

# Martens

Member of GHM GROUP



**Reacts before the danger appears**  
Safety-TL4896 safety temperature limiter



# Heat safely!

## New safety solution for heaters in accordance with EN 746-2

### Areas of application for the Safety-TL4896 of GHM GROUP

Heating can quickly become dangerous! Whenever the installed heating output must be configured well beyond the actual typical requirement at the operating point of a heating system, an uncontrolled malfunction, device failure or undesired "runaway" of the heater will result in excessive temperatures that have a damaging effect on the system itself and thus product it is used to produce. After all, the influences on the heating environment endanger not only product quality, but also most irreparable installation devices and can harm the health of the people working with the equipment. Water preparation is a prime example of the necessity of safety monitoring with early automatic intervention. Instead of lukewarm water for hand-washing, boiling water could suddenly emerge unexpectedly from the tap. Underfloor heating would also destroy parquet floors due to thermal expansion. Installation pipes could rupture and the leaking water could cause further damage in the masonry and then furnishings and wall hangings or, for example, destroy museum exhibits and irreparably harm parts of historical buildings.

The necessity to take extensive safety precautions to reliably prevent the effects of excessive temperatures becomes clear rather quickly in these everyday cases, not to mention all industrial applications for tempering, drying and heat treatment.

### Special applications

These industrial plants include - in addition to steam boilers and hot water heaters (e.g. CHP) - hardening vessels and autoclaves, which are used in various sizes and applications in diverse sectors. They are used for the production of construction materials, such as lime sand brick and lightweight

concrete. Steam hardening produces plaster, cement and fibre materials. Wood is tempered in impregnation vessels. Temperature homogeneity is a top priority for composite safety glass. The vulcanization process in the cross-linking of rubber and plastic products and the thermal treatment of composite materials for the automotive industry and aerospace industry, take place in furnaces and autoclaves and must be meet the highest quality demands and satisfy requirements for reliable reproducibility. The medical sector includes areas of application such as sterilisers. Autoclaves are used for various reaction processes in biology and chemistry. For industrial food production and refinement, temperatures are crucial variables in recipes and safety areas at various measuring points which must be monitored for pasteurization, boiling, simmering, cooking and steaming (pressure cooking), for baking and roasting, drying, mixing, conveying and flowing of various substances subjected to heat.

In other words: In addition to installations with sensors and actuators for the control and regulation of a heating system, a safety concept consisting of independent sensors (for temperatures, pressures, fill levels, etc.) and fail-safe evaluation technology must also be integrated and thus operate as a safety chain which automatically and reliably interrupts the continued supply of heat in case of an alarm. This applies not only to large heating systems, but any application in which an uncontrolled supply of heat will result in dangerous conditions for the life, limb and environment.

### Safety temperature limiter

Therefore, along with regulators (mechanical thermostats, electronic temperature regulators or software controllers), measuring transducers and control units with safety temperature limiting functions (threshold monitors and limit comparators), independently operating safety temperature limiters STL are used to monitor temperatures. The task of the safety temperature limiter is to switch the

system to an operationally-safe state in accordance with DIN EN 12828 in case of overheating – when the defined threshold temperature is reached. Should this malfunction occur, manual unlocking of the STL is required. This should guarantee that the system is checked and the source of the fault, if applicable, is corrected before the system can be switched back to normal operation. This switching characteristic for safety temperature limiters is prescribed in the standard DIN EN 14597 for the use of safety devices for thermal engineering plants. With the autarkic device technology required by DIN EN 61508 "Functional safety", i.e. independent of PLC systems, regulating systems and SCADA systems, only the permissible safety temperature limiters are used for industrial heat generators in accordance with DIN EN 14597 and the safety requirement level of functional safety in accordance with SIL2.

### New approaches with front panel installation

Previously, safety temperature limiters were frequently installed as top-hat rails devices in the switch cabinet. Now, for the first time, the Safety-TL4896 from the Competence-Center Martens of GHM Group also offers installation in the front panel. In the process, the actual and limit values on the large display can be read conveniently and the reset process after correction of the cause of an error takes place on the front panel in the same manner as for all other operating processes.



Fig. 1: Safety temperature limiter Safety-TL4896

As a result, separate devices and their wiring can be eliminated, because their functions are already integrated: Indicator and reset button. With the

integrated, adjustable pre-alarm, no additional limiters are required and redundancy with the automation unit is provided in order to independently warn the regulating and control device of impermissibly high actual values. Before the forced shut-off is activated, additional alarm messages can be issued and corresponding functional processes can be initiated in order to achieve a safe stand-by status, eliminate errors and avoid a time-consuming and costly complete shut-down and subsequent restart of a thermal engineering plant.

A second measuring chain is eliminated by the analogue output and thus the installation of an additional sensor can also be dispensed with. The Safety-TL4896 can be configured with the front buttons and thus tailored to the application.

### The heart of the matter

Particularly with compact thermal engineering plants whose complete automation electronics are contained in the operating device (e.g. with use of the GHM-ONE multifunctional device or a compact industrial PC/ PLC system), there is no longer a central, large and conventional traditional switch cabinet.

