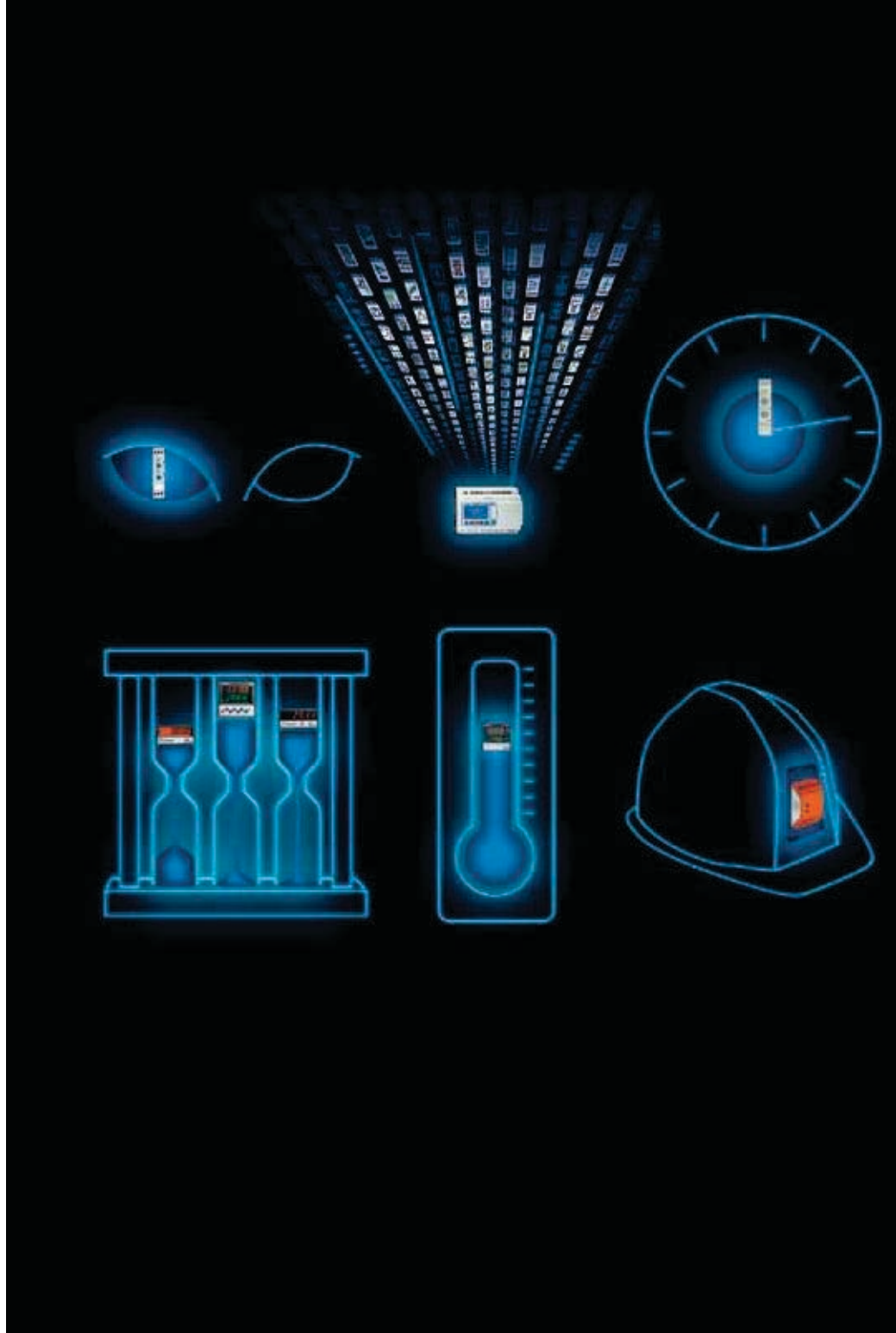


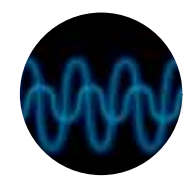
- Timers
- Control relays
- Counters and
Ratemeters
- Temperature
controllers
- Safety relays
- Logic controllers



Control & Automation Overview

Behind every project,
technologies and expertise

Contents



Crouzet Control

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DIN rail mounted



Panel mounted

Timers



Control relays

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Modular casing



Industrial casing

Control relays



Counters and Ratemeters

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Electronic



Electromechanical

Counters and Ratemeters



Temperature controllers

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Digital



Accessories

Temperature controllers



Safety relays

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Relevelling control



Machine safety

Safety relays



Logic controllers

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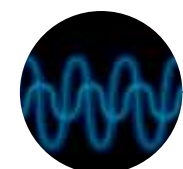
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Millenium 3



Accessories

Logic controllers



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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.

InnoVista Sensors™

your trusted partner of choice to
face industrial challenges of today
and tomorrow

InnoVista Sensors™ is a worldwide industrial specialist of sensors, controllers and actuators for automated systems.

Through its brands, Crouzet Aerospace, Crouzet Automation, Crouzet Control, Crouzet Motors, Crouzet Switches and Systron Donner Inertial, InnoVista Sensors™ offers a wide range of reliable, efficient and customizable components dedicated to the Aerospace & Defence, Transportation and Industrial market and segments.

Thanks to the recognized expertise of its teams and a strong innovation policy, InnoVista Sensors™ brings performance enhancing solutions to its customers worldwide.

Crouzet Control / Crouzet Automation team worldwide.



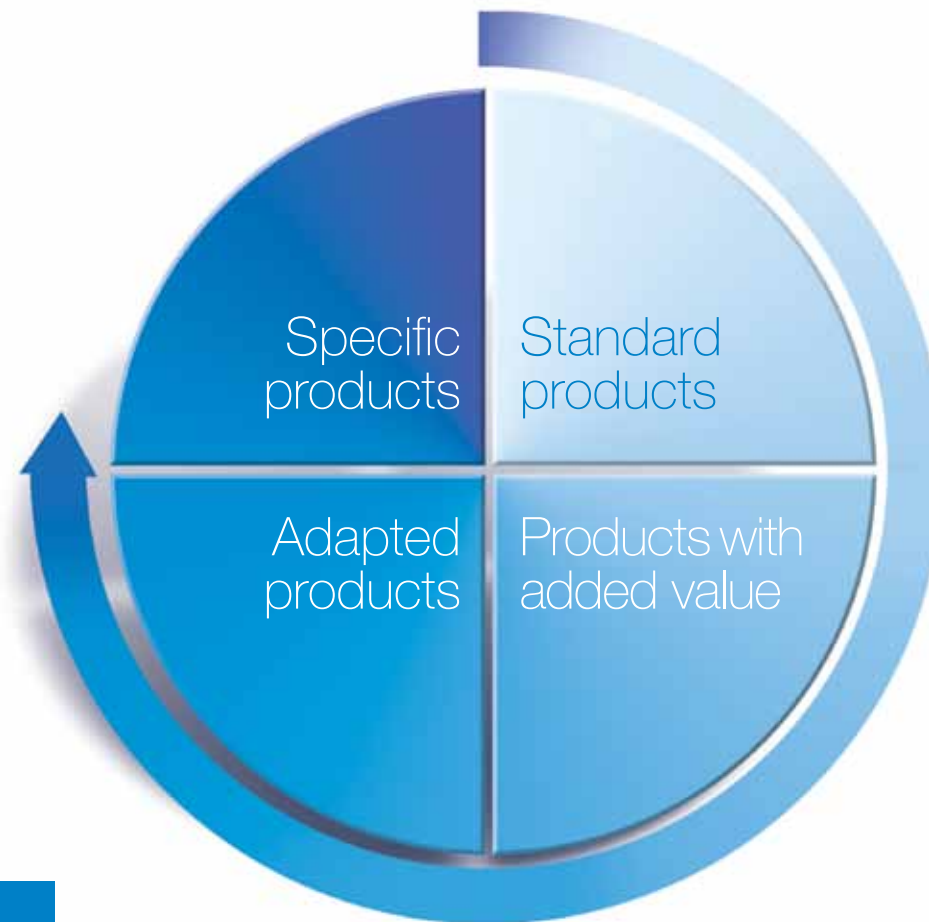
The Crouzet Control process

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.



A multi-skilled team

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

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.

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.

Logistics and After-Sales Service

Expertise:

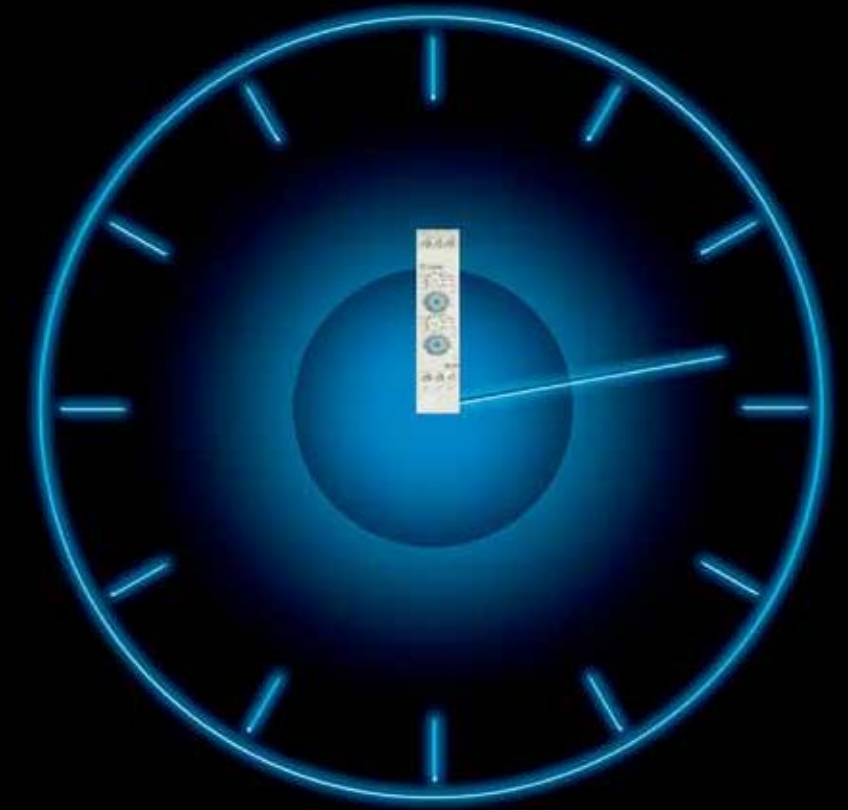
- **PROVIDING** an optimum level of service and **GUARANTEEING** a prompt delivery schedule, whatever the type of order: small-scale or mass production, standard or adapted products.
- **TRACKING** all orders in real time on www.crouzet.com

Crouzet Control

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



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 **flas** .

Triggering

Actuating

Delaying

Flashing

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

Crouzet Control, timers

A panel mounted range and a DIN rail mounted range



815 timer

MLR1

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 **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.
- A **timing range** of up to 9,999 hrs to cope with prolonged processing operations.

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

Packaging



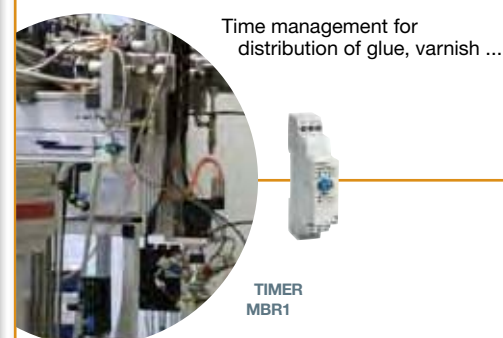
Illuminated signs



Fan



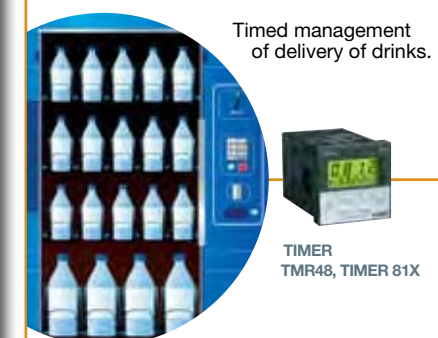
Dosage



Ice maker



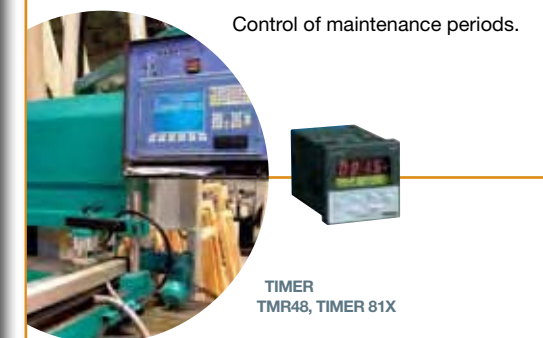
Drink vending machine



Lighting for mobile homes



Machine tools



Sensing on assembly line



Remote machinery



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

DIN rail industrial casings

Casing width (mm)	Connections	Functions	Type of output	Output(s)	Timing	Supply	Part number	Type
	Screw terminals	A / At / B / C / H / Ht	Relay	1 x 8 A changeover	0.1 s ⇒ 100 h	24 V $\overline{\sim}$ / 24 ⇒ 240 V $\sim$	88 865 105	TUR1
		Di / D / Ac / Bw					88 865 115	TAR1
		A / At					88 865 125	TBR1
		B					88 865 135	TCR1
		C					88 865 145	THR1
		H / Ht					88 865 155	TLR1
		L / Li					88 865 175	TQR1
		Q					88 866 175*	RQR1*
		K					88 865 265	TK2R1
				2 x 8 A changeover	0.1 s ⇒ 160 s			
	Screw terminals	A / At / B / C / H / Ht	Relay	1 x 8 A changeover	0.1 s ⇒ 100 h	12 V $\sim$	88 865 300	TU2R4
		Di / D / Ac / Bw					88 866 300*	RU2R4*
		A / At					88 865 100	TUR4
		A / At / B / C / H / Ht					88 865 215	TA2R1
		Di / D / Ac / Bw					88 866 215*	RA2R1*
	Spring terminals	Ad / Ah / N / O / P					88 865 103	TUR3
		Pt / TL / Tt / W					88 865 503	TURc3
	Screw terminals	Q					88 865 385	TX2R1
		A / At / B / C / H / Ht					88 866 385*	RX2R1*
		Di / D / Ac / Bw					88 865 185	TXR1
							88 865 176	TQR6
							88 866 176*	RQR6*
	Screw terminals		Relay	1 x 8 A changeover	0.1 s ⇒ 100 h	230 ⇒ 440 V $\sim$	88 865 303	TU2R3
							88 866 303*	RU2R3*
							88 865 305	TU2R1
							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

