

The reliable program



NEWTRONIC 

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Price list 2022

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Immersion heaters

MAWO- Immersion heaters are used for the direct heating of aggressive liquids in electroplating and the chemical industry.

Various sheath materials are used, which are chemically resistant.

An overview of the durability of the sheath materials can be found in our resistance list.

Basically, we distinguish 2 types of immersion heaters:

R- types: Immersion heaters with a tube as coat

H- types: hairpin-shaped curved immersion heaters

On the immersion heaters there is an ring-shaped marking marking the **minimum immersion depth** (ET). This marking divides the heated area (lower part) and the unheated area (upper part). The heated area must always be surrounded by liquid!

The prices are valid for immersion heaters with a MAWO cover cap including a conducting cable with a length of 1,6m. Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. If desired or required, the immersion heaters can also be supplied with a PPH or PVDF cover cap. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Consulting

We would be pleased to support your planning of the heating of your bath or your plant.

If you send us our power calculation sheet with your data, we will calculate the heat demand of your bath free of charge and show you whether energy savings are possible.

Furthermore we suggest suitable heaters for your bath.

Quality assurance

Every production step is constantly monitored qualitatively. All products are finally checked for functionality and safety.

Our immersion heaters have the VDE mark and the CE mark. The VDE Testing and Certification Institute monitors our production with factory inspections.



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General conditions for the supply of products and services of the electrical industry.

R- types

R- types are immersion heaters with a tube as coat .

They consist of:

- MAWO- Cover cap with supply line
- flange combination
- Heating insert/ heating cartridge
- casing tube

These components can also be purchased and exchanged separately.

R- types tube materials:

- R Mild Steel Ø 42 mm
- R Mild Steel Ø 45 mm
- R Stainless Steel 1.4571 Ø 42 mm
- R Titanium 3.7035 Ø 42 mm
- R Glass Ø 48 mm
- R Quartz glass Ø 48 mm
- R Hard porcelain Ø 48 mm
- R PTFE Ø 49 mm



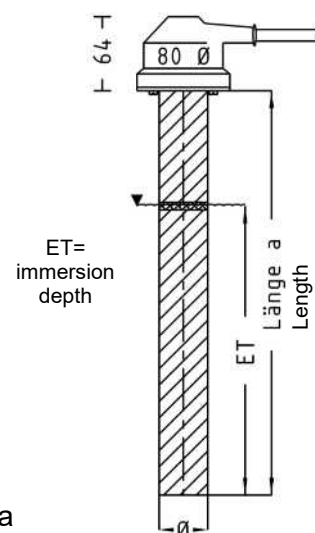
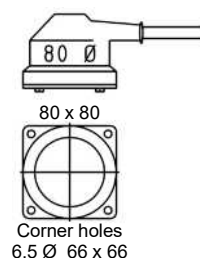
R Mild Steel Ø 42 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ³ ~ (also 230V 3~) DKK
300	230	500	1.102	
350	250	500	1.102	
450	350	750	1.195	
450	350	1000	1.230	
450	350	1500	1.277	1.395
600	250	1000	1.348	
600	400	1300	1.348	
600	450	500	1.348	
600	450	1000	1.348	
600	450	1500	1.359	*
600	450	2000	1.512	1.617
600	450	2500	1.629	1.629
670	500	2000	1.734	1.734
670	500	3000	1.734	1.734
800	600	666	1.594	
800	600	888	1.629	
800	600	1500	1.781	1.781
800	600	2000	1.594	*
800	600	2500	1.629	*
800	600	3000	1.781	1.781
1000	700	3000	1.852	1.852
1000	800	2000	1.629	*
1000	800	2500	1.641	*
1000	800	3000	1.652	
1100	900	1000	1.688	
1100	900	3000	1.699	*
1100	900	3500	1.863	1.863
1100	900	5000		1.980
1300	900	3000	2.039	2.039
1300	900	5000		2.191
1300	1100	1000	1.746	
1300	1100	3000	1.746	
1400	1150	3000	2.098	2.098
1800	1100	4000		2.215
1800	1100	5000		2.367
1800	1400	4000		2.215
2000	1550	4000		2.297

* also available with 400V²~



Protection class IP 66



The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V



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R- types

Immersion heaters with a tube as coat

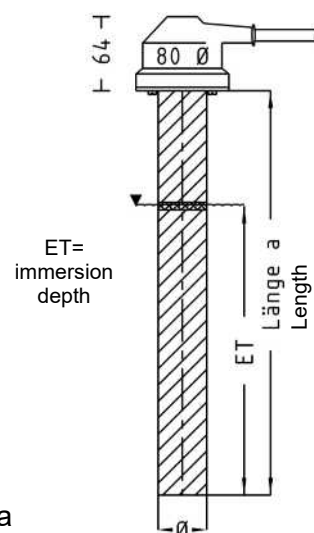
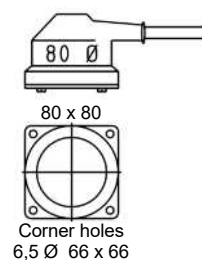
R Mild Steel Ø 45 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ^{3~} (also 230V 3~) DKK
300	230	500	1.113	
350	250	500	1.113	
450	350	750	1.207	
450	350	1000	1.242	
450	350	1500	1.289	1.406
600	250	1000	1.371	
600	400	1300	1.371	
600	450	500	1.371	
600	450	1000	1.371	
600	450	1500	1.383	*
600	450	2000	1.535	1.641
600	450	2500	1.652	1.652
670	500	2000	1.758	1.758
670	500	3000	1.758	1.758
800	600	666	1.629	
800	600	833	1.664	
800	600	1500	1.816	1.816
800	600	2000	1.629	*
800	600	2500	1.664	*
800	600	3000	1.816	1.816
1000	700	3000	1.887	1.887
1000	800	2000	1.664	*
1000	800	2500	1.676	*
1000	800	3000	1.688	
1100	900	1000	1.723	
1100	900	3000	1.734	*
1100	900	3500	1.898	1.898
1100	900	5000		2.016
1300	900	3000	2.086	2.086
1300	900	5000		2.238
1300	1100	1000	1.793	
1300	1100	3000	1.793	
1400	1150	3000	2.145	2.145
1800	1100	4000		2.262
1800	1100	5000		2.414
1800	1400	4000		2.262
2000	1550	4000		2.344

* also available with 400V^{2~}



Protection class IP 66



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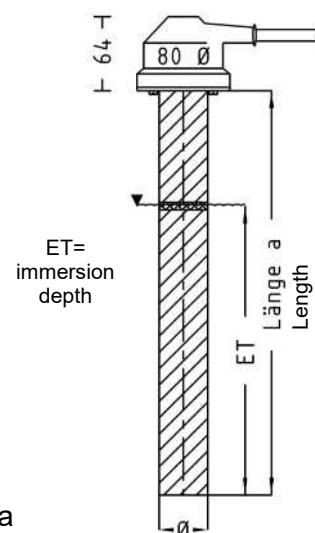
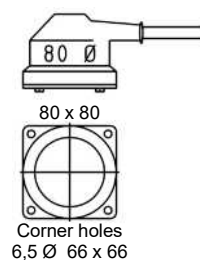
R Stainless Steel 1.4571 Ø 42 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ³ ~ (also 230V 3~) DKK
300	230	500	1.137	
350	250	500	1.137	
450	350	750	1.266	
450	350	1000	1.301	
450	350	1500	1.359	1.477
600	250	1000	1.418	
600	400	1300	1.441	
600	450	500	1.441	
600	450	1000	1.441	
600	450	1500	1.453	*
600	450	2000	1.617	1.723
600	450	2500	1.828	1.828
670	500	2000	2.027	2.027
670	500	3000	2.027	2.027
800	600	666	1.793	
800	600	833	1.840	
800	600	1500	2.133	2.133
800	600	2000	1.793	*
800	600	2500	1.840	*
800	600	3000	2.133	2.133
1000	700	3000	2.215	2.215
1000	800	2000	1.887	*
1000	800	2500	1.887	*
1000	800	3000	1.887	
1100	900	1000	1.969	
1100	900	3000	1.969	*
1100	900	3500	2.332	2.332
1100	900	5000		2.449
1300	900	3000	2.695	2.695
1300	900	5000		2.848
1300	1100	1000	2.238	
1300	1100	3000	2.238	
1400	1150	3000	2.883	2.883
1800	1100	4000		2.918
1800	1100	5000		3.070
1800	1400	4000		2.918
2000	1550	4000		2.988

* also available with 400V²~



Protection class IP 66



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R- types

Immersion heaters with a tube as coat

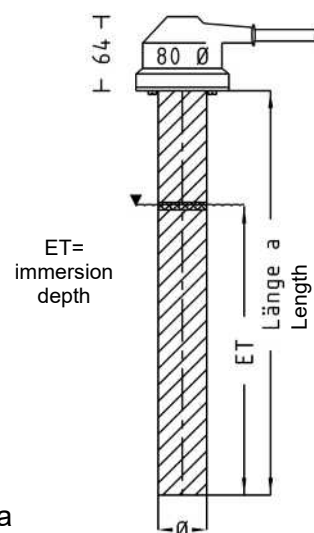
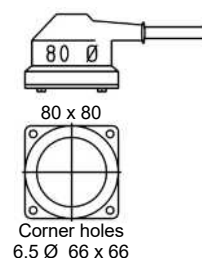
R Titanium 3.7035 Ø 42 mm

Length mm	ET mm	Power Watt	230V~ DKK	400V ³ ~ (also 230V 3~) DKK
300	230	500	1.956	
350	250	500	1.956	
450	350	750	2.179	
450	350	1000	2.218	
450	350	1500	2.258	2.389
600	250	1000	2.297	
600	400	1300	2.336	
600	450	500	2.336	
600	450	1000	2.297	
600	450	1500	2.336	*
600	450	2000	2.520	2.638
600	450	2500	2.664	2.664
670	500	2000	2.717	2.717
670	500	3000	2.717	2.717
800	600	666	2.612	
800	600	833	2.691	
800	600	1500	2.993	2.993
800	600	2000	2.612	*
800	600	2500	2.691	*
800	600	3000	2.993	2.993
1000	700	3000	3.098	3.098
1000	800	2000	2.848	*
1000	800	2500	2.848	*
1000	800	3000	2.848	
1100	900	1000	3.176	
1100	900	3000	3.176	*
1100	900	3500	3.531	3.531
1100	900	5000		3.662
1300	900	3000	3.675	3.675
1300	900	5000		3.846
1300	1100	1000	3.504	
1300	1100	3000	3.504	
1400	1150	3000	3.793	3.793
1800	1100	4000		4.056
1800	1100	5000		4.226
1800	1400	4000		4.056
2000	1550	4000		4.292

* also available with 400V²~



Protection class IP 66



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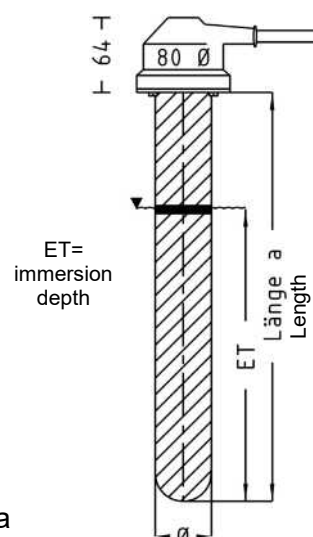
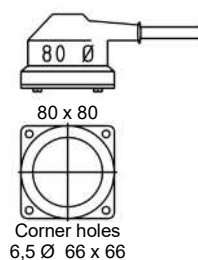
R Glass Ø 48 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ³ ~ (also 230V 3~) DKK
350	250	500	1.160	
450	350	750	1.242	
450	350	1000	1.277	
450	350	1500	1.324	1.441
600	250	1000	1.371	
600	400	1300	1.406	
600	450	500	1.406	
600	450	1000	1.371	
600	450	1500	1.406	*
600	450	2000	1.559	1.664
600	450	2500	1.734	1.734
670	500	2000	1.840	1.840
670	500	3000	1.840	1.840
800	600	666	1.699	
800	600	833	1.746	
800	600	1500	1.887	1.887
800	600	2000	1.699	*
800	600	2500	1.746	*
800	600	3000	1.887	1.887
1000	700	3000	2.051	2.051
1000	800	2000	1.805	*
1000	800	2500	1.805	*
1000	800	3000	1.805	
1100	900	1000	1.898	
1100	900	3000	1.898	*
1100	900	3500	2.133	2.133
1100	900	5000		2.238
1300	900	3000	2.473	2.473
1300	900	5000		2.602
1300	1100	1000	2.156	
1300	1100	3000	2.156	
1800	1100	4000		2.684
1800	1100	5000		2.836
1800	1400	4000		2.684

* also available with 400V²~



Protection class IP 66



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R- types

Immersion heaters with a tube as coat

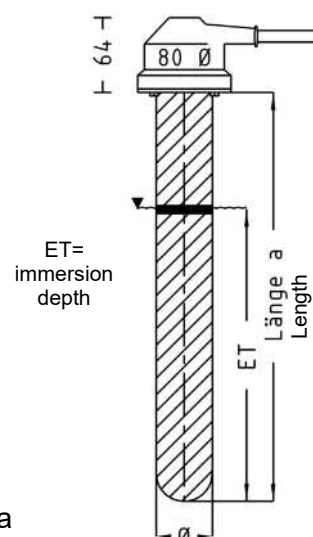
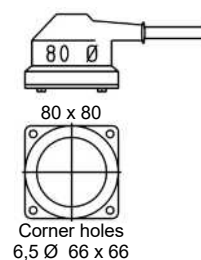
R Quartz glass Ø 48 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ³ ~ (also 230V 3~) DKK
300	230	500	1.509	
350	250	500	1.509	
450	350	750	1.641	
450	350	1000	1.680	
450	350	1500	1.719	1.851
600	250	1000	1.838	
600	400	1300	1.864	
600	450	500	1.864	
600	450	1000	1.838	
600	450	1500	1.864	*
600	450	2000	2.048	2.218
600	450	2500	2.258	2.258
670	500	2000	2.468	2.468
670	500	3000	2.468	2.468
800	600	666	2.166	
800	600	833	2.218	
800	600	1500	2.546	2.546
800	600	2000	2.166	*
800	600	2500	2.218	*
800	600	3000	2.546	2.546
1000	700	3000	2.730	2.730
1000	800	2000	2.415	*
1000	800	2500	2.415	*
1000	800	3000	2.415	
1100	900	1000	2.481	
1100	900	3000	2.481	*
1100	900	3500	2.874	2.874
1100	900	5000		3.006
1300	900	3000	3.268	3.268
1300	900	5000		3.439
1300	1100	1000	2.822	
1300	1100	3000	2.822	
1800	1100	4000		4.305
1800	1100	5000		4.476
1800	1400	4000		4.305

* also available with 400V²~



Protection class IP 66



The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

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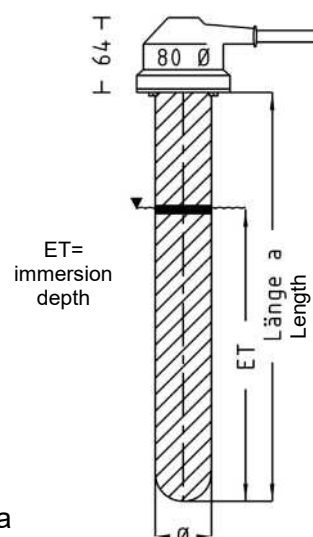
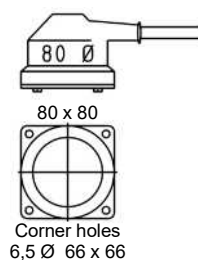
R Hard Porcelain Ø 48 mm

Length mm	ET mm	Power Watt	Total price	
			230V~ DKK	400V ³ ~ (also 230V 3~) DKK
300	230	500	1.242	
350	250	500	1.242	
450	350	750	1.359	
450	350	1000	1.395	
450	350	1500	1.441	1.559
600	250	1000	1.512	
600	400	1300	1.547	
600	450	500	1.547	
600	450	1000	1.512	
600	450	1500	1.547	*
600	450	2000	1.746	1.863
600	450	2500	1.863	1.863
670	500	2000	2.074	2.074
670	500	3000	2.074	2.074
800	600	666	1.828	
800	600	833	1.863	
800	600	1500	2.168	2.168
800	600	2000	1.828	*
800	600	2500	1.863	*
800	600	3000	2.168	2.168
1000	700	3000	2.238	2.238
1000	800	2000	2.086	*
1000	800	2500	2.086	*
1000	800	3000	2.086	
1100	900	1000	2.156	
1100	900	3000	2.156	*
1100	900	3500	2.332	2.332
1100	900	5000		2.426
1300	900	3000	2.801	2.801
1300	900	5000		2.953
1300	1100	1000	2.484	
1300	1100	3000	2.484	

* also available with 400V²~



Protection class IP 66



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R- types

Immersion heaters with a tube as coat

R PTFE Ø 49 mm

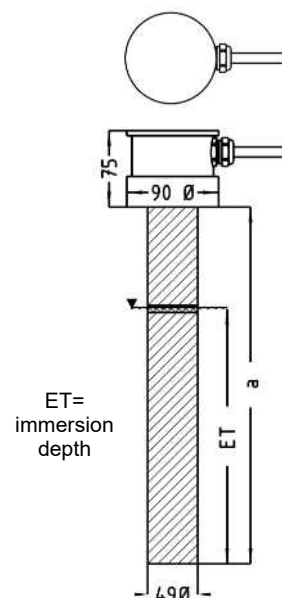
**230V alternating current (AC)- or
400V three-phase- version:**

R- Type		PTFE Ø 49 mm		230V~	400V ³ ~ (also 230V3~)
Power Watt	a mm	ET mm	T max. °C	Price DKK	Price DKK
750	450	350	110 °C	2.918	-
1000	600	450	110 °C	3.387	3.387
1500	800	600	110 °C	4.090	4.090
2000	1000	750	110 °C	4.676	4.676
2500	1200	950	110 °C	5.367	5.367
3000	1400	1150	110 °C	5.988	5.988
4000	2000	1550	110 °C	-	7.523



T max. = maximum bath temperature

All listed types are also available with other power (wattage) and immersion depths (ET) on request.



The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

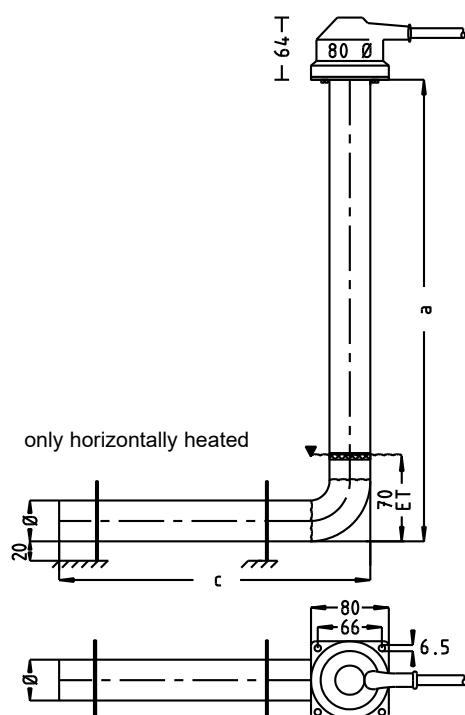


R Angular Immersion Heaters Ø 42 mm

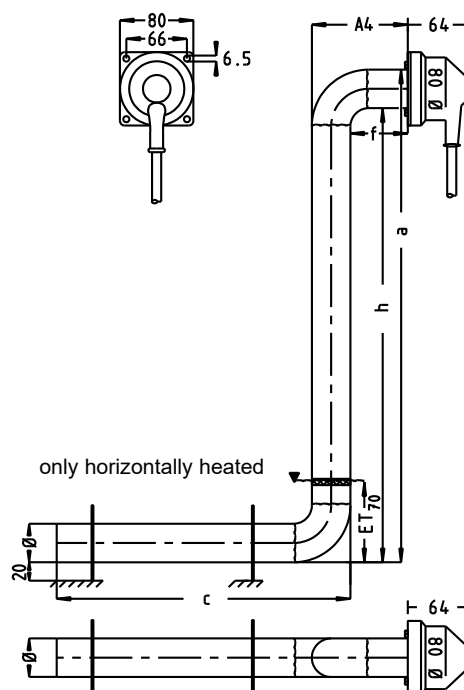
Mild Steel

Stainless Steel 1.4571

Titanium 3.7035



ET=
immersion
depth



Protection class IP 66

Individual production according to customer requirements.
Various versions with 230V~, 400V²~, 230V³~ and 400V³~ possible.

Price on request.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

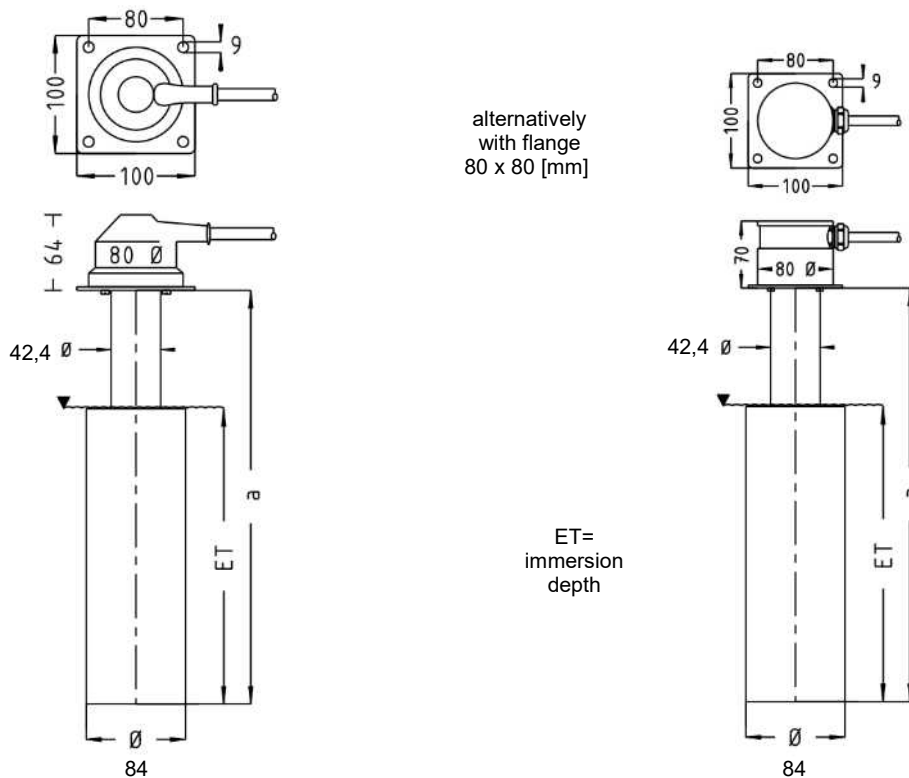


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General conditions for the supply of products and services of the electrical industry.

R- types

Immersion heaters with a tube as coat

R Stainless Steel 1.4571 Ø 84 mm / 42,4 mm with reduced surface charge



Protection class IP 66



on photo with flange 80x80

Stainless Steel immersion heaters with reduced surface load.
Purpose: for example phosphating baths
Individual production according to customer requirements.
Various versions with 230V~, 400V²~, 230V³~ and 400V³~ possible.

Price on request.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

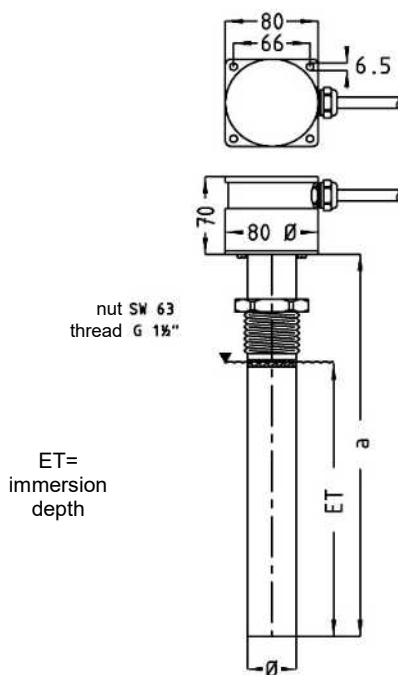
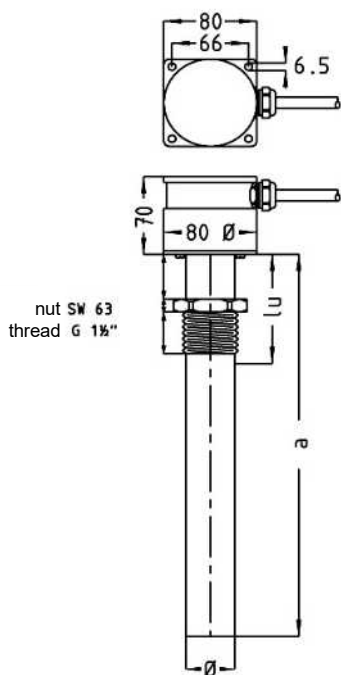
Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

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**R Stainless Steel 1.4571 Ø 42 mm alternatively Ø 42,4 mm
with welded nut and thread**



ET=
immersion
depth



Individual production according to customer requirements.
Various versions with 230V~, 400V²~, 230V³~ and 400V³~ possible.

