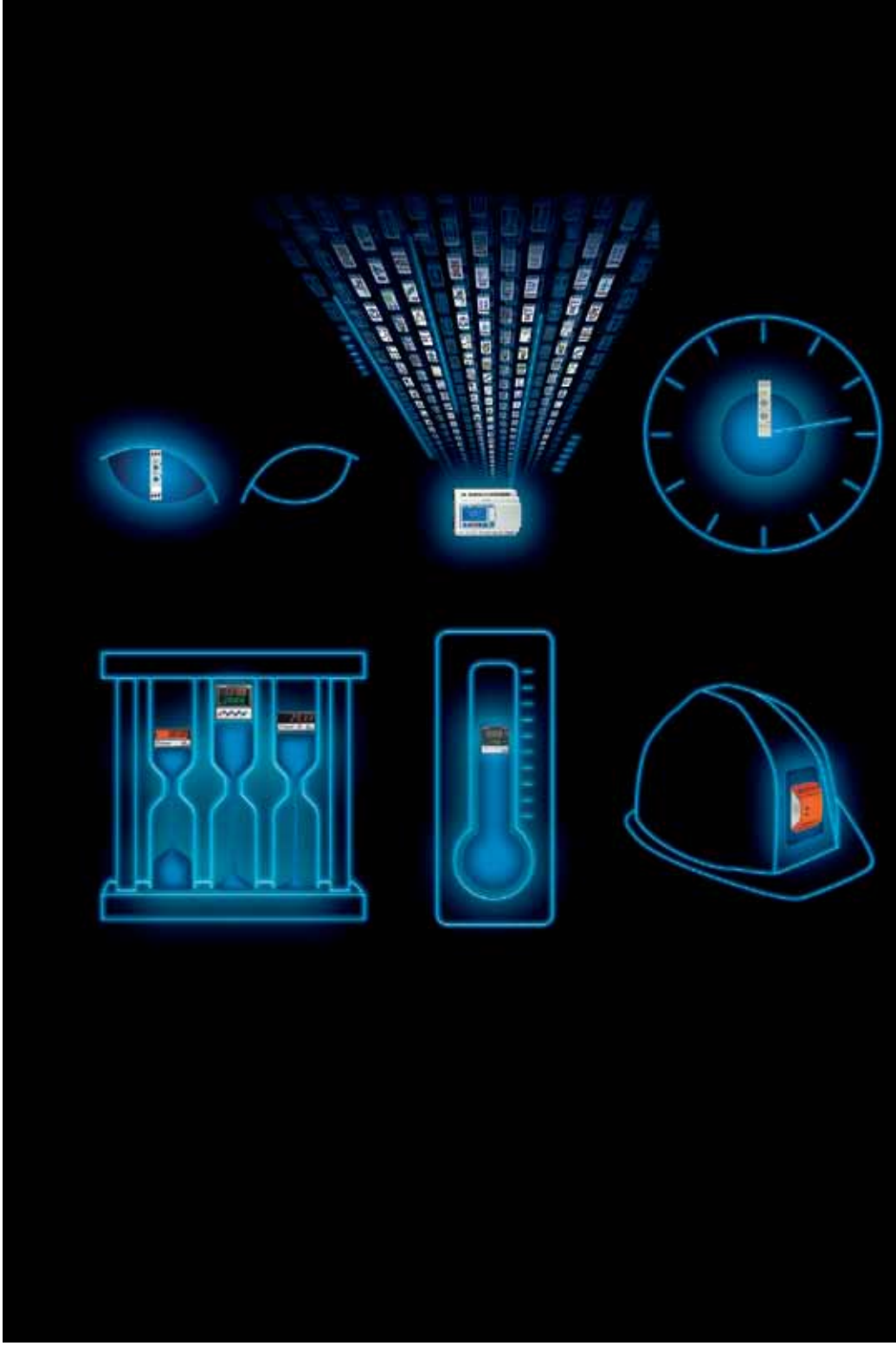
CROUZET

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



Control & Automation Overview

Behind every project, technologies and expertise

www.crouzet.com

A brand of CST
CUSTOM SENSORS & TECHNOLOGIES

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Millenium 3

Accessories

Logic controllers

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To order: Customer Service
Tel : 01 256 318 900 - **info@crouzet.co.uk**

Presentation

CROUZET CONTROL

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

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

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

Custom Sensors & Technologies (CST),

is a specialist in sensing, control and motion products.

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

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

www.cstsensors.com

Crouzet Control / Crouzet Automation team worldwide.

Expertise

The Crouzet Control process

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

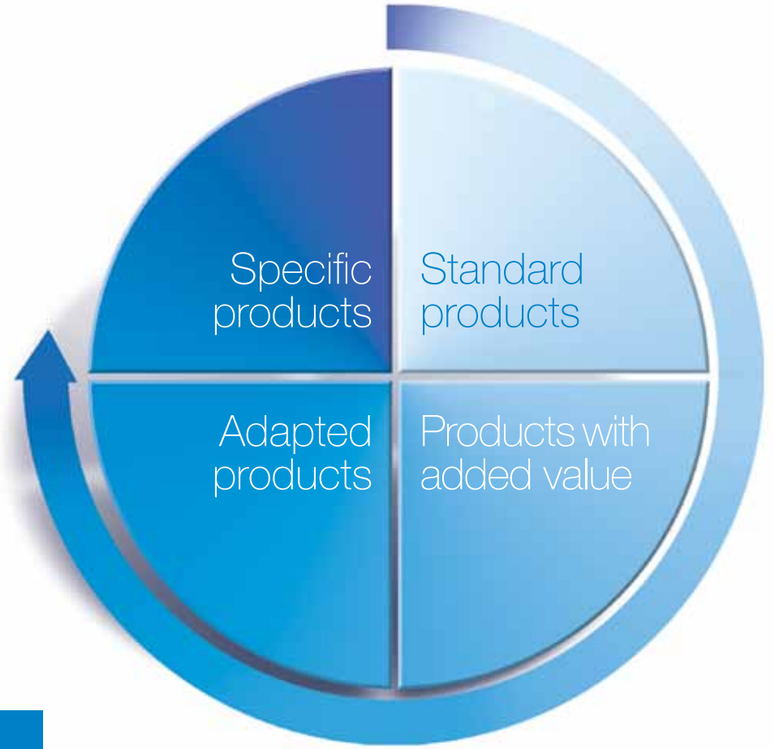
A multi-skilled team

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

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.



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:

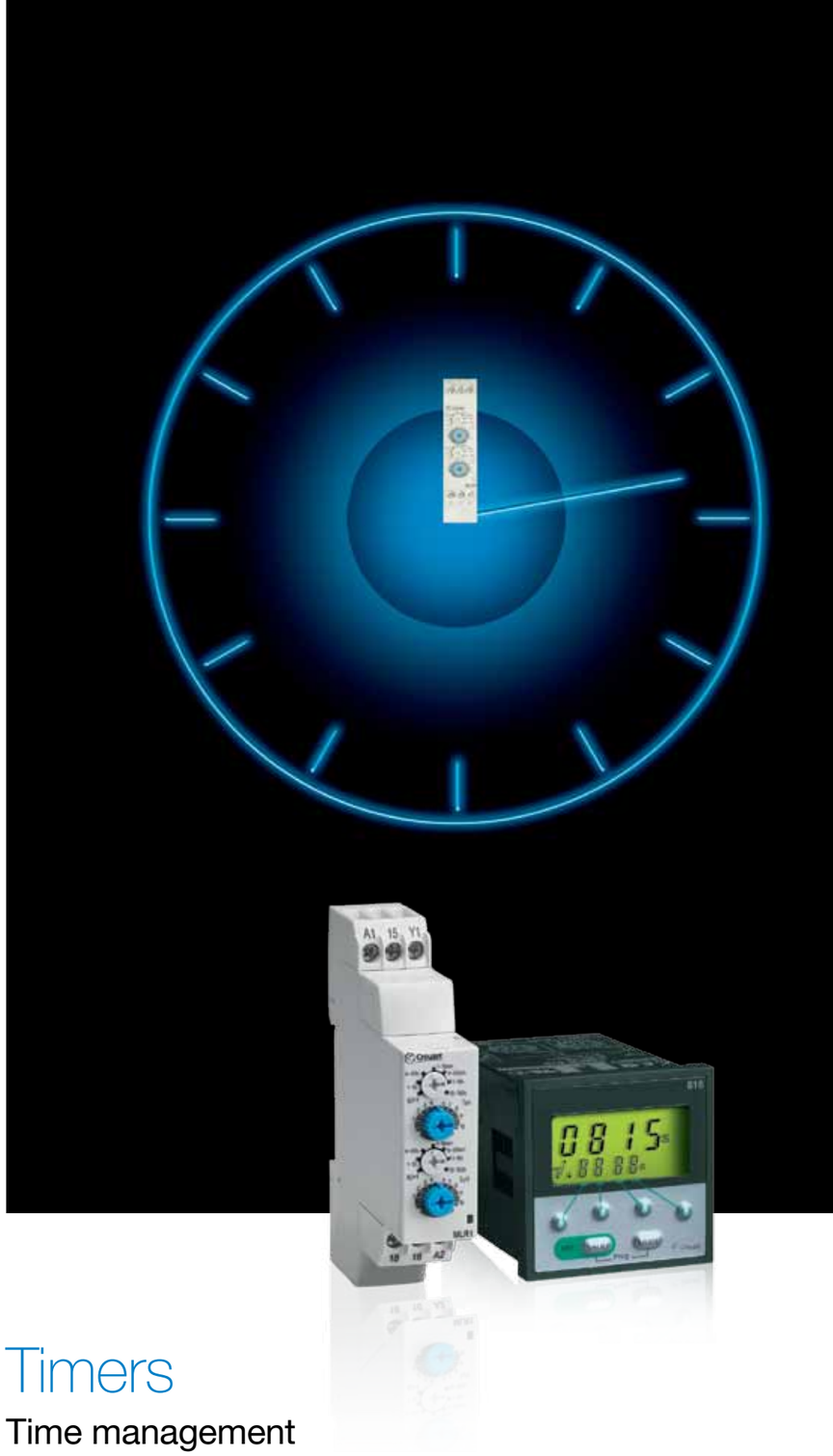
- PROVIDING an optimum level of service and GUARANTEEING a prompt delivery schedule, whatever the type of order: small-scale or mass production, standard or adapted products.
- TRACKING all orders in real time on www.crouzet.com

