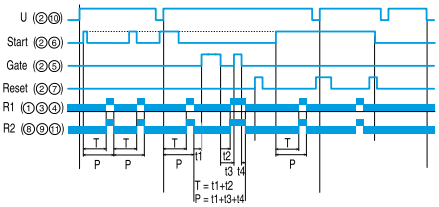
• Bw function: Pulse output (adjustable)



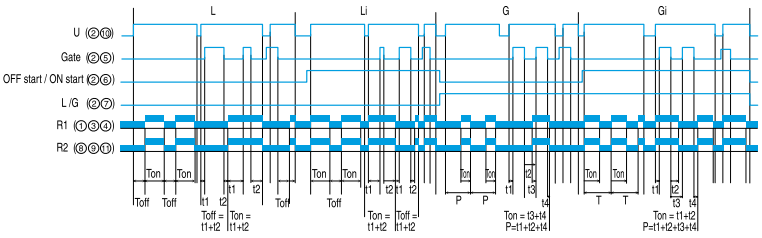
• C function: Off-delay



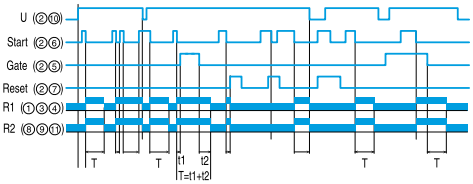
• G function: Cyclical function



• L/LiG/Gi function: Cyclical flashing timers



• W function: Off-delay

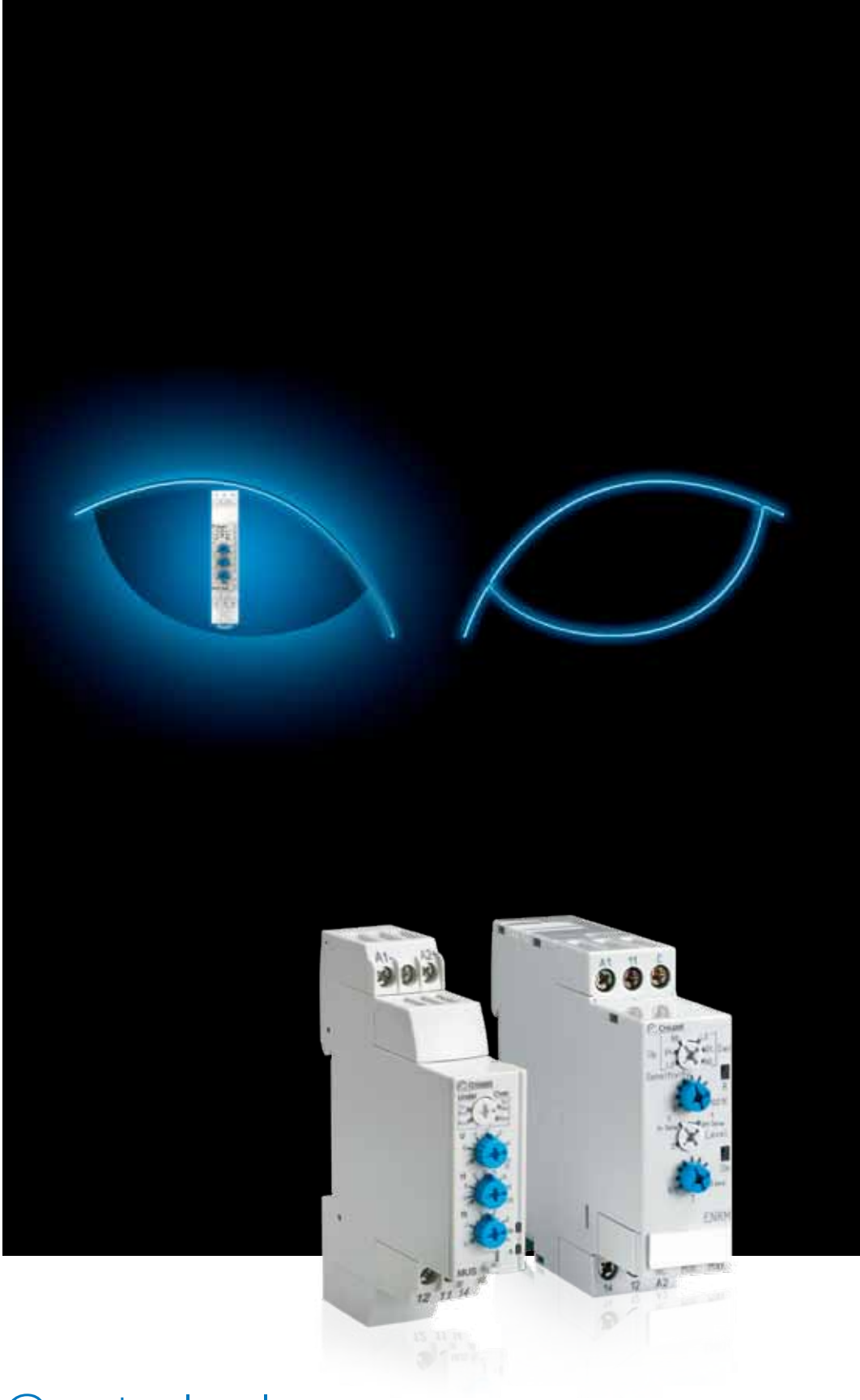


Crouzet Control Technologies

Behind every project, technologies and expertise

- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
- Certifications: **ISO 9001, ISO 14001, OHSAS 18001**.
- Products which **comply with international standards** (UL, CSA, EC).
- A **dynamic R&D department**.

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.



Control relays

Instinctive control

A control relay
How can it be defined in simple terms?

The control relay is an electronic device which can be used to detect and monitor physical values or electrical values.
If a device is found to be operating abnormally, the control relay trips to halt its operation.

A control relay
To execute which actions?

Protecting, Monitoring

The control relay is used to **protect** machines by monitoring values such as current, voltage, phase presence and sequence, levels, etc.

The control relay ensures total availability of equipment, a major challenge for industries keen to improve their productivity and operating profits.

It is one of the indispensable **monitoring** components for ensuring continuity of service of each installation.

Protection

Monitoring

Sensing, Alerting

If a fault is **detected**, the machine is not allowed to run and the user is informed of the anomaly by a visual signal.

Thus **alerted,** the user can then correct any malfunctions. This avoids expensive breakdowns, synonymous with production delays and loss of profitability.

Sensing

Alerting

Controlling, Triggering

In level **control**, the control relay takes on a different role: it controls the pump in order to manage the level of water in a container (tank, swimming pool, sink, etc). Directly interfacing with probes, it **triggers** a signal and thus safeguards against machine breakdowns due to threshold adjustment.

Controlling

Triggering

In addition to this catalogue, the **www.crouzet.com** website offers technical data sheets and installation manuals for each product, available as free downloads.

Crouzet control relays

C-Lynx modular casings and E, F, L industrial casings

MUS (C-Lynx)

ENRM (E, F, L)

Crouzet control relays

Their features:

- **Positive logic output** to protect installations in the event of a power failure.
- **True RMS** guaranteed regardless of interference on the electrical supply.
- Better integration in industrial and commercial cabinets thanks to **modular casings and industrial casings.**
- Simplified installation thanks to a **power supply** for single-phase products and a **self-powered** version for three-phase products.
- The **combination of a number of control functions** in one unit **optimises** wiring time and simplifies installation.
- A range of power supplies from 24 to 240 V in one unit **for optimised stocks.**

Applications

Crouzet control relays

Where are they found?

In electrical cabinets associated with other automation functions for the following markets:

- Food industry
- Industrial automation systems
- Quarries
- Building equipment
- Water treatment
- Transport

Lift

Monitoring the internal temperature of the PTC probe. For lift machine rooms, monitoring the temperature between 4° and 40°C according to standard EN81.

C-LYNX THERMOCONTROL RELAYS FOR LIFTS
HWT81

Ice maker

Fluid management: cold management compressor current control.