Price on request.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V



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230V alternating current (AC)- Cartridges

Cartridges for replacement

R- types

Length mm	ET mm	Power Watt	Cartridge for replacement 230V~ DKK
300	230	500	492
350	250	500	504
450	350	750	563
450	350	1000	598
450	350	1500	656
600	250	1000	668
600	400	1300	668
600	450	500	668
600	450	1000	668
600	450	1500	668 *
600	450	2000	785
600	450	2500	914
670	500	2000	984
670	500	3000	984
800	600	666	797
800	600	833	809
800	600	1500	1.043
800	600	2000	809 *
800	600	2500	844 *
800	600	3000	1.043
1000	700	3000	1.090
1000	800	2000	891 *
1000	800	2500	891 *
1000	800	3000	891
1100	900	1000	914
1100	900	3000	914 *
1100	900	3500	1.125
1300	900	3000	1.242
1300	1100	1000	1.055
1300	1100	3000	1.055
1400	1150	3000	1.313

* also available with 400V^{2~}

ET=
immersion
depth

Special voltages possible,
e.g. 115V, 127V, 208V, 277V, 415V,
440V, 460V, 480V



400V three-phase- Cartridges

Length mm	ET mm	Power Watt	Cartridge for replacement 400V ^{3~} (also 230V 3~) DKK
450	350	1500	785
600	450	1500	867
600	450	2000	879
600	450	2500	914
670	500	2000	984
670	500	3000	984
800	600	1500	1.066
800	600	2000	1.031
800	600	2500	1.043
800	600	3000	1.066
1000	700	3000	1.090
1100	900	3000	1.102
1100	900	3500	1.125
1100	900	5000	1.254
1300	900	3000	1.242
1300	900	5000	1.395
1400	1150	3000	1.324
1800	1100	4000	1.582
1800	1100	5000	1.734
1800	1400	4000	1.582
2000	1550	4000	1.746

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Tubes for replacement R-types

Mild Steel 42 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	410
350	250	422
450	350	492
600	250	539
600	400	539
600	450	539
670	500	551
800	600	563
1000	700	574
1000	800	574
1100	900	598
1300	900	633
1300	1100	633
1400	1150	656
1800	1100	832
1800	1400	832
2000	1550	867



Mild Steel 45 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	422
350	250	434
450	350	504
600	250	563
600	400	563
600	450	563
670	500	574
800	600	598
1000	700	609
1000	800	609
1100	900	633
1300	900	680
1300	1100	680
1400	1150	703
1800	1100	879
1800	1400	879
2000	1550	914



ET=
immersion
depth

Stainless Steel 1.4571 42 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	516
350	250	527
450	350	609
600	250	691
600	400	691
600	450	691
670	500	750
800	600	844
1000	700	961
1000	800	961
1100	900	1.008
1300	900	1.160
1300	1100	1.160
1400	1150	1.266
1800	1100	1.453
1800	1400	1.453
2000	1550	1.512

Stainless Steel: Price surcharge reserved



Titanium 3.7035 42 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	1.089
350	250	1.103
450	350	1.208
600	250	1.523
600	400	1.523
600	450	1.523
670	500	1.588
800	600	1.693
1000	700	1.982
1000	800	1.982
1100	900	2.061
1300	900	2.271
1300	1100	2.271
1400	1150	2.376
1800	1100	2.796
1800	1400	2.796
2000	1550	3.006

Titanium: Price surcharge reserved



Tubes for replacement R-types

Glass 48 Ø

Length mm	ET mm	Tube for replacement DKK
350	250	375
450	350	457
600	250	480
600	400	480
600	450	480
670	500	551
800	600	598
1000	700	691
1000	800	691
1100	900	750
1300	900	879
1300	1100	879
1800	1100	1.160
1800	1400	1.160



Quartz glass 48 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	774
350	250	774
450	350	853
600	250	984
600	400	984
600	450	984
670	500	1.063
800	600	1.129
1000	700	1.299
1000	800	1.299
1100	900	1.391
1300	900	1.549
1300	1100	1.549
1800	1100	2.704
1800	1400	2.704



ET=
immersion
depth

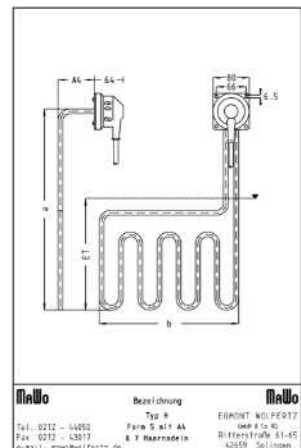
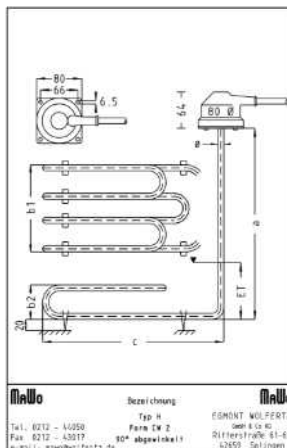
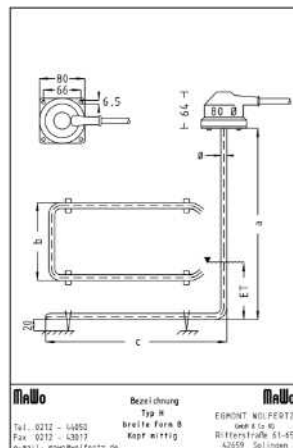
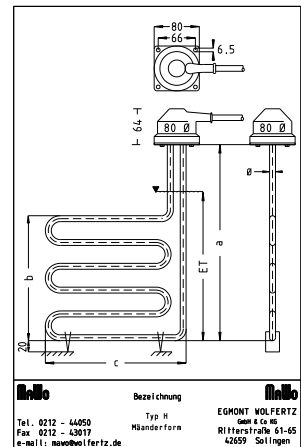
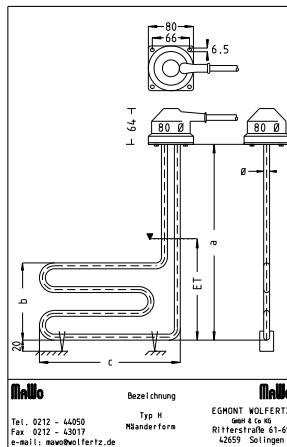
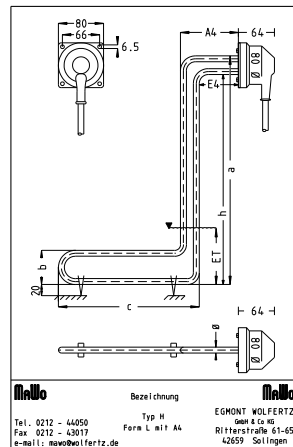
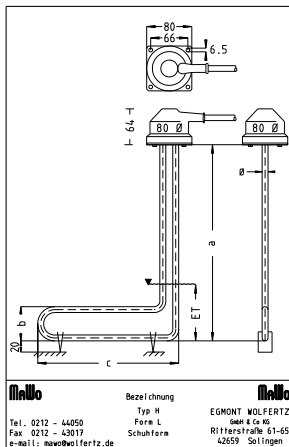
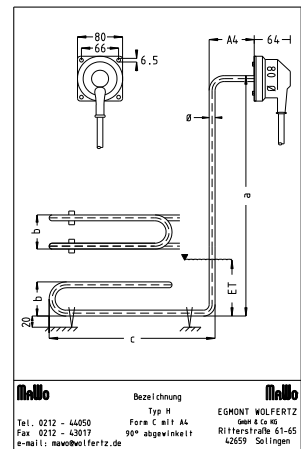
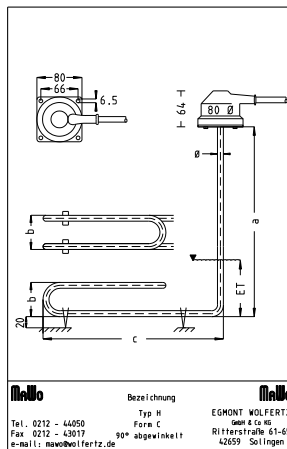
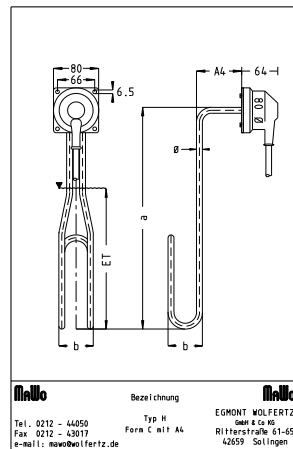
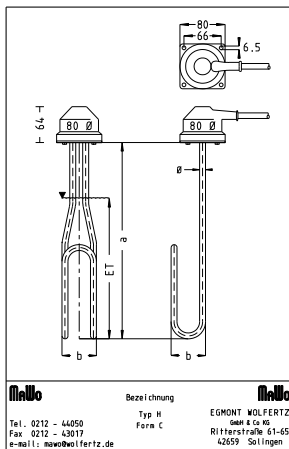
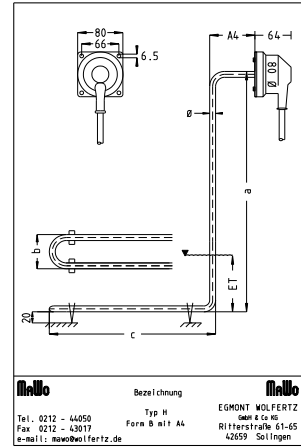
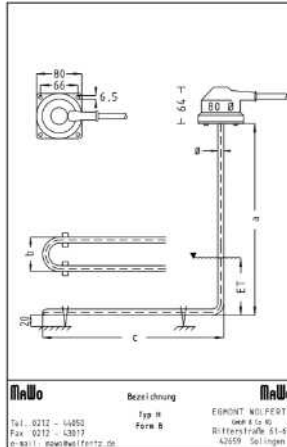
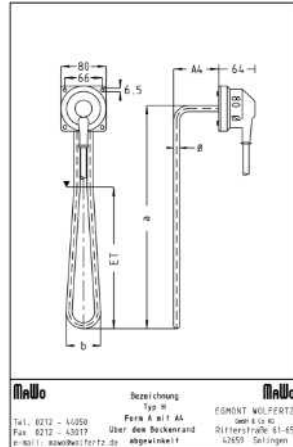
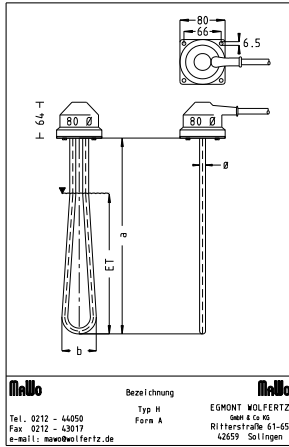
Hard porcelain 48 Ø

Length mm	ET mm	Tube for replacement DKK
300	230	551
350	250	551
450	350	633
600	250	750
600	400	750
600	450	750
670	500	809
800	600	902
1000	700	1.043
1000	800	1.043
1100	900	1.125
1300	900	1.242
1300	1100	1.242



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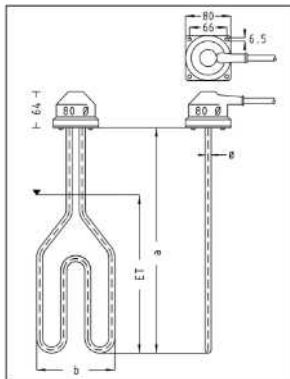
many further
bending forms
are available



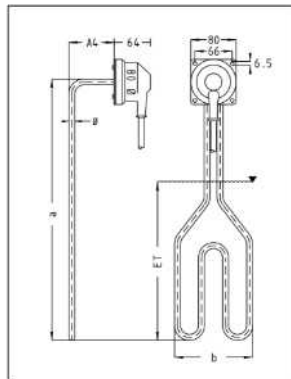
H- types

Bending forms, 1-part, alternating current

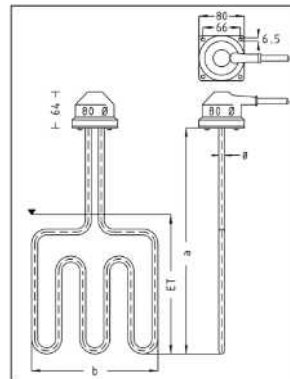
MaWo
IMMERSION HEATERS



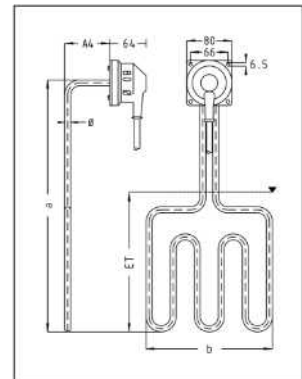
MaWo Bezeichnung MaWo
Typ H Form W
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



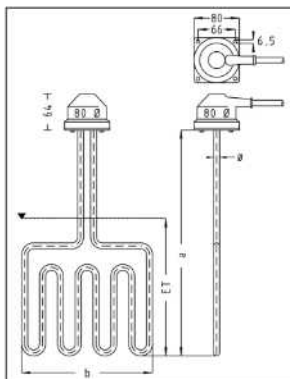
MaWo Bezeichnung MaWo
Typ H Form W mit A4
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



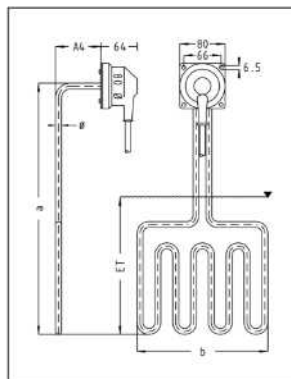
MaWo Bezeichnung MaWo
Typ H Form W mit 5 Heizrunden
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



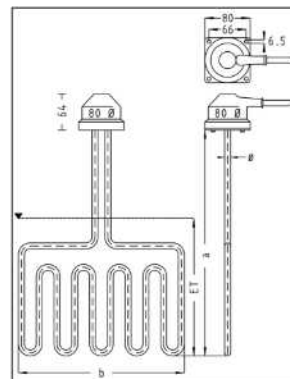
MaWo Bezeichnung MaWo
Typ H Form W mit A4 & 5 Heizrunden
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



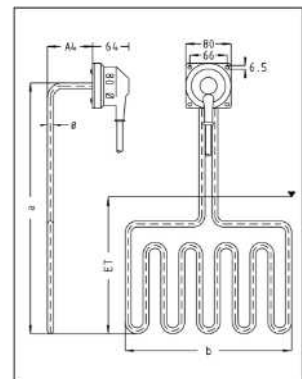
MaWo Bezeichnung MaWo
Typ A Form W mit 3 Heizrunden
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



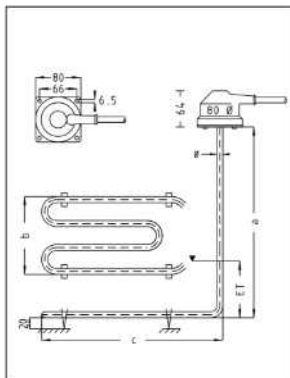
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Typ H Form W mit A4 & 3 Heizrunden
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



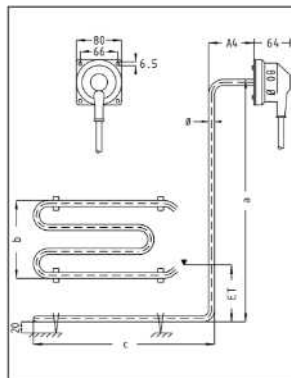
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DK-8700 Horsens
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Fax: 0212 - 43017
e-mail: info@newtronic.dk



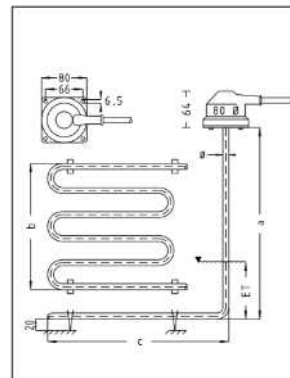
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DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



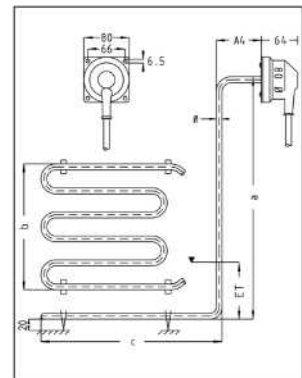
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Typ H Form W 90° abgewinkelt
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



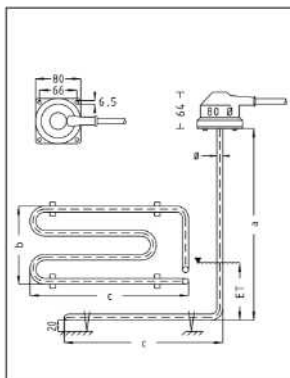
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Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



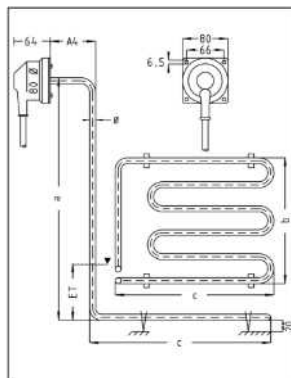
MaWo Bezeichnung MaWo
Typ H Form W mit 5 Heizrunden 90° abgewinkelt
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



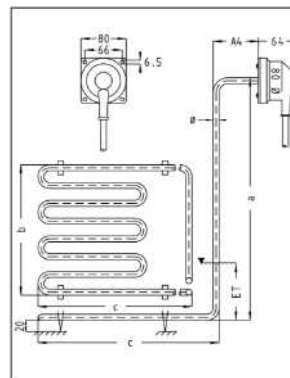
MaWo Bezeichnung MaWo
Typ H Form W mit 5 Heizrunden 90° abgewinkelt mit A4
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



MaWo Bezeichnung MaWo
Typ H Form W mit 3 Heizrunden Kopf in Ecke
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk



MaWo Bezeichnung MaWo
Typ H Form W mit 5 Heizrunden 90° abgewinkelt Kopf in Ecke
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk

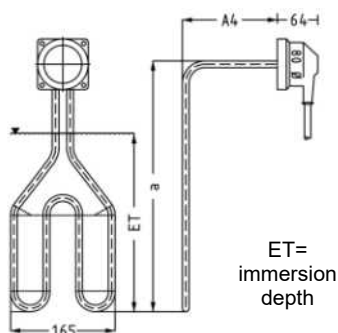


MaWo Bezeichnung MaWo
Typ H Form W mit 5 Heizrunden 90° abgewinkelt Kopf in Ecke
EGMONT WULFERTZ
Ove Jensen Alle 35F
DK-8700 Horsens
Tel.: 0212 - 44050
Fax: 0212 - 43017
e-mail: info@newtronic.dk

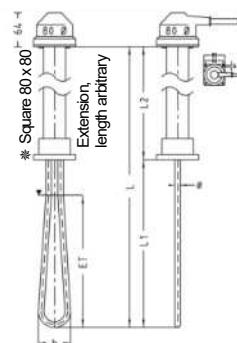
many further
bending forms
are available



with bent head (A4):



with extension:



with assembled thermostat:



with assembled thermostat
and with temperature safety device:



with temperature safety device:

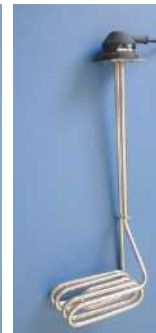


A sensor tube with a temperature fuse is attached to the immersion heater. The connection cable of the cover cap has two more marked wires which are checked for interruption (for example with the contact protection relay). In the case of a dry run, the thermal fuse breaks and this circuit is interrupted. Thereafter, the thermal fuse must be replaced. Suitable thermal fuses can be obtained from us.

many further bending forms:

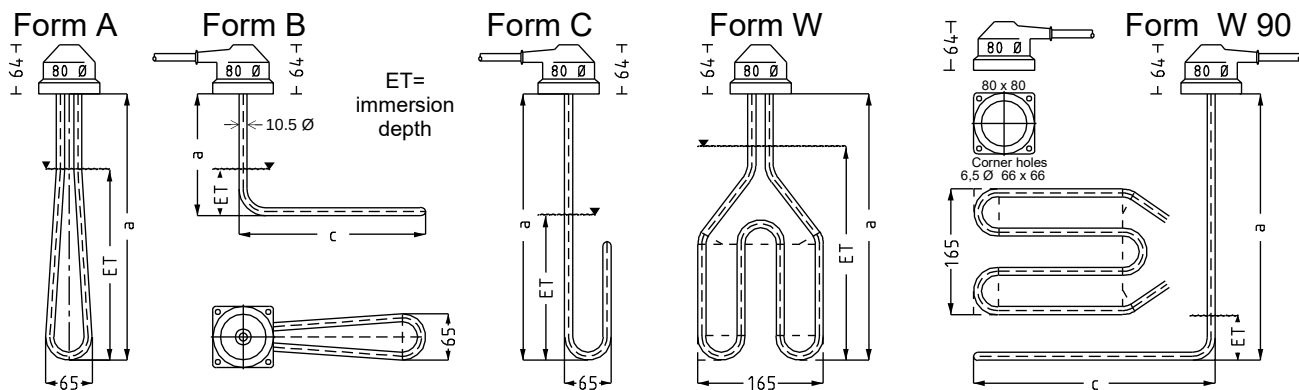


many further bending forms and versions:



H- types

Titanium- and Stainless Steel Immersion heater



H- Type	Form A		Form B			Form C		Form W		Form W 90			Stainless Steel	Titanium
Power	a	ET	a	c	ET	a	ET	a	ET	a	c	ET	Form A** 230V~ DKK	Form A** 230V~ DKK
Watt	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
500	350	250	160	210	60	240	130						1.160	1.547
alternative 1000W 750	450	350	160	310	60	290	180						1.348	1.793
750	530	320	210	350	30	370	160	320	190	210	200	30	1.395	1.980
1000	600	450	140	480	30	390	230						1.430	2.156
1000	750	450	290	480	30	520	220	550	270	290	260	30	1.688	2.496
1500	600	450	140	480	30	390	230						1.441	2.168
alternative 1500W 2000	800	600	190	630	30	515	305						1.746	2.602
2500	900	700	190	730	30	565	355						1.922	2.848
alternative 2000W 3000	1100	900	190	930	30	665	455						2.203	3.293
4000*	1100	900	190	930	30	665	455						2.203	3.293
4000	1350	1150	180	1250	30	800	600	900	700	600	450	400	2.449	3.645
1500	870	470	400	500	30	670	270	670	280	400	280	30	1.922	2.848
1500	1050	450	570	490	30	820	240	840	265	580	280	30	2.145	3.199
1500*	1850	1600	240	1650	30	1100	850	1100	850	240	900	30	2.836	4.254
1600	1000	500	500	520	30	770	260	770	280	500	290	30	2.098	3.141
2000	1000	600	400	620	30	715	305	720	330	400	340	30	2.098	3.141
2000	1100	600	500	620	30	815	305	820	330	500	340	30	2.203	3.293
2000	1250	600	640	640	30	970	330	975	330	650	350	30	2.379	3.539
2000	1350	950	400	970	30	880	490	890	500	400	520	30	2.449	3.645
2000	1700	1200	530	1190	30	1120	600	1150	630	530	650	30	2.801	4.184
3000	1400	900	500	920	30	965	455	980	490	500	500	30	2.543	3.762
3000	1700	1500	200	1540	30	965	750	1150	930	200	780	30	2.801	4.184
3000	1900	1500	400	1540	30	1165	775	1170	780	400	800	30	3.059	4.547
3000	2150	1500	600	1590	30	1400	750	1600	950	660	800	30	3.375	4.910
3000*	2500	2100	400	2150	30	1500	1100	1600	1200	400	1100	30	3.621	5.320
4000*	1300	900	400	920	30	865	455	870	480	400	480	30	2.426	3.598
4000*	1500	900	590	940	30	1060	470	1080	485	600	500	30	2.660	3.891
4000*	1600	1200	400	1220	30	1010	600	1020	630	400	635	30	2.766	4.043
4500*	1850	1600	240	1650	30	1100	850	1100	850	240	900	30	3.047	4.535
5500*	1900	1500	400	1520	30	1165	755	1165	775	400	780	30	3.059	4.547
2000	1800	600	1100	750	30	1500	400	1450	440	1000	450	30	3.035	4.523
3000	2100	900	1100	1050	30	1650	550	1600	590	1000	600	30	3.387	4.840
4000*	2100	900	1100	1050	30	1650	550	1600	590	1000	600	30	3.387	4.840
4000*	2750	2000	780	2000	30	1800	1150	2000	1250	700	1100	30	3.855	5.496
5500*	2500	1300	1100	1450	30	1850	750	1800	790	1000	800	30	3.621	5.320
2500*	2900	1900	1000	1900	30	1900	1000	2000	1000	1000	1000	30	3.973	5.695

*) only 400 V ~ All types are also available in Mild Steel or Incoloy.

X Types with reduced surface load

**) Forms B, C, W and W90 +247 DKK surcharge

Many further bending forms are available.
Tell us your heating problem. We propose suitable bending forms.

You can order the Forms B, C, W and W 90 with other bending measurements.

If necessary for the installation space, you can order the outside measures of the bends with approx. 40mm.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

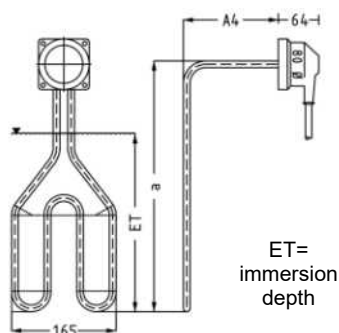
Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



with bent head (A4):



with assembled thermostat:



many further bending forms and versions:



H- types PFA- (PTFE)- Immersion heaters

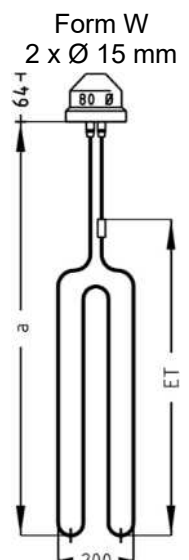
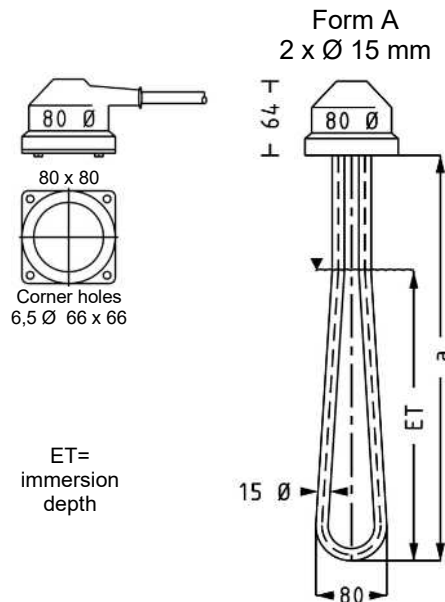
PFA- (PTFE-) 230V~ Immersion heaters 2 x Ø 15 mm

H- Type PFA (PTFE) Form A** 2x Ø 15 mm

Power Watt	a mm	ET mm	T max. °C	Price 230V~ DKK
500	350	250	55 °C	2.051
750	450	350	55 °C	2.074
1000	600	450	55 °C	2.414
1400	800	600	55 °C	2.883
2000	1100	900	55 °C	3.234
833	800	600	90 °C	2.883
1000	800	600	90 °C	2.883
1000	1150	630	90 °C	3.281
1333	1730	950	90 °C	4.160
1500	1100	900	90 °C	3.234
1500	1600	1050	90 °C	3.961
1500	1700	1050	90 °C	4.137
2000	1750	1350	90 °C	4.266
2000	1900	1400	90 °C	4.418
2000	2000	1450	90 °C	4.453
2000	2100	1450	90 °C	4.559
2000	2250	1450	90 °C	4.629
3000	2600	2100	90 °C	5.051
3000	2800	2000	90 °C	5.297
3000	3200	2100	90 °C	5.672

T max. = maximum bath temperature

** Forms B, C, W and W 90 also possible, Surcharge 247 DKK



All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you. Surcharge: 247 DKK.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included. General conditions for the supply of products and services of the electrical industry.



Bending examples of PFA- (PTFE-) Immersion heaters

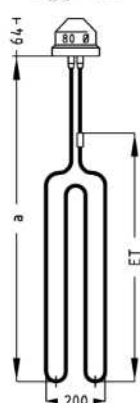
Form A



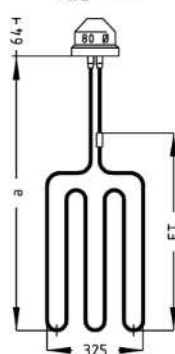
Form A		Form A		Form A
Power		a	ET	Price
Watt	Volt	mm	mm	DKK
1500	230	1600	1050	3.961
1500	230	1700	1050	4.137
2000	230	1900	1450	4.418
2000	230	2000	1450	4.453
2000	230	2100	1450	4.559
2000	230	2250	1450	4.629
3000	230	2600	2150	5.051
3000	230	2800	2000	5.297

outer sheath:
15 mm Ø PFA-tubing,
suitable up to
bath temperatures of 90°C

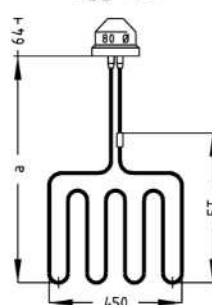
Form W
Typ W1



Form W
Typ W2



Form W
Typ W3



ET=
immersion
depth

Forms W		TYP W1		TYP W2		TYP W3		Forms W
Power		a	ET	a	ET	a	ET	Price
Watt	Volt	mm	mm	mm	mm	mm	mm	DKK
1500	230	1100	580	930	420	770	300	4.207
1500	230	1200	580	1030	420	870	300	4.383
2000	230	1200	750	950	550	800	400	4.664
2000	230	1300	750	1050	550	900	400	4.699
2000	230	1400	750	1150	550	1000	400	4.805
2000	230	1550	750	1300	550	1150	400	4.875
3000	230	1550	1100	1200	800	1000	600	5.297
3000	230	1850	1050	1530	750	1350	600	5.543

All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

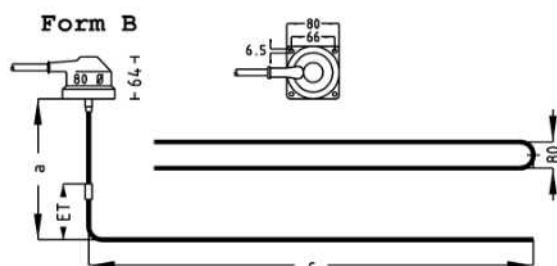
Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Bending examples of PFA- (PTFE-) Immersion heaters

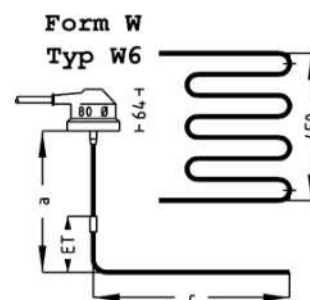
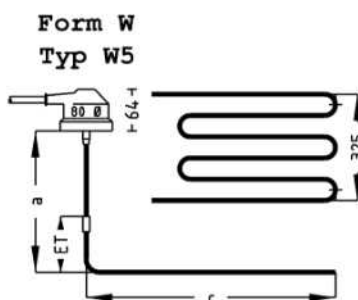
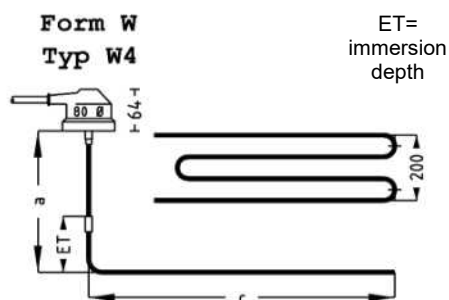
outer sheath: 15 mm Ø PFA-tubing, suitable up to bath temperatures of 90°C



Form B		Form B		Form B
Power		a	c	Price
Watt	Volt	mm	mm	DKK
1500	230	540	1100	4.207
1500	230	640	1100	4.383
2000	230	460	1500	4.664
2000	230	560	1500	4.699
2000	230	660	1500	4.805
2000	230	810	1500	4.875
3000	230	460	2200	5.297
3000	230	810	2100	5.543

all bending forms:

ET = 35 mm, heating area only in horizontal part



Forms W		TYP W4		TYP W5		TYP W6		Forms W
Power		a	c	a	c	a	c	Price
Watt	Volt	mm	mm	mm	mm	mm	mm	DKK
1500	230	540	560	540	380	540	240	4.207
1500	230	640	560	640	380	640	240	4.383
2000	230	460	760	460	520	460	360	4.664
2000	230	560	760	560	520	560	360	4.699
2000	230	660	760	660	520	660	360	4.805
2000	230	810	760	810	520	810	360	4.875
3000	230	460	1120	460	750	460	550	5.297
3000	230	810	1050	810	710	810	500	5.543

All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you.