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 **flash**.

Triggering

Actuating

Delaying

Flashing

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

Crouzet 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 timing range** of up to 9,999 hrs to cope with prolonged processing operations.
- A **range of supply voltages** from 12 to 240 V in one unit for optimised stocks.
- Recognised **quality** and **reliability** ensures the correct operation of equipment.

Applications

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

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

TIMER
MUR1, MXR1, MAR1

Illuminated signs

Managing flashing on illuminated signs.

TIMER
MLR

Fan

Time management for delayed fan start-up.

TIMER
(TMR48, TIMER 81X)

Dosage

Time management for distribution of glue, varnish ...

TIMER
MBR1

Ice maker

Managing the duration of refrigeration.

TIMER
TUR1, MUR1, MAR

Drink vending machine

Timed management of delivery of drinks.

TIMER
TMR48, TIMER 81X

Lighting for mobile homes

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

TIMED IMPULSE RELAY
MXR

Machine tools

Control of maintenance periods.

TIMER
TMR48, TIMER 81X

Sensing on assembly line

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

TIMER
MCR1

Remote machinery

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

TIMER
TK2R1

Chronos 2 DIN rail mounted, Timers

DIN rail modular casings

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

DIN rail industrial casings

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

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 ⎓ / 24 ⇨ 240 V ∿	88 867 105	0UR1
		A		2 x 8 A changeover			88 867 215	0A2R1
		C		1 x 8 A changeover			88 867 135	0CR1
		L / Li					88 867 155	0LR1
		A / At / B / C / H / Ht Di / D / Ac / Bw				12 V ⎓	88 867 100	0UR4
						12 ⇨ 240 V ⎓	88 867 103	0UR3
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 ⎓ / 24 ⇨ 240 V ∿	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 ⎓	88 867 300	PU2R4
						12 ⇨ 240 V ⎓	88 867 303	PU2R3
21	Plug-in 8-pin base	A	Relay	2 x 5 A changeover	0.1s ⇨ 100 h	12 V ⎓	88 895 201	RTMA2
						24 V ⎓	88 895 202	RTMA2
						24 V ∿	88 895 203	RTMA2
						110 V ∿	88 895 206	RTMA2
						230 V ∿	88 895 207	RTMA2
	Plug-in 14-pin base			4 x 3 A changeover		12 V ⎓	88 896 201	RTMA4
						24 V ⎓	88 896 202	RTMA4
						24 V ∿	88 896 203	RTMA4
						110 V ∿	88 896 206	RTMA4
						230 V ∿	88 896 207	RTMA4

"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 ⎓ 24 ⇨ 240 V ∿	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				88 886 106	TMR 48 A
		A1, A2, H1, H2, Q1, Q2, D-Di		2 timed changeover or 1 timed and 1 instantaneous (2 x 5 A)		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 ⎓	88 857 409	Timer 812
					110 V ∿	88 857 406	Timer 812
					220 ⇨ 240 V ∿	88 857 400	Timer 812
		A, B, C, D, Di, H		1 x 8 A timed changeover	12 V ⎓ / 24 ⇨ 48 V ⎓	88 857 003	Timer 814
					24 V ⎓ / 110 ⇨ 240 V ∿	88 857 005	Timer 814
48 x 48	Plug-in 11-pin base	A, B, C, D, Di, H	Relay	1 x 8 A timed changeover	12 V ⎓ / 24 ⇨ 48 V ⎓	88 857 103	Timer 814
					24 V ⎓ / 110 ⇨ 240 V ∿	88 857 105	Timer 814
		A1, A2, AM, AMt		2 timed changeover or 1 timed and 1 instantaneous (2 x 8 A)	12 V ⎓ / 42 ⇨ 48 V ⎓	88 857 302	Timer 815
					24 V ⎓ / 110 V ∿	88 857 307	Timer 815
					24 V ⎓ / 220 ⇨ 240 V ∿	88 857 301	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)	12-24 V ⎓ / 100⇨240 V ∿	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 ⎓ / 48 V ⎓	88 857 604	Timer 816
					24 V ⎓ / 110 V ∿	88 857 607	Timer 816
					24 V ⎓ / 220 ⇨ 240 V ∿	88 857 601	Timer 816
	Plug-in 11-pin base				24 V ⎓ / 48 V ⎓	88 857 704	Timer 816
					24 V ⎓ / 110 V ∿	88 857 707	Timer 816
					24 V ⎓ / 220 ⇨ 240 V ∿	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

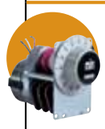
MBA series

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
						110 ⇨ 127 V ∿	88 226 015	Top 2000
	Plug-in 8-pin base					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 40 s)	127 / 230 V ∿ 50 Hz	88 256 401	88 256 4
					15 min (Max.display time: 14 min)		88 256 402	88 256 4
					30 min (Max.display time: 28 min)		88 256 403	88 256 4
					60 min (Max.display time: 56 min)		88 256 404	88 256 4
					120 min (Max.display time: 1 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 40 s)	127 / 230 V ∿ 50 Hz	88 256 506	88 256 5
					15 min (Max.display time: 14 min)		88 256 507	88 256 5
					30 min (Max.display time: 28 min)		88 256 508	88 256 5
					60 min (Max.display time: 56 min)		88 256 509	88 256 5
					120 min (Max.display time: 1 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 40 s)	127 / 230 V ∿ 50 Hz	88 256 906	88 256 9
					15 min (Max.display time: 14 min)		88 256 907	88 256 9
					30 min (Max.display time: 28 min)		88 256 908	88 256 9
					60 min (Max.display time: 56 min)		88 256 909	88 256 9
					120 min (Max.display time: 1 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

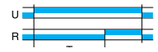
Function diagrams

Generic functions

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

• A function: Delay on energisation

1 relay



Single shot timing which starts on energisation.

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

1 relay

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

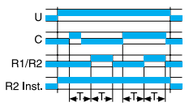
• Ad function: Delay on energisation (cannot be reset)

1 relay

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

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

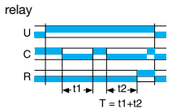
2 timers or
2 relays including
1 instantaneous



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

• At function: Timing on energisation with memory

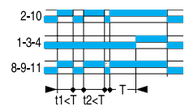
1 relay



Adds up the opening time of a contact.

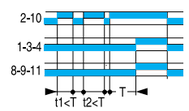
Output relay "R" (or the load) changes state at the end of timing.

• A1 function: Delay on energisation



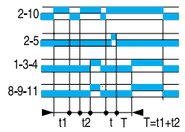
1 timer
1 instantaneous relay

• A2 function: Delay on energisation



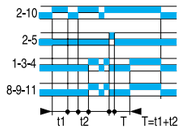
2 timers.

• AM function: Delay on energisation



Latching during the time delay.

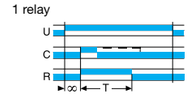
• AMt function: Delay on energisation



Latching during and after the time delay.

