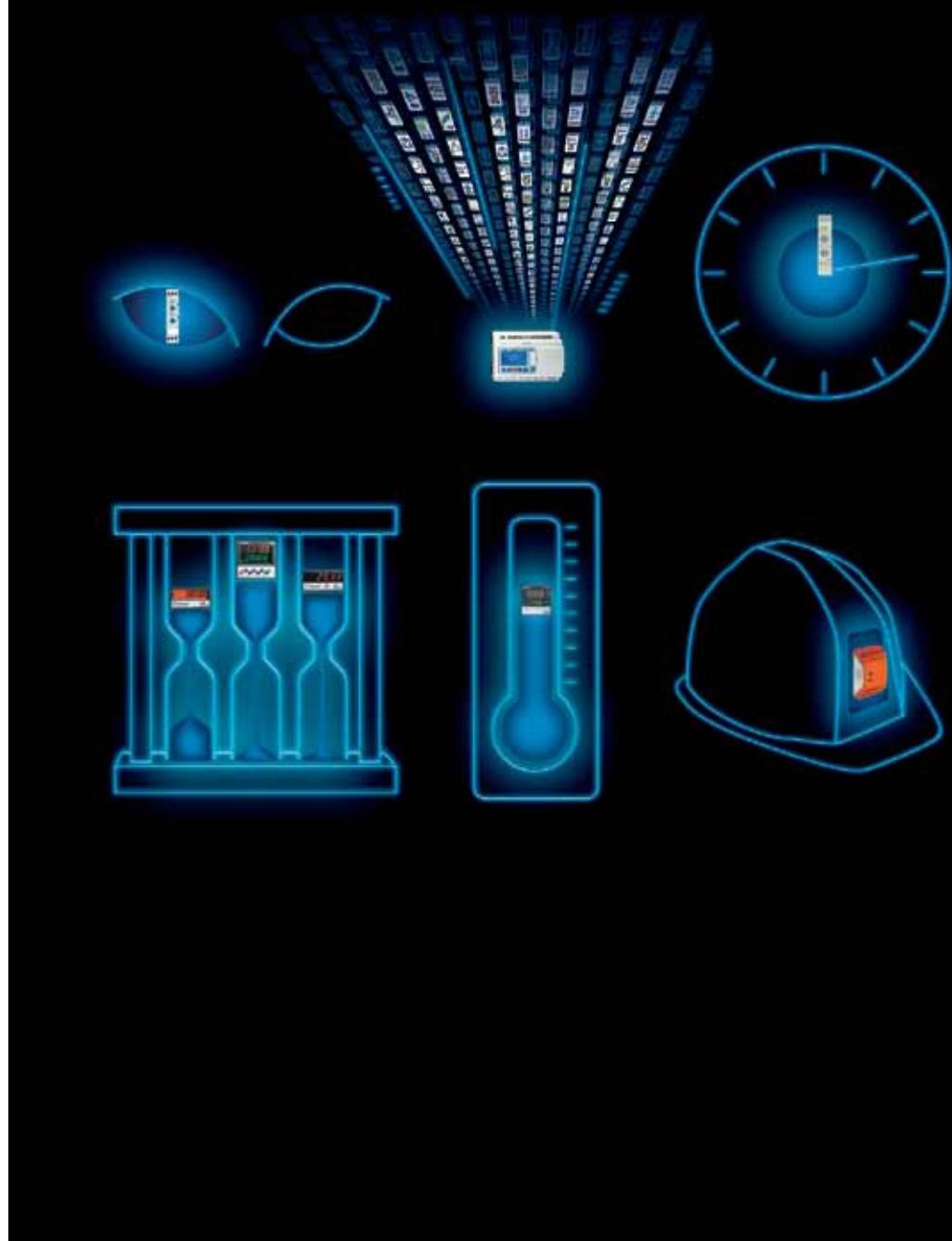


- Timers
- Control relays
- Counters and Ratemeters
- Temperature controllers
- Safety relays
- Logic controllers



## Control & Automation Overview

Behind every project,  
technologies and expertise

# Contents



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## Counters and Ratemeters

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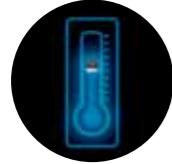


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## Logic controllers

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**To order:** Customer Service  
Tel : 01 256 318 900 - [info@crouzet.co.uk](mailto:info@crouzet.co.uk)

# Presentation



Widely recognised for over 50 years as the specialist in electromechanical, electronic technology and software engineering, Crouzet Control 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 Control products are easy to program and install.

**With operations around the globe**, Crouzet Control 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 Control 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 Control is able to deliver products, whether small-scale or mass production items, in the best possible timescale.

**In this new Panorama,**  
**Crouzet Control presents:**

**A new range of redesigned Safety Relays** for machine safety applications with new functions and easy installation.

**New Chronos 2 timers** (17.5 mm) substituting the existing range with an improved electronic and mechanical design allowing added robustness and reliability.



Crouzet Automation, supported by an **experienced sales and technical team** and an **easy-to-use software**, is the adaptable alternative for any automation solution. Crouzet Automation is the perfect solution for any specialized or demanding need.

These products are specifically suited for integration in a **wide range of applications** such as waste and water treatment, access control, renewable energies, building equipment, industrial machines and transportation.

**Custom Sensors & Technologies (CST),**  
**is a specialist in sensing, control and motion products.**

Through its brands, BEI Kimco, BEI Sensors, BEI PSSC, Crouzet, Crydom, Kavlico, Newall and Systron Donner Inertial, CST offers **customizable, reliable and efficient components** for mission-critical systems in Aerospace & Defense, Transportation, Energy & Infrastructure, Medical, Food and Beverage and Building Equipment markets.

Focused on premium value offers and committed to excellence, CST, with **4,400 employees worldwide** and **sales of \$604M US** in 2012, is the dependable and adaptable partner for the most demanding customers.

[www.cstsensors.com](http://www.cstsensors.com)

Crouzet Control / Crouzet Automation team worldwide.

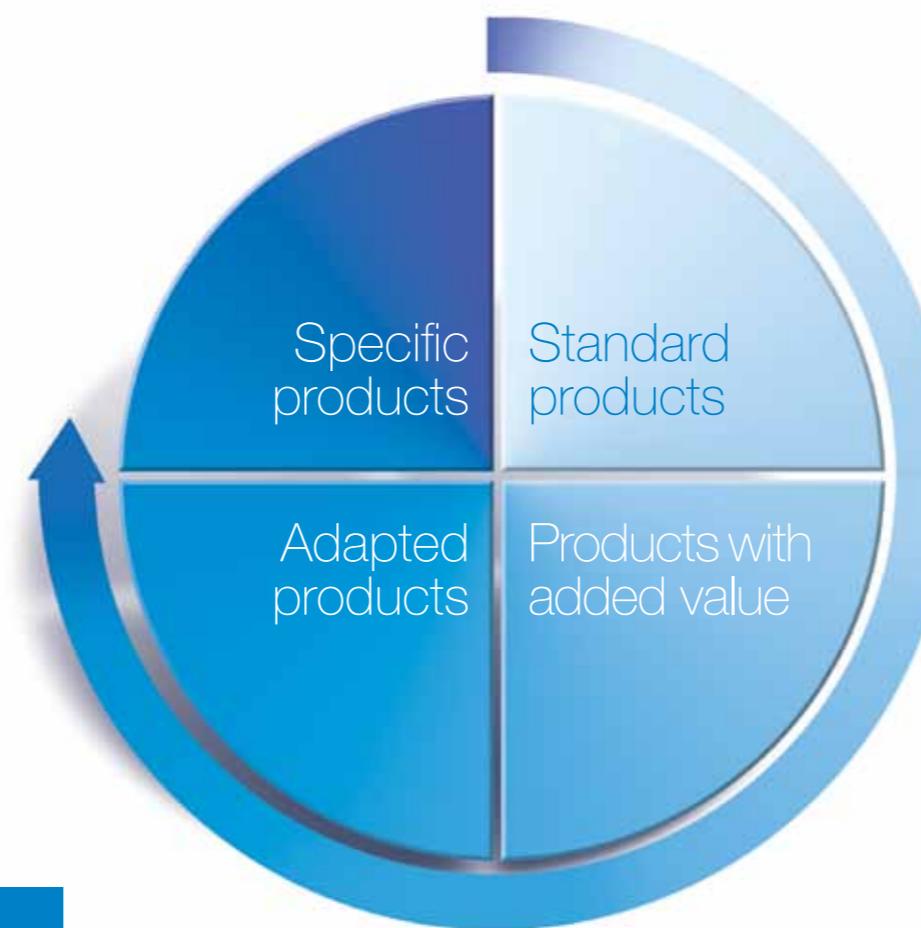


○ Production  
● Sales subsidiaries

# Expertise

## The Crouzet Control process

In addition to high-performance products, advice and support, Crouzet Control offers tailor-made solutions for any application.



### 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 INDUSTRIALIZING** custom products.

### A multi-skilled team

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

### 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 **MINIMIZE** 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](http://www.crouzet.com)

**Crouzet Control**

# 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, technical data sheets and installation manuals for each product.



## Timers

Time management

# The basics



Timers

## 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](http://www.crouzet.com) website offers technical data sheets and installation manuals for each product, available as free downloads.

## Crouzet Control, timers

### A panel mounted range and a DIN rail mounted range

Timers



## Crouzet Control, timers

### Their features:

- Available in **mono** or **multifunction** versions (analogue or digital, with or without memory), 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 supply voltages** from 12 to 240 V in one unit for optimised stocks.
- Recognised **quality** and **reliability** ensures the correct operation of equipment.

# Applications

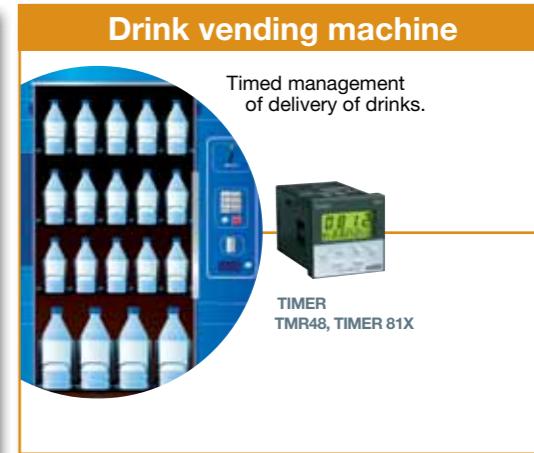
Timers

## Crouzet Control, timers

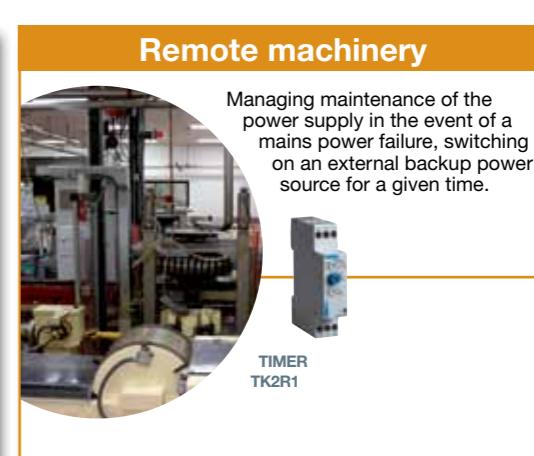
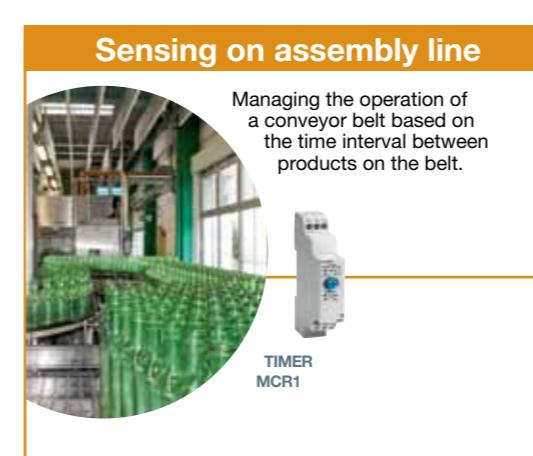
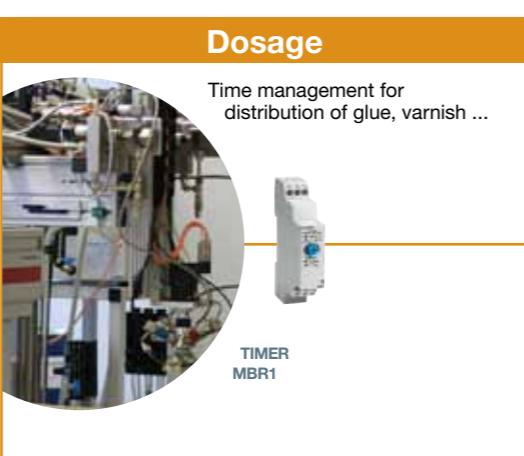
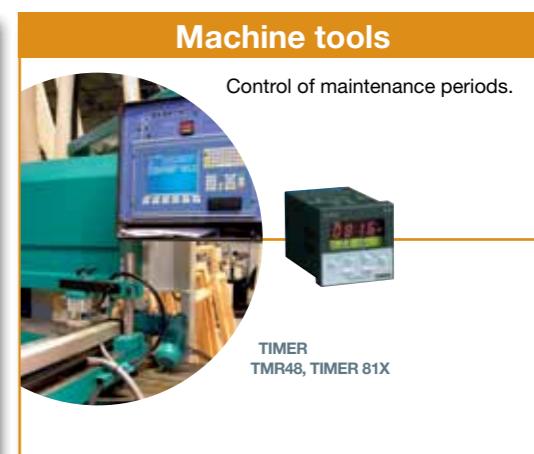
### Where are they found?

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



Timers



# Selection guide

Timers

## Chronos 2 DIN rail mounted, Timers

### DIN rail modular casings

Casing width (mm)	Connections	Functions	Type of output	Output(s)	Timing	Supply	Part number	Type
17.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	1 x 8 A changeover	0.1 s $\Rightarrow$ 100 h	24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 827 105	MUR1
		A / At					88 827 115	MAR1
		B					88 827 125	MBR1
		C					88 827 135	MCR1
		H / Ht					88 827 145	MHR1
17.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	1 x 8 A changeover	0.1 s $\Rightarrow$ 100 h	12 V $\sim$ 24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 827 150	MLR4
		Spring terminals					88 827 155	MLR1
		Screw terminals					88 827 100	MUR4
		Ad / Ah / N / O / P Pt / TL / Tt / W					88 827 103	MUR3
		A / At / B / C / H / Ht Di / D / Ac / Bw					88 827 503	MURc3
17.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw	Solid state	0.7 A	0.1 s $\Rightarrow$ 100 h	24 $\Rightarrow$ 240 V $\sim$ 24 $\Rightarrow$ 240 V $\sim$ 24 $\Rightarrow$ 240 V $\sim$	88 827 185	MXR1
		A					88 827 004	MUS2
		H / Ht					88 827 014	MAS5
		L / Li					88 827 044	MHS2
		A					88 827 054	MLS2
17.5	Screw terminals	A / At / B / C / H / Ht Di / D / W / Pe	Relay	1 x 5A changeover	0.1 s $\Rightarrow$ 20 h	240 V $\sim$ 110 V $\sim$ 24 V $\sim$ 12 $\Rightarrow$ 240 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 829 117	EMAR7
		A					88 829 112	EMAR2
		A / At / B / C / H / Ht Di / D / W / Pe					88 829 119	EMAR9
		Ac / Ad / Bw / Cx / N / O / Tt					88 829 198	EMER8
		Ac / Ad / Bw / Cx / N / O / Tt					88 829 108	EMYR8

Timers

### DIN rail industrial casings

Casing width (mm)	Connections	Functions	Type of output	Output(s)	Timing	Supply	Part number	Type
22.5	Screw terminals	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	1 x 8 A changeover	0.1 s $\Rightarrow$ 100 h	24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 865 105	TUR1
		A / At					88 865 115	TAR1
		B					88 865 125	TBR1
		C					88 865 135	TCR1
		H / Ht					88 865 145	THR1
22.5	Screw terminals	L / Li					88 865 155	TLR1
		Q					88 865 175	TQR1
		K					88 866 175*	RQR1*
		A / At / B / C / H / Ht Di / D / Ac / Bw					88 865 265	TK2R1
		1 x 8 A changeover					88 865 300	TU2R4
22.5	Screw terminals	1 inst. or timed 8 A					88 866 300*	RU2R4*
		1 x 8 A changeover					88 865 100	TUR4
		A / At					88 865 215	TA2R1
		2 x 8 A changeover					88 866 215*	RA2R1*
		1 x 8 A changeover					88 865 103	TUR3
22.5	Screw terminals	1 x 8 A changeover					88 865 503	TURc3
		Ad / Ah / N / O / P Pt / TL / Tt / W					88 865 385	TX2R1
		1 inst. or timed 8 A					88 866 385*	RX2R1*
		Q					88 865 185	TXR1
		A / At / B / C / H / Ht Di / D / Ac / Bw					88 865 176	TQR6
22.5	Screw terminals	1 x 8 A changeover					88 866 176*	RQR6*
		1 inst. or timed 8 A					88 865 303	TU2R3
		230 $\Rightarrow$ 440 V $\sim$					88 866 303*	RU2R3*
		12 $\Rightarrow$ 240 V $\sim$					88 865 305	TU2R1
		24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$					88 866 305*	RU2R1*