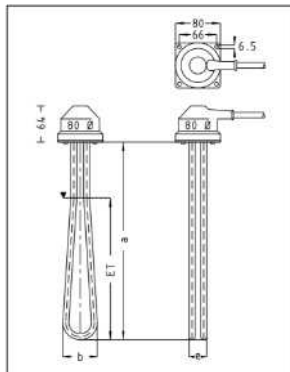
The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

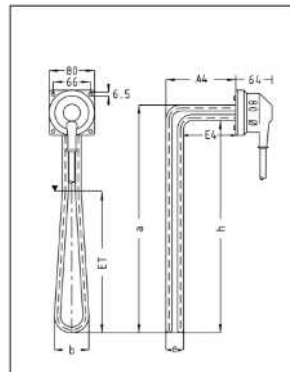
Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included. General conditions for the supply of products and services of the electrical industry.

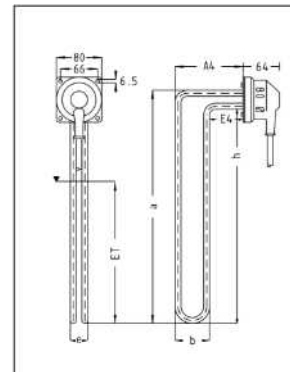




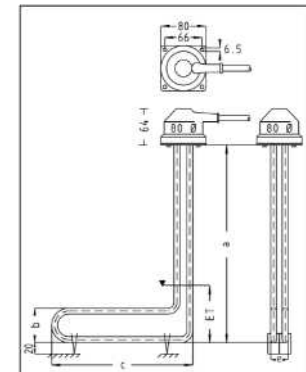
Bezeichnung: Typ H
Form A
EGMONT WOLPERTZ
Typ H
Form A
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



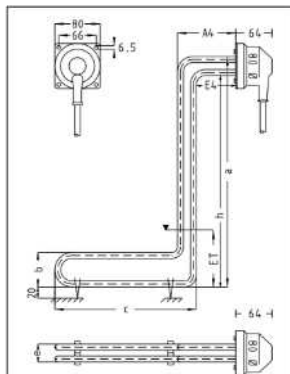
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Form A mit Ak
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Typ H
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MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



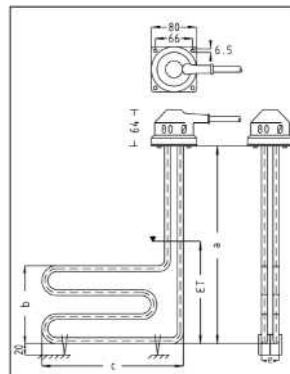
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Typ H
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



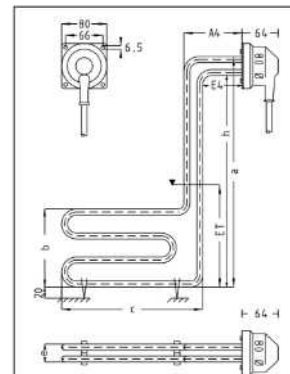
Bezeichnung: Typ H
Form B
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Typ H
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MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



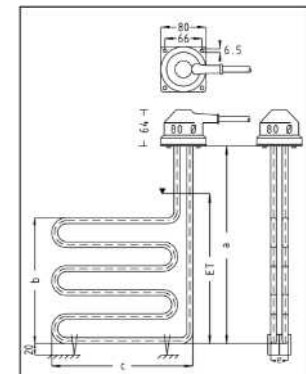
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



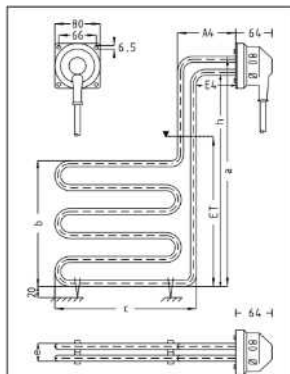
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Form C
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



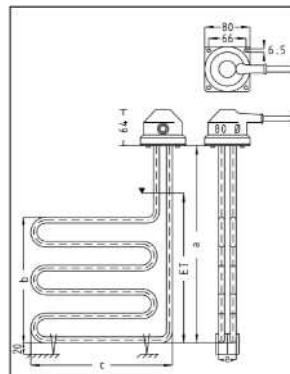
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Form C mit Ak
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Typ H
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



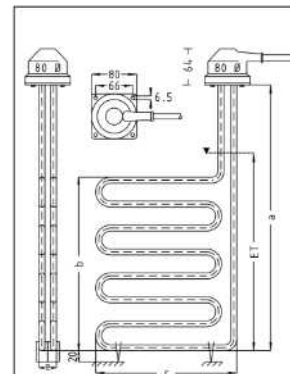
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



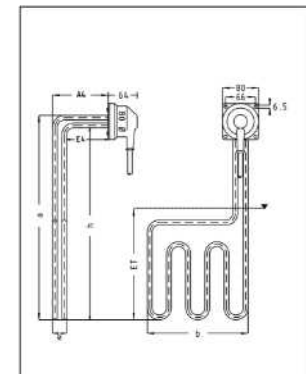
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Form D mit Ak
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Typ H
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MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



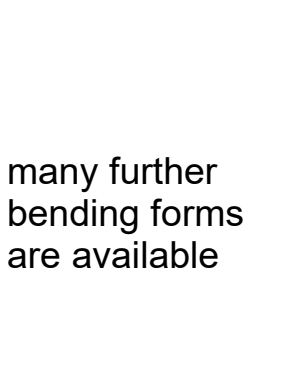
Bezeichnung: Typ H
Form E
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Typ H
Form E
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



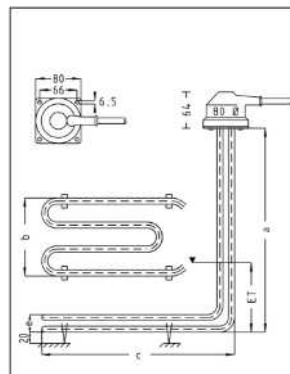
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Typ H
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MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



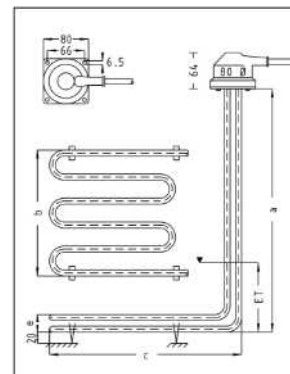
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Form F
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Typ H
Form F
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Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



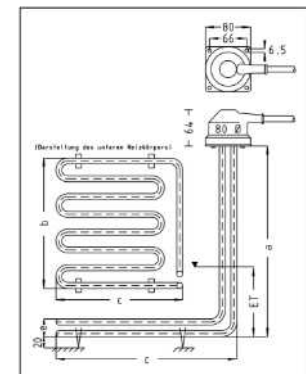
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Form F mit Ak
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Typ H
Form F mit Ak
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



Bezeichnung: Typ H
Form G
EGMONT WOLPERTZ
Typ H
Form G
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen



Bezeichnung: Typ H
Form G mit Ak
EGMONT WOLPERTZ
Typ H
Form G mit Ak
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen

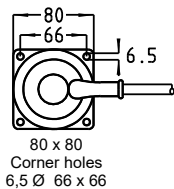
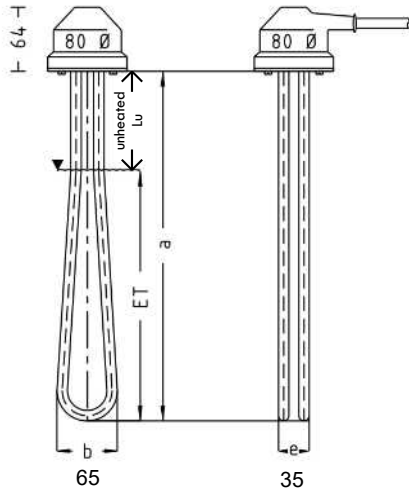


Bezeichnung: Typ H
Form H
EGMONT WOLPERTZ
Typ H
Form H
MaWo
Tel. 0212 - 43050
Fax 0212 - 43017
e-mail: maewolpertz.de
Riffersstraße 61-65
42699 Solingen

many further
bending forms
are available



Stainless Steel / Incoloy / Titanium- 2- parts Immersion heaters

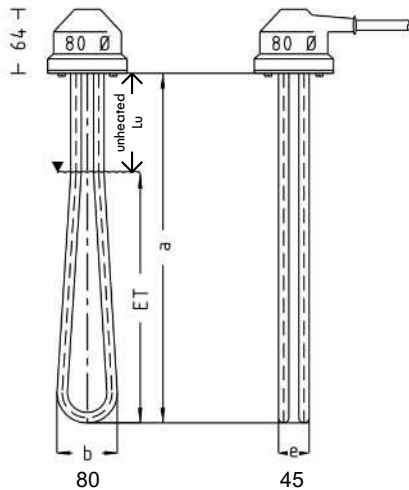


ET=
immersion
depth

H-Type Form A				Stainless Steel	Incoloy	Titanium
Length a mm	ET mm	Lu mm	Power Watt	230V~ Price DKK	230V~ Price DKK	230V~ Price DKK
350	250	100	1000	1.969	2.156	2.930
450	350	100	1500	2.086	2.297	3.270
450	350	100	2000	2.086	2.297	3.270
530	320	210	1500	2.180	2.402	3.516
600	450	150	2000	2.273	2.496	3.727
600	450	150	3000	2.273	2.496	3.727
750	450	300	2000	2.426	2.672	4.184
800	600	200	3000	2.496	2.754	4.336
870	470	400	3000	2.719	2.988	4.781
1000	500	500	3200	2.836	3.117	5.133
1050	450	600	3000	2.906	3.199	5.273
1850	1600	250	3000	3.879	4.266	7.805

All types are also available in Mild Steel.

PFA- (PTFE-) 2- parts Immersion heaters



H- Type PFA (PTFE) Form A 4x Ø 15 mm

Power Watt	a mm	ET mm	T max. °C	230V~ Price DKK
1000	350	250	55 °C	2.848
1500	450	350	55 °C	3.070
2000	600	450	55 °C	3.586
2800	800	600	55 °C	4.184
1666	800	600	90 °C	4.184
2000	800	600	90 °C	4.184
2000	1150	630	90 °C	5.262
2666	1730	950	90 °C	6.082
3000	1100	900	90 °C	5.145
3000	1600	1050	90 °C	6.082
3000	1700	1050	90 °C	6.141

T max. = maximum bath temperature

All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you. Surcharge: 352 DKK.

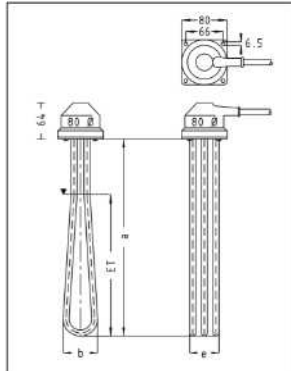
The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

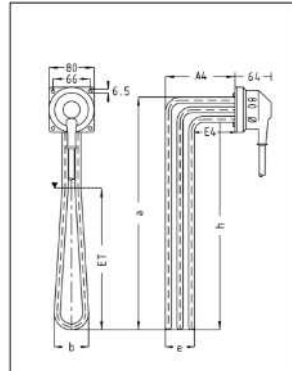
Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included. General conditions for the supply of products and services of the electrical industry.

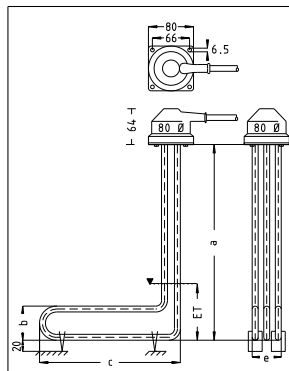




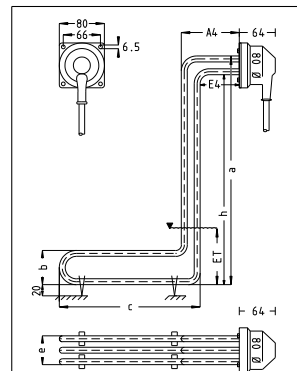
MaWo Bezeichnung: **Typ H**
Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Form A
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



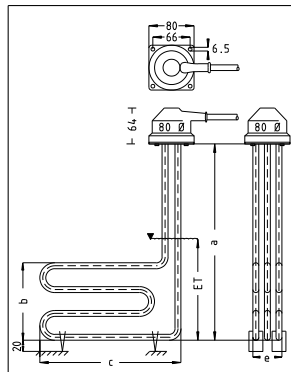
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Form A mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



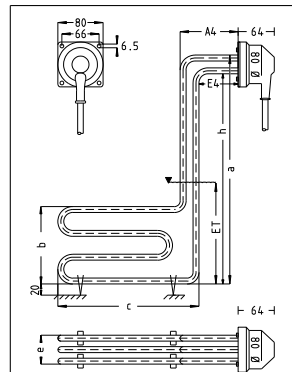
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Form L, Schuförmig
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



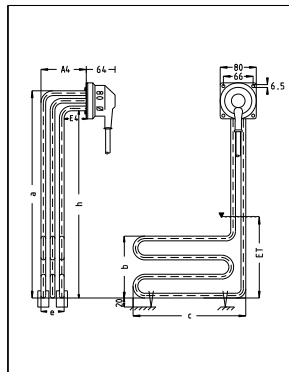
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Schuförmig, Form L mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



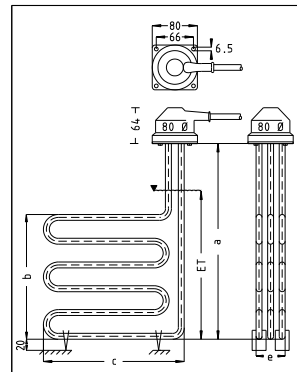
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Mäanderform
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



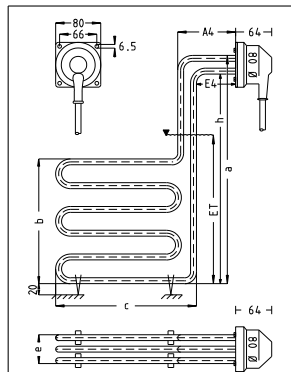
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Fax 0212 - 43017 Mäanderform mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



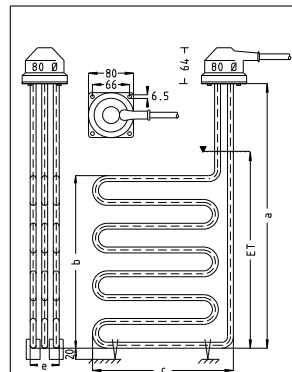
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Fax 0212 - 43017 Mäanderform mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



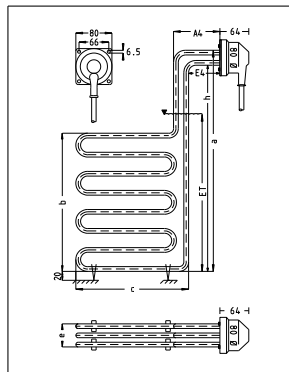
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Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



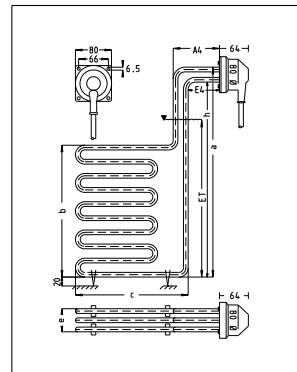
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Fax 0212 - 43017 Mäanderform mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



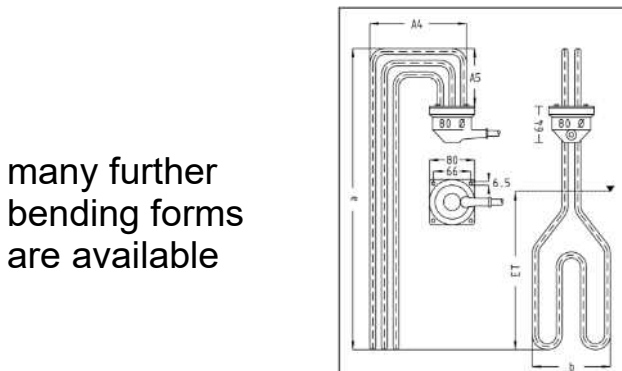
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Mäanderform
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



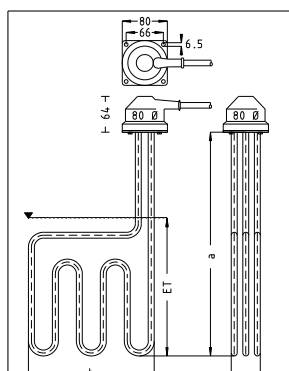
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Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Mäanderform mit A4
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



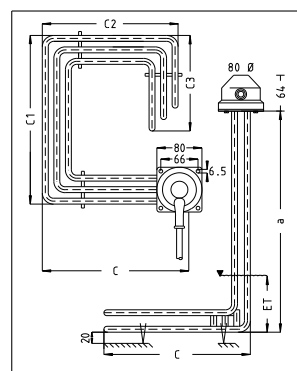
MaWo Bezeichnung: **Typ H**
Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Mäanderform
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



MaWo Bezeichnung: **Typ H**
Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Form W mit A4 & A5
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de



MaWo Bezeichnung: **Typ H**
Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Form S mit 5 Haarnadeln
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de

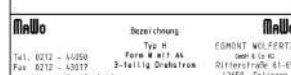
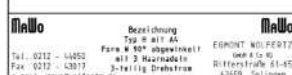
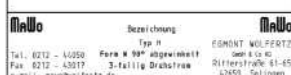
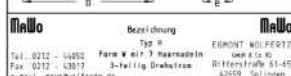
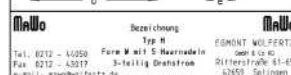


MaWo Bezeichnung: **Typ H**
Tel. 0212 - 44050 EGMONT WOLFERTZ
Fax 0212 - 43017 Einerschleier
Ritterstraße 61-65
42659 Solingen
e-mail: nawowolfertz.de

many further
bending forms
are available



MaWo
IMMERSION HEATERS



Form A:



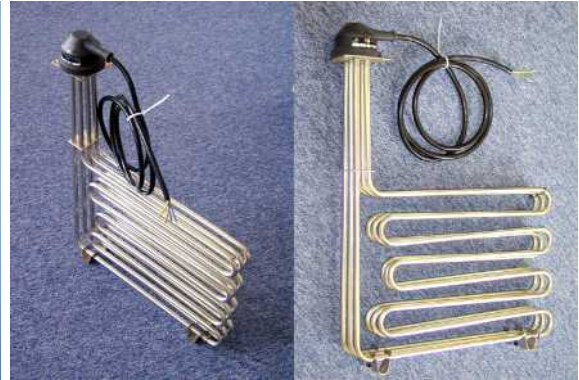
Form L (shoe shaped):



with bent head (A4):



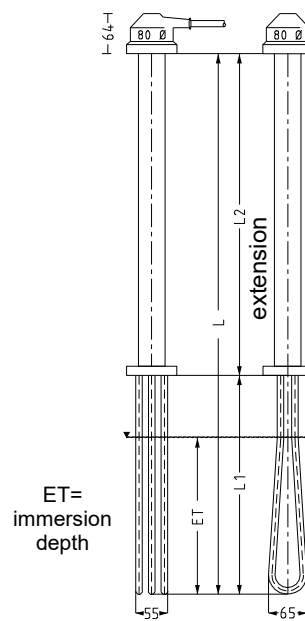
many further bending forms and versions:



with extension:

All types can be extended.
Length arbitrary.

with temperature safety device, double head version:



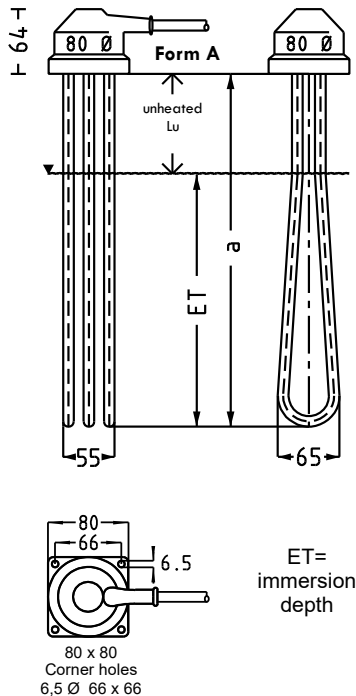
with temperature safety device, Version with PP or PVDF cover cap with 2 PVDF cable glands:



H- types

Three-phase- Immersion heaters 230V/400V^{3~}

Stainless Steel / Incoloy / Titanium- three-phase- Immersion heaters



All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you.
Surcharge: 469 DKK.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

H-Type Form A	Length a mm	ET mm	Lu mm	Power Watt	Stainless Steel 400V ^{3~} (also 230V ^{3~}) Price DKK	Incoloy 400V ^{3~} (also 230V ^{3~}) Price DKK	Titanium 400V ^{3~} (also 230V ^{3~}) Price DKK
	350	250	100	1500 *	2.918	3.211	4.383
	450	350	100	2250 *	3.152	3.469	4.898
	450	350	100	3000 *	3.152	3.469	4.898
	530	320	210	2250 *	3.328	3.656	5.262
	600	450	150	1000 ^x *	3.492	3.844	5.590
	600	450	150	1500 ^x *	3.492	3.844	5.590
	600	450	150	3000 *	3.492	3.844	5.590
	600	450	150	4500	3.492	3.844	5.590
	750	450	300	3000 *	3.797	4.172	6.270
	800	600	200	1500 ^x *	3.973	4.371	6.492
	800	600	200	2000 ^x *	3.973	4.371	6.492
	800	600	200	4500	3.973	4.371	6.492
	800	600	200	6000	3.973	4.371	6.492
	870	470	400	4500	4.172	4.594	7.172
	900	700	200	2500 ^x *	4.172	4.594	7.172
	900	700	200	7500	4.172	4.594	7.172
	1000	500	500	4800	4.359	4.793	7.688
	1000	600	400	6000	4.359	4.793	7.688
	1050	450	600	4500	4.430	4.875	7.910
	1100	600	500	2000 ^x *	4.559	4.980	8.156
	1100	600	500	6000	4.559	4.980	8.156
	1100	900	200	3000 ^x *	4.559	5.016	8.156
	1100	900	200	4000 ^x	4.559	5.016	8.156
	1100	900	200	6000	4.559	5.016	8.156
	1100	900	200	9000	4.559	5.016	8.156
	1100	900	200	12000	4.559	5.016	8.156
	1250	600	650	6000	4.828	5.309	8.906
	1300	900	400	4000 ^x	4.898	5.391	9.152
	1300	900	400	12000	4.898	5.391	9.152
	1350	950	400	6000	5.039	5.543	9.398
	1350	1150	200	12000	5.133	5.648	9.398
	1400	900	500	3000 ^x *	5.133	5.648	9.645
	1400	900	500	9000	5.133	5.648	9.645
	1500	900	600	4000 ^x	5.273	5.801	9.785
	1500	900	600	12000	5.273	5.801	9.785
	1600	1200	400	4000 ^x	5.449	6.000	10.090
	1600	1200	400	12000	5.449	6.000	10.090
	1700	1200	500	6000	5.625	6.188	10.629
	1700	1500	200	9000	5.625	6.188	10.629
	1800	600	1200	6000	5.836	6.422	11.590
	1850	1600	250	4500 ^x	5.906	6.492	11.695
	1850	1600	250	13500	5.906	6.492	11.695
	1900	1500	400	5500 ^x	6.000	6.598	11.906
	1900	1500	400	9000	6.000	6.598	11.906
	1900	1500	400	16500	6.000	6.598	11.906
	2100	900	1200	3000 ^x *	6.328	6.961	12.516
	2100	900	1200	4000 ^x	6.328	6.961	12.516
	2100	900	1200	9000	6.328	6.961	12.516
	2100	900	1200	12000	6.328	6.961	12.516
	2150	1500	650	9000	6.422	7.066	12.680
	2500	1300	1200	5500 ^x	7.008	7.711	13.758
	2500	1300	1200	16500	7.008	7.711	13.758
	2500	2100	400	9000 ^x	7.008	7.711	13.758
	2750	2000	750	4000 ^x	7.254	7.980	14.016
	2750	2000	750	12000	7.254	7.980	14.016
	2900	1900	1000	7500 ^x	7.570	8.332	14.297

All types are also available in Mild Steel.

* also available with 230V~

X Types with reduced surface load

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



with bent head (A4):



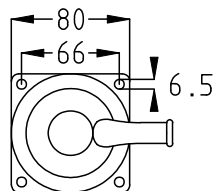
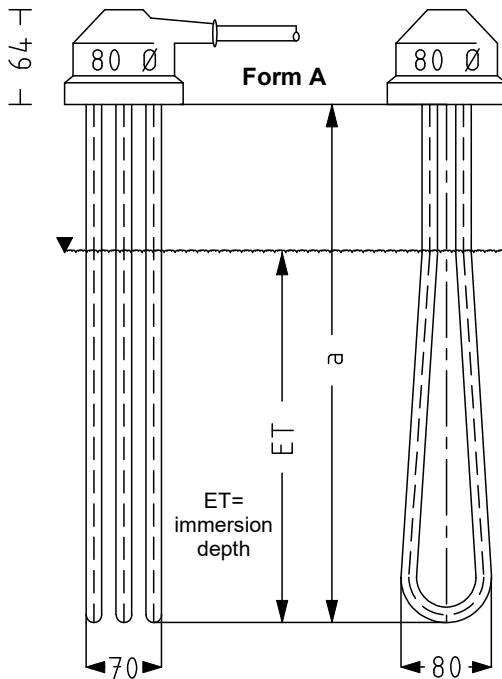
Version with PTFE plate with construction for sealing closed tank:



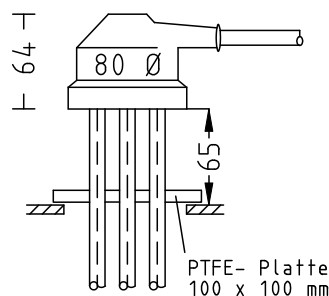
many further bending forms and versions:



PFA- (PTFE-) three-phase- Immersion heaters



Special version:
with PTFE plate
for sealing
closed tank



H- Type PFA (PTFE) Form A** 6x Ø 15 mm

Power Watt	a mm	ET mm	T max. °C	Price DKK
1500*	350	250	55 °C	4.230
2250*	450	350	55 °C	4.559
3000*	600	450	55 °C	5.332
4200	800	600	55 °C	6.211
6000	1100	900	55 °C	7.734
2500*	800	600	90 °C	6.211
3000*	800	600	90 °C	6.211
3000*	1150	630	90 °C	7.875
4000	1730	950	90 °C	9.270
4500	1100	900	90 °C	7.734
4500	1600	1050	90 °C	9.059
4500	1700	1050	90 °C	9.211
6000	1750	1350	90 °C	9.363
6000	1900	1400	90 °C	10.266
6000	2000	1450	90 °C	10.383
6000	2100	1450	90 °C	10.488
6000	2250	1450	90 °C	10.605
9000	2600	2100	90 °C	11.121
9000	2800	2000	90 °C	11.426
9000	3200	2100	90 °C	12.070

* also with 230V monophase

T max. = maximum bath temperature

All specified types are also available with other bending forms. Please tell us your desired measurements and we design a suitable immersion heater for you. Surcharge: 469 Euro.