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

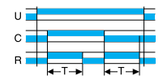
1 relay



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

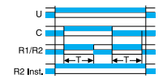
• Bw function: Pulse output (adjustable)

1 relay



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

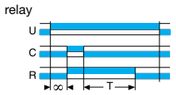
2 timers or
2 relays including 1 instantaneous



• C function: Timing after impulse True delay off

(without auxiliary power supply)

1 relay

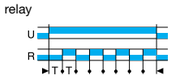


After energisation, closing of the control contact C (Y1) results in the change of state of output relay "R" (or the load).
Timing will only start when this contact opens.

• D or Di functions: Symmetrical flashing

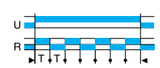
Repetitive cycle which alternately sets the output relay "R" (or the load) to operating and rest position for equal periods of time.

1 relay



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

1 relay

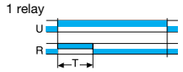


Di function:
The cycle starts with relay "R" in operating position.

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

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

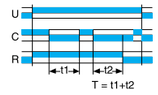
1 relay



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

• Ht function: Delay on energisation with memory

1 relay

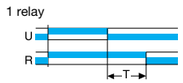


Adds up the total opening time of a contact.
On energisation, the output relay "R" (or the load) changes state, and stays there for the whole duration of the time delay and drops out at the end of the single shot cycle.

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

(without auxiliary power supply)

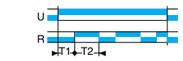
1 relay



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

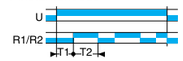
• L function: Asymmetrical flashing

1 relay



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

2 timers or
2 relays including
1 instantaneous



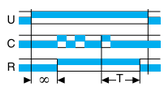
Note: The cycle starts with the relay "R" in the rest position.

• Li function: Asymmetrical flashing

1 relay

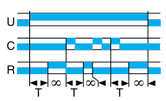
Repetitive cycle with two times which can be set independently.

• N function: "Safe-guard"



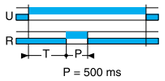
On the first control pulse, the output is excited.
If the interval between two impulses is longer than the timing value, this occurs normally and the output relay "R" (or the load) will change state at the end of timing. Otherwise, relay "R" stays in its original state until the condition is fulfilled.

• O function: "Delayed safe-guard"

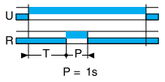


On energisation, a first timer runs and the output relay "R" (or the load) changes state.
On the appearance of a control pulse, relay "R" returns to its initial position and stays there as long as the time interval between 2 impulses is less than the timing value. Otherwise, relay "R" will change state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

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

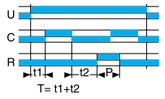


P function:
Timing starts on energisation.
At the end of timing, the output relay "R" (or the load) changes state for approximately 500 ms.



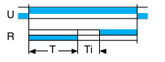
Pe function:
On energisation.
At the end of timing, the output relay "R" (or the load) changes state for approximately 1 s.

• Pt function: Impulse counter (delay on)



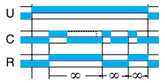
Adds up the total opening time of a contact.
At the end of timing, the output is excited for approximately 500 ms.

• Q function: "Star-delta" starting



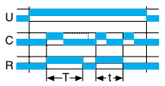
On energisation, the "star" contact closes instantaneously and timing starts.
At the end of timing the Ti "star" contact opens. After a pause of 40 to 100 ms the "delta" contact closes.

• TL function: Impulse relay



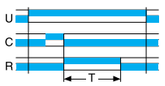
After energisation, a control pulse or latching contact closes the relay. A second control pulse opens the relay.

• Tt function: Timed impulse relay



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

• W function: Timing after pulse on control contact



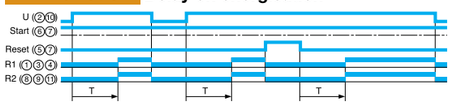
After energisation, opening of the control contact results in a change in the state of output "R" (or the load) and timing starting.

Function diagrams

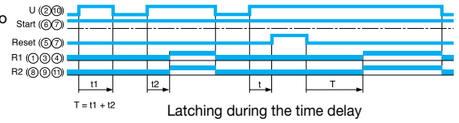
815E dedicated functions

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

• A2 function: Delay on energisation

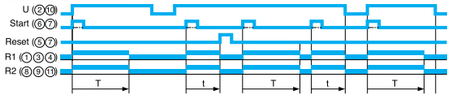


• AM function: Delay on energisation

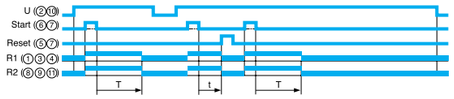


Latching during the time delay

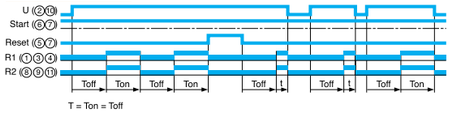
• B function: Timing on impulse (one shot)



• C function: Timing after impulse

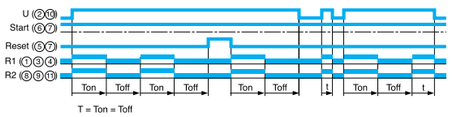


• D function: Flip-flop



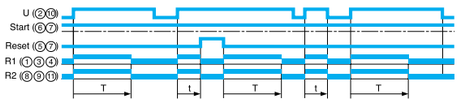
T = Ton = Toff

• Di function with latching: Flip-flop

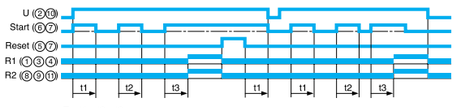


T = Ton = Toff

• H function: Timing on energisation

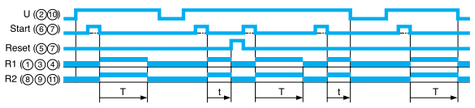


• T function: Timing on energisation

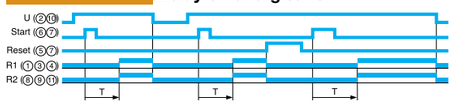


T = t1 + t2 + t3

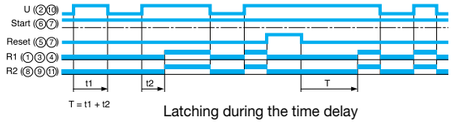
• W function: Off-delay



• A2c function: Delay on energisation

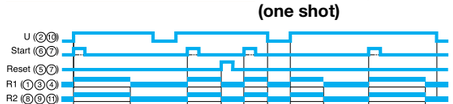


• AMt function: Delay on energisation



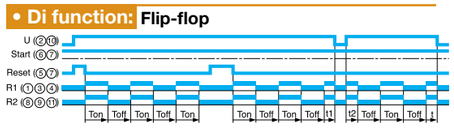
Latching during the time delay

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



• C function with latching: Timing after impulse

• Di function: Flip-flop

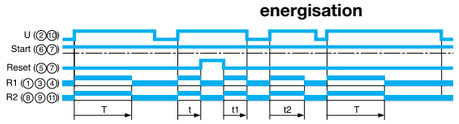


T = Ton = Toff = t1 + t2

• D pause function: Flip-flop

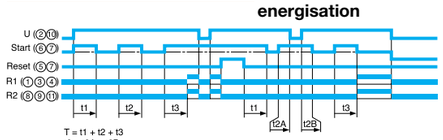
T = Ton = Toff = t1 + t2

• H function with latching: Timing on energisation



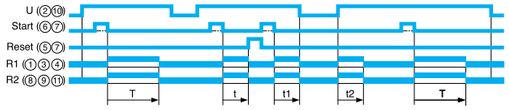
T = t1 + t2

• T function with latching: Timing on energisation



T = t1 + t2 + t3
t2 = t2A + t2B

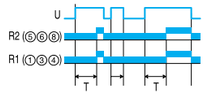
• W function with latching: Off-delay timer



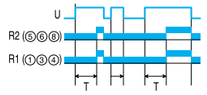
TMR48 dedicated functions

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

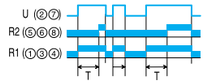
• TMR48 A A function: Delay on energisation



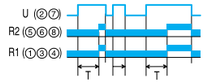
• TMR48 U A function: On-delay



• A1 function: Delay on energisation

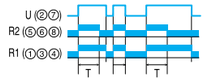


• A2 function: Delay on energisation

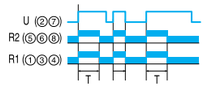


• D-Di function: Symmetrical flashing

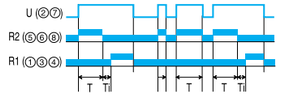
• H1 function: Timing on energisation



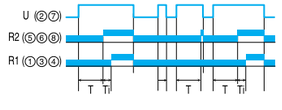
• H2 function: Timing on energisation



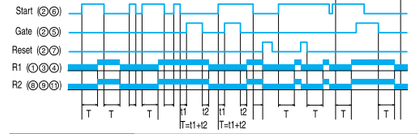
• Q1 function: Star-delta "starting"