\* Available in 2014. The casing of the new range will be different from the ones presented here.  
Further information can be found on the data sheets available at [www.crouzet.com](http://www.crouzet.com)

# Selection guide

Timers

## Plug-in industrial casings

Casing width (mm)	Connections	Functions (detail on pages 20 to 23)	Type of output	Output(s)	Timing	Supply	Part number	Type
35	Plug-in 8-pin base	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	1 x 8 A changeover	0.1s $\Rightarrow$ 100 h	24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 867 105	OUR1
		A		2 x 8 A changeover			88 867 215	OA2R1
		C		1 x 8 A changeover			88 867 135	OCR1
		L / Li		1 x 8 A changeover			88 867 155	OLR1
		A / At / B / C / H / Ht Di / D / Ac / Bw		12 V $\sim$			88 867 100	OUR4
		A		12 $\Rightarrow$ 240 V $\sim$			88 867 103	OUR3
35	Plug-in 11-pin base	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	1 x 8 A changeover 1 inst. or timed 8 A	0.1s $\Rightarrow$ 100 h	24 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 240 V $\sim$	88 867 305	PU2R1
		A		2 x 8 A changeover			88 867 415	PA2R1
		C		1 x 8 A changeover 1 inst. or timed 8 A			88 867 435	PC2R1
		L / Li		12 V $\sim$			88 867 455	PL2R1
		A / At / B / C / H / Ht Di / D / Ac / Bw		12 $\Rightarrow$ 240 V $\sim$			88 867 300	PU2R4
		A		120 V $\sim$			88 867 303	PU2R3
21	Plug-in 8-pin base	A / At / B / C / H / Ht Di / D / Ac / Bw	Relay	2 x 5 A changeover	0.1s $\Rightarrow$ 100 h	12 V $\perp\!\!\!\perp$	88 895 201	RTMA2
		A		24 V $\perp\!\!\!\perp$			88 895 202	RTMA2
	Plug-in 14-pin base	A		24 V $\sim$			88 895 203	RTMA2
		A		110 V $\sim$			88 895 206	RTMA2
		A		230 V $\sim$			88 895 207	RTMA2
		A		12 V $\perp\!\!\!\perp$			88 896 201	RTMA4
		A		24 V $\perp\!\!\!\perp$			88 896 202	RTMA4
		A		24 V $\sim$			88 896 203	RTMA4
		A		110 V $\sim$			88 896 206	RTMA4
		A		230 V $\sim$			88 896 207	RTMA4

## "Panel mounted", Timers

### Analogue - TMR48 series

Dimensions (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Supply	Part number	Type
48 x 48	Plug-in 11-pin base	L / Li - G / Gi	Relay	2 timed changeover 2 x 5 A	12 $\Rightarrow$ 240 V $\perp\!\!\!\perp$ 24 $\Rightarrow$ 240 V $\sim$	88 886 516	TMR 48 L
		A, B, C, W, G, Ac, Bw		2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)		88 886 016	TMR 48 U
	Plug-in 8-pin base	A		24 V $\perp\!\!\!\perp$		88 886 106	TMR 48 A
		A1, A2, H1, H2, Q1, Q2, D-Di		24 V $\sim$		88 886 116	TMR 48 X

### Digital

Dimensions (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Supply	Part number	Type
48 x 48	Plug-in 8-pin base	A	Relay	2 timed changeover 2 x 5 A	24 V $\sim$	88 857 409	Timer 812
		A, B, C, D, Di, H		110 V $\sim$	110 V $\sim$	88 857 406	Timer 812
	Plug-in 11-pin base	A, B, C, D, Di, H		1 x 8 A timed changeover	220 $\Rightarrow$ 240 V $\sim$	88 857 400	Timer 812
		A1, A2, AM, AMt		12 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 48 V $\sim$	12 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 48 V $\sim$	88 857 003	Timer 814
		A		24 V $\sim$ / 110 $\Rightarrow$ 240 V $\sim$	24 V $\sim$ / 110 $\Rightarrow$ 240 V $\sim$	88 857 005	Timer 814
		A1, A2, AM, AMt		12 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 48 V $\sim$	12 V $\perp\!\!\!\perp$ / 24 $\Rightarrow$ 48 V $\sim$	88 857 103	Timer 814
48 x 48	Plug-in 11-pin base	A, B, C, D, Di, H		24 V $\sim$ / 110 $\Rightarrow$ 240 V $\sim$	24 V $\sim$ / 110 $\Rightarrow$ 240 V $\sim$	88 857 105	Timer 814
		A1, A2, AM, AMt		12 V $\perp\!\!\!\perp$ / 42 $\Rightarrow$ 48 V $\sim$	12 V $\perp\!\!\!\perp$ / 42 $\Rightarrow$ 48 V $\sim$	88 857 302	Timer 815
	Plug-in 8-pin base	A1, A2, AM, AMt		24 V $\sim$ / 110 V $\sim$	24 V $\sim$ / 110 V $\sim$	88 857 307	Timer 815
		A		24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	88 857 301	Timer 815
		A		24 V $\perp\!\!\!\perp$ / 100 $\Rightarrow$ 240 V $\sim$	24 V $\perp\!\!\!\perp$ / 100 $\Rightarrow$ 240 V $\sim$	88 857 311	Timer 815E
		A, B, C, D, Di, H		24 V $\perp\!\!\!\perp$ / 48 V $\sim$	24 V $\perp\!\!\!\perp$ / 48 V $\sim$	88 857 604	Timer 816
48 x 48	Plug-in 8-pin base	A, B, C, D, Di, H		24 V $\perp\!\!\!\perp$ / 110 V $\sim$	24 V $\perp\!\!\!\perp$ / 110 V $\sim$	88 857 607	Timer 816
		A, B, C, D, Di, H		24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	88 857 601	Timer 816
	Plug-in 11-pin base	A, B, C, D, Di, H		24 V $\sim$ / 48 V $\sim$	24 V $\sim$ / 48 V $\sim$	88 857 704	Timer 816
		A		24 V $\sim$ / 110 V $\sim$	24 V $\sim$ / 110 V $\sim$	88 857 707	Timer 816
		A		24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	24 V $\perp\!\!\!\perp$ / 220 $\Rightarrow$ 240 V $\sim$	88 857 701	Timer 816

Accessories available: base socket 8-pin for DIN Rail mount 25 622 130, base socket 11-pin for DIN Rail mount 25 622 080.

The timer accessories guide is available on the product data sheets which can be downloaded from the website [www.crouzet.com](http://www.crouzet.com)

# Selection guide

Timers

## MBA series

Casing width (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Timing	Supply	Part number	Type		
22 (diameter)	Screw terminals	A	Solid state	400 mA	0.1 s $\Rightarrow$ 1 s	100 $\Rightarrow$ 240 V $\sim$	88 901 308	MBA2F		
					0.5 s $\Rightarrow$ 10 s		88 901 328	MBA2F		
					3 s $\Rightarrow$ 60 s		88 901 348	MBA2F		
					0.5 min $\Rightarrow$ 10 min		88 901 378	MBA2F		
					3 min $\Rightarrow$ 60 min		88 901 398	MBA2F		
	Screw terminals			200 mA	0.1 s $\Rightarrow$ 1 s	24 V $\sim$	88 901 302	MBA3F		
					0.5 s $\Rightarrow$ 10 s		88 901 322	MBA3F		
					3 s $\Rightarrow$ 60 s		88 901 342	MBA3F		
					0.5 min $\Rightarrow$ 10 min		88 901 372	MBA3F		
					3 min $\Rightarrow$ 60 min		88 901 392	MBA3F		

## Electromechanical - Top 2000 range

Casing width (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Timing	Supply	Part number	Type				
48 x 48	Screw terminals	2-3-4	Relay	1 timed changeover and 1 timed instantaneous (2 x 5 A)	6 s $\Rightarrow$ 12 mn	24 V $\sim$	88 226 013	Top 2000				
						42 $\Rightarrow$ 48 V $\sim$	88 226 019	Top 2000				
						110 $\Rightarrow$ 127 V $\sim$	88 226 012	Top 2000				
						220 $\Rightarrow$ 240 V $\sim$	88 226 011	Top 2000				
						24 V $\sim$	88 226 501	Top 2000				
	Plug-in 8-pin base					42 $\Rightarrow$ 48 V $\sim$	88 226 502	Top 2000				
						110 $\Rightarrow$ 127 V $\sim$	88 226 503	Top 2000				
						220 $\Rightarrow$ 240 V $\sim$	88 226 504	Top 2000				
						24 V $\sim$	88 226 016	Top 2000				
						24 V $\sim$	88 226 505	Top 2000				
48 x 48	Screw terminals					42 $\Rightarrow$ 48 V $\sim$	88 226 017	Top 2000				
						42 $\Rightarrow$ 48 V $\sim$	88 226 506	Top 2000				
						110 $\Rightarrow$ 127 V $\sim$	88 226 015	Top 2000				
						110 $\Rightarrow$ 127 V $\sim$	88 226 507	Top 2000				
						220 $\Rightarrow$ 240 V $\sim$	88 226 014	Top 2000				
	Plug-in 8-pin base					220 $\Rightarrow$ 240 V $\sim$	88 226 508	Top 2000				

## Manual reset

Casing width (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Timing	Supply	Part number	Type					
55	Faston connectors 6.35 mm	A	Relay	1 x 16 A timed changeover	5 min (Max.display time: 4 min 40 s) 15 min (Max.display time: 14 min) 30 min (Max.display time: 28 min) 60 min (Max.display time: 56 min) 120 min (Max.display time: 1 h 53 min) 5 h (Max.display time: 4 h 43 min) 15 h (Max.display time: 14 h 10 min) 30 h (Max.display time: 28 h 20 min)	127/230 V $\sim$ 50 Hz	88 256 401	88 256 4					
							88 256 402	88 256 4					
							88 256 403	88 256 4					
							88 256 404	88 256 4					
							88 256 405	88 256 4					
	Faston connectors 6.35 mm						88 256 406	88 256 4					
							88 256 407	88 256 4					
							88 256 408	88 256 4					
							88 256 506	88 256 5					
							88 256 507	88 256 5					
55	Faston connectors 6.35 mm	A	Relay	2 x 16 A timed changeover	5 min (Max.display time: 4 min 40 s) 15 min (Max.display time: 14 min) 30 min (Max.display time: 28 min) 60 min (Max.display time: 56 min) 120 min (Max.display time: 1 h 53 min) 5 h (Max.display time: 4 h 43 min) 15 h (Max.display time: 14 h 10 min) 30 h (Max.display time: 28 h 20 min)	127/230 V $\sim$ 50 Hz	88 256 508	88 256 5					
							88 256 509	88 256 5					
							88 256 510	88 256 5					
							88 256 511	88 256 5					
							88 256 512	88 256 5					
	Faston connectors 6.35 mm						88 256 513	88 256 5					
							88 256 906	88 256 9					
							88 256 907	88 256 9					
							88 256 908	88 256 9					
							88 256 909	88 256 9					

The timer accessories guide is available on the product data sheets which can be downloaded from the website [www.crouzet.com](http://www.crouzet.com)

Timers

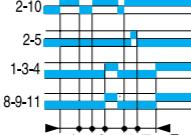
# Function diagrams

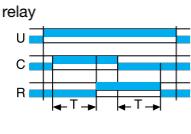
Timers

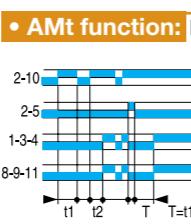
## Generic functions

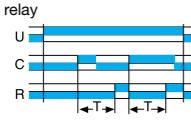
**U** : Supply  
**R** : Output relay or load  
**T** : Timing  
 $\infty$  : Infinity  
**C (Y1)** : Command

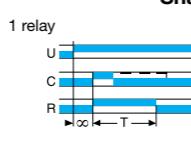
- A function: Delay on energisation**  
 1 relay  

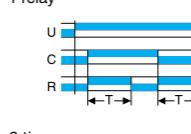

Single shot timing which starts on energisation.
- AM function: Delay on energisation**  
 1 relay  


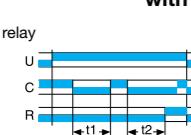
Latching during the time delay.
- Ac function: Timing after closing and opening of control contact**  
 1 relay  


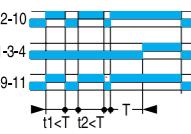
After energisation, closing of the control contact results in starting of the time delay  $T$ . Output relay "R" (or the load) changes state at the end of this time delay. After opening of contact C (Y1), relay "R" drops out after a second time delay  $T$ .
- AMt function: Delay on energisation**  
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


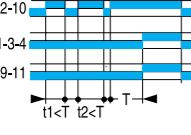
Latching during and after the time delay.
- Ad function: Delay on energisation (cannot be reset)**  
 1 relay  


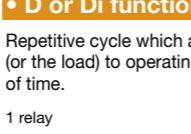
After energisation, a control pulse or latching contact starts timing. At the end of timing, the output is excited. The output will be reset when a new control pulse or latching contact occurs.
- B function: Timing on impulse (one shot) - Shaping (cannot be reset)**  
 1 relay  


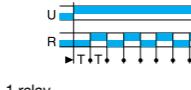
After energisation, an impulse ( $\geq 50$  ms) or a latching contact causes a change in state of the output relay "R" (or the load) which drops out at the end of timing.
- Bw function: Pulse output (adjustable)**  
 1 relay  


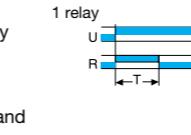
On closing and opening of the control contact C (Y1), the output relay "R" (or the load) changes state for as long as the time delay lasts.
- At function: Timing on energisation with memory**  
 1 relay  


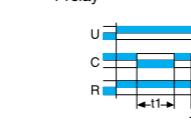
Adds up the opening time of a contact. Output relay "R" (or the load) changes state at the end of timing.
- A1 function: Delay on energisation**  
 2-10  
 1-3-4  
 8-9-11  
 1 timer  
 1 instantaneous relay  


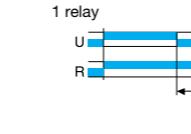
1 timer  
 1 instantaneous relay
- A2 function: Delay on energisation**  
 2-10  
 1-3-4  
 8-9-11  
 2 timers  


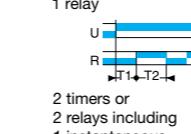
2 timers.
- D or Di functions: Symmetrical flashing**  
 1 relay  


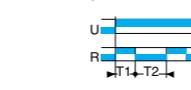
Repetitive cycle which alternately sets the output relay "R" (or the load) to operating and rest position for equal periods of time.
- D function:**  
 The cycle starts with relay "R" in rest position.  
 1 relay  

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

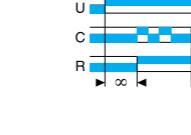
- H function: Timing on energisation - Pulse output (adjustable)**  
 1 relay  


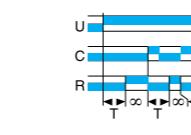
On energisation, the output relay "R" (or the load) changes state, and stays there for the whole duration of the time delay and drops out at the end of the single shot cycle.
- Ht function: Delay on energisation with memory**  
 1 relay  


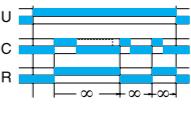
Adds up the total opening time of a contact. On energisation, the output relay "R" (or the load) changes state, and stays there for the whole duration of the time delay and drops out at the end of the single shot cycle.
- K function: Delay on de-energisation True delay off (without auxiliary power supply)**  
 1 relay  


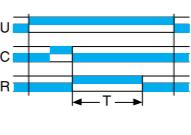
On energisation, the output relay "R" (or the load) changes state. On de-energisation timing starts and the relay "R" will only drop out at the end of this time delay.
- L function: Asymmetrical flashing**  
 1 relay  


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).
- Li function: Asymmetrical flashing**  
 1 relay  


Repetitive cycle with two times which can be set independently.
- N function: "Safe-guard"**  
 1 relay  


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"**  
 1 relay  


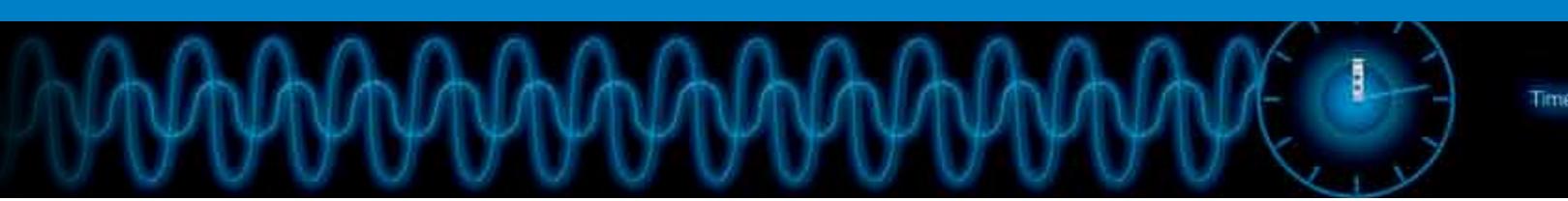
On energisation, a first timer runs and the output relay "R" (or the load) changes state. On the appearance of a control pulse, relay "R" returns to its initial position and stays there as long as the time interval between 2 impulses is less than the timing value. Otherwise, relay "R" will change state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


