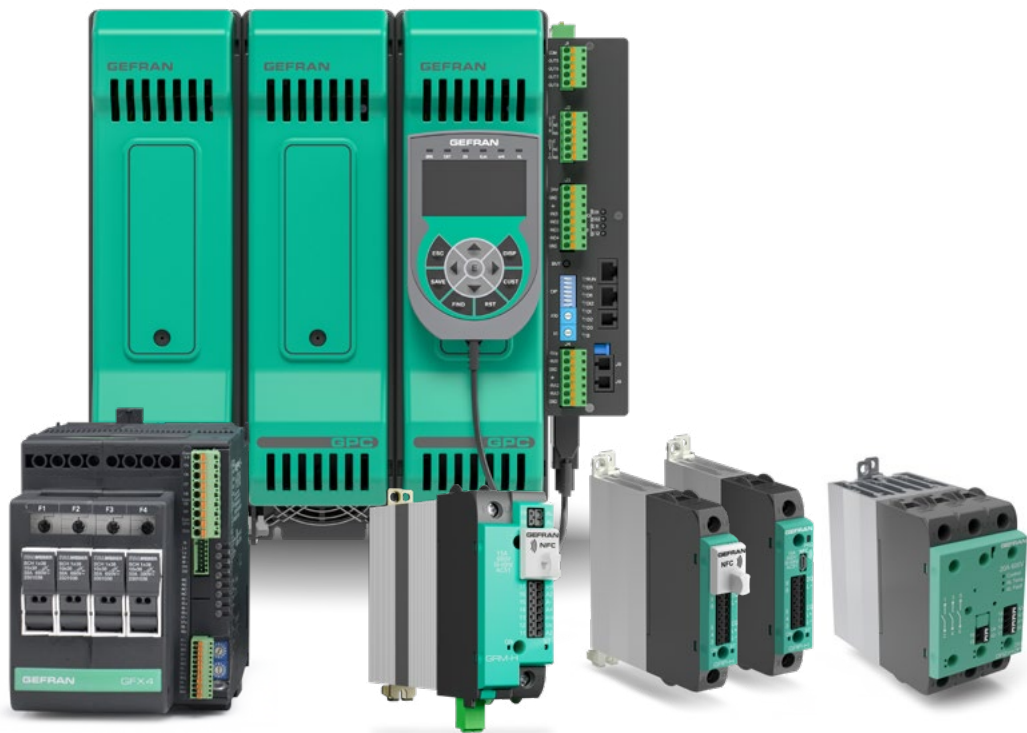


ENG

POWER CONTROL

RELAYS, STATIC UNITS AND POWER CONTROLLERS



GEFRAN

BEYOND TECHNOLOGY



GEFRAN

BEYOND TECHNOLOGY

More than fifty years of experience, an organisation with a strong focus on the customer's needs and non-stop technological innovation have made Gefran a benchmark in the design and production of sensors, systems and components for industrial process automation and control. Expertise, flexibility and process quality are the factors that distinguish Gefran in the production of integrated tools and systems for specific applications in various fields of industry, with consolidated know-how in the plastics, mobile hydraulics, heating and lifting sectors.

Technology, innovation and versatility represent the catalogue's added value, in addition to the ability to create specific application solutions in association with the world's leading machine manufacturers.

APPLICATION SECTORS



Thanks to its consolidated experience in the supply of process controls and an ongoing research and development programme, Gefran offers a series of solutions for all applications requiring accurate and safe control in heating processes with electric heaters to meet today's challenges in a variety of industries.

Gefran offers a wide range of products that are scalable in terms of both performance and characteristics, indispensable for management of various types of electrical resistors, such as infrared lamps, linear resistors, SiC, MoSi2 and graphite. Gefran's Power Controllers and SSR units are designed with a special focus on ease of use and configuration. In addition, Gefran's internationally patented system (Xtra) automatically triggers a safety mechanism in the event of a short circuit, which, combined with an automatic reset, guarantees continuity of production in the event of a momentary short circuit.

Not only resistive load control, but also connectivity, remote diagnostics, predictive maintenance and energy counting. These are just some of the additional features that allow devices to communicate and make decisions independently, basing their actions on the process data available to them, turning them into intelligent components.