The prices are valid for immersion heaters with a cover cap including a conducting cable with a length of 1,6m.

Longer cable lengths are available for a surcharge. All connecting cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see on our page [Spare parts \(accessories\)](#).

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 415V, 440V, 460V, 480V

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included. General conditions for the supply of products and services of the electrical industry.



Individual solutions on request

*Cable protection
especially for
aggressive media*



*Extra high feet
(mud feet)*

*PP- or PVDF- cover caps
available on request*



Surcharge PVDF cover cap with Viton- sealing:
Surcharge PP cover cap with Viton- sealing:

*PTFE- plate with
construction for
sealing closed
tank*



842 DKK
303 DKK

H- types and R- types

Spare parts / accessories and repairs

The prices of all immersion heaters are valid with a cover cap including a conducting cable with a length of 1,6 m. Longer cable lengths are available for a surcharge. All connection cables are also available with CEE plugs. For more details on our cover caps, cables, plugs, etc., please see this page.



Accessories

Cover cap

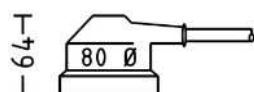
The round cover cap has a square flange with 4 drill holes for fixing.

The power connection and the waterproof cap are an integrated unit.

Alternating current	230 V~:	3 x 1,5-2,5 mm ² , without plug
	400 V~:	3 x 1,5-2,5 mm ² , without plug
Three-phase	230 V ³ ~:	4 x 1-4 mm ² , without plug
	400 V ³ ~:	4 x 1-4 mm ² , without plug

On request (additional order) the connecting cables are also available with Schuko plug (16 A, 230 V) or with CEE- plug.

Cover cap with power connection



	(~)	(³ ~)
1,6 m	352 kr.	399 kr.
3,5 m	399 kr.	446 kr.
5,0 m	446 kr.	493 kr.
10,0 m	563 kr.	610 kr.



Surcharge *Mounting CEE- plug (16A):* 118 kr.

Surcharge *Mounting CEE- plug (32A):* 165 kr.

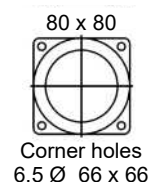
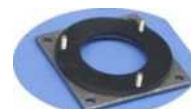


Filling ring: 12 kr.



Flange combination:

Stainless steel flange, seal, 3 stainless steel screws: 106 kr.



Mantling / Dismantling for repairs: 165 kr.

Mounting support:

Material PPH, 90 x 250 mm: 160 kr.



Repairs

If you have any questions do not hesitate to contact us.

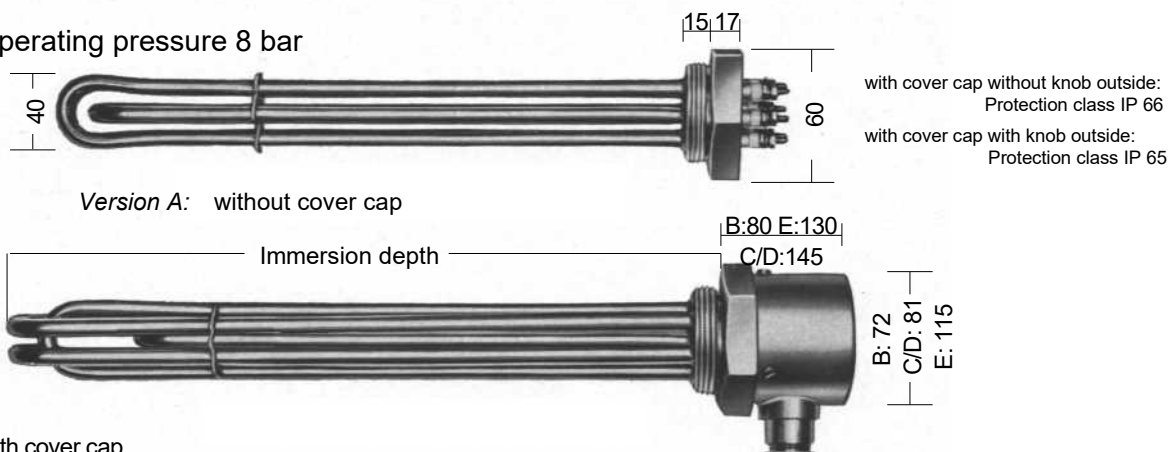
If you wish that we repair your defective heater in our house, please send the affected Immersion heater with a brief description of the fault and the cause.

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Screw-in heater with massive screw head G 1½"

maximum operating pressure 8 bar



Version B: with cover cap

Version C1: with temp. controller 5-95°C, adjusting knob outside

Version C2: with temp. controller 5-95°C, adjusting knob inside

Version C3: with temp. controller 60-300°C, adjusting knob outside

Version C4: with temp. controller 60-300°C, adjusting knob inside

Version D1: with temp. limiter fixed, 120°C,
resetting inside

Version D2: with temp. limiter adjustable, 50-300°C,
resetting inside

Version E1: combination, with temp. controller 5-75°C
and limiter 100°C, adjusting knob outside

Version E2: combination, with temp. controller 5-95°C
and limiter 110°C, adjusting knob outside

Version E3: combination, with temp. controller 5-75°C
and limiter 100°C, adjusting knob inside

Screw head:

Brass bright

Pipe material:

Stainless Steel 1.4571
for heating water and washing lyes

Immersion depth mm	Power Watt	Specific load W/cm²	Version A DKK	Version B DKK	Version C or D DKK	available versions						Version E1 / E2 / E3 DKK
						C1	C2	C3	C4	D1	D2	
150	1500	9,5	1.562	1.897	3.777	x	x	x	x	x	x	4.239
180	2000	9,5	1.594	1.928	3.809	x	x	x	x	x	x	4.271
240	3000	9,5	1.642	1.976	3.857	x	x	x	x	x	x	4.319
340	4500	9,5	1.801	2.136	4.016	x	-*	x	x	x	-*	4.478
440	6000	9,5	1.976	2.311	4.192	x	-*	x	x	x	-*	4.654
510	7500	9,5	2.104	2.438	4.319	x	-*	x	x	x	-*	4.781
630	9000	9,5	2.375	2.709	4.590	x	-*	x	x	x	-*	5.052
880	12000	9,5	2.693	3.028	4.909	x	-*	-*	-*	x	-*	5.371

Other immersion depths / powers on request.

With stainless steel screw head on request.

Special version: tubular heater with welded stainless steel screw head on request.

Stainless Steel locknut G 1½"	176 DKK
Sealing ring G 1½"	24 DKK
Reducing adapter G 2" - G 1½", Stainless Steel	224 DKK
Reducing adapter G 2½" - G 1½", Stainless Steel	303 DKK

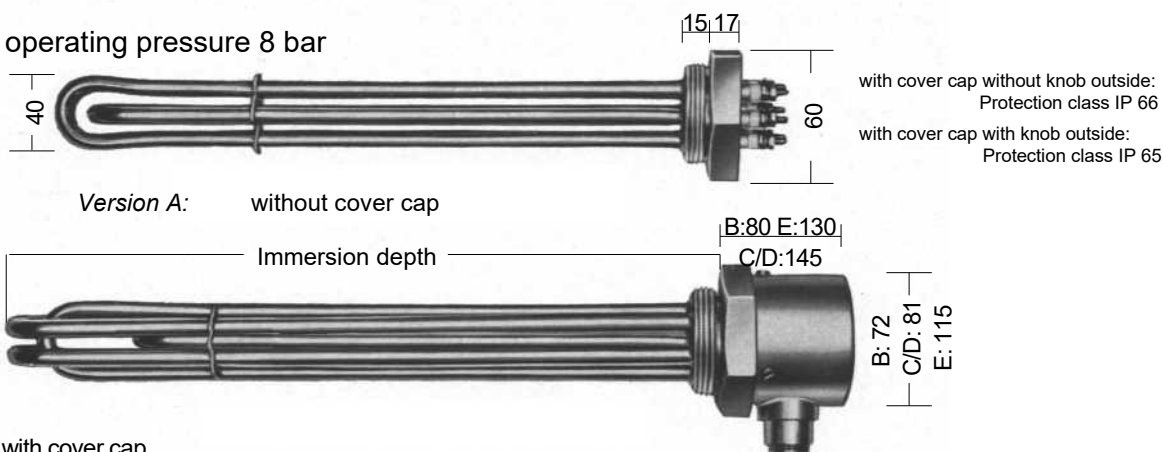
Standard version:	star connection	400 V	three-phase
by reconnecting:	delta connection	230 V	three-phase
	parallel connection	230 V	monophase (up to 3000W)

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Screw-in heater Stainless steel

Screw-in heater with massive screw head G 1½"

maximum operating pressure 8 bar



Version A: without cover cap

Version B: with cover cap

Version C1: with temp. controller 5-95°C, adjusting knob outside

Version C2: with temp. controller 5-95°C, adjusting knob inside

Version C3: with temp. controller 60-300°C, adjusting knob outside

Version C4: with temp. controller 60-300°C, adjusting knob inside

Version D1: with temp. limiter fixed, 120°C, resetting inside

Version D2: with temp. limiter adjustable, 50-300°C, resetting inside

Version E1: combination, with temp. controller 5-75°C and limiter 100°C, adjusting knob outside

Version E2: combination, with temp. controller 5-95°C and limiter 110°C, adjusting knob outside

Version E3: combination, with temp. controller 5-75°C and limiter 100°C, adjusting knob inside

Screw head:

Brass bright

Pipe material:

Stainless Steel 1.4571
for heating water and washing lyes

Immersion depth mm	Power Watt	Specific load W/cm ²	Version A DKK	Version B DKK	Version C or D DKK	available versions						Version E1 / E2 / E3 DKK
						C1	C2	C3	C4	D1	D2	
240	1500	4,9	1.658	1.992	3.873	x	x	x	x	x	x	4.335
400	3000	4,9	1.881	2.215	4.096	x	x	x	x	x	x	4.558
630	4500	4,9	2.407	2.741	4.622	x	*	x	x	x	*	5.084
810	6000	4,9	2.582	2.917	4.797	x	*	x	x	x	*	5.259
1010	7500	4,9	3.172	3.506	5.387	x	*	x	x	x	*	5.849
880	4000	3,2	2.693	3.028	4.909	x	*	x	x	x	*	5.371 (only 400V 3~)

Other immersion depths / powers on request.

With stainless steel screw head on request.

Special version: tubular heater with welded stainless steel screw head on request.

x = available

* = switching capacity 1x16A, can switch up to 3kW at 230V directly, at higher powers a contactor is needed

Stainless Steel locknut G 1½"	176 DKK
Sealing ring G 1½"	24 DKK
Reducing adapter G 2" - G 1½", Stainless Steel	224 DKK
Reducing adapter G 2½" - G 1½", Stainless Steel	303 DKK

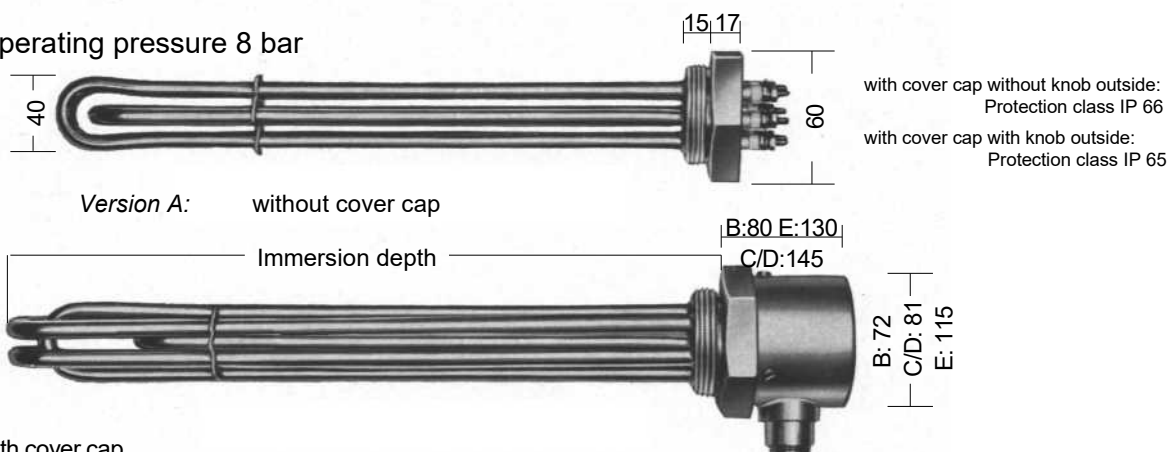
Standard version:	star connection	400 V	three-phase
by reconnecting:	delta connection	230 V	three-phase
	parallel connection	230 V	monophase (up to 3000W)

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Screw-in heater with massive screw head G 1½"

maximum operating pressure 8 bar



Version B: with cover cap

Version C1: with temp. controller 5-95°C, adjusting knob outside

Version C2: with temp. controller 5-95°C, adjusting knob inside

Version C3: with temp. controller 60-300°C, adjusting knob outside

Version C4: with temp. controller 60-300°C, adjusting knob inside

Version D1: with temp. limiter fixed, 120°C,
resetting inside

Version D2: with temp. limiter adjustable, 50-300°C,
resetting inside

Version E1: combination, with temp. controller 5-75°C
and limiter 100°C, adjusting knob outside

Version E2: combination, with temp. controller 5-95°C
and limiter 110°C, adjusting knob outside

Version E3: combination, with temp. controller 5-75°C
and limiter 100°C, adjusting knob inside

Screw head:

Brass bright

Pipe material:

Stainless Steel 1.4571
for heating media, < 2 W/cm² and < 4 W/cm²

Immersion depth mm	Power Watt	Specific load W/cm²	Version A DKK	Version B DKK	Version C or D DKK	available versions						Version E1 / E2 / E3 DKK	remark
						C1	C2	C3	C4	D1	D2		
150	170	1,1	1.610	1.944	3.825	x	x	x	x	x	x	4.287	only 230V 1~
180	230	1,1	1.642	1.976	3.857	x	x	x	x	x	x	4.319	only 230V 1~
240	340	1,1	1.689	2.024	3.905	x	x	x	x	x	x	4.367	only 230V 1~
340	500	1,1	1.849	2.183	4.064	x	x	x	x	x	x	4.526	only 230V 1~
440	666	1,1	2.024	2.359	4.239	x	x	x	x	x	x	4.702	only 230V 1~
510	833	1,1	2.152	2.486	4.367	x	x	x	x	x	x	4.829	only 230V 1~
630	1000	1,1	2.454	2.789	4.670	x	x	x	x	x	x	5.132	only 230V 1~
310	1050	1,9	1.785	2.120	4.000	x	x	x	x	x	x	4.463	
510	1500	1,9	2.152	2.486	4.367	x	x	x	x	x	x	4.829	
760	2400	1,9	2.582	2.917	4.797	x	x	x	x	x	x	5.259	
1010	3000	1,9	3.219	3.554	5.435	x	x	x	x	x	x	5.897	
880	4000	3,2	2.757	3.092	4.973	x	-*	x	x	x	-*	5.435	only 400V 3~
400	2100	3,9	1.897	2.231	4.112	x	x	x	x	x	x	4.574	
510	3000	3,9	2.152	2.486	4.367	x	x	x	x	x	x	4.829	
760	4500	3,9	2.582	2.917	4.797	x	-*	x	x	x	-*	5.259	
1010	6000	3,9	3.219	3.554	5.435	x	-*	x	x	x	-*	5.897	
510	4500	6,5	2.152	2.486	4.367	x	-*	x	x	x	-*	4.829	
1010	9000	6,5	3.219	3.554	5.435	x	-*	x	x	x	-*	5.897	

Other immersion depths / powers on request.

x = available

With stainless steel screw head on request.

-* = switching capacity 1x16A, can switch up to 3kW at 230V directly, at higher powers a contactor is needed

Special version: tubular heater with welded stainless steel screw head on request.

Stainless Steel locknut G 1½" 176 DKK

Sealing ring G 1½" 24 DKK

Reducing adapter G 2" - G 1½", Stainless Steel 224 DKK

Reducing adapter G 2½" - G 1½", Stainless Steel 303 DKK

Standard version: star connection 400 V three-phase

by reconnecting: delta connection 230 V three-phase
parallel connection 230 V monophase (up to 3000W)

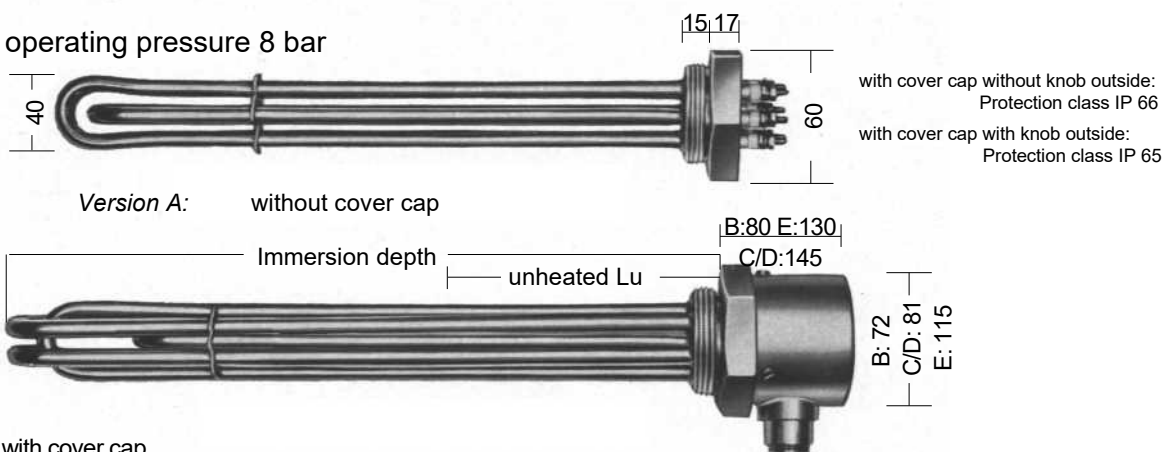
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General conditions for the supply of products and services of the electrical industry.

Screw-in heater with massive screw head G 1½"

maximum operating pressure 8 bar



Version B: with cover cap

Version C1: with temp. controller 5-95°C, adjusting knob outside

Version C2: with temp. controller 5-95°C, adjusting knob inside

Version C3: with temp. controller 60-300°C, adjusting knob outside

Version C4: with temp. controller 60-300°C, adjusting knob inside

Version D1: with temp. limiter fixed, 120°C, resetting inside

Version D2: with temp. limiter adjustable, 50-300°C, resetting inside

Version E1: combination, with temp. controller 30-75°C and limiter 99°C, adjusting knob outside

Version E2: combination, with temp. controller 5-95°C and limiter 110°C, adjusting knob outside

Version E3: combination, with temp. controller 30-75°C and limiter 99°C, adjusting knob inside

Screw head:

Brass bright

Pipe material:

Incoloy 2.4858

Heating pipes insulated installed for hot water storage tank

Immersion depth mm	Power Watt	Specific load W/cm ²	Version A DKK	Version B DKK	Version C or D DKK	available versions						Version E1 / E2 / E3 DKK
						C1	C2	C3	C4	D1	D2	
320	2000	7,9	1.673	1.969	3.628	x	x	x	x	x	x	4.036
400	3000	7,9	1.730	2.025	3.684	x	x	x	x	x	x	4.092
500	4500	7,9	1.884	2.180	3.839	x	-*	x	x	x	-*	4.247
630	6000	7,9	2.166	2.461	4.120	x	-*	x	x	x	-*	4.528
720	7500	7,9	2.222	2.517	4.177	x	-*	x	x	x	-*	4.584
850	9000	7,9	2.559	2.855	4.514	x	-*	x	x	x	-*	4.922

Special feature: All screw-in heaters with built-in sensor protection tube.

x = available

-* = switching capacity 1x16A, can switch up to 3kW at 230V directly, at higher powers a contactor is needed

Unheated length **Lu = 120 mm** for installation in insulated tanks.

Stainless Steel locknut G 1½"	176 DKK
Sealing ring G 1½"	24 DKK
Reducing adapter G 2" - G 1½", Stainless Steel	224 DKK
Reducing adapter G 2½" - G 1½", Stainless Steel	303 DKK

Standard version: star connection 400 V three-phase

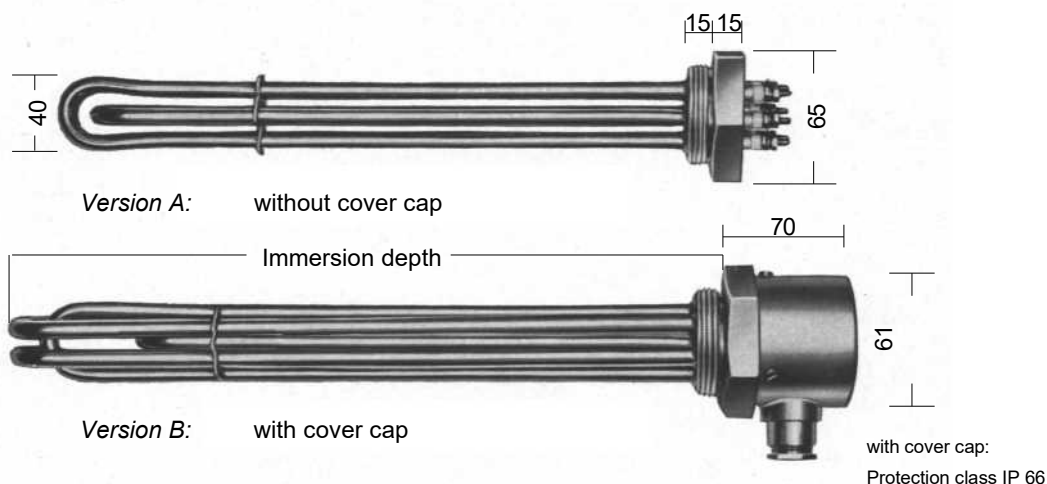
by reconnecting: delta connection 230 V three-phase
parallel connection 230 V monophase (up to 3000W)

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Screw-in heater with massive screw head G 1½"

maximum operating pressure 8 bar



Screw head:

Brass nickel-plated

Pipe material:

Copper nickel-plated
for heating water and washing lyes

Immersion depth mm	Power Watt	Specific load W/cm ²	Version A DKK	Version B DKK
180	2000	9,1	1.387	1.721
340	4500	9,5	1.578	1.913
440	6000	9,5	1.753	2.088
530	7500	9,5	1.865	2.199
630	9000	9,5	1.976	2.311

Other immersion depths / powers on request.

Pipe material Steel or Incoloy on request.

Stainless Steel locknut G 1½"	176 DKK
Sealing ring G 1½"	24 DKK
Reducing adapter G 2" - G 1½", Stainless Steel	224 DKK
Reducing adapter G 2½" - G 1½", Stainless Steel	303 DKK

<i>Standard version:</i>	star connection	400 V	three-phase
<i>by reconnecting:</i>	delta connection	230 V	three-phase
	parallel connection	230 V	monophase (up to 3000W)

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Air heater / Tubular heating element

Application: Furnace construction, drying oven, drying plants

width across flat SW 19

Material: Stainless steel 1.4828



Power Watt	Voltage V	Length of the hairpin mm	Specific load W/cm ²	unheated mm	Price 230V~ DKK
500	230	410	3,1	120	473
500	230	460	3,1	170	473
500	230	830	1,3	110	604
500	230	900	1,4	220	630
666	230	1230	1,3	270	722
750	230	660	2,8	170	538
833	230	1230	1,6	270	761
1000	230	660	3,7	170	578
1000	230	780	4,9	400	604
1000	230	900	2,7	220	604
1000	230	1800	1,2	270	919
1300	230	840	4,2	220	630
1500	400	830	3,9	110	604
1500	* 230	900	4,1	220	630
2000	* 230	1230	3,8	270	722
2500	* 230	1230	4,8	270	761
3000	230	1600	4,1	270	866
3000	* 230	1800	3,6	270	919



* = also in 400 V ~ available ex stock

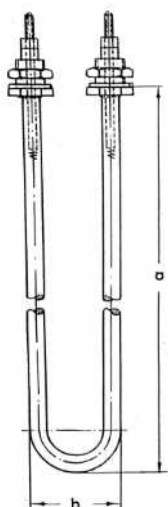
Mounting flange:

131 kr.

pressed, zinc-plated steel nipples, M14 x 1,5 x 15: 131 kr. (both ends)

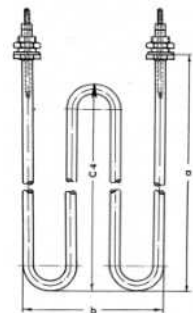
Bending:

150 kr. to 263 kr., depending on the bending form

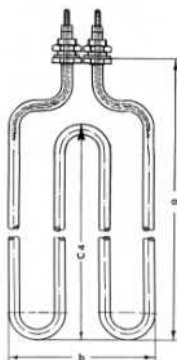


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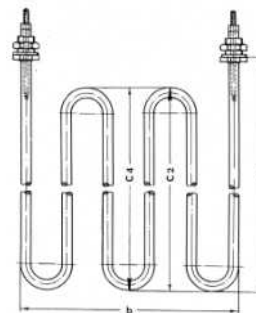
possible bending forms, further bending forms are available:



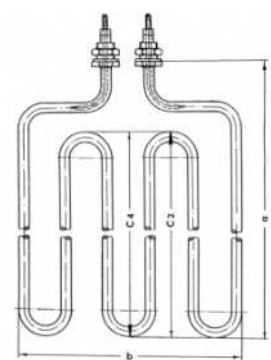
(with 3 hairpins)



(with 3 hairpins)



(with 5 hairpins)



(with 5 hairpins)

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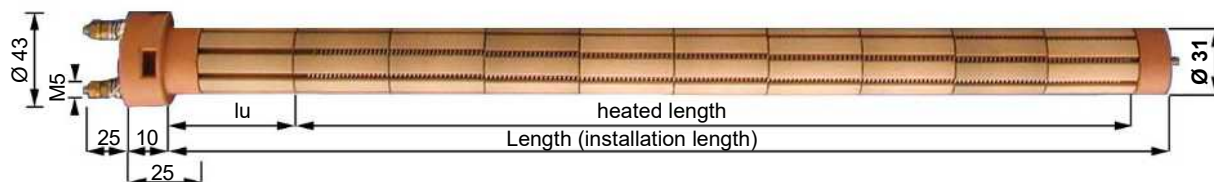


Heating cartridges Ø 31 mm

Heating cartridges consists out of ceramic heating element supports in whose open slots the heating conductors are inserted.

Prices of heating cartridges with other diameters on request.

Bolt connection: M5



Ceramic heating cartridges Ø 31 mm		
Length mm	Power Watt*	Price DKK
340	700	827
390	800	928
440	1000	1.013
490	1250	1.046
540	1400	1.097
590	1600	1.114
640	1800	1.148
740	2200	1.181
840	2500	1.283
940	3000	1.401
1040	3250	1.536
1190	3500	1.671
1490	4500	2.042
1790	5500	2.447

Prices are valid for horizontal mounting,
230 V or 400 V alternating current version,
Tubes are not included in the price

* is valid for water with approx. 4 W/cm²
for oil half power, 2 W/cm²

Three-phase version: 152 kr. surcharge	
for vertical mounting: 10 % surcharge	
Tubes:	inside Ø 33 to 35 mm (e.g. Steel 36 x 1,5 mm)

Other lengths and powers on request.

unheated length lu

Standard version: lu = 25 mm (1 element unheated)

on request: lu = 15 mm (0 element unheated)
lu = 35 mm (2 elements unheated)
lu = 45 mm (3 elements unheated)
etc.