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 ⇒ 100 h	24 V $\overline{\sim}$ / 24 ⇒ 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		88 867 155				OLR1	
		A / At / B / C / H / Ht Di / D / Ac / Bw		12 V $\overline{\sim}$	88 867 100		OUR4		
12 ⇒ 240 V $\overline{\sim}$	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 ⇒ 100 h	24 V $\overline{\sim}$ / 24 ⇒ 240 V $\sim$	88 867 305	PU2R1
		A			2 x 8 A changeover			88 867 415	PA2R1
		C						88 867 435	PC2R1
		L / Li						88 867 455	PL2R1
		A / At / B / C / H / Ht Di / D / Ac / Bw	1 x 8 A changeover 1 inst. or timed 8 A		12 V $\overline{\sim}$			88 867 300	PU2R4
12 ⇒ 240 V $\overline{\sim}$	88 867 303	PU2R3							
 21	Plug-in 8-pin base	A	Relay	2 x 5 A changeover	0.1s ⇒ 100 h	12 V $\overline{\sim}$	88 895 201	RTMA2	
						24 V $\overline{\sim}$	88 895 202	RTMA2	
						24 V $\sim$	88 895 203	RTMA2	
						110 V $\sim$	88 895 206	RTMA2	
						230 V $\sim$	88 895 207	RTMA2	
						12 V $\overline{\sim}$	88 896 201	RTMA4	
	Plug-in 14-pin base			4 x 3 A changeover		24 V $\overline{\sim}$	88 896 202	RTMA4	
						24 V $\sim$	88 896 203	RTMA4	
						110 V $\sim$	88 896 206	RTMA4	
						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 ⇄ 240 V $\overline{\sim}$ 24 ⇄ 240 V $\sim$	88 886 516	TMR 48 L	
		A, B, C, W, G, Ac, Bw					88 886 016	TMR 48 U	
	Plug-in 8-pin base	A			2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)		88 886 106	TMR 48 A	
		A1, A2, H1, H2, Q1, Q2, D-Di					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 $\overline{\sim}$	88 857 409	Timer 812			
		110 V $\sim$				88 857 406	Timer 812				
		A, B, C, D, Di, H			1 x 8 A timed changeover	220 $\Rightarrow$ 240 V $\sim$	88 857 400	Timer 812			
						12 V $\overline{\sim}$ / 24 $\Rightarrow$ 48 V $\overline{\sim}$	88 857 003	Timer 814			
 48 x 48	Plug-in 11-pin base	A, B, C, D, Di, H		Relay	1 x 8 A timed changeover	24 V $\overline{\sim}$ / 110 $\Rightarrow$ 240 V $\sim$	88 857 005	Timer 814			
		12 V $\overline{\sim}$ / 24 $\Rightarrow$ 48 V $\overline{\sim}$				88 857 103	Timer 814				
		A1, A2, AM, AMt			2 timed changeover or 1 timed and 1 instantaneous (2 x 8 A)	24 V $\overline{\sim}$ / 110 $\Rightarrow$ 240 V $\sim$	88 857 105	Timer 814			
						12 V $\overline{\sim}$ / 42 $\Rightarrow$ 48 V $\overline{\sim}$	88 857 302	Timer 815			
		 48 x 48		Plug-in 11-pin base	A1, A1C, A2, A2C, AM, AMt, B, BM, C, CM, D, Di, DiM, Dpause, H, HM, T,TM, W, WM	Relay	2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)	24 V $\overline{\sim}$ / 110 V $\sim$	88 857 307	Timer 815	
								24 V $\overline{\sim}$ / 220 $\Rightarrow$ 240 V $\sim$	88 857 301	Timer 815	
								12-24 V $\overline{\sim}$ / 100 $\Rightarrow$ 240 V $\sim$		88 857 311	Timer 815E
 48 x 48	Plug-in 8-pin base	A, B, C, D, Di, H	Relay	1 x 8 A timed changeover	24 V $\overline{\sim}$ / 48 V $\overline{\sim}$	88 857 604	Timer 816				
					24 V $\overline{\sim}$ / 110 V $\sim$	88 857 607	Timer 816				
					24 V $\overline{\sim}$ / 220 $\Rightarrow$ 240 V $\sim$	88 857 601	Timer 816				
	Plug-in 11-pin base				24 V $\overline{\sim}$ / 48 V $\overline{\sim}$	88 857 704	Timer 816				
					24 V $\overline{\sim}$ / 110 V $\sim$	88 857 707	Timer 816				
					24 V $\overline{\sim}$ / 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

Selection guide



Timers

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 ⇒ 1 s	100 ⇒ 240 V ~	88 901 308	MBA2F
					0.5 s ⇒ 10 s		88 901 328	MBA2F
					3 s ⇒ 60 s		88 901 348	MBA2F
					0.5 min ⇒ 10 min		88 901 378	MBA2F
					3 min ⇒ 60 min		88 901 398	MBA2F
 22 (diameter)	Screw terminals	A	Solid state	200 mA	0.1 s ⇒ 1 s	24 V ---	88 901 302	MBA3F
					0.5 s ⇒ 10 s		88 901 322	MBA3F
					3 s ⇒ 60 s		88 901 342	MBA3F
					0.5 min ⇒ 10 min		88 901 372	MBA3F
					3 min ⇒ 60 min		88 901 392	MBA3F

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 ⇒ 12 mn	24 V ~	88 226 013	Top 2000
							42 ⇒ 48 V ~	88 226 019	Top 2000
							110 ⇒ 127 V ~	88 226 012	Top 2000
							220 ⇒ 240 V ~	88 226 011	Top 2000
	Plug-in 8-pin base						24 V ~	88 226 501	Top 2000
							42 ⇒ 48 V ~	88 226 502	Top 2000
							110 ⇒ 127 V ~	88 226 503	Top 2000
							220 ⇒ 240 V ~	88 226 504	Top 2000
 48 x 48	Screw terminals	2-3-4		Relay	1 timed changeover and 1 timed instantaneous (2 x 5 A)	6 mn ⇒ 12 h	24 V ~	88 226 016	Top 2000
							24 V ~	88 226 505	Top 2000
							42 ⇒ 48 V ~	88 226 017	Top 2000
							42 ⇒ 48 V ~	88 226 506	Top 2000
	Plug-in 8-pin base						110 ⇒ 127 V ~	88 226 015	Top 2000
							110 ⇒ 127 V ~	88 226 507	Top 2000
							220 ⇒ 240 V ~	88 226 014	Top 2000
							220 ⇒ 240 V ~	88 226 508	Top 2000

Manual reset

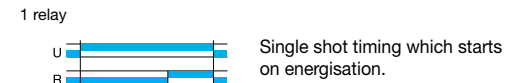
Casing width (mm)	Connections	Functions (Detail on pages 20 to 23)	Type of output	Output(s)	Timing	Supply	Part number	Type
 55	Faston connectors 6.35 mm	A	Relay	1 x 16 A timed changeover	5 min (Max.display time: 4 min 40s)	127 / 230 V ~ 50 Hz	88 256 401	88 256 4
					15 min (Max.display time: 14 min)		88 256 402	88 256 4
					30 min (Max.display time: 28 min)		88 256 403	88 256 4
					60 min (Max.display time: 56 min)		88 256 404	88 256 4
					120 min (Max.display time: 1 h 53 min)		88 256 405	88 256 4
					5 h (Max.display time: 4 h 43 min)		88 256 406	88 256 4
					15 h (Max.display time: 14 h 10 min)		88 256 407	88 256 4
					30 h (Max.display time: 28 h 20 min)		88 256 408	88 256 4
 55	Faston connectors 6.35 mm	A	Relay	2 x 16 A timed changeover	5 min (Max.display time: 4 min 40s)	127 / 230 V ~ 50 Hz	88 256 506	88 256 5
					15 min (Max.display time: 14 min)		88 256 507	88 256 5
					30 min (Max.display time: 28 min)		88 256 508	88 256 5
					60 min (Max.display time: 56 min)		88 256 509	88 256 5
					120 min (Max.display time: 1 h 53 min)		88 256 510	88 256 5
					5 h (Max.display time: 4 h 43 min)		88 256 511	88 256 5
					15 h (Max.display time: 14 h 10 min)		88 256 512	88 256 5
					30 h (Max.display time: 28 h 20 min)		88 256 513	88 256 5
 55	Faston connectors 6.35 mm	A	Relay	3 x 16 A timed changeover	5 min (Max.display time: 4 min 40s)	127 / 230 V ~ 50 Hz	88 256 906	88 256 9
					15 min (Max.display time: 14 min)		88 256 907	88 256 9
					30 min (Max.display time: 28 min)		88 256 908	88 256 9
					60 min (Max.display time: 56 min)		88 256 909	88 256 9
					120 min (Max.display time: 1 h 53 min)		88 256 910	88 256 9
					5 h (Max.display time: 4 h 43 min)		88 256 911	88 256 9
					15 h (Max.display time: 14 h 10 min)		88 256 912	88 256 9
					30 h (Max.display time: 28 h 20 min)		88 256 913	88 256 9

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

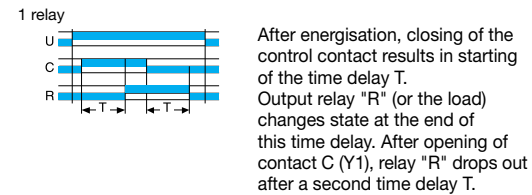
Function diagrams

Generic functions

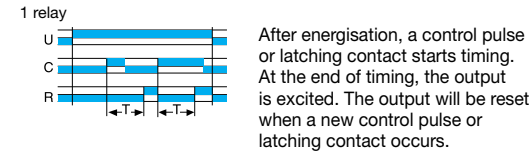
• A function: Delay on energisation



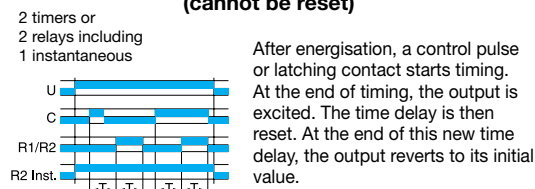
• Ac function: Timing after closing and opening of control contact



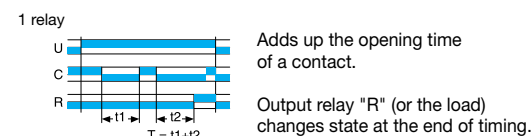
• Ad function: Delay on energisation (cannot be reset)



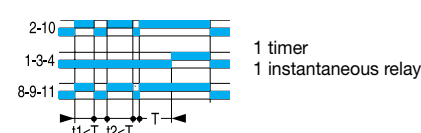
• Ah function: Single shot flip-flo (cannot be reset)



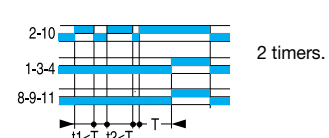
• At function: Timing on energisation with memory



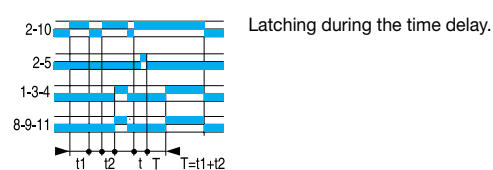
• A1 function: Delay on energisation



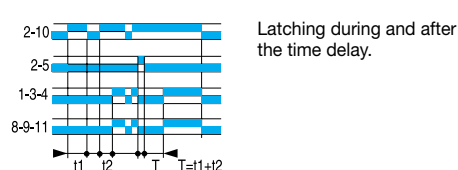
• A2 function: Delay on energisation



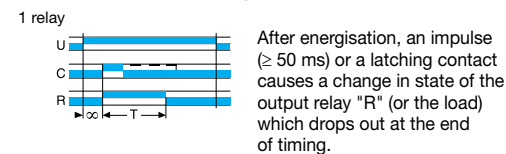
• AM function: Delay on energisation



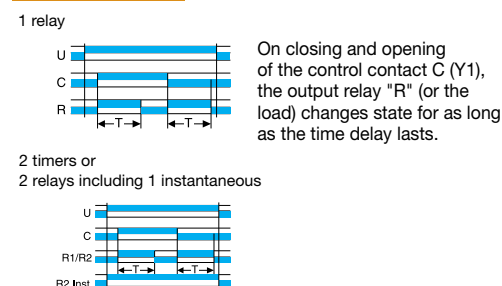
• AMt function: Delay on energisation



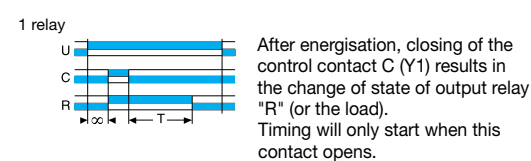
• B function: Timing on impulse (one shot) - Shaping (cannot be reset)



• Bw function: Pulse output (adjustable)

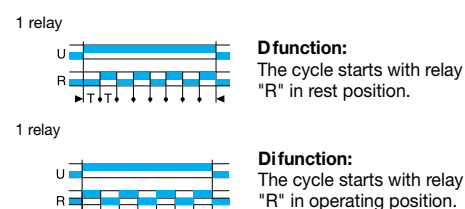


• C function: Timing after impulse True delay off (without auxiliary power supply)

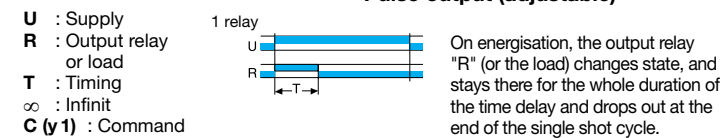


• D or Di functions: Symmetrical flashin

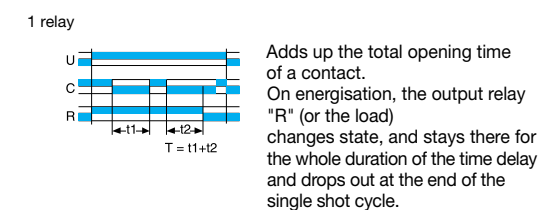
Repetitive cycle which alternately sets the output relay "R" (or the load) to operating and rest position for equal periods of time.