AUTOMOTIVE



AEROSPACE
AERONAUTICAL



FOOD
INDUSTRY



INDUSTRIAL FURNACES



LABORATORIES /
MEDICAL



OIL & GAS



HEAT TRACING



PLASTIC
EXTRUSION INJECTION
BLOW MOLDING



PACKAGING



GLASS PRODUCTION



IR DRYING
PROCESSES



PRINTING
MACHINES



COMPOUND MATERIAL
PRODUCTION



THERMOFORMING

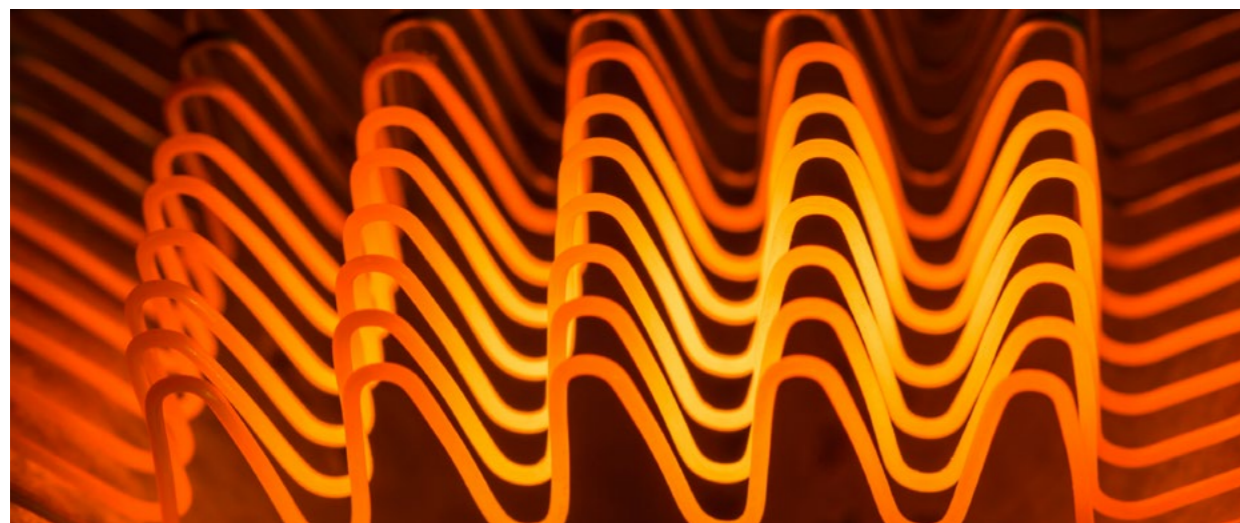
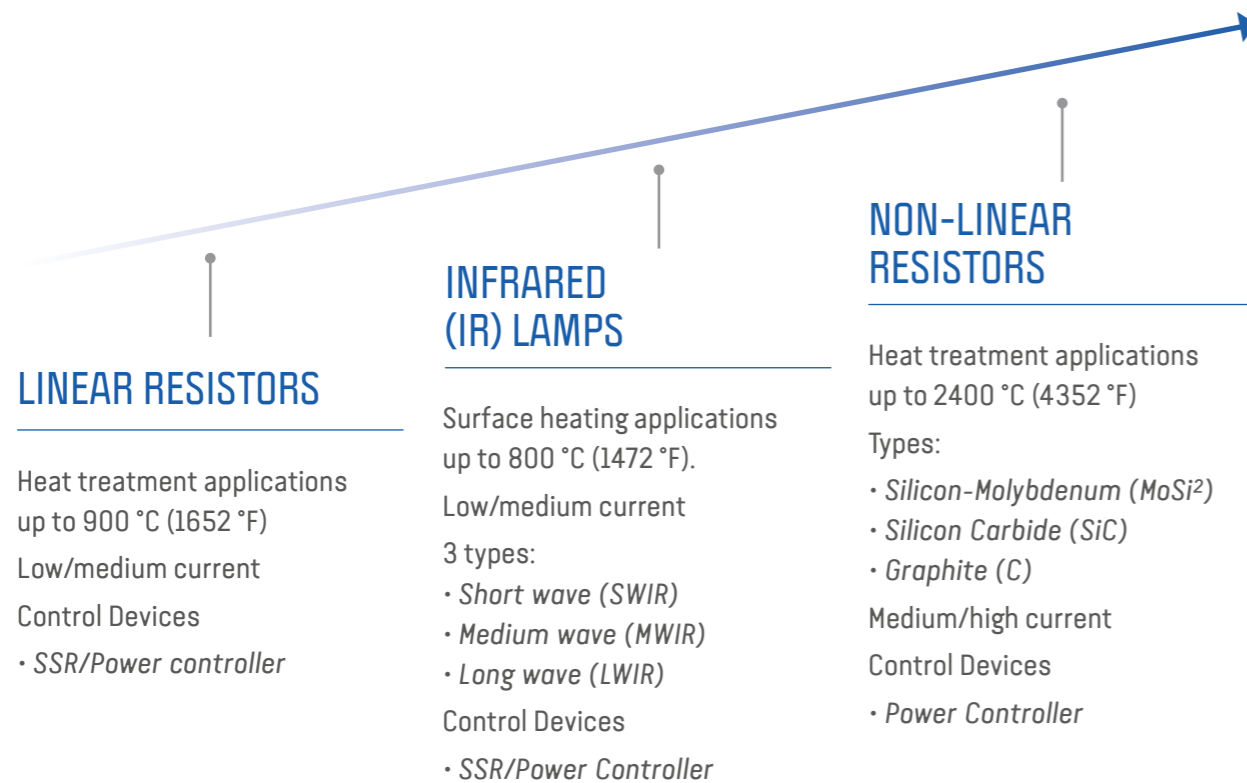


PHOTOVOLTAIC

RESISTIVE ELECTRICAL LOADS

Electrical energy is transformed into thermal energy (heat) by devices called "electrical resistors".

Different types of resistors are used depending on the temperature of the heating process, requiring different types of control.

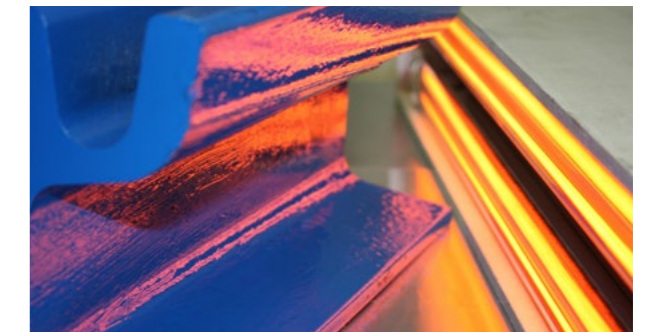
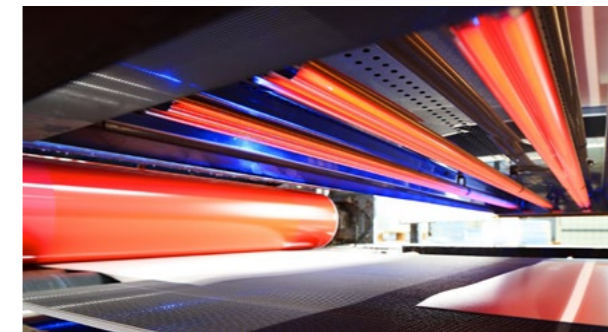


THE RIGHT SETTING FOR ALL IR HEATING LAMPS

Gefran offers a complete range of devices for precise control of infrared heating lamps, from long wave lamps to short wave lamps.

Infrared lamps are used in many applications due to their versatility and their ability to provide thermal energy with precision, high efficiency and energy savings.

Gefran Power Controllers, with their specific functions, allow safe, perfect control of infrared lamps, optimizing their performance and increasing their average operating life.



DEDICATED SOFT START IR

A dedicated Soft Start algorithm ensures precise control of overloads and the current peaks typical of infrared lamps in cold heating phases.

CONFIGURABLE TRIP MODE

Half Single Cycle mode allows you to control IR lamps by reducing flickering and eliminating EMC emissions. Phase Angle mode ensures perfect stability of control power.

FEEDBACK FUNCTIONS

Voltage, current or power control feedback functions permit perfect regulation, automatically correcting any variations in voltage and current so that exactly the amount of energy required is supplied at any time and under all conditions.

BROKEN LAMP DETECTION

Rapid reading of RMS current ensures that lamp breakage is reported in all control modes. The self-learning function of the thermal characteristics of lamps improves the accuracy of lamp breakage diagnostics.

