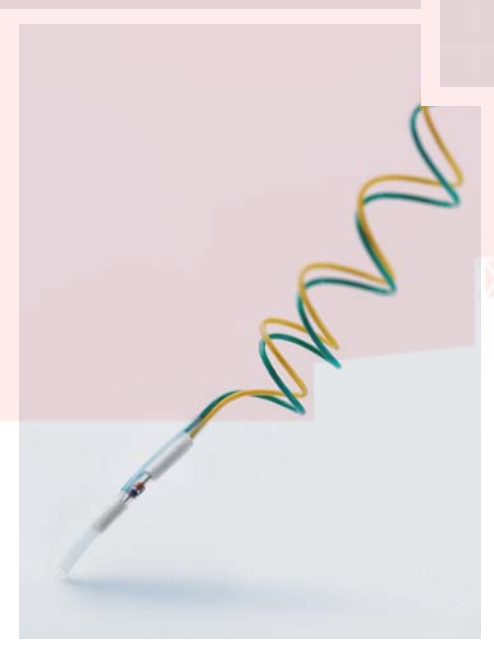




Product Overview



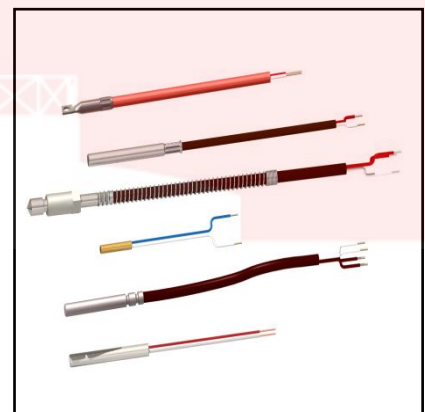
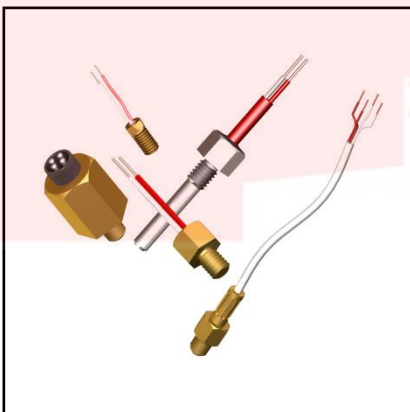
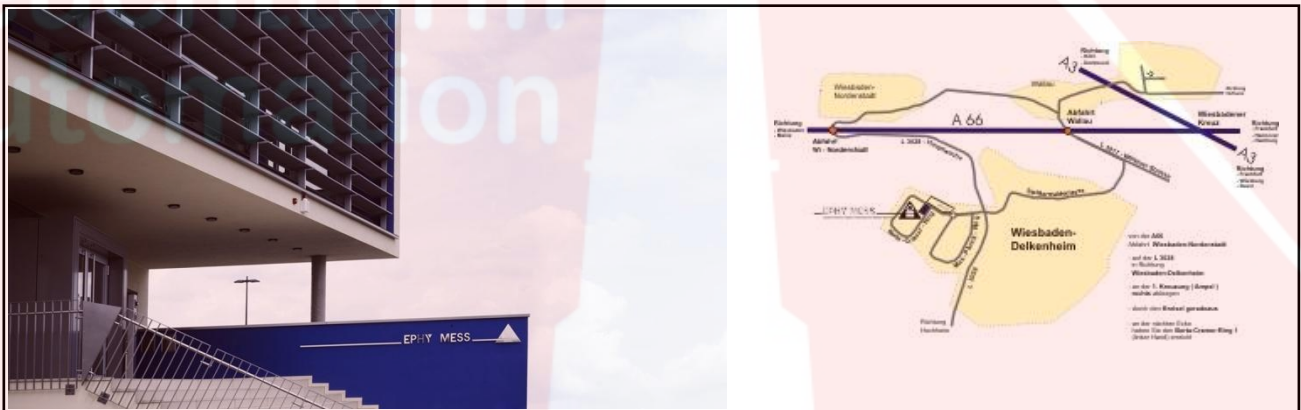
Leuchtturm
Automation





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1. Introduction

EPHY-MESS GmbH is one of the main manufactures of temperature measurement technique. For over 60 years we have been manufacturing temperature sensors for the industry, trade and commerce. Our main emphasis is on the development and production of thermometers for the supervision of electrical machines and drives. We provide an extensive range of thermometers for temperature monitoring of the coil, slot and bearing of these machines. The thermometers are based on measuring resistors, PTC and NTC thermistors, bimetallic elements/ bimetals and thermocouples. For the utilization in hazardous areas, many thermometers have an ATEX accreditation according to the 94/9/EG guideline respectively acc. to the new directive 2014/34/EU valid from 04/2016.

Another EPHY-MESS focal point is the production of temperature sensors for the railway industry. These sensors are developed especially for the utilization under harsh conditions in rail vehicles. We supply single sensors as well as complete cable harnesses for locomotives and trains.

Continuous product improvement, innovation and high quality standards make us a reliable partner for contacting temperature measuring technology.

EPHY-MESS is certified according to:



DIN EN ISO 9001:2008
DIN EN ISO 14001



IRIS



Germanischer
Lloyd



ATEX



IECEx



TR

EPHY-MESS is a member of the following trade associations:



VDB Verband der Bahnindustrie in Deutschland e.V. Berlin



AMA Fachverband für Sensorik e.V. Berlin



ZVEI Zentralverband Elektrotechnik- und Elektroindustrie e.V. Frankfurt

2. Notes concerning this product overview

The technical data contained in this overview, generally pertains to standard products. Custom-made versions and customer alterations are possible. We would be happy to develop a tailor-made solution together with you.