CURRENT CONTROL RELAY
MUS

Cranes

Monitoring overcurrent in the event of motor overload. When too high an overload occurs, the current exceeds the fixed threshold and the relay contact closes.

CURRENT CONTROL RELAY
MIC

Pump management

Protecting the pump: detection of no-load operation by undercurrent control, detection of jamming by overcurrent control.

CURRENT CONTROL RELAY
HIH

Generating set

Frequency control in generating sets or detection of backup units.

C-LYNX CONTROL RELAY (UNDERFREQUENCY/ OVERFREQUENCY)
HHZ

Fountains

Maintaining an adequate water level for the pumps or water jet to work properly, preventing no-load operation (which often irreparably damages the pumps, and always stops the water jet effect).

CONTROL RELAY
HNM

Motors

Control of mains voltage (prevents overheating, destruction of insulation and change of direction). Motor protection, detection of anomalies (temperature too high, motor stopping).

MOTOR TEMPERATURE CONTROL RELAY
HWTM

Crushers

Detection of obstruction or jamming.

CURRENT CONTROL RELAY
HIH

Escalators

Control/detection of phase sequence and failure on motors.

PHASE CONTROL RELAY
HWUA

Steam systems

Level control (maintaining a constant level).

LEVEL CONTROL RELAYS
ENRM

Control relays, C-Lynx modular casings

Phase control (3-phase supply)

Phase failure

Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing
 With 70 % regeneration	Yes / No	No / No	No
		No / -20 % ⇨ -2 %	0.1 ⇨ 10 s
	Yes / 5 ⇨ 15 %	No / No	
		Window +2 ⇨ +20 % -20 ⇨ -2 %	
 Without regeneration	Yes / No	No / No	No
	No / No	+2 ⇨ +20% / -20 ⇨ -2 %	0.3 ⇨ 30 s
	Yes / 5 ⇨ 15%		0.1 ⇨ 10 s
	No / No		0.3 ⇨ 30 s

Loss of phase and neutral

Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing
 Without regeneration	No / No	+2 ⇨ +20 % / -20 ⇨ -2 %	0.3 ⇨ 30 s

Motor temperature control and phase sequence and failure

Sensor	Test	Latching	Supply voltage
 PTC	No	No	24 ⇨ 240 V ∿
	Reset on front panel	Yes	

Single-phase DC voltage control with selectable latching

Measurement range	Functions	Hysteresis	Timing
 9 ⇨ 15 V ⎓	Over / Undervoltage	5 % ⇨ 20 %	0.1 ⇨ 10 s
20 ⇨ 80 V ∿			
65 ⇨ 260 V ∿			
0.2 ⇨ 60 V ∿	Over or Undervoltage	5 % ⇨ 50 %	0.1 ⇨ 3 s
15 ⇨ 600 V ∿			
 20 ⇨ 80 V ∿	Window	3% fixed	0.1 ⇨ 10 s
65 ⇨ 260 V ∿			

Current control (over or undercurrent)

Measurement range	Built-in CT	Hysteresis	Latching / Timing
 2 ⇨ 20 A ∿	Yes	15% fixed	No / No
2 ⇨ 500 mA ∿	No	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s
0.1 ⇨ 10 A ∿			

Output(s)	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
1 x 5 A changeover	17.5	208 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 022	MWG
			84 873 023	MWU
			84 873 024	MWA
			84 873 025	MWUA
1 x 5 A changeover	17.5	208 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 020	MWS
2 x 5 A changeover		208 ⇨ 440 V ∿ - 50 / 60 Hz	84 873 021	MWS2
1 x 5 A changeover		208 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 222	M3US
2 x 5 A changeover	35	220 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 026	HWUA
			84 873 220	H3US

Output relay	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
2 x 5 A changeover	35	120 ⇨ 277 V ∿ - 50 / 60 Hz	84 873 221	H3USN

Output relay	Casing width (mm)	Supply	Part number	Type
2 x 5 A N / O	35	208 ⇨ 480 V ∿	84 873 027	HWTM
			84 873 028	HWTM2

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 140	MUS
			84 872 141	MUS
			84 872 142	MUS
2 x 5 A changeover	35	24 ⇨ 240 V ∿ ⎓	84 872 120	HUL
			84 872 130	HUH
1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 151	MUSF
			84 872 152	MUSF

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 5 A changeover	17.5	24 ⇨ 240 V ∿ ⎓	84 871 122	MIC
2 x 5 A changeover	35		84 871 120	HIL
			84 871 130	HIH

The control relay accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Selection guide

Frequency control with window

	Measurement range	Selectable latching	Hysteresis	Timing	
	40 ⇨ 70 Hz	Yes	0.3 Hz fixed	0.1 ⇨ 10 s	

Level control

	Probe	Emptying / Filling	Level / Measurement range	Timing	
	Resistive	Yes / Yes	1 or 2 / 250 ⇨ 1 MΩ	0.1 ⇨ 5 s	
	Digital or PNP / NPN		1 or 2 / None		
	Digital	No / Yes	1 / None		

Over/underspeed control

	Sensor	Measurement range	Hysteresis	Timing	
	3-wire NPN/PNP sensor, 0 ⇨ 30 V, NAMUR Volt-free contact	0.05 s ⇨ 10 min	5 % fixed	0.6 ⇨ 60 s	

Temperature control with window (lifts) according to EN81

	Sensor	Built-in phase control	Measurement range	Timing	
	3-wire Pt100	No	Low threshold -1 ⇨ +11°C High threshold +34 ⇨ +46°C	0.1 ⇨ 10 s	
	3-wire Pt100				
	3-wire Pt100	Yes 480 V			

Control relays, Industrial casings E, F, L

Phase sequence or phase failure control

	Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing	
	None	Yes / No	No / No	No	

Voltage control with selectable latching

	Measurement range	Functions	Hysteresis	Timing	
	0.2 ⇨ 60 V ≂	Over / Undervoltage	5 % ⇨ 50 %	0.1 ⇨ 3 s	
	15 ⇨ 600 V ≂	Over / Undervoltage	5 % ⇨ 50 %	0.1 ⇨ 3 s	

Output relay	Casing width (mm)	Supply	Part number	Type
2 x 5 A changeover	35	120 ⇨ 277 V ∿	84 872 501	HHZ

Output relay	Casing width (mm)	Supply	Part number	Type
2 x 5 A changeover	35	24 ⇨ 240 V ∿ ⎓	84 870 700	HNM
1 x 5 A changeover			84 870 710	HNE
	17.5		84 870 720	MNS

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 5 A changeover	35	24 ⇨ 240 V ∿ ⎓	84 874 320	HSV

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 5 A changeover	35	24 ⇨ 240 V ∿ ⎓	84 874 110	HT81
2 x 5 A N / O			84 874 120	HT81-2
2 x 5 A N / O			84 874 130	HWT81

Output relay	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
1 x 8 A changeover	22.5	200 ⇨ 500 V ∿	84 892 299	EWS
2 x 8 A changeover		200 ⇨ 460 V ∿	84 873 004	EWS2

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 8 A changeover	22.5	24 V ⎓	84 872 020	EUL
		24 V ∿	84 872 021	EUL
		120 V ∿	84 872 023	EUL
		230 V ∿	84 872 024	EUL
1 x 8 A changeover	22.5	24 V ⎓	84 872 030	EUH
		24 V ∿	84 872 031	EUH
		120 V ∿	84 872 033	EUH
		230 V ∿	84 872 034	EUH

The control relay accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Selection guide

Current control (over / undercurrent)

	Measurement range	With CT	Hysteresis	Latching / Timing
	2 ⇨ 500 mA	No	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s
	0.1 ⇨ 10 A	No	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s
	10 ⇨ 100 A	26 852 304	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s