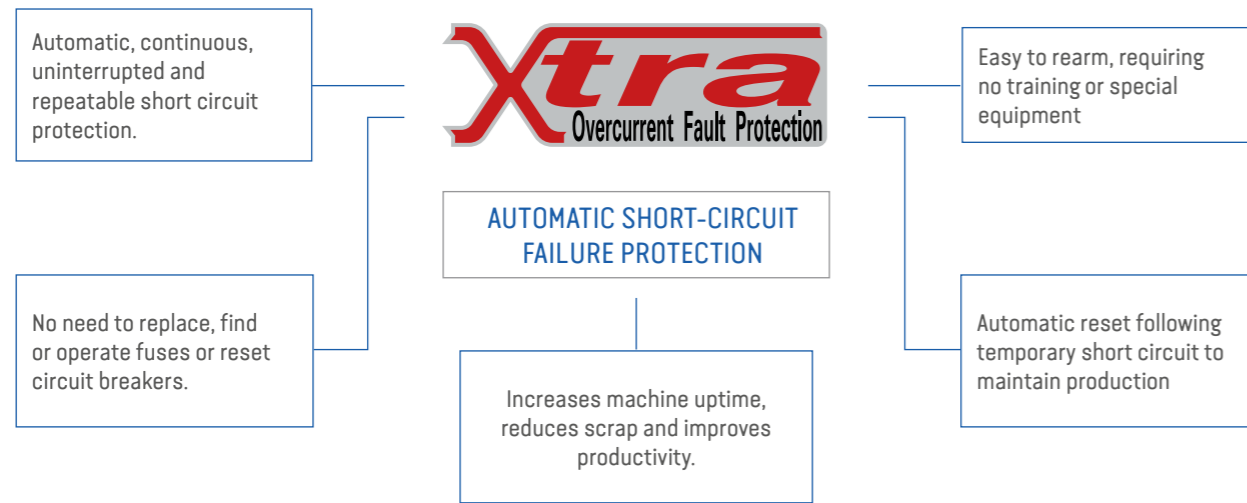
CURRENT LIMITS

The current limit function prevents the risk of exceeding the command limit. Peaks and RMS current value are constantly under control.



GEFRAN Xtra POWER CONTROL

PERMANENT COMPLETE PROTECTION



BENEFITS



Cost reduction and optimization of spare fuse stocks



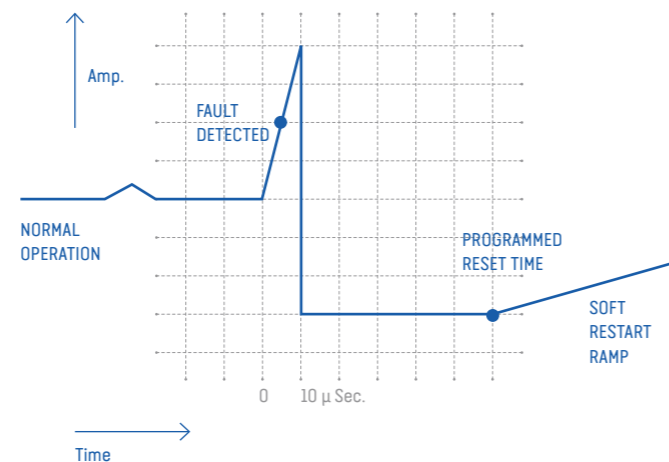
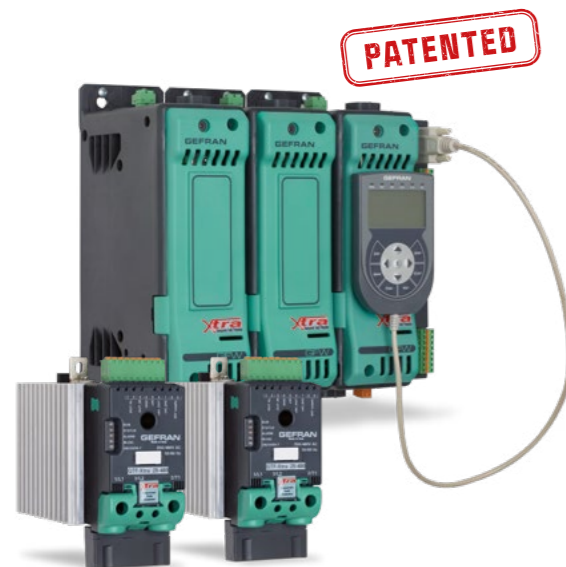
Guaranteed production



Easy to install with limited maintenance



Fully automated reset



SHORT CIRCUIT CURRENT RATING (SCCR)

WHAT IS SCCR CERTIFICATION

The amount of current that a component, if applied correctly, can safely withstand in the event of a failure.

WHAT IS REQUIRED

Having sufficient protection against short circuits in industrial control panels to protect equipment and personnel from risks and damage.

WHERE IT IS APPLICABLE

In US industrial control panels used for machines or plants.

WHO REQUIRES IT?

The Occupational Safety and Health Administration (OSHA) and the National Electrical Code (NEC), via Underwriters Laboratories (UL).