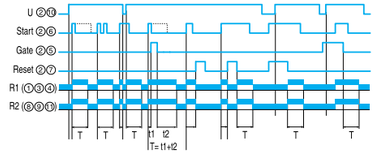
• Q2 function: "Star-delta 2" starting



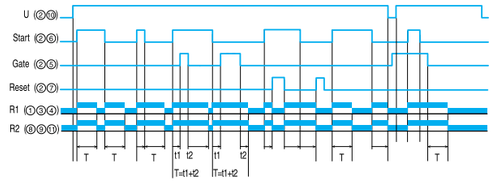
• Ac function: Timing after closing and opening of control contact



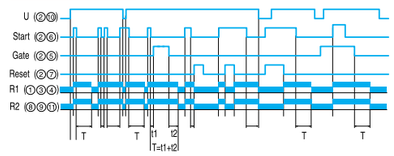
• B function: Timing on impulse (one shot)



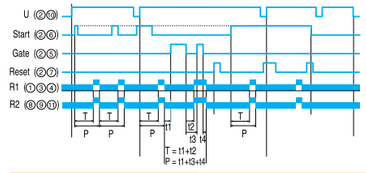
• Bw function: Pulse output (adjustable)



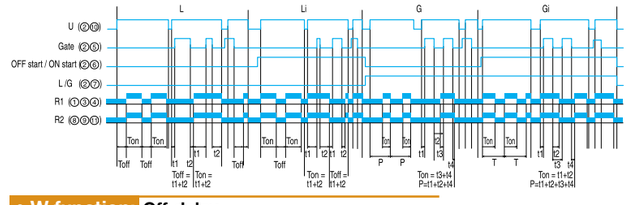
• C function: Off-delay



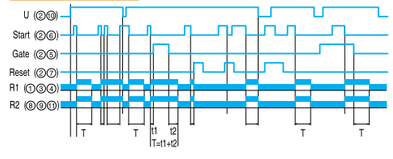
• G function: Cyclical function



• L/LiG/Gi function: Cyclical flashing timers



• W function: Off-delay

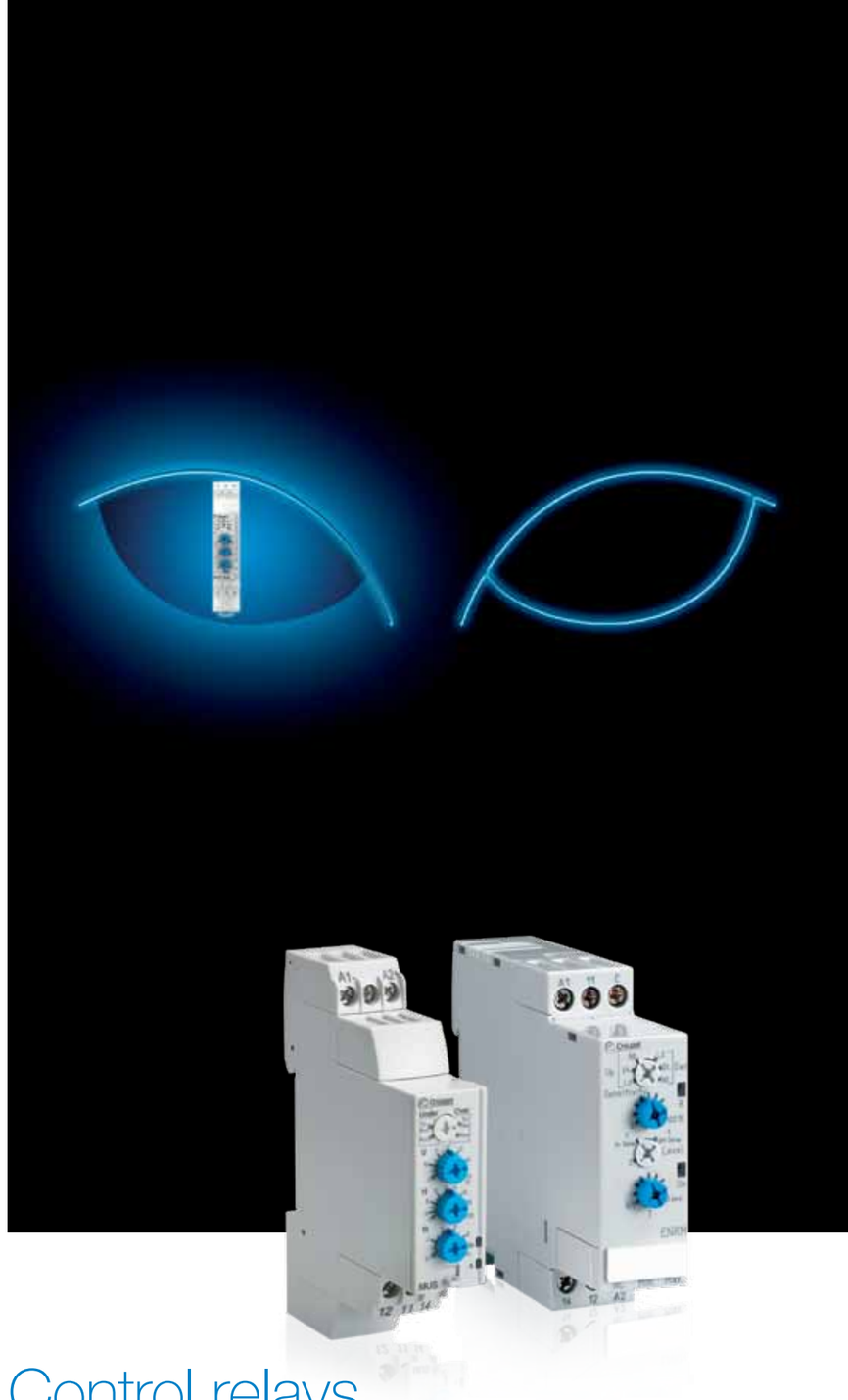


Crouzet Control

Behind every project, technologies and expertise

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

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



Control relays

Instinctive control

The basics

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

MUS (C-Lynx)

ENRM (E, F, L)

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.**

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 RELAYS FOR LIFTS
HWT81

Ice maker

Fluid management: cold management compressor current control.

CURRENT CONTROL RELAY
MUS

Cranes

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

CURRENT CONTROL RELAY
MIC

Pump management

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

CURRENT CONTROL RELAY
HIH

Generating set

Frequency control in generating sets or detection of backup units.

C-LYNX CONTROL RELAY (UNDERFREQUENCY/ OVERFREQUENCY)
HHZ

Fountains

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

CONTROL RELAY
HNM

Motors

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

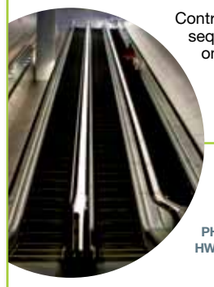
MOTOR TEMPERATURE CONTROL RELAY
HWTM

Crushers

Detection of obstruction or jamming.

CURRENT CONTROL RELAY
HIH

Escalators



Control/detection of phase sequence and failure on motors.

PHASE CONTROL RELAY
HWUA

Steam systems

Level control (maintaining a constant level).

LEVEL CONTROL RELAYS
ENRM

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		1 x 5 A changeover	17.5	208 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 022	MWG
		No / -20 % ⇨ -2 %	0.1 ⇨ 10 s					84 873 023	MWU
	Yes / 5 ⇨ 15 %	No / No						84 873 024	MWA
		Window +2 ⇨ +20 % -20 ⇨ -2 %						84 873 025	MWUA
Without regeneration	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		208 ⇨ 440 V ∿ - 50 / 60 Hz	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		2 x 5 A changeover	35	220 ⇨ 480 V ∿ - 50 / 60 Hz	84 873 026	HWUA
	No / No		0.3 ⇨ 30 s					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

Motor temperature control and phase sequence and failure

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

Single-phase DC voltage control with selectable latching

Measurement range	Functions	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
9 ⇨ 15 V ⎓	Over / Undervoltage	5 % ⇨ 20 %	0.1 ⇨ 10 s		1 x 5 A changeover	17.5	Monitors its own supply voltage	84 872 140	MUS
20 ⇨ 80 V ⎓ ∿								84 872 141	MUS
65 ⇨ 260 V ⎓ ∿								84 872 142	MUS
0.2 ⇨ 60 V ⎓ ∿	Over or Undervoltage	5 % ⇨ 50 %	0.1 ⇨ 3 s		2 x 5 A changeover	35	24 ⇨ 240 V ⎓ ∿	84 872 120	HUL
15 ⇨ 600 V ⎓ ∿								84 872 130	HUH
20 ⇨ 80 V ⎓ ∿	Window	3% fixed	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% fixed	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 fixed	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**	**HNE**
Digital	No / Yes	1 / None				17.5		**84 870 720**	**MNS**