Level control

	Probe	Emptying / Filling	Level / Measurement range	Timing
	Resistive	Yes / Yes	1 or 2 / 5 ⇨ 100 KΩ	No
	Resistive	Yes / Yes	2 / 250 Ω ⇨ 1 MΩ	0.1 ⇨ 5 s
	Resistive	Yes / Yes	1 or 2 / 5 ⇨ 100 KΩ	No
	Resistive	Combined with monitoring of wells	2 / 5 ⇨ 100 KΩ	No
	Resistive	Yes / Yes + Alarm	2 / 5 ⇨ 100 KΩ 2 / 250 Ω ⇨ 5 KΩ	No

Motor temperature control

	Sensor	Test	Latching	Manual reset
	PTC	No	Yes	No
			Yes	Yes
	PTC	No	Yes	Yes

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 8 A changeover	22.5	24 V ⎓	84 871 020	EIL
		24 V ∿	84 871 021	EIL
		48 V ∿	84 871 022	EIL
		120 V ∿	84 871 023	EIL
		230 V ∿	84 871 024	EIL
1 x 8 A changeover	22.5	24 V ⎓	84 871 030	EIL
		24 V ∿	84 871 031	EIH
		48 V ∿	84 871 032	EIH
		120 V ∿	84 871 033	EIH
		230 V ∿	84 871 034	EIH
1 x 8 A changeover	22.5	24 V ⎓	84 871 040	EIT
		24 V ∿	84 871 041	EIT
		48 V ∿	84 871 042	EIT
		120 V ∿	84 871 043	EIT
		230 V ∿	84 871 044	EIT

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 8 A changeover	22.5	24 V ∿	84 870 201	ENR
		48 V ∿	84 870 202	ENR
		120 V ∿	84 870 203	ENR
		230 V ∿	87 870 204	ENR
1 x 8 A changeover	22.5	24 V ∿	84 870 211	ENRM
		48 V ∿	84 870 212	ENRM
		120 V ∿	84 870 213	ENRM
		230 V ∿	84 870 214	ENRM
1 x 8 A changeover	39 Removable 8-pin base	24 V ∿	84 870 301	LN
		120 V ∿	84 870 303	LN
		230 V ∿	84 870 304	LN
	39 Removable 11-pin base	24 V ∿	84 870 306	LN
		120 V ∿	84 870 308	LN
		230 V ∿	84 870 309	LN
1 x 8 A changeover	39 Removable 11-pin base	24 V ∿	84 870 401	L2N
		120 V ∿	84 870 403	L2N
		230 V ∿	84 870 404	L2N
2 changeover	45	24 V ∿	84 870 501	FN
		48 V ∿	84 870 502	FN
		120 V ∿	84 870 503	FN
		230 V ∿	84 870 504	FN
			84 870 803	FN LS

Output relay	Casing width (mm)	Supply	Part number	Type
1 x 8 A N / O	22.5	24 V ∿	84 874 015	ETM
		120 V ∿	84 874 013	ETM
		230 V ∿	84 874 014	ETM
1 x 8 A changeover		24 V ∿	84 874 025	ETM 2
		120 V ∿	84 874 023	ETM 2
		230 V ∿	84 874 024	ETM 2
2 x 8 A changeover	22.5	24 V ∿	84 874 035	ETM 22
		120 V ∿	84 874 033	ETM 22
		230 V ∿	84 874 034	ETM 22

The control relay accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Crouzet Control Technologies

Behind every project, technologies and expertise

- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
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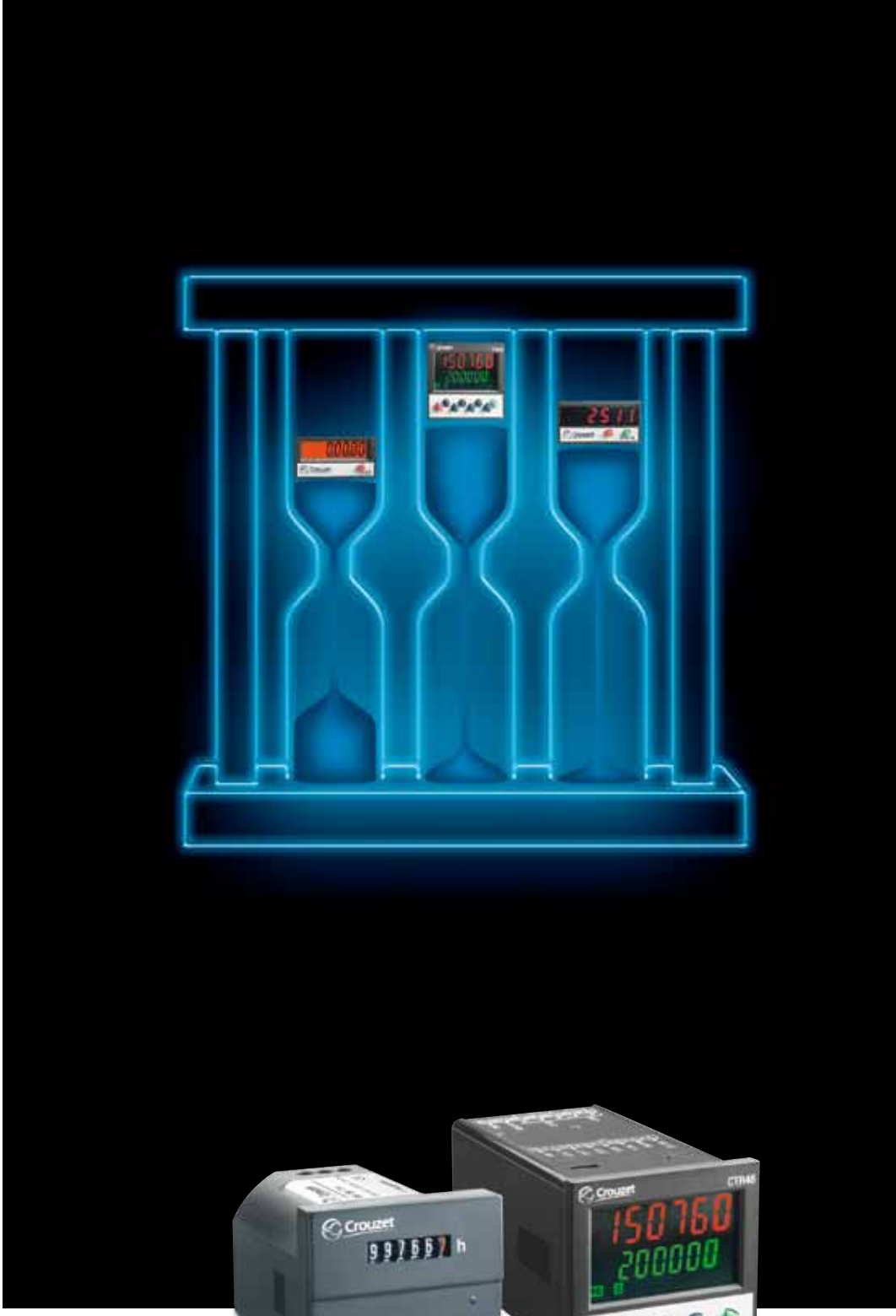


Counters and Ratemeters

Counting accuracy

A counter, a ratemeter

How can they be defined in simple terms?

A counter can be used to count a number of actions or events.
It thus participates in production management and preventive maintenance.
A ratemeter can be used to display the speed of rotation of a motor in real time.

A counter, a ratemeter

To execute which actions?

Up counting, Down counting

For **up counting** or **down counting** a number of parts, events, a running time, the counter is the ideal solution. There are different types of counter with the following functions: up/down counter, batch counter, ratemeter, chronometer, multi-totalizer, elapsed time counter, impulse counter.

Informing, Displaying

A counter can allow a user to be **informed** and to **display** data and quantities easily. The data displayed can be read directly on the front panel.

Triggering, Actuating

A counter can be used to **trigger** an action or an intervention on a machine. The outputs **actuate** directly and/or transmit data to the control system.