Further technical information can be found in our specialized catalogs and technical data sheets. The product pictures are not to scale.

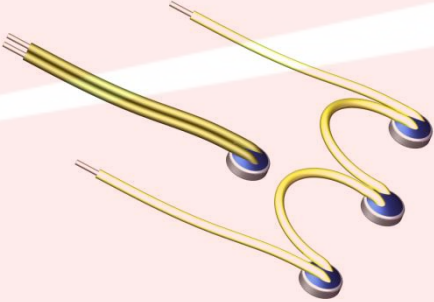

If you require further documentation or have questions concerning our products, please contact our sales department (contact information can be found on page 12).



3. Products

3.1. Bimetallic switches and thermostats

Bimetallic switches or respectively bimetallic thermostats can be utilized if a switching operation should be triggered (open or close a circuit) when a predetermined temperature threshold is reached. They are an economic solution, because temperature measuring and switching operation can be handled by only one part. No additional electronics are therefore required.

Examples	Features	Sensor
	<p>Bimetallic switches <i>BIS</i></p> <ul style="list-style-type: none"> • In a single, double or triple circuit • Normally closed or normally open • Nominal switching temperature (NST) of +60...+200°C • Standard cable length: 300mm • Maximum nominal switching current up to 10A/25A • Optionally with a screw-in housing (<i>L0x</i>) • With UL / CSA on request • Special versions on request • Especially suited for the installation into the coil of electric motors/generators 	<p>BIS</p>
	<p>Bimetallic thermostats <i>TBIS</i></p> <ul style="list-style-type: none"> • Connection of the supply line through soldering pins, blade terminal or permanently connected supply line • Nominal switching temperature (NST) of -20...+400°C • Normally closed or normally open • Switching tolerances and hysteresis depend on the nominal switching temperature • Maximum switching current up to 25A • Installation via screw connector or flange 	<p>BIS</p>



3.2. Temperature sensors

EPHY-MESS offers a wide variety of diverse temperature sensors. It spans from measuring resistors that are based on platinum, nickel or copper, over KTY silicon sensors up to motor protection thermistors. All sensors can be purchased as single or as preassembled units.

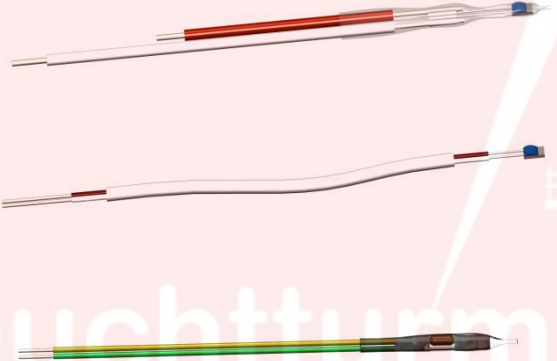



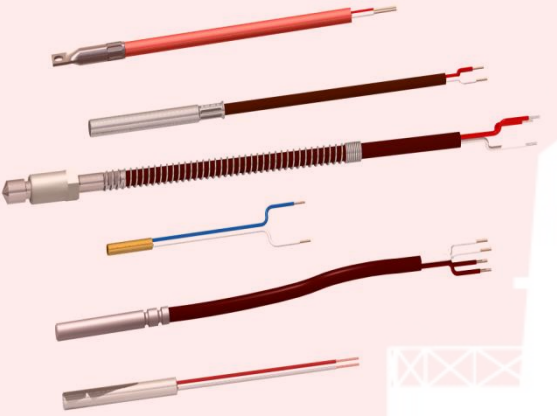



Examples	Features	Sensor
	<p>Measuring resistors <i>M-xx</i></p> <ul style="list-style-type: none"> • Measuring resistors made of platinum, nickel or copper • Various forms and dimensions • Thin-film and wire wound measuring resistors bare, in ceramic or glass housing • Measuring range from -200 ... +800°C • As single or double resistor • Special models, dimensions or tolerances on request 	MW
	<p>Motor protection thermistors <i>PTC</i></p> <ul style="list-style-type: none"> • Shrinking tube insulated PTC pill with permanently connected single wires • As single and triplet thermistors • Characteristics according to DIN 44080-82 • Nominal response temperature (NAT) of +60...+200°C • Customer specific configurations 	PTC
	<p>Thermistors <i>NTC</i></p> <ul style="list-style-type: none"> • NTC sensors of the K227 series insulated with shrinking tube • Permanently connected single wires $cl=380$ or 2000mm • Nominal values: $1.8\text{ k}\Omega$ or respectively $10\text{ k}\Omega$ at 100°C • Pill dimensions (insulated) $\varnothing 5 \times 14\text{ mm}$ 	NTC
	<p>KTY-sensors <i>KTY</i></p> <ul style="list-style-type: none"> • Series KTY83-xxx and 84-xxx • Are often used for thermal motor protection • Application range from $-50 \dots +300^\circ\text{C}$ • Other KTY-series on request • Numerous configuration models are available on customer request 	KTY
	<p>Thermocouples <i>TE</i></p> <ul style="list-style-type: none"> • Thermocouples type (K, T, J, L, S) • Other types on request 	TE