After energisation, a control pulse or latching contact closes the relay. A second control pulse opens the relay.
- W function: Timing after pulse on control contact**  
 1 relay  


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

Timers

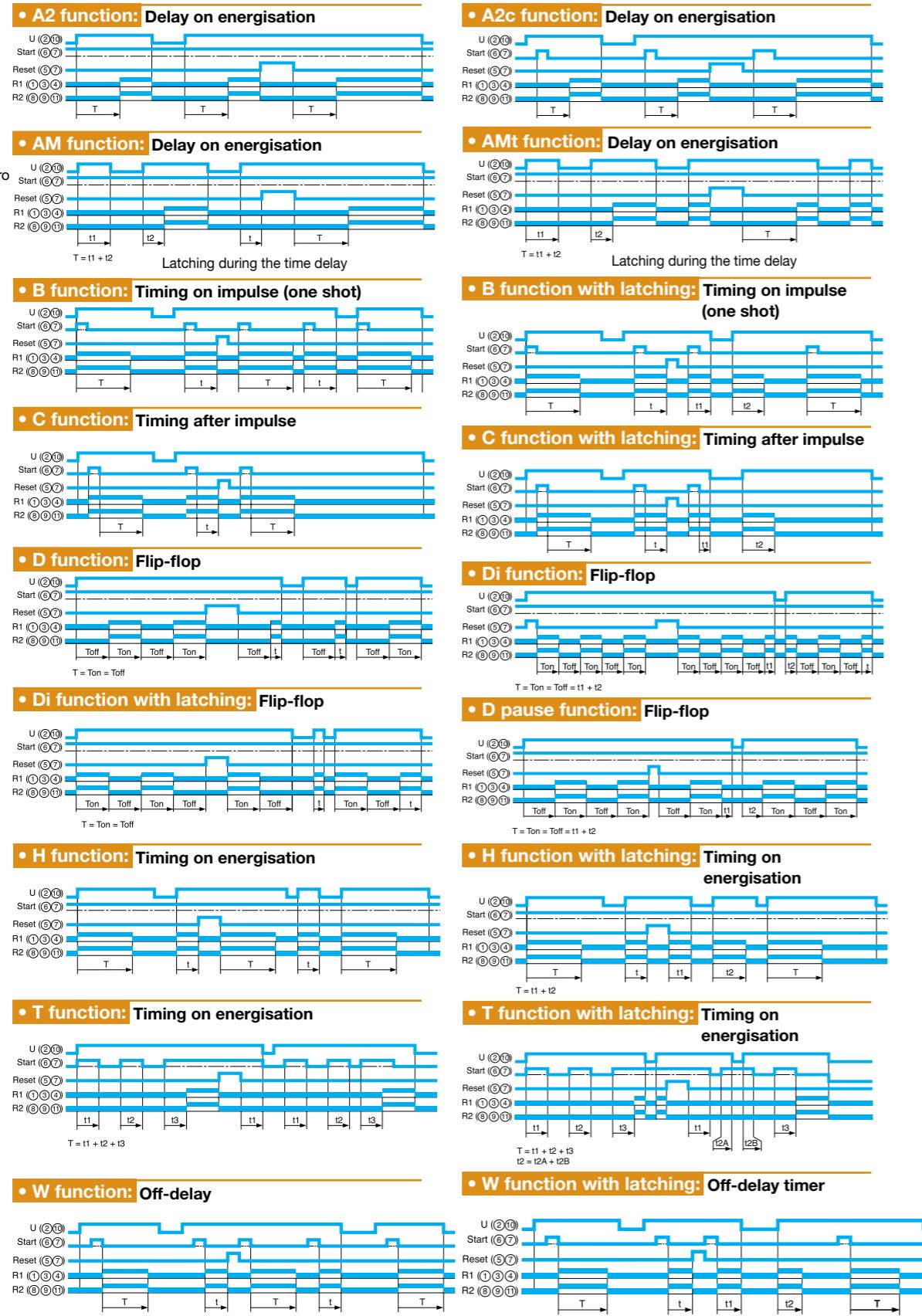
# Function diagrams



Timers

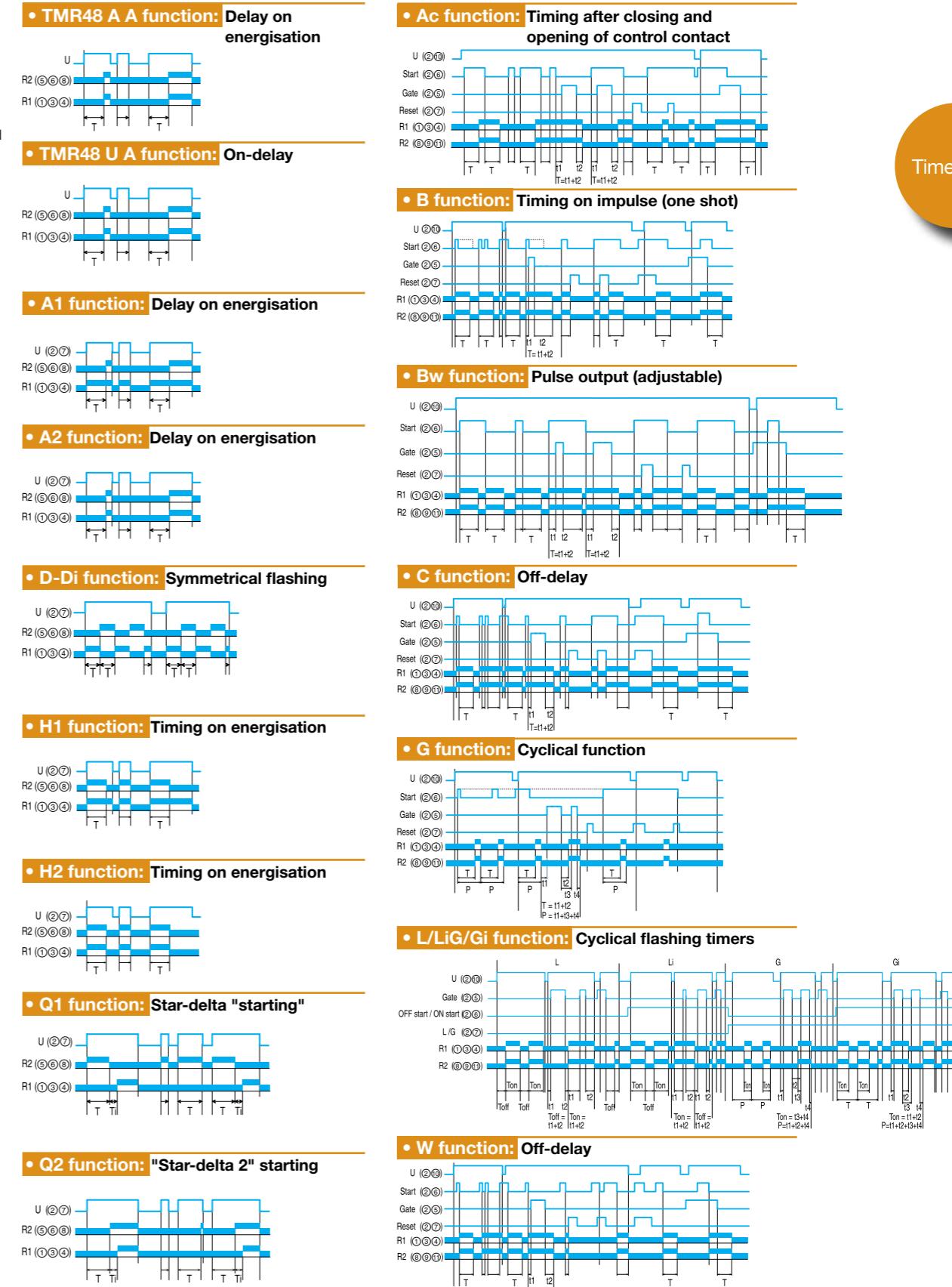
## 815E dedicated functions

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



## TMR48 dedicated functions

**U** : Supply  
**R** : Output relay or load  
**T** : Timing  
 $\infty$  : Infinity  
**C (Y1)** : Command



**Crouzet Control**

# 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 technical data sheets and installation manuals for each product.



**Control relays**  
Instinctive control

# The basics

Control relays

## 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.

#### 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.

#### 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.

## Protection

## Monitoring

## Sensing

## Alerting

## Controlling

## Triggering

In addition to this catalog, the [www.crouzet.com](http://www.crouzet.com) website offers technical data sheets and installation manuals for each product, available as free downloads.

## Crouzet Control, control relays

### C-Lynx modular housing and E, F, L industrial housing



MUS (C-Lynx)



ENRM (E, F, L)

Control relays

## Crouzet Control, 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

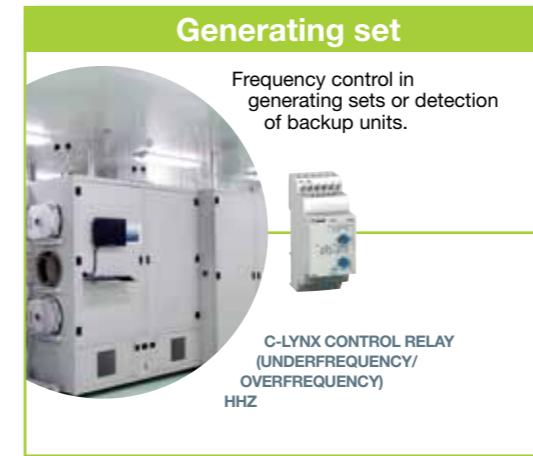
Control relays

## Crouzet Control, control relays

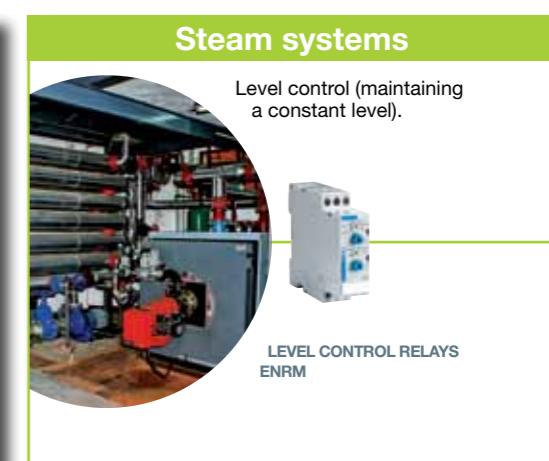
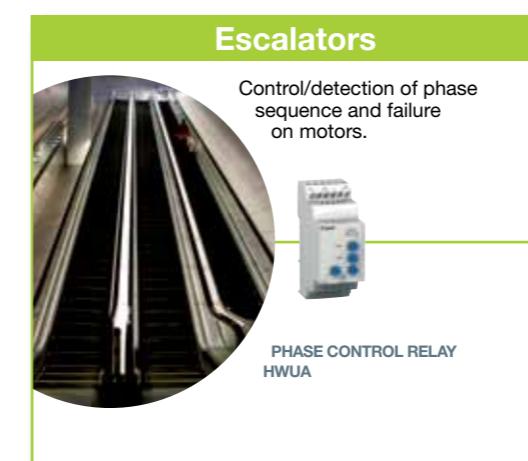
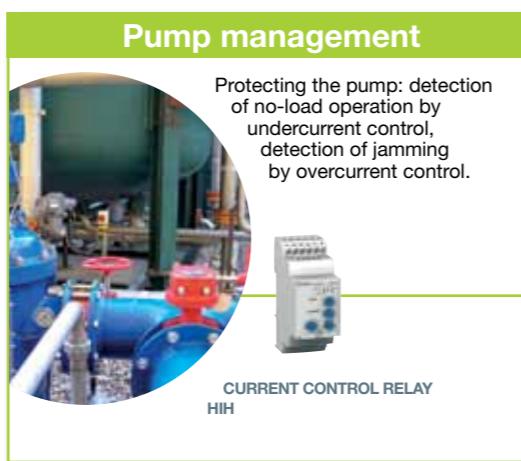
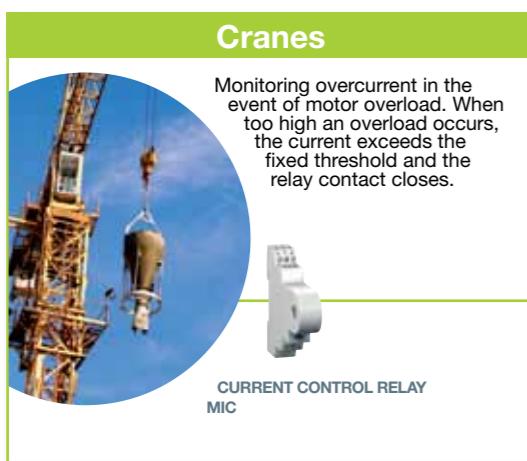
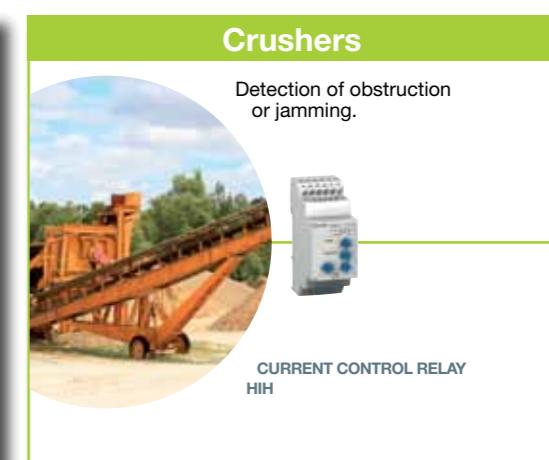
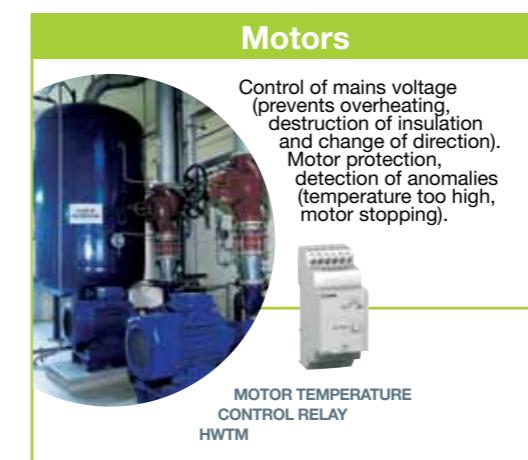
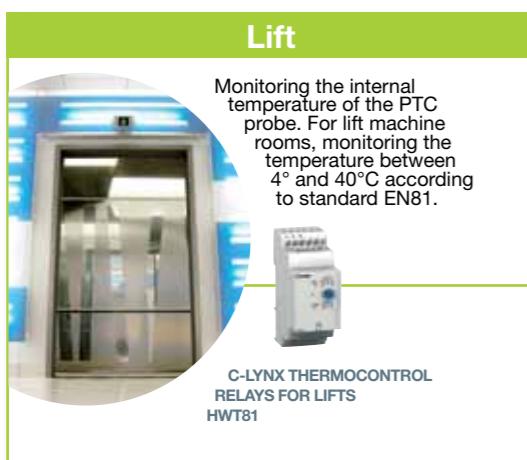
### Where are they found?