Measuring, Chronometer timing

A counter can be used to schedule preventive maintenance. The machine running time is **measured** and the duration of an action **timed with a chronometer**.

Up counting

Down counting

Informing

Displaying

Triggering

Actuating

Measuring

Chronometer timing

In addition to this catalogue, the **www.crouzet.com** website offers technical data sheets and installation manuals for each product, available as free downloads.

Crouzet counters and ratemeters

A digital range and an electromechanical range

CTR48

CEM48

Crouzet counters and ratemeters

Their features:

- For fast count applications, a high-speed counting frequency: up to **50 kHz**.
- A **two-colour or backlit LCD dual display** for ease of reading.
- Considerable space saving due to **dual-function** electromechanical and electronic ranges.
- A **complete** output operating **logic** to cover complex applications.
- **Easier maintenance** thanks to removable connectors (CTR48).
- An enhanced **multifunction** electronic range **for optimised stocks**.

Applications

Crouzet counters and ratemeters

Where are they found?

In electrical cabinets associated with other automation functions for the following markets:

- Industrial automation systems
- Building equipment
- Industrial machines
- Medical

Tachometer systems

Speed measurement and control on shrink wrapping machine.

ELECTRONIC COUNTER
CTR24L 2511

Counting quantities

Managing quantities - Packaging by unit, batch or series of batches.

ELECTRONIC COUNTER
CTR48

Length measurement

Calculation of cut length on wood and paper machines.

ELECTRONIC COUNTER
CTR48

Position control

Managing quantities - Calculation of distance of travel.

ELECTRONIC COUNTER
CTR48

Compressors

Counting operating hours and counting the number of starts.

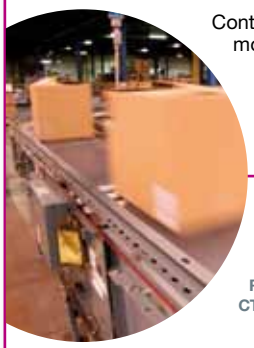
ELECTROMECHANICAL HOUR AND IMPULSE COUNTER
CMM48

Dehumidifiers

Counting operating hours, energy consumption.

ELECTROMECHANICAL HOUR AND ENERGY COUNTER
CEM48

Assembly line speed



Control of conveyor movement speed.

RATEMETER
CTR24L 2511

Milling machine

Combined ratemeter and counter for controlling the position and speed of a router.

ELECTRONIC RATEMETER AND COUNTERS
CTR24L 2513

Lifts

Combined impulse and hour counters - Maintenance. Start counters and operating time counters.

ELECTRONIC COUNTER
CTR24L 2514

UV lamp

Counting and display of operating times. Event management, wear control.

HOUR COUNTER
CTR24 2323

Selection guide

Electronic counters

24 x 48 multifunction counters without preselection

Functions	Modes	Multiplication coefficient / Decimal point	Max. counting speed
 Totalizer or Hour counter or Ratemeter	Dir / up.dn / up.up Ph / 2-ph / 4-ph	Yes / Yes	50 kHz
	Start / Stop	No / Yes	999,999 hrs
	sec -1 / min -1	Yes / Yes	50 kHz
 Double totalizer Independent inputs (A and B)	Counting A / B / A-B / A+B AdivB / %AB	Yes / Yes	25 kHz
 Totalizer and Ratemeter Independent inputs	Dir / up.dn / up.up Ph / 2-ph / 4-ph	Yes / Yes	30 kHz
	sec -1 / min -1		
 Double totalizer Common input	Counting (total / partial)	Yes / Yes	50 kHz
 Totalizer + Ratemeter or Totalizer + Totalizer or Totalizer + Hour or Hour + Hour	Counting + sec -1 / min -1	Yes / Yes	35 kHz
	Counting		50 kHz
	Counting + Start / Stop		40 kHz
			999,999 hrs
	Start / Stop	No / Yes	999,999 hrs

24 x 48 counters without preselection

Functions	Inputs / Reset	Max. counting speed	Display
 Hour	PNP / Contact	99,999.99 hrs	LCD
	NPN / Contact		
	Voltage / Contact		
 Hour	PNP / Contact	99,999.99 hrs	Orange (backlit)
	NPN / Contact		
	Voltage / Contact		
 Totalizer	Voltage / Contact	99,999,999	LCD
	PNP / Contact		
	NPN / Contact		
	Voltage / Contact		
 Totalizer	PNP / Contact	99,999,999	Orange (backlit)
	NPN / Contact		
	Voltage / Contact		

Display	Counting capacity	Supply	Part number	Type
LED	999,999 0.001 s ⇨ 999,999 hrs 999,999	10 ⇨ 30 V ⎓	87 623 570	CTR24L - 2511
LED	999,999	10 ⇨ 30 V ⎓	87 623 571	CTR24L - 2512
LED	999,999	10 ⇨ 30 V ⎓	87 623 572	CTR24L - 2513
LED	999,999	10 ⇨ 30 V ⎓	87 623 573	CTR24L - 2514
LED	999,999 999,999 0.001 s ⇨ 999,999 hrs 0.001 s ⇨ 999,999 hrs	10 ⇨ 30 V ⎓	87 623 574	CTR24L - 2515

Counting capacity	Supply	Part number	Type
0.1 s ⇨ 99,999.99 hrs	Lithium battery	87 622 161	CTR24 - 2223
		87 622 162	CTR24 - 2233
		87 622 170	CTR24 - 2224
0.1 s ⇨ 99,999.99 hrs	Lithium battery	87 622 181	CTR24 - 2323
		87 622 182	CTR24 - 2333
		87 622 190	CTR24 - 2324
99,999,999	Lithium battery	87 610 340	CP2 - 2108
		87 622 061	CTR24 - 2241
		87 622 062	CTR24 - 2251
		87 622 070	CTR24 - 2242
99,999,999	Lithium battery	87 622 081	CTR24 - 2341
		87 622 082	CTR24 - 2351
		87 622 090	CTR24 - 2342

The counters and ratemeters accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

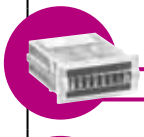
Selection guide

48 x 48 multifunction counters with preselection

	Functions	Number of preset(s)	Max. counting speed	Display
	Preselection counter Ratemeter Chronometer Multi-totalizer	1	40 KHz	Backlit LCD (orange) extra-bright 2 lines
	Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter	2		
	Preselection counter Ratemeter Chronometer Multi-totalizer	1	40 KHz	Two-colour LCD (red and green) 2 lines
	Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter	2		
	Preselection counter Chronometer	1	5 KHz	Backlit LCD (green) 2 lines
		2		

Electromechanical counters

Hour counters

	Dimensions (mm)	Counting capacity
	48 x 48	99,999.99
	48 x 48	999,999.99
	24 x 48	99,999.99
		999,999.99
	15 x 32	99,999.99
	Modular DIN rail 35 mm	99,999.99

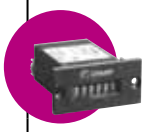
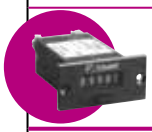
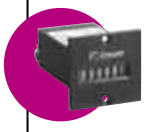
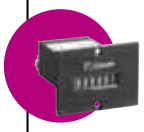
Counting capacity	Outputs	Supply	Part number	Type
-999,999 ⇨ 999,999	1 x 5 A changeover 1 solid state	10 ⇨ 30 V ⎓	87 621 111	CTR48
		24 V ∿	87 621 112	CTR48
		90 ⇨ 260 V ∿	87 621 115	CTR48
	1 x 5 A changeover 1 x 5 A N / O 2 solid state	10 ⇨ 30 V ⎓	87 621 121	CTR48
		24 V ∿	87 621 122	CTR48
		90 ⇨ 260 V ∿	87 621 125	CTR48
-999,999 ⇨ 999,999	1 x 5 A changeover 1 solid state	10 ⇨ 30 V ⎓	87 621 211	CTR48
		24 V ∿	87 621 212	CTR48
		90 ⇨ 260 V ∿	87 621 215	CTR48
	1 x 5 A changeover 1 x 5 A N / O 2 solid state	10 ⇨ 30 V ⎓	87 621 221	CTR48
		24 V ∿	87 621 222	CTR48
		90 ⇨ 260 V ∿	87 621 225	CTR48
-999,999 ⇨ 999,999	1 x 3 A changeover	11 ⇨ 30 V ⎓	87 629 111	CTR48E
		115 V ∿	87 629 113	CTR48E
		230 V ∿	87 629 114	CTR48E
	1 x 3 A changeover 1 x 3 A N / O	11 ⇨ 30 V ⎓	87 629 121	CTR48E
		115 V ∿	87 629 123	CTR48E
		230 V ∿	87 629 124	CTR48E