Over/underspeed control

Sensor	Measurement range	Hysteresis	Timing		Output relay	Casing width (mm)	Supply	Part number	Type
3-wire NPN/PNP sensor, 0 ⇨ 30 V, NAMUR Volt-free contact	0.05 s ⇨ 10 min	5 % fixed	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**

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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 ⎓	**84 871 020**	**EIL**
						24 V ∿	**84 871 021**	**EIL**
						48 V ∿	**84 871 022**	**EIL**
						120 V ∿	**84 871 023**	**EIL**
						230 V ∿	**84 871 024**	**EIL**
0.1 ⇨ 10 A	No	5 % ⇨ 50 %	Yes / 0.1 ⇨ 3 s	1 x 8 A changeover	22.5	24 V ⎓	**84 871 030**	**EIH**
						24 V ∿	**84 871 031**	**EIH**
						48 V ∿	**84 871 032**	**EIH**
						120 V ∿	**84 871 033**	**EIH**
						230 V ∿	**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 ⎓	**84 871 040**	**EIT**
						24 V ∿	**84 871 041**	**EIT**
						48 V ∿	**84 871 042**	**EIT**
						120 V ∿	**84 871 043**	**EIT**
						230 V ∿	**84 871 044**	**EIT**

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**
						48 V ∿	**84 870 502**	**FN**
						120 V ∿	**84 870 503**	**FN**
						230 V ∿	**84 870 504**	**FN**
		2 / 250 Ω ⇨ 5 KΩ					**84 870 803**	**FN LS**

Motor temperature control

Sensor	Test	Latching	Manual reset	Output relay	Casing width (mm)	Supply	Part number	Type
PTC	No	Yes	No	1 x 8 A NO	22.5	24 V ∿	**84 874 015**	**ETM**
						120 V ∿	**84 874 013**	**ETM**
						230 V ∿	**84 874 014**	**ETM**
		Yes	Yes	1 x 8 A changeover		24 V ∿	**84 874 025**	**ETM 2**
						120 V ∿	**84 874 023**	**ETM 2**
						230 V ∿	**84 874 024**	**ETM 2**
PTC	No	Yes	Yes	2 x 8 A changeover	22.5	24 V ∿	**84 874 035**	**ETM 22**
						120 V ∿	**84 874 033**	**ETM 22**
						230 V ∿	**84 874 034**	**ETM 22**

* 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

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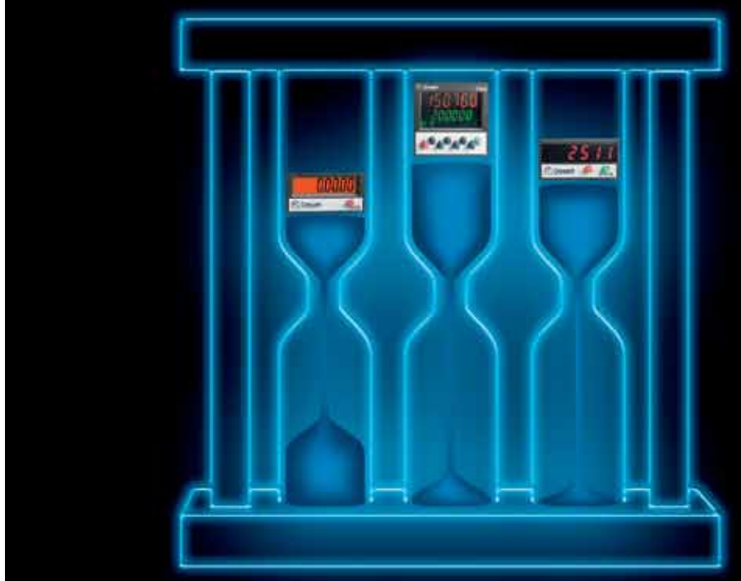


Counters and Ratemeters

Counting accuracy

The basics

A counter, a ratemeter
How can they be defined in simple terms?

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

A counter, a ratemeter
To execute which actions?

Up counting, Down counting

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

Informing, Displaying

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

Triggering, Actuating

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

Measuring, Chronometer timing

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

Up counting

Down counting

Informing

Displaying

Triggering

Actuating

Measuring

Chronometer timing

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

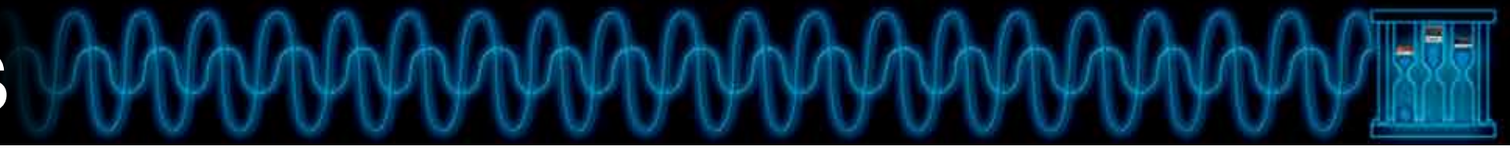
Crouzet Control, counters and ratemeters
A digital range and an electromechanical range

CTR48

CEM48

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
- Building equipment
- Industrial machines
- Medical

Compressors

Counting operating hours and counting the number of starts.

ELECTROMECHANICAL HOUR AND IMPULSE COUNTER
CMM48

Dehumidifiers

Counting operating hours, energy consumption.

ELECTROMECHANICAL HOUR AND ENERGY COUNTER
CEM48

Tachometer systems

Speed measurement and control on shrink wrapping machine.

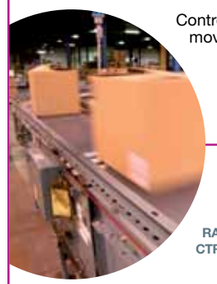
ELECTRONIC COUNTER
CTR24L 2511

Counting quantities

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

ELECTRONIC COUNTER
CTR48

Assembly line speed



Control of conveyor movement speed.

RATEMETER
CTR24L 2511

Milling machine

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

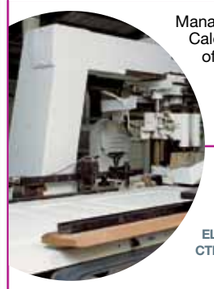
ELECTRONIC RATEMETER AND COUNTERS
CTR24L 2513

Length measurement

Calculation of cut length on wood and paper machines.

ELECTRONIC COUNTER
CTR48

Position control



Managing quantities - Calculation of distance of travel.

ELECTRONIC COUNTER
CTR48

Lifts

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

ELECTRONIC COUNTER
CTR24L 2514

UV lamp

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

HOUR COUNTER
CTR24 2323

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 0.001 s ⇨ 999,999 hrs			
	Counting + Start / Stop			40 kHz					
				999,999 hrs					
	Start / Stop	No	Yes	999,999 hrs		0.001 s ⇨ 999,999 hrs			

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**

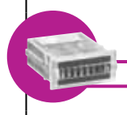
The counters and ratemeters accessories guide is available on the product data sheets which can be downloaded from the website www.crouzet.com

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 ⎓	87 621 111	CTR48
								24 V ∿	87 621 112	CTR48
								90 ⇨ 260 V ∿	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 ⎓	87 621 121	CTR48
								24 V ∿	87 621 122	CTR48
								90 ⇨ 260 V ∿	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 ⎓	87 621 211	CTR48
								24 V ∿	87 621 212	CTR48
								90 ⇨ 260 V ∿	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 ⎓	87 621 221	CTR48
								24 V ∿	87 621 222	CTR48
								90 ⇨ 260 V ∿	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 ⎓	87 629 111	CTR48E
								115 V ∿	87 629 113	CTR48E
								230 V ∿	87 629 114	CTR48E
		2					1 x 3 A changeover 1 x 3 A NO	11 ⇨ 30 V ⎓	87 629 121	CTR48E
								115 V ∿	87 629 123	CTR48E
								230 V ∿	87 629 124	CTR48E

Electromechanical counters

Hour counters

	Dimensions (mm)	Counting capacity		Frequency	Supply	Part number	Type
	48 x 48	99,999.99		50 Hz ∿	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
		999,999.99		⎓	10 ⇨ 30 V ⎓	99 782 810	CHM24
	15 x 32	99,999.99		⎓	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

Impulse counters

	Dimensions (mm)	Reset to zero	Counting capacity	Supply	Part number	Type
	15 x 32 Clip-fixing	No	9,999,999	24 V ∿ - 50 / 60 Hz	**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 V ⎓	**99 778 810**	**CIM15**
	24 x 48 Clip-fixing	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-fixing	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-fixing	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-fixing	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-fixing	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-fixing	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-fixing	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**
				110 V ⎓	**99 776 705**	**CIM 36 x 48**
	36 x 48 Screw-fixing	Yes	999,999	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

