

Operating instructions  
**Infrared-Emitter module M110**

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# 1 Safety Information

## 1.1 Explanation of Symbols

The symbols used are marked on the system and contained in the technical documentation/operating manual to warn of remaining risks pertaining to the various safety levels. The symbols should help the user recognize and remember them quickly and more easily.

### Safety instructions:

	<b>WARNING!</b> Dangerous Electrical Voltage! Disregard of these safety regulations will result in mortal injuries.
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	<b>CAUTION/ DANGER</b> Safety note! Disregard of these safety regulations will result in injuries and/or material damage.
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### User Information:



**Within operating manual:  
Note on optimal usage!**

## 1.2 Safety instructions

	<b>CAUTION</b> Disregard of the safety regulations or improper operation of the Infrared Heating System can lead to injuries and material damage.
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Infrared emitters basically consist of pure quartz glass and a heating spiral.

There is a possibility that quartz glass of the emitters may either break or chip off. (Glass splinters in the emitter cannot be clearly seen). Users might hurt themselves on the broken emitter glass. Quartz glass splinters may drop on the materials to be exposed to radiation. In order to avoid damage to property or injuries to persons, the machine manufacturer/operator must take appropriate measures (as regards the design/maintenance intervals).

Infrared radiation is an intensive heat source! Extreme heat radiation of this type may harm the human body as a result of the heat produced in the absorption process (comparable to danger from an open or blazing fire). The most immediate risk is of IR erythema (skin burns). Additionally, medical studies have

emphasised that the use of IR radiation, particularly when over-used for years or decades, can damage the cornea and the lens, causing an IR cataract.

To protect the machine operator from the heat produced by the IR emitters during the heating process, the DIN EN 12198 Directive "Machine Safety: Evaluation and Risk Reduction from Radiation-emitting Machines" was established, which serves as the basis for categorising the IR radiation emitted by machines and also lists the measuring procedures and safety and protection measures to be taken (e.g. housing of IR emitter, IR protective filter in accordance with DIN EN 171 as personal eye protection).

The machine directive should be taken into account by the machine manufacturer when designing machines using IR light as a heat source.

The Infrared Heating System may only be used by skilled and specifically-instructed operating personnel. The system operator/owner must provide a procedure-specific operating manual with instructions for the operating personnel.

If a potentially explosive atmosphere can be formed (resulting from solvent vapour/air mixtures), the relevant standard EN 1539 must be observed since there is a risk of ignition at the infrared twin-tube emitter (the solvent vapour concentration must be below 25% of the lower explosion threshold). Released vapours must be expelled at the installation site by the customer. The safety regulations for coating material processes (Germany: BGV D 25) must be observed.

The IR Heating System may be used only for industrial heating and drying processes (General safety regulations in accordance with EN 60519-1/DIN VDE 0721, Part 911).

The safety and function of the IR Heating System are guaranteed only if original parts and replacement parts from HERAEUS Noblelight are used.

## 2 Technical description

The Infrared Heating System M110 has been specially designed for use according to the customer's specifications in this project.

For any other application, the rules in the „Declaration of Conformity“ and the „Manufacturer's Declaration“ will not apply.

### Electrical data, dimensions and emitter arrangement

(see Technical Description of order confirmation)

### Module type

The outer housing is made of aluminium. The external terminal boxes are equipped with plastic terminals.

To install the module in a fitting frame to be provided by the customer, use the M6 nuts on the back panel.

The IR emitter module is comprised of:

- Axial fan (75 m<sup>3</sup>/h) with equipment temperature control

## 3 Assembly

### 3.1 Installation of IR heating module

- The IR emitter module must be connected to a solid support structure.



**One connection must be to a rigid socket, the others to an elastic socket to allow for heat expansion.**

### 3.2 Assembly of IR Emitters



**Fingerprints on the quartz tube will cause devitrification. These lead to radiation losses and mechanical failure.**

- Transport the IR emitter in the packaging provided to the place of installation.

If the IR emitter must be transported without its packaging, wear linen gloves.

- Always carry the emitter with both hands. Carry the emitter so that the cross section faces up to avoid bending and breaking.
- Do not grip the IR emitter on just one side nor carry it by its cable end.
- Avoid any pressure on the flat base
- Remove the cover of the IR heating module and loosen the knurled nut.

- Snap the IR emitter into the clamp and spring mounting by rotating it around its longitudinal axis.