Frequency	Supply	Part number	Type
50 Hz ∿	20 ⇨ 30 V ∿	99 772 710	CHM48
	42 ⇨ 48 V ∿	99 772 711	CHM48
	100 ⇨ 130 V ∿	99 772 712	CHM48
	360 ⇨ 440 V ∿	99 772 713	CHM48
	187 ⇨ 264 V ∿	99 772 714	CHM48
60 Hz ∿	20 ⇨ 30 V ∿	99 772 718	CHM48
	42 ⇨ 48 V ∿	99 772 719	CHM48
	100 ⇨ 130 V ∿	99 772 715	CHM48
	360 ⇨ 440 V ∿	99 772 717	CHM48
	187 ⇨ 264 V ∿	99 772 716	CHM48
⎓	10 ⇨ 30 V ⎓	99 772 810	CHM48
	36 ⇨ 80 V ⎓	99 772 811	CHM48
	100 ⇨ 130 V ⎓	99 772 812	CHM48
50 Hz ∿	20 ⇨ 30 V ∿	99 782 710	CHM24
	100 ⇨ 130 V ∿	99 782 712	CHM24
	187 ⇨ 264 V ∿	99 782 714	CHM24
60 Hz ∿	20 ⇨ 30 V ∿	99 782 718	CHM24
	100 ⇨ 130 V ∿	99 782 715	CHM24
	187 ⇨ 264 V ∿	99 782 716	CHM24
⎓	10 ⇨ 30 V ⎓	99 782 810	CHM24
⎓	4.5 ⇨ 35 V ⎓	99 792 810	CHM15
50 Hz ∿	24 V ∿	99 793 710	CHMDR
	115 V ∿	99 793 712	CHMDR
	230 V ∿	99 793 714	CHMDR
⎓	10 ⇨ 27 V ⎓	99 793 810	CHMDR

The counters and ratemeters accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

Selection guide

Impulse counters

	Dimensions (mm)	Reset to zero
	15 x 32 Clip-fixing	No
	24 x 48 Clip-fixing	No
	24 x 48 Clip-fixing	Yes
	24 x 48 Screw-fixing	No
	24 x 48 Screw-fixing	Yes
	36 x 37 Screw-fixing	No
	36 x 37 Screw-fixing	Yes
	36 x 48 Screw-fixing	No
	36 x 48 Screw-fixing	Yes

Dual function 48 x 48 counters

	Functions	Reset to zero	Counting capacity
	Impulse Hour	No	9,999,999 99,999.99 hrs
	Hour Energy	No	9,999,999 / 999,999.99 hrs 99,999.9 hrs 99,999.9 kWh

Counting capacity	Supply	Part number	Type
9,999,999	24 V ∿ - 50 / 60 Hz	99 778 710	CIM 15
	115 V ∿ - 50 / 60 Hz	99 778 712	CIM 15
	230 V ∿ - 50 / 60 Hz	99 778 714	CIM 15
	5 V ⎓	99 778 805	CIM 15
	12 V ⎓	99 778 806	CIM 15
	24 V ⎓	99 778 810	CIM 15
999,999	24 V ∿ - 50 / 60 Hz	99 777 710	CIM 24
	230 V ∿ - 50 / 60 Hz	99 777 714	CIM 24
	12 V ⎓	99 777 815	CIM 24
	24 V ⎓	99 777 810	CIM 24
99,999	24 V ∿ - 50 / 60 Hz	99 777 720	CIM 24
	230 V ∿ - 50 / 60 Hz	99 777 724	CIM 24
	12 V ⎓	99 777 825	CIM 24
	24 V ⎓	99 777 820	CIM 24
999,999	24 V ∿ - 50 / 60 Hz	99 776 904	CIM 24 x 48
	115 V ∿ - 50 / 60 Hz	99 776 902	CIM 24 x 48
	230 V ∿ - 50 / 60 Hz	99 776 901	CIM 24 x 48
	24 V ⎓	99 776 907	CIM 24 x 48
	110 V ⎓	99 776 905	CIM 24 x 48
99,999	24 V ∿ - 50 / 60 Hz	99 776 924	CIM 24 x 48
	115 V ∿ - 50 / 60 Hz	99 776 922	CIM 24 x 48
	230 V ∿ - 50 / 60 Hz	99 776 921	CIM 24 x 48
	24 V ⎓	99 776 927	CIM 24 x 48
999,999	24 V ∿ - 50 / 60 Hz	99 776 604	CIM 36 x 37
	115 V ∿ - 50 / 60 Hz	99 776 602	CIM 36 x 37
	230 V ∿ - 50 / 60 Hz	99 776 601	CIM 36 x 37
	24 V ⎓	99 776 607	CIM 36 x 37
	110 V ⎓	99 776 605	CIM 36 x 37
99,999	24 V ∿ - 50 / 60 Hz	99 776 613	CIM 36 x 37
	115 V ∿ - 50 / 60 Hz	99 776 611	CIM 36 x 37
	230 V ∿ - 50 / 60 Hz	99 776 610	CIM 36 x 37
	24 V ⎓	99 776 616	CIM 36 x 37
999,999	24 V ∿ - 50 / 60 Hz	99 776 704	CIM 36 x 48
	115 V ∿ - 50 / 60 Hz	99 776 702	CIM 36 x 48
	230 V ∿ - 50 / 60 Hz	99 776 701	CIM 36 x 48
	24 V ⎓	99 776 707	CIM 36 x 48
	48 V ⎓	99 776 736	CIM 36 x 48
	110 V ⎓	99 776 705	CIM 36 x 48
99,999	24 V ∿ - 50 / 60 Hz	99 776 713	CIM 36 x 48
	115 V ∿ - 50 / 60 Hz	99 776 711	CIM 36 x 48
	230 V ∿ - 50 / 60 Hz	99 776 710	CIM 36 x 48
	24 V ⎓	99 776 716	CIM 36 x 48

Frequency	Supply	Part number	Type
50 Hz ∿	20 ⇨ 30 V ∿	99 779 710	CMM48
	100 ⇨ 130 V ∿	99 779 712	CMM48
	187 ⇨ 264 V ∿	99 779 714	CMM48
60 Hz ∿	20 ⇨ 30 V ∿	99 779 718	CMM48
	100 ⇨ 130 V ∿	99 779 715	CMM48
	187 ⇨ 264 V ∿	99 779 716	CMM48
⎓	10 ⇨ 30 V ⎓	99 779 810	CMM48
50 Hz ∿	115 V ∿	99 780 712	CEM48
	230 V ∿	99 780 714	CEM48

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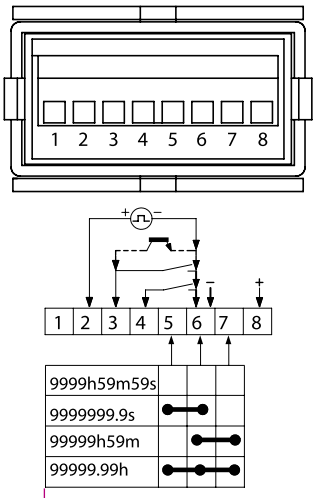
Connection diagrams