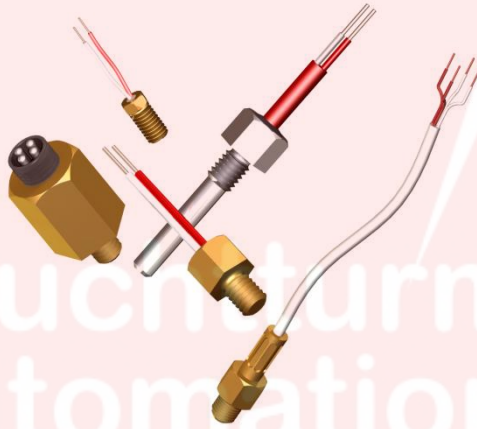



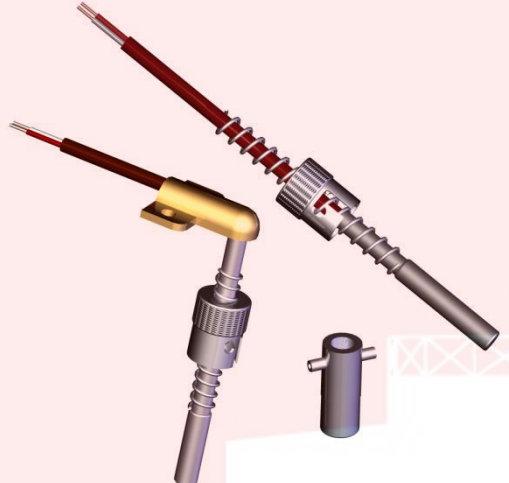



3.3. Assembled sensors and cable thermometers

The **temperature sensors** supplied by EPHY-MESS are also available **custom-made**. We can offer you an individual assembly according to your request and requirements, and if you wish we can employ plugs or other accessory parts supplied by you.

Cable thermometers are offered in any imaginable variation. Thermometers with a metal or ceramic sleeve, different screw-in housings or with a bayonet lock are available. Dimensions, wiring and materials are usually aligned to customer requirements. There are models for the most diverse applications. For instance, thermometers with a very high dielectric strength for the installation into the coil of electrical machines or sensor versions with a protection class up to IP67 for the utilization in damp environments are available. If you have further special requirements, please contact our sales department.

Examples	Features	Sensor
	<p>Assembled sensors</p> <ul style="list-style-type: none"> • Sensor with a permanently connected supply line, bare or insulated with shrinking tube. On request also assembled with a plug • Measuring range from -200 ... +600°C • Measuring range ATEX from -60°C ... +180°C • Connection as 2, 3 or 4 wired circuit • High-quality supply lines with Teflon or silicone insulation as single wires, hose or flat hose line • Supply line ends bare, tin coated, with cable end sleeve or assembled with a plug • Test voltage up to 8kV (standard) • IECEx and ATEX approval for use in hazardous areas (except bimetallic switches) • TR certificate for Eurasian Customs Union 	<p>MW PTC NTC KTY TE BIS</p>   
	<p>Cable thermometers in a metal sleeve (MH)</p> <ul style="list-style-type: none"> • Sensor with a permanently connected supply line, installed in diverse sleeve forms, for example a stepped sleeve, flattened sleeve with a mounting hole, with bend protection etc. • Measuring range from -60 ... +260°C • Measuring range ATEX from -60°C ... +180°C • Material: brass or stainless steel • Sleeve diameter starting at ø3mm • Sleeve length starting at 10mm, other dimensions on request • Screened version with grounding line • IP protection class up to IP67 available • With single wires, hose line or screened wire • As single or double thermometer • Connection as 2, 3 or 4 wired circuit • IECEx and ATEX approval for use in hazardous areas (except NTC) • TR certificate for Eurasian Customs Union 	<p>MW PTC NTC KTY TE</p>   

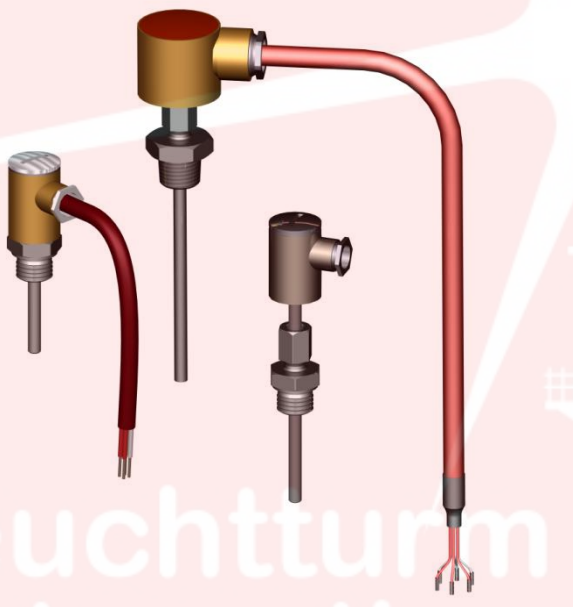







Examples	Features	Sensor
	<p>Cable thermometers in a ceramic sleeve (KH)</p> <ul style="list-style-type: none"> • Sensor with a permanently connected supply line encapsulated in a ceramic sleeve • Measuring range from -60 ...+400°C • Measuring range ATEX from -60°C ... +180°C • Dimensions: $\varnothing 3 \times 15$; $\varnothing 4,9 \times 16$; $\varnothing 4,9 \times 30$; $\varnothing 4 \times 25 \text{ mm}$ • Permanently connected single wires or hose line • Test voltage up to 5kV • Suitable for the installation into the coil of electrical machines • IECEx and ATEX approval for use in hazardous areas (except NTC) • TR certificate for Eurasian Customs Union 	<p>MW PTC</p> <p>KTY TE</p>   
	<p>Cable thermometers in screw-in housing (SGH)</p> <ul style="list-style-type: none"> • Sensor built into various screw-in housings, optionally with a permanently connected supply line or with a connection plug • Measuring range from -60...+260°C • Measuring range ATEX from -60°C ... +180°C • Screw-in housing made of brass, aluminium or VA • Customer specific dimensions are possible • IECEx and ATEX approval for use in hazardous areas (except BIS and NTC) • TR certificate for Eurasian Customs Union 	<p>MW PTC NTC KTY TE</p>   
	<p>Thermometers with a bayonet lock</p> <ul style="list-style-type: none"> • Simple and fast installation/disassembly of the thermometer • Stageless adjustable bayonet lock • Contact pressure and pretension adjustable • Measuring range: -40...+400°C • Measuring range ATEX from -60°C ... +180°C • Metal sleeve with adjustable bayonet lock • Straight or angled form • Different screw-in nipples are optionally available • Explosion protected version • IECEx and ATEX approval for use in hazardous areas (except NTC) • TR certificate for Eurasian Customs Union 	<p>MW PTC NTC KTY TE</p>   