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

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



Control relays



# Selection guide

Control relays

## C-Lynx modular housing, Control relays

### Phase control (3-phase supply)

Phase failure									
Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing		Output(s)	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
With 70 % regeneration	Yes / No	No / No	No	0.1 ⇄ 10 s	1 x 5 A changeover	17.5	208 ⇄ 480 V ~ - 50 / 60 Hz	84 873 022	MWG
		No / -20 % ⇄ -2 %						84 873 023	MWU
		No / No						84 873 024	MWA
	Yes / 5 ⇄ 15 %	Window +2 ⇄ +20 %		0.1 ⇄ 10 s	1 x 5 A changeover	17.5	208 ⇄ 480 V ~ - 50 / 60 Hz	84 873 025	MWUA
		-20 ⇄ -2 %						84 873 020	MWS
		Window +2 ⇄ +20 %						84 903 020	EMWS
Without regeneration	Yes / No	No / No	No	0.3 ⇄ 30 s	1 x 5 A changeover	17.5	208 ⇄ 440 V ~ - 50 / 60 Hz	84 873 021	MWS2
		No / No						84 873 222	M3US
		Yes / 5 ⇄ 15 %						84 873 026	HWUA
	+2 ⇄ +20 % / -20 ⇄ -2 %	No / No		0.3 ⇄ 30 s	2 x 5 A changeover	35	220 ⇄ 480 V ~ - 50 / 60 Hz	84 873 220	H3US
		+2 ⇄ +20 % / -20 ⇄ -2 %						84 873 221	H3USN
		No / No							
Loss of phase and neutral									
Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing		Output relay	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
Without regeneration	No / No	+2 ⇄ +20 % / -20 ⇄ -2 %	0.3 ⇄ 30 s		2 x 5 A changeover	35	120 ⇄ 277 V ~ - 50 / 60 Hz	84 873 221	H3USN

Control relays

### Motor temperature control and phase sequence and failure

Sensor	Test	Latching	Supply voltage		Output relay	Casing width (mm)	Supply	Part number	Type
PTC	No	No	24 ⇄ 240 V ~		2 x 5 A NO	35	208 ⇄ 480 V ~	84 873 027	HWTM
	Reset on front panel	Yes						84 873 028	HWTM2

### Single-phase DC voltage control with selectable latching

Measurement range	Functions	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
9 ⇄ 15 V ==	Over / Undervoltage	5 % ⇄ 20 %	0.1 ⇄ 10 s		1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 140	MUS
20 ⇄ 80 V ~								84 872 141	MUS
65 ⇄ 260 V ~								84 872 142	MUS
0.2 ⇄ 60 V ~	Over or Undervoltage	5 % ⇄ 50 %	0.1 ⇄ 3 s		2 x 5 A changeover	35	24 ⇄ 240 V ~	84 872 120	HUL
15 ⇄ 600 V ~								84 872 130	HUH
20 ⇄ 80 V ~								84 872 151	MUSF
65 ⇄ 260 V ~	Window	3% fixed	0.1 ⇄ 10 s		1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 152	MUSF

### Current control (over or undercurrent)

Measurement range	Built-in CT	Hysteresis	Latching / Timing		Output relay	Casing width (mm)	Supply	Part number	Type				
2 ⇄ 20 A ~	Yes	15% fixed	No / No		1 x 5 A changeover	17.5	24 ⇄ 240 V ~	84 871 122	MIC				
2 ⇄ 500 mA ~		5 % ⇄ 50 %	Yes / 0.1 ⇄ 3 s					84 871 120	HIL				
0.1 ⇄ 10 A ~								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](http://www.crouzet.com)

# Selection guide

Control relays

## Frequency control with window

Measurement range	Selectable latching	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
40 $\Rightarrow$ 70 Hz	Yes	0.3 Hz fixed	0.1 $\Rightarrow$ 10 s		2 x 5 A changeover	35	120 $\Rightarrow$ 277 V $\sim$	84 872 501	HHZ

## Level control

Probe	Emptying / Filling	Level / Measurement range	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
Resistive	Yes / Yes	1 or 2 / 250 $\Rightarrow$ 1 M $\Omega$	0.1 $\Rightarrow$ 5 s		2 x 5 A changeover	35	24 $\Rightarrow$ 240 V $\sim$	84 870 700	HNM
Digital or PNP / NPN		1 or 2 / None			1 x 5 A changeover			84 870 710	HNE
Digital		1 / None				17.5		84 870 720	MNS

## Over/underspeed control

Sensor	Measurement range	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
3-wire NPN/PNP sensor, 0 $\Rightarrow$ 30 V, NAMUR Volt-free contact	0.05 s $\Rightarrow$ 10 min	5 % fixed	0.6 $\Rightarrow$ 60 s		1 x 5 A changeover	35	24 $\Rightarrow$ 240 V $\sim$	84 874 320	HSV

## Temperature control with window (lifts) according to EN81

Sensor	Built-in phase control	Measurement range	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
3-wire Pt100	No	Low threshold -1 $\Rightarrow$ +11°C High threshold +34 $\Rightarrow$ +46°C	0.1 $\Rightarrow$ 10 s		1 x 5 A changeover	35	24 $\Rightarrow$ 240 V $\sim$	84 874 110	HT81
3-wire Pt100					2 x 5 A NO			84 874 120	HT81-2
3-wire Pt100					2 x 5 A NO			84 874 130	HWT81

## Industrial housing E, F, L, Control relays

### Phase sequence or phase failure control

Regeneration	Sequence / Asymmetry	Overvoltage / Undervoltage	Timing		Output relay	Casing width (mm)	Meas. range (Self-powered)	Part number	Type
None	Yes / No	No / No	No		1 x 8 A changeover	22.5	200 $\Rightarrow$ 500 V $\sim$	84 892 299	EWS
					2 x 8 A changeover		200 $\Rightarrow$ 460 V $\sim$	84 873 004	EWS2

### Voltage control with selectable latching

Measurement range	Functions	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
0.2 $\Rightarrow$ 60 V $\sim$	Over / Undervoltage	5 % $\Rightarrow$ 50 %	0.1 $\Rightarrow$ 3 s		1 x 8 A changeover	22.5	24 V $\sim$	84 872 020	EUL
							24 V $\sim$	84 872 021	EUL
							120 V $\sim$	84 872 023	EUL
							230 V $\sim$	84 872 024	EUL
15 $\Rightarrow$ 600 V $\sim$	Over / Undervoltage	5 % $\Rightarrow$ 50 %	0.1 $\Rightarrow$ 3 s		1 x 8 A changeover	22.5	24 V $\sim$	84 872 030	EUH
							24 V $\sim$	84 872 031	EUH
							120 V $\sim$	84 872 033	EUH
							230 V $\sim$	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](http://www.crouzet.com)

# Selection guide

Control relays

## Current control (over / undercurrent)

Measurement range	With CT	Hysteresis	Latching / Timing	Output relay	Casing width (mm)	Supply	Part number	Type
2 $\Rightarrow$ 500 mA	No	5 % $\Rightarrow$ 50 %	Yes / 0.1 $\Rightarrow$ 3 s	1 x 8 A changeover	22.5	24 V $\perp\!\!\!\perp$ 24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 871 020 84 871 021 84 871 022 84 871 023 84 871 024	EIL
0.1 $\Rightarrow$ 10 A	No	5 % $\Rightarrow$ 50 %	Yes / 0.1 $\Rightarrow$ 3 s	1 x 8 A changeover	22.5	24 V $\perp\!\!\!\perp$ 24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 871 030 84 871 031 84 871 032 84 871 033 84 871 034	EIH
10 $\Rightarrow$ 100 A	26 852 304	5 % $\Rightarrow$ 50 %	Yes / 0.1 $\Rightarrow$ 3 s	1 x 8 A changeover	22.5	24 V $\perp\!\!\!\perp$ 24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 871 040 84 871 041 84 871 042 84 871 043 84 871 044	EIT

## Level control

Probe	Emptying / Filling	Level / Measurement range	Timing	Output relay	Casing width (mm)	Supply	Part number	Type
Resistive	Yes / Yes	1 or 2 / 5 $\Rightarrow$ 100 K $\Omega$	No	1 x 8 A changeover	22.5	24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$ 24 $\Rightarrow$ 240 V $\sim$	84 870 201 84 870 202 84 870 203 84 870 204 84 870 200*	ENR
Resistive	Yes / Yes	2 / 250 $\Omega$ $\Rightarrow$ 1 M $\Omega$	0.1 $\Rightarrow$ 5 s	1 x 8 A changeover	22.5	24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$ 24 $\Rightarrow$ 240 V $\sim$	84 870 211 84 870 212 84 870 213 84 870 214 84 870 210*	ENRM
Resistive	Yes / Yes	1 or 2 / 5 $\Rightarrow$ 100 K $\Omega$	No	1 x 8 A changeover	39 Plug-in 8-pin base	24 V $\sim$ 120 V $\sim$ 230 V $\sim$ 24 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 870 301 84 870 303 84 870 304 84 870 306 84 870 308 84 870 309	LN
Resistive	Combined with monitoring of wells	2 / 5 $\Rightarrow$ 100 K $\Omega$	No	1 x 8 A changeover	39 Plug-in 11-pin base	24 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 870 401 84 870 403 84 870 404	L2N
Resistive	Yes / Yes + Alarm	2 / 5 $\Rightarrow$ 100 K $\Omega$	No	2 changeover	45	24 V $\sim$ 48 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 870 501 84 870 502 84 870 503 84 870 504 84 870 803	FN FN FN FN FN LS
		2 / 250 $\Omega$ $\Rightarrow$ 5 K $\Omega$						

\* Available in 2014. The casing of the new range will be different from the ones presented here.  
Further information can be found on the data sheets available at [www.crouzet.com](http://www.crouzet.com)

## Motor temperature control

Sensor	Test	Latching	Manual reset	Output relay	Casing width (mm)	Supply	Part number	Type
PTC	No	Yes	No	1 x 8 A NO	22.5	24 V $\sim$ 120 V $\sim$ 230 V $\sim$ 24 V $\sim$	84 874 015 84 874 013 84 874 014 84 874 025	ETM
		Yes	Yes	1 x 8 A changeover		120 V $\sim$ 230 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 874 023 84 874 024	ETM 2
PTC	No	Yes	Yes	2 x 8 A changeover	22.5	24 V $\sim$ 120 V $\sim$ 230 V $\sim$	84 874 035 84 874 033 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](http://www.crouzet.com)

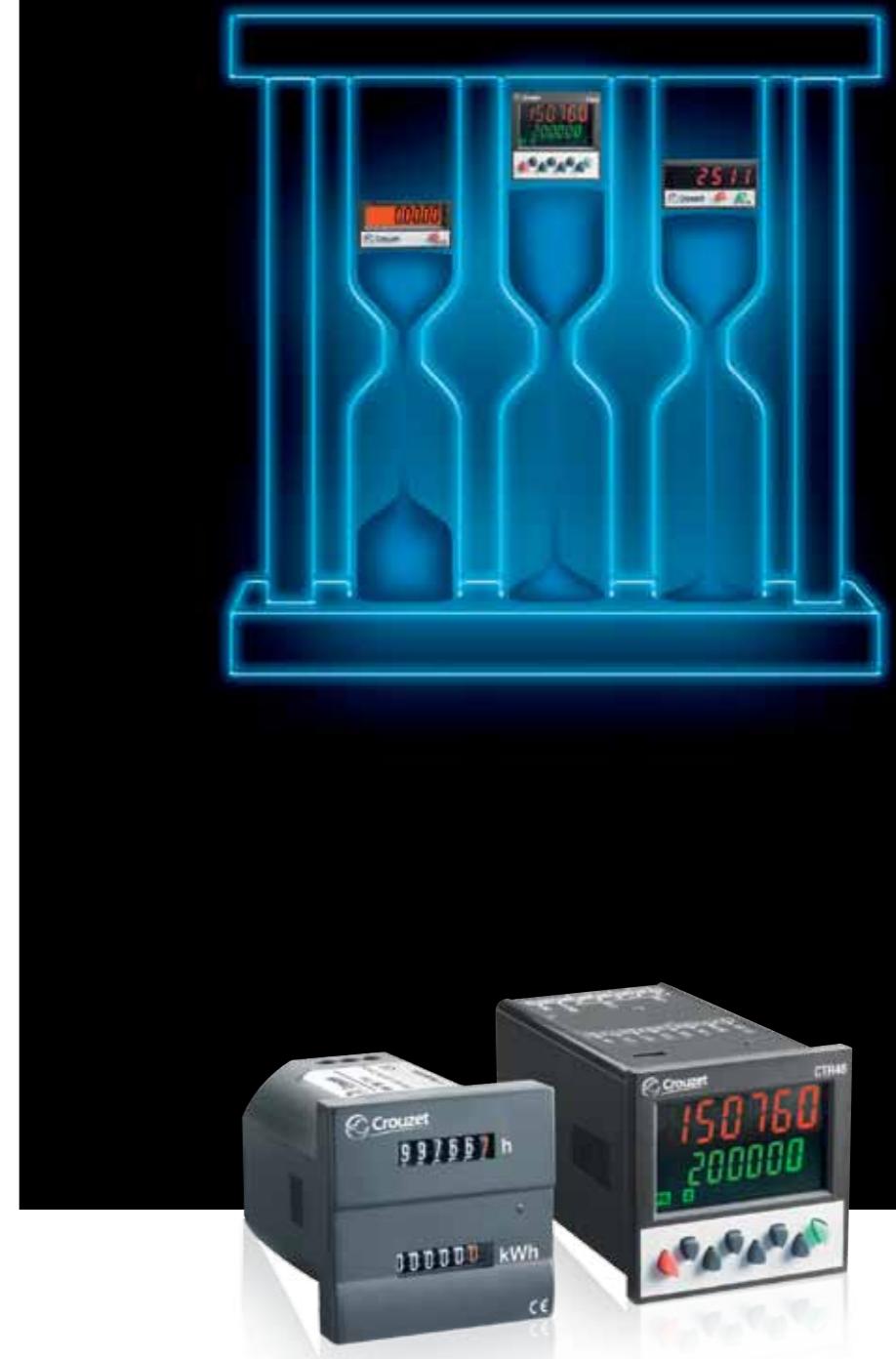
Control  
relays

**Crouzet Control**

## Behind every project, technologies and expertise

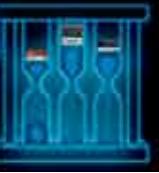
- **Local** support for all industrial projects.
- A **multi-skilled team**.
- A sales presence in over **40 countries**.
- A Premium offer designed to ensure **the excellence** of products and services.
- **Eco-design integrated** in Crouzet's "Offer Creation Process".
- Certifications: **ISO 9001, 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 technical data sheets and installation manuals for each product.



**Counters and Ratemeters**  
Counting accuracy

# The basics



## 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

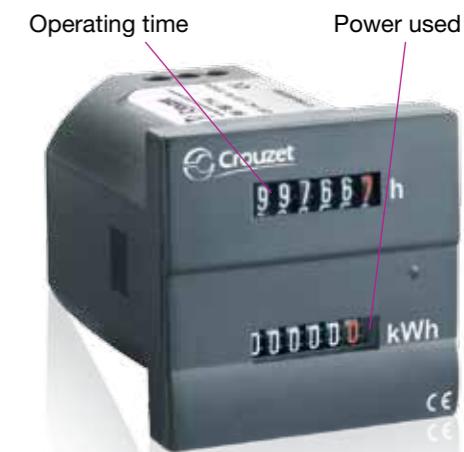
#### Chronometer timing

## Crouzet Control, counters and ratemeters

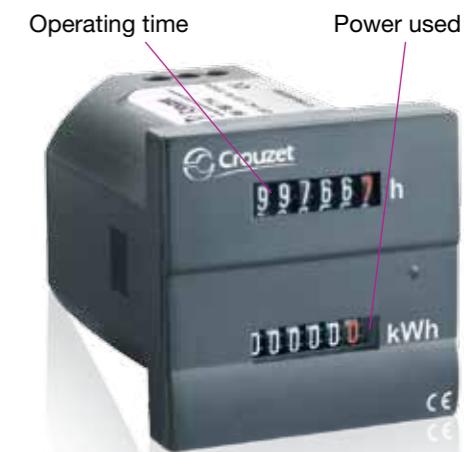
### A digital range and an electromechanical range



CTR48



CEM48



In addition to this catalogue, the [www.crouzet.com](http://www.crouzet.com) website offers technical data sheets and installation manuals for each product, available as free downloads.

## Crouzet Control, counters and ratemeters

### Their features:

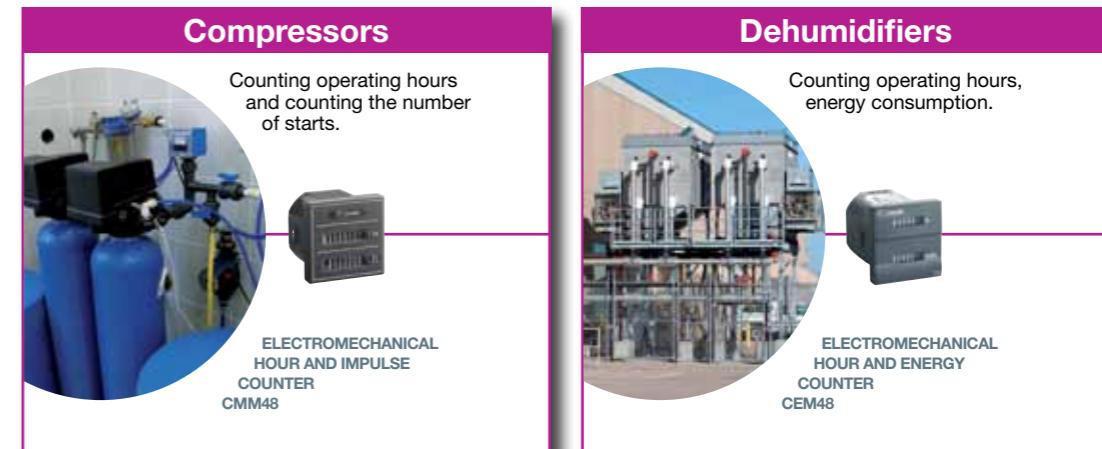
- For fast count applications, a high-speed counting frequency: up to **50 kHz**.
- A **two-colour or backlit LCD dual display** for ease of reading.
- Considerable space saving due to **dual-function** electromechanical and electronic ranges.
- A **complete** output operating **logic** to cover complex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