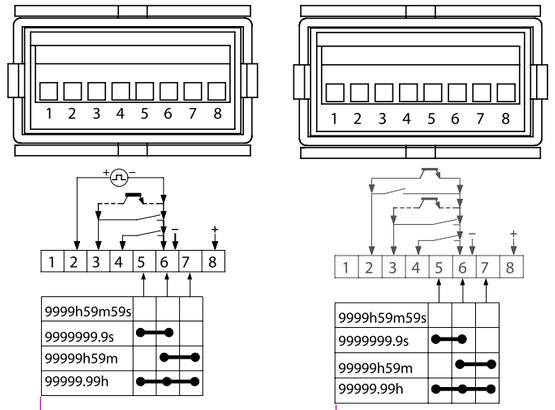
	Functions	Reset to zero	Counting capacity	Frequency	Supply	Part number	Type
	Impulse Hour	No	9,999,999 99,999.99 hrs	50 Hz ∿	20 ⇨ 30 V ∿	**99 779 710**	**CMM48**
					100 ⇨ 130 V ∿	**99 779 712**	**CMM48**
					187 ⇨ 264 V ∿	**99 779 714**	**CMM48**
				60 Hz ∿	20 ⇨ 30 V ∿	**99 779 718**	**CMM48**
	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

Connection diagrams

CTR24 counters
Connections

Hour counters



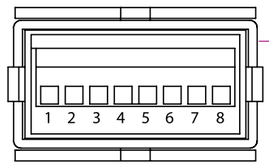
Types 2223 and 2323:

Part numbers:
- 87 622 161
- 87 622 181

Types 2233 and 2333:

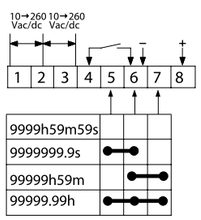
Part numbers:
- 87 622 162
- 87 622 182

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



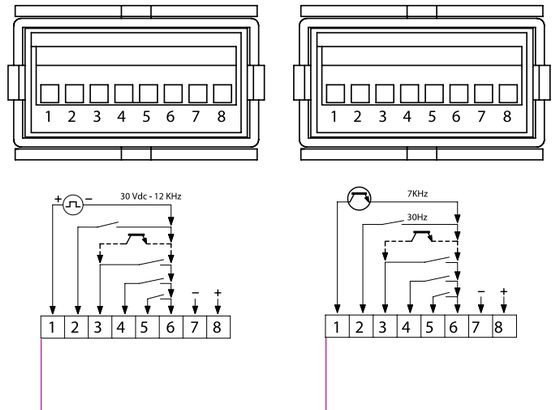
Types 2224 and 2324:

Part numbers:
- 87 622 170
- 87 622 190



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

Impulse counters



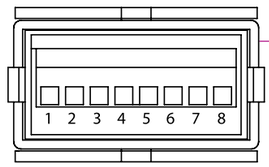
Types 2241 and 2341:

Part numbers:
- 87 622 061
- 87 622 081

Types 2251 and 2351:

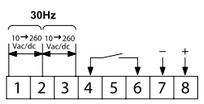
Part numbers:
- 87 622 062
- 87 622 082

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



Types 2242 and 2342:

Part numbers:
- 87 622 070
- 87 622 090



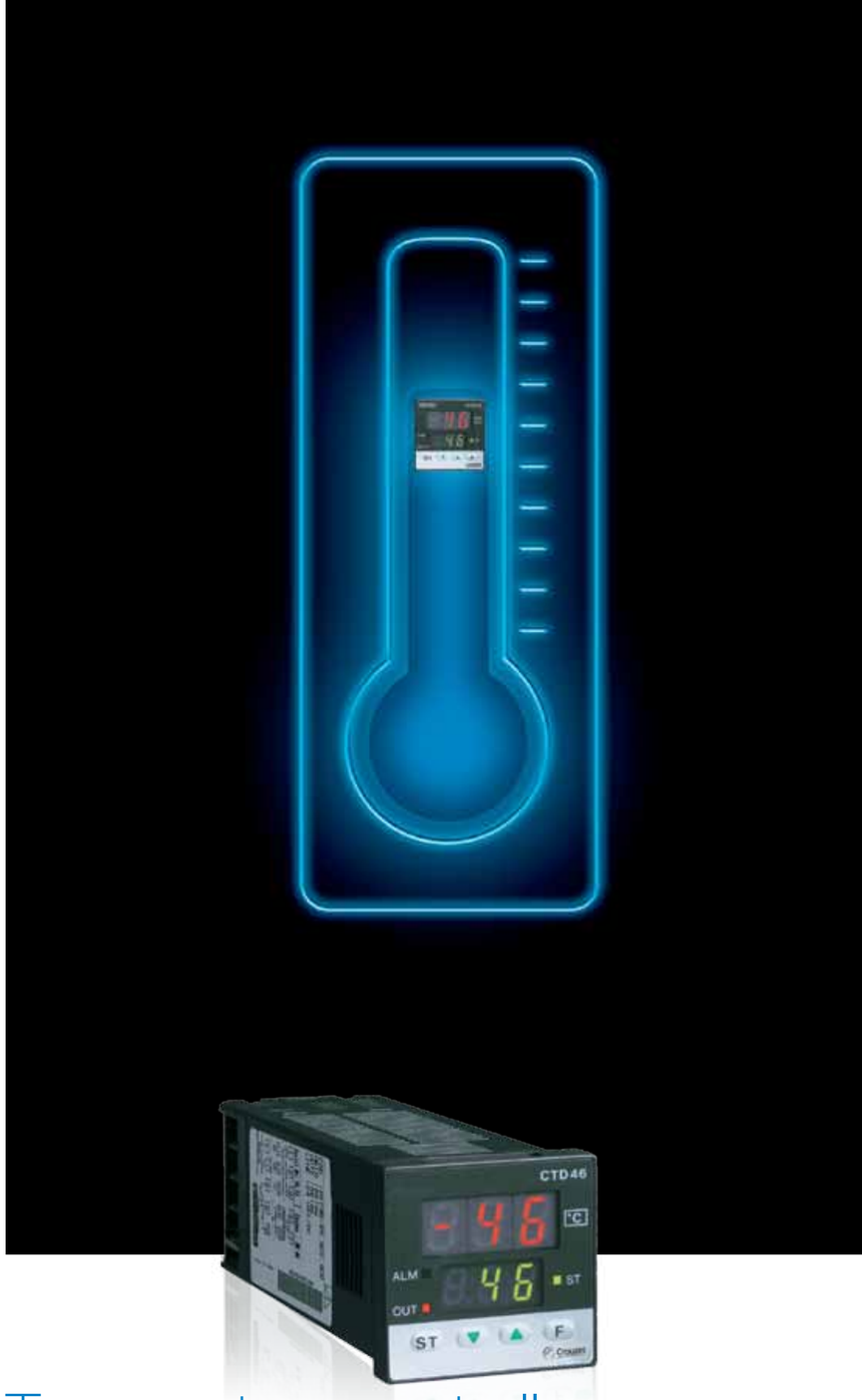
1. Fast count
2. Common ≂
3. Reset input
4. Enable front panel Reset
5. NC
6. GND
7. Optional backlighting - (only 23xx)
8. Optional backlighting + (only 23xx)

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.



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

CTD46

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.

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

Chocolate factory

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

TEMPERATURE CONTROLLER
CTD43

Bain-Marie

Maintaining the temperature of a bain-marie during cooking.

TEMPERATURE CONTROLLER
CTD46

Packaging

Monitoring the heating temperature of the various packages.

TEMPERATURE CONTROLLER
MIC48

Fluid management

Maintaining the temperature of a ceramic oven.

TEMPERATURE CONTROLLER
CTD43

Oven

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

TEMPERATURE CONTROLLER
MIC48

Cold room

Maintaining a storage room at freezing temperature.

TEMPERATURE CONTROLLER
CTD46

Brewing

Managing cooling of fermentation tanks.

TEMPERATURE CONTROLLER
MIC48

Cooking

Control of industrial ovens.

TEMPERATURE CONTROLLER
CTD46

Air treatment plant

Maintaining forced air at the correct temperature.