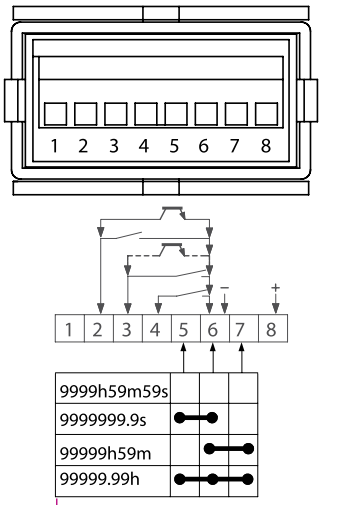
CTR24 counters

Connections



Types 2223 and 2323:

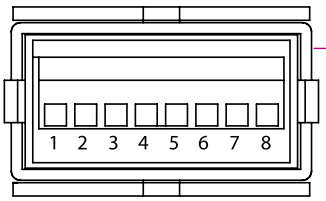
Part numbers:
- 87 622 161
- 87 622 181



Types 2233 and 2333:

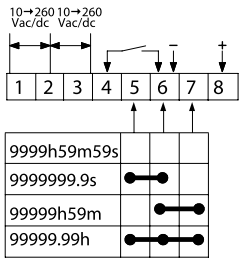
Part numbers:
- 87 622 162
- 87 622 182

1. NC
2. Start / Stop input
3. Reset input
4. Enable front panel Reset
5. Mode 1 (Time selection)
6. GND / Optional backlighting - (only 23xx)
7. Mode 2 (Time selection)
8. Optional backlighting + (only 23xx)

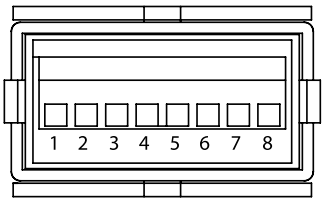


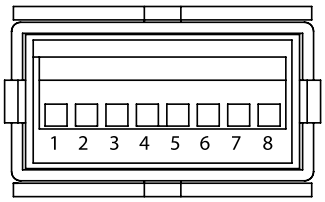
Types 2224 and 2324:

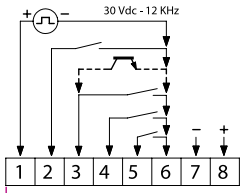
Part numbers:
- 87 622 170
- 87 622 190

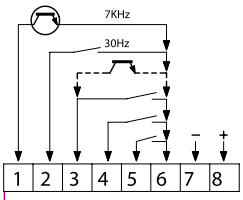


1. Common ≂
2. Start / Stop input
3. Reset input
4. Enable front panel Reset
5. Mode 1 (Time selection)
6. GND / Optional backlighting - (only 23xx)
7. Mode 2 (Time selection)
8. Optional backlighting + (only 23xx)









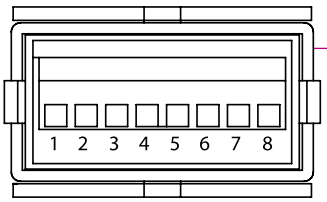
Types 2241 and 2341:

Part numbers:
- 87 622 061
- 87 622 081

Types 2251 and 2351:

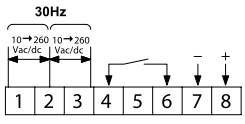
Part numbers:
- 87 622 062
- 87 622 082

1. Fast count
2. Slow count
3. Reset input
4. Enable front panel Reset
5. Counting (counting direction)
6. GND
7. Optional backlighting - (only 23xx)
8. Optional backlighting + (only 23xx)



Types 2242 and 2342:

Part numbers:
- 87 622 070
- 87 622 090



1. Fast count
2. Common ≂
3. Reset input
4. Enable front panel Reset
5. NC
6. GND
7. Optional backlighting - (only 23xx)
8. Optional backlighting + (only 23xx)

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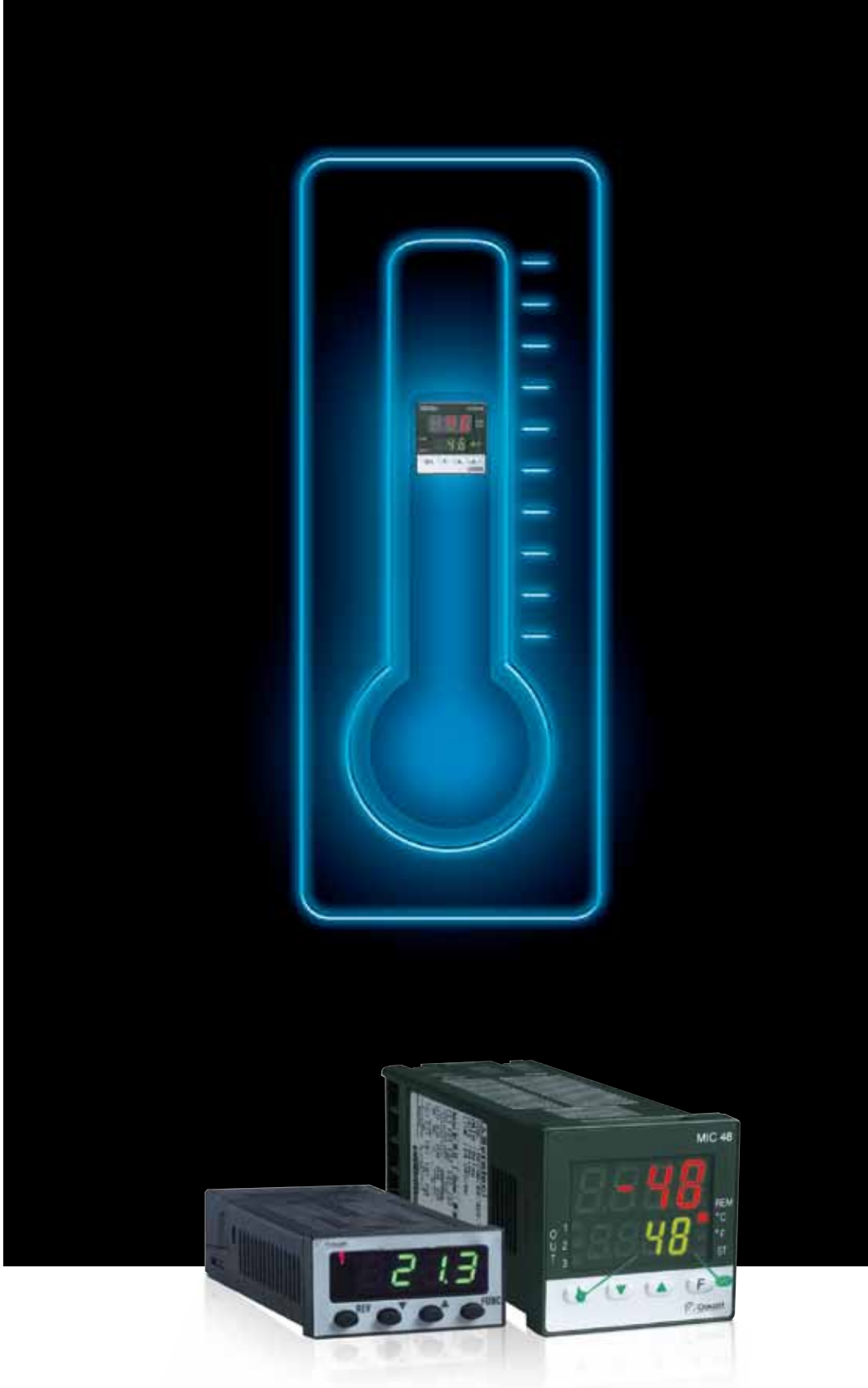


Temperature controllers

A degree of constancy

A temperature controller
How can it be defined in simple terms?

A temperature controller is an electronic device which is used to monitor and ensure a constant temperature according to a setpoint.

A temperature controller
To execute which actions?