# Applications

## Crouzet Control, 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



# Selection guide

Counters and Ratemeters

## Electronic counters

### 24 x 48 multifunction counters without preselection

Functions	Modes	Multiplication coefficient	Decimal point	Max. counting speed	Display	Counting capacity	Supply	Part number	Type
Totalizer or Hour counter or Ratemeter	Dir / up.dn / up.up Ph / 2-ph / 4-ph	Yes	Yes	50 kHz (DIR mode)	LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 570	CTR24L - 2511
	Start / Stop sec $^{-1}$ / min $^{-1}$	No	Yes	999,999 hrs		0.001 s $\Rightarrow$ 999,999 hrs			
		Yes	Yes	50 kHz		999,999			
Double totalizer Independent inputs (A and B)	Counting A / B / A-B / A+B AdivB / %AB	Yes	Yes	25 kHz	LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 571	CTR24L - 2512
	Dir / up.dn / up.up Ph / 2-ph / 4-ph	Yes	Yes	30 kHz	LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 572	CTR24L - 2513
Totalizer and Ratemeter Independent inputs	sec $^{-1}$ / min $^{-1}$				LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 573	CTR24L - 2514
	Counting (total / partial)	Yes	Yes	50 kHz	LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 574	CTR24L - 2515
Totalizer + Ratemeter or Totalizer + Totalizer or Totalizer + Hour or Hour + Hour	Counting + sec $^{-1}$ / min $^{-1}$	Yes	Yes	35 kHz	LED	999,999	10 $\Rightarrow$ 30 V $\text{---}$	87 623 574	CTR24L - 2515
	Counting			50 kHz		999,999			
	Counting + Start / Stop			40 kHz		999,999			
	Start / Stop		No	999,999 hrs		0.001 s $\Rightarrow$ 999,999 hrs			
				999,999 hrs		0.001 s $\Rightarrow$ 999,999 hrs			

Counters and Ratemeters

### 24 x 48 counters without preselection

Functions	Inputs / Reset	Max. counting speed	Display	Counting capacity	Supply	Part number	Type
Hour	PNP / Contact	99,999.99 hrs	LCD	0.1 s $\Rightarrow$ 99,999.99 hrs	Lithium battery	87 622 161	CTR24 - 2223
	NPN or contact / Contact					87 622 162	CTR24 - 2233
	Voltage / Contact					87 622 170	CTR24 - 2224
Hour	PNP / Contact	99,999.99 hrs	Orange (backlit)	0.1 s $\Rightarrow$ 99,999.99 hrs	Lithium battery	87 622 181	CTR24 - 2323
	NPN or contact / Contact					87 622 182	CTR24 - 2333
	Voltage / Contact					87 622 190	CTR24 - 2324
Totalizer	PNP / Contact	99,999,999	LCD	99,999,999	Lithium battery	87 622 061	CTR24 - 2241
	NPN or contact / Contact					87 622 062	CTR24 - 2251
	Voltage / Contact					87 622 070	CTR24 - 2242
Totalizer	PNP / Contact	99,999,999	Orange (backlit)	99,999,999	Lithium battery	87 622 081	CTR24 - 2341
	NPN or contact / Contact					87 622 082	CTR24 - 2351
	Voltage / Contact					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](http://www.crouzet.com)

# Selection guide

## 48 x 48 multifunction counters with preselection

Functions	Number of preset(s)	Max. counting speed	Display	Counting capacity	Outputs	Supply	Part number	Type
Preselection counter Ratemeter Chronometer Multi-totalizer	1	40 KHz	Backlit LCD (orange) extra-bright 2 lines	-999,999 ⇒ 999,999	1 x 5 A changeover 1 solid state	10 ⇒ 30 V $\equiv$	87 621 111	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter						24 V $\sim$	87 621 112	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						90 ⇒ 260 V $\sim$	87 621 115	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter					1 x 5 A changeover 1 x 5 A NO 2 solid state	10 ⇒ 30 V $\equiv$	87 621 121	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						24 V $\sim$	87 621 122	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						90 ⇒ 260 V $\sim$	87 621 125	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer	1	40 KHz	Two-colour LCD (red and green) 2 lines	-999,999 ⇒ 999,999	1 x 5 A changeover 1 solid state	10 ⇒ 30 V $\equiv$	87 621 211	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter						24 V $\sim$	87 621 212	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						90 ⇒ 260 V $\sim$	87 621 215	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter					1 x 5 A changeover 1 x 5 A NO 2 solid state	10 ⇒ 30 V $\equiv$	87 621 221	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						24 V $\sim$	87 621 222	CTR48
Preselection counter Ratemeter Chronometer Multi-totalizer						90 ⇒ 260 V $\sim$	87 621 225	CTR48
Preselection counter Chronomètre	1	5 KHz	Backlit LCD (green) 2 lines	-999,999 ⇒ 999,999	1 x 3 A changeover	11 ⇒ 30 V $\equiv$	87 629 111	CTR48E
Preselection counter Chronomètre						115 V $\sim$	87 629 113	CTR48E
Preselection counter Chronomètre						230 V $\sim$	87 629 114	CTR48E
Preselection counter Chronomètre					1 x 3 A changeover 1 x 3 A NO	11 ⇒ 30 V $\equiv$	87 629 121	CTR48E
Preselection counter Chronomètre						115 V $\sim$	87 629 123	CTR48E
Preselection counter Chronomètre						230 V $\sim$	87 629 124	CTR48E

## Electromechanical counters

### Hour counters

Dimensions (mm)	Counting capacity	Frequency	Supply	Part number	Type
48 x 48	99,999.99	50 Hz $\sim$	20 ⇒ 30 V $\sim$	99 772 710	CHM48
			42 ⇒ 48 V $\sim$	99 772 711	CHM48
			100 ⇒ 130 V $\sim$	99 772 712	CHM48
			360 ⇒ 440 V $\sim$	99 772 713	CHM48
			187 ⇒ 264 V $\sim$	99 772 714	CHM48
			20 ⇒ 30 V $\equiv$	99 772 718	CHM48
			42 ⇒ 48 V $\equiv$	99 772 719	CHM48
			100 ⇒ 130 V $\sim$	99 772 715	CHM48
			187 ⇒ 264 V $\sim$	99 772 716	CHM48
			360 ⇒ 440 V $\sim$	99 772 717	CHM48
48 x 48	999,999.99	60 Hz $\sim$	10 ⇒ 30 V $\equiv$	99 772 810	CHM48
			36 ⇒ 80 V $\equiv$	99 772 811	CHM48
			100 ⇒ 130 V $\equiv$	99 772 812	CHM48
		50 Hz $\sim$	20 ⇒ 30 V $\sim$	99 782 710	CHM24
			100 ⇒ 130 V $\sim$	99 782 712	CHM24
			187 ⇒ 264 V $\sim$	99 782 714	CHM24
24 x 48	99,999.99	60 Hz $\sim$	20 ⇒ 30 V $\sim$	99 782 718	CHM24
			100 ⇒ 130 V $\sim$	99 782 715	CHM24
			187 ⇒ 264 V $\sim$	99 782 716	CHM24
		50 Hz $\sim$	10 ⇒ 30 V $\equiv$	99 782 810	CHM24
			4.5 ⇒ 35 V $\equiv$	99 792 810	CHM15
			24 V $\sim$	99 793 710	CHMDR
15 x 32	999,999.99	60 Hz $\sim$	115 V $\sim$	99 793 712	CHMDR
			230 V $\sim$	99 793 714	CHMDR
		50 Hz $\sim$	10 ⇒ 27 V $\equiv$	99 793 810	CHMDR
			10 ⇒ 27 V $\equiv$	99 793 810	CHMDR
Modular Rail Din 35 mm	99,999.99				

 The counters and ratemeters accessories guide is available on the product data sheets which can be downloaded from the website [www.crouzet.com](http://www.crouzet.com)

# Selection guide

Counters and Ratemeters

## Impulse counters

Dimensions (mm)	Reset to zero	Counting capacity	Supply	Part number	Type
 15 x 32 Clip-fixing	No	9,999,999	24 V ~ - 50 / 60 Hz 115 V ~ - 50 / 60 Hz 230 V ~ - 50 / 60 Hz 5 V --- 12 V --- 24 V ---	99 778 710 99 778 712 99 778 714 99 778 805 99 778 806 99 778 810	CIM15 CIM15 CIM15 CIM15 CIM15 CIM15
 24 x 48 Clip-fixing	No	999,999	24 V ~ - 50/60Hz 230 V ~ - 50/60Hz 12 V --- 24 V ---	99 777 710 99 777 714 99 777 815 99 777 810	CIM 24 CIM 24 CIM 24 CIM 24
 24 x 48 Clip-fixing	Yes	99,999	24 V ~ - 50/60Hz 230 V ~ - 50/60Hz 12 V --- 24 V ---	99 777 720 99 777 724 99 777 825 99 777 820	CIM 24 CIM 24 CIM 24 CIM 24
 24 x 48 Screw-fixing	No	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V --- 110 V ---	99 776 904 99 776 902 99 776 901 99 776 907 99 776 905	CIM 24 x 48 CIM 24 x 48 CIM 24 x 48 CIM 24 x 48 CIM 24 x 48
 24 x 48 Screw-fixing	Yes	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V ---	99 776 924 99 776 922 99 776 921 99 776 927	CIM 24 x 48 CIM 24 x 48 CIM 24 x 48 CIM 24 x 48
 36 x 37 Screw-fixing	No	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V --- 110 V ---	99 776 604 99 776 602 99 776 601 99 776 607 99 776 605	CIM 36 x 37 CIM 36 x 37 CIM 36 x 37 CIM 36 x 37 CIM 36 x 37
 36 x 37 Screw-fixing	Yes	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V ---	99 776 613 99 776 611 99 776 610 99 776 616	CIM 36 x 37 CIM 36 x 37 CIM 36 x 37 CIM 36 x 37
 36 x 48 Screw-fixing	No	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V --- 48 V --- 110 V ---	99 776 704 99 776 702 99 776 701 99 776 707 99 776 736 99 776 705	CIM 36 x 48 CIM 36 x 48
 36 x 48 Screw-fixing	Yes	999,999	24 V ~ - 50/60Hz 115 V ~ - 50/60Hz 230 V ~ - 50/60Hz 24 V ---	99 776 713 99 776 711 99 776 710 99 776 716	CIM 36 x 48 CIM 36 x 48 CIM 36 x 48 CIM 36 x 48

Counters  
and  
Ratemeters

## Dual function 48 x 48 counters

Functions	Reset to zero	Counting capacity	Frequency	Supply	Part number	Type
 Impulse Hour	No	9,999,999 99,999.99 hrs	50 Hz ~	20 ⇒ 30 V ~ 100 ⇒ 130 V ~ 187 ⇒ 264 V ~ 20 ⇒ 30 V ~	99 779 710 99 779 712 99 779 714 99 779 718	CMM48 CMM48 CMM48 CMM48
 Power Hour	No	9,999,999 / 999,999.99 hrs 99,999.99 kw/hrs	60 Hz ~ --- 50/60 Hz ~	100 ⇒ 130 V ~ 187 ⇒ 264 V ~ 10 ⇒ 30 V --- 115 V ~ 230 V ~	99 779 715 99 779 716 99 779 810 99 780 712 99 780 714	CMM48 CMM48 CMM48 CEM48 CEM48

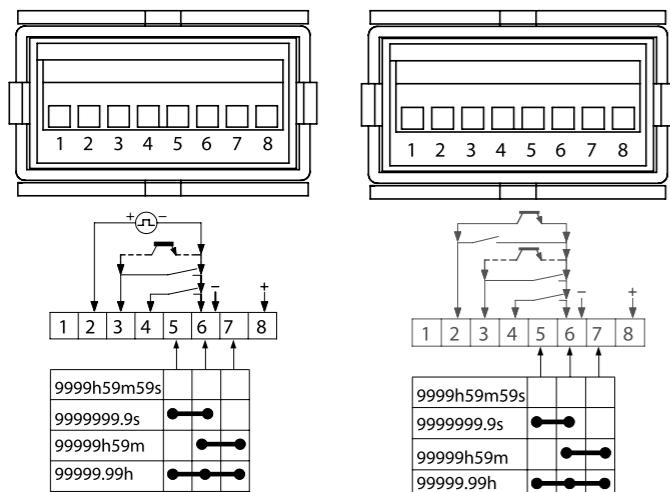
The counters and ratemeters accessories guide is available on the product data sheets which can be downloaded from the website [www.crouzet.com](http://www.crouzet.com)

# Connection diagrams

## CTR24 counters

### Connections

#### Hour counters



##### Types 2223 and 2323:

Part numbers:

- 87 622 161
- 87 622 181

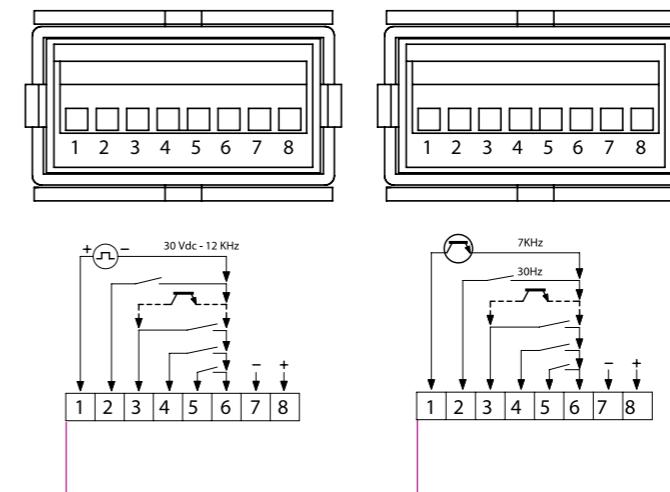
1. NC
2. Start / Stop input
3. Reset input
4. Enable front panel Reset
5. Mode 1 (Time selection)
6. GND / Optional backlighting - (only 23xx)
7. Mode 2 (Time selection)
8. Optional backlighting + (only 23xx)

##### Types 2233 and 2333:

Part numbers:

- 87 622 162
- 87 622 182

#### Impulse counters



##### Types 2241 and 2341:

Part numbers:

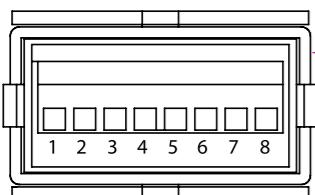
- 87 622 061
- 87 622 081

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 2251 and 2351:

Part numbers:

- 87 622 062
- 87 622 082

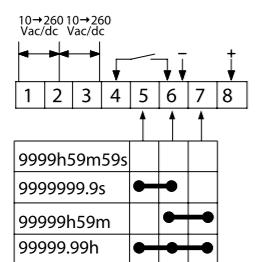


##### Types 2224 and 2324:

Part numbers:

- 87 622 170
- 87 622 190

1. Common  $\approx$
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 2242 and 2342:

Part numbers:

- 87 622 070
- 87 622 090

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

**Crouzet Control**

# Behind every project, technologies and expertise

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## Temperature controllers

A degree of constancy

# The basics



## 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 <b>measure</b> 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 <b>controls</b> and <b>displays</b> the temperature of the enclosure.
It can be used to set an <b>alert</b> in the event of an anomaly (low and/or high temperature).
Monitoring
The temperature controller action is not limited to <b>monitoring</b> . 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 <b>implements</b> a heating or cooling action.