Alternating current / Three-phase

Standard version: 230 V or 400 V alternating current

on request: Three-phase: 152 kr. surcharge

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 400V

horizontal / vertical mounting

Standard version: for horizontal mounting

on request: for vertical mounting: 10 % surcharge

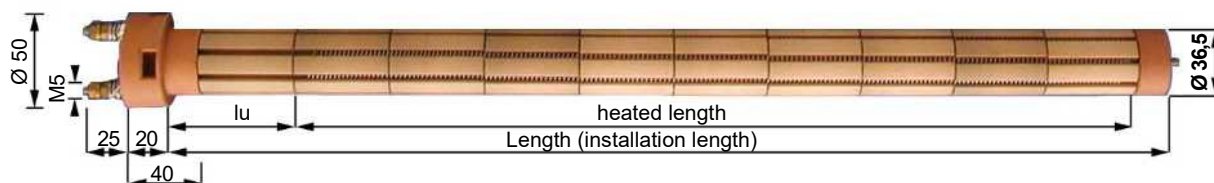
The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Heating cartridges Ø 36,5 mm

Heating cartridges consists out of ceramic heating element supports in whose open slots the heating conductors are inserted.

Prices of heating cartridges with other diameters on request.

Bolt connection: M5



Ceramic heating cartridges Ø 36,5 mm		
Length mm	Power Watt*	Price DKK
340	1000	996
390	1250	1.063
440	1500	1.114
490	1750	1.148
540	2000	1.181
590	2250	1.215
640	2500	1.316
740	3000	1.536
840	3250	1.637
940	3500	1.789
1040	4000	1.873
1190	5000	2.093
1490	6000	2.346
1790	7000	2.683

Prices are valid for horizontal mounting,
230 V or 400 V alternating current version,
Tubes are not included in the price

* is valid for water with approx. 4 W/cm²
for oil half power, 2 W/cm²

Three-phase version: 152 kr. surcharge	
for vertical mounting: 10 % surcharge	
Tubes:	inside Ø 38 mm
Other lengths and powers on request.	

unheated length lu

Standard version: lu = 70 mm (1 element unheated)

on request: lu = 20 mm (0 element unheated)
lu = 120 mm (2 elements unheated)
lu = 170 mm (3 elements unheated)
etc.

Alternating current / Three-phase

Standard version: 230 V or 400 V alternating current

on request: Three-phase: 152 kr. surcharge

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 400V

horizontal / vertical mounting

Standard version: for horizontal mounting

on request: for vertical mounting: 10 % surcharge

Tubes for welding into tanks and for drying ovens

Standard version: Tubes are not included in the price.

on request: Tubes out of mild steel, stainless steel, titanium with bottom and flange available.
Prices on request.

Minimum length = Length (installation length of the heating cartridge) + 20 mm

e.g. Mild Steel 45 x 3 mm

Stainless Steel 42,4 x 2 mm

Stainless Steel 42 x 1 mm

Titanium 42 x 1 mm

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.

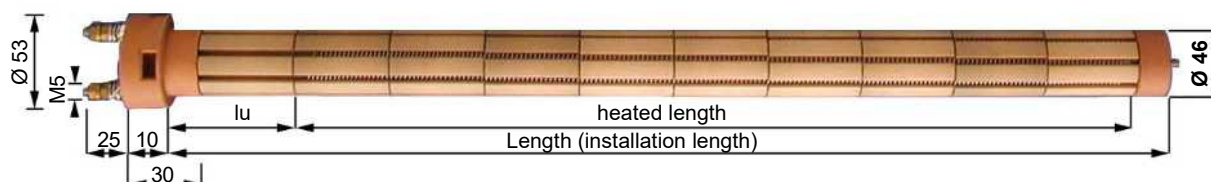
General conditions for the supply of products and services of the electrical industry.

Heating cartridges Ø 46 mm

Heating cartridges consists out of ceramic heating element supports in whose open slots the heating conductors are inserted.

Prices of heating cartridges with other diameters on request.

Bolt connection: M5



Ceramic heating cartridges Ø 46 mm		
Length mm	Power Watt*	Price DKK
340	1250	1.164
390	1500	1.316
440	1750	1.502
490	2000	1.553
540	2250	1.603
590	2500	1.654
640	2750	1.721
740	3500	1.823
840	3750	1.924
940	4000	2.109
1040	4500	2.396
1190	5000	2.649
1490	6000	3.324
1790	7000	4.016

Prices are valid for horizontal mounting,
230 V or 400 V alternating current version,
Tubes are not included in the price

* is valid for water with approx. 4 W/cm²
for oil half power, 2 W/cm²

Three-phase version: 152 kr. surcharge

for vertical mounting: 10 % surcharge

Tubes: inside Ø 48 to 50 mm
(e.g. Steel 52 x 2 mm)

Other lengths and powers on request.

unheated length *lu*

Standard version: *lu* = 50 mm (1 element unheated)

on request: *lu* = 20 mm (0 element unheated)
lu = 30 mm (depending on the element)
lu = 40 mm
etc.

Alternating current / Three-phase

Standard version: 230 V or 400 V alternating current

on request: Three-phase: 152 kr. surcharge

Special voltages possible, e.g. 115V, 127V, 208V, 277V, 400V

horizontal / vertical mounting

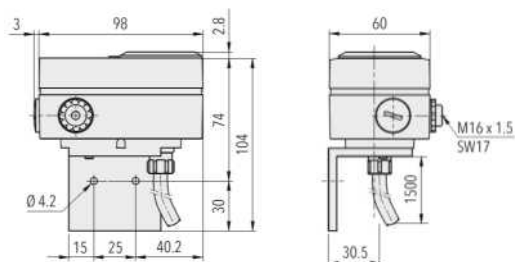
Standard version: for horizontal mounting

on request: for vertical mounting: 10 % surcharge

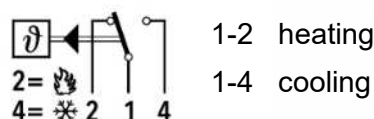
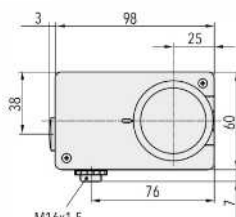
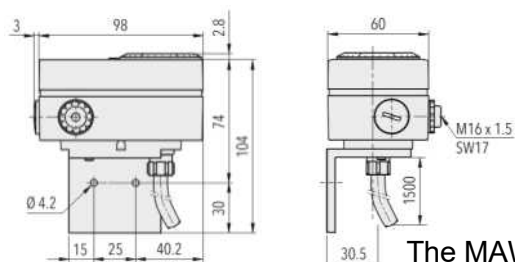
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Internal adjustment



External adjustment



The MAWO thermostat is designed for operation in galvanic baths with corrosive media. The housing made of Polycarbonate is closed on all sides and equipped with corrosion-resistant accessories. The sensor system is protected with a FEP Teflon tube.

Switch point adjustment: knob inside (*Internal* adjustment)
optionally knob outside (*External* adjustment)

Setting range: 5°C to 95°C Switching differential: 2,5°C (fix)
optionally Medium temperature (Sensor): max 105 °C

on request: 20°C to 150°C Switching differential: 3,0°C (fix)
Medium temperature (Sensor): max 165 °C

Frost protection: -10°C to 35°C Switching differential: 2,5°C (fix)
Medium temperature (Sensor): max 50 °C

Capillary tube length L: L = 1500 mm
optionally L = 900 mm
L = 600 mm
L = 350 mm

Switching capacity: AC 230 V / 400 V 15 A

Protection class: IP54

Operating temperature: -30...+70 °C

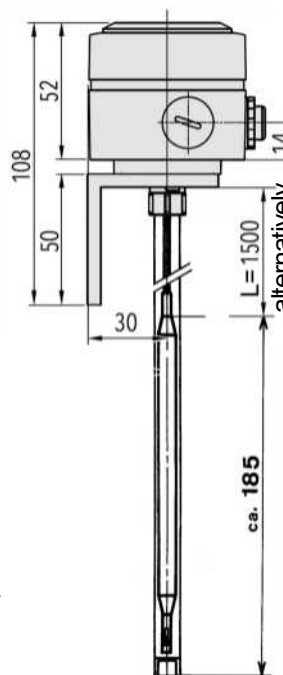
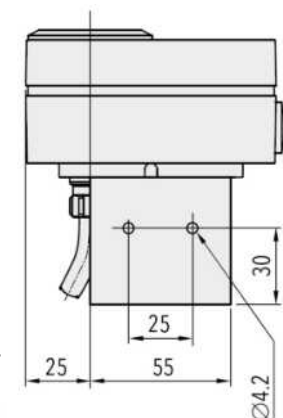
Output signal: Potential-free changeover contact

Sensor: Capillary tube with freely mountable sensor

Sensor material: Copper with Teflon protection tube FEP

Electrical connection: Screw terminal

Electronic temperature controllers and Pt100 resistance thermometers on request.

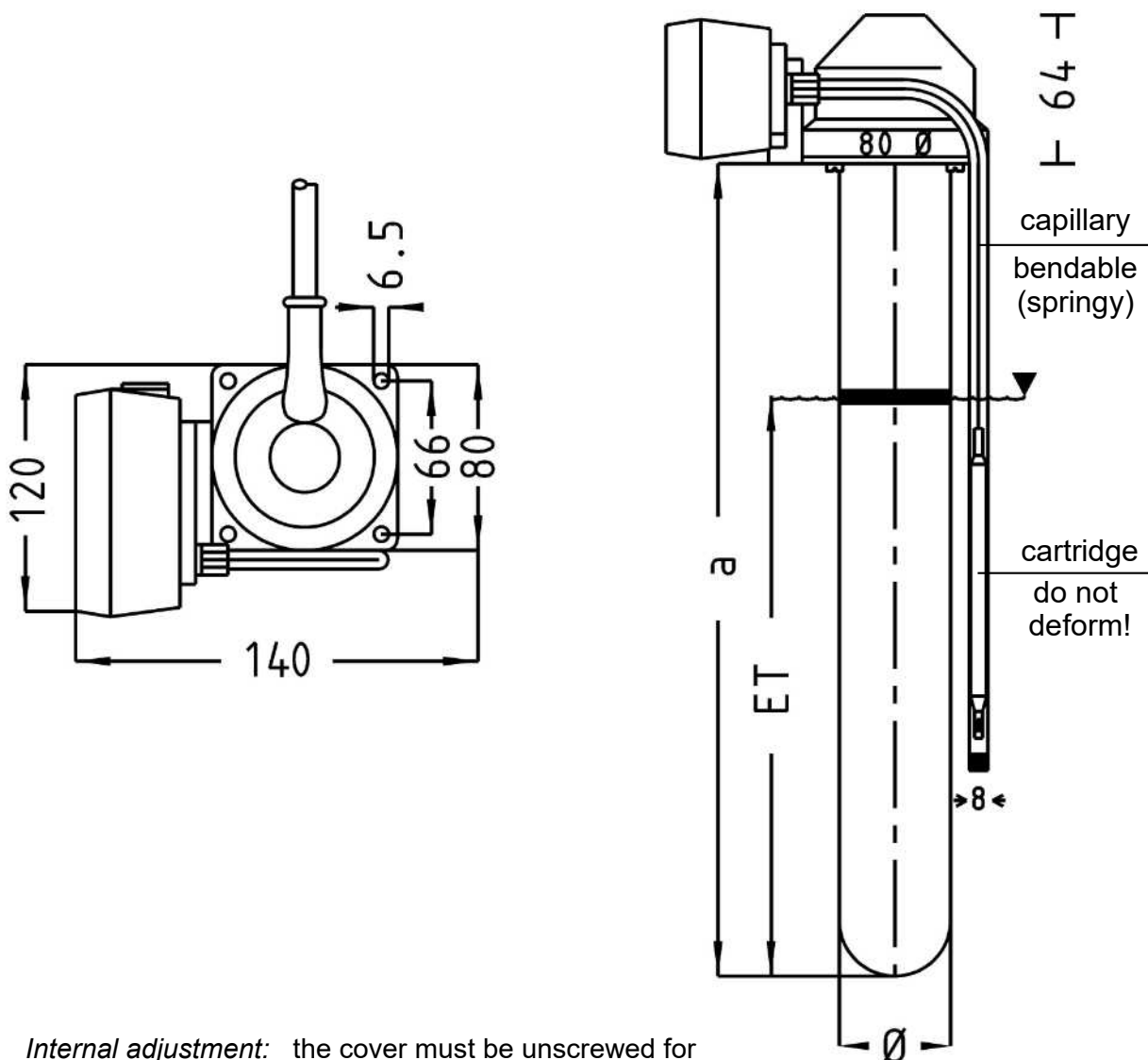


Thermostat with	Unit price DKK
Internal adjustment	2.685
External adjustment	2.835
Frost protection, however with internal adjustment	2.835

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Immersion heater with mounted thermostat



Internal adjustment: the cover must be unscrewed for temperature adjustment

External adjustment: the temperature adjustment button is accessible from the outside

For fixing to the edge of the tank a mounting bracket is supplied.

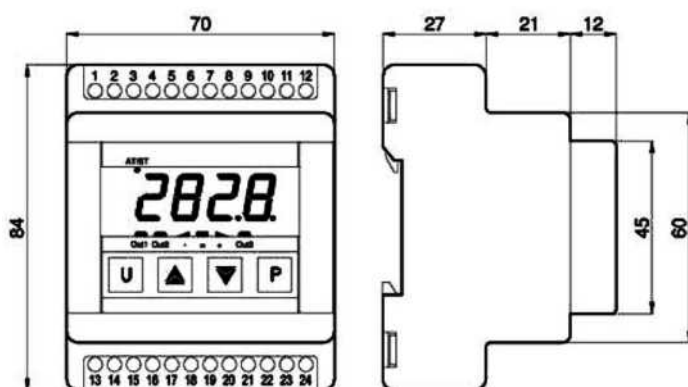
On request the MAWO thermostat can also be fixed to the immersion heater.

Costs for fixing directly to an immersion heater: 360 kr.

Digital Temperature Controller DTR 1- HUT for DIN rail mounting

Digital microprocessor-based controller, 2-point, 3-point or PID Control

- Mounting depth of 60 mm
- Several sensor inputs:
Resistance thermometer, thermocouple
- Splash-proof front construction (IP65 with gasket)
- Convenient handling



Specifications

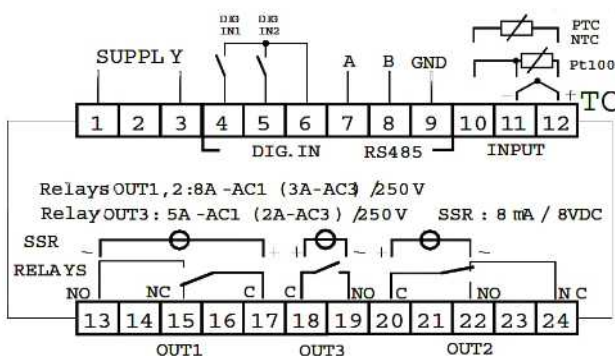
Size / weight / mounting:	70 x 84 x 60 (WxHxD) in mm 230g for mounting on standard DIN rail TS35
Supply voltage:	Standard: 100 to 240 VAC $\pm 10\%$
Sensor input:	Resistance thermometer: Pt100 (3-wire) Thermocouple: J, K, S
Outputs:	2 relay outputs (make contact: 8A/3A, 250V AC)
Electrical life:	100.000 switching-cycles
Control method:	2-point, 3-point control or PID
Adjustment procedure:	Digital setting using front panel keys
Display:	single-row 4-digit, 12 mm high LED display switchable actual value and set value
Ambient temperature:	0 to 50 °C (without condensation or hoarfrost)
Humidity:	30 to 95% relative humidity
Storage temperature:	-10 to 60 °C (without condensation or hoarfrost)
Display accuracy:	$\pm 0,5\%$ of the scale range

programmable as
temperature controller
or as limiter

Unit price DTR 1-HUT:

with 2 relay outputs: 2085 kr.

Connection diagram



Digital Temperature Controller DTR 1

Digital microprocessor-based controller, 2-point, 3-point or PID Control

- Mounting depth of 78 mm
- Several sensor inputs:
Resistance thermometer, thermocouple
- Splash-proof front construction (IP65 with gasket)
- Convenient handling



Specifications

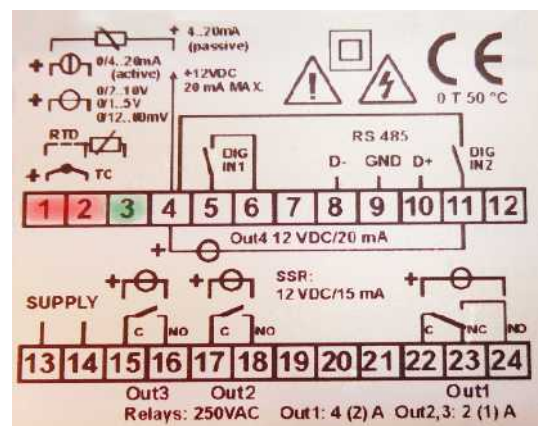
Size / weight / mounting:	78 x 35 x 78 (WxHxD) in mm 180 g Attachment with clamping frame, Panel Cut-out 71 x 29 (-0...+0.6) mm
Supply voltage:	Standard: 100 to 240 VAC (-15... +10%) on request: 24VAC (-25... +12%) or 24VDC (-15... +25%)
Sensor input:	Resistance thermometer: Pt100 (3-wire), Pt1000 (2-wire) Thermocouple: J, K, R, S, T, mA, mV, V
Outputs:	2 relay outputs (changeover contact 4 A, normally open contact 2 A, 250V AC) and SSR output, programmable on request 3 relay outputs
Electrical life:	100.000 switching-cycles
Control method:	2-point, 3-point control or PID
Adjustment procedure:	Digital setting using front panel keys
Display:	Two lines, each 4-digit, 11 mm and 6 mm high LED display Above: Actual value (optional red, green or orange, 11 mm) Below: Set point (green, 6 mm)
Ambient temperature:	0 to 50 °C (without condensation or hoarfrost)
Humidity:	20 to 85% relative humidity
Storage temperature:	-20 to 70 °C (without condensation or hoarfrost)
Display accuracy:	±0,5% of the scale range

programmable as temperature
controller or as limiter

Unit price DTR 1: 1935 kr.

compatible with 75 x 33 mm controllers (LxH)
(Front 33x75)

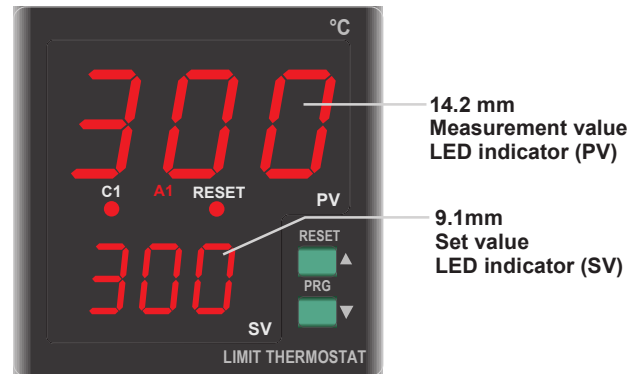
Connection diagram



Digital Temperature Controller DTR 2

usable as a temperature controller, temperature monitor / temperature limiter

- Dimensions 48 x 48mm
- 14.2 mm / 9.1 mm 7-segment LED display
- 2-Wire Pt100 input
- Limit or monitor or ON/OFF control selection
- PV and SV indicators can be set to ON or OFF state
- C1 Limit output contacts
- Zero point input shift
- External Reset input
- Reset Key
- In case of probe failure, C1 output is OFF



Specifications

Dimensions: 48 x 48 x 53/67 (WxHxD) in mm, ca. 230g, suitable for flush-panel mounting according to DIN 43700

Power Supply: 230 V AC +10% / -15% 50/60 Hz

Sensor Input: 2- Wire Pt100 Platinum resistance thermometer

Output Relay: Relay: 250 V AC, 2A (for resistive load). NO.

Control algorithm: Single setpoint value control, On-Off, A/D converter 12 bit, Sampling time: 100ms

Display: Two rows, each with 3 digits, 7-segment LED displays

Top display: Present value (14.2 mm)

Bottom display: Set value (9.1 mm)

Ambient temperature: 0°C to 50 °C (without condensation or hoarfrost)

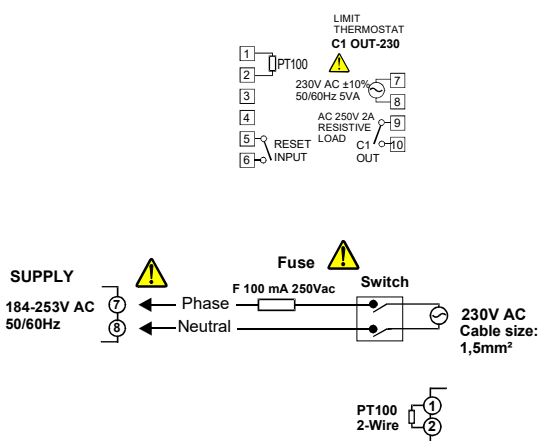
Max relative humidity: 80% up to 31°C, decreasing linearly 50% at 40°C

Storage temperature: -25°C to 70 °C (without condensation or hoarfrost)

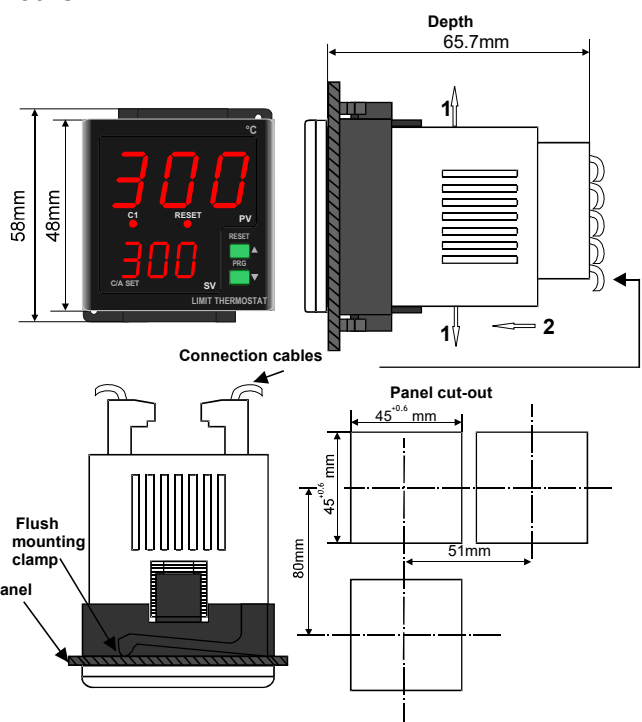
Accuracy: ± 1% of full scale, ±1 digit

Hysteresis: adjustable between 1°C and 50°C

Connection diagram:



Unit price DTR 2: 2385 kr.



Digital Temperature Controller DTR 3

Electronic temperature controller with digital indication for actual and setpoint, 2 signal contacts, DTR 3

for connection of resistance-thermometers Pt 100

- 11 mm high LED display, resolution: 0,1 / 1,0°C
- control accuracy adjustable
- direct connection of resistance- thermometer Pt 100, 2- or 3-wired
- built-in housing according to DIN 43700
dimensions: 96 x 48 mm, installation depth: 105 mm
- switching to setpoint by pressing button
- floating distant switch contacts 230 V / 10 A
- connection by AMP plug connection 6,3 mm
- with water resistant clear plastic door (Add-on "GL") on the frontside (protection class IP 55)



MAWO- DTR 3-digital controller are electronical devices with 2 switch contacts in spacesaving version. The contact K1 is the control contact, contact K2 for additional functions like cooling, alarm etc. The actual temperature is shown permanently, setpoint is shown by pressing the button. The values are adjusted by a ten-course potentiometer

The controller is especially suited for controlling and supervising of temperatures in galvanically bathes, in food industry, but also in many other sectors.

Inputs: Resistance-thermometer Pt 100 DIN in 3- or 4-wire-circuit.

In case of 3-wire-circuit also longer connection cables are useable without adjustment.

Outputs: 2 switch relays with floating distant switch contact, 230 V / 10 A

Control mode: Signal contacts without feedback, switch hysteresis adjustable from 0,3 to 0,8 K

Power supply voltage: 230 V / 50 Hz, 110 V / 60 Hz, 24 V AC

Protection circuit: The device is shutting down in case of resistance-thermometer breach.

Actual value-Setpoint indication: LED, 7 segment display 11 mm high

Indication accuracy: $\pm 0,8 \%$ of scale, ± 1 digit

Switch point accuracy: $\pm 0,3 \%$

Ambiente air temperature effect: $\pm 0,5 \%$ / 10K

Allowed ambiente air temperature: 0 - 50°C

Contact K1 is adjustable by a rotary switch, contact K2 by a screwdriver. On demand it also can be produced with a potentiometer.

Every contact is shown by a LED. The LED lights, wenn the assigned relay is responded.

Measuring and control range: 0 + 99, °C : 0,1 °C, 0 + 199 °C : 1, 0 °C
0 to 99°C, or optionally 0 to 199°C

The electronic temperature controller can not switch the heating power over 2300 W 230V directly. A power contactor is required.

Unit price DTR 3: 3885 kr.

Digital Temperature Controller DTR 4

Compact and intelligent temperature controller

- selectable supply voltage
- selectable sensor input
- selectable control output
- splashproof front construction (IP66/NEMA4)
- easy-to-read actual value display and setpoint display



Specifications

Dimensions: 48 x 48 x 60 (WxHxD) in mm

PLEASE TICK: 3 SELECTION POSSIBILITIES, 8 DIFFERENT COMBINATIONS POSSIBLE

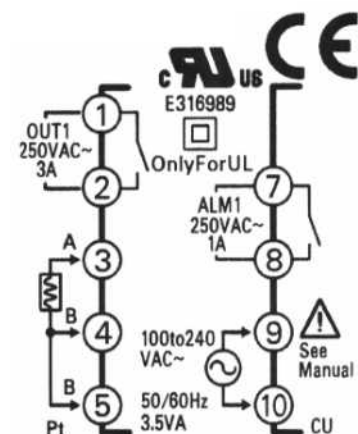
<i>Power supply voltage:</i>	100 to 240 V AC, 50/60 Hz ☐	or	24 V AC, 50/60 Hz or 24 V DC ☐
<i>Sensor input:</i>	Platinum resistance thermometer: Pt100 ☐	or	Thermocouple: K, J, T, R, S ☐
<i>Relay output:</i>	Relay: SPST-NO, 250 VAC, 3A ☐	or	Output voltage: 12 VDC25%/-15% (PNP), max. 21mA, for driving SSR ☐

<i>Alarm output:</i>	Relay: SPST-NO, 250 VAC, 1A
<i>Control method:</i>	ON/OFF control or 2-PID control (with auto-tuning)
<i>Setting method:</i>	Digital setting using front panel keys
<i>Display:</i>	Actual value display: 4-digit, 16 mm high red LED-display Single display: 4-digit, 8 mm high green LED-display
<i>Ambient temperature:</i>	-10 to 50 °C (with no condensation or icing)
<i>Humidity:</i>	25 to 85% relative humidity
<i>Storage temperature:</i>	-25 to 65 °C (with no condensation or icing)
<i>Display accuracy:</i>	Platinum resistance thermometer and Thermocouple: ±0,5% of the displayed value or ±1°C, always the higher value, ±1 digit max.

Connection diagram example:

Power supply voltage: 100 to 240 V AC, 50/60 Hz
Sensor input: Platinum resistance thermometer Pt100
Relay output: Relay
Alarm output: Relay

Unit price DTR 4: 2535 kr.