3.4. Screw-in thermometers

Screw-in thermometers are commonly used for industrial purposes. They possess a fixed or a moveable processing connector and are mostly flanged on containers or pipes. They are available in various dimensions and forms. The thermometers of the EM24/38 series have a compact form and are often used as bearing thermometers in electric motors and drives.

Examples	Features	Sensor
	<p>Screw-in thermometers with an EM24/38 head</p> <ul style="list-style-type: none"> • Sensor built into a stainless steel protective tube with a compact connection head type EM24/38 • Measuring range: -60...+400°C • Measuring range ATEX from -60°C ... +180°C • Connection head diameter EM24 =24mm respectively EM38 = 38mm • Optionally with head transmitter 4-20mA • As single or double thermometer • Connection as 2, 3 or 4 wired circuit • Explosion protected version • IECEx and ATEX approval for use in hazardous areas (except NTC) • TR certificate for Eurasian Customs Union 	<p>MW PTC NTC KTY TE </p>
	<p>Screw-in thermometers with DIN head</p> <ul style="list-style-type: none"> • Screw-in thermometer with DIN connection head and a fixed or exchangeable measuring insert • Measuring range -60...+600°C • Measuring range ATEX from -60°C ... +180°C • Connection head form MA, A or B • Processing connector with a fixed or flexible screw connection • With a fixed or exchangeable measuring insert • As single or double thermometer • Optionally with a connection head transmitter 4-20mA / 2-10V etc. • IECEx and ATEX approval for use in hazardous areas (except NTC) • TR certificate for Eurasian customs union 	<p>MW PTC NTC KTY TE   </p>



3.5. Slot resistance thermometers




As a specialist for slot resistance thermometers for the utilization in electric motors or generators, EPHY-MESS offers a broad type variety.

A specialty is the slot resistance thermometer with bifilar measuring winding. It is available in 3 different forms. These are the rigid, mica insulated NWT-ST, the flexible, shrinking tube insulated NWT-SH and the completely shielded NWT-A.

All thermometers can be obtained with an IECEx, ATEX or TR approval according to the respective regulations for the utilization in hazardous areas. The bifilar wound slot resistance thermometers are complemented by a series of different forms, in which all available basic sensors can be implemented.

Examples	Features	Sensor
	<p>Slot thermometers with a bifilar measuring winding</p> <ul style="list-style-type: none"> • Temperature sensitive length selectable • Version as a rigid NWT-ST, flexible NWT-SH or shielded NWT-A slot resistance thermometer • Insulated with mica or shrinking tube • Bifilar measuring winding made of platinum, nickel or copper wire • Nominal values windable up to 150 Ohm • Tolerances according to the norm of the respective resistor material • As single or double thermometer available • Connection as 2, 3 or 4 wired circuit • Dimensions: thickness starting at 1mm, width starting at 6mm, length starting at 80mm • Special dimensions are available on customer request • Ampacity up to 50A for NWT-A • Dielectric strength up to 5kV • With single wires, hose or flat hose line • Single wires and hose lines can be shielded if desired • Also available as slot thermocouple • IECEx and ATEX approval for use in hazardous areas • TR certificate for Eurasian customs union 	<p>MW</p>



Examples	Features	Sensor
	<p>Slot thermometers with thin-film sensors</p> <ul style="list-style-type: none"> • Model with a insertion case (AK) made of fibre glass • Model with intermediate slider case (ZS) made of epoxy • Model with a plastic case (KS) • Dimensions aligned to the slot form • Different temperature sensors can be implemented • Measuring range from -60...+200°C • Measuring range ATEX from -60°C ... +180°C • Dimensions: thickness starting at 2mm, width starting at 6mm, length starting at 10mm • Special dimensions available on request • Test voltage up to 5kV • Connection as 2, 3 or 4 wired circuit • With single wires, hose or flat hose line • IECEx and ATEX approval for use in hazardous areas • TR certificate for Eurasian Customs Union 	<p>MW PTC KTY</p>   

3.6. Jacket resistance thermometers and thermocouples

Jacket resistance thermometers are well-suited for measuring high temperatures due to their configuration. They are generally designed moisture sealed and shock resistant. Depending on the diameter, they are quite bendable and flexible and can therefore be adapted very well to the respective installation location.