**The gold reflector must point to the back panel.**

- Tighten knurled nut on clamp spring

### 3.3 Cleaning of quartz glass

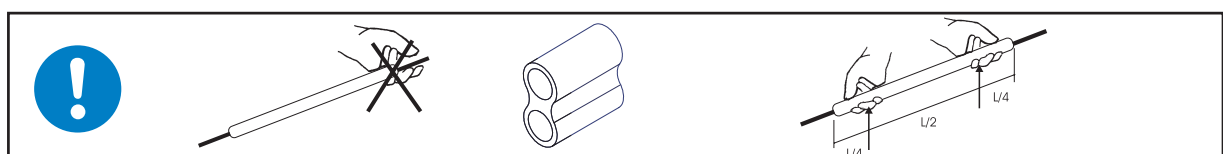


**The gilded side must not be cleaned.**

Remove any dust or fingerprints with a clean linen cloth soaked in rubbing alcohol (without textile finishing agents).

### 3.4 Disposal of IR Emitters

IR emitters are not affected by the RoHS (Restriction of Certain Hazardous Substances), WEEE (Waste from Electrical and Electronic Equipment) and Elektro G (electrical/electronic component) regulations. They can be disposed of with the normal domestic or industrial waste.



## 4 Electrical Connection

### 4.1 Electrical Connection

The electrical connections must be made authorized, skilled personnel.

The German regulations (e.g. DIN VDE 0100 and UVV BGV A3 “Electrical Systems and Operating Equipment”) must be observed.

- Integrate the IR emitter module into the protective conductor system of your installation.
- Feed the cable ends of the IR emitter through the ceramic bushes to the terminal box.
- Cut the cable ends to the required length.
- Fit cable sleeve to the bare end of the cable.
- The terminal clamps must be tightened down according to DIN VDE 0609 „torque requirements (e.g. Federal Republic of Germany: Terminal Clamping Points for Connection...) or equivalent requirements.

**CAUTION:**



**Danger of fire**

Do not bunch the cable ends.  
Counteract Jule effect by cooling the system.  
Do not run the cable ends in a flammable environment.

- Following the electrical connection, check IR heating system in accordance with directive DIN VDE 0721 „Industrial electrical heating systems“ (equipment and accessories).

### 4.2 Thermal safety

The IR Emitter Module must be positioned, set up and operated so that even if it is unsupervised or unintentionally switched on, the heat emitted by the heating system will pose no risk to its operators, the environment or the feed material.

The IR emitter module is cooled by means of axial fans to keep the equipment temperature (self-heating) within the permitted temperature range.



**Max. temperature of inlet air: 40°C**

The separate ventilation must be monitored.

For this purpose, the IR Emitter Module has been equipped with a temperature control.

### 4.3 Temperature control

The temperature is controlled by a floating contact for voltages up to 230 VAC, 6 A.

It is the customer’s responsibility to integrate the temperature control into a suitable monitoring system.

Whenever the equipment temperature control responds, the IR emitters must be switched off.

With an active temperature control, the IR Emitter Module has a thermal safety according to DIN 60519-2/VDE 721 Teil 411 Part 1 (if the separate ventilation fails there is no risk due to heat built-up).

Temperature fuses must always be replaced after a fault. The temperature switches reset automatically. The heating can be switched on again once the failure has been removed.

## 5 Maintenance

### DANGER

#### Electrical Voltage!

Turn off main switch before maintenance and repair work and secure it against unauthorized switch-on.



### WARNING

Maintenance and repair work may be done by authorized personnel only, as improper use of the system may result in injury and damage to property .



### CAUTION

The safety and performance of the system are only guaranteed and the conditions of the "electromagnetic compatibility" complied with if original accessories and spare parts are used.



We recommend that you keep the required replacement parts in stock.