Digital Temperature Controller ELTC 1

Directly usable digital controller for immersion heaters 230V up to 3500W

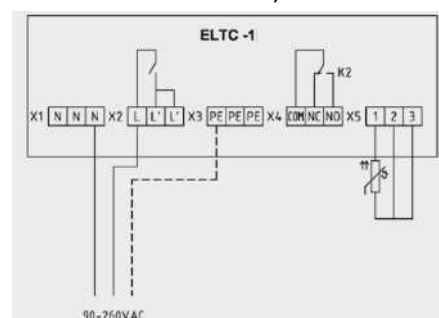
- With housing IP55
- Suitable for Pt 100 with 2 or 3 wires
- Programmable 0 °C up to +390 °C
- For switching 20 A resistive load with hybridrelay
- Easy handling



Specifications

<i>Size / weight / housing:</i>	130 x 130 x 75 (WxHxD) in mm 470g Housing IP55 for wall mounting
<i>Power supply voltage:</i>	90 to 260 V AC 50/60 Hz
<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire, 2-wire)
<i>Control output:</i>	Relay 20A 230V AC normally open contact
<i>Alarm output:</i>	Relay 8A 230V AC changeover contact Signal contact, configurable as alarm or release contact
<i>Control method:</i>	2- point
<i>Setting method:</i>	Digital setting using front panel keys
<i>Display:</i>	Switchable actual- and setpoint- display, two-row, each 3-digit, 11 mm high red LED-display operable down to -25°C
<i>Ambient temperature:</i>	-25 °C to 55 °C (without condensation or hoarfrost)
<i>Display accuracy:</i>	± 1K

Unit price ELTC 1: 3172 kr.



Connection diagram

Electronic thermometer DTA 1 with extra large LED display

- With housing IP66
- For Pt100 temperature sensors
- Display range: -50 °C to +200 °C
- With 1,6m connection cable and Schuko plug



Specifications

<i>Size / weight / housing:</i>	130 x 95 x 80 (WxHxD) in mm Housing IP66 for wall mounting
<i>Power supply voltage:</i>	230 V AC 50 Hz
<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire, 2-wire) compatible with all Pt100 probes
<i>Display:</i>	Actual value display Display range: -50 °C to +200 °C 4-digit, 20 mm extra large red LED display
<i>Display accuracy:</i>	0,1°C ± 1 digit
<i>Unit price DTA 1:</i>	2216 kr.

Digital temperature control box DTS1

- Housing protection IP65, size 190 x 250 x 165 (WxHxD) in mm
- Built-in thermostat DTR1 with sensor input for Pt100-resistance thermometer or thermocouple J, K, S with setpoint and actual temperature display
- Integrated power contactor 16A
- Integrated circuit breaker 16A
- Integrated earth leakage circuit breaker ELCB 30mA
- Maximum permanent switching power 3500W
- Schuko plug socket 230V~
- with Schuko plug 230V~
- On- and Off switch with lit



Specifications of the built-in temperature controller DTR1

<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire) Thermocouple: J, K, S
<i>Outputs:</i>	2 relay outputs
<i>Electrical life:</i>	100.000 switching-cycles
<i>Control method:</i>	2- point, 3- point control
<i>Adjustment procedure:</i>	Digital setting using front panel keys
<i>Display:</i>	Two lines, each 4-digit, 11 mm and 6 mm high LED display Above: Actual value (optional red, green or orange, 11 mm) Below: Set point (green, 6 mm)
<i>Ambient temperature:</i>	0 to 50 °C (without condensation or hoarfrost)
<i>Humidity:</i>	30 to 85% relative humidity
<i>Storage temperature:</i>	-10 to 70 °C (without condensation or hoarfrost)
<i>Display accuracy:</i>	±0,5% of the scale range

Picture with timer
(optional accessories)



Unit price DTS1: 6041 kr.

optional accessories:

Temperature limiter for a surcharge of 2216 kr.

Level relay for a surcharge of 2216 kr. (optional for float switch or conductive level detector)

Week time - switching computer (Timer switch) for a surcharge of 2216 kr.

Sensor: see our datasheets temperature probe / temperature sensor



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Digital temperature control box DTS2

- Housing protection IP65, size 230 x 330 x 210 (WxHxD) in mm
- Built-in thermostat DTR1 with sensor input for Pt100- resistance thermometer or thermocouple J, K, S with setpoint and actual temperature display
- Integrated power contactor 16A
- Integrated circuit breaker 16A
- Integrated earth leakage circuit breaker ELCB 30mA
- Maximum permanent switching power 3500W
- CEE socket blue 230V~
- with CEE-plug blue 230V~
- On/Off switch (Main circuit breaker)



Specifications of the built-in temperature controller DTR1

<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire) Thermocouple: J, K, S
<i>Outputs:</i>	2 relay outputs
<i>Electrical life:</i>	100.000 switching-cycles
<i>Control method:</i>	2- point, 3- point control
<i>Adjustment procedure:</i>	Digital setting using front panel keys
<i>Display:</i>	Two lines, each 4-digit, 11 mm and 6 mm high LED display Above: Actual value (optional red, green or orange, 11 mm) Below: Set point (green, 6 mm)
<i>Ambient temperature:</i>	0 to 50 °C (without condensation or hoarfrost)
<i>Humidity:</i>	30 to 85% relative humidity
<i>Storage temperature:</i>	-10 to 70 °C (without condensation or hoarfrost)
<i>Display accuracy:</i>	±0,5% of the scale range

Unit price DTS2: 7316 kr.

optional accessories:

Temperature limiter for a surcharge of 2216 kr.

Level relay for a surcharge of 2216 kr. (optional for float switch or conductive level detector)

Week time - switching computer (Timer switch) for a surcharge of 2216 kr.

Sensor: see our datasheets temperature probe / temperature sensor

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
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Digital temperature control box DTS3

- Housing protection IP65, size 400 x 250 x 200 (WxHxD) in mm
- Built-in thermostat DTR1 with sensor input for Pt100- resistance thermometer or thermocouple J, K, S with setpoint and actual temperature display
- Integrated power contactor 3x16A
- Integrated circuit breaker 3x16A
- Integrated earth leakage circuit breaker ELCB 30mA
- Maximum permanent switching power 9000W
- CEE socket red 16A 400V3~
- with CEE-plug red 16A 400V3~
- On/Off switch (Main circuit breaker)



Specifications of the built-in temperature controller DTR1

<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire) Thermocouple: J, K, S
<i>Outputs:</i>	2 relay outputs
<i>Electrical life:</i>	100.000 switching-cycles
<i>Control method:</i>	2- point, 3- point control
<i>Adjustment procedure:</i>	Digital setting using front panel keys
<i>Display:</i>	Two lines, each 4-digit, 11 mm and 6 mm high LED display Above: Actual value (optional red, green or orange, 11 mm) Below: Set point (green, 6 mm)
<i>Ambient temperature:</i>	0 to 50 °C (without condensation or hoarfrost)
<i>Humidity:</i>	30 to 85% relative humidity
<i>Storage temperature:</i>	-10 to 70 °C (without condensation or hoarfrost)
<i>Display accuracy:</i>	±0,5% of the scale range

Unit price DTS3: 8750 kr.

optional accessories:

Temperature limiter for a surcharge of 2216 kr.

Level relay for a surcharge of 2216 kr. (optional for float switch or conductive level detector)

Week time - switching computer (Timer switch) for a surcharge of 2216 kr.

Sensor: see our datasheets temperature probe / temperature sensor



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.



General conditions for the supply of products and services of the electrical industry.

Digital temperature control box DTS4

- Housing protection IP65, size 400 x 250 x 200 (WxHxD) in mm
- Built-in thermostat DTR1 with sensor input for Pt100- resistance thermometer or thermocouple J, K, S with setpoint and actual temperature display
- Integrated power contactor 3x40A
- Integrated circuit breaker 3x32A
- Integrated earth leakage circuit breaker ELCB 30mA
- Maximum permanent switching power 18000W
- CEE socket red 32A 400V3~
- with CEE-plug red 32A 400V3~
- On/Off switch (Main circuit breaker)



Specifications of the built-in temperature controller DTR1

<i>Sensor input:</i>	Resistance thermometer: Pt100 (3-wire) Thermocouple: J, K, S
<i>Outputs:</i>	2 relay outputs
<i>Electrical life:</i>	100.000 switching-cycles
<i>Control method:</i>	2- point, 3- point control
<i>Adjustment procedure:</i>	Digital setting using front panel keys
<i>Display:</i>	Two lines, each 4-digit, 11 mm and 6 mm high LED display Above: Actual value (optional red, green or orange, 11 mm) Below: Set point (green, 6 mm)
<i>Ambient temperature:</i>	0 to 50 °C (without condensation or hoarfrost)
<i>Humidity:</i>	30 to 85% relative humidity
<i>Storage temperature:</i>	-10 to 70 °C (without condensation or hoarfrost)
<i>Display accuracy:</i>	±0,5% of the scale range

Picture with timer
(optional accessories)



Unit price DTS4: 10185 kr.

optional accessories:

Temperature limiter for a surcharge of 2216 kr.

Level relay for a surcharge of 2216 kr. (optional for float switch or conductive level detector)

Week time - switching computer (Timer switch) for a surcharge of 2216 kr.

Sensor: see our datasheets temperature probe / temperature sensor

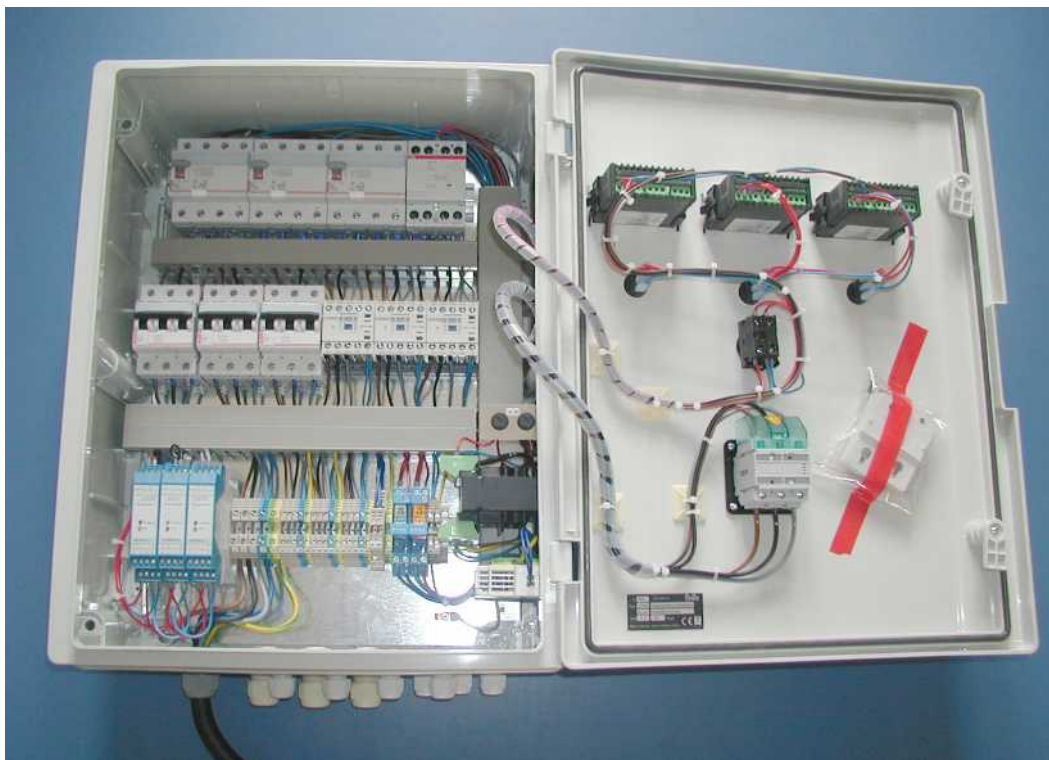
The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Customized Digital temperature control box DTSi



In consultation with you we produce customized Digital temperature control boxes which are customized to your system and your requirements.



Unit price DTSi: on request



Customized Digital temperature control box DTSi

- Matching circuit breakers depending on the maximum switching load
- Built-in thermostat DTR1 with sensor input for Pt100- resistance thermometer or thermocouple J, K, S with setpoint and actual temperature display
- Integrated power contactor
- Integrated earth leakage circuit breaker ELCB 30mA
- Adjustment to the desired maximum permanent switching power
- Socket upon consultation
- Plug upon consultation
- On/Off switch (Main circuit breaker)

Usable in any combination:

- Temperature controller
- Temperature limiter
- Level relay for conductive level detector
- Level relay for float switch
- Timer
- Motor protecting switch
- Leakage sensor
- Selfhold function

other components upon consultation



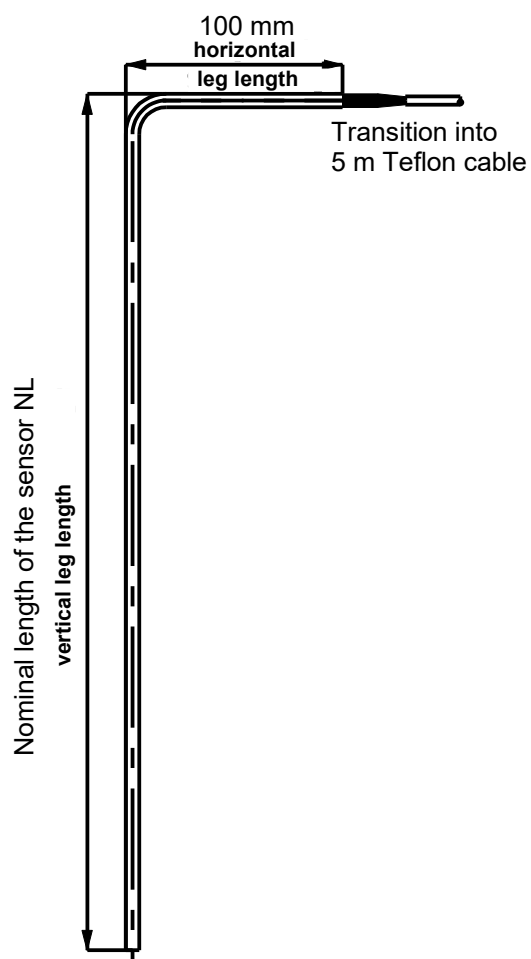
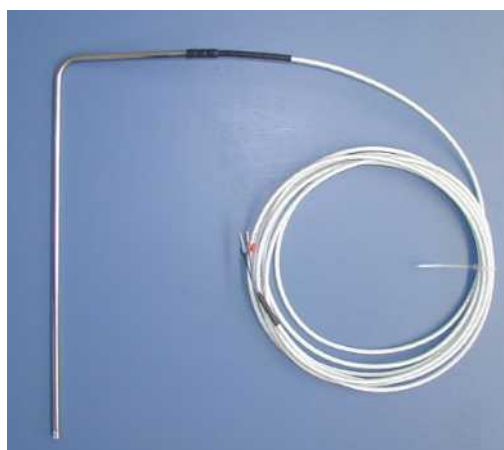
Temperature sensor Pt100

TYPE ST 400 EDST

Nominal length of the sensor NL = 300 mm
Material Stainless steel 1.4571, Ø 6 mm
Angled 90 ° at the top and passing there in 5 m Teflon cable
Three-wire circuit

Unit price **TYPE ST 400 EDST:** 1260 kr.

Surcharge for 100 mm additional sensor length: 31 kr.
(up to NL = 1000 mm, NL > 1000 mm Price on request)



TYPE ST 400 PTFE

Nominal length of the sensor NL = 300 mm
Material Stainless steel coated with PTFE-tube, Ø 8 mm
Angled 90 ° at the top and passing there in 5 m Teflon cable
Three-wire circuit

Unit price **TYPE ST 400 PTFE:** 1578 kr.

Surcharge for 100 mm additional sensor length: 47 kr.
(up to NL = 1000 mm, NL > 1000 mm Price on request)



in the same design **also available with other sensors / probes**

PTC, NTC, IC, Pt, e.g. **KTY 81-110, KTY 81-210**
 NTC 1,8kΩ , NTC 5kΩ , NTC 10kΩ , NTC 20kΩ
 LM235Z, DS18B20,
 Pt500, Pt1000

CE The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Temperature sensor Pt100

TYPE MAWO EDST

Nominal length of the sensor NL = 300 mm
Material Stainless steel 1.4571, Ø 8 mm
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price TYPE MAWO EDST: 1371 kr.

Surcharge for 100 mm additional sensor length: 29 kr.



TYPE MAWO INCOLOY

Nominal length of the sensor NL = 300 mm
Material Incoloy 2.4858, Ø 8 mm
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price TYPE MAWO INCOLOY: 1435 kr.

Surcharge for 100 mm additional sensor length: 31 kr.

TYPE MAWO TITAN

Nominal length of the sensor NL = 300 mm
Material Titanium 3.7035, Ø 8 mm
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price TYPE MAWO TITAN: 1515 kr.

Surcharge for 100 mm additional sensor length: 32 kr.

in the same design **also available with other sensors / probes**

PTC, NTC, IC, Pt, e.g. **KTY 81-110, KTY 81-210**
 NTC 1,8kΩ , NTC 5kΩ , NTC 10kΩ , NTC 20kΩ
 LM235Z, DS18B20,
 Pt500, Pt1000

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Temperature sensor Pt100

TYPE MAWO PTFE

Nominal length of the sensor NL = 300 mm
Material Stainless steel coated with PTFE-tube, 8 mm Ø
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price **TYPE MAWO PTFE:** 1738 kr.

Surcharge for 100 mm additional sensor length: 47 kr.

(up to NL = 1000 mm, NL > 1000 mm Price on request)



**Special versions for
particularly aggressive media**
on request



in the same design **also available with other sensors / probes**

PTC, NTC, IC, Pt, e.g.

KTY 81-110, KTY 81-210

NTC 1,8kΩ , NTC 5kΩ , NTC 10kΩ , NTC 20kΩ

LM235Z, DS18B20,

Pt500, Pt1000

CE The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Resistance thermometer Pt100

- Length according to customer requirements
- PTFE tube Ø 6 mm
- Flexibly bendable
- „Bottom“ tightly welded
- Pt100 probe directly passing into Teflon cable
- Optionally 2-wire, 3-wire or 4-wire technology



TYPE MAWO FLEX PTFE

Nominal length of the sensor NL = 2000 mm
Pt100 sensor coated with PTFE-tube, Ø 6 mm,
passing into 100 mm Teflon cable and wires for connection
Three-wire circuit

<i>Unit price</i>	TYPE MAWO FLEX PTFE:	875 kr.
	Surcharge for 100 mm additional sensor length:	31 kr.

in the same design **also available with other sensors / probes**

PTC, NTC, IC, Pt, e.g. **KTY 81-110, KTY 81-210**
 NTC 1,8kΩ , NTC 5kΩ , NTC 10kΩ , NTC 20kΩ
 LM235Z, DS18B20,
 Pt500, Pt1000

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Temperature sensor Pt100 made of PP



TYPE MAWO PP

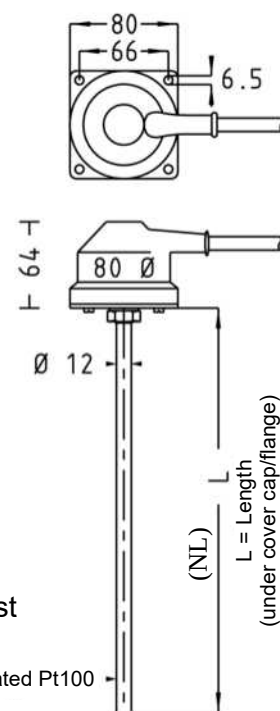
Nominal length of the sensor NL = 300 mm
Material PP up to 80°C bath temperature, Ø 12 mm
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price **TYPE MAWO PP with NL=300mm**: 1515 kr.

Unit price **TYPE MAWO PP with NL=400mm**: 1546 kr.

Unit price **TYPE MAWO PP with NL=500mm**: 1578 kr.

Unit price **TYPE MAWO PP with NL=user-defined**:
on request



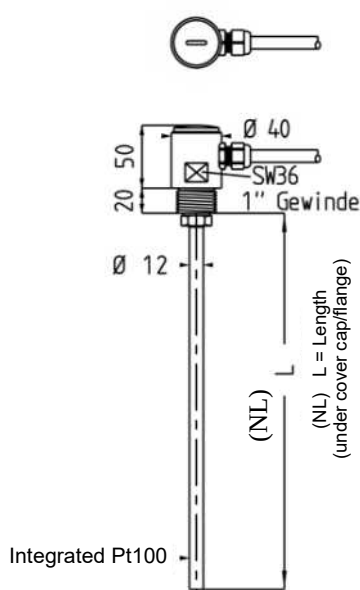
Surcharge *Mini-PPH- cap with 1" thread*: 0 kr.

Surcharge *PP cover cap with Viton- sealing*: 303 kr.

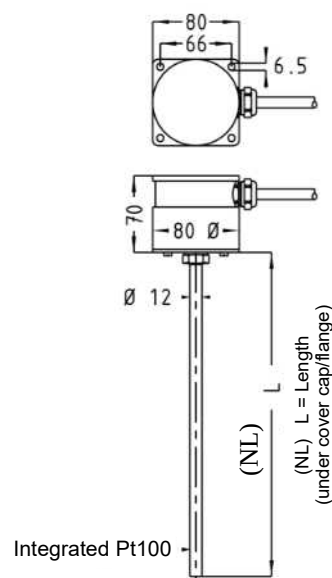
PPH- holder 250 x 90 x 10 (LxWxH) in mm for MAWO-/PP- cover cap: 160 kr.

PPH- holder 80 x 45 x 10 (LxWxH) in mm with thread ½" or 1" for Mini-PPH- cap: 192 kr.

with Mini-PPH- cap:



with PPH- cap:



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.



General conditions for the supply of products and services of the electrical industry.

Temperature sensor Pt100 made of PVDF

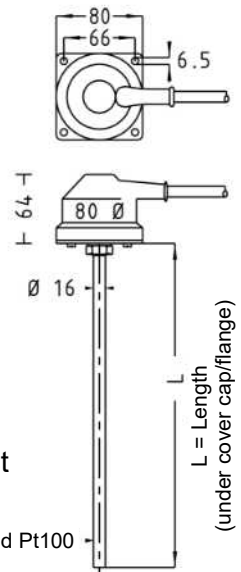


TYPE MAWO PVDF

Nominal length of the sensor NL = 300 mm
Material PVDF up to 130°C bath temperature, Ø 16 mm
with MAWO- cover cap with 1,6 m cable
Three-wire circuit

Unit price **TYPE MAWO PVDF** with NL=300mm: 2375 kr.

Unit price **TYPE MAWO PVDF** with NL= user-defined:
on request

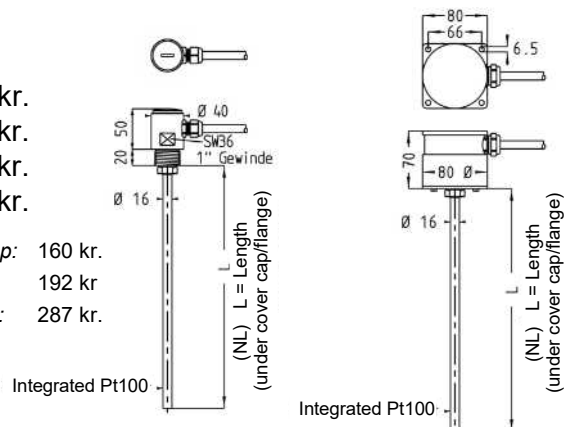


Surcharge Mini-PPH- cap with 1" thread:	0 kr.
Surcharge Mini-PVDF- cap with 1" thread:	297 kr.
Surcharge PP cover cap with Viton- sealing:	303 kr.
Surcharge PVDF cover cap with Viton- sealing:	842 kr.

PPH- holder 250 x 90 x 10 (LxWxH) in mm for MAWO-/PP-/PVDF- cover cap: 160 kr.

PPH- holder 80 x 45 x 10 (LxWxH) in mm with thread ½" or 1" for Mini- cap: 192 kr

PVDF-holder 80 x 45 x 10 (LxWxH) in mm with thread ½" or 1" for Mini- cap: 287 kr.



with Mini-PPH- cap:



with Mini-PVDF- cap:



with PPH- cap:



with PVDF- cap:



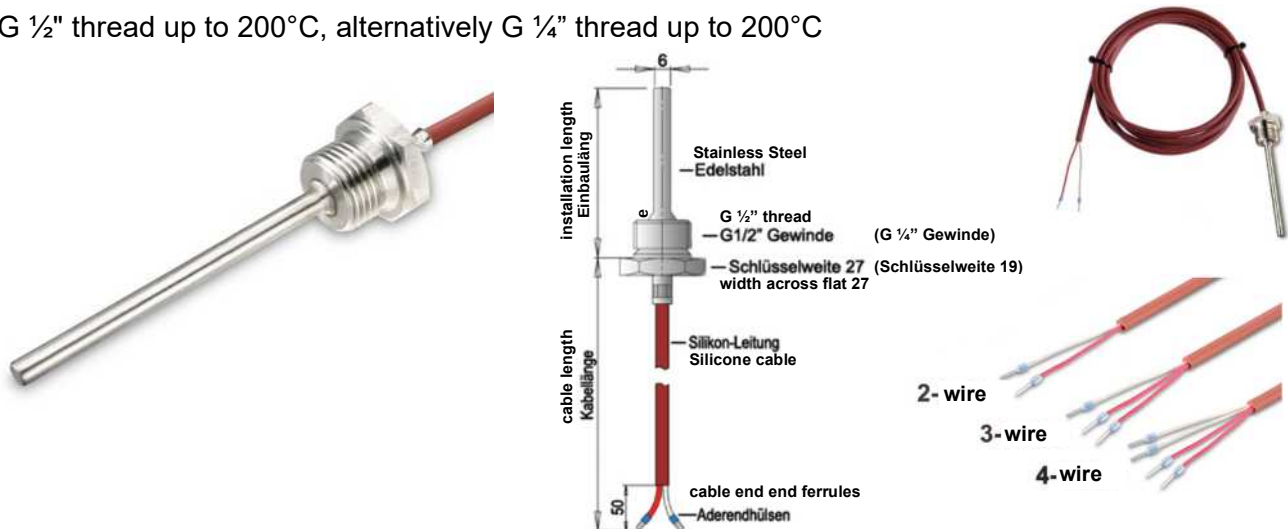
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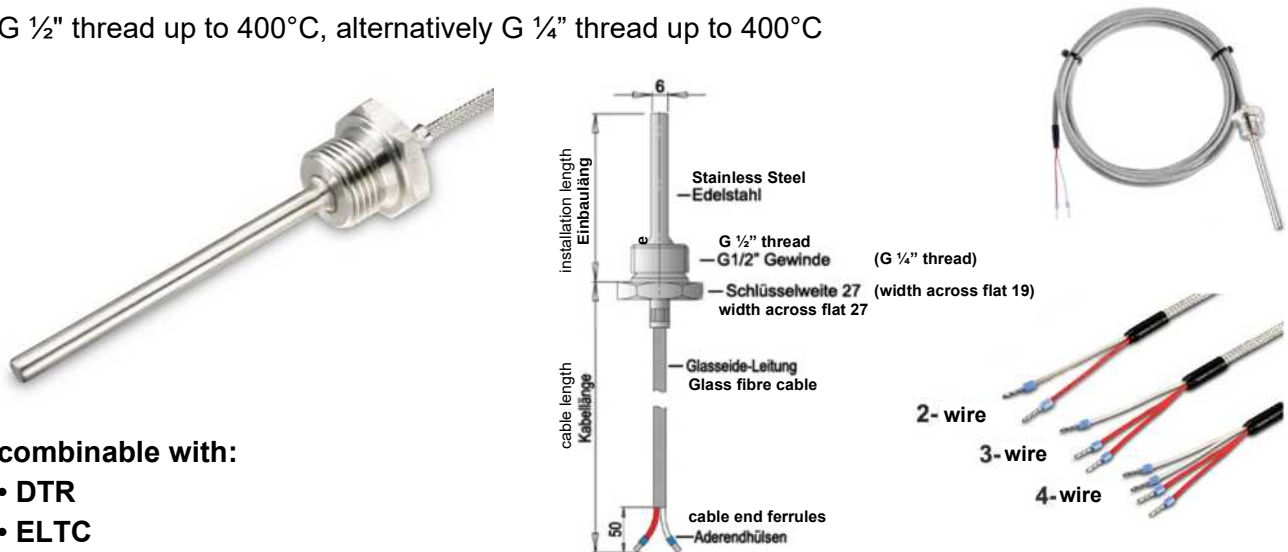
Temperature sensor Pt100 with thread

The screw-in temperature sensors measure the temperature of liquid and gaseous media in the range of -50 ° C to + 400 ° C (depending on the connection cable). The sensors are screwed directly into the container of the medium to be measured. The probes can also be pushed through a hole and fixed by means of a lock nut. This lock nut is not included in the delivery.