As an autarkic front panel unit in slim DIN format 48x96, the new Safety-TL4896 enables a consistently compact design of modern systems, reduces the wiring work and facilitates ergonomic operation in the monitoring and observance of safety requirements. The Safety-TL4896 saves time and money for wiring and installation.

With the easy operation from the front side, the requisite safety functions and ergonomic operation of safety temperature limiters are fulfilled for the first time.

### Industry award for the Safety-TL4896

The innovation of GHM GROUP, the unique Safety-TL4896 safety temperature limiter for direct mounting in the control panel or control cabinet, has been awarded by INDUSTRIEPREIS for its outstanding performance as advanced industrial product in the field of electrical engineering with the BEST OF 2018. In 2006, Huber Verlag für Neue Medien GmbH launched the INDUSTRIEPREIS and it honors annually the most advanced products and solutions, which are characterized by e.g. their technological properties or ecological benefits.



contact us



#### Headquarter

GHM Messtechnik GmbH  
**GHM GROUP CORPORATE**  
Tennert Weg 2-8  
42897 Remscheid | GERMANY  
Phone +49 2191 9573-0  
info@ghm-group.de  
www.ghm-group.de

#### Centers of Competences

GHM Messtechnik GmbH  
**GHM GROUP – Greisinger**  
Hans-Sachs-Straße 26  
95128 Regenstein | GERMANY  
Phone +49 2432 9363-0  
info@greisinger.de | www.greisinger.de

GHM Messtechnik GmbH  
**GHM GROUP – Honsberg**  
Tennert Weg 2-8  
42897 Remscheid | GERMANY

GHM Messtechnik GmbH  
**GHM GROUP – Martens**  
Klabitzhorn 18  
22855 Barstölzel | GERMANY

GHM Messtechnik GmbH  
**GHM GROUP – Imtron**  
Carl-Benz-Straße 11  
68696 Owingen | GERMANY

Delta OHM S.r.l. a socio unico  
**GHM GROUP – Delta OHM**  
Via Marconi 5  
35030 Caselle di Selvazzano  
Padova (PD) | ITALY  
Phone +39 049 8977150  
info@deltoahm.com  
www.deltoahm.com

Valco srl  
**GHM GROUP – VALCO**  
Via Rovereto 2/11  
20014 S. Ilario di Nervesa  
Milano (MI) | ITALY  
Phone +39 0331 53 59 20  
valco@valco.it  
www.valco.it

#### GHM GROUP International

**Austria**  
GHM Messtechnik GmbH  
Office Austria  
Breitenseer Str. 76/1/36  
1140 Vienna | AUSTRIA  
Phone +43 660 7335628  
afoeast@ghm-messtechnik.de

**Brazil & Latin America**  
GHM Messtechnik do Brasil Ltda  
Av. José de Souza Campos, 1073, c| 06  
Campinas, SP  
13025 320 | BRAZIL  
Phone +55 19 3504 3408  
info@grupoghms.com.br

**Czech Republic / Slovakia**  
GHM Greisinger s.r.o.  
Ovčihajek 2/2153  
158 00 Prague 5  
Nové Butovice | CZECH REPUBLIC  
Phone +420 251 613528  
Fax +420 251 613607  
info@greisinger.cz | www.greisinger.cz

**Denmark**  
GHM Maateknik ApS  
Maateknik Byvej 2  
5320 Maarslet | DENMARK  
Phone +45 646422-00  
Fax +45 646422-01  
info@ghm.dk | www.ghm.dk

**France**  
GHM GROUP France SAS  
Parc des Pivoines  
9 Rue de Catalogne  
69150 Dardnès-Charpieu Lyons | FRANCE  
Phone +33 4 72 37 45 30  
a.jouanilou@ghm-group.fr

**India**  
GHM Messtechnik India Pvt Ltd.  
209 | Udyog Bhavan | Sonowala Road  
Gurgaon (E1) | Mumbai - 400 063  
INDIA  
Phone +91 22 40236235  
info@ghmgroup.in | www.ghmgroup.in

**Italy for Greisinger & Delta OHM**  
GHM GROUP – Delta OHM  
Via Marconi 5  
35030 Caselle di Selvazzano  
Padova (PD) | ITALY  
Phone +39 049 8977150  
a.casale@ghm-messtechnik.de

**Italy for Honsberg, Martens, Valco**  
GHM GROUP – Valco  
Via Rovereto 2/11  
20014 S. Ilario di Nervesa  
Milano (MI) | ITALY  
Phone +39 0331 53 59 20  
alestandro.parego@valco.it

**Netherlands**  
GHM Messtechnik BV  
Zeeftweg 30  
3753 KA Eemnes | NETHERLANDS  
Phone +31 35 53825-40  
Fax +31 35 53825-41  
info@ghm-nl.com | www.ghm-nl.com

**South Africa**  
GHM Messtechnik SA (Pty) Ltd  
16 Oliver Street  
Verwoerdpark, Alberton 1455  
SOUTH AFRICA  
Phone +27 74 4592040  
j.grobler@ghm-sa.co.za

...and more than  
100 qualified distributors!



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