SCCR RMS SYM
100KA / 600V

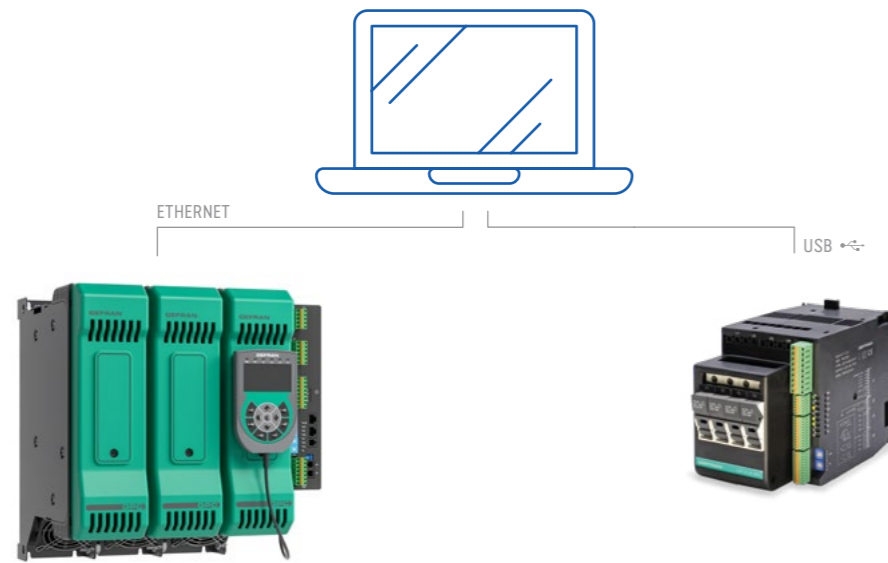


CONFIGURATION SOFTWARE



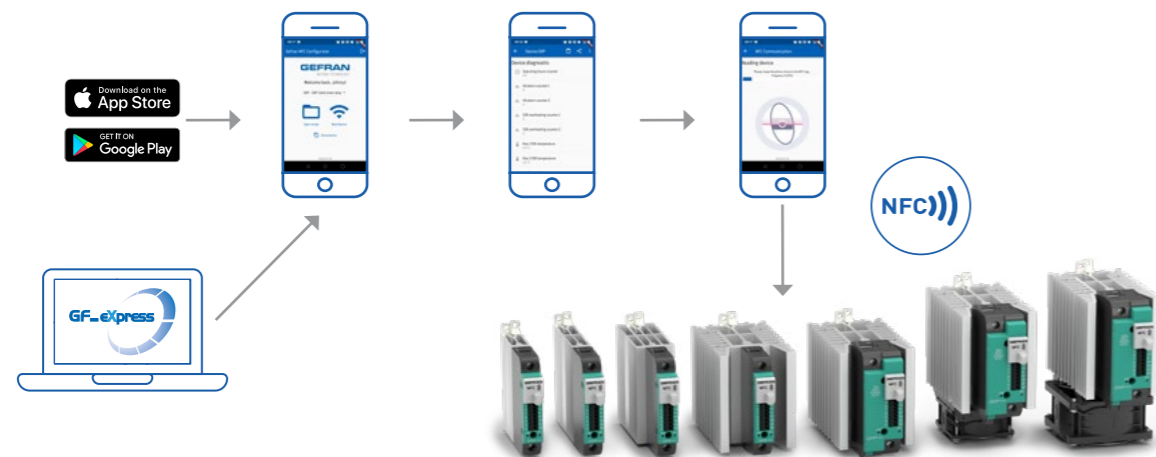
GF_express is a software for configuration/parameterization of all GEFran devices (components, automation products, drives and sensors).

The selection and parameterization of the device is simple and intuitive thanks to a completely graphic interface.



“GEFRAN NFC” APP - SMART CONFIGURATION

- Easy-to-use configuration
- Data monitoring
- Integrated diagnostic
- Backup and Restore configuration
- Remote sharing GF_express configuration file



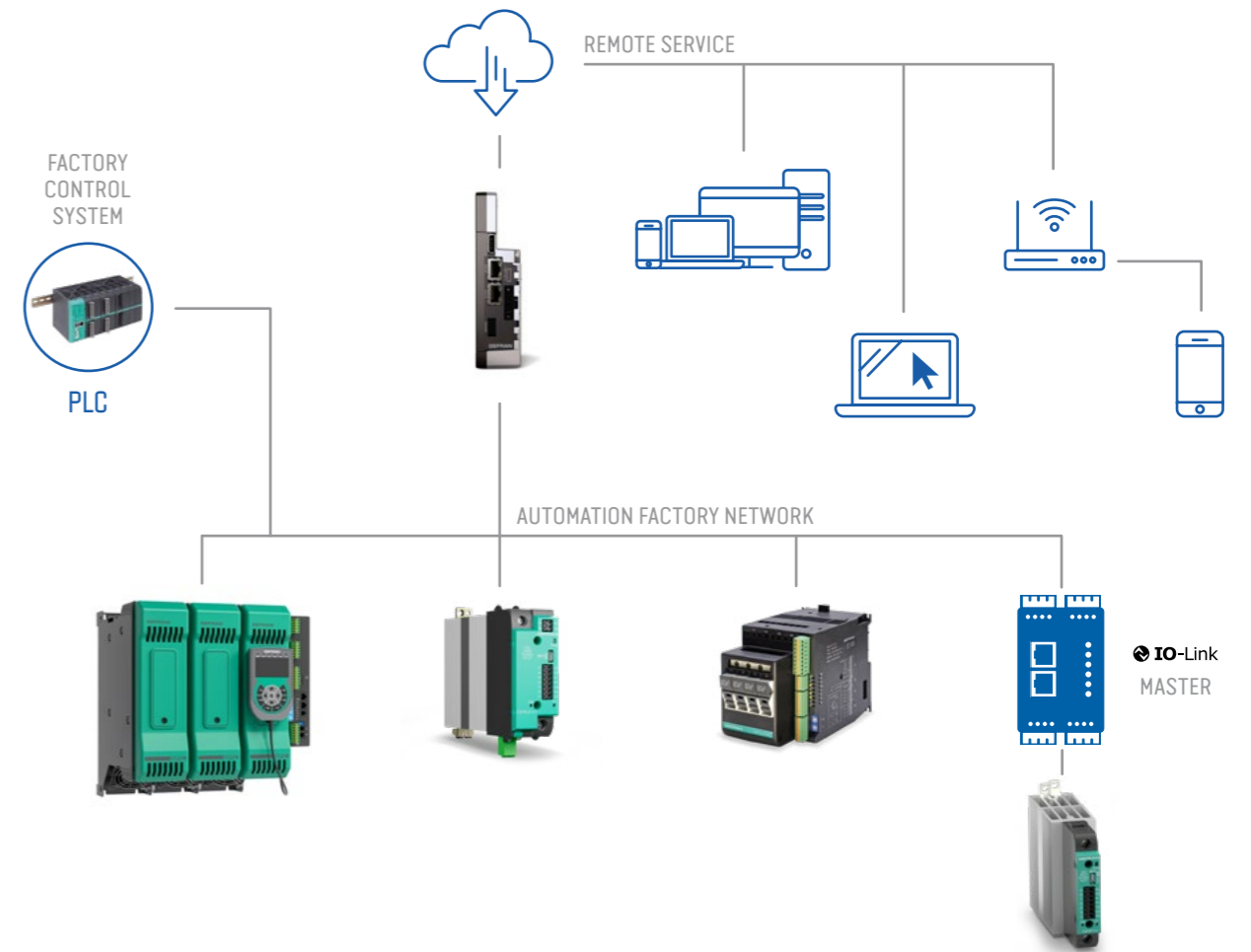
CONNECTIVITY

FACTORY INTEGRATION AND SYSTEM DIAGNOSTICS

Solid State Relay and Power Controllers are prepared for connection to centralized acquisition or control systems such as HMI and DCS within factory automation networks. Thanks to the wide range of communication fieldbuses available, Power Controllers may be connected with all major factory automation systems.