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## Measuring

## Controlling

## Displaying

## Alerting

## Monitoring



CTD46

## Crouzet Control, temperature controllers

### A complete range

## Crouzet Control, 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

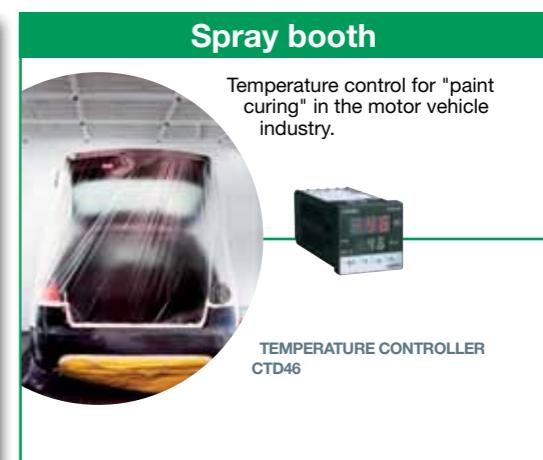
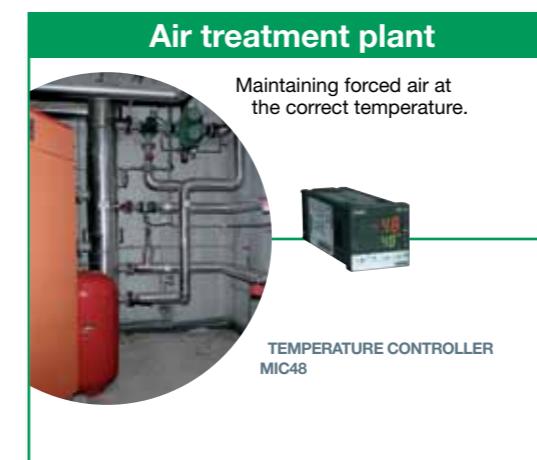
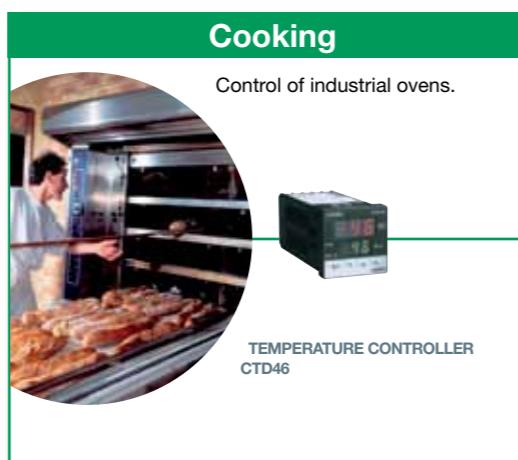
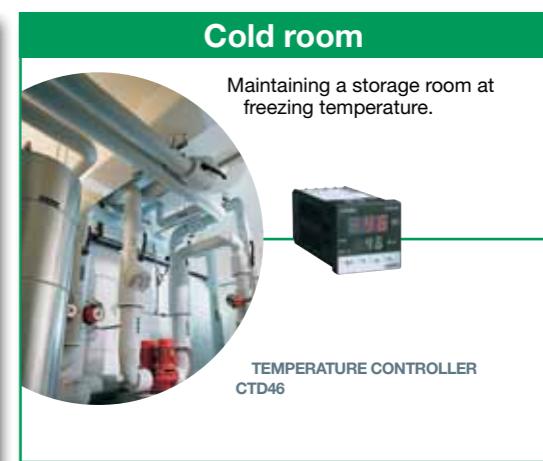
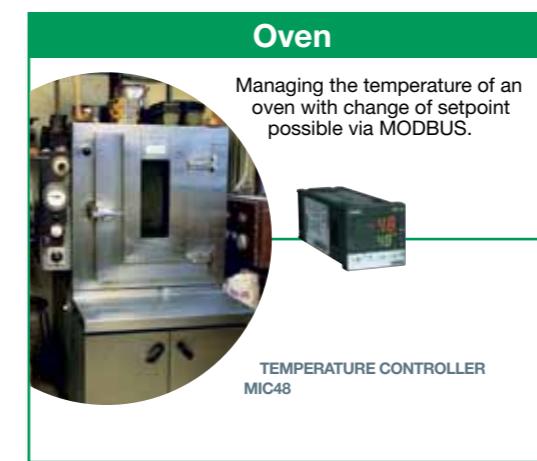
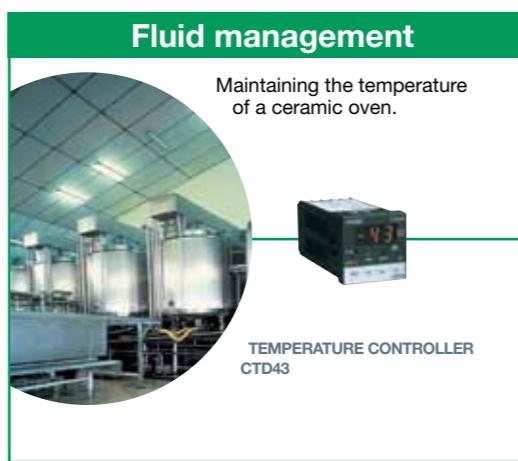
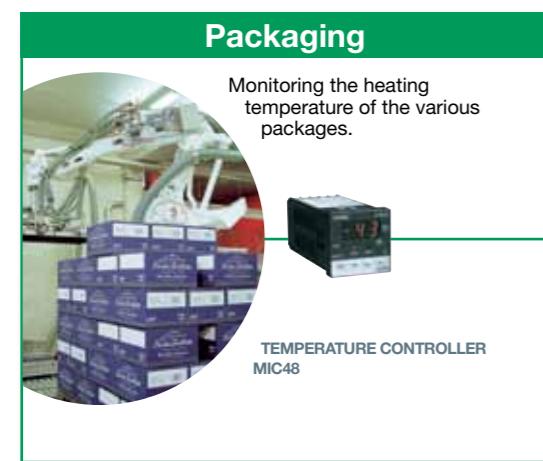
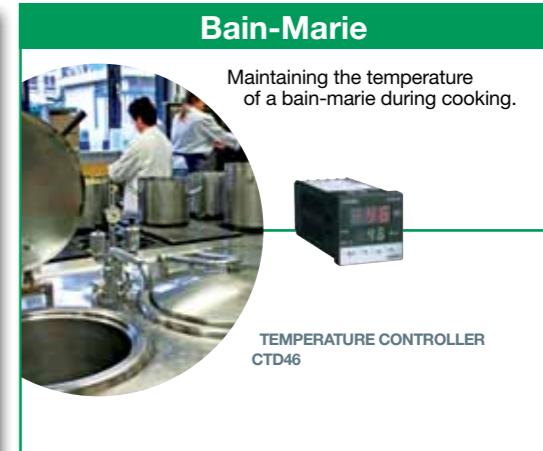
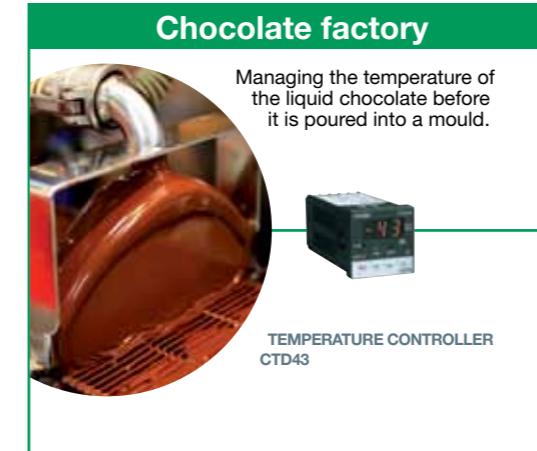
Temperature controllers

## Crouzet Control, temperature controllers

### Where are they found?

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

- Industrial automation systems
- Food industry
- Building equipment



Temperature controllers

# Selection guide

Temperature controllers

## Temperature controllers

### 48 x 48 digital

Functions	Type of control	Alarm		Input	Output	Display	Supply	Part number	Type
Heating or Cooling	PID with auto-tune and adaptive tune	1 alarm		3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output 1 voltage logic 1 x 1 A relay	1 line (3 digits)	24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$ 24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$	89 421 102 89 421 108 89 421 112 89 421 118	CTD43
Heating or Cooling	PID with auto-tune and adaptive tune	1 alarm		3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output 1 voltage logic 1 x 1 A relay	2 lines (3 digits)	24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$ 24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$	89 422 102 89 422 108 89 422 112 89 422 118	CTD46
Heating and Cooling	PID with auto-tune and adaptive tune	No		3-wire Pt100 or Thermocouple J, K, L, N	1 x 3 A output 1 x 1 A output 1 voltage logic 1 x 1 A relay	2 lines (3 digits)	24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$ 24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$	89 422 502 89 422 508 89 422 512 89 422 518	CTH46
Heating and / or Cooling	PID with auto-tune and adaptive tune Load break monitoring	2 alarms		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 1 voltage logic 1 x 1 A relay	2 lines (4 digits)	24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$ 24 V $\approx$ 100 $\Rightarrow$ 240 V $\sim$	89 422 002 89 422 008 89 422 012 89 422 018	MIC48

### 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

### 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

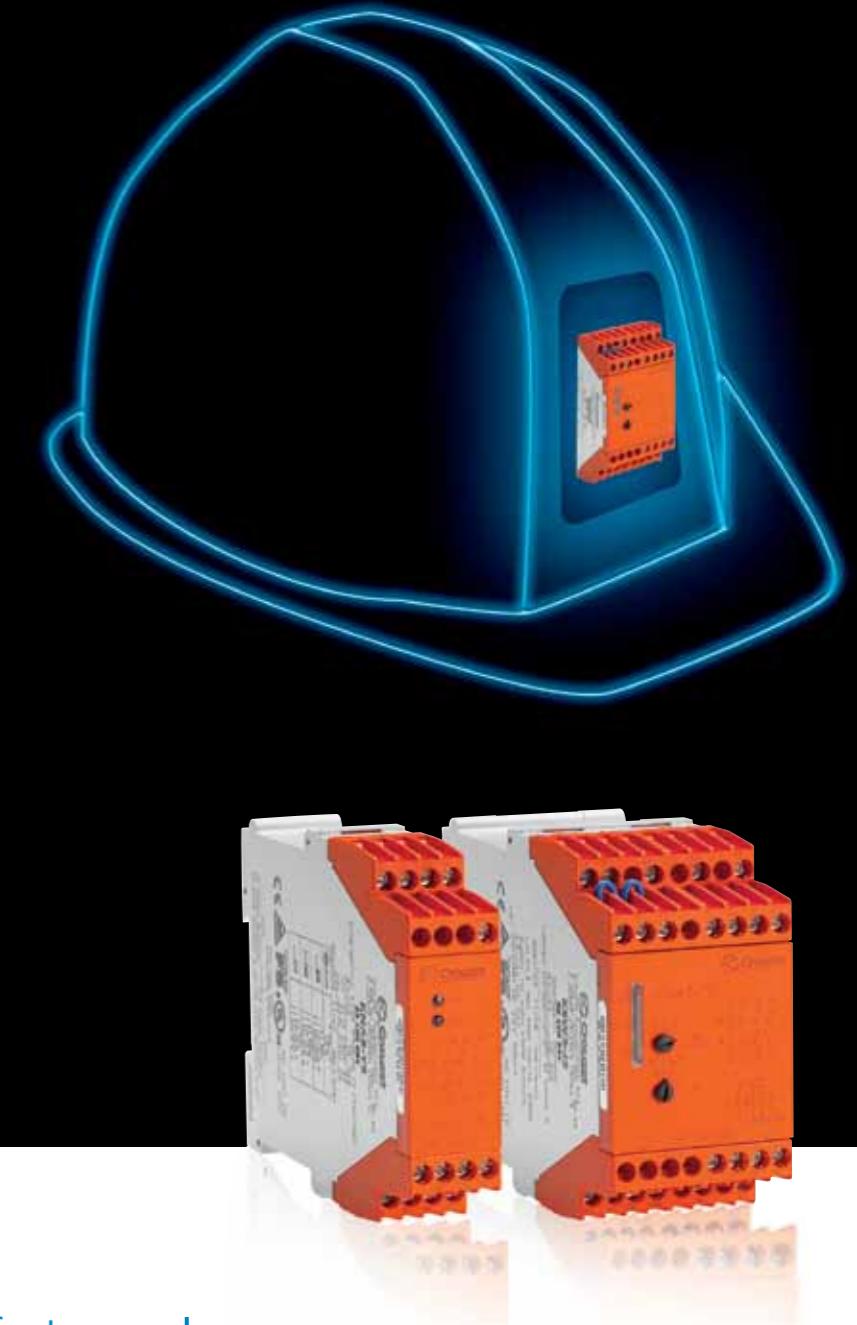
Temperature controllers

**Crouzet Control**

## 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 technical data sheets and installation manuals for each product.



**Safety relays**  
User protection

# The basics

## 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 machine safety standards (EN ISO 13849-1 and IEC/EN 62061).

## 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 accidentally.

#### 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, etc which could be hazardous for the user.

#### Protecting

#### Controlling

#### Monitoring

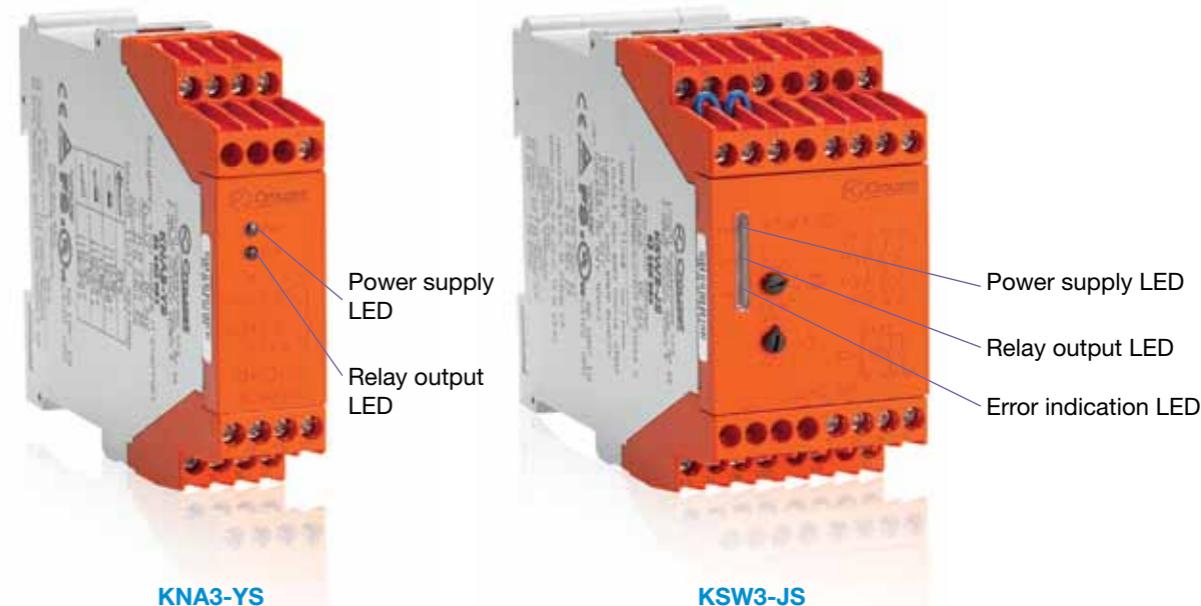
#### Sensing

#### Actuating

In addition to this catalogue, technical data sheets for each product are available as free downloads on the [www.crouzet.com](http://www.crouzet.com) website.

## Crouzet Control, safety relays

### A relevelling range and a machine safety range



## Crouzet Control, safety relays

### Their features:

- A range covering **machine applications**: emergency stop and mobile guard monitoring, emergency stop with timed contact, two-hand control, zero speed monitoring, expansion module and power supply accessory. A relevelling **control relay** for the lift market.
- A safety component with **one or two channels**.
- Prohibition of machine starting if a problem becomes apparent through **self-checking of the integrity of the control devices**.
- A range conforming to:
  - **Performance Level (PL) e** and **category 4** according to EN ISO 13849-1
  - **Limit value SIL 3 (SIL CL)** according to IEC/EN 62061

# Selection guide

Safety relays

## Crouzet Control, safety relays, How to choose?

### Machine safety

Function(s)	Safety category	Safety contacts	Data contact	Connection	Casing width (mm)	Supply	Part number	Type		
 Emergency stop & Safety guard monitoring with 1 channel	3	3 x NO	1 x NC	Screw terminals	22.5	24 V $\perp\!\!\!\perp$	85 102 031	KNA3-YS		
						110 V $\sim$	85 102 034			
	4	3 x NO	1 x NC			230 V $\sim$	85 102 035			
						24 V $\perp\!\!\!\perp$	85 103 031	KNAC3-YS		
						110 V $\sim$	85 103 034			
						230 V $\sim$	85 103 035			
	4	2 x NO (instantaneous) 1 x NO (timed)	-	Screw terminals	22.5	24 V $\perp\!\!\!\perp$	85 102 436	KNE3-YS		
						110 - 115 V $\sim$	85 102 434			
						230 V $\sim$	85 102 435			
						24 V $\perp\!\!\!\perp$	85 103 436	KNEC3-YS		
	4	5 x NO	1 x NC (feedback loop)	Screw terminals	22.5	24 V $\perp\!\!\!\perp$	85 102 736	KZR3-YS		
						24 V $\perp\!\!\!\perp$	85 102 956	KZE5-YS		
						110 - 115 V $\sim$	85 102 954			
						230 - 240 V $\sim$	85 102 955			
	4	3 x NO 1 x NC	1 x NO 2 x solid state outputs	Screw terminals	45	24 V $\perp\!\!\!\perp$	85 102 331	KSW3-JS		
						24 V $\perp\!\!\!\perp$	85 102 621	KZH2-Y2		
						24 V $\perp\!\!\!\perp$	85 102 631	KZH3-YS		
						24 V $\sim$	85 102 632			
	-	-	-	Screw terminals	22.5	85 $\Rightarrow$ 265 V $\perp\!\!\!\perp$	85 102 208	KPS0-YS		
						24 V $\perp\!\!\!\perp$	85 102 826	KZHNU-YS		
						24 V $\perp\!\!\!\perp$	85 102 526	KZHNV-YS		

Safety  
relays

### Relevelling control according to EN 81-1, -2 (lift standard)

Function(s)	Safety category	Safety contacts	Data contact	Connection	Casing width (mm)	Supply	Part number	Type
	4	2 x NO	-	Removable screw terminals	22.5	24 V $\perp\!\!\!\perp$	85 102 826	KZHNU-YS
Relevelling zone control for lifts			1 x NC			24 V $\perp\!\!\!\perp$	85 102 526	KZHNV-YS

# Applications

Safety relays

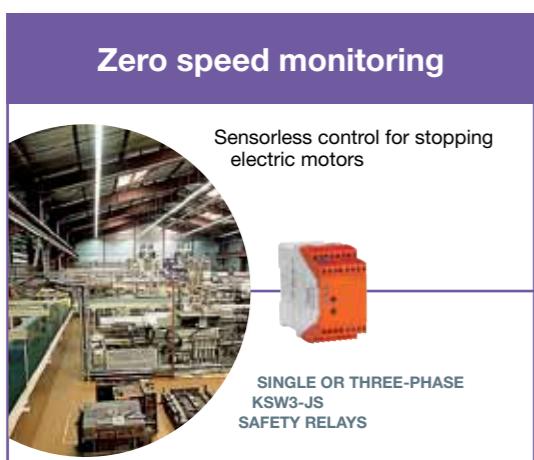
## Crouzet Control, safety relays

### Where are they found?



They can be found in electrical cabinets, associated with other automation functions in the following markets:

- Building equipment
- Industrial automation systems



## Crouzet Control

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Safety  
relays

## Notes



# 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

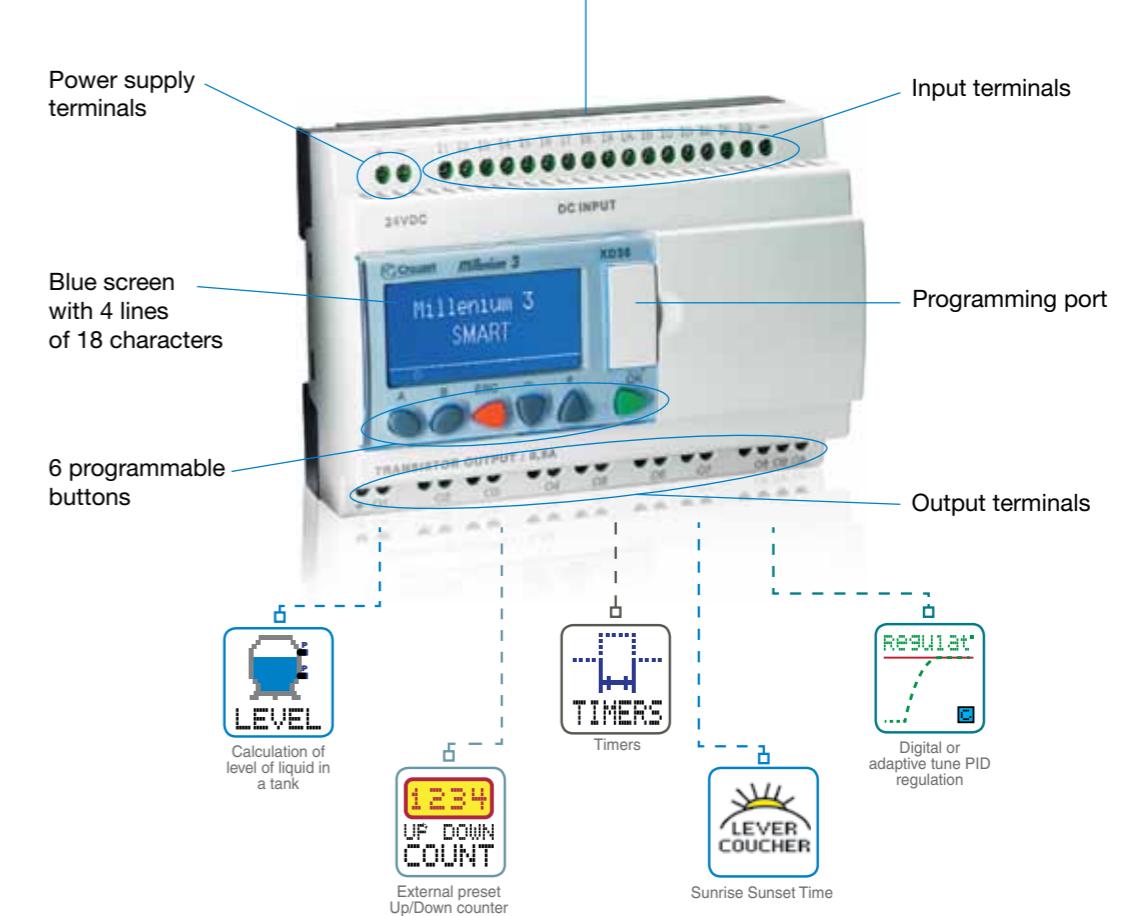
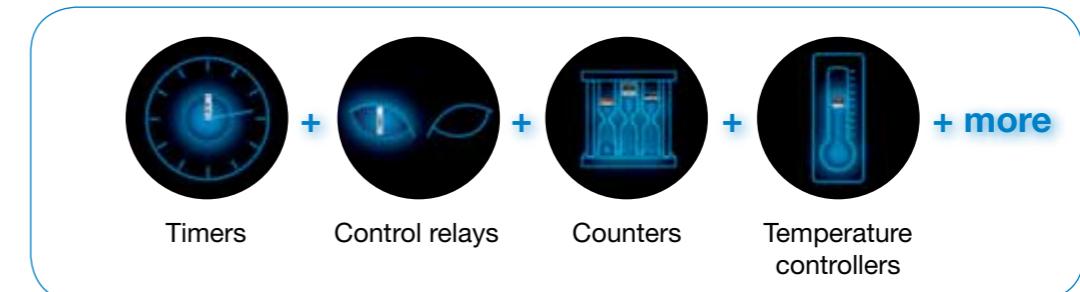
#### Communicating

#### Triggering

## Crouzet Automation Logic Controllers

### Millenium 3, concentrated performance

The **Millenium 3 Smart** logic controller is a programmable logic controller which enables the control and monitoring of machines or automation installations with up to 50 I/O.



To tackle simpler applications that still require a powerful logic controller, Crouzet Automation offers the Millenium 3 **“Essential”** range. The 12 VDC or 24 VDC Millenium 3 Essential range includes a variety of versions and is compatible with a large range of accessories. It is the right solution for simple needs.

# The range

# Accessories

## Crouzet Automation Logic Controllers The Millenium 3 Smart range

- **Multiple configuration options** derived from an extensive product range with numerous accessories
- **Simplified connectivity** making integration of communication systems easy
- **Easy implementation** supported by free, user-friendly programming software (M3 Soft)
- **Application-specific solutions** thanks to dedicated and easy to use specific function blocks
- **Enhanced visibility** on the display with high contrast, blue back lit LCD screen

### Expandable versions



### Compact versions



## Crouzet Automation Logic Controllers Accessories

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



# Communication solutions

Logic controllers

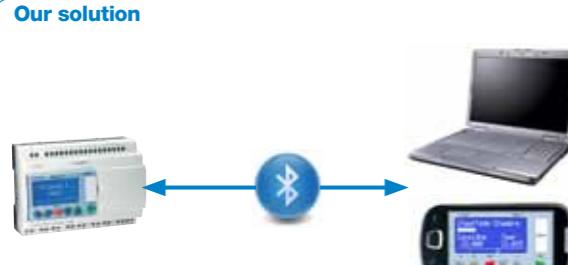
## Crouzet Automation Logic Controllers Extensive Connectivity Options

### Solutions with close proximity to your installation

#### Millenium 3 Virtual Display - Bluetooth® or USB

**Your requirements**

- Viewing setpoints on a panel less than 10 m away
- Changing and modifying setpoints
- Locating the Millenium 3 display unit remotely
- Reading counters in the vicinity



#### Main functions

- Remote viewing of the Millenium 3 display unit
  - on an Android smartphone via Bluetooth®
  - on a PC via Bluetooth® or USB
- Display/modification of program setpoints
- Access to a virtual panel (Millenium 3 without display unit)

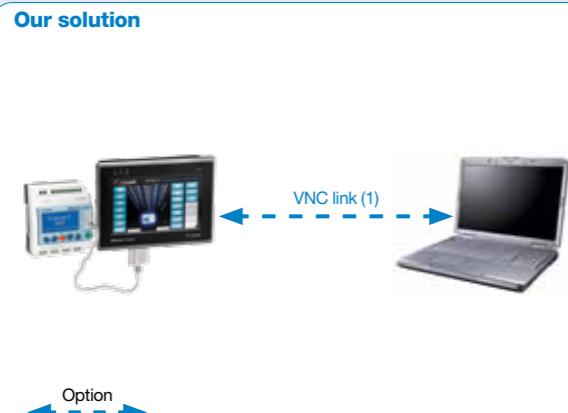
#### In summary

- Bluetooth® interface (10 m): Millenium 3 accessory
- Two versions: Lite (ESC/ENTER buttons disabled) & Standard

#### MTP programmable touch panels - RS232 cable

**Your requirements**

- Displaying data on a graphic panel
- Modifying setpoints from the touch panel
- Taking control of the remote panel from a distance



#### Main functions

- Supervision of your installation
- Use of Millenium 3 internal data, processing alarms and recipes
- Display of text, data, graphics, animations
- Archiving of data
- Customization of interfaces (picture library)
- Remote control of panel

#### In summary

- Storage: 128 MB flash memory, SD card and USB key
- Direct communication using the Millenium 3 programming port
- Programmable with EB software (compatible with Windows 2000/XP/Vista/7)
- Extensive connectivity

(1) VNC: Virtual Network Computing. Allows a device to be controlled remotely.

### Wide Area Network (WAN) solutions

#### M3MOD - GSM modem communication interface

**Your requirements**

- Receiving remote early warning of an event
- Consulting a value or an internal state
- Occasionally modifying setpoints



#### Main functions

- Automatic notification of alarms via SMS
- Input and output states, as well as all program values, can be polled and controlled remotely
- Reports can be produced using the available variables
- Management of telephone contacts

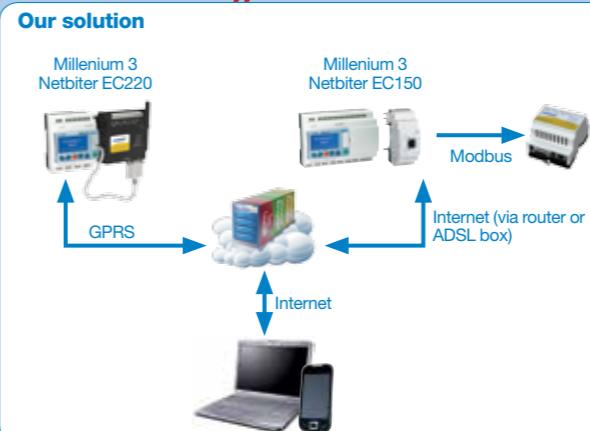
#### In summary

- Reliable plug & play solution that is simple to install
- Solution managed using M3 Soft software
- Option to send SMS messages via a telecom operator service

#### Remote management solutions with - Cloud

**Your requirements**

- Supervising and monitoring installations with up to 50 remote I/O
- Managing an installed base of machines
- Accessing your data remotely, 24/7
- Optimizing your maintenance operations



#### Main functions

- Remote control of an automated application
- Display of Millenium 3 program parameters and values via the internet
- Remote setpoint modification
- Data logging
- Management of events sent via emails or SMS

#### In summary

- Direct communication between Netbiter and Millenium 3 via the SLin/SLout protocol or via Modbus
- GPRS: SIM card procured via HMS
- Cloud solution: secure remote server
- Easy to set up and use
- Several Millenium 3 can be connected via Modbus

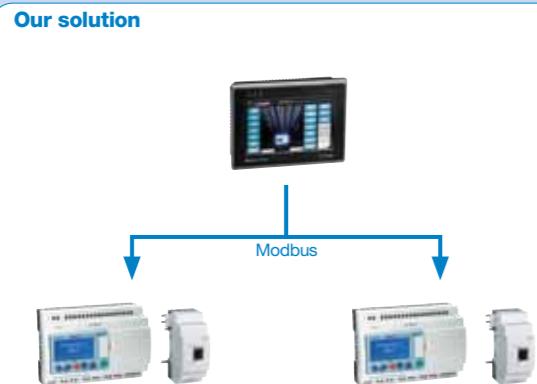
(2) Partnership solutions with the HMS company, validated by Crouzet Automation and HMS. Information relating to the products has been provided by the supplier of each product respectively, and they are wholly responsible for its accuracy in addition to supplying and providing backup for their products.

### Local Area Network (LAN) solutions

#### Programmable touch panels and communication extensions – Modbus networks

**Your requirements**

- Managing a group of machines or an installation on a local area network
- Centralizing data
- Displaying data on a graphic panel
- Modifying setpoints from the panel
- Accessing the system locally in real time



#### Main functions

- See MTP programmable touch panels solution
- Management and centralizing of data in a single place
- Display of Millenium 3 program values
- Remote setpoint modification

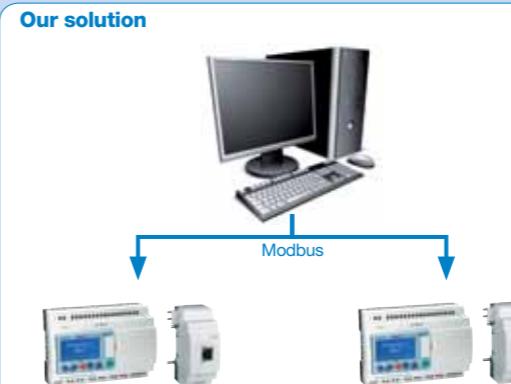
#### In summary

- MTP panel Modbus master
- XN05 extension: Modbus Ethernet TCP/IP
- XN06 extension: Modbus RS485 RTU

#### Communication extensions - Modbus RS485 or Modbus Ethernet TCP/IP

**Your requirements**

- Managing a group of machines or an installation on a local area network
- Centralizing data
- Accessing the system locally in real time



#### Main functions

- Can be combined with distributed automation
- Management and centralizing of data in a single place
- Display of Millenium 3 program values
- Remote setpoint modification

#### In summary

- Uses Modbus protocol
- XN05 extension: Modbus Ethernet TCP/IP
- XN06 extension: Modbus RS485 RTU
- Compatible with standard supervisors

Logic controllers

# M3 Soft software



## Crouzet Automation Logic Controllers Millenium 3 and M3 Soft

The M3 Soft is a **high-performance** software platform used to program the Millenium 3 logic controller and **optimize** design times.

### Free

The Millenium 3 programming software (M3 Soft) can be **downloaded free of charge** from the Crouzet website at [www.crouzet.com](http://www.crouzet.com)

## M3 Soft software Its features

### Simple

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



Blocks can be wired in wiring mode or text mode

Move one or more blocks without disconnecting the wires

Choice of programming language

Clear work area

Customized password protection

### Powerful

- A complete range of **basic 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

- Software available in **5 languages**: English, French, Italian, German and Spanish
- Function block **programming** is **fun** and **very visual**
- **Blocks simply organized** by function for quick access
- **Help** associated with each function block accessible **at the click of a button**
- Programming langages: **FBD** (Function Bloc Diagram) and **SFC** (Sequential Function Chart/Grafset) or **LD** (Ladder Diagram)

### User-definable and effective

- Possibility of creating and saving **custom macros** in the macro tab allowing the user to simplify programs and utilize their expertise
- Possibility of protecting macros by locking them with a password for **greater security**

Logic controllers

# Function blocks

APPLICATION	
 <b>Cam Bloc</b>	Control of a group of 8 integral cam wheels.
 <b>Angular Cam Timer</b>	Cam timer with the angle made by the cams as the command input.
 <b>Pumps management</b>	Pumps Management (Tank Management with circular pump changeover).
 <b>Sunrise Sunset Time</b>	Calculation of the sunrise and sunset time in relation to the latitude and longitude.
 <b>Solar Tracking one Axis</b>	Calculation of the sun's position so that a sun dial can be placed.
 <b>Analog PID Regulation (8 bits)</b>	Temperature control (pressure or other) with 8 bits analog output.
 <b>PWM PID Regulation (8 bits)</b>	Temperature control (pressure or other) with 8 bits digital output.
 <b>Pressure Gain</b>	Interface between a Pressure Sensor and the Millenium 3 logic controller.
 <b>Flow</b>	Calculation of the flow of a liquid in a pipe using a differential pressure element or by measuring the dynamic pressure.
 <b>Level</b>	Calculation of the level of a liquid with or without constant density, in an open or closed tank, using pressure sensors.
 <b>CTN 1</b>	Temperature measurement. It is dedicated to CTN1 (-25 to +85 °C).
 <b>CTN 2</b>	Temperature measurement. It is designed for CTN2 type CTNs (-35°C to +120°C).
 <b>CTN 3</b>	Temperature measurement. It is designed for CTN3 type CTNs (0°C to +200°C).
 <b>LUX-I</b>	Light measurement. It is designed for photoresistors and internal light meters.
 <b>Twilight</b>	Calculation of the sunrise and sunset times and also the twilight times in relation to the latitude and longitude read on the function block inputs.
 <b>Solar Tracking Dual Axis</b>	Calculation of the sun's position so that a sun dial can be placed. This positioning depends on the two angles calculated by the function: the elevation angle and the azimuth angle.
 <b>Swimming Pool Filtration</b>	Filtration time information in relation to the water temperature.
 <b>Defrost</b>	Defrost cycle management
 <b>Heat Curve</b>	Modulation of the heating water temperature according to the atmospheric conditions. The function uses automatic regulation depending on the temperature outdoors called the temperature curve or "water ratio".
 <b>Analog PID Regulator (Auto-tuning)</b>	Auto-tuning proportional-integral-derivative (PID) controller.
PROG	
 <b>1 Constant On</b>	Constant On
 <b>0 Constant Off</b>	Constant Off
 <b>YES</b>	Copy of the input to the output. (very helpful when macros are being used)
 <b>Numerical Constant</b>	Integer with a value between -32768 and +32767.
 <b>Yes Num</b>	Copy of the input to the output. (very helpful when macros are being used)
 <b>Memory</b>	Saving of a value between -32768 and 32767.
 <b>Storage</b>	Storage of data values with an average value.
 <b>Archive</b>	Saving of two values simultaneously with the information relating to their time-stamping.
 <b>Random</b>	Generation of a pseudo-random value between the min and max values set by the user.