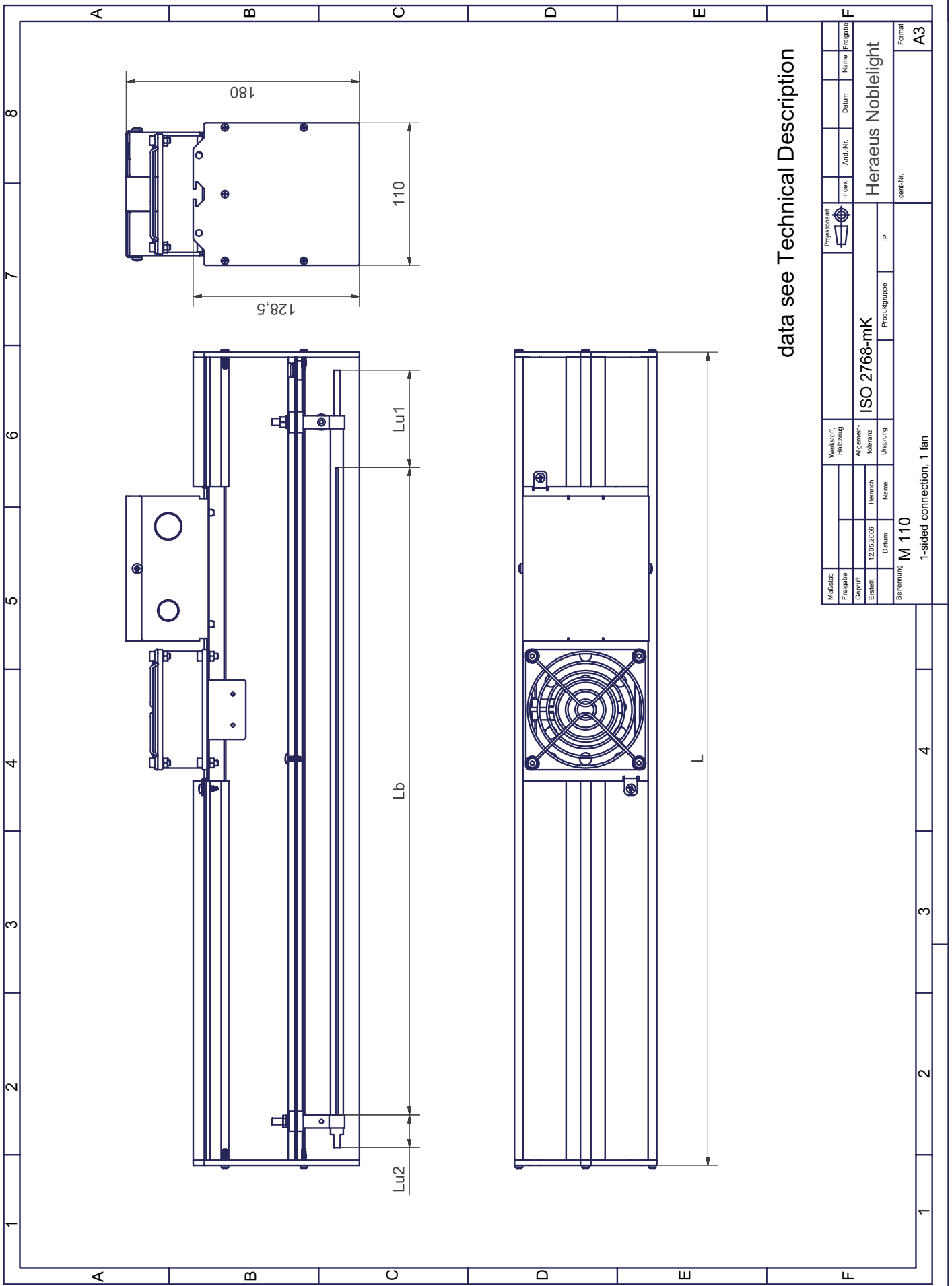
Please order the replacement part indicating the HNG order number.

## 6.1 Replacement

Pos.Replacement	Description	Supplier	Component	Ident-No.
1 A	CLAMP HOLDER Model KW, SMW 23x11			0975 9287
2 A	CLAMP HOLDER Model KW, SMW 34x14			0975 8026
3 A	CLAMP HOLDER Model MW, 18x8			0975 8010
4 A	CLAMP HOLDER Model MW 22x10			0975 8013
5 A	CLAMP HOLDER Model MW 33x15			0975 8016
6 A	CLAMP HOLDER Model CRS 19			8001 2071
7 A	CLAMP HOLDER Model CZW 34x14			0975 8026
8 A	SPRING HOLDER Model KW, SMW 23x11			0975 9286
9 A	SPRING HOLDER Model KW, SMW 34x14			0975 8018
10 A	SPRING HOLDER Model MW, 18x8			0975 8011
11 A	SPRING HOLDER Model MW 22x10			0975 8014
12 A	SPRING HOLDER Model MW 33x15			0975 8017
13 A	SPRING HOLDER Model CRS 19			8001 2072
14 A	SPRING HOLDER Model CZW 34x14			0975 8018
15 A	AXIAL FAN 230 V 75m <sup>3</sup> /h	EBM	3656	4510 2289
16 A	TEMPERATURESWITCH 70°C OEFFNER	RS	335-308	4510 1350
17 A	SAFETY FUSE 96°C	RS	SF96E #176-9249	45100473
18 A	INFRARED EMITTER (Model see acknowledgment)			