CERTIFICATIONS

ODVA and PI certification for Ethernet/IP and ProfiNET fieldbuses, respectively, guarantees the efficiency and compatibility of data exchange between the Power Controller and the control system.



SOLID STATE RELAY SERIES

SIMPLE AND ROBUST, SUITABLE FOR A VARIETY OF APPLICATIONS

- 10A to 120A
- Logic / Analogic command
- Load disconnection alarm (HB) and overheating alarm
- Single and three-phase
- With and without integrated heat sink



GQ

(15... 90A)



GRS

(15... 120A)



GRZ

(10... 75A)
(BI-THREE-PHASE)



GRP

(15... 120A)



GRS-H

(15... 120A)



GRZ-H

(10... 75A)
(BI-THREE-PHASE)



GRP-H

(15... 120A)

GFX4-IR / GFX4 POWER CONTROLLER SERIES

AN EXCLUSIVE COMPACT PRODUCT INTEGRATING PID & POWER CONTROLLER REGULATION

- 4 Solid State relays
- Up to 40A/channel
- 4 PID regulators
- Fieldbus communication



GRM POWER CONTROLLER SERIES

COMPACT AND VERSATILE, SUITABLE FOR THE CONTROL OF MEDIUM AND HIGH COMPLEXITY ELECTRIC HEATING PROCESSES

- From 10A to 120A
- Linear and non-linear resistors and transformers
- Single-phase
- Fully configurable command signal, firing mode and feedback
- Digital communication



GPC POWER CONTROLLER SERIES

SIMPLE AND PRECISE, IDEAL FOR ADVANCED ELECTRIC HEATING CONTROL

- 40A to 600A
- Linear and non-linear resistors and transformers
- Mono, two and three phase
- Fieldbus communication
- Preventive maintenance



ZERO CROSSING

LOAD DISCONNECTION ALARM

"BURST FIRING" ZERO CROSSING

HALF SINGLE CYCLE, PHASE ANGLE, FEEDBACK

<p>PHOTOVOLTAIC, PLASTIC, FURNACES, GLASS, PAPER, FOOD</p> <p>POWER CONTROLLER</p>	 <p>GFX-M1 GFX-S1 (25A ... 120A)</p>	 <p>GFX-M2 GFX-S2 (5A,10A,15A)</p>	 <p>GFX4 (16,32,40A) (4 CHANNELS)</p>	 <p>GTF-XTRA (PATENTED) (25...60A).</p>  <p>GFW-XTRA (PATENTED) (40...100A).</p>  <p>GRM/GRM-H (10...120A).</p>  <p>IR12/IR24 9A (12/24 CHANNELS)</p>	 <p>GFW/GPC (40...600A).</p>  <p>GFX4-IR (16, 32, 40A)(4 CHANNELS)</p>
<p>PLASTIC, PACKAGING, FURNACES</p> <p>STATIC UNITS</p>	 <p>GRS-H (15... 120A)</p>	 <p>GRZ-H (10... 75A) (BI-THREE-PHASE)</p>		 <p>GRP-H (15... 120A)</p>	
<p>PLASTICS, PACKAGING</p> <p>STATIC RELAYS</p>	 <p>GQ (15... 90A)</p>	 <p>GRS (15... 120A)</p>	 <p>GRZ (10... 75A) (BI-THREE-PHASE)</p>	 <p>GRP (15... 120A)</p>	<p>MULTIFIELDBUS</p>  <p>DeviceNet EtherNet/IP</p> 

SELECTION GUIDE BY FUNCTION

SERIES		STATIC RELAYS			
		GQ	GRS	GRP	GRZ
RATING	Rated voltage values (Vac)	230Vac, 480Vac, 600Vac	230Vac, 600Vac	230Vac, 600Vac	400Vac, 480Vac, 600Vac
	Rated current values (A)	15, 25, 50, 90	15, 25, 30, 40, 50, 60, 75, 90, 120	15, 25, 30, 40, 50, 60, 75, 90, 120	15, 25, 30, 40, 50, 75 (2 pole) 10, 20, 25, 30, 40, 65 (3 pole)
INTEGRATED HEAT SINK	Integrated heat sink with DIN rail mounting	no	no	no	no
TYPE OF LOAD	Low thermal coefficient resistors	X	X	X	X
	Long wave IR lamps	X	X	X	X
	Medium wave IR lamps			X	
	Short wave IR lamps				
	High thermal coefficient resistors: (Kanthal, Super Kanthal, Silicon Carbide)				
	Single-phase transformers				
	Three-phase transformers				
INPUT CONTROLS	Digital ON/OFF Vdc	X	X	X	X
	Digital ON/OFF Vac	X	X		X
	Digital PWM				
	Analogue 0-10V, 4-20mA			X	
	Analogue, potentiometer			X	
	IO-Link communication			X	
TYPE OF TRIGGER	Zero crossing, ON/OFF (ZC)	X	X	X	X
	Fast "Burst firing" (BF) zero crossing			X	
	Optimized fast zero crossing "Half Single Cycle" (HSC)			X	
	Phase angle (PA)			X	
	Delay triggering (DT)				
				X	
OPTIONS	Soft Start			X	
	Current limits				
	Disconnected load alarm		X	X	X
	Short circuit alarm			X	
	Overheating alarm		X	X	X
	Integrated extra-rapid fuse				
	Overcurrent fault protection (Xtra) (*)				
	Temperature PID on board				
FEEDBACK FUNCTIONS	V, I, P analogue retransmission				
	Voltage feedback (V, V ²)				
	Current feedback (I, I ²)				
FIELDBUS	Power feedback				
	Profibus DP				
	CanOpen				
	DeviceNet				
	Modbus TCP/RTU				
	Ethernet/ IP				
	EtherCAT				
	Profinet				
	IO-Link			X	
CONFIGURATION	PC configuration			X	
	Easy "Smart Configuration"			APP Android/IOs	
	Hand-held keypad programming				
CERTIFICATION	CE	X	X	X	X
	UL	X	X	X	X
	TÜV				
	CSA	X			
	EAC	X	X		
	SCCR (Short Circuit Current Rating)	100KA with appropriate fuse	X	X	X