G ½" thread up to 200°C, alternatively G ¼" thread up to 200°C



G ½" thread up to 400°C, alternatively G ¼" thread up to 400°C



combinable with:

- DTR
- ELTC
- DTA
- DTS

Sensor tube out of Stainless steel 1.4571

Screw head G ½" Stainless steel 1.4571, width across flat SW27

Screw head G ¼" Stainless steel 1.4571, width across flat SW19

Installation length G ½": 50mm, 100mm, 150mm, 200mm, 300mm

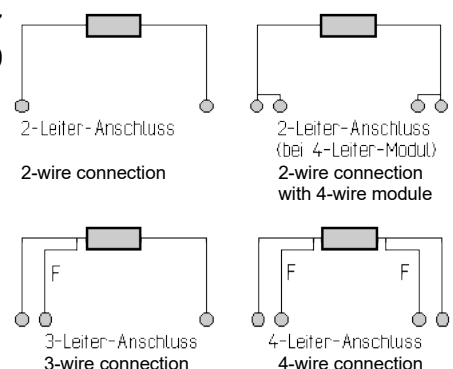
Installation length G ¼": 50mm, 100mm

Connection cables: Silicone up to 200°C
Glass fibre up to 400°C

Dimensions: 1m, 2m, 3m, 4m, 5m, 6m, 10m, 15m, 20m

Connection: free ends are wired with cable end ferrules
two-wire / three-wire / four-wire

Unit price: on request



Time switch



- Time switch digital weekly
- Switchboard panel
- 1 channel
- Daily and weekly program
- 46 memory locations
- Minimum interval 1 min
- Switching capacity 8 A per channel
- Permanent by date / holiday function
- Manual permanent mode
- Manual override
- Automatic sorting of switching times on readout
- Unrestricted block programming
- Fully automatic daylight saving time
- Elapsed time and pulse counter
- Pulse function
- Security by PIN-Code
- Data-key function
- External input

- Text based Menu
- High resolution Display with two text lines
- Easy handling
- Quick and intuitive programmable
- 4 years battery-reserve
- Unlimited program security by E²-PROM

Unit price Time switch: 1578 kr.

Accessories

Trim 55 x 55 mm

Mask Ø 72
(for installation- Ø 60)

Mask 72 x 72 mm

Maske Ø 72
(for installation- Ø 50,5)



Technical data

Supply voltage: 230 V, 50–60 Hz

Power consumption (real power): 0,7 W

Channel (potential of supply voltage): change-over, contact gap .. 3 mm (μ)

Contact material: AgNi

Switching capacity per channel: 8 A / 250 V~ at cosφ=1 (resistive load)

6 A at cosφ=0,6 (inductive load)

Min. switching power: 300 mW (5 V / 5 mA)

External input (potential of supply voltage): for pushbutton / manual override

Switching functions: ON; OFF; pulse; holiday

Pulse length Pulse function: 00:01 up to 59:59 mm:ss

Memory locations: 46

Minimum interval: 1 Min.

Time base: Quartz

Power back-up (at 20°C): approx. 4 years (depends on the Lithiumbattery life)

Data security unlimited (E²-PROM)

Quartz accuracy (at 20°C): <= ±0,5 Sec./day

Display: high resolution LCD (visible area 7,5 cm²)

Permitted ambient temperature: –30°...+50°C

Housing: self-extinguishing thermoplastic

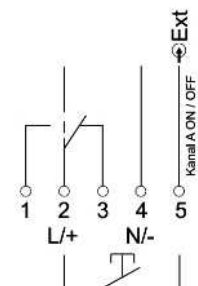
Dimensions: 48 x 48 mm (to DIN EN 43700)

Panel mounting: Retaining clip in cutout

Type of connection: Screw terminals (pull-up type)

Type of protection: IP 20 to DIN EN 60529

Class of protection: II when installed according to regulations



Level Switch made of PPH

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

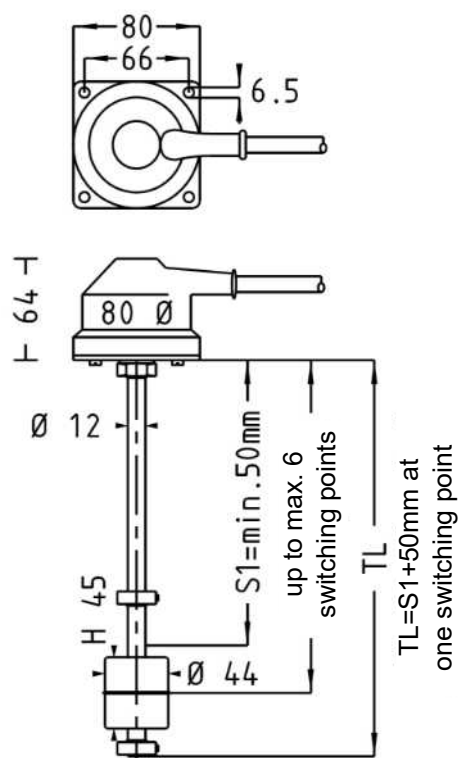
Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover.

Standard version:

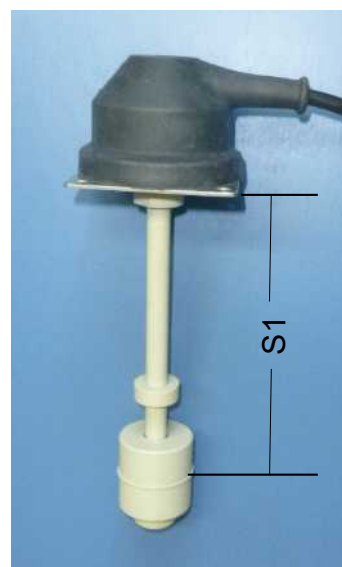
One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, MAWO- cover cap.

S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point

Material PPH up to 80°C bath temperature



Standard version:



Standard version PPH with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 50 mm	1.620
Level Switch with S1 = 100 mm	1.650
Level Switch with S1 = 150 mm	1.680
Level Switch with S1 = 200 mm	1.710
Level Switch with S1 = 250 mm	1.740
Level Switch with S1 = 300 mm	1.770
Level Switch with S1 = 400 mm	1.830
Level Switch with S1 = 500 mm	1.890
Level Switch with S1 user-defined	on request

with PPH- cap:



with Mini-PPH- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

on request:

- several switching points (2 to max. 6) possible
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection or
- Mini-PPH- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.



General conditions for the supply of products and services of the electrical industry.

Level Switch made of Stainless steel

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

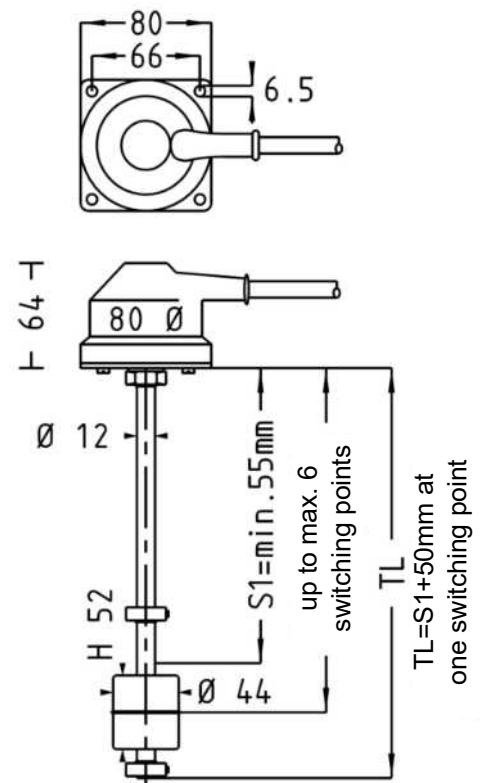
Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover.

Standard version:

One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, MAWO- cover cap.

S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point

Material Stainless steel 1.4571 up to 140°C bath temperature



Standard version:



Standard version Stainless steel with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 50 mm	2.385
Level Switch with S1 = 100 mm	2.415
Level Switch with S1 = 150 mm	2.445
Level Switch with S1 = 200 mm	2.475
Level Switch with S1 = 250 mm	2.505
Level Switch with S1 = 300 mm	2.535
Level Switch with S1 = 400 mm	2.595
Level Switch with S1 = 500 mm	2.655
Level Switch with S1 user-defined	on request

with PPH- cap:



with PVDF- cap:



with Mini-
PPH- cap:



with Mini-
PVDF- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

on request:

- several switching points (2 to max. 6) possible
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection
- PVDF- cap with PVDF- screw connection
- Mini-PPH- cap with PVDF- screw connection
- Mini-PVDF- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Level Switch made of PVDF

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

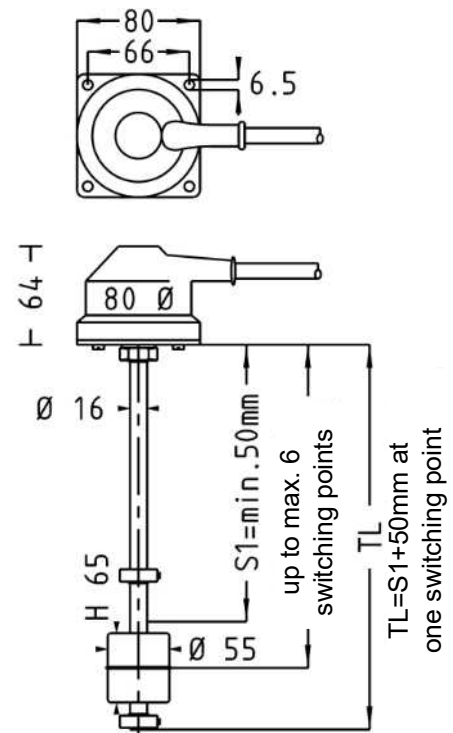
Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover.

Standard version:

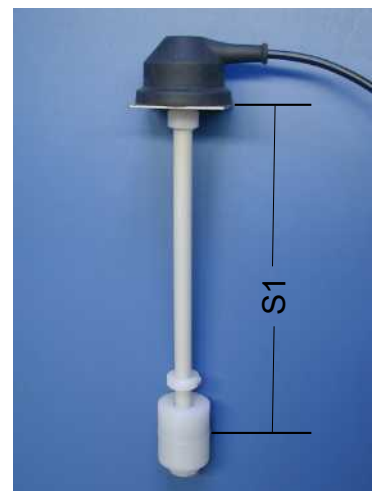
One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, MAWO- cover cap.

S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point

Material PVDF up to 130°C bath temperature



Standard version:



Standard version PVDF with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 50 mm	on request
Level Switch with S1 = 100 mm	
Level Switch with S1 = 150 mm	
Level Switch with S1 = 200 mm	
Level Switch with S1 = 250 mm	
Level Switch with S1 = 300 mm	
Level Switch with S1 = 400 mm	
Level Switch with S1 = 500 mm	
Level Switch with S1 user-defined	

with PPH- cap:



with PVDF- cap:



with Mini-
PPH- cap:



with Mini-
PVDF- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

on request:

- several switching points (2 to max. 6) possible
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection
- PVDF- cap with PVDF- screw connection
- Mini-PPH- cap with PVDF- screw connection
- Mini-PVDF- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.



General conditions for the supply of products and services of the electrical industry.

Level Switch made of PPH with Pt100 sensor

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover. The Pt100 positioned at the bottom of the tube measures the bath temperature.

Standard version with integrated temperature sensor Pt100:

One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, integrated temperature sensor Pt100, Three-wire circuit, MAWO- cover cap.

S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point

Material PPH up to 80°C bath temperature

Standard version PPH with Pt100 with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 200 mm	2.145
Level Switch with S1 = 300 mm	2.205
Level Switch with S1 = 500 mm	2.325
Level Switch with S1 user-defined	on request

with PPH- cap:



with Mini-PPH- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

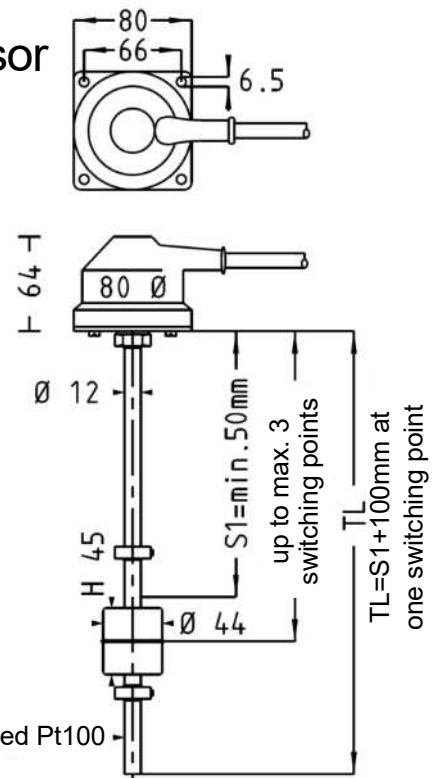
on request:

- several switching points (2 to max. 3) possible
(max. 4 switching points with Ø16 and float Ø 55 H 65)
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection or
- Mini-PPH- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Standard version:



Level Switch made of Stainless steel with Pt100 sensor

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

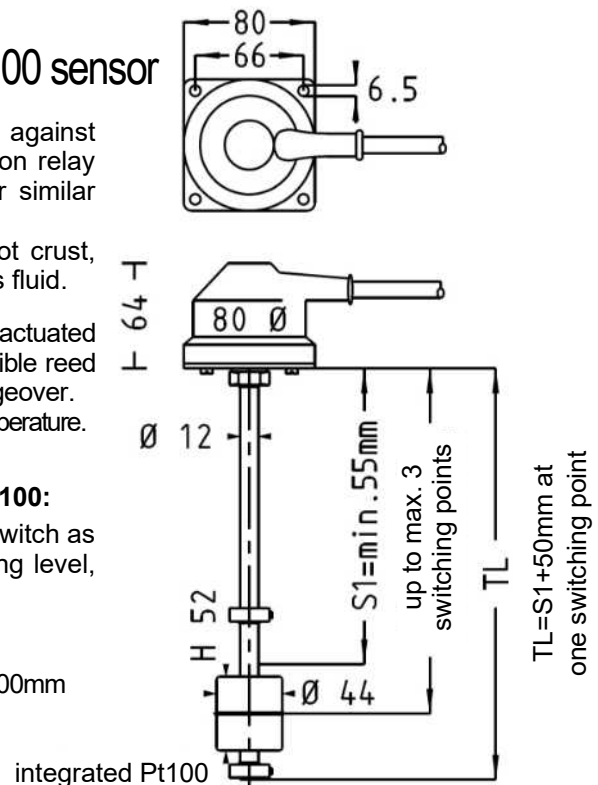
The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover. The Pt100 positioned at the bottom of the tube measures the bath temperature.

Standard version with integrated temperature sensor Pt100:

One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, integrated temperature sensor Pt100, Three-wire circuit, MAWO- cover cap.

S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point



Material Stainless steel 1.4571 up to 140°C bath temperature

Standard version:



Standard version Stainless steel with Pt100 with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 200 mm	on request
Level Switch with S1 = 300 mm	
Level Switch with S1 = 500 mm	
Level Switch with S1 user-defined	

with PPH- cap:

with PVDF- cap:



with Mini-
PPH- cap:

with Mini-
PVDF- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

on request:

- several switching points (2 to max. 3) possible
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection
- PVDF- cap with PVDF- screw connection
- Mini-PPH- cap with PVDF- screw connection
- Mini-PVDF- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.



General conditions for the supply of products and services of the electrical industry.

Level Switch made of PVDF with Pt100 sensor

Applications: Level switches monitor the levels of liquids against dry run and / or overfilling. By means of a contact protection relay and if necessary a contactor immersion heaters, pumps or similar can be switched directly.

The float must always remain freely movable and must not crust, stick together or be affected by contamination of the process fluid.

Function: A permanent magnet is installed in the float. This actuated by its magnetic field the installed reed switch in the pipe. Possible reed switch functions are: normally open, normally closed or changeover. The Pt100 positioned at the bottom of the tube measures the bath temperature.

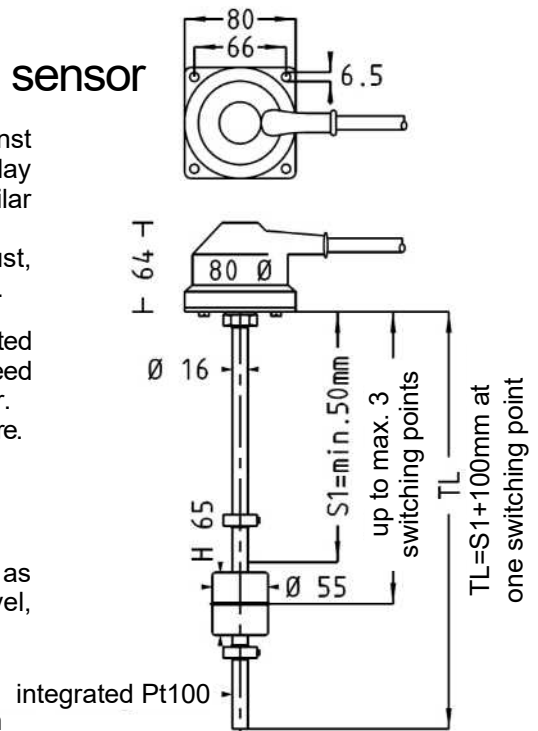
Standard version with integrated temperature sensor Pt100:

One switching point S1, dry run protection function, a reed switch as 1-pole contact opens at falling level and closes at ascending level, integrated temperature sensor Pt100, Three-wire circuit, MAWO- cover cap.

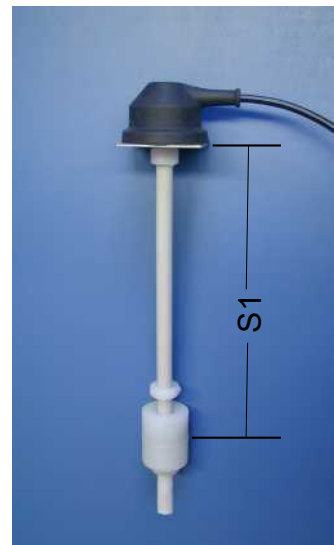
S1 = 50mm/100mm/150mm/200mm/250mm/300mm/400mm/500mm
or freely selectable
measured from the support surface
until the switching point

Material PVDF up to 130°C bath temperature

Standard version PVDF with Pt100 with MAWO- cover cap (1,6m cable)	Unit price DKK
Level Switch with S1 = 200 mm	on request
Level Switch with S1 = 300 mm	
Level Switch with S1 = 500 mm	
Level Switch with S1 user-defined	



Standard version:



with PPH- cap: with PVDF- cap:



with Mini-
PPH- cap:



with Mini-
PVDF- cap:



Switching power:

Normally open/Normally closed: 230 V AC; 100 VA; 1 A AC
230 V DC; 50 W; 0,5 A DC

Change-over contact: 230 V AC; 40 VA; 1 A AC
230 V DC; 20 W; 0,5 A DC

on request:

- several switching points (2 to max. 3) possible
- Switch contacts NC / NO / changeover switch selectable

Version with

- PPH- cap with PVDF- screw connection
- PVDF- cap with PVDF- screw connection
- Mini-PPH- cap with PVDF- screw connection
- Mini-PVDF- cap with PVDF- screw connection possible

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



Conductive level probe

TYP MAWO NIV

- 1 to 8 pieces of electrodes, electrodes can be cut to desired length individually by the customer

Materials:

- Stainless steel 1.4571
- Titanium
- PVDF flange
80x80x10 mm
- Cable length according to customer requirements
- Suitable holder for attachment possible



Unit price **TYP MAWO NIV:** on request



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Combination Conductive level probe/Pt100

TYP MAWO NIV/PT100KOMBI

- 1 to 5 pieces of electrodes, electrodes can be cut to desired length individually by the customer

Materials:

- Stainless steel 1.4571
- Titanium
- PVDF flange 80x80x10 mm
- Pt100 in three-wire or optionally four-wire
- Double Pt100 possible
- Cable length according to customer requirements
- Suitable holder for attachment possible



Variant with PP- cover cap:



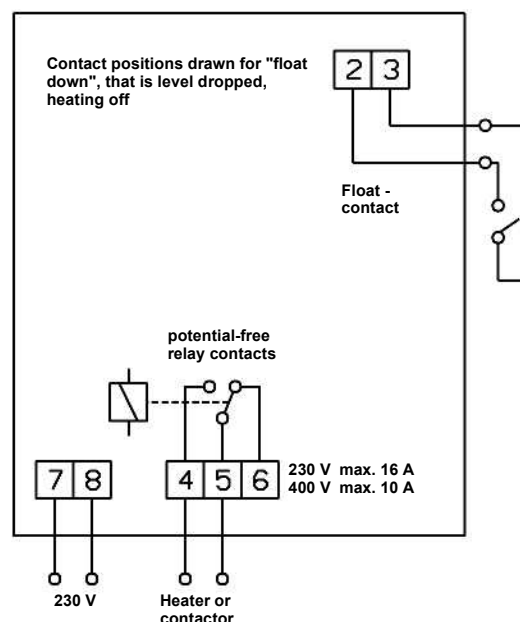
Unit price **TYP MAWO NIV/PT100KOMBI**: on request

The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Contact protection relay



Connection diagram



General description

Switching amplifiers, also called contact protection relays, are used when contacts (of small and reed relays) or sensors with low current load are used and loads (voltages and currents) must be switched.

Applications

- Machine switch-off by safety devices
- Dry run protection for pumps (float switch)
- Pump control for level (float switch)
- Protection for immersion heaters (float switch)
- Switching load relays or contactors etc.

**suitable for all level switches,
see our brochure**

Technical data	
Supply voltage:	230 V ~, 50 - 60 Hz
Power input:	ca. 3 VA
Output contact:	1 changeover contact 16 A, 230 V AC 10 A, 400 V AC
Control voltage:	12 V DC
Housing:	Polycarbonate, 130x94x57mm
Protection class:	IP 65
Per. operating temperature:	0°C to +50°C
Weight:	ca. 300 g

Unit price **Contact protection relay:** 1335 kr.


 The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
 General conditions for the supply of products and services of the electrical industry.

Switching amplifier ESV1 for level switch

General description ESV1

Switching amplifiers, also called contact protection relays, are used when contacts (of small and reed relays) or sensors with low current load are used and loads (voltages and currents) must be switched.

Applications

- Machine switch-off by safety devices
- Dry run protection for pumps (float switch)
- Pump control for level (float switch)
- Protection for immersion heaters (float switch)
- Switching load relays or contactors etc.

The slim module housing for rail mounting (see picture) enables space-saving solutions.



Characteristics

- small housing with plug-in terminals
- Relay 6A /250 VAC
- Supply 230V AC

Technical specifications

Housing	Housing for rail mounting ME22,5 22,5 x 99 x 114,5 mm (W x H x D)
Protection class	IP 20
Supply voltage	230V AC
Input	Contact (about 12VDC/20mA)
Output	1 changeover contact 6A/ 250VAC at ESV-1K
Auxiliary voltage	12V DC approx. 2-42mA
Environment	Operating temperature 0...+50°C Storage temperature -20...+70°C Humidity 0...95% without condensation

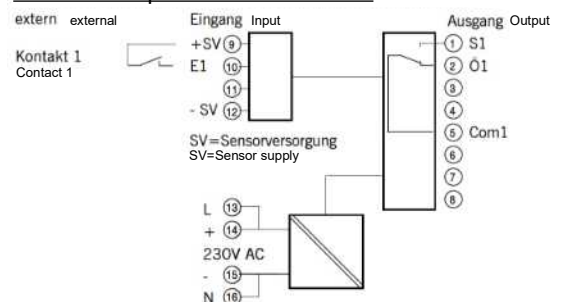
**suitable for all level switches,
see our brochure**

Unit price **ESV1:** 1260 kr.



Connection diagram ESV

Control with potential-free contact



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.

Version 1 – Level Probe in plastic housing

Electric interface through terminal screws in the probe head. Cable feed out through a M16 gland, for protection class IP 65.

- Electrode length available 5 to 4000mm (please specify with your order)
- 1 - 7 electrodes
- For conductive filling level acquisition



Technical data

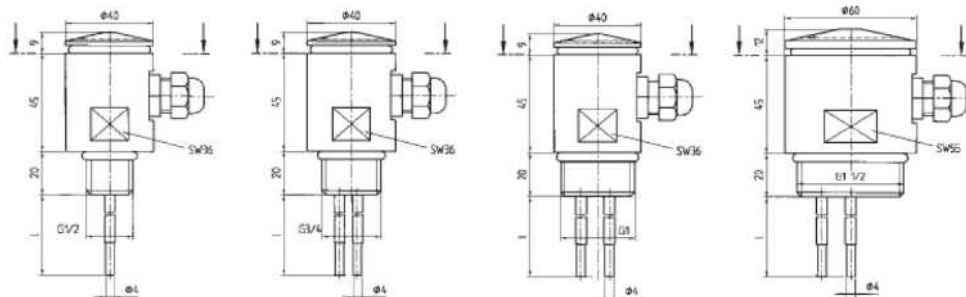
Mounting method: Thread
Mounting orientation: any
Media temperature: max. 90°C
Media pressure: max. 10 bar (at 60°C)

Probe-head material: PPH
Electrode material: V4A / 1.4571 (optional HAC-C4; Titanium)
Coating: Polyolefin (alternatively PVDF)

Size	Electrodes	Standard-Model
1/2"	1	GPPE - 1VP1
1/2"	2	GPPE - 2VP1
1"	1	GPPG - 1VP1
1"	2	GPPG - 2VP1
1"	3	GPPG - 3VP1
1"	4	GPPG - 4VP1

Size	Electrodes	Standard-Model
1 1/2"	2	GPPI - 2VP1
1 1/2"	3	GPPI - 3VP1
1 1/2"	4	GPPI - 4VP1
1 1/2"	5	GPPI - 5VP1
1 1/2"	6	GPPI - 6VP1
1 1/2"	7	GPPI - 7VP1

Dimensions



Options

Distance fastener Material PPH

Accessories

Lock-nut Material PPH

Junction cable with numeric labeled wires

Version 2 – Level Probe in plastic housing

Electric interface through a factory mounted cord with numbered wires. Case casted. Protection class IP 68.

- Connection cable with the length of 3m (or as required)
- Electrode length available 5 to 4000mm (please specify with your order)
- 1 - 7 electrodes
- For conductive filling level acquisition



Technical data

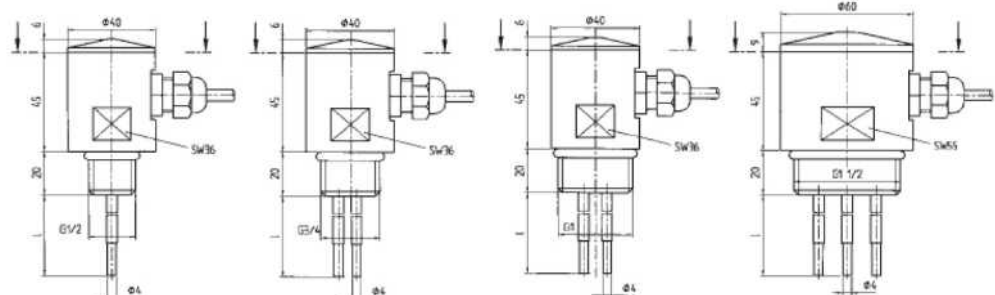
Mounting method: Thread
Mounting orientation: any
Media temperature: max. 90°C
Media pressure: max. 10 bar (at 60°C)

Probe-head material: PPH
Electrode material: V4A / 1.4571
 (optional HAC-C4; Titanium)
Coating: Polyolefin (alternatively PVDF)

Size	Electrodes	Standard-Model
1/2"	1	GPPE - 1VP2
1/2"	2	GPPE - 2VP2
1"	1	GPPG - 1VP2
1"	2	GPPG - 2VP2
1"	3	GPPG - 3VP2
1"	4	GPPG - 4VP2

Size	Electrodes	Standard-Model
1 1/2"	2	GPPI - 2VP2
1 1/2"	3	GPPI - 3VP2
1 1/2"	4	GPPI - 4VP2
1 1/2"	5	GPPI - 5VP2
1 1/2"	6	GPPI - 6VP2
1 1/2"	7	GPPI - 7VP2

Dimensions



Options

Distance fastener Material PPH

Accessories

Lock-nut Material PPH

Version 1 – Level Probe with stainless steel housing

Electric interface through terminal screws in the probe head. Cable feed out through a M16 gland, for protection class IP 65.