TEMPERATURE CONTROLLER
MIC48

Spray booth

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

TEMPERATURE CONTROLLER
CTD46

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
							100 ⇨ 240 V ∿	89 421 108	CTD43
					1 voltage logic 1 x 1 A relay		24 V ⎓	89 421 112	CTD43
							100 ⇨ 240 V ∿	89 421 118	CTD43
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
							100 ⇨ 240 V ∿	89 422 108	CTD46
					1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 112	CTD46
							100 ⇨ 240 V ∿	89 422 118	CTD46
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
							100 ⇨ 240 V ∿	89 422 508	CTH46
					1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 512	CTH46
							100 ⇨ 240 V ∿	89 422 518	CTH46
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
							100 ⇨ 240 V ∿	89 422 008	MIC48
					1 voltage logic 1 x 1 A relay		24 V ⎓	89 422 012	MIC48
							100 ⇨ 240 V ∿	89 422 018	MIC48

Accessories

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

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**.

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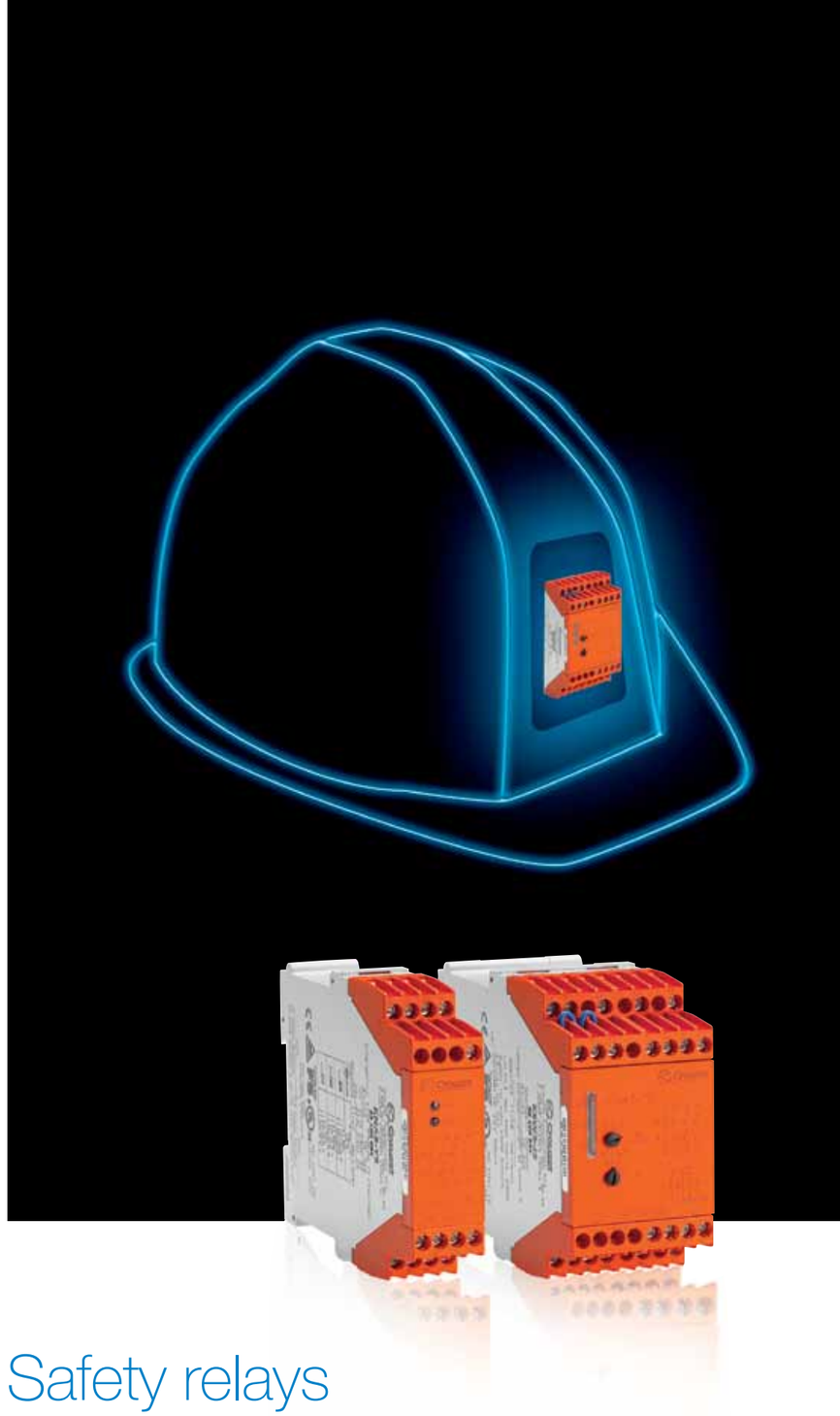


Safety relays

User protection

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

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

It is essential for compliance with 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

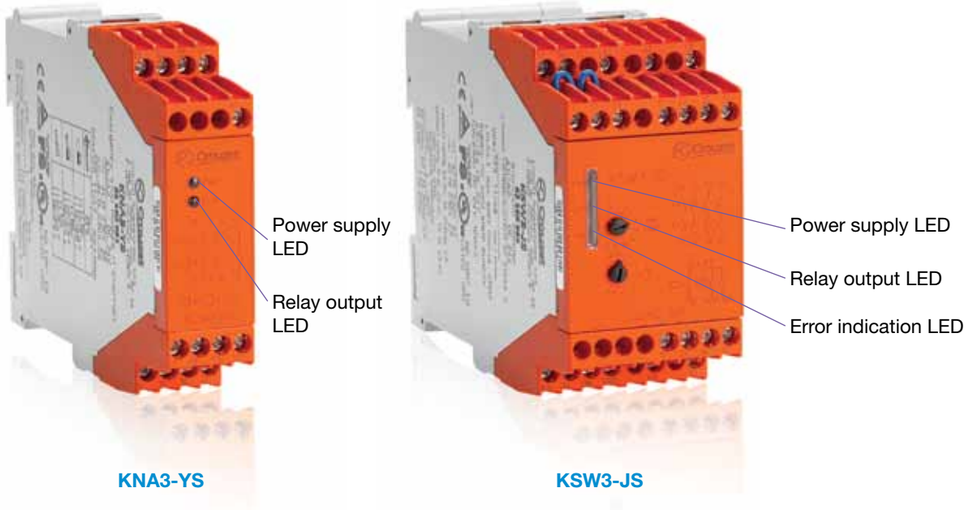
Monitoring

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 relevelling range and a machine safety range



KNA3-YS KSW3-JS

Crouzet Control, safety relays
Their features:

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

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 ⎓	85 102 031	KNA3-YS
							110 V ∿	85 102 034	
							230 V ∿	85 102 035	
					Removable spring terminals		24 V ⎓	85 103 031	KNAC3-YS
							110 V ∿	85 103 034	
							230 V ∿	85 103 035	
	Emergency stop & Safety guard monitoring with 2 channels	4	3 x NO	1 x NC	Screw terminals	22.5	24 V ⎓/∿	85 102 436	KNE3-YS
							110 - 115 V ∿	85 102 434	
							230 V ∿	85 102 435	
					Removable spring terminals		24 V ⎓/∿	85 103 436	KNEC3-YS
	Timed contacts 1 ⇨ 10 s	4	2 x NO (instantaneous) 1 x NO (timed)	-	Screw terminals	22.5	24 V ⎓/∿	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 ⎓/∿	85 102 956	KZE5-YS
							110 - 115 V ∿	85 102 954	
							230 - 240 V ∿	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 ⎓	85 102 331	KSW3-JS
	Two-hand control	4	2 x NO	-	Screw terminals	22.5	24 V ⎓	85 102 621	KZH2-Y2
			3 x NO	1 x NC			24 V ⎓	85 102 631	KZH3-YS
							24 V ∿	85 102 632	
	Power supply for 24 V ⎓ safety relays	-	-	-	Screw terminals	22.5	85 ⇨ 265 V ⎓/∿	85 102 208	KPS0-YS

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

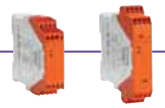
	Function(s)	Safety category	Safety contacts	Data contact	Connection	Casing width (mm)	Supply	Part number	Type
	Relevelling zone control for lifts	4	2 x NO	-	Removable screw terminals	22.5	24 V ⎓/∿	85 102 826	KZHNU-YS
				1 x NC			24 V ⎓/∿	85 102 526	KZHNV-YS

Applications

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

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Notes

CROUZET
AUTOMATION

Logic controllers

Concentrated performance

Millenium 3 *Smart & Essential*

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

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

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

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

A logic controller
To execute which actions?