Measuring

The temperature controller is used to **measure** and maintain the temperature of a room, an enclosure, a liquid.

It guarantees a constant temperature and ensures optimum use of the systems in which it is found: ovens, baths, cold rooms, machines.

Controlling, Displaying, Alerting

Directly interfacing with probes, the temperature controller **controls** and **displays** the temperature of the enclosure.

It can be used to set an **alert** in the event of an anomaly (low and/or high temperature).

Monitoring

The temperature controller action is not limited to **monitoring**. It senses and controls the temperature, acting on the system heating or cooling.

If the controlled temperature does not conform to the setpoint, the controller **implements** a heating or cooling action.

Measuring

Controlling

Displaying

Alerting

Monitoring

In addition to this catalogue, the **www.crouzet.com** website offers technical data sheets and installation manuals for each product, available as free downloads.

Crouzet temperature controllers

A complete range

Crouzet temperature controllers

Their features:

- **Adaptive tuning products** which manage their parameters independently: **PID**, temperature rise and inertia curve to simplify the installation.
- A **sophisticated** control **algorithm** to obtain a temperature as close as possible to the setpoint.
- A **dual display** makes it user-friendly and easy to use.
- Compatibility with all types of probe thanks to a **"Multi-technology probe input".**
- **Multiple outputs** (logic and/or relay) for optimum integration in **any** system.

Applications

Crouzet temperature controllers

Where are they found?

In electrical cabinets associated with other automation functions for the following markets:

- Industrial automation systems
- Building equipment
- Food industry

Packaging

Monitoring the heating temperature of the various packages.

TEMPERATURE CONTROLLER
MIC48

Fluid management

Maintaining the temperature of a ceramic oven.

TEMPERATURE CONTROLLER
CT48A

Brewing

Managing cooling of fermentation tanks.

TEMPERATURE CONTROLLER
MIC48

Cooking

Control of industrial ovens.

TEMPERATURE CONTROLLER
CTD46

Chocolate factory

Managing the temperature of the liquid chocolate before it is poured into a mould.

TEMPERATURE CONTROLLER
CTD24

Bain-Marie

Maintaining the temperature of a bain-marie during cooking.

TEMPERATURE CONTROLLER
CTD46

Oven

Managing the temperature of an oven with change of setpoint possible via MODBUS.

TEMPERATURE CONTROLLER
MIC48

Cold room

Maintaining a storage room at freezing temperature.

TEMPERATURE CONTROLLER
CTD46

Air treatment plant

Maintaining forced air at the correct temperature.

TEMPERATURE CONTROLLER
MIC48

Spray booth

Temperature control for "paint curing" in the motor vehicle industry.

TEMPERATURE CONTROLLER
CTD46

Selection guide

Temperature controllers

8-pin 48 x 48 analogue

Functions	Type of control	Temperature range
 Heating	Digital Proportional, Derivative (via wiring)	0 ⇨ 250°C
		0 ⇨ 450°C
		0 ⇨ 600°C
		0 ⇨ 800°C
		0 ⇨ 1200°C
 Heating	Digital Proportional, Derivative (via wiring)	-50 ⇨ +30°C
		0 ⇨ 40°C
		0 ⇨ 120°C
		0 ⇨ 200°C
		0 ⇨ 400°C

24 x 48 digital

Functions	Type of control	Alarm
 Heating or Cooling	PID with auto-tune and adaptive tune	1 alarm

48 x 48 digital

Functions	Type of control	Alarm
 Heating or Cooling	PID with auto-tune and adaptive tune	1 alarm
 Heating or Cooling	PID with auto-tune and adaptive tune	1 alarm
 Heating and Cooling	PID with auto-tune and adaptive tune	No
 Heating and / or Cooling	PID with auto-tune and adaptive tune Load break monitoring	2 alarms

Accessories

Description	Part number
Current transformer for MIC 48 (10 A / 50 mA)	**26 852 301**
Current transformer for MIC 48 (25 A / 50 mA)	**26 852 302**
Current transformer for MIC 48 (50 A / 50 mA)	**26 852 303**
Current transformer for MIC 48 (100 A / 50 mA)	**26 852 304**
Thermocouple probe J with nickel-plated brass eyelet - max: 400°C	**79 696 030**
Thermocouple probe J with 304 stainless steel casing - max: 600°C	**79 696 031**

Input	Output	Supply	Part number	Type
Thermocouple J	1 x 5 A relay	230 V ∿	89 420 047	CT48A
			89 420 067	CT48A
			89 420 097	CT48A
Thermocouple K			89 420 077	CT48A
			89 420 087	CT48A
2-wire Pt100	1 x 5 A relay	230 V ∿	89 420 207	CT48A
			89 420 217	CT48A
			89 420 227	CT48A
			89 420 237	CT48A
			89 420 257	CT48A

Input	Output	Display	Supply	Part number	Type
2 and 3-wire Pt100 or Thermocouple J, K, R, S, L, N or voltage	2 x 3 A outputs	1 (4 digits)	24 V ⎓	89 422 702	CTD24
			100 ⇨ 240 V ∿	89 422 708	CTD24
	1 x 3 A relay 1 voltage logic		24 V ⎓	89 422 712	CTD24
			100 ⇨ 240 V ∿	89 422 718	CTD24
	2 voltage logic		24 V ⎓	89 422 722	CTD24
			100 ⇨ 240 V ∿	89 422 728	CTD24

Input	Output	Display	Supply	Part number	Type
3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output	1 (3 digits)	24 V ⎓	89 421 102	CTD43
			100 ⇨ 240 V ∿	89 421 108	CTD43
	1 voltage logic 1 x 1 A relay		24 V ⎓	89 421 112	CTD43
			100 ⇨ 240 V ∿	89 421 118	CTD43
3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output	2 (3 digits)	24 V ⎓	89 422 102	CTD46
			100 ⇨ 240 V ∿	89 422 108	CTD46
	1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 112	CTD46
			100 ⇨ 240 V ∿	89 422 118	CTD46
3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output	2 (3 digits)	24 V ⎓	89 422 502	CTH46
			100 ⇨ 240 V ∿	89 422 508	CTH46
	1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 512	CTH46
			100 ⇨ 240 V ∿	89 422 518	CTH46
3-wire Pt100 or Thermocouple J, K, R, S,T, L, N or voltage or current	1 x 3 A output 1 x 1 A output	2 (4 digits)	24 V ⎓	89 422 002	MIC48
			100 ⇨ 240 V ∿	89 422 008	MIC48
	1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 012	MIC48
			100 ⇨ 240 V ∿	89 422 018	MIC48

Accessories (continued)