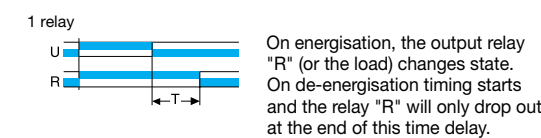
• H function: Timing on energisation - Pulse output (adjustable)



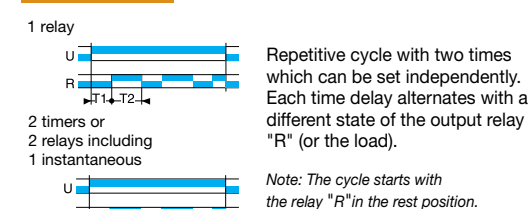
• Ht function: Delay on energisation with memory



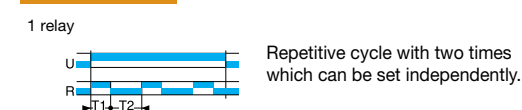
• K function: Delay on de-energisation True delay off (without auxiliary power supply)



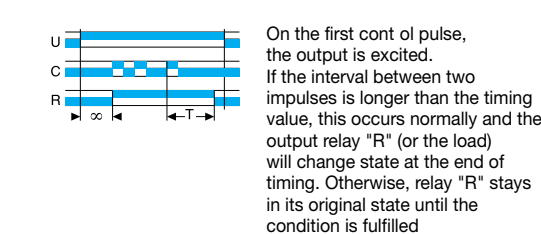
• L function: Asymmetrical flashin



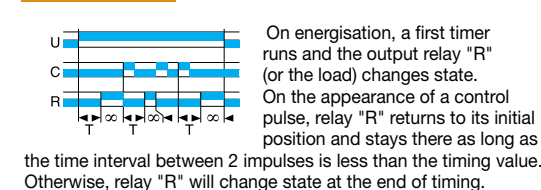
• Li function: Asymmetrical flashin



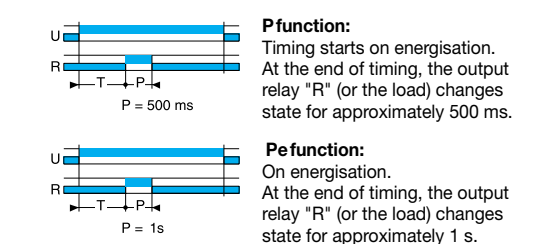
• N function: "Safe-guard"



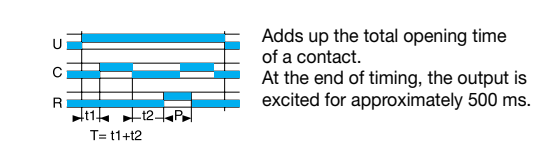
• O function: "Delayed safe-guard"



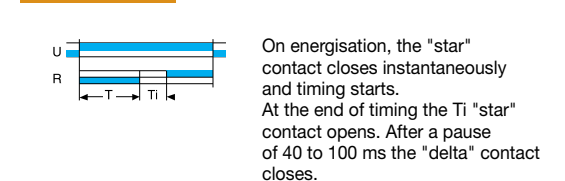
• P and Pe functions: Impulse counter (delay on)



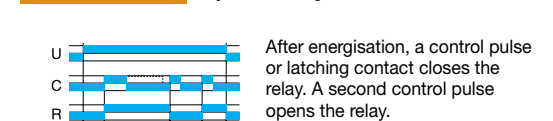
• Pt function: Impulse counter (delay on)



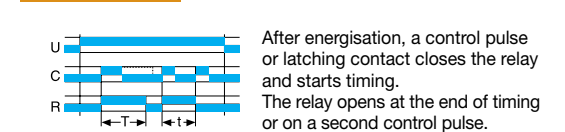
• Q function: "Star-delta" starting



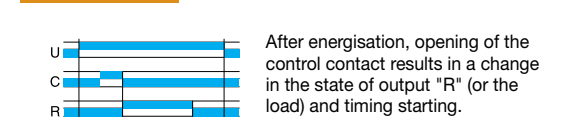
• TL function: Impulse relay



• Tt function: Timed impulse relay



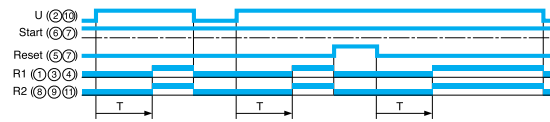
• W function: Timing after pulse on control contact



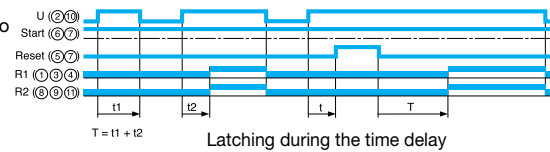
Function diagrams

815E dedicated functions

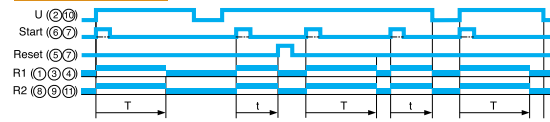
• A2 function: Delay on energisation



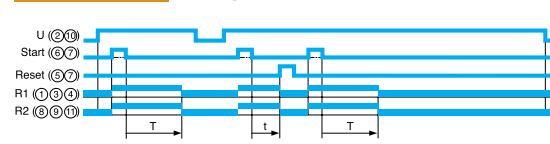
• AM function: Delay on energisation



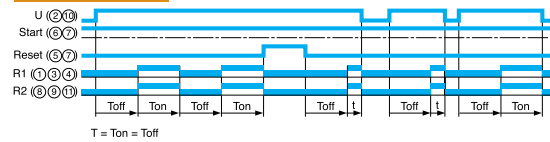
• B function: Timing on impulse (one shot)



• C function: Timing after impulse



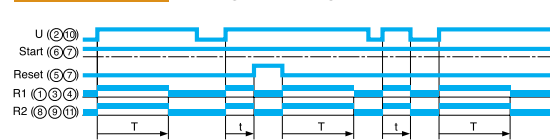
• D function: Flip-flo



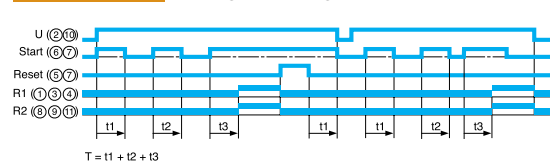
• Di function with latching: Flip-flo



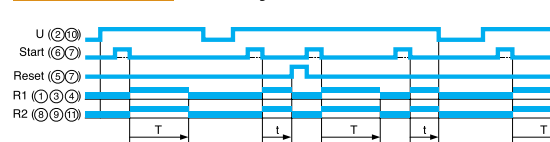
• H function: Timing on energisation



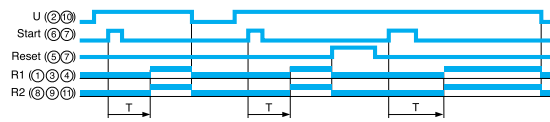
• T function: Timing on energisation



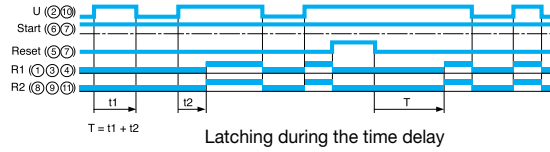
• W function: Off-delay



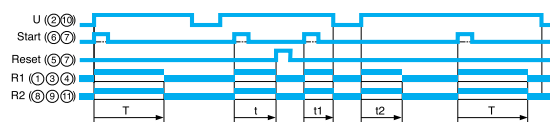
• A2c function: Delay on energisation



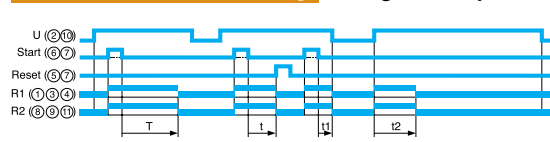
• AMt function: Delay on energisation



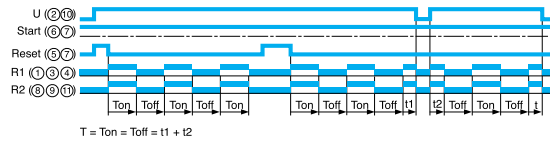
• B function with latching: Timing on impulse (one shot)



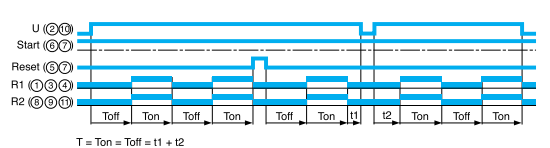
• C function with latching: Timing after impulse



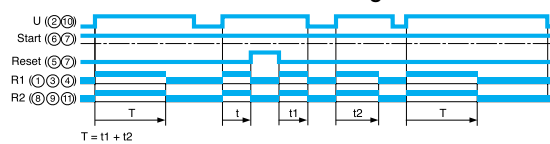
• Di function: Flip-flo



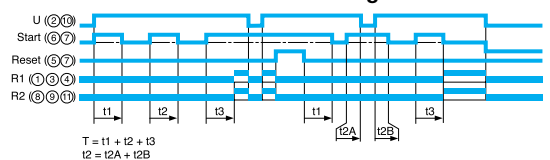
• D pause function: Flip-flo



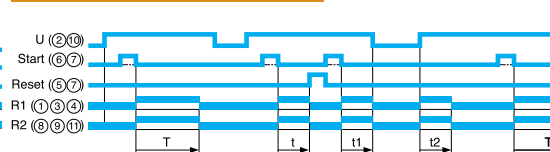
• H function with latching: Timing on energisation



• T function with latching: Timing on energisation

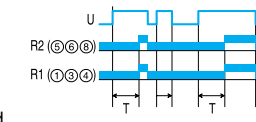


• W function with latching: Off-delay timer

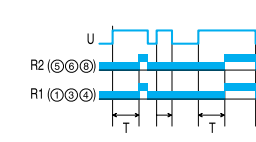


TMR48 dedicated functions

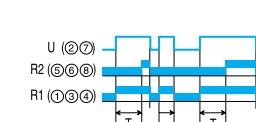
• TMR48 A A function: Delay on energisation



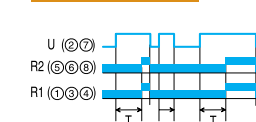
• TMR48 U A function: On-delay



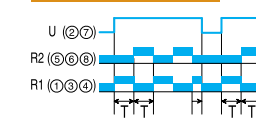
• A1 function: Delay on energisation



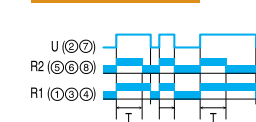
• A2 function: Delay on energisation



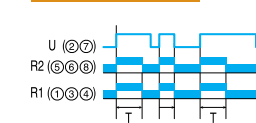
• D-Di function: Symmetrical flashin



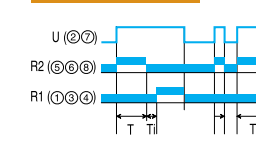
• H1 function: Timing on energisation



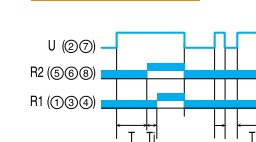
• H2 function: Timing on energisation



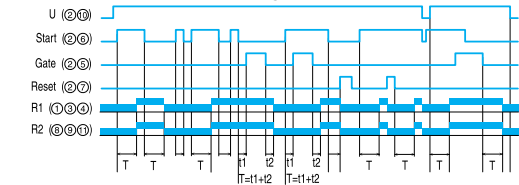
• Q1 function: Star-delta "starting"



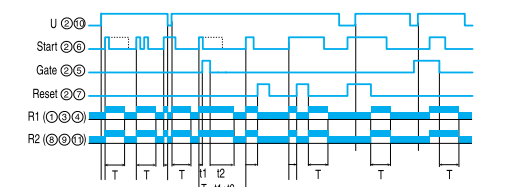
• Q2 function: "Star-delta 2" starting



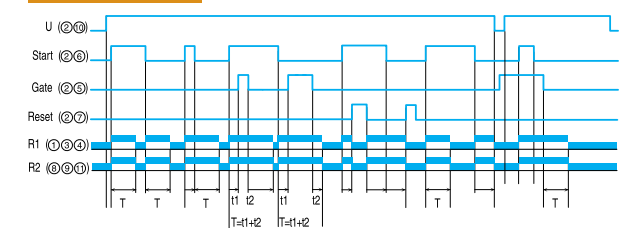
• Ac function: Timing after closing and opening of control contact



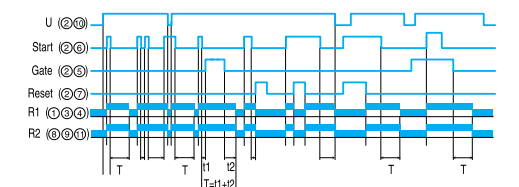
• B function: Timing on impulse (one shot)



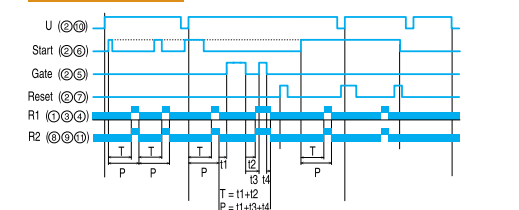
• Bw function: Pulse output (adjustable)