Examples	Features	Sensor
	<p>Jacket resistance thermometers</p> <ul style="list-style-type: none"> • With bare supply line ends • With a permanently connected plug (Lemos, etc.) • With a cable transition sleeve and a permanently connected supply line • As single or double thermometer • Connection as 2, 3 or 4 wired circuit • Diameter starting at ø1mm • Nominal length according to customer request • Measuring range from -200 ...+700°C 	<p>MW</p>



3.7. Foil thermometers

Examples	Features	Sensor
	<p>Foil thermometers</p> <ul style="list-style-type: none"> • Very thin, flexible foil thermometers as Pt100 or thermocouple • Partially also with (the factory attached) adhesive film • Dimensions: <ul style="list-style-type: none"> 8 mm x 8 mm x 0.7 mm, 50 mm x 21 mm x 0.3 mm; 10 mm x 102 mm x 0.5 mm • On request with a permanently connected supply line • As thermocouple type J and K 	PT100 TE

3.8. Analysis electronics

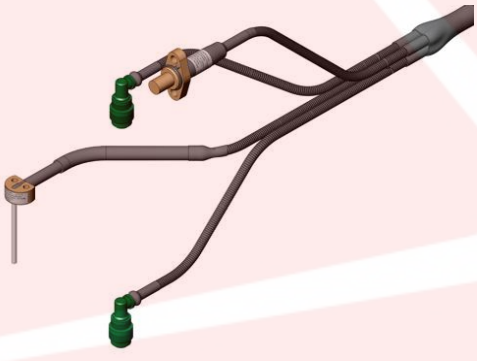
Examples	Features	Sensor
	<p>Analysis electronics</p> <ul style="list-style-type: none"> • Digital and analog display devices • Release devices for RTD, thermistor and KTY-sensors • Programmable temperature transmitters for head and rail mounting • Explosion protected temperature transmitters and release devices 	MW PTC NTC KTY TE

3.9. Electric band heaters

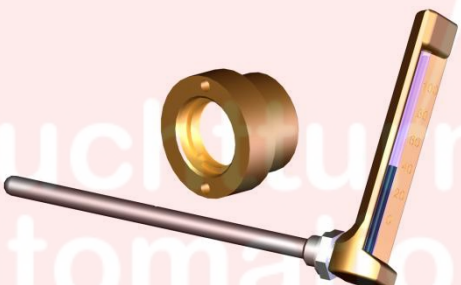
Examples	Features	Sensor
	<p>Electric band heaters</p> <ul style="list-style-type: none"> • Silicone insulated, flexible heating band with a permanently connected supply line cl=500mm • Temperature range: -40...+180°C • For utilization in the coil of electric motors and generators • Vacuum impregnable due to glass silk tube • As 110V respectively 230V version, power up to 100W • Special versions available on request • Self-limiting version possible • ATEX approval for use in hazardous areas • TR certificate for Eurasian Customs Union 	HZL SLHZL




3.10. Sensors for rail vehicles

Examples	Features	Sensor
	<p>Sensors for rail vehicles</p> <ul style="list-style-type: none"> • Measuring range from -50...+250°C • Highly shock resistant temperature sensors for monitoring the rail vehicle drive systems and wheel set bearings • Speed sensors for rail vehicles • Complete cable harnesses assembled with temperature sensors and speed sensors including the installation set • Oil level gauges with high mechanical load capacity for rail vehicles 	<p>RTD DWG</p>

3.11. Special products

Examples	Features	Sensor
	<p>Special products</p> <ul style="list-style-type: none"> • Oil level gauges for rail vehicles • Oil level gauges for utilization under harsh industrial conditions • Machine glass thermometer • Pointer type thermometers 	

3.12. Parts and accessories

Examples	Features	Sensor
	<p>Parts and accessories</p> <ul style="list-style-type: none"> • Cable and thermal lines • Screw connections and swivel parts • Shrinking tubes and other insulation material • Connection plugs and couplings (Lemos, Hirschmann, Harting, etc.) • TE -plugs and couplings in standard and miniature versions • Sleeves made of VA, brass and ceramic 	



4. Contact data

EPHY-MESS GmbH, Berta-Cramer-Ring 1, 65205 Wiesbaden, Germany

Phone: +49 6122 9228 0

www.ephy-mess.de

Fax: +49 6122 9228 99

info@ephy-mess.de

Sales Director

Mr. Aleksandar Lenhart

+49 6122 9228-8834

aleksandar.lenhart@ephy-mess.de

Manager Business Segment Industry

Mr. Patrick Mitternacht

+49 6122 9228-8826

patrick.mitternacht@ephy-mess.de

Manager Sales Business Segment Industry

Mr. Hans-Joachim Krech

+49 6122 9228-28

joachim.krech@ephy-mess.de

Manager Business Segment Wind-Power

Mr. Werner Hix

+49 6122 9228-46

werner.hix@ephy-mess.de

Manager Business Segment Rail

Mr. Gerhard Herdt

+49 6122 9228-13

gerhard.herdt@ephy-mess.de

5. Services

Technical consulting and customer service

Development and construction of special thermometers and custom-made products

Prototype construction and installation

6. List of abbreviations

BIS	Bimetallic switch
CL	Cable length
TBIS	Bimetallic thermostat
RTD	Resistance thermometer
MW	Measuring resistor
TE	Thermocouple
PTC	PTC thermistor
NTC	NTC thermistor
KTY	Silicon sensors of the KTY series
HZL	Heating band
SLHZL	Self-limiting heating band
DWG	Speed sensor



General Terms and Conditions of EPHY-MESS Gesellschaft für Elektro-Physikalische Messgeräte mbH