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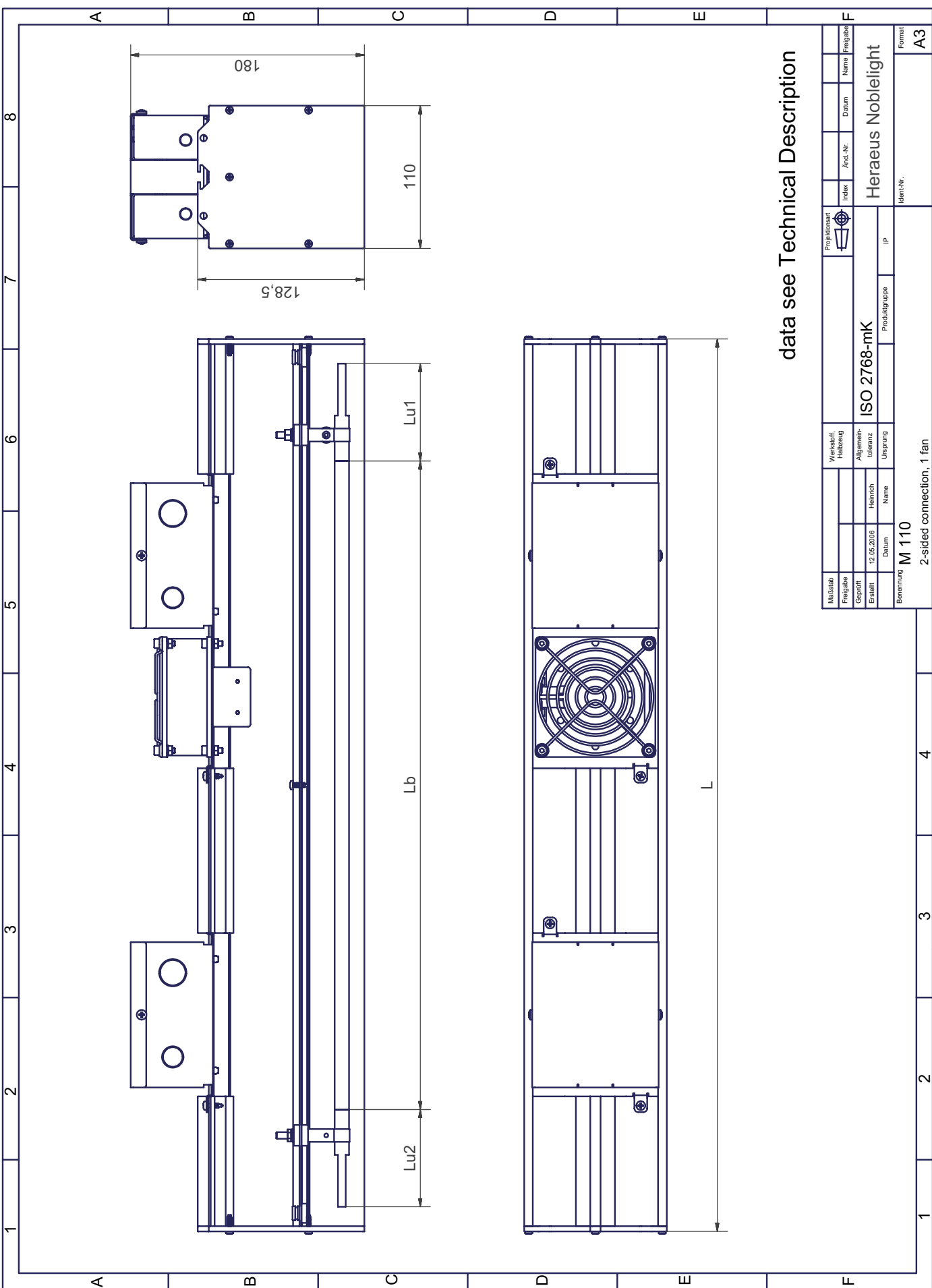


data see Technical Description

Multistab Freigabe	Werkstoff: Holzbohrung	Projektorart	Index	Avi-Nr.	Datum	Name Freigabe
Geprüft: 12.05.2008	Herreich	ISO 2768-mK	Heraeus Noblelight			
Erstellt:	Datum	Name	Ursprung	Produktgruppe	IP	Ident-Nr.
Benennung: M 110		1-sided connection, 1 fan		Format: A3		