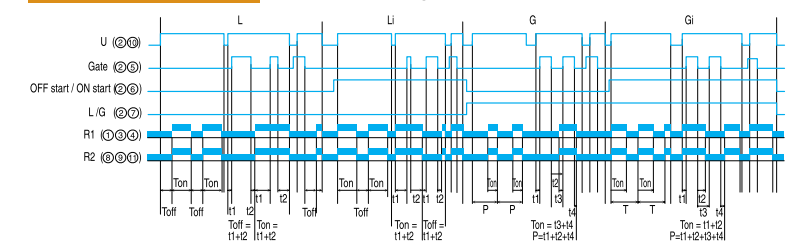
• C function: Off-delay



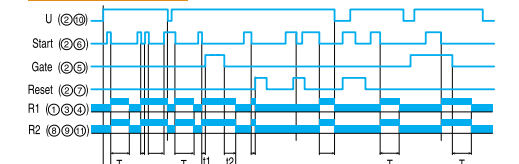
• G function: Cyclical function



• L/Li/Gi function: Cyclical flashing timer



• W function: Off-delay

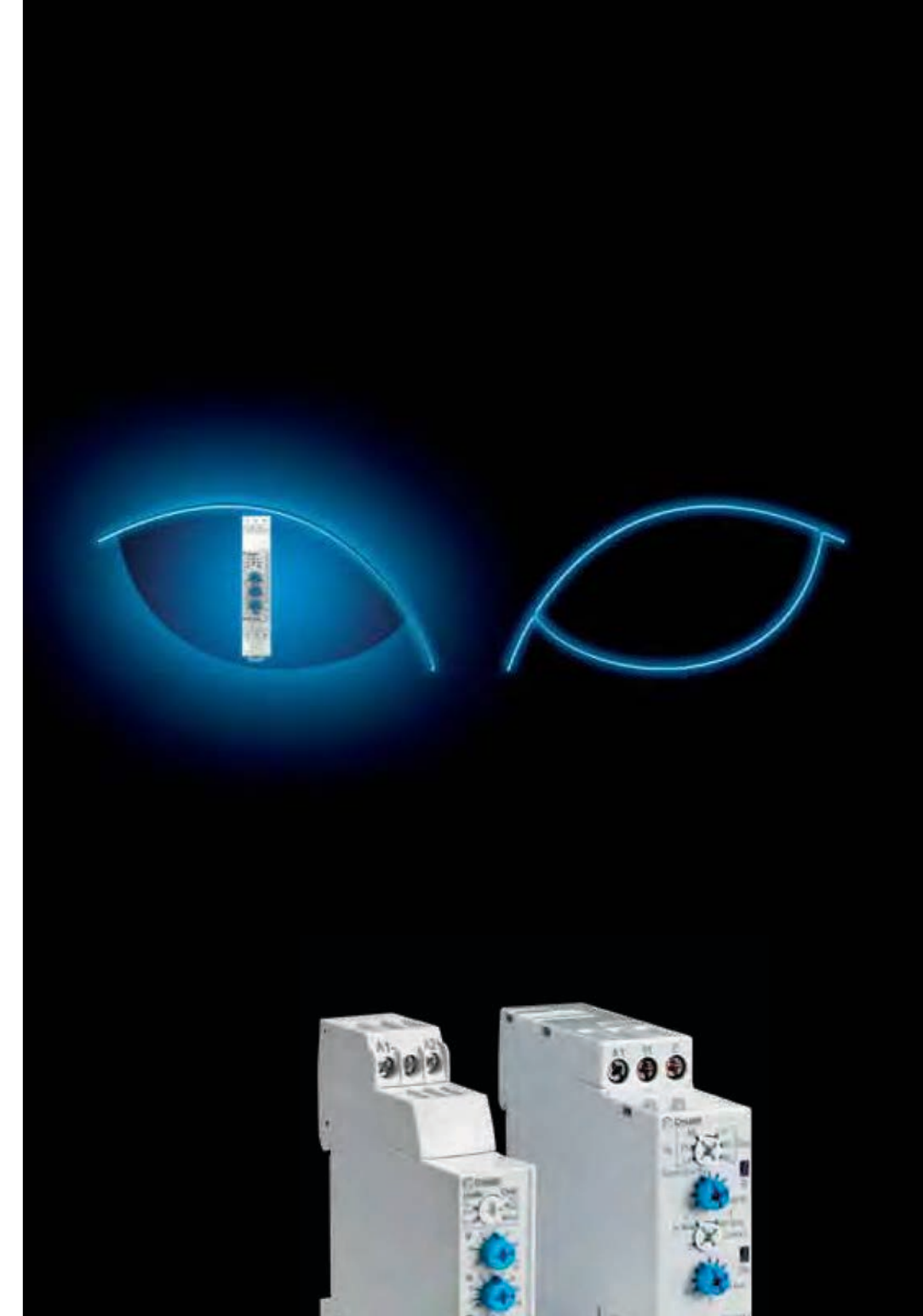


Crouzet Control

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



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 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



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

Lift



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



C-LyNX THERMOCONTROL RELAY S FOR LIFTS HWT81

Ice maker



Fluid management: cold management compressor current control.



CURRENT CONTROL RELAY MUS

Cranes



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



CURRENT CONTROL RELAY MIC

Pump management



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



CURRENT CONTROL RELAY HHH

Generating set



Frequency control in generating sets or detection of backup units.



C-LyNX CONTROL RELAY (UNDeRf ReQUeNCy/OveRf ReQUeNCy) HHZ

Fountains



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



CONTROL RELAY HNM

Motors



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



MOTOR TEMPERATURE CONTROL RELAY HWTM

Crushers



Detection of obstruction or jamming.



CURRENT CONTROL RELAY HHH

Escalators



Control/detection of phase sequence and failure on motors.



PHASE CONTROL RELAY HWUA

Steam systems



Level control (maintaining a constant level).



LEVEL CONTROL RELAYS ENRM

Control relays

Selection guide



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	
	Yes / 5 ⇒ 15 %	No / No	84 873 024						MWA	
		Window +2 ⇒ +20 % -20 ⇒ -2 %	84 873 025						MWUA	
	Yes / No	No / No	No	1 x 5 A changeover		17.5	208 ⇒ 480 V ~ - 50 / 60 Hz	84 873 020	MWS	
				1 x 5 A changeover				84 903 020	EMWS	
				2 x 5 A changeover				84 873 021	MWS2	
	No / No	+2 ⇒ +20% / -20 ⇒ -2 %	0.3 ⇒ 30 s	1 x 5 A changeover		208 ⇒ 480 V ~ - 50 / 60 Hz	84 873 222	M3US		
	Yes / 5 ⇒ 15%		0.1 ⇒ 10 s	84 873 026		HWUA				
	No / No		0.3 ⇒ 30 s	2 x 5 A changeover		35	220 ⇒ 480 V ~ - 50 / 60 Hz	84 873 220	H3US	
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
	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 ~	Window	3% fixe	0.1 ⇒ 10 s		1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 151	MUSF
65 ⇒ 260 V ~								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% fixe	No / No		1 x 5 A changeover	17.5	24 ⇨ 240 V ~	84 871 122	MIC
2 ⇨ 500 mA ~	No	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s		2 x 5 A changeover	35		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

Selection guide



Frequency control with window

Measurement range	Selectable latching	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
40 ⇒ 70 Hz	Yes	0.3 Hz fixe	0.1 ⇒ 10 s		2 x 5 A changeover	35	120 ⇒ 277 V ~	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 ⇨ 1 MΩ	0.1 ⇨ 5 s		2 x 5 A changeover	35	24 ⇨ 240 V ~	84 870 700	HNM
Digital or PNP / NPN		1 or 2 / None			1 x 5 A changeover				84 870 710
Digital	No / Yes	1 / None						17.5	84 870 720

Over/underspeed control

Sensor	Measurement range	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
3-wire NPN/PNP sensor, 0 ⇒ 30 V, NAMUR Volt-free contact	0.05 s ⇒ 10 min	5 % fixe	0.6 ⇒ 60 s		1 x 5 A changeover	35	24 ⇒ 240 V ~	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 ⇒ +11°C High threshold +34 ⇒ +46°C	0.1 ⇒ 10 s		1 x 5 A changeover	35	24 ⇒ 240 V ~	84 874 110	HT81
3-wire Pt100					2 x 5 A NO			84 874 120	HT81-2
3-wire Pt100	Yes 480 V				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 ⇒ 500 V ~	84 892 299	EWS
					2 x 8 A changeover		200 ⇒ 460 V ~	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 ⇒ 60 V ~	Over / Undervoltage	5 % ⇒ 50 %	0.1 ⇒ 3 s		1 x 8 A changeover	22.5	24 V ---	84 872 020	EUL
							24 V ~	84 872 021	EUL
							120 V ~	84 872 023	EUL
							230 V ~	84 872 024	EUL
15 ⇒ 600 V ~	Over / Undervoltage	5 % ⇒ 50 %	0.1 ⇒ 3 s		1 x 8 A changeover	22.5	24 V ---	84 872 030	EUH
							24 V ~	84 872 031	EUH
							120 V ~	84 872 033	EUH
							230 V ~	84 872 034	EUH

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

Selection guide

Current control (over / undercurrent)

Measurement range	With CT	Hysteresis	Latching / Timing		Output relay	Casing width (mm)	Supply	Part number	Type
 2 ⇒ 500 mA	No	5 % ⇒ 50 %	Yes / 0.1 ⇒ 3 s		1 x 8 A changeover	22.5	24 V $\equiv$	84 871 020	EIL
							24 V $\sim$	84 871 021	EIL
							48 V $\sim$	84 871 022	EIL
							120 V $\sim$	84 871 023	EIL
							230 V $\sim$	84 871 024	EIL
 0.1 ⇒ 10 A	No	5 % ⇒ 50 %	Yes / 0.1 ⇒ 3 s		1 x 8 A changeover	22.5	24 V $\equiv$	84 871 030	EIH
							24 V $\sim$	84 871 031	EIH
							48 V $\sim$	84 871 032	EIH
							120 V $\sim$	84 871 033	EIH
							230 V $\sim$	84 871 034	EIH
 10 ⇒ 100 A	26 852 304	5 % ⇒ 50 %	Yes / 0.1 ⇒ 3 s		1 x 8 A changeover	22.5	24 V $\equiv$	84 871 040	EIT
							24 V $\sim$	84 871 041	EIT
							48 V $\sim$	84 871 042	EIT
							120 V $\sim$	84 871 043	EIT
							230 V $\sim$	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 ⇒ 100 KΩ	No	1 x 8 A changeover	22.5	24 V ~	84 870 201	ENR
							48 V ~	84 870 202	ENR
							120 V ~	84 870 203	ENR
							230 V ~	84 870 204	ENR
							24 ⇒ 240 V ~	84 870 200*	ENR*
	Resistive	Yes / Yes	2 / 250 Ω ⇒ 1 MΩ	0.1 ⇒ 5 s	1 x 8 A changeover	22.5	24 V ~	84 870 211	ENRM
							48 V ~	84 870 212	ENRM
							120 V ~	84 870 213	ENRM
							230 V ~	84 870 214	ENRM
							24 ⇒ 240 V ~	84 870 210*	ENRM*
	Resistive	Yes / Yes	1 or 2 / 5 ⇒ 100 KΩ	No	1 x 8 A changeover	39 Plug-in 8-pin base	24 V ~	84 870 301	LN
							120 V ~	84 870 303	LN
							230 V ~	84 870 304	LN
						39 Plug-in 11-pin base	24 V ~	84 870 306	LN
							120 V ~	84 870 308	LN
							230 V ~	84 870 309	LN
	Resistive	Combined with monitoring of wells	2 / 5 ⇒ 100 KΩ	No	1 x 8 A changeover	39 Plug-in 11-pin base	24 V ~	84 870 401	L2N
							120 V ~	84 870 403	L2N
							230 V ~	84 870 404	L2N
	Resistive	Yes / Yes + Alarm	2 / 5 ⇒ 100 KΩ	No	2 changeover	45	24 V ~	84 870 501	FN
			2 / 250 Ω ⇒ 5 KΩ				48 V ~	84 870 502	FN
							120 V ~	84 870 503	FN
							230 V ~	84 870 504	FN
								84 870 803	FN LS

Motor temperature control

Further information can be found on the data sheets available at www.moeller.com									
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 ~	84 874 015	ETM
		Yes	1 x 8 A changeover		120 V ~		84 874 013	ETM	
					230 V ~		84 874 014	ETM	
					24 V ~		84 874 025	ETM 2	
					120 V ~		84 874 023	ETM 2	
 PTC	No	Yes	Yes		2 x 8 A changeover	22.5	230 V ~	84 874 024	ETM 2
		Yes	2 x 8 A changeover		24 V ~		84 874 035	ETM 22	
					120 V ~		84 874 033	ETM 22	
					230 V ~		84 874 034	ETM 22	
					24 V ~		84 874 034	ETM 22	

* 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

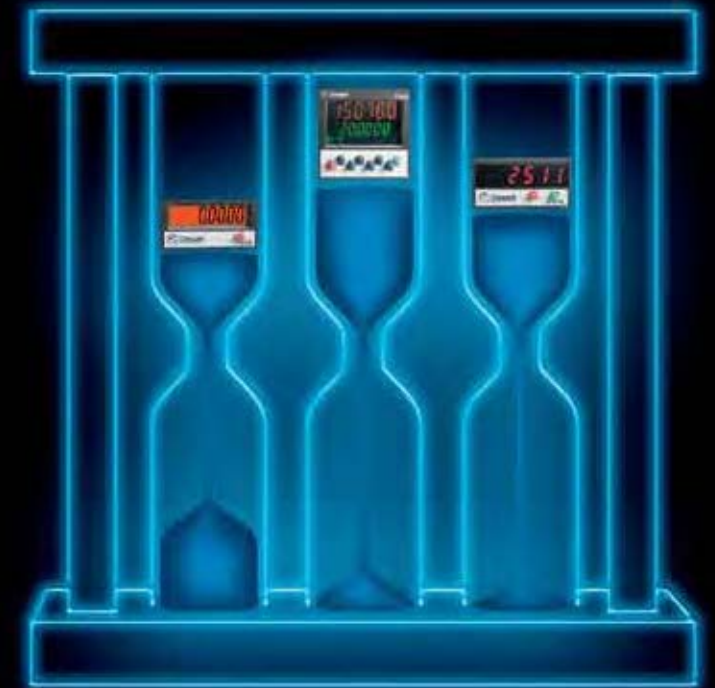
The control relay accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

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.



Counters and Ratemeters

Counting accuracy



A counter, a ratemeter

How can they be defined in simple terms

A **counter** can be used to count a number of actions or events.

It thus participates in production management and preventive maintenance.

A **ratemeter** can be used to display the speed of rotation of a motor in real time.

A counter, a ratemeter

To execute which actions?