1. Conclusion of a Contract, Quality, Order Confirmation

- 1.1 Our offers are without engagement. We are only bound to our offers if they have been expressly designated as binding. Otherwise, they are considered to be an invitation to make an offer. In such cases, the bringing about of a contract requires our written order confirmation.
- 1.2 We reserve the copyright and the ownership at all in connection with an offer or other reasons committed documents, in particular calculations, drawings and other documentation. It is strictly forbidden to make them accessible to any third party.
- 1.3 Our written order confirmation is the authoritative document defining the scope of the delivery.
- 1.4 Verbal supplementary agreements or assurances from our employees or representatives require our written confirmation to be legally binding.
- 1.5 With respect to orders acknowledged and accepted by us, under no circumstances will we accept requests by customer to (i) cancel an order, or (ii) delay or re-schedule delivery of products. Exceptions to this prohibition must be in writing and approved by our managing director or his representative. We reserve the right for compensation of suffered losses in this case.
- 1.6 Properties of the products which the purchaser of our product ("customer") can expect, based on our public statements in particular in our advertising or labeling of the products, or which fall under trade usages, shall only be deemed as contractually agreed properties if they are expressly set forth in an offer or an order confirmation. Guarantees are only binding for us if they are designated as such in an offer or an order confirmation and our specific obligations from the guarantee are set down therein.
- 1.7 No responsibility is taken for the ability of our products for specific applications wished by our customer. Our recommendations or proposals are made to the best of knowledge. They are for information only and without engagement and any duty of replacement for damages and harms regardless of its nature. They don't exempt the customer from own tests and examinations.

2. Pricing

- 2.1 Our prices are understood to be net prices plus the respective legal value added tax delivered seller's plant (FCA Wiesbaden Incoterms 2000) excluding packaging.
- 2.2 Unless otherwise agreed in written, all after conclusion of the contract newly rolled out or raised fees as well as any increases of the prices of raw or auxiliary materials, wages, carrying costs, custom duties et cetera which increase the products directly or indirectly be at the expense of the customer and we are entitled to increase our prices adequate.

3. Conditions of Payment

- 3.1 Our prices are due immediately and payable within thirty (30) days after invoice and delivery, the receipt of payment by us being the decisive date. Payments are, if there is no other written agreement expressly permitting otherwise, to be made directly non-cashly or per money transfer to us without deduction. Cheques are accepted only for means of payment after special agreement. All resulting additional costs and charges are transferred to the customer.
- 3.2 In the case of the customer being in default with payment we are entitled to demand interest at the date of eight (8) percentage points above the respective applicable basic interest rate as published by the Central Bank of Germany from time to time without prejudice to our other or further rights.
- 3.3 If we find it necessary to refer an account to an attorney or an agent for collection of delinquent accounts, the customer shall pay all costs of collection including, without limitation, reasonable attorneys' fees.
- 3.4 Set-off or application of the right of retention due to counter claims by the customer which are disputed by us and not res judicata are excluded. The application of the right of retention is also excluded as far as the counter claims of the customer are not based on the same contractual relationship.
- 3.5 We reserve the right to change the credit terms provided herein if we are of the opinion that this is justified or required by the financial condition or the previous payment record of the customer.



4. Deterioration of Customer's financial situation

- 4.1 The customer's acceptance of delivery of any products shall constitute a declaration of his solvency.
- 4.2 If the customer becomes unable to pay his debts after contract conclusion, if an application is filed to open insolvency proceedings regarding customer's assets or if conditions arise after contract conclusion, which essentially influence the creditworthiness of the customer, we can refuse our delivery until the consideration is performed or the customer has provided security for it. This shall also apply if these facts already existed prior to entering into contract, but were not known to us.
- 4.3 If the customer does not perform the consideration or provide security for it within an adequate time period, we are entitled to withdraw from the contract or to claim damages. If we select to claim damages, we can charge lump sum damages in the amount of twenty (20) percent of the value of the order (Incl. Value Added Tax). The right of proof of a lower or higher damage is reserved to both contracting parties.

5. Inspection and Acceptance

- 5.1 The customer is obliged to give written notice of any defect at the latest within five (5) business days after taking delivery of the products for recognizable defects and at the latest within five (5) business days after their discovery for hidden defects. These deadlines are preclusion periods. If the customer fails to give such notice, the products shall be deemed accepted and to conform to the terms of the contract of sale.
- 5.2 We will not accept return of products, defective or otherwise, unless you have requested and received a return material authorization ("RMA") from us. We will only accept product returns that are not based on warranty claims, if customer notifies us hereof in writing within thirty (30) days of receipt of the invoice. Products authorized to be returned shall be shipped to our specified location (DDP Incoterms 2010).
- 5.3 When we have accepted the return of nonconforming products, conforming shipment may be made in accordance with clause 6 and clause 8 of these General Terms and Conditions without further liability on our part.
- 5.4 We will reimburse the customer any transportation charges in the event that the products returned to us are defective or not in accordance with these terms and conditions.

6. Delivery, Packaging and Risk of Loss

- 6.1 Deliveries and the transfer of risk shall be pursuant to Incoterms 2010 (FCA Wiesbaden, excluding packaging). Place of fulfillment for all our performance obligations shall be our premises, unless otherwise specified in the order confirmation.
- 6.2 All transport costs incurred shall be borne by the customer, unless otherwise explicitly agreed in writing. This can be claimed in the form of a flat charge that covers the costs incurred by us.
- 6.3 Specified delivery deadlines are considered to be only approximate agreed upon time guidelines unless they have been expressly stated as binding in our order confirmation. Every delivery period is extended by the length of the interruption of our work operation caused by impediments due to measures in connection with labour disputes in our company or those of our sub-suppliers, in particular strikes and legal lock-outs as well as the occurrence of unforeseen events which do not fall under our responsibilities. The foregoing circumstances do not fall under our responsibility only because they emerge during an already existing default. If, by reason of such circumstance, our supplies of the products covered hereby are limited, we shall have the right to allocate the available supply among our customers in such manner as we, in our sole discretion, deem appropriate. The customer will be informed of the beginning and ending of these kinds of impediments as soon as possible.
- 6.4 Partial deliveries are permissible insofar as these are economically acceptable for the customer. We shall be entitled to invoice an appropriate partial amount for every partial delivery.
- 6.5 If delivery periods have not been designated expressly as binding, we come into default with delivery at the earliest four (4) weeks after expiration of the delivery period by means of a written demand issued by the customer. In the case of delay in delivery caused by slight negligence the claim for damages which arises from breach of a contractual duty or default is limited to a maximum of five (5) percent of the total price of the products affected by the delay.
- 6.6 Products will be packed for shipment in a manner suitable to the method of shipment specified by the customer or to the method selected by us in the absence of instructions from the customer. In the absence of customer's specifications the shipment will be effected in our discretion on the most favourable conditions weighting the risks, costs and expenditure of time.
- 6.7 Should the scope of services and supply include software installed on the product, we reserve all software rights, in particular copyrights and associated rights of use and exploitation, unless these have been explicitly granted to the customer