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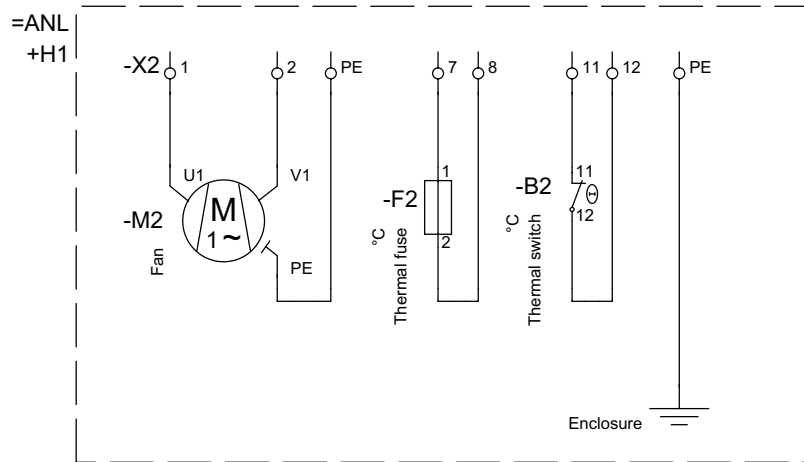
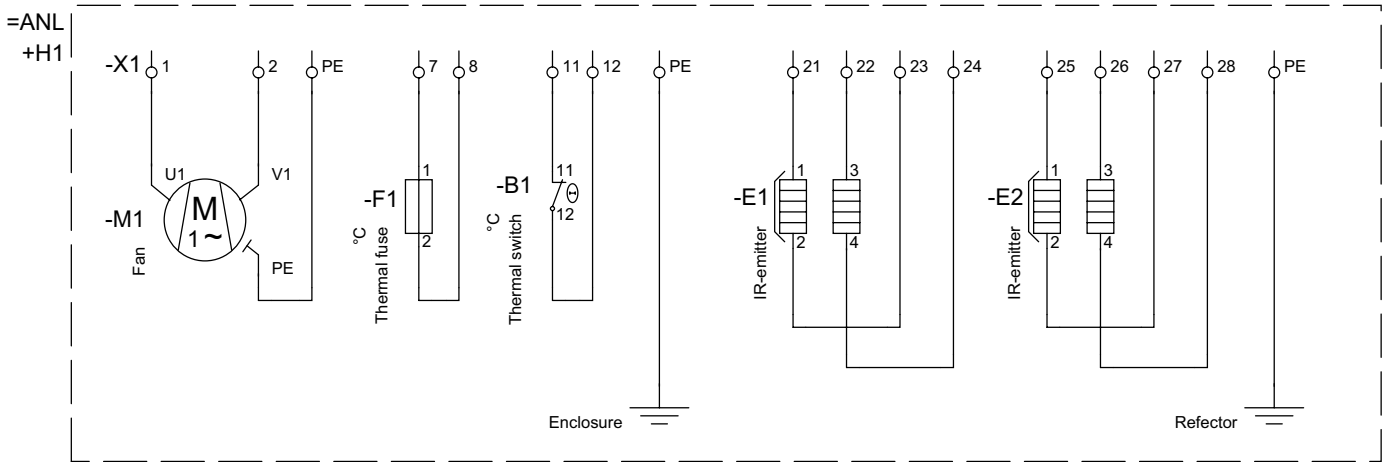
data see Technical Description

Modell	Verkaufst.	Projektionsart	Index	And.-Nr.	Name	Freigabe
Freigabe	Freigabe					
Geprüft	Algemein-	ISO 2768-mK	Heraeus Noblelight			
Erstellt	Toleranz	Produktgruppe	Formal			
12.05.2008	Heinrich	ip	A3			
Datum	Name	Ursprung	Ident-Nr.			
M 110	2-sided connection, 1 fan					