Up counting, Down counting

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

Informing, Displaying

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

Triggering, Actuating

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

Measuring, Chronometer timing

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

Up counting

Down counting

Informing

Displaying

Triggering

Actuating

Measuring

Chronometer timing

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

Crouzet Control, counters and ratemeters

A digital range and an electromechanical range



Counters and Ratemeters

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**.

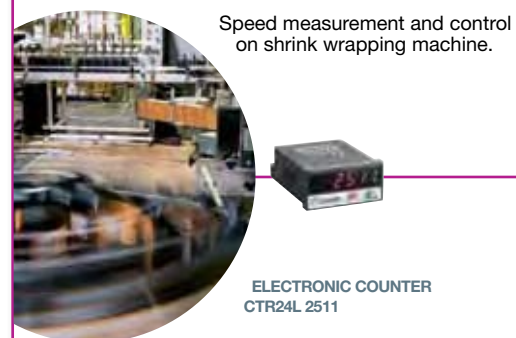
Crouzet Control, counters and ratemeters

Where are they found?

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

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

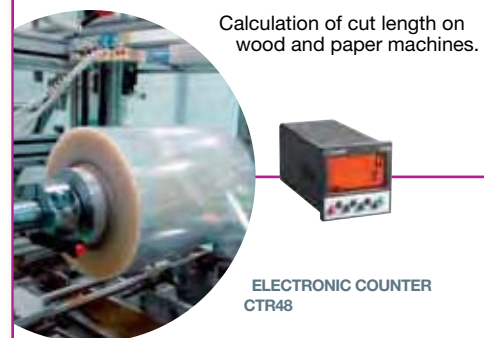
Tachometer systems



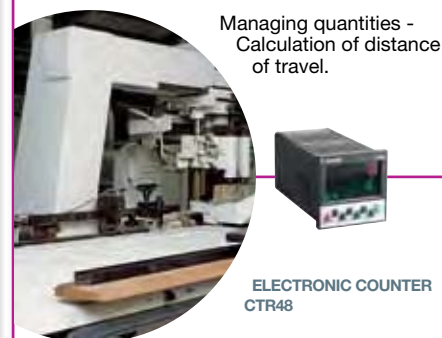
Counting quantities



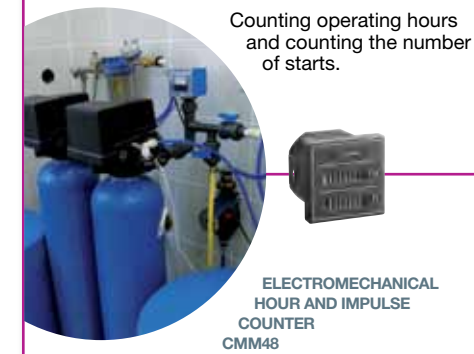
Length measurement



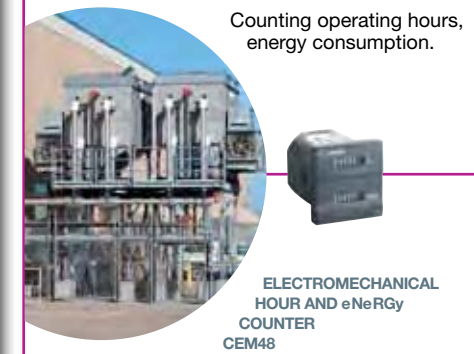
Position control



Compressors



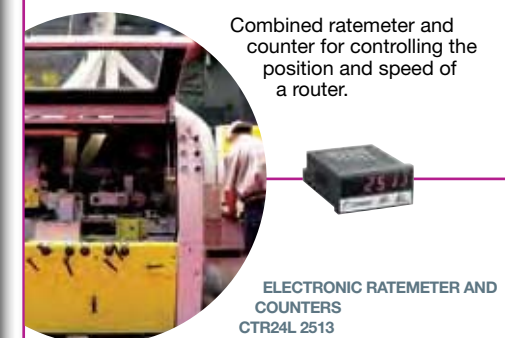
Dehumidifier



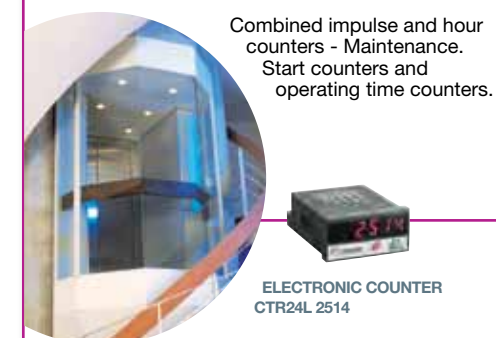
Assembly line speed



Milling machine



Lifts



Uv lamp



Selection guide



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 ⇒ 30 V 	87 623 570	CTR24L - 2511
	Start / Stop	No	Yes	999,999 hrs			0.001 s ⇒ 999,999 hrs			
	sec ⁻¹ / min ⁻¹	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 ⇒ 30 V 	87 623 571	CTR24L - 2512
 Totalizer and Ratemeter Independent inputs	Dir / up.dn / up.up Ph / 2-ph / 4-ph	Yes	Yes	30 kHz		LED	999,999	10 ⇒ 30 V 	87 623 572	CTR24L - 2513
	sec ⁻¹ / min ⁻¹									
 Double totalizer Common input	Counting (total / partial)	Yes	Yes	50 kHz		LED	999,999	10 ⇒ 30 V 	87 623 573	CTR24L - 2514
 Totalizer + Ratemeter or Totalizer + Totalizer or Totalizer + Hour or Hour + Hour	Counting + sec ⁻¹ / min ⁻¹	Yes	Yes	35 kHz		LED	999,999	10 ⇒ 30 V 	87 623 574	CTR24L - 2515
	Counting			50 kHz			999,999			
	Counting + Start / Stop			40 kHz			0.001 s ⇒ 999,999 hrs			
				999,999 hrs			0.001 s ⇒ 999,999 hrs			
	Start / Stop	No	Yes	999,999 hrs			0.001 s ⇒ 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 ⇒ 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 ⇒ 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

Selection guide



Counters and Ratemeters

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 $\overline{\text{---}}$	87 621 111	CTR48	
							24 V $\sim$	87 621 112	CTR48	
							90 ⇨ 260 V $\sim$	87 621 115	CTR48	
	Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter					2	1 x 5 A changeover 1 x 5 A NO 2 solid state	10 ⇨ 30 V $\overline{\text{---}}$	87 621 121	CTR48
								24 V $\sim$	87 621 122	CTR48
								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 $\overline{\text{---}}$	87 621 211	CTR48		
						24 V $\sim$	87 621 212	CTR48		
						90 ⇨ 260 V $\sim$	87 621 215	CTR48		
	Preselection counter Ratemeter Chronometer Multi-totalizer Batch counter				2	1 x 5 A changeover 1 x 5 A NO 2 solid state	10 ⇨ 30 V $\overline{\text{---}}$	87 621 221	CTR48	
							24 V $\sim$	87 621 222	CTR48	
							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 $\overline{\text{---}}$	87 629 111	CTR48E		
						115 V $\sim$	87 629 113	CTR48E		
						230 V $\sim$	87 629 114	CTR48E		
					1 x 3 A changeover 1 x 3 A NO	11 ⇨ 30 V $\overline{\text{---}}$	87 629 121	CTR48E		
						115 V $\sim$	87 629 123	CTR48E		
						230 V $\sim$	87 629 124	CTR48E		

Counters and Ratemeters

Electromechanical counters

Hour counters

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

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

Selection guide



Impulse counters

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

Dual function 48 x 48 counters

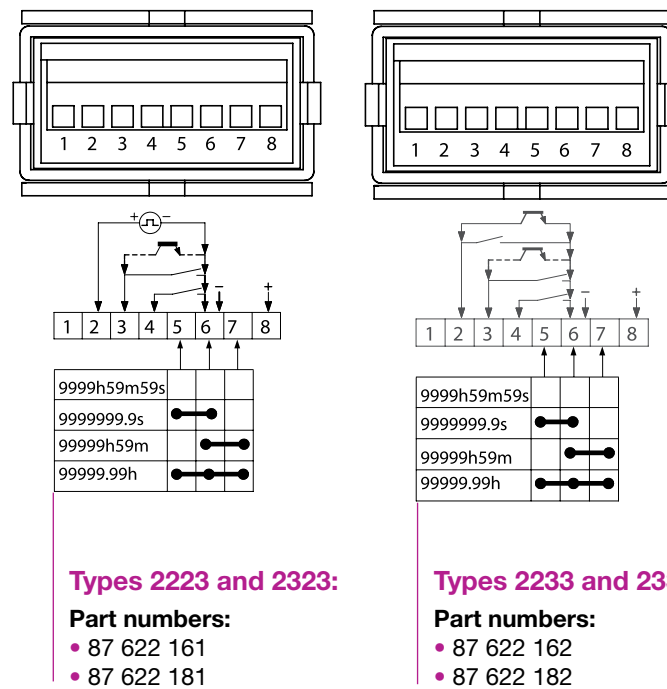
Functions	Reset to zero	Counting capacity		Frequency	Supply	Part number	Type
	No	9,999,999 99,999.99 hrs		50 Hz ~	20 ÷ 30 V ~	99 779 710	CMM48
					100 ÷ 130 V ~	99 779 712	CMM48
					187 ÷ 264 V ~	99 779 714	CMM48
				60 Hz ~	20 ÷ 30 V ~	99 779 718	CMM48
					100 ÷ 130 V ~	99 779 715	CMM48
	No	9,999,999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

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

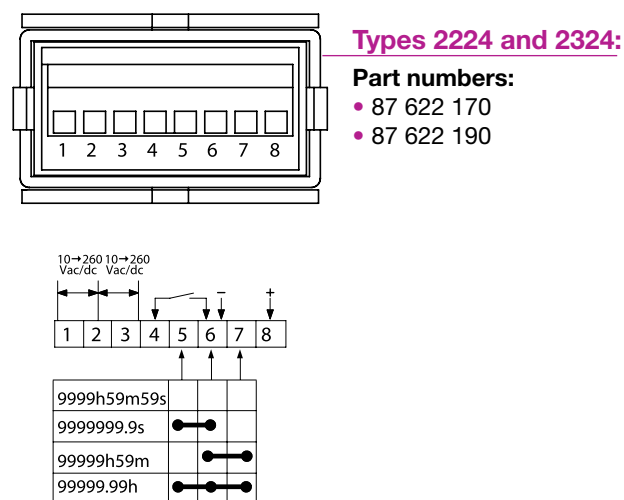
CTR24 counters

Connections

Hour counters

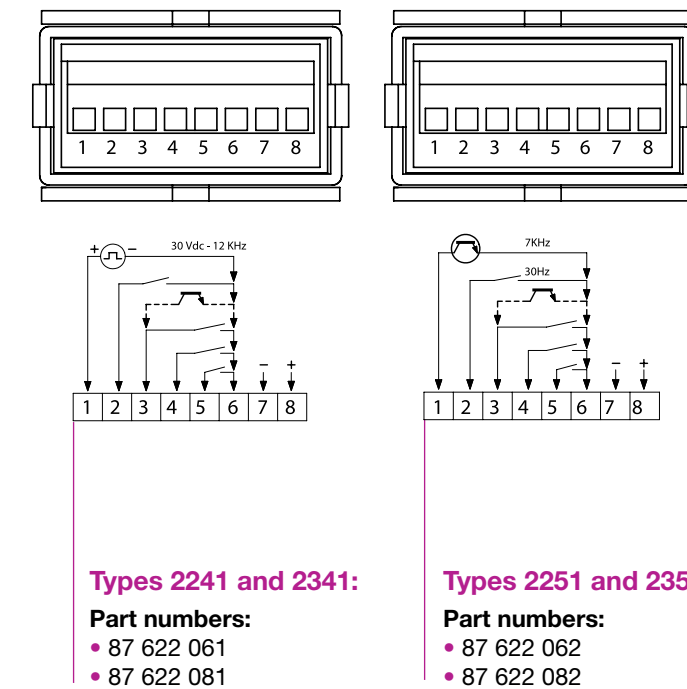


1. NC
2. Start / Stop input
3. Reset input
4. Enable front panel Reset
5. Mode 1 (Time selection)
6. GND / Optional backlighting - (only 23xx)
7. Mode 2 (Time selection)
8. Optional backlighting + (only 23xx)

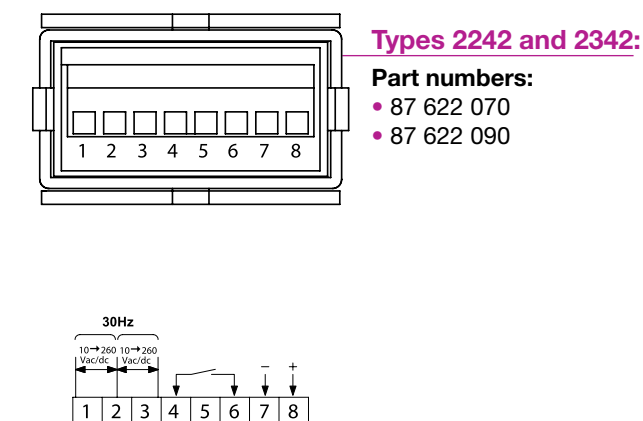


1. Common $\sim$
2. Start / Stop input
3. Reset input
4. Enable front panel Reset
5. Mode 1 (Time selection)
6. GND / Optional backlighting - (only 23xx)
7. Mode 2 (Time selection)
8. Optional backlighting + (only 23xx)

Impulse counters



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)



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

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- 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.



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 **measure** and maintain the temperature of a room, an enclosure, a liquid.

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

Controlling, Displaying, Alerting

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

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

Monitoring

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

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

Measuring

Controlling

Displaying

Alerting

Monitoring

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

Crouzet 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

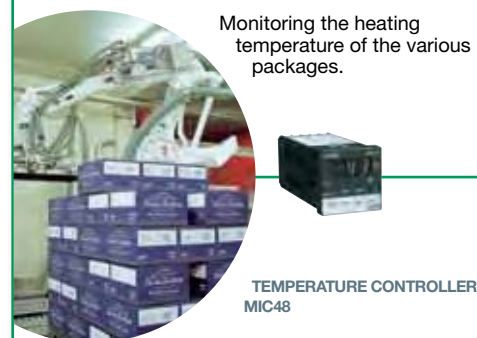
Temperature controllers

Crouzet Control, temperature controllers Where are they found?