in a separate agreement. Otherwise the customer shall only be granted the limited right to use the software in accordance with the purpose and scope of the contract based on a specially concluded software license agreement.

6.8 We reserve the title to all items delivered by us until complete settlement of invoice. If the customer sells the items supplied by us prior to settlement of invoice, the items delivered by us shall be substituted with the claim of the customer against his purchasers (prolonged reservation of title). The customer here and now assigns to us the corresponding claim; we hereby accept this assignment. If the customer processes the items supplied by us or combines or mixes them with other items, our title shall be substituted with a co-ownership of the new item in the ratio of the value of the items (extended reservation of title). In the event of sale of the new product prior to complete settling of our invoices, we reserve the extended title to that part of the claim of our customer against his purchasers which corresponds to the ratio of the value of the items delivered by us to the total value of the new items. The customer here and now assigns this claim to us; we hereby accept this assignment.

7. Taxes

7.1 The customer is responsible for the ultimate payment of all taxes on the products sold or the services provided to the customer, irrespective of their type or reason.

7.2 If the customer claims that a transaction is not subject to any such tax, that customer is exempt, or that we are not required to collect such tax, the customer agrees to provide us with all documentation necessary to support such a claim, to allow us to document any decision not to collect such tax(es), and to indemnify and hold us harmless from and against any and all fines, penalties, interest, taxes, and other expenses, including, without limitation, reasonable legal defense costs, incurred by us as a result of reliance upon customer's position.

8. Claims in the case of defects

8.1 In case of a defect we are entitled at our choice to either rectify the defect or provide a replacement delivery (subsequent performance). Any further claims based on defects on the part of the customer shall be precluded except for damage claims restricted by the provision in clause 9 of these General Terms and Conditions.

8.2 If subsequent performance is not successful, the customer is entitled, at his choice, to either withdraw from the contract or to demand an appropriate reduction of the purchase price.

8.3 In order to permit us to properly administer this warranty, customer shall (a) notify us promptly in writing of any claims; (b) provide us with an opportunity to inspect and test the products claimed to be defective (such inspection may be on customer's premises or we may request customer to return the products at customer's expense; such expense will be reimbursed if the Product is found to be defective); and (c) Customer will not return product without an RMA pursuant to clause 5.2 of these General Terms and Conditions.

8.4 Products transferred outside the country of original delivery, by actions subsequent to delivery, may be subject to additional charges prior to warranty repair or replacement of such products based on the actual location of such products and our warranty and / or service surcharges for such location(s). These additional costs shall be borne by the customer.

8.5 No liability is accepted for loss, defects or blemishes, as long as that are caused by unsuitable or improper handling and/or defective installation or commissioning by the customer or by third parties not instructed or authorized by us (also in reference to intervention in the software), natural wear and tear, false or careless treatment, unsuitable equipment by the customer, replacement materials, faulty construction, creation of chemical, electromechanical or electrical influences. Also excluded from claims for defects are changes to the products or unskilled repairs to the products which are attributable to the customer or third parties authorized by the customer to do so.

8.6 We reserve the right to alter the outer appearance or the equipping or technical details of our products insofar these modifications are reasonable to the customer or the changes are insignificant to the designated use. Any claims for faults due to such changes are precluded.

8.7 The subsequent performance is effected without recognition of a legal obligation and does not cause the limitation period to start anew. This also applies when spare parts have been installed in the course of rectification of a defect. Replaced parts will become our property and are to be handed over to us.

8.8 If an inspection of the claimed defects shows that no claim for defects exists, the customer is obliged to bear the costs brought about by the inspection.

8.9 If used objects, including demonstration units, are subject of the contract, all liability for defects is excluded, as far as we are not guilty of fraudulent behavior.

8.10 The limitation period for claims for defects is twelve (12) months starting at the date of the passing of the risk, if nothing to the contrary has been explicitly agreed in writing.



9. Limitation of Liability

- 9.1 Unless by virtue of compelling statutory provisions, e.g. regarding product liability, relief from liability is precluded or otherwise explicitly agreed with the customer in writing, the following disclaimers and liability restrictions shall apply to all cases of statutory or contractual liability.
- 9.2 Liability shall be precluded in cases of slight negligence except in cases of injury to life, limb or health.
- 9.3 If a corresponding liability restriction is permitted by law, we shall only be liable for the foreseeable damage which is typical of the contract. Liability for indirect damage, consequential damage or lost profit shall be precluded. In addition our liability shall be restricted to a maximum of three times the price of our contractual services, however, to a maximum of 1,500,000.00 EURO, and in the case of pecuniary damage to twice the price, to a maximum of 1,000,000.00 EURO, if this liability restriction is permitted by law.
- 9.4 The limitation period for damage claims is two years starting from the date on which the customer became aware of the damage or, irrespective of the knowledge thereof three years starting from the date on which the damaging event occurred for the first time.
- 9.5 The foregoing liability limitations also apply in the case of damage claims by the customer against our employees or agents.