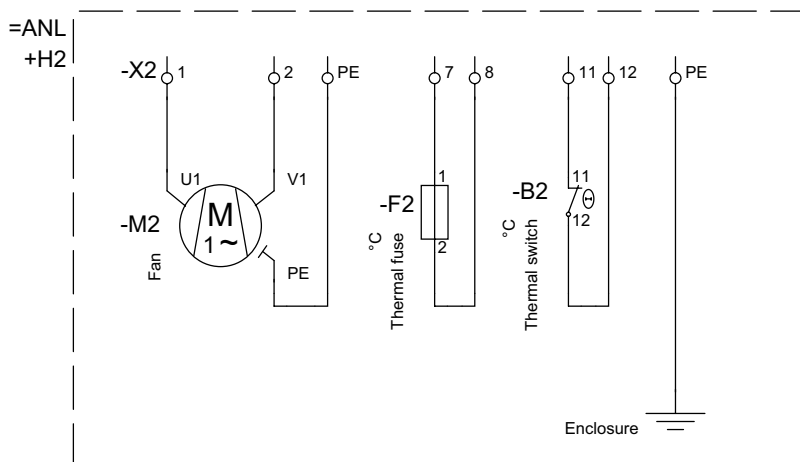
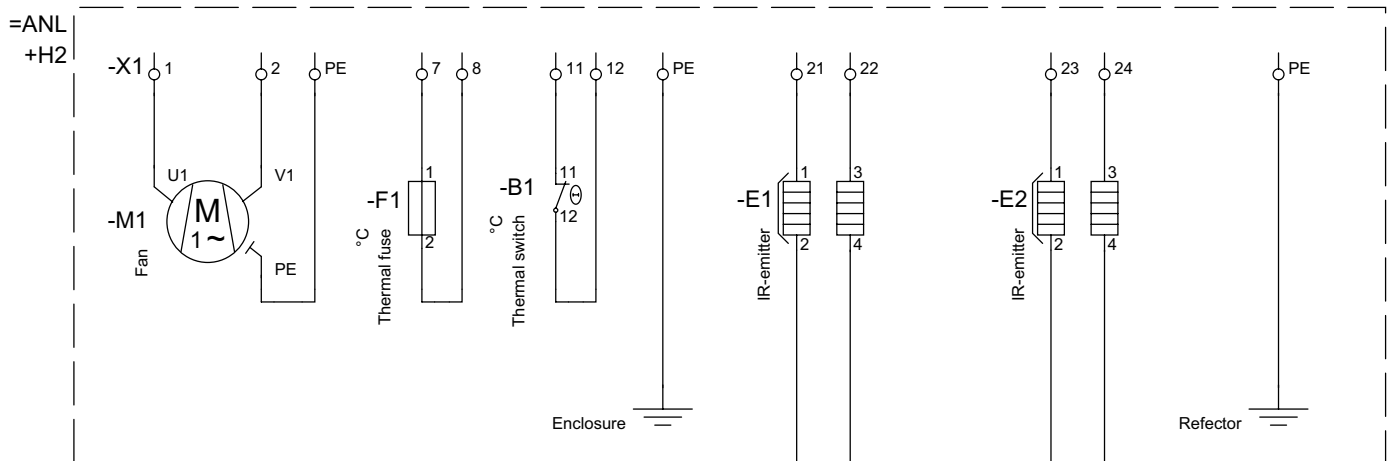
# Circuit diagram

(Emitter with connection point on one side)



# Circuit diagram

(Emitter with connection point on both sides)





## Appendix

### A.1 EU Declaration of Conformity

Product designation: Infrared-Emitter Module M110

### A.2 Manufacturer's Declaration

in accordance with EC machine regulation (98/37 EC directive)

We declare that our product, the Infrared Emitter Module, corresponds to the German standard VDE 0721.

The Infrared Heating Module may not be installed in a machine nor used in the assembly with other machines until it has been confirmed that the complete installation meets the regulations of the Directive 98/37/EC and then only after the corresponding declaration of conformity has been issued.

Heraeus Noblelight GmbH



sig Diehl  
General Manager, Processing Technology



**Heraeus Noblelight GmbH**  
Reinhard-Heraeus-Ring 7,  
63801 Kleinostheim  
Telefon +49 (0) 6181/35-8484  
Fax +49 (0) 6181/35-168484  
hng-infrared@heraeus.com  
www.heraeus-noblelight.com

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