(*) European Patent No. 2660843

SERIES		STATIC UNITS		
		GRS-H	GRP-H	GRZ-H
RATING	Rated voltage values (Vac)	230Vac, 600Vac	230Vac, 600Vac	400Vac, 480Vac, 600Vac
	Rated current values (A)	15, 25, 30, 40, 50, 60, 75, 90, 120	15, 25, 30, 40, 50, 60, 75, 90, 120	15, 25, 30, 40, 50, 75 (2 pole) 10, 20, 25, 30, 40, 65 (3 pole)
INTEGRATED HEAT SINK	Integrated heat sink with DIN rail mounting	yes	yes	yes
TYPE OF LOAD	Low thermal coefficient resistors	X	X	X
	Long wave IR lamps	X	X	X
	Medium wave IR lamps		X	
	Short wave IR lamps			
	High thermal coefficient resistors: (Kanthal, Super Kanthal, Silicon Carbide)			
	Single-phase transformers			
	Three-phase transformers			
INPUT CONTROLS	Digital ON/OFF Vdc	X	X	X
	Digital ON/OFF Vac	X		X
	Digital PWM			
	Analogue 0-10V, 4-20mA		X	
	Analogue, potentiometer		X	
	IO-Link communication		X	
TYPE OF TRIGGER	Zero crossing, ON/OFF (ZC)	X	X	X
	Fast "Burst firing" (BF) zero crossing		X	
	Optimized fast zero crossing "Half Single Cycle" (HSC)		X	
	Phase angle (PA)		X	
	Delay triggering (DT)			
			X	
OPTIONS	Soft Start		X	
	Current limits			
	Disconnected load alarm	X	X	X
	Short circuit alarm		X	
	Overheating alarm	X	X	X
	Integrated extra-rapid fuse			
	Overcurrent fault protection (Xtra) (*)			
	Temperature PID on board			
FEEDBACK FUNCTIONS	V, I, P analogue retransmission			
	Voltage feedback (V, V ²)			
	Current feedback (I, I ²)			
FIELDBUS	Power feedback			
	Profibus DP			
	CanOpen			
	DeviceNet			
	Modbus TCP/RTU			
	Ethernet/ IP			
	EtherCAT			
	Profinet			
	IO-Link		X	
CONFIGURATION	PC configuration		X	
	Easy "Smart Configuration"		APP Android/IOs	
	Hand-held keypad programming			
CERTIFICATION	CE	X	X	X
	UL	X	X	X
	TÜV			
	CSA			
	EAC	X		
	SCCR (Short Circuit Current Rating)	X	X	X

SELECTION GUIDE BY FUNCTION

SERIES		POWER CONTROLLERS				
		GFX-M/S/E-1	GFX-M/S-2	GFX4	GFX4-IR	IR12/IR24
RATING	Rated voltage values (Vac)	480V	480V	480Vac	480Vac	480Vac
	Rated current values (A)	25,40, 60, 75, 90, 120	5,10,15	16, 32, 40	16, 32, 40	9A/ch
INTEGRATED HEAT SINK	Integrated heat sink with DIN rail mounting	yes	yes	yes	yes	yes (panel mount)
TYPE OF LOAD	Heating elements with low thermal coefficient	X	X	X	X	X
	Long wave IR lamps	X	X	X	X	X
	Medium wave IR lamps				X	X
	Short wave IR lamps				X	X
	High thermal coefficient resistors: (Kanthal, Super Kanthal, Silicon Carbide)				X	
	Single phase transformers				X	
	Three-phase transformers				X	
INPUT CONTROLS	Digital ON/OFF Vdc			X	X	
	Digital ON/OFF Vac					
	Digital PWM					
	Analogue 0-10V, 4-20mA			X (4-20mA)	X	
	Analogue, potentiometer					
TYPE OF TRIGGER	Fieldbus	X	X	X	X	X
	Zero crossing, ON/OFF (ZC)	X	X	X	X	X
	Fast "Burst firing" (BF) zero crossing				X	X
	Optimized fast zero crossing "Half Single Cycle" (HSC)				X	X
	Phase angle (PA)				X	X
	Delay triggering (DT)				X	
OPTIONS	Soft Start	X	X	X	X	X
	Current limits				X	
	Disconnected load alarm	X	X	X	X	X
	Short circuit alarm			X	X	X
	Overheating alarm	X	X	X	X	X
	Integrated extra-rapid fuse		X	X	X	X
	Overcurrent fault protection (Xtra) (*)					
	V, I, P analogue retransmission				X	
FEEDBACK FUNCTIONS	Voltage feedback (V, V ²)				X	X (V)
	Current feedback (I, I ²)				X	
	Power feedback				X	
FIELDBUS	Profibus DP	X	X	X	X	
	CanOpen	X	X	X	X	
	DeviceNet	X	X	X	X	
	Modbus TCP/RTU	X	(Modbus RTU)	X	X	(Modbus RTU)
	Ethernet/IP			X	X	
	EtherCAT			X	X	
CONFIGURATION	Profinet			X	X	X
	PC configuration	X	X	X	X	X
	Easy "Smart Configuration"				X	
CERTIFICATION	Hand-held keypad programming	X	X	X	X	
	CE	X	X	X	X	X
	UL	X	X	X	X	X
	TÜV					
	CSA			X	X	
	EAC	X	X	X	X	
	SCCR (Short Circuit Current Rating)			UL 508 100KA	UL 508 100KA	