10. Indemnification against third party claims

- 10.1 We agree to defend or settle, at our own expense, any claims against the customer alleging that the use of the products infringes an intellectual property right (patent, copyright, trademark or other commercial property right), and assume all costs and compensation payments incurred to the customer in this connection. The foregoing obligations are conditional on: (a) our being promptly notified in writing of the assertion of such claim, (b) our being given sole control of the defense relating thereto and any related settlement negotiations, (c) our being provided with, at our expense, all reasonable assistance in such defense, and (d) our being liable for the infringement of third party intellectual property rights in accordance with clause 9 of this General Terms & Conditions.
- 10.2 To the extent that a final legally valid title of prohibition exists against the use of the product by the customer or a settlement in accordance with clause 10.1 has been concluded, we, at our own reasonable discretion and at our own expense, either (a) supply the customer with the further right to use the product or (b) replace or modify the product in such a way that no further third party intellectual property rights are infringed while still maintaining in essence the performance properties. To the extent that none of the foregoing alternatives is reasonably practicable in our view, we will take back the product and reimburse the license fees paid less a reasonable compensation for use for the time during which the product was in the customer's possession, calculated on the basis of a total utilization period of three (3) years.
- 10.3 The claims of the customer pursuant to infringement of an industrial property right as described in clauses 10.1 and 10.2 do not exist in the case of infringements of intellectual property rights attributable to (a) use of product contrary to the provisions of the respective manuals, (b) use of the product in combination with other products, accessories, software or data not supplied by us, unless this is expressly provided for in the documentation, (c) modification of the product by the customer or third parties, or (d) continued use of the product by the customer after we made a modified version of the product not infringing these intellectual property rights available to the customer.
- 10.4 Subject to the provisions in clause 9, the provisions set out in this clause 10 shall be deemed to finally regulate our liability and the claims of the customer relating to intellectual property infringement by the product.
- 10.5 With the exception of claims based on malice, any claims of the customer pursuant to clauses 10.1 to 10.4. shall become statute-barred within 12 months of delivery of the product.

11. Software Licences and Copyright Material

- 11.1 We provide software products by license only. The terms of the license are available from us and are deemed accepted by the customer on delivery of licensed software.
- 11.2 Unless otherwise specified, our copyright material (software, firmware, and printed documentation) may not be copied except for archive purposes, to replace a defective copy, or for program error verification by the customer.

12. Export

- 12.1 The customer shall undertake not to export or re-export our products or technology or related technical data insofar as this conflicts to the export control regulations of the Federal Republic of Germany or of the European Community. The customer acknowledges as well that our products and the related technical information, accessories and the software data are subject to export control regulations which may prohibit their delivery to certain countries or end-users, or make such delivery subject to export licensing prior to any shipment.



12.2 We may refuse the fulfillment of our obligations in accordance with order confirmations if and for as long as such fulfillment may violate German or EC export control legislation. Such refusal shall give not rise to any claim against us.

13. Protection of data and intellectual property

13.1 All personal data shall be collected, processed and used in compliance with the applicable data protection provisions.

13.2 If we are requested or deem it appropriate in connection with the sale, purchase, use or service of the products to communicate data or information which we deem to be confidential or protected by law, we are under no circumstances are obliged to supply such data or information unless the customer enters into a Non-Disclosure Agreement (NDA) on the handling of this information, its use, copying, retention and return in accordance with our instructions. We shall not accept any customer information which is protected by law or confidential unless such a written agreement signed by one of our authorized representatives exists.

14. Final Clauses

14.1 The terms stipulated herein are the contractual basis of our business relation with the customer. These General Terms and Conditions shall likewise agree for all future business transactions with the customer.

14.2 We shall not accept the customer's Terms and Conditions, unless we have explicitly consented to them in writing. This shall also apply if we execute a delivery without having explicitly repudiated the Terms and Conditions of the customer.

14.3 German law applies with the exclusion of the UN Convention on Contracts for the International Sale of Goods (CISG).

14.4 Exclusive place of jurisdiction for disputes arising from our business relationships with the customer is the seat of our company.

14.5 The customer shall neither assign nor transfer nor delegate his rights or obligations in connection with the business relationship or cede them to use to third parties without our prior written consent. Any purported assignment of such rights or obligations without our explicit prior written consent shall be null and void.

14.6 In the event of individual provisions of these General Terms and Conditions being or becoming null and void, this shall not affect the efficacy of the remaining provisions. A legally permissible provision which as closely as possible approaches the legal and economic purpose of the ineffective provision shall replace the ineffective provision. All parties to the contract shall be entitled and obliged to cooperate in any necessary alterations or amendments to the agreement. The same shall apply in case of a loophole in the contract.

14.7 The captions of the individual provisions are set for clear view only. They do not possess a legal binding, in particularly not with regard to a concluding regulation.

14.8 The English version of these general terms and conditions is provided for convenience purposes only. In case of conflict, the German version shall prevail.



Leuchtturm
Automation

EPHY MESS
Gesellschaft für Elektro-Physikalische Meßgeräte mbH



Berta-Cramer-Ring 1
D-65205 Wiesbaden
Tel.: 06122 / 9228-0
Fax: 06122 / 9228-99
www.ephy-mess.de

深圳市朝瑞自动化系统有限公司