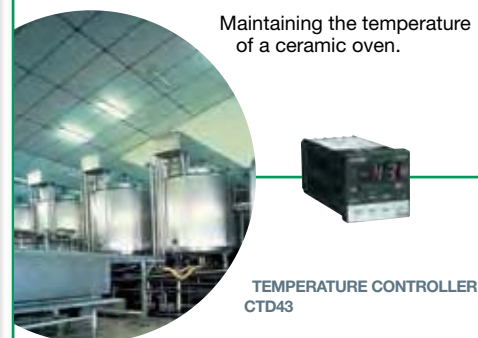
In electrical cabinets associated with other automation functions for the following markets:

- Industrial automation systems
- Building equipment
- Food industry

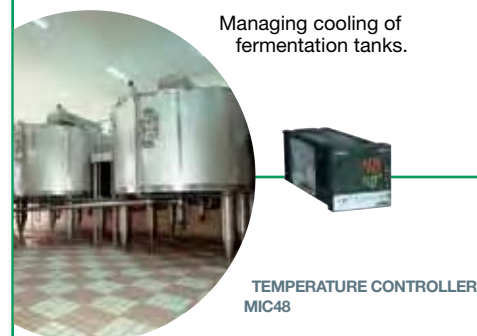
Packaging



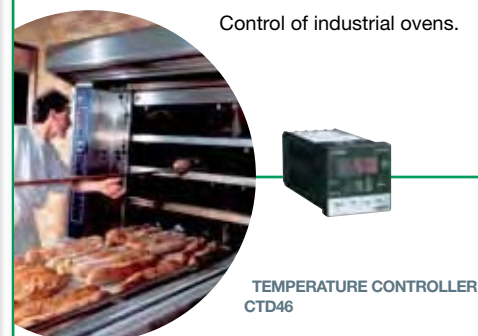
Fluid management



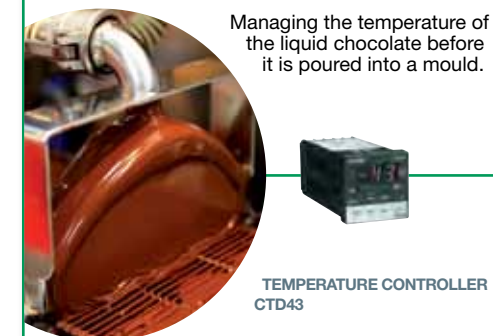
Brewing



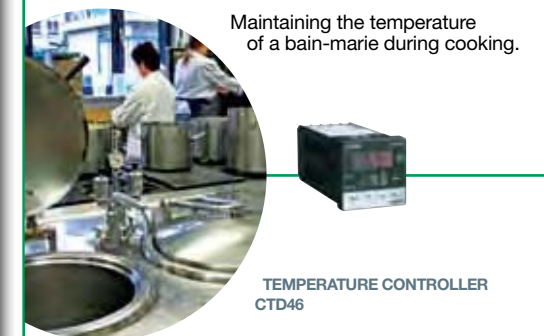
Cooking



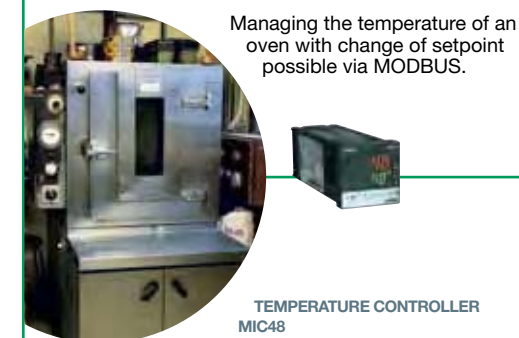
Chocolate factory



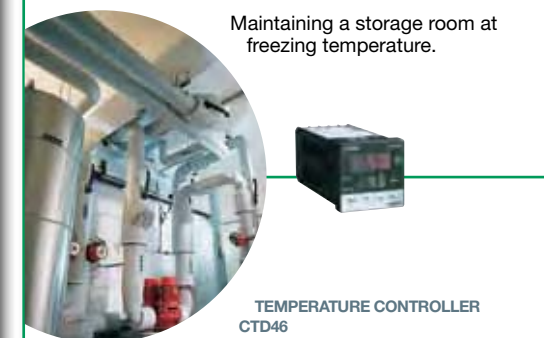
Bain-Marie



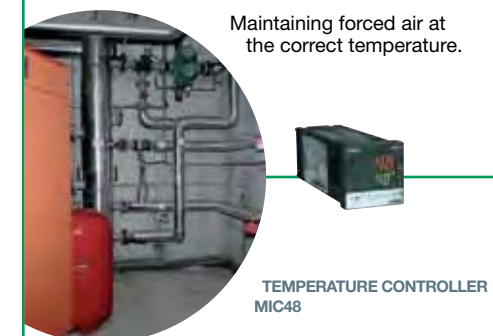
Oven



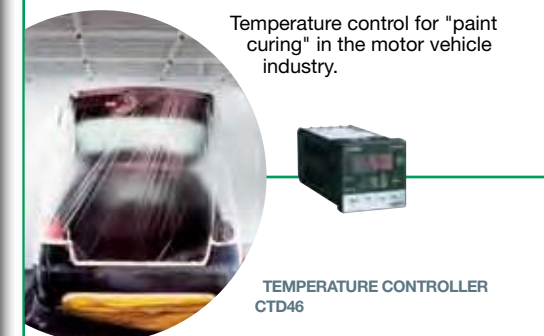
Cold room



Air treatment plant



Spray booth



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 line (3 digits)	24 V ~	89 421 102	CTD43
					1 voltage logic 1 x 1 A relay		100 ⇨ 240 V ~	89 421 108	CTD43
							24 V ~	89 421 112	CTD43
							100 ⇨ 240 V ~	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	2 lines (3 digits)	24 V ~	89 422 102	CTD46
					1 voltage logic 1 x 1 A relay		100 ⇨ 240 V ~	89 422 108	CTD46
							24 V ~	89 422 112	CTD46
							100 ⇨ 240 V ~	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	2 lines (3 digits)	24 V ~	89 422 502	CTH46
					1 voltage logic 1 x 1 A relay		100 ⇨ 240 V ~	89 422 508	CTH46
							24 V ~	89 422 512	CTH46
							100 ⇨ 240 V ~	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	2 lines (4 digits)	24 V ~	89 422 002	MIC48
					1 voltage logic 1 x 1 A relay		100 ⇨ 240 V ~	89 422 008	MIC48
							24 V ~	89 422 012	MIC48
							100 ⇨ 240 V ~	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



Safety relays

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

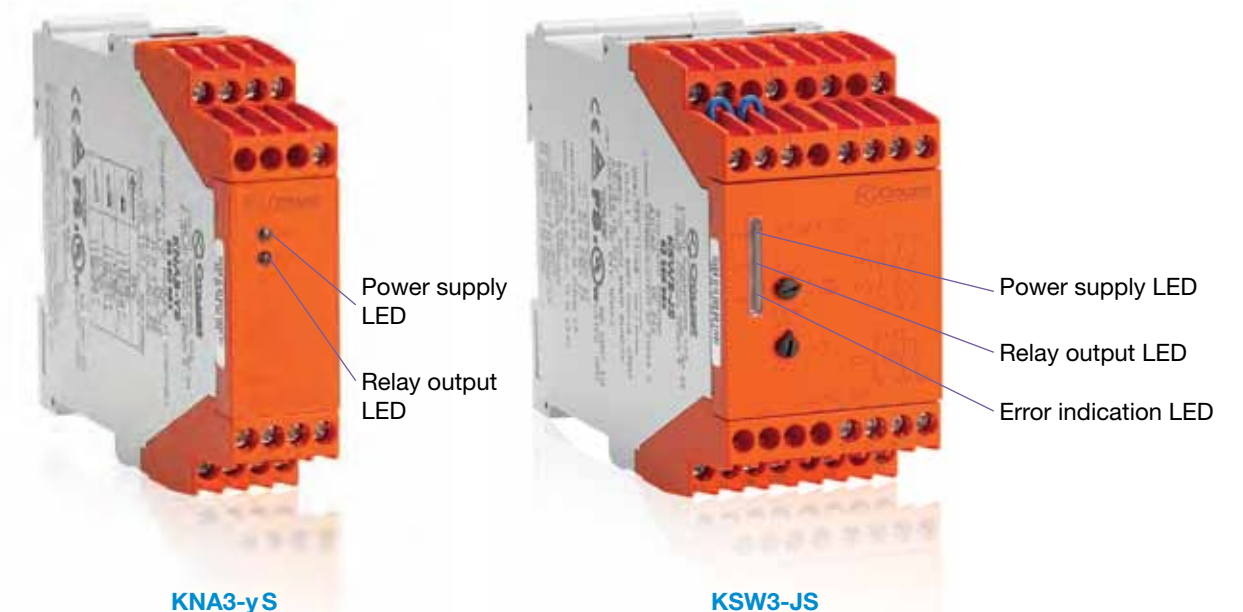
Sensing

Actuating

In addition to this catalogue, technical data sheets for each product are available as free downloads on the www.crouzet.com website.

Crouzet Control, safety relays

A rellevelling 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 rellevelling **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

Safety relays

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 $\overline{\text{---}}$	85 102 031	KNA3-YS
							110 V $\sim$	85 102 034	
							230 V $\sim$	85 102 035	
					Removable spring terminals		24 V $\overline{\text{---}}$	85 103 031	KNAC3-YS
							110 V $\sim$	85 103 034	
							230 V $\sim$	85 103 035	
 Emergency stop & Safety guard monitoring with 2 channels	4	3 x NO	1 x NC		Screw terminals	22.5	24 V $\sim$	85 102 436	KNE3-YS
							110 - 115 V $\sim$	85 102 434	
							230 V $\sim$	85 102 435	
					Removable spring terminals		24 V $\sim$	85 103 436	KNEC3-YS
 Timed contacts 1 $\Rightarrow$ 10 s	4	2 x NO (instantaneous) 1 x NO (timed)	-		Screw terminals	22.5	24 V $\sim$	85 102 736	KZR3-YS
 Expansion module for safety relays	4 (combined with a level 4 safety relay)	5 x NO	1 x NC (feedback loop)		Screw terminals	22.5	24 V $\sim$	85 102 956	KZE5-YS
							110 - 115 V $\sim$	85 102 954	
							230 - 240 V $\sim$	85 102 955	
 Zero speed monitoring	4	3 x NO 1 x NC	1 x NO 2 x solid state outputs		Screw terminals	45	24 V $\overline{\text{---}}$	85 102 331	KSW3-JS
 Two-hand control	4	2 x NO	-		Screw terminals	22.5	24 V $\overline{\text{---}}$	85 102 621	KZH2-Y2
		3 x NO	1 x NC				24 V $\overline{\text{---}}$	85 102 631	KZH3-YS
							24 V $\sim$	85 102 632	
 Power supply for 24 V $\overline{\text{---}}$ safety relays	-	-	-		Screw terminals	22.5	85 $\Rightarrow$ 265 V $\sim$	85 102 208	KPS0-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
 Relevelling zone control for lifts	4	2 x NO	-		Removable screw terminals	22.5	24 V $\sim$	85 102 826	KZHNU-YS
			1 x NC				24 V $\sim$	85 102 526	KZHNV-YS

Crouzet Control, safety relays

Where are they found?

Emergency stop and guard monitoring



Emergency stop modules with 1 or 2 channels

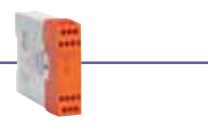


KNA3-yS and KNE3-yS,
KNAC3-yS and KNEC3-yS
SAFETY RELAYs

Relevelling lift cars



Levelling the landing and the lift car



KZHNU-yS and KZHNv-yS
SAFETY RELAYs

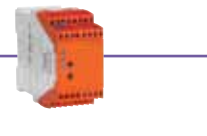
They can be found in electrical cabinets, associated with other automation functions in the following markets:

- Building equipment
- Industrial automation systems

Zero speed monitoring



Sensorless control for stopping electric motors

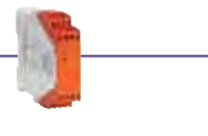


SINGLE OR THREE-PHASE
KSW3-JS
SAFETY RELAYs

Two-hand control



Control of two-hand control console



KZH2-yS and KZH3-yS
SAFETY RELAYs

Crouzet Control

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67

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

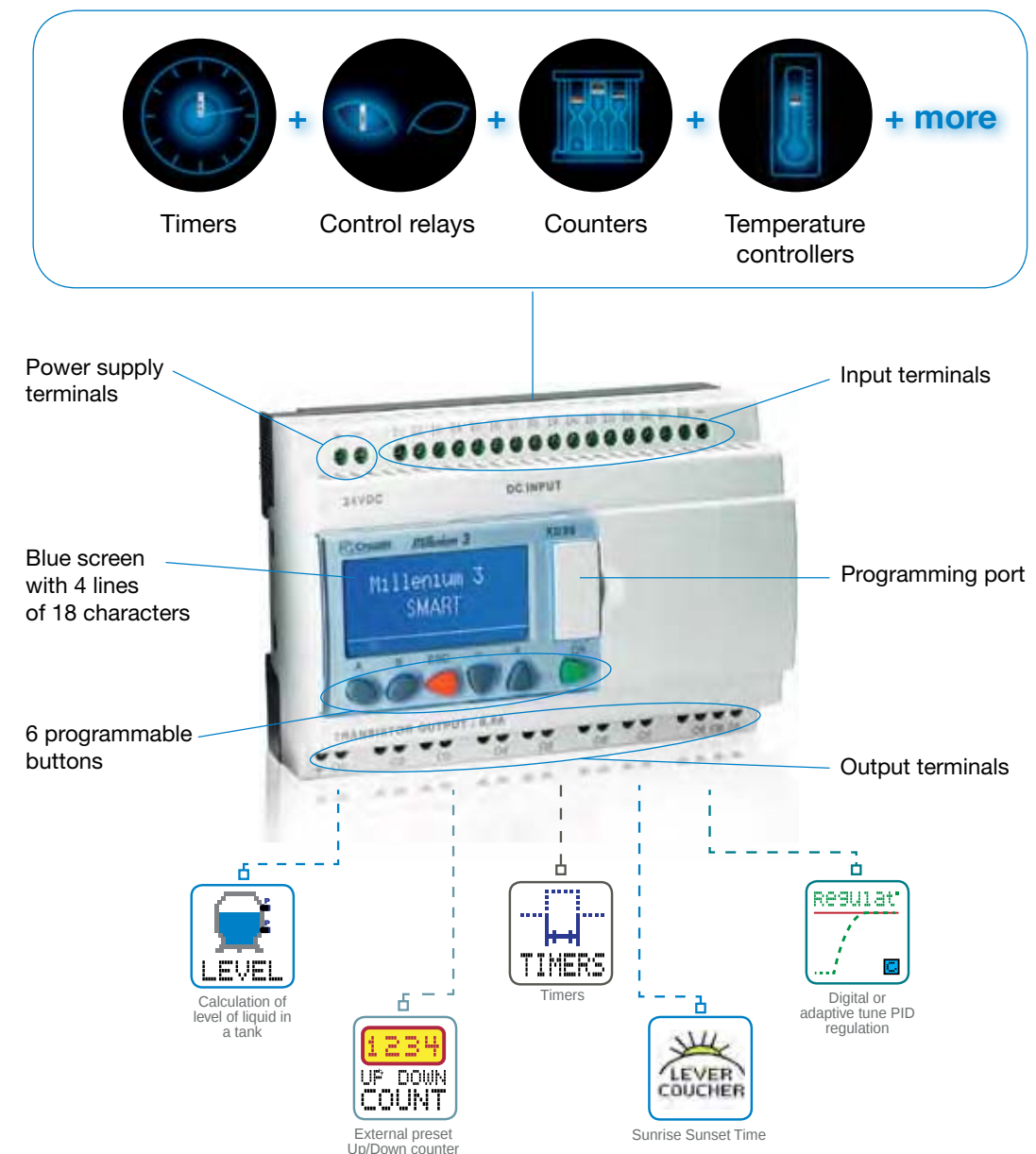
Communicating

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.