SERIES		POWER CONTROLLERS					
		GRM	GTF	GTF-XTRA	GFU	GPC	GFU-XTRA
RATING	Rated voltage values (Vac)	230Vac, 600Vac	480Vac, 600Vac, 690Vac	480Vac	480Vac, 600Vac, 690Vac	480Vac, 600Vac, 690Vac	480Vac
	Rated current values (A)	10, 15, 25, 30, 40, 50, 60, 75, 90, 120	25, 40, 50, 60, 75, 90, 120, 150, 200, 250	25, 40, 50, 60	40, 60, 100, 150, 200, 250, 300	40, 60, 100, 150, 200, 250, 300, 400, 500, 600	40, 60, 100
INTEGRATED HEAT SINK	Integrated heat sink with DIN rail mounting	yes	yes	yes	yes (panel mount)	yes (panel mount)	yes (panel mount)
TYPE OF LOAD	Heating elements with low thermal coefficient	X	X	X	X	X	X
	Long wave IR lamps	X	X	X	X	X	X
	Medium wave IR lamps	X	X	X	X	X	X
	Short wave IR lamps	X	X	X	X	X	X
	High thermal coefficient resistors: (Kanthal, Super Kanthal, Silicon Carbide)	X	X	X	X	X	X
	Single phase transformers	X	X	X	X	X	X
	Three-phase transformers				X	X	X
INPUT CONTROLS	Digital ON/OFF Vdc	X	X	X	X	X	X
	Digital ON/OFF Vac						
	Digital PWM	X	X	X	X	X	X
	Analogue 0-10V, 4-20mA	X	X	X	X	X	X
	Analogue, potentiometer	X	X	X	X	X	X
TYPE OF TRIGGER	Fieldbus	X	X	X	X	X	X
	Zero crossing, ON/OFF (ZC)	X	X	X	X	X	X
	Fast "Burst firing" (BF) zero crossing	X	X	X	X	X	X
	Optimized fast zero crossing "Half Single Cycle" (HSC)	X	X	X	X	X	X
	Phase angle (PA)	X	X	X	X	X	X
	Delay triggering (DT)	X	X	X	X	X	X
OPTIONS	Soft Start	X	X	X	X	X	X
	Current limits	X	X	X	X	X	X
	Disconnected load alarm	X	X	X	X	X	X
	Short circuit alarm	X	X	X	X	X	X
	Overheating alarm	X	X	X	X	X	X
	Integrated extra-rapid fuse			X (I ≥ 150A)	X	X	
	Overcurrent fault protection (Xtra) (*)			X			X
	V, I, P analogue retransmission					X	
FEEDBACK FUNCTIONS	Voltage feedback (V, V ²)	X	X	X	X	X	X
	Current feedback (I, I ²)	X	X	X	X	X	X
	Power feedback	X	X	X	X	X	X
FIELDBUS	Profibus DP				X	X	X
	CanOpen				X	X	X
	DeviceNet						
	Modbus TCP/RTU	(Modbus RTU)	(Modbus RTU)	(Modbus RTU)	X	X	X
	Ethernet/IP				X	X	X
	EtherCAT				X	X	X
CONFIGURATION	IO-Link	X					
	Profinet				X	X	X
	PC configuration	X	X	X	X	X	X
CERTIFICATION	Easy "Smart Configuration"	APP Android/IOs			X	X	X
	Hand-held keypad programming				X	X	X
	CE	X	X	X	X	X	X
	UL	X	X	X	X	X	X
	TÜV		X	X			
	CSA	X	X	X	X (up to 250A)	X (up to 250A)	X
	EAC		X	X	X	X	X
	SCCR (Short Circuit Current Rating)	X	UL 508 100KA (200A; 250A)		UL 508 100KA (100A...300A) **	UL 508 100KA (100A...600A) **	

(*) European Patent No. 2660843 - (**) not applicable for 150A

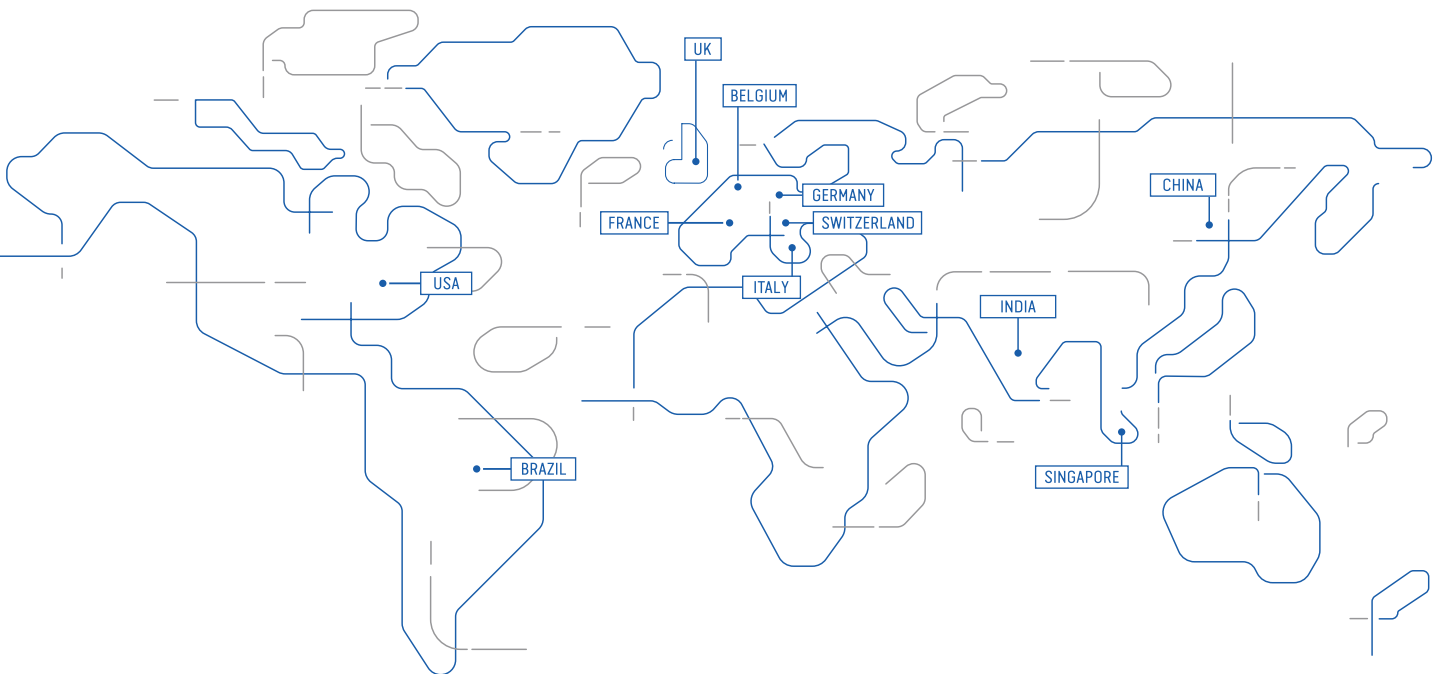
SELECTION GUIDE FOR CONNECTIONS / TYPE OF LOADS