CALCUL	
 <b>Gain</b>	Conversion of an analog value by changing the scale and offset.
 <b>Add/Subb</b>	Simple operations on integers: Addition and/or Subtraction.
 <b>Mul/Div</b>	Simple operations on integers: Multiplication and/or Division.
 <b>ADD/SUB 2 Inputs</b>	The ADD-SUB (Addition or Subtraction) function is used to perform simple operations on integers.
 <b>Sin/Cos</b>	Calculation of the cos and sin of an angle between 0° and 90°.
 <b>Square Root</b>	Calculation of the square root of the number present as an input with accuracy to two decimal points.
 <b>Bit Multiplexer</b>	Copy of the selected A or B input to the outputs Q and/Q.
 <b>Multiplexer A B</b>	Multiplexing function on 2 analog values.
 <b>Demultiplexer</b>	Demultiplexing of integers. Used to direct the value of the input to one of the 4 outputs.
 <b>Multiplexer</b>	Multiplexing word inputs. Used to direct the value of one of the selected inputs to a predefined output.
 <b>Dec/Bin</b>	Break down of an integer type input (16 bits) into 16 bit type outputs.
 <b>Bin/Dec</b>	Make up of an integer type output (16 bits) from 16 bit type inputs.
 <b>SPLIT 16 bits to 4</b>	Split of a 16-bit word into four 16-bit words with values between 0 and 15.
 <b>SPLIT 16 bits to 2</b>	Split of a 16-bit word into two 16-bit words with values between 0 and 255.
 <b>Word Shift Register</b>	Shifting of the 16-bit words on each rising edge of the clock.
 <b>Shift Register</b>	Shifting of information by saving it to the memory (shifting of bits in a 16-bit word on each rising edge of the clock).
 <b>Transfer Function</b>	Table of correspondence between the X input and the Y output. The table of correspondence is created from a csv file
 <b>Transfer Function 50 values</b>	Table of correspondence between the X input and the Y output. The table of correspondence (50 rows max) is created from a sv file
 <b>Timer Transfer Function</b>	Correspondence table for the Minutes operating time and the Y output.
 <b>Timer Transfer Function 50 values</b>	Correspondence table for the Minutes operating time and the Y output. (50 Values)
PROG	
 <b>Hour Minute</b>	Indication of the time from the controller (hour and minutes).
 <b>Hr Mn Converter</b>	Conversion of a time period in the "hour : minute" format to minutes and vice versa.
 <b>Controller Status</b>	Access to the controller states and modify the behaviour of its FBD and/or SFC program depending on these states.
 <b>Summertime</b>	Active function throughout summer time, and inactive throughout winter time.
MACROS	
 <b>Display 15 texts</b>	Display of 15 texts one after each other with 15 Displays Function Blocs
 <b>Scroll 4 lines</b>	Scroll down of a text of four lines on the screen of the Controller
 <b>My Macro</b>	Possibility to create a personal macro library and to store them in the Macro tab.

INPUTS/OUTPUTS	
 <b>Discrete Input</b>	Large set of timer functions (A/C, BW, B/H,Li/L, Totalizer)
 <b>Filtered Digital Input</b>	Monitoring of an analog value in relation to two thresholds.
 <b>Analog Input 0..10V</b>	Delay of actions for a predefined time.
 <b>Pulse Output</b>	Impulse relay function.
 <b>Filtered Analog Input</b>	Bistable memory - Priority assigned to either SET or RESET.
 <b>Analog Input Expansion 10 bits</b>	Trigger of operation of a particular device at a fixed time for a period set by the user.
 <b>Analog Input Expansion 12 bits</b>	The blinking input function is active every second.
 <b>Integer Input</b>	Comparison of a value between two setpoints (the MIN and MAX values determine the zone).
 <b>Discrete Output</b>	Comparison of two analog values using the =, >, <, >=, <= operators.
 <b>PWM Output</b>	Activation of the output corresponding to the value present on the "Value" input.
 <b>Analog Output Expansions 10 bits</b>	Comparison of a value against 5 thresholds.
 <b>Integer Output</b>	Saving of the minimum and maximum values of a variable signal.
 <b>Analog Input Expansion 12 bits</b>	Update of the configured average of a number of values by deleting the minimum and maximum values.

CONTROL	
 <b>Timer</b>	Large set of timer functions (A/C, BW, B/H,Li/L, Totalizer)
 <b>Schmitt Trigger</b>	Monitoring of an analog value in relation to two thresholds.
 <b>Timer A</b>	Delay of actions for a predefined time.
 <b>Bistable</b>	Impulse relay function.
 <b>Set Reset</b>	Bistable memory - Priority assigned to either SET or RESET.
 <b>Timer Set Reset</b>	Trigger of operation of a particular device at a fixed time for a period set by the user.
 <b>One Second Clock</b>	The blinking input function is active every second.
 <b>Compare in Zone</b>	Comparison of a value between two setpoints (the MIN and MAX values determine the zone).
 <b>Compare</b>	Comparison of two analog values using the =, >, <, >=, <= operators.
 <b>Multi Compare</b>	Activation of the output corresponding to the value present on the "Value" input.
 <b>HL Switch</b>	Comparison of a value against 5 thresholds.
 <b>Min Max</b>	Saving of the minimum and maximum values of a variable signal.
 <b>Reduced Average</b>	Update of the configured average of a number of values by deleting the minimum and maximum values.
 <b>Time Prog</b>	Daily, weekly, monthly and yearly time programmer.
 <b>Weekly Time Prog</b>	Daily, weekly, monthly and yearly time programmer.
 <b>Preset Counter</b>	Preset up/down counter
 <b>Up Down Counter</b>	External preset up/down counter.
 <b>Preset H Meter</b>	Preset hour counter (preselection of hour, minute).
 <b>High Speed Count</b>	Counting of the pulses arriving at the inputs of a controller powered by a DC supply at rates in excess of one pulse every 6 ms.
 <b>Fast Count</b>	Counting of the pulses arriving at the input at rates in excess of one pulse every 10 ms.
LOGIC	
 <b>Not</b>	Or 6 inputs
 <b>And 2 Inputs</b>	Nand 4 inputs
 <b>And 4 Inputs</b>	Nor 4 inputs
 <b>And 6 Inputs</b>	Xor 2 inputs
 <b>Or 2 Inputs</b>	Boolean 6 inputs/2 outputs
 <b>Or 4 Inputs</b>	Boolean
Function block marked in red:	
 <b>CTN 1</b>	Available only for the Millenium 3 Smart Range

# Applications

## Crouzet Automation Logic Controllers

### Where are they found?

#### Buidling Equipment

##### Access Control

**Opening control for doors**



Opening control for doors and other associated security devices for restricting access; synchronization between the various doors

**BOOLEAN**  
Create logic equations between the connected inputs

**Automatic barriers**



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

**1234 PRESET COUNT UP/DOWN COUNTER**  
Up/Down counter with external preset

##### HVAC

**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

**Air treatment plant**



Maintaining forced air at the correct temperature

**NTC1**  
Temperature measurement  
**REGULATION**  
Analog PID regulation  
**GAIN**  
Conversion of an analog value by changing the scale and datum point

##### Building Automation

**Solar water heating**



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

**Regulat®**  
TEMPERATURE CONTROL (pressure or other)

**Illuminated signs**



Managing flashing on illuminated signs

**WEEKLY TIME PROGRAMMER**  
Programming of time slots during which it will be possible to execute actions  
**LUX-I**  
Measurement of the light level  
**TWILIGHT**  
Calculation of the sunrise and sunset times

## Infrastructure and Energy

### Fluid management

**Swimming pools, fountains, spas**



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

**FILTRATION**  
Filtration duration settings depending on the water temperature

**Irrigation/Sprinklers**



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

**PUMP MANAGEMENT**  
Pump rotation function

### Water treatment

**Reverse osmosis**



Circulation pumps management, supervision of flow pressure and temperature of osmosis processed water

**CTN2 °C**  
Temperature measurement (-35 to +120 °C)

**FLOW**  
Calculation of the flow of a liquid in a pipe

**Pump management**



Circulation pumps management, supervision of levels and pressure

**GAIN**  
Conversion of an analog value by changing the scale and datum point

**LEVEL**  
Calculation of the level of liquid in a tank

## Industrial OEMs

### Packing machines

**Stretch wrapping machines**



Controlling 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 (TEMPORISATEURS)**  
A/C function - BW function - B/H function - Li/L function

**Packaging**



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

**1234 H-SPEED COUNT**  
High speed count of pulses

**AND**  
Logical AND with 2 inputs

**Other typical applications:**  
Medical, Solar, Agricultural Equipment, Transportation, Hoisting, Handling...

Logic controllers

Logic controllers

# Selection guide

## Millenium 3 range

Type	Part number	Supply	Inputs	Outputs	Available in 12 V $\perp\!\!\!\perp$	Available in 24 V $\sim$	Available with Solid State Output 0.5 A/PWM	Available in / compatible with the Essential version **
<b>M3 Smart kits</b> 	Kit 12 Smart*	88 974 080	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A			
	Kit 12 Smart*	88 974 081	100 $\perp\!\!\!\perp$ 240 V $\sim$	8	4 relays 8 A			
	Kit 20 Smart*	88 974 082	24 V $\perp\!\!\!\perp$	12 (6 configurable as analog)	8 relays 8 A			
	Kit 20 Smart*	88 974 083	100 $\perp\!\!\!\perp$ 240 V $\sim$	12	8 relays 8 A			
	Kit 26 Smart*	88 974 084	24 V $\perp\!\!\!\perp$	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A			
	Kit 26 Smart*	88 974 085	100 $\perp\!\!\!\perp$ 240 V $\sim$	16	8 relays 8 A and 2 relays 5 A			
<b>Compact versions</b>								
With display	CD12 Smart*	88 974 041	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A	•	•	•
	CD12 Smart*	88 974 043	100 $\perp\!\!\!\perp$ 240 V $\sim$	8	4 relays 8 A		•	
	CD20 Smart*	88 974 051	24 V $\perp\!\!\!\perp$	12 (6 configurable as analog)	8 relays 8 A	•	•	•
	CD20 Smart*	88 974 053	100 $\perp\!\!\!\perp$ 240 V $\sim$	12	8 relays 8 A		•	
Without display	CB12 Smart*	88 974 021	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A	•		•
	CB12 Smart*	88 974 023	100 $\perp\!\!\!\perp$ 240 V $\sim$	8	4 relays 8 A		•	
	CB20 Smart*	88 974 031	24 V $\perp\!\!\!\perp$	12 (6 configurable as analog)	8 relays 8 A			•
	CB20 Smart*	88 974 033	100 $\perp\!\!\!\perp$ 240 V $\sim$	12	8 relays 8 A		•	
<b>Expandable versions</b>								
With display	XD10 Smart*	88 974 141	24 V $\perp\!\!\!\perp$	6 (4 configurable as analog)	4 relays 8 A	•	•	•
	XD10 Smart*	88 974 143	100 $\perp\!\!\!\perp$ 240 V $\sim$	6	4 relays 8 A		•	
	XD26 Smart*	88 974 161	24 V $\perp\!\!\!\perp$	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A	•	•	•
	XD26 Smart*	88 974 163	100 $\perp\!\!\!\perp$ 240 V $\sim$	16	8 relays 8 A and 2 relays 5 A		•	
Without display	XB10 Smart*	88 974 131	24 V $\perp\!\!\!\perp$	6 (4 configurable as analog)	4 relays 8 A	•	•	•
	XB10 Smart*	88 974 133	100 $\perp\!\!\!\perp$ 240 V $\sim$	6	4 relays 8 A		•	
	XB26 Smart*	88 974 151	24 V $\perp\!\!\!\perp$	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A	•	•	•
	XB26 Smart*	88 974 153	100 $\perp\!\!\!\perp$ 240 V $\sim$	16	8 relays 8 A and 2 relays 5 A		•	
<b>With Removable Terminal Blocks</b>								
CD12 RBT Smart*	88 974 441	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A				
	XD26 RBT Smart*	88 974 561	24 V $\perp\!\!\!\perp$	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A			
<b>Sandwich extensions</b>								
Communication	XN05 Modbus TCP/IP	88 970 270	24 V $\perp\!\!\!\perp$					•
	XN06 Modbus RS485	88 972 250	24 V $\perp\!\!\!\perp$					•
	XN07 Master RS485	88 974 250	24 V $\perp\!\!\!\perp$					
Digital	XE10	88 970 321	24 V $\perp\!\!\!\perp$	6	4 relays 5 A			•
	XE10	88 970 323	100 $\perp\!\!\!\perp$ 240 V $\sim$	6	4 relays 5 A		•	•
<b>Termination Extensions</b>								
Digital	XR06	88 970 211	24 V $\perp\!\!\!\perp$	4	2 relays 8 A	•		•
	XR06	88 970 213	100 $\perp\!\!\!\perp$ 240 V $\sim$	4	2 relays 8 A		•	•
	XR10	88 970 221	24 V $\perp\!\!\!\perp$	6	4 relays 8 A	•		•
	XR10	88 970 223	100 $\perp\!\!\!\perp$ 240 V $\sim$	6	4 relays 8 A		•	•
	XR14	88 970 231	24 V $\perp\!\!\!\perp$	8	4 relays 8 A and 2 relays 5 A	•		•
	XR14	88 970 233	100 $\perp\!\!\!\perp$ 240 V $\sim$	8	4 relays 8 A and 2 relays 5 A		•	•
Analog	XA03 3xPt100	88 970 800	24 V $\perp\!\!\!\perp$	3 analog (Pt100)				
	XA04 2AI/2AO	88 970 241	24 V $\perp\!\!\!\perp$	2 analog 0-10V/0-20mA (1 Pt100)	2 analog 0-10V/PWM			•
<b>Bare board and resin board versions</b>								
Bare board	NB12	88 970 001	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A	•		
	NB12	88 970 003	100 $\perp\!\!\!\perp$ 240 V $\sim$	8	4 relays 8 A			
	NB20	88 970 011	24 V $\perp\!\!\!\perp$	12 (6 configurable as analog)	8 relays 8 A			
	NB20	88 970 013	100 $\perp\!\!\!\perp$ 240 V $\sim$	12	8 relays 8 A			
Resin board	NBR12	88 973 001	24 V $\perp\!\!\!\perp$	8 (4 configurable as analog)	4 relays 8 A	•		•
	NBR26	88 973 061	24 V $\perp\!\!\!\perp$	16 (6 configurable as analog)	10 relays 8 A	•		•
	NBR32	88 973 211	24 V $\perp\!\!\!\perp$	20 (6 configurable as analog)	12 relays 8 A	•		
	NBR40	88 973 231	24 V $\perp\!\!\!\perp$	24 (6 configurable as analog)	16 relays 8 A	•		

\* Millenium 3 Smart: backlit blue LCD display. Extended operating temperature range and function block library

\*\*Millenium 3 Essential: Logic Controller with green screen and industrial temperature range

## Millenium 3 accessories

### Power supplies and DC/DC converters in modular casings

	Part number	Tension d'entrée	Input voltage	Nominal power	Output current
	88 950 303	100 $\perp\!\!\!\perp$ 240 V $\sim$	24 V $\perp\!\!\!\perp$	7.5 W	0.3 A
	88 950 304	100 $\perp\!\!\!\perp$ 240 V $\sim$	24 V $\perp\!\!\!\perp$	15 W	0.6 A
	88 950 307	100 $\perp\!\!\!\perp$ 240 V $\sim$	24 V $\perp\!\!\!\perp$	30 W	1.2 A
	88 950 302	100 $\perp\!\!\!\perp$ 240 V $\sim$	24 V $\perp\!\!\!\perp$	60 W	2.5 A
	88 950 305	100 $\perp\!\!\!\perp$ 240 V $\sim$	5 V $\perp\!\!\!\perp$	20 W	4 A
	88 950 306	100 $\perp\!\!\!\perp$ 240 V $\sim$	12 V $\perp\!\!\!\perp$	24 W	2 A
	88 950 320	9.2 $\perp\!\!\!\perp$ 18 V $\perp\!\!\!\perp$	12 V $\perp\!\!\!\perp$	10 W	0.8 A
	88 950 321	9.2 $\perp\!\!\!\perp$ 36 V $\perp\!\!\!\perp$	24 V $\perp\!\!\!\perp$	6 $\perp\!\!\!\perp$ 10 W	0.4 A

### Connection accessories, tools and programming software

	Part number	Name
	88 970 111	M3 Soft: Millenium 3 programming software (CD-ROM)
	88 970 108	Memory cartridge for transfer and saving of programmes
	88 970 102	3 m serial link cable: PC DB9 F $\perp\!\!\!\perp$ Millenium 3
	88 974 104	Millenium 3 $\perp\!\!\!\perp$ Bluetooth® interface (class A 10 m)
	88 970 109	3 m USB link cable: PC $\perp\!\!\!\perp$ Millenium 3
	88 970 110	Bluetooth® adaptor $\perp\!\!\!\perp$ USB (class A 10 m)
	88 970 123	1.80 m serial link cable: DB9 M/DB9 F
	88 970 510	0.50 m serial link cable: Millenium 3 $\perp\!\!\!\perp$ DB9 M
	88 974 106	Ready to use Millenium 3 Smart democase including: - a CD12 Smart, a CTN probe, a LDR probe, an I/O simulator - a 3 m USB link cable: PC $\perp\!\!\!\perp$ Millenium 3, a M3 Soft CD - a power supply 110 V-230 V $\sim$

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