Crouzet Automation Logic Controllers The Millenium 3 Smart range

- **Multiple configuration option** 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

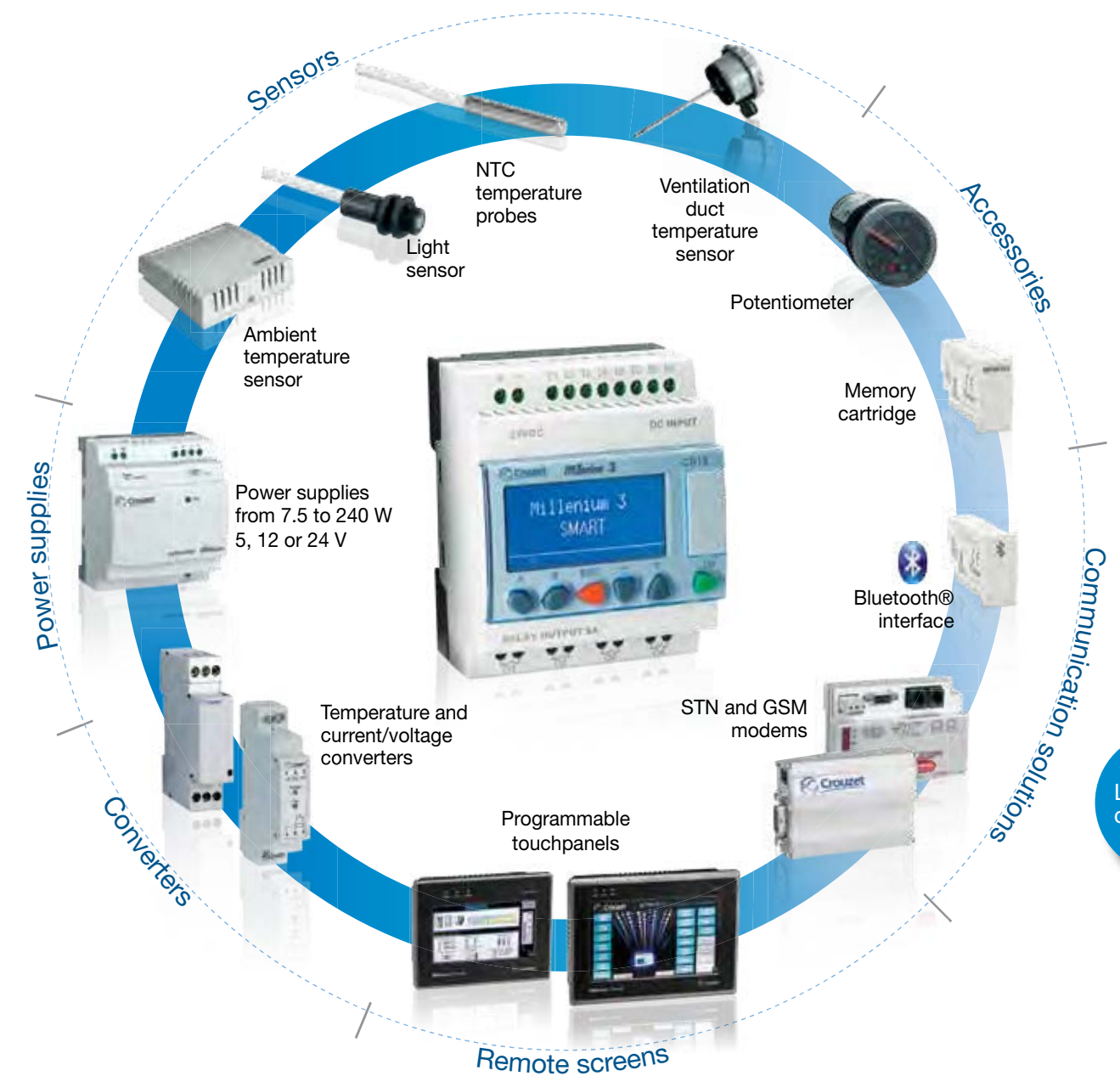


Compact versions



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

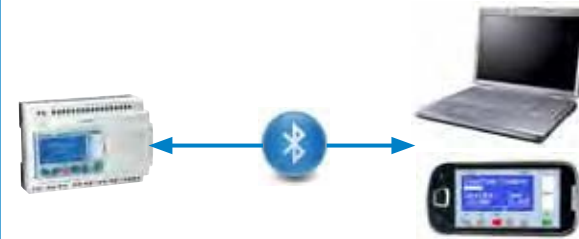
Solutions with close proximity to your installation

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

Our solution



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

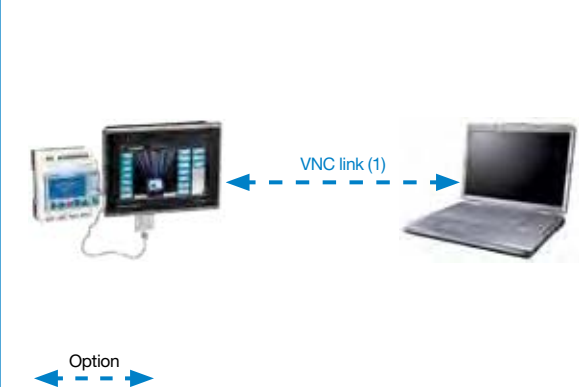
- **Bluetooth® interface** (10 m): Millenium 3 accessory
- Two versions: **Lite** (ESC/ENTER buttons disabled) & **Standard**

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

Our solution



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

Our solution



Main functions

- **Automatic notificatio** 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

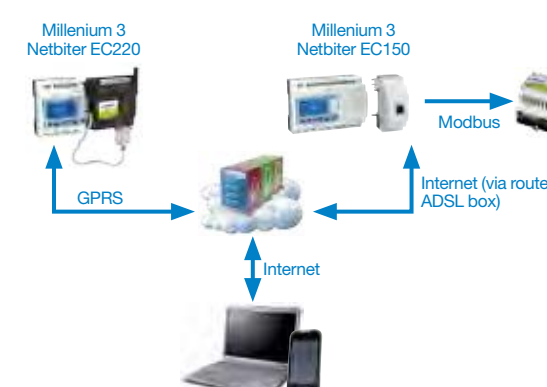
- Reliable **plug & play** solution that is simple to install
- Solution managed using **M3 Soft** software
- Option **to send SMS messages** via a telecom operator service

Remote management solutions with HMS⁽²⁾ - 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**

Our solution



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.

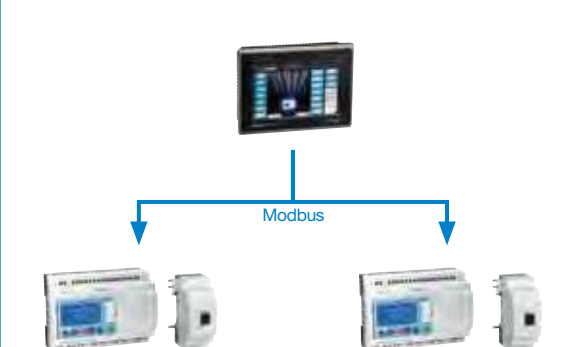
Local Area Network (LAN) solutions

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**

Our solution



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

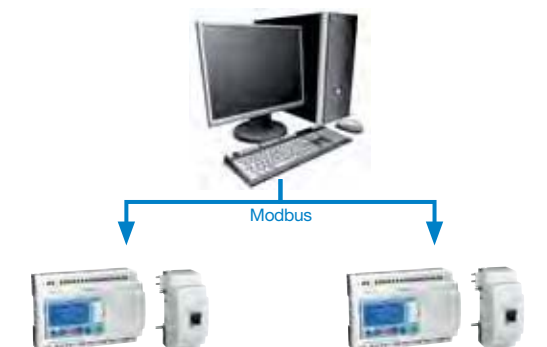
- MTP panel **Modbus master**
- XN05 extension: **Modbus ethernet TCP/IP**
- XN06 extension: **Modbus RS485 RTU**

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**

Our solution



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

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



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

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

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 flo

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 languages: **FBD** (Function Bloc Diagram) and **SFC** (Sequential Function Chart/ Grafcet) 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**

Function blocks

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

CALCUL		
	Gain	Conversion of an analog value by changing the scale and offset.
	Add/Subb	Simple operations on integers: Addition and/or Subtraction.
	Mul/Div	Simple operations on integers: Multiplication and/or Division.
	ADD/SUB 2 Inputs	The ADD-SUB (Addition or Subtraction) function is used to perform simple operations on integers.
	Sin/Cos	Calculation of the cos and sin of an angle between 0° and 90°.
	Square Root	Calculation of the square root of the number present as an input with accuracy to two decimal points.
	Bit Multiplexer	Copy of the selected A or B input to the outputs Q and/Q.
	Multiplexer A B	Multiplexing function on 2 analog values.
	Demultiplexer	Demultiplexing of integers. Used to direct the value of the input to one of the 4 outputs.
	Multiplexer	Multiplexing word inputs. Used to direct the value of one of the selected inputs to a predefined output.
	Dec/Bin	Break down of an integer type input (16 bits) into 16 bit type outputs.
	Bin/Dec	Make up of an integer type output (16 bits) from 16 bit type inputs.
	SPLIT 16 bits to 4	Split of a 16-bit word into four 16-bit words with values between 0 and 15.
	SPLIT 16 bits to 2	Split of a 16-bit word into two 16-bit words with values between 0 and 255.
	Word Shift Register	Shifting of the 16-bit words on each rising edge of the clock.
	Shift Register	Shifting of information by saving it to the memory (shifting of bits in a 16-bit word on each rising edge of the clock).
	Transfer Function	Table of correspondence between the X input and the Y output.The table of correspondence is created from a csv file
	Transfer Function 50 values	Table of correspondence between the X input and the Y output.The table of correspondence (50 rows max) is created from a sv file
	Timer Transfer Function	Correspondence table for the Minutes operating time and the Y output.
	Timer Transfer Function 50 values	Correspondence table for the Minutes operating time and the Y output. (50 Values)

PROG		
	Hour Minute	Indication of the time from the controller (hour and minutes).
	Hr Mn Converter	Conversion of a time period in the "hour : minute" format to minutes and vice versa.
	Controller Status	Access to the controller states and modify the behaviour of its FBD and/or SFC program depending on these states.
	Summertime	Active function throughout summer time, and inactive throughout winter time.

MACROS		
	Display 15 texts	Display of 15 texts one after each other with 15 Displays Function Blocs
	Scroll 4 lines	Scroll down of a text of four lines on the screen of the Controller
	My Macro	Possibility to create a personal macro library and to store them in the Macro tab.

INPUTS/OUTPUTS		
	Discrete Input	 Integer Input
	Filtered Digital Input	 Discrete Output
	Analog Input 0..10V	 PWM Output
	Filtered Analog Input	 Analog Output Expansions 10 bits
	Analog Input Expansion 10 bits	 Integer Output
	Analog Input Expansion 12 bits	

HMI		
	Display	 B Button
	Text	 ESC Button
	Menu Scroll	 Minus Button
	LCD Backlight Output	 Plus Button
	A Button	 OK Button

COMMUNICATION		
	SL In	Writing via serial link of data stored in the controller's fixed addresses
	SL In S (saved)	Data transmission via a programming port to memory space in the controller's fixed addresses. Data is protected in the event of disconnection of the controller
	SL Out	Reading via programming port of data stored in the controller's fixed addresses.
	Alarm	Control of 10 alarm levels and distribution of a serial data to a digital output, connected to a modem digital input. For example to send a SMS.
	Message	distribution of alarm messages to mobile phones, to the Millenium 3 Alarm tool or to e-mail addresses via the M3MOD

GRAFCET SFC		
	Resettable Initial Step	When RESET function is activated, activation of the STEP OUTPUT for the function, which is the initial step, and reinitialization of all of the ther active steps.
	Initial Step	Initial step of an SFC chart
	Step	A step of an SFC chart.
	Or Divergence Step	Transition of one step to be simultaneously made toward one or two steps.
	Or Convergence	Transition of one to four step(s) to be simultaneously made toward one step.
	And Divergence	Transition of one or two steps to be simultaneously made toward two steps.
	And Convergence Step	Transition of two steps to be simultaneously made toward one step.
	Wait SFC Step	Set up of a wait phase or step for a PLC or a device.
	Move SFC Step	Set up of a move step for a motor controlled by the PLC to a position specified on the TARGET input.
	Motor Multiplexer	Combination of the motor control signals produced by two linked MOVE SFC steps.