CONNECTIONS	TYPE OF LOADS	MODELS					
		GRM GRM-H	GTF	GTF-XTRA	GFW	GPC	GFW-XTRA
		10...120A	25...250A	25...60A	40...300A	40...600A	40...100A
SINGLE PHASE	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor	1M	1M	1M	1PH	1PH	1PH
	Long wave IR lamp	1M	1M	1M	1PH	1PH	1PH
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp	1M	1M	1M	1PH	1PH	1PH
	Short wave IR lamp	1M	1M	1M	1PH	1PH	1PH
	Kanthal, Super Kanthal elements	1M	1M	1M	1PH	1PH	1PH
	Silicon carbide elements	1M	1M	1M	1PH	1PH	1PH
SINGLE PHASE TRANSFORMER	LOW THERMAL COEFFICIENT RESISTORS						
	Resistance	1M	1M	1M (**)	1PH	1PH	1PH (**)
	Long wave IR lamp	1M	1M	1M (**)	1PH	1PH	1PH (**)
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp	1M	1M	1M (**)	1PH	1PH	1PH (**)
	Short wave IR lamp	1M	1M	1M (**)	1PH	1PH	1PH (**)
	Kanthal, Super Kanthal elements	1M	1M	1M (**)	1PH	1PH	1PH (**)
	Silicon carbide elements	1M	1M	1M (**)	1PH	1PH	1PH (**)
TWO-PHASE (Triangle closed star, no neutral)	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor	1M 1S	1M 1S	1M 1S	2PH	2PH	2PH
	Long wave IR lamp	1M 1S	1M 1S	1M 1S	2PH	2PH	2PH
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp						
	Short wave IR lamp						
	Kanthal, Super Kanthal elements						
	Silicon carbide elements						
THREE-PHASE OPEN TRIANGLE	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor	3M	1M 2S	1M 2S	3PH	3PH	3PH
	Long wave IR lamp	3M	1M 2S	1M 2S	3PH	3PH	3PH
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp	3M	3M	3M	3PH	3PH	3PH
	Short wave IR lamp	3M	3M	3M	3PH	3PH	3PH
	Kanthal, Super Kanthal elements	3M	3M	3M	3PH	3PH	3PH
	Silicon carbide elements	3M	3M	3M	3PH	3PH	3PH
THREE-PHASE STAR WITH NEUTRAL	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor	3M	1M 2S	1M 2S	3PH	3PH	3PH
	Long wave IR lamp	3M	1M 2S	1M 2S	3PH	3PH	3PH
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp	3M	3M	3M	3PH	3PH	3PH
	Short wave IR lamp	3M	3M	3M	3PH	3PH	3PH
	Kanthal, Super Kanthal elements	3M	3M	3M	3PH	3PH	3PH
	Silicon carbide elements	3M	3M	3M	3PH	3PH	3PH
THREE-PHASE	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor	1M 2S	1M 2S	1M 2S	3PH	3PH	3PH
	Long wave IR lamp	1M 2S	1M 2S	1M 2S	3PH	3PH	3PH
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp				3PH	3PH	3PH
	Short wave IR lamp				3PH	3PH	3PH
	Silicon carbide elements				3PH	3PH	3PH
THREE-PHASE TRANSFORMER (**)	LOW THERMAL COEFFICIENT RESISTORS						
	Resistor				2PH [A]/3PH [A]	2PH [A]/3PH [A]	2PH [A]/3PH [A]
	Long wave IR lamp				2PH [A]/3PH [A]	2PH [A]/3PH [A]	2PH [A]/3PH [A]
	HIGH THERMAL COEFFICIENT RESISTORS						
	Medium wave IR lamp				3PH [A]	3PH [A/B]	3PH [A]
	Short wave IR lamp				3PH [A]	3PH [A/B]	3PH [A]
	Kanthal, Super Kanthal elements					3PH [A/B]	
	Silicon carbide elements				3PH [A]	3PH [A/B]	3PH [A]

RECOMMENDED FIRING		RECOMMENDED FUNCTIONS					NOMINAL CURRENT CALCULATION (*)	NB:			
ZC	BF	HSC	PA	DT	Soft Start	Current Limit	Feedback (I)	Feedback (U)	Feedback (P)	P= total power I= rated current to be selected	pw= % of controllable power on the load
x	x									I=P/Vline	
x	x									I=P/Vline	
		x	x		x	x				I=P/Vline	
		x	x		x	x				I=P/Vline	
			x		x		x			I=P/Vline	
		x	x		x			x		I=P/Vline	
x				x						I= 1.2 (P+10%)/ Vline	
x				x						I= 1.2 (P+10%)/ Vline	
			x		x	x				I= 1.2 (P+10%)/ Vline	
			x		x	x				I= 1.2 (P+10%)/ Vline	
			x		x		x			I= 1.2 (P+10%)/ Vline	
			x		x			x		I= 1.2 (P+10%)/ Vline	
x	x									I= P/ (√3 Vline)	
x	x									I= P/ (√3 Vline)	
x	x									I= P/ (3 Vline)	
x	x									I= P/ (3 Vline)	
		x	x		x	x				I= P/ (3 Vline)	
		x	x		x	x				I= P/ (3 Vline)	
			x		x		x			I= P/ (3 Vline)	
		x	x		x			x		I= P/ (3 Vline)	
x	x									I= P/ (√3 Vline)	
x	x									I= P/ (√3 Vline)	
		x	x		x	x				I= P/ (√3 Vline)	pw>6%P (***)
		x	x		x	x				I= P/ (√3 Vline)	pw>6%P (***)
			x		x			x		I= P/ (√3 Vline)	pw>6%P (***)
x				x						I= 1.2 (P+10%)/ (√3 Vline) (**)	
x				x						I= 1.2 (P+10%)/ (√3 Vline) (**)	
		x			x	x				I= 1.2 (P+10%)/ (√3 Vline) (**)	pw>6%P (***)
		x			x	x				I= 1.2 (P+10%)/ (√3 Vline) (**)	pw>6%P (***)
			x		x			x		I= 1.2 (P+10%)/ (√3 Vline) (**)	pw>6%P (***)

(*) It is recommended to always add a safety margin of at least 10% on the theoretical calculation of the current - Formulas valid if Vline=Vload
 (**) It is advisable to contact GEFran's specialized personnel
 (***) Valid only for GFW / GFW-Xtra

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