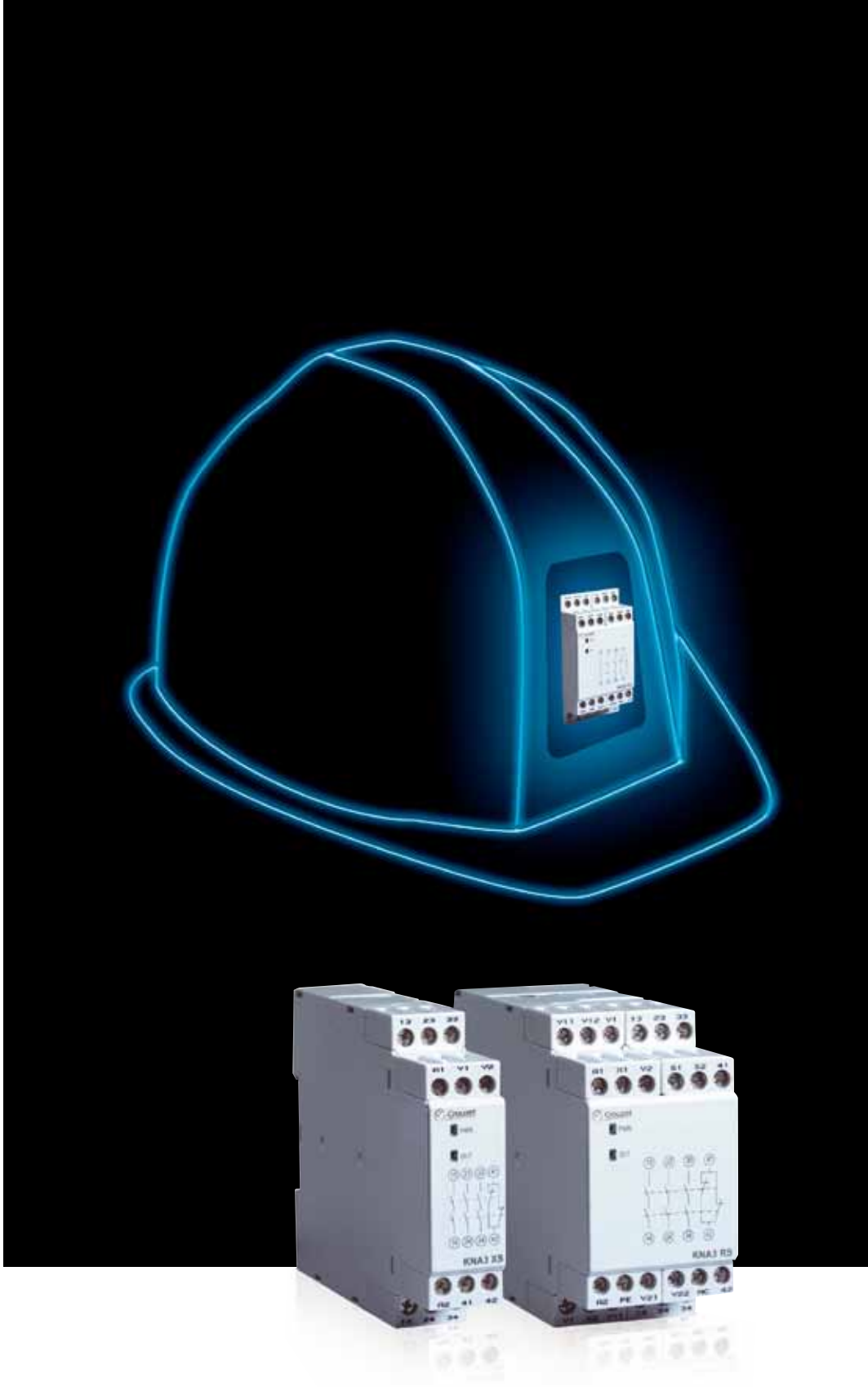
Description	Part number
Thermocouple probe J with 316 stainless steel sheath - diameter 6 mm - max: 400°C	79 696 032
Thermocouple probe J with 316 stainless steel sheath - diameter 5 mm - max: 400°C	79 696 033
Thermocouple probe K with 304 stainless steel casing - max: 1100°C	79 696 034
Pt100 probe Class B with 316 stainless steel sheath - max: 200°C	79 696 035
Pt100 probe Class B with 316 stainless steel sheath - max: 400°C	79 696 036
Pt100 probe Class B with aluminium V6 sheath - max: 200°C	79 696 037

Crouzet Control Technologies

Behind every project, technologies and expertise

- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
- Certifications: **ISO 9001, ISO 14001, OHSAS 18001**.
- Products which **comply with international standards** (UL, CSA, EC).
- A **dynamic R&D department**.

In addition to this catalogue, the **www.crouzet.com** website offers the latest tools, available as free downloads, including M3 Soft software, technical data sheets and installation manuals for each product.



Safety relays

User protection

A safety relay
How can it be defined in simple terms?

A safety relay is an automation component which is part of a machine's safety system, thus contributing to the safety of people around it.

It is essential for compliance with safety standards and ensuring that users are protected.

A safety relay
To execute which actions?

Protecting, Controlling
The safety relay **protects** people. It **controls** a user's action to ensure that this does not lead to anything that may damage his health, either voluntarily or involuntarily.
Monitoring, Sensing
When a machine may be dangerous for the user, it is necessary to **monitor** all hazardous operations, and **detect** the slightest anomaly.
Actuating
It is then necessary to **actuate** safety contacts to stop cutting, rotating, burning items… which could be hazardous for the user.

Protecting

Controlling

Monitoring

Sensing

Actuating

In addition to this catalogue, the **www.crouzet.com** website offers technical data sheets and installation manuals for each product, available as free downloads.

Crouzet safety relays

A relevelling range and a safety relay range

KNA3-XS

KNA3-RS

Crouzet safety relays

Their features:

- A range covering industrial needs (emergency stop, 2-hand control station and mobile guard monitoring). A **relevelling control** relay for the lift market.
- A safety component with **one or two channels.**
- A **separate return loop** for enhanced checking.
- Prohibition of machine starting if a problem becomes apparent through **self-checking of the integrity of the control devices.**
- A range conforming to applications **up to category 4.**

Crouzet safety relays
Where are they found?

Lift

Levelling the landing and the hydraulic lift car.

RELEVELLING SAFETY RELAY
K2HNV-XS

Two-hand control

Control of two-hand control console.

MACHINE SAFETY
START MODULES
KZH2-XS

Crouzet safety relays, Selection guide

EN81 relevelling control (lifts)

Synchronisation difference	Safety level	Output contacts	Data contact
< 500 ms	4	2 x N / O safety contacts	1 N / C signalling contact
< 2 s			

Machine safety

Function(s)	Safety level	Output contacts	Data contact
Emergency stop and safety guard monitoring	3	3 N / O safety contacts	1 N / C signalling contact
	4		
Two-hand control	4	2 x N / O safety contacts	No
		3 x N / O safety contacts	1 N / C signalling contact
Extension	Depending on main relay	3 x N / O safety contacts	1 N / C return loop

In electrical cabinets associated with other automation functions for the following markets:

- Building equipment
- Industrial automation systems

Emergency stop and safety guards

Monitoring moving guards.

MACHINE SAFETY RELAY
KNA3-RS

Protection of access to a conveyor belt zone

Controlling the safety circuit and stopping the conveyor if it is interrupted.

MACHINE SAFETY RELAYS
XNA3-XS

	Connection	Casing width (mm)	Supply	Part number	Type
	Screw terminals	22.5	24 V ⎓	85 100 526	KZHNV-XS
				85 100 821	KZHNV-XS

	Connection	Casing width (mm)	Supply	Part number	Type
	Spring	22.5	24 V ⎓	85 101 036	KNAC3-XS
	Screw terminals		24 V ⎓	85 100 036	KNA3-XS
			40 ⇨ 260 V ⎓	85 100 037	KNA3-XS
		45	24 V ⎓	85 100 436	KNA3-RS
			230 V ∿	85 100 435	KNA3-RS
			115 V ∿	85 100 434	KNA3-RS
	Screw terminals	22.5	24 V ⎓	85 100 626	KZH2-XS
		45	24 V ⎓	85 100 636	KZH3-RS
			230 V ∿	85 100 635	KZH3-RS
			115 V ∿	85 100 634	KZH3-RS
	Screw terminals	22.5	24 V ⎓	85 100 936	KZE3-XS

The safety relay accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

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99 772 717	48 x 48 electromechanical hour counter - 60 Hz	CHM48	***66-67***
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99 772 811	48 x 48 electromechanical hour counter - DC version	CHM48	***66-67***
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99 776 604	36 x 37 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 37	***68-69***
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99 776 607	36 x 37 electromechanical impulse counter - DC version	CIM 36 x 37	***68-69***
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99 776 707	36 x 48 electromechanical impulse counter - DC version	CIM 36 x 48	***68-69***
99 776 710	36 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 48	***68-69***
99 776 711	36 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 48	***68-69***

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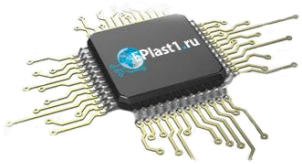

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