CONTROL		
	Timer	Large set of timer functions (A/C, BW, B/H,LI/L, Totalizer)
	Schmitt Trigger	Monitoring of an analog value in relation to two thresholds.
	Timer A	Delay of actions for a predefined time.
	Bistable	Impulse relay function.
	Set Reset	Bistable memory - Priority assigned to either SET or RESET.
	Timer Set Reset	Trigger of operation of a particular device at a fixed time for a period set by the user.
	One Second Clock	The blinking input function is active every second.
	Compare in Zone	Comparison of a value between two setpoints (the MIN and MAX values determine the zone).
	Compare	Comparison of two analog values using the =, >, <, >=, <=, != operators.
	MULTI COMPARE	Activation of the output corresponding to the value present on the "Value" input.
	HL Switch	Comparison of a value against 5 thresholds.
	Min Max	Saving of the minimum and maximum values of a variable signal.
	Reduced Average	Update of the configured average of a number of values by deleting the minimum and maximum values.
	Time Prog	Daily, weekly, monthly and yearly time programmer.
	Weekly Time Prog	Daily, weekly, monthly and yearly time programmer.
	Preset Counter	Preset up/down counter
	Up Down Counter	External preset up/down counter.
	Preset H Meter	Preset hour counter (preselection of hour, minute).
	High speed count	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.
	Fast count	Counting of the pulses arriving at the input at rates in excess of one pulse every 10 ms.

LOGIC		
	Not	 Or 6 Inputs
	And 2 Inputs	 Nand 4 Inputs
	And 4 Inputs	 Nor 4 Inputs
	And 6 Inputs	 Xor 2 Inputs
	Or 2 Inputs	 Boolean 6 Inputs/2 Outputs
	Or 4 Inputs	 Boolean

Function block marked in red:

	CTN 1	Available only for the Millenium 3 Smart Range
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Applications

Crouzet Automation Logic Controllers

Where are they found?

Building 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 OR LOGIC
Create logic equations between the connected inputs

Automatic barriers



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



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



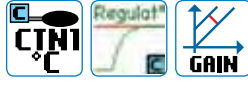
WATER RATIO
Water temperature control

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



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



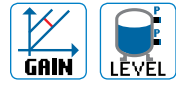
FLOW
Calculation of the flow of a liquid in a pipe

CTN
Temperature measurement (-35 to +120 °C)

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

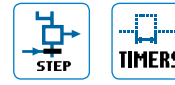
Industrial OEMs

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



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

TIMERS (TEMPORISATEURS)
A/C function - BW function - B/H function - L/L function

Packaging



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



HIGH SPEED COUNT
Counting of pulses

AND
Logical AND with 2 inputs

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

Selection guide

Millenium 3 range

Type		Part number	Supply	Inputs	Outputs	Available in		Available with Solid State Output 0.5 A/PWM	Available in / compatible with the Essential version **
						12 V ---	24 V ~		
M3 Smart kits 	Kit 12 Smart*	88 974 080	24 V ---	8 (4 configurable as analog)	4 relays 8 A				
	Kit 12 Smart*	88 974 081	100 ⇨ 240 V ~	8	4 relays 8 A				
	Kit 20 Smart*	88 974 082	24 V ---	12 (6 configurable as analog)	8 relays 8 A				
	Kit 20 Smart*	88 974 083	100 ⇨ 240 V ~	12	8 relays 8 A				
	Kit 26 Smart*	88 974 084	24 V ---	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A				
	Kit 26 Smart*	88 974 085	100 ⇨ 240 V ~	16	8 relays 8 A and 2 relays 5 A				

Compact versions

 With display	CD12 Smart*	88 974 041	24 V ---	8 (4 configurable as analog)	4 relays 8 A	•		•	•
	CD12 Smart*	88 974 043	100 ⇨ 240 V ~	8	4 relays 8 A		•		
	CD20 Smart*	88 974 051	24 V ---	12 (6 configurable as analog)	8 relays 8 A	•		•	•
	CD20 Smart*	88 974 053	100 ⇨ 240 V ~	12	8 relays 8 A		•		
 Without display	CB12 Smart*	88 974 021	24 V ---	8 (4 configurable as analog)	4 relays 8 A	•			•
	CB12 Smart*	88 974 023	100 ⇨ 240 V ~	8	4 relays 8 A		•		
	CB20 Smart*	88 974 031	24 V ---	12 (6 configurable as analog)	8 relays 8 A				•
	CB20 Smart*	88 974 033	100 ⇨ 240 V ~	12	8 relays 8 A		•		

Expandable versions

 With display	XD10 Smart*	88 974 141	24 V ---	6 (4 configurable as analog)	4 relays 8 A	•		•	•
	XD10 Smart*	88 974 143	100 ⇨ 240 V ~	6	4 relays 8 A		•		
	XD26 Smart*	88 974 161	24 V ---	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A	•		•	•
	XD26 Smart*	88 974 163	100 ⇨ 240 V ~	16	8 relays 8 A and 2 relays 5 A		•		
 Without display	XB10 Smart*	88 974 131	24 V ---	6 (4 configurable as analog)	4 relays 8 A	•		•	•
	XB10 Smart*	88 974 133	100 ⇨ 240 V ~	6	4 relays 8 A		•		
	XB26 Smart*	88 974 151	24 V ---	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A	•		•	•
	XB26 Smart*	88 974 153	100 ⇨ 240 V ~	16	8 relays 8 A and 2 relays 5 A		•		

With Removable Terminal Blocks

	CD12 RBT Smart*	88 974 441	24 V ---	8 (4 configurable as analog)	4 relays 8 A				
	XD26 RBT Smart*	88 974 561	24 V ---	16 (6 configurable as analog)	8 relays 8 A and 2 relays 5 A				

Sandwich extensions

 Communication	XN05 Modbus TCP/IP	88 970 270	24 V ---						•
	XN06 Modbus RS485	88 972 250	24 V ---						•
	XN07 Master RS485	88 974 250	24 V ---						
 Digital	XE10	88 970 321	24 V ---	6	4 relays 5 A				•
	XE10	88 970 323	100 ⇨ 240 V ~	6	4 relays 5 A		•		•

Termination Extensions

 Digital	XR06	88 970 211	24 V ---	4	2 relays 8 A	•			•
	XR06	88 970 213	100 ⇨ 240 V ~	4	2 relays 8 A		•		•
	XR10	88 970 221	24 V ---	6	4 relays 8 A	•			•
	XR10	88 970 223	100 ⇨ 240 V ~	6	4 relays 8 A		•		•
	XR14	88 970 231	24 V ---	8	4 relays 8 A and 2 relays 5 A	•			•
	XR14	88 970 233	100 ⇨ 240 V ~	8	4 relays 8 A and 2 relays 5 A		•		•
 Analog	XA03 3xPt100	88 970 800	24 V ---	3 analog (Pt100)					
	XA04 2AI/2AO	88 970 241	24 V ---	2 analog 0-10V/0-20mA (1 Pt100)	2 analog 0-10V/PWM				•

Bare board and resin board versions

 Bare board	NB12	88 970 001	24 V ---	8 (4 configurable as analog)	4 relays 8 A	•			
	NB12	88 970 003	100 ⇨ 240 V ~	8	4 relays 8 A				
	NB20	88 970 011	24 V ---	12 (6 configurable as analog)	8 relays 8 A				
	NB20	88 970 013	100 ⇨ 240 V ~	12	8 relays 8 A				
 Resin board	NBR12	88 973 001	24 V ---	8 (4 configurable as analog)	4 relays 8 A	•		•	
	NBR26	88 973 061	24 V ---	16 (6 configurable as analog)	10 relays 8 A	•		•	
	NBR32	88 973 211	24 V ---	20 (6 configurable as analog)	12 relays 8 A	•			
	NBR40	88 973 231	24 V ---	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 ⇨ 240 V ~	24 V ---	7.5 W	0.3 A
	88 950 304	100 ⇨ 240 V ~	24 V ---	15 W	0.6 A
	88 950 307	100 ⇨ 240 V ~	24 V ---	30 W	1.2 A
	88 950 302	100 ⇨ 240 V ~	24 V ---	60 W	2.5 A
	88 950 305	100 ⇨ 240 V ~	5 V ---	20 W	4 A
	88 950 306	100 ⇨ 240 V ~	12 V ---	24 W	2 A
	88 950 320	9.2 ⇨ 18 V ---	12 V ---	10 W	0.8 A
	88 950 321	9.2 ⇨ 36 V ---	24 V ---	6 ⇨ 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 ⇨ Millenium 3
	88 974 104	Millenium 3 ⇨ Bluetooth® interface (class A 10 m)
	88 970 109	3 m USB link cable: PC ⇨ Millenium 3
	88 970 110	Bluetooth® adaptor ⇨ USB (class A 10 m)
	88 970 123	1.80 m serial link cable: DB9 M/DB9 F
	88 970 510	0.5 m serial link cable: Millenium 3 ⇨ 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 ⇨ Millenium 3, a M3 Soft CD - a power supply 110 V-230 V~

Name	
Millenium 3 virtual Display	
	Android smartphone and tablet as well as Windows XP/7 PC application

Man/Machine interface

	TFT-LCD compact 4.3" and 7" resistive touch panels - MTP6/50 (Réf 88 970 492), MTP8/50 (Réf 88 970 494) & MTP8/70 (Réf 88 970 496)*
	Plug & Play remote LCD displays/keypads (Réf 88 970 410)*
	Remote LED display - Input 0-10 V (Réf 88 950 400)*

Remote control communication solutions

	Modem communication solutions M3MOD (Réf 88 970 117), GSM Modem (Réf 88 970 119) and STN Modem (Réf 88 970 118)*
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Temperature probes and light sensors

	NTC Temperature probes CTN2 PVC (Réf 89 750 174) / CTN2 Inox (Réf 89 750 182) / CTN3 Silicone (Réf 89 750 186)*
	LDR Light sensors (Réf 89 750 183)*
	0-10 V Temperature sensors (Réf 89 750 150 / 89 750 151 / 89 750 152 / 89 750 153)*
	Temperature probes Pt100 & Thermocouple (Réf 79 696 030 / 79 696 031 / 79 696 032 / 79 696 033 / 79 696 034 / 79 696 035 / 79 696 036)

Temperature and signal converters

	Thermocouple Pt100/Pt1000 ⇨ 0-10 V (Réf 88 950 150 / 88 950 151 / 88 950 152 / 88 950 153 / 88 950 154 / 88 950 155)*
	PWM to 0-10 V/4-20 mA (Réf 88 950 112) to 0-10 V (Réf 88 950 108)*

Other accessories and kits

	Standard Smart and Essential product kits
	Removable connectors
	Potentiometer ø 22 mm
	Faceplates

* Data sheets can be downloaded from the website www.crouzet.com

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99 776 705	36 x 48 electromechanical impulse counter - DC version	CIM 36 x 48	46-47
99 776 707	36 x 48 electromechanical impulse counter - DC version	CIM 36 x 48	46-47
99 776 710	36 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 48	46-47
99 776 711	36 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 48	46-47
99 776 713	36 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM 36 x 48	46-47
99 776 716	36 x 48 electromechanical impulse counter - DC version	CIM 36 x 48	46-47
99 776 736	36 x 48 electromechanical impulse counter - DC version	CIM 36 x 48	46-47
99 776 901	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 902	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 904	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 905	24 x 48 electromechanical impulse counter - Screw fixing - DC version	CIM 24 x 48	46-47
99 776 907	24 x 48 electromechanical impulse counter - Screw fixing - DC version	CIM 24 x 48	46-47
99 776 921	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 922	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 924	24 x 48 electromechanical impulse counter - Screw fixing - Frequency between 50 and 60 Hz	CIM 24 x 48	46-47
99 776 927	24 x 48 electromechanical impulse counter - Screw fixing - DC version	CIM 24 x 48	46-47
99 777 710	24 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM24	46-47

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99 777 714	24 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM24	46-47
99 777 720	24 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM24	46-47
99 777 724	24 x 48 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM24	46-47
99 777 810	24 x 48 electromechanical impulse counter - DC version	CIM24	46-47
99 777 815	24 x 48 electromechanical impulse counter - DC version	CIM24	46-47
99 777 820	24 x 48 electromechanical impulse counter - DC version	CIM24	46-47
99 777 825	24 x 48 electromechanical impulse counter - DC version	CIM24	46-47
99 778 710	15 x 32 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM15	46-47
99 778 712	15 x 32 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM15	46-47
99 778 714	15 x 32 electromechanical impulse counter - Frequency between 50 and 60 Hz	CIM15	46-47
99 778 805	Electromechanical impulse counter 15 x 32 - DC version	CIM15	46-47
99 778 806	Electromechanical impulse counter 15 x 32 - DC version	CIM15	46-47
99 778 810	Electromechanical impulse counter 15 x 32 - DC version	CIM15	46-47
99 779 710	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	46-47
99 779 712	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	46-47
99 779 714	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	46-47
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99 779 718	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	46-47
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99 780 712	Dual function 48 x 48 electromechanical counter - Hour and energy	CEM48	46-47
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99 782 710	24 x 48 electromechanical hour counter - 50 Hz	CHM24	44-45
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99 782 716	24 x 48 electromechanical hour counter - 60 Hz	CHM24	44-45
99 782 718	24 x 48 electromechanical hour counter - 60 Hz	CHM24	44-45
99 782 810	24 x 48 electromechanical hour counter - DC version	CHM24	44-45
99 792 810	24 x 48 electromechanical hour counter - DC version	CHM15	44-45
99 793 710	Electromechanical hour counter rail DIN - 50 Hz	CHMDR	44-45
99 793 712	Electromechanical hour counter rail DIN - 50 Hz	CHMDR	44-45
99 793 714	Electromechanical hour counter rail DIN - 50 Hz	CHMDR	44-45
99 793 810	Electromechanical hour counter rail DIN - DC version	CHMDR	44-45

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