Controlling

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

Measuring, Operator dialogue

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

Managing

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

Communicating, Triggering

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

Controlling

Measuring

Operator dialogue

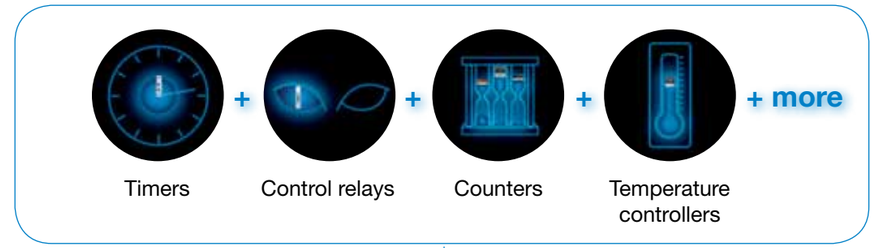
Managing

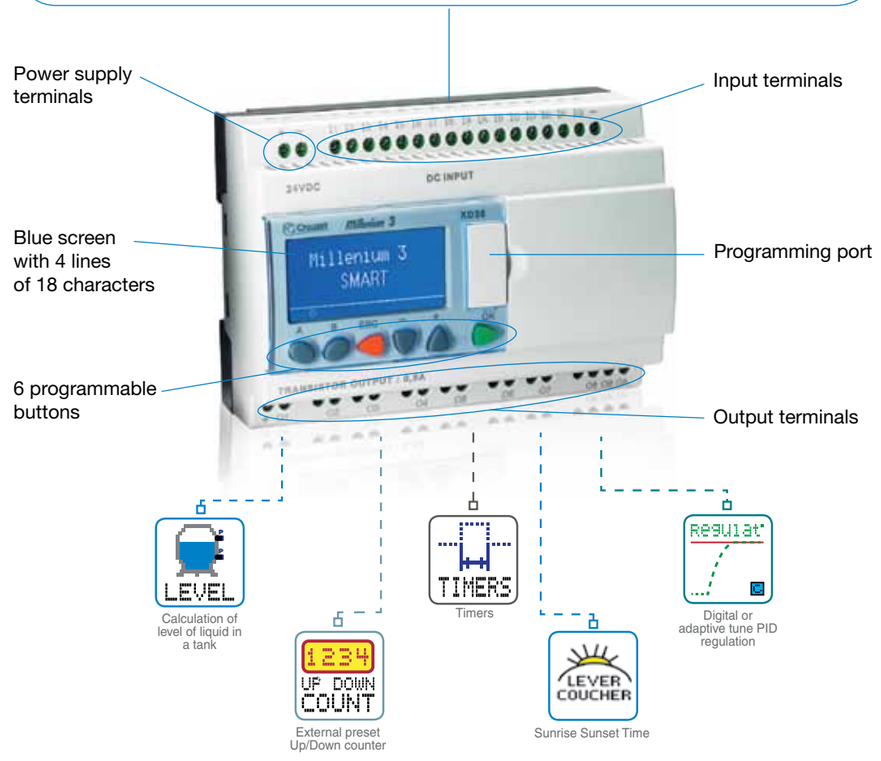
Communicating

Triggering

Crouzet Automation Logic Controllers
Millenium 3, concentrated performance

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





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

Crouzet Automation Logic Controllers
The Millenium 3 Smart range

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

Expandable versions

XD26 XB26

XD10 XB10

Expandable kit

Compact versions

CD20 CB20

CD12 CB12

Compact kit

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

Crouzet Automation Logic Controllers
Extensive Connectivity Options

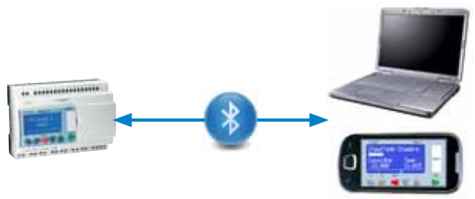
Solutions with close proximity to your installation

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

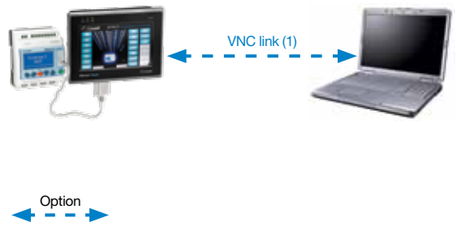
- **Bluetooth® interface** (10 m): Millenium 3 accessory
- Two versions: **Lite** (ESC/ENTER buttons disabled) & **Standard**

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.

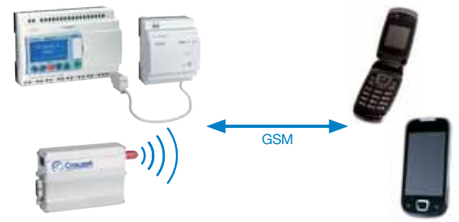
Wide Area Network (WAN) solutions

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

In summary

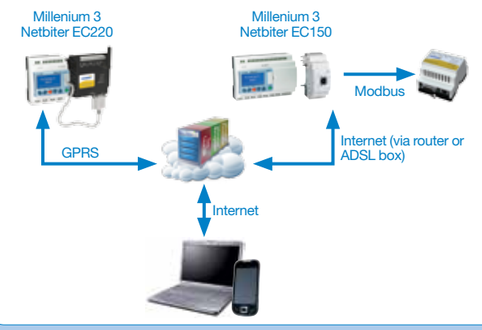
- Reliable **plug & play** solution that is simple to install
- Solution managed using **M3 Soft** software
- Option **to send SMS messages** via a telecom operator service

Remote management solutions with 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.

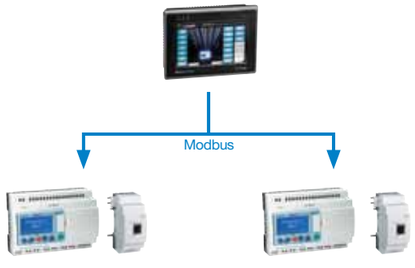
Local Area Network (LAN) solutions

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

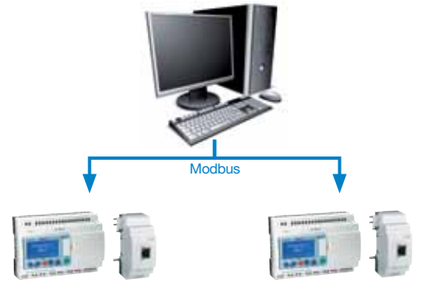
- MTP panel **Modbus master**
- XN05 extension: **Modbus Ethernet TCP/IP**
- XN06 extension: **Modbus RS485 RTU**

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

M3 Soft software

Crouzet Automation Logic Controllers

Millenium 3 and M3 Soft

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

Free

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

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 flow

User-friendly and ergonomic

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

Logic controllers

Function block marked in red:

CTN 1	Available only for the Millenium 3 Smart Range

Applications

Crouzet Automation Logic Controllers

Where are they found?

Buidling Equipment

Access Control

Opening control for doors

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

BOOLEAN

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.

1234 PRESET COUNT

TIME PROG

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

TIME PROG

WATER RATIO
Water temperature control

CLOCK
Weekly and yearly time programmer

Air treatment plant

Maintaining forced air at the correct temperature

CTN1 °C

Regulat°

GAIN

NTC1
Temperature measurement

REGULATION
Analog PID regulation

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

Building Automation

Solar water heating

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

Regulat°

TEMPERATURE CONTROL
(pressure or other)

Illuminated signs

Managing flashing on illuminated signs

TIME PROG

LUX-I

WEEKLY TIME PROGRAMMER
Programming of time slots during which it will be possible to execute actions

LUX-I
Measurement of the light level

TWILIGHT
Calculation of the sunrise and sunset times

Infrastructure and Energy

Fluid management

Swimming pools, fountains, spas

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

FILTRATION
Filtration duration settings depending on the water temperature

Irrigation/Sprinklers

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

PUMP MANAGEMENT
Pump rotation function

Water treatment

Reverse osmosis

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

CTN2 °C

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

LEVEL

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

LEVEL
Calculation of the level of liquid in a tank

Industrial OEMs

Packing machines

Stretch wrapping machines

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

STEP

TIMERS

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

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

Packaging

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

1234 H-SPEED COUNT

&

AND

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 12 V ⎓	Available in 24 V ∿	Available with Solid State Output 0.5 A/PWM	Available in / compatible with the Essential version **
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 programms
	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)*
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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99 777 724	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*
99 779 715	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	*46-47*
99 779 716	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	*46-47*
99 779 718	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	*46-47*
99 779 810	Dual function 48 x 48 electromechanical counter - Hour and impulse	CMM48	*46-47*
99 780 712	Dual function 48 x 48 electromechanical counter - Hour and energy	CEM48	*46-47*
99 780 714	Dual function 48 x 48 electromechanical counter - Hour and energy	CEM48	*46-47*
99 782 710	24 x 48 electromechanical hour counter - 50 Hz	CHM24	*44-45*
99 782 712	24 x 48 electromechanical hour counter - 50 Hz	CHM24	*44-45*
99 782 714	24 x 48 electromechanical hour counter - 50 Hz	CHM24	*44-45*
99 782 715	24 x 48 electromechanical hour counter - 60 Hz	CHM24	*44-45*
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*
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