- Electrode length available 5 to 4000mm (please specify with your order)
- 1 - 7 electrodes
- For heavy-duty
- For conductive filling level acquisition



Technical data

Mounting method:	Thread	Probe-head material:	V2A / 1.4305
Mounting orientation:	any		Cover and Cable gland brass, nickel-plated
Case temperature:	max. 110°C	Electrode material:	V4A / 1.4571 (HAC-C4; Titanium)
Media temperature:	max. 120°C (Polyolefin max. 100°C)	Coating:	PVDF "K" (alternatively Polyolefin "P")
Media pressure:	max. 10 bar		

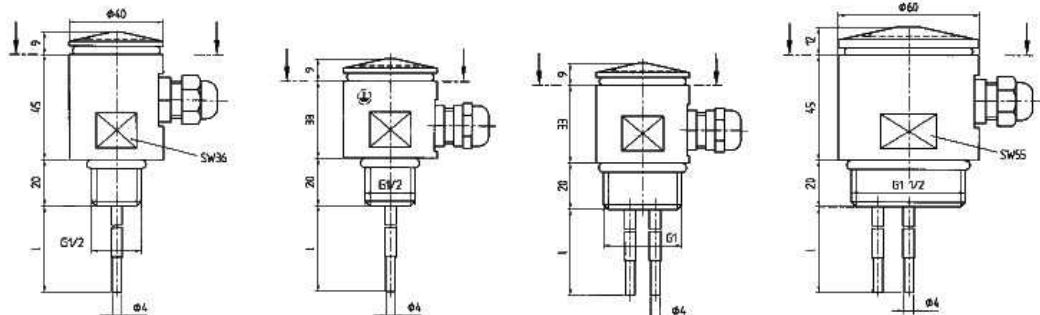
Size	Electrodes	Standard-Model
1/2"	1	GVAE - 1VK1
1/2"	1 (2)*	GVAE - 1VK1R
1/2"	2	GVAE - 2VK1
1"	2	GVAG - 2VK1
1"	3	GVAG - 3VK1
1"	4	GVAG - 4VK1

Size	Electrodes	Standard-Model
1 1/2"	2	GVAI - 2VK1
1 1/2"	3	GVAI - 3VK1
1 1/2"	4	GVAI - 4VK1
1 1/2"	5	GVAI - 5VK1
1 1/2"	6	GVAI - 6VK1
1 1/2"	7	GVAI - 7VK1

⚠ To order the Polyolefin-coated version insert "P" instead of "K" - e.g. "GVAE - 1VP1"

* Single pole probe with the reference connection tied to the mounting for use in electrical conductive vessels, functionality is the very same as for a bipolar probe.

Dimensions



Accessories

Junction cable

with numeric labeled wires

Version 2 – Level Probe with stainless steel housing

Electric interface through a factory mounted cord with numbered wires. Case casted. Protection class IP 68.

- Connection cable with the length of 3m (or as required)
- Electrode length available 5 to 4000mm (please specify with your order)
- 1 - 7 electrodes
- For heavy-duty
- For conductive filling level acquisition



Technical data

Mounting method: Thread

Mounting orientation: any

Case temperature: max. 110°C

Media temperature: max. 120°C
(Polyolefin max. 100°C)

Media pressure: max. 10 bar

Probe-head material: V2A / 1.4301 , 1.4305
Cover and Cable gland brass, nickel-plated

Electrode material: V4A / 1.4571 (HAC-C4; Titanium)
Coating: PVDF "K" (alternatively Polyolefin "P")

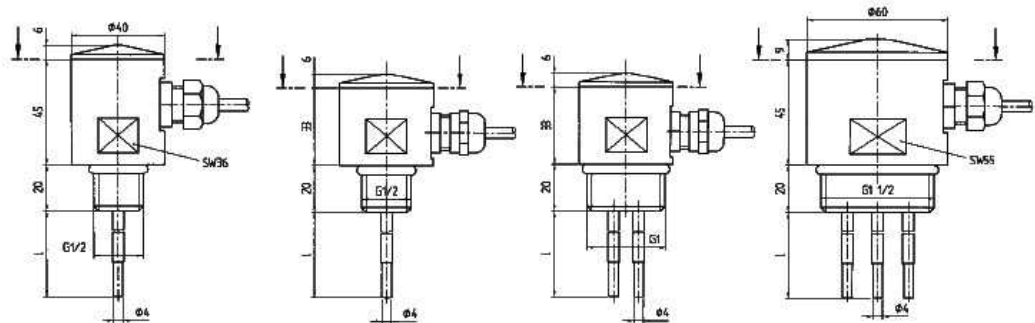
Size	Electrodes	Standard-Model
1/2"	1	GVAE - 1VK2
1/2"	1 (2)*	GVAE - 1VK2R
1/2"	2	GVAE - 2VK2
1"	2	GVAG - 2VK2
1"	3	GVAG - 3VK2
1"	4	GVAG - 4VK2

Size	Electrodes	Standard-Model
1 1/2"	2	GVAI - 2VK2
1 1/2"	3	GVAI - 3VK2
1 1/2"	4	GVAI - 4VK2
1 1/2"	5	GVAI - 5VK2
1 1/2"	6	GVAI - 6VK2
1 1/2"	7	GVAI - 7VK2

⚠ To order the Polyolefin-coated version insert "P" instead of "K" - e.g. "GVAE - 1VP2"

* Single pole probe with the reference connection tied to the mounting for use in electrical conductive vessels, functionality is the very same as for a bipolar probe.

Dimensions



Accessories

Junction cable

with numeric labeled wires

Level Controller NR/RN 01

Sensing for 1 or 2 levels.

Basic functions

Min-Max - 2 switch points NR-Pump Up RN-Pump Down	Max - 1 switching point NR-Overflow protection RN-Run Dry protection
---	--

The NR / RN mode can be selected by jumpers



- Conductive measurement principle (for conductive media)
- Sensitivity is adjustable
- LED indicators for relay state and operation
- Probes are operated with alternate current signal
- Supply and measurement signal are isolated from each other
- Safety measure against supply or transformer malfunction, then the filling and / or draining process will be stopped

Technical data

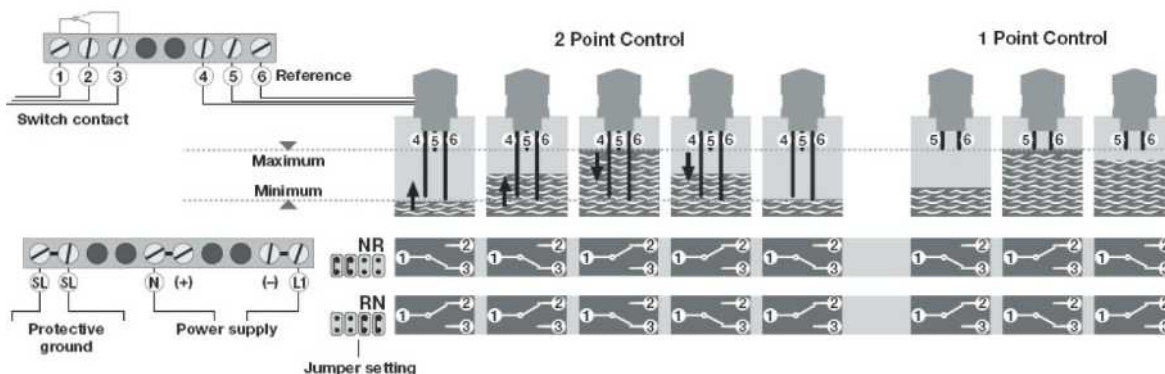
Dimensions:	L 120 x W 80 x H 55mm	Protection class:	Housing IP65
Housing:	ABS for Wall mounting, with quick-release cover		touch-proof terminals, captive, self-lifting terminal screws
Output:	1 changeover contact (SPDT), working current principle	Supply voltage:	230V AC
Switching voltage:	max. 250V AC	on request:	24V AC, 42V AC, 115V AC
Switching current:	6A	Supply frequency:	50-60 Hz
Power On time:	100 %	Tolerance:	-15% to +10%
Probe voltage:	Centre position 12V AC max. 25V AC	Power consumption:	max. 2,7 VA
		Ambient temperature:	-20°C up to +60°C

Type	Resistivity Range KΩ (centre position)	Conductance μS max.	Probe Current ≈ μA	Cable Capacity nF (centre position)	Cable Length m (centre position)
Setting 1	-70 (20)	14	< 800	60	500
Setting 2	-800 (330)	1,25	< 80	4	30
Setting 3	-680 (400)	0,85	< 50	1	8

Jumper

Setting 1 Setting 2 Setting 3

Functional and wiring diagram



Options

Variant -3	High sensible, for media with less conductivity, e.g. full demineralized water, condense
Variant -VZ	Switching delay, e.g. useful for moving filling media, undulation
Variant -3VZ	High sensible and switching delay together
all Variants	any combination available



Level controller S-NR 01 / S-RN 01

Level Controller S-NR 01, S-RN 01

Sensing for 1 or 2 levels. With test-button.

Basic functions

Min-Max - 2 switch points NR-Pump Up RN-Pump Down	Max -1 switching point NR-Overflow protection RN-Run Dry protection
---	---

- Conductive measurement principle (for conductive media)
- Sensitivity is adjustable
- LED indicators for relay state and operation
- Probes are operated with alternate current signal
- Supply and measurement signal are isolated from each other
- Safety measure against supply or transformer malfunction, then the filling and / or draining process will be stopped



Technical data

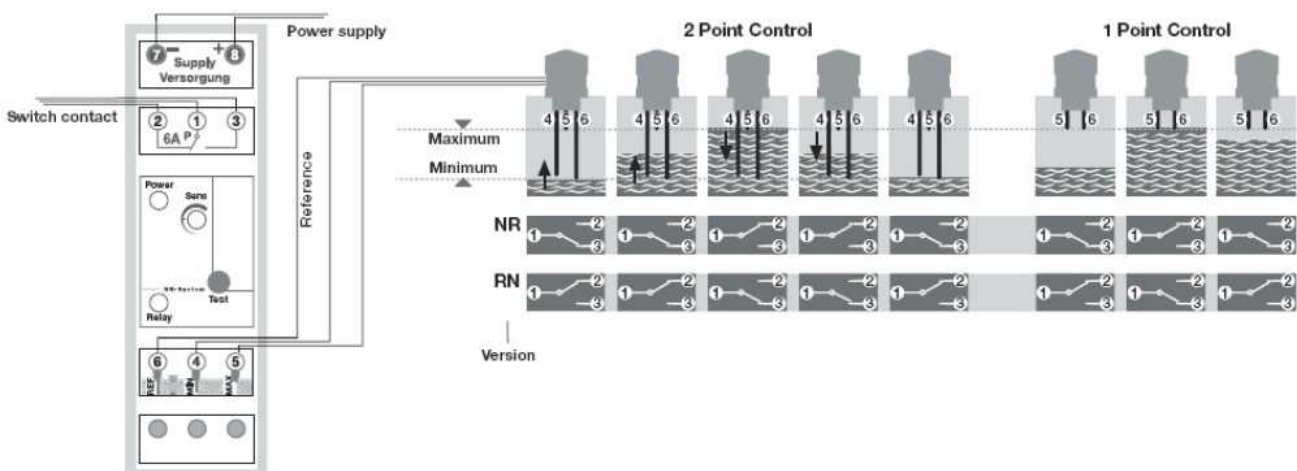
Dimensions:	L 75 x W 22,5 x H 110mm	Protection class:	Housing IP40 / Terminal IP20
Housing:	DIN standard housing quick mounting for standard rail DIN EN 50022		touch-proof terminals, captive, self-lifting terminal screws
Output:	1 changeover contact (SPDT), working current principle	Supply voltage:	230V AC
Switching voltage:	max. 250V AC	on request:	24V DC, 24V AC, 115V AC
Switching current:	6A	Supply frequency:	50-60 Hz
Power On time:	100 %	Tolerance:	-15% to +10%
Probe voltage:	AC 12V ss ca. 50Hz	Power consumption:	max. 3,3 VA
			Version 24V DC: 0,6VA
		Ambient temperature:	-20°C up to +60°C

Type	Resistivity Range KΩ (centre position)	Conductance μS max.	Probe Current ≈ μA	Cable Capacity nF (centre position)	Cable Length m (centre position)
Standard	-110 (50)	10	< 200	9-120 (60)	25-300 (150)

Article number	Supply Voltage
SNR01 23056	230V / 50-60Hz
SNR01 11556	115V / 50-60Hz
SNR01 2456	24V / 50-60Hz
SNR01 G2400	24V DC

Article number	Supply Voltage
SRN01 23056	230V / 50-60Hz
SRN01 11556	115V / 50-60Hz
SRN01 2456	24V / 50-60Hz
SRN01 G2400	24V DC

Functional and wiring diagram



Level Controller NR 98, RN 98

Sensing for 1 or 2 levels.

Basic functions

Min-Max - 2 switch points	Max -1 switching point
NR-Pump Up	NR-Overflow protection
RN-Pump Down	RN-Run Dry protection

- Conductive measurement principle (for conductive media)
- Sensitivity is adjustable
- LED indicators for relay state and operation
- Probes are operated with alternate current signal
- Supply and measurement signal are isolated from each other
- Safety measure against supply or transformer malfunction, then the filling and / or draining process will be stopped

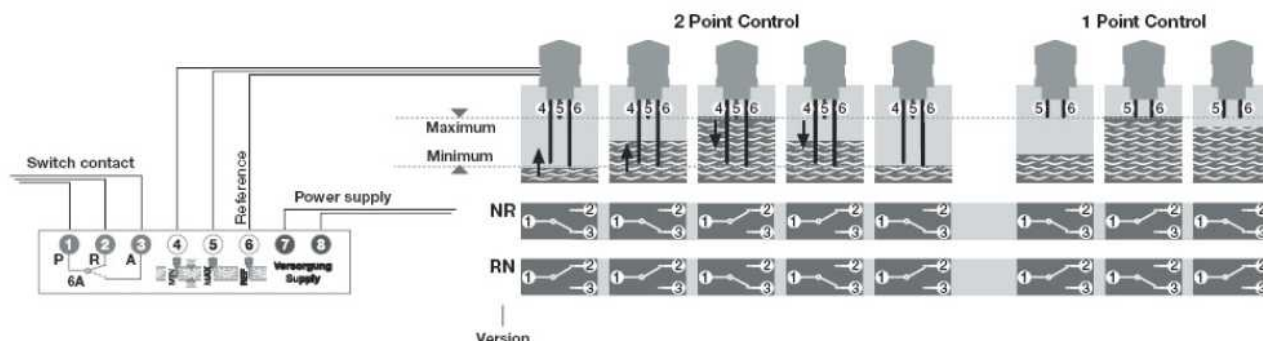


Technical data

Dimensions:	L 75 x W 55 x H 110mm	Protection class:	Housing IP40 / Terminal IP20
Housing:	DIN standard housing quick mounting for standard rail DIN EN 50022		touch-proof terminals, captive, self-lifting terminal screws
Output:	1 changeover contact (SPDT), working current principle	Supply voltage:	230V AC
Switching voltage:	max. 250V AC	on request:	24V DC, 42V AC, 115V AC
Switching current:	6A	Supply frequency:	50-60 Hz
Power On time:	100 %	Tolerance:	-15% to +10%
Probe voltage:	Centre position 12V AC max. 25V AC	Power consumption:	max. 2,7VA Version 24V DC: 0,6VA
		Ambient temperature:	-20°C up to +60°C

Type	Resistivity Range KΩ (centre position)	Conductance μS max.	Probe Current ≈ μA	Cable Capacity nF (centre position)	Cable Length m (centre position)
Standard	-70 (20)	14	< 340	60	500
-3	-800 (330)	1,25	< 30	4	30
-3/12	-1200 (700)	0,85	< 20	1	8

Functional and wiring diagram



Options

Variant -3	High sensible, for media with less conductivity, e.g. full demineralized water, condense
Variant -VZ	Switching delay, e.g. useful for moving filling media, undulation
Variant -3VZ	High sensible and switching delay together
all Variants	any combination available



Level Controller LC-01

Sensing for 1 or 2 Levels.

Basic functions

Min-Max - 2 switch points

UP (NR)-Pump Up
DOWN (RN)-Pump Down

Max - 1 switch point

UP (NR)-Overflow protect
DOWN (RN)-Run dry protect

- Function switch UP (NR) / DOWN (RN)
- Conductive measurement principle (for conductive media)
- Sensitivity adjustable
- LED indicators: power - relay state - cable break
- Probes are operated with alternate current signal
- Supply and measurement signal are isolated from each other
- Safety circuit against supply or transformer malfunction; filling and / or draining process will be stopped
- Line break monitoring, useable with 1 switch point in connection with level probe type - W
- Adjustable On and Off switch delay
max. 20 sec. (middle position 10 sec.)



Technical data

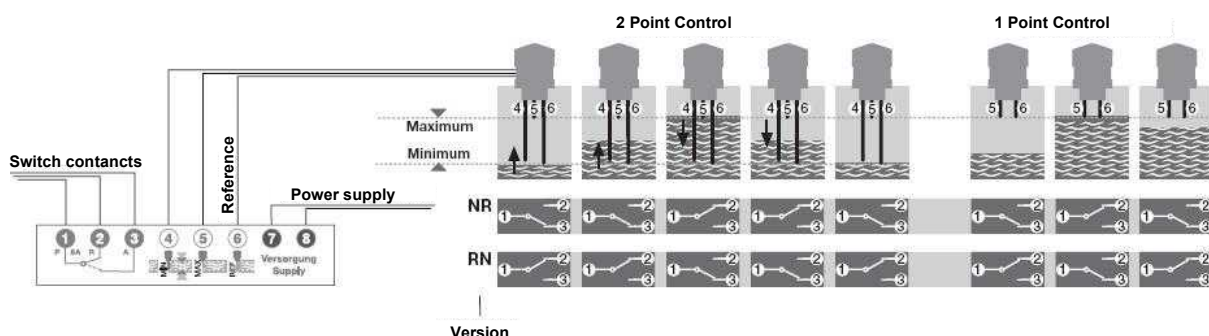
Dimensions:	L 75 x W 55 x H 110mm
Housing:	DIN standard housing quick mounting for standard rail DIN EN 50022
Output:	1 changeover contact (SPDT), closed circuit current principle
Switching voltage:	max. 250V AC
Switching current:	6A
Power On time:	100 %
Probe voltage:	12V AC

Protection class:	Housing IP40 / Terminal IP20 touch-proof terminals, captive, self-lifting terminal screws
Supply voltage:	230V AC, 24V DC
on request:	24V AC
Supply frequency:	50-60 Hz
Tolerance:	-15% to +10%
Power consumption:	max. 3,1 VA Version 24V DC: 0,7 VA
Ambient temperature:	-20°C up to +60°C

Measuring Range

Position DIP-Switch 2	Resistivity Range (Ω)	Conductance (μS) max.	Probe Current (μA)	Cable Length (m) max.
Up (10k)	-330 k	3	<36	100
Up (10k)	-150 k	7	<80	200
Up (10k)	-70 k	14	<170	500
Down (100k)	-1,8 M	0,55	<7	100

Functional and wiring diagram



Level relay with 16A changeover contact

- Configurable function, optional dry run protection or overflow protection (emptying or filling)
- Suitable for all conductive level probes and level electrodes
- Adjustable sensitivity 5kΩ to 150kΩ
- Switching delay adjustable, 0.5s or 7s
- Electrode voltage 4V AC with max. 0.2mA
- For mounting rail DIN EN 60715 (TH35)
- With changeover contact 16A to 250V ohmic load
- LED status display

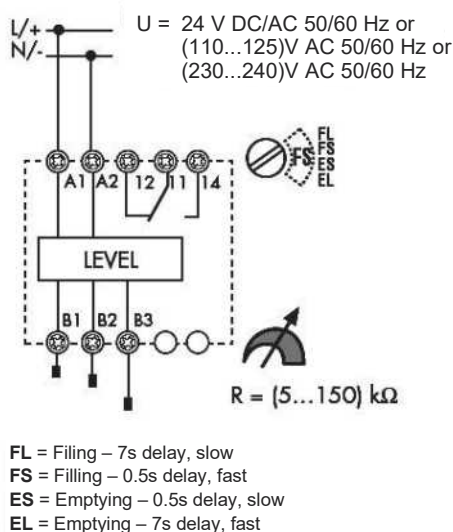
optionally available

- for supply voltage 230V AC
- or
- for supply voltage 24V DC

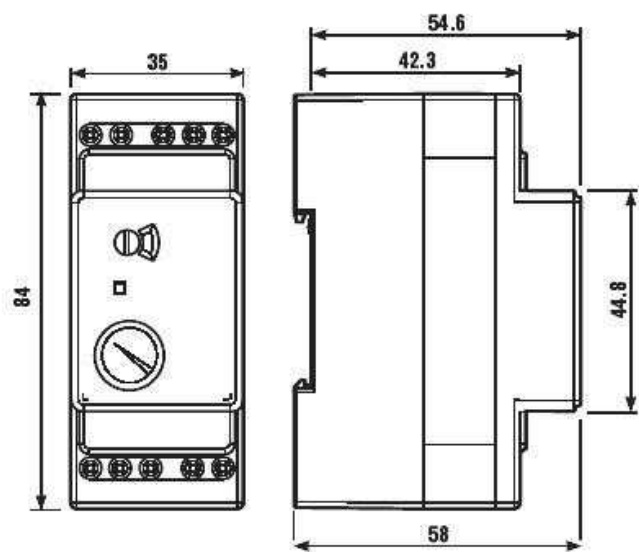


Unit price **NR1**: 1185 kr.

Circuit diagram:



Dimensions:



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
General conditions for the supply of products and services of the electrical industry.



MaWo Connector IP68 3-pole

TYPE MAWO / 3-POLE

The "MaWo Connector IP68" allows fast connection of two pieces of 2-core or 3-core cables, which can also have different diameters. This is achieved by a lamella construction, which adapts the seals to the cable and simultaneously represents a secure strain relief and sealing. The two halves of the housing are also easily and safely closed with a union nut including an O-ring and integrated **child safety lock**.

Due to the high **degree of protection IP 68**, it is particularly suitable for outdoor use, as well as for universal connection and repair work of defective cables and cables with an outer diameter of 6 to 13 mm (up to H05VV-F 3G2,5 mm²).



The connector consists of:

- 2 Housing halves with lamella construction
- 1 Union nut
- 2 Cap nuts
- 1 Connection terminal 3-pole
- 2 Seal inserts for lamella construction
- 1 O-ring for housing sealing

Polyamide (PA 6) blue (UL 94 – V0)
 Polyamide (PA 6) blue (UL 94 – V0)
 Polyamide (PA 6) black (UL94 – V0)
 Polyamide (PA 6.6) white (UL 94 – V2)
 Elastomers
 Elastomers

Technical specifications:

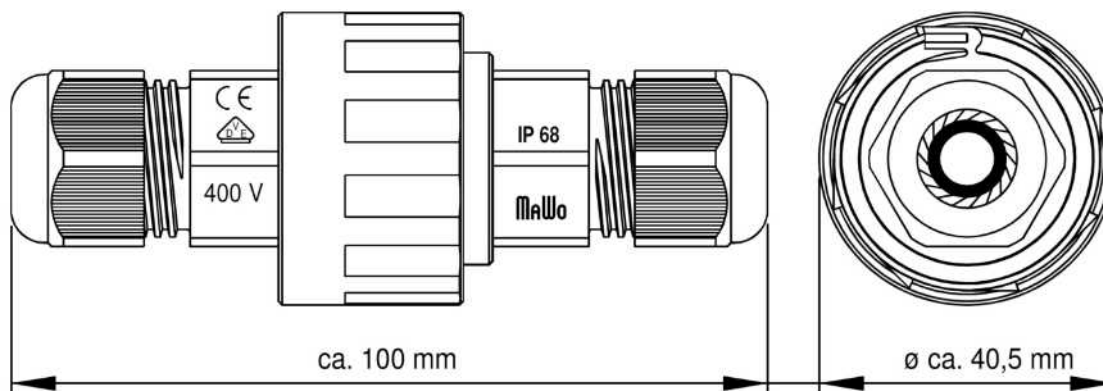
Nominal cross section:	2,5 mm ²
Nominal voltage:	400 V
Number of poles connecting clamp:	3 – pole
Clamping range cable diameter:	6 – 13 mm (up to H05VV-F 3G2,5 mm ²)
Temperature range:	-20°C to 80°C (connection clamp up to 100°C)
Protection class:	IP 68 – 5 bar
Wrench-wide cable clamp:	SW 24

Approvals / test marks:



Unit price Type MaWo / 3-pole: 158 kr.

Dimensions:



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
 General conditions for the supply of products and services of the electrical industry.

MaWo Connector IP68 5-pole

TYPE MAWO / 5-POLE

The "**MaWo Connector IP68**" allows fast connection of two pieces of 5-core cables, which can also have different diameters. This is achieved by a lamella construction, which adapts the seals to the cable and simultaneously represents a secure strain relief and sealing. The two halves of the housing are also easily and safely closed with a union nut including an O-ring and integrated **child safety lock**.

Due to the high **degree of protection IP 68**, it is particularly suitable for outdoor use, as well as for universal connection and repair work of defective cables and cables with an outer diameter of 6 to 13 mm (up to H05VV-F 5G1,5 mm²).



The connector consists of:

- 2 Housing halves with lamella construction
- 1 Union nut
- 2 Cap nuts
- 1 connection terminal 5-pole
- 2 Seal inserts for lamella construction
- 1 O-ring for housing sealing

Polyamide (PA 6) blue (UL 94 – V0)
 Polyamide (PA 6) blue (UL 94 – V0)
 Polyamide (PA 6) black (UL94 – V0)
 Polyamide (PA 6.6) white (UL 94 – V2)
 Elastomers
 Elastomers

Technical specifications:

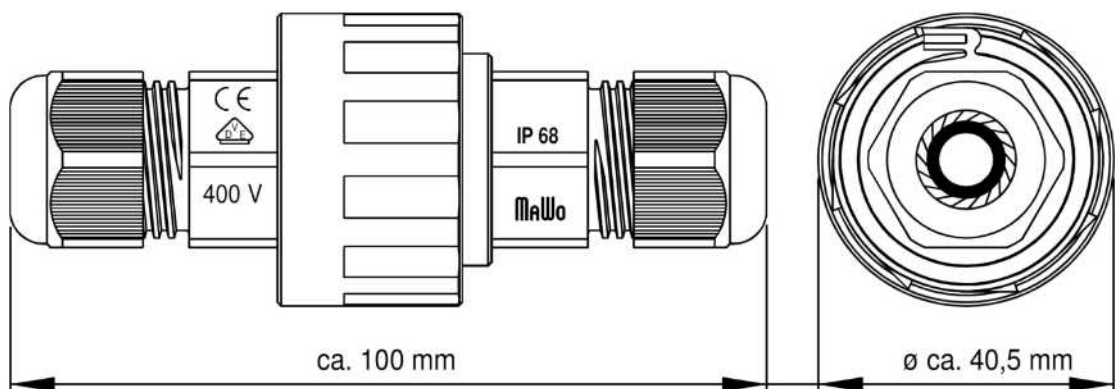
Nominal cross section:	2,5 mm ²
Nominal voltage:	400 V
Number of poles connecting clamp:	5 – pole
Clamping range cable diameter::	6 – 13 mm (up to H05VV-F 5G1,5 mm ²)
Temperature range:	-20°C to 80°C
Protection class:	IP 68 – 5 bar
Wrench-wide cable clamp:	SW 24

Approvals / test marks:



Unit price Type MaWo / 5-pole: 222 kr.

Dimensions:



The prices are valid ex our works, packing, freight insurance, any taxes or custom duties not included.
 General conditions for the supply of products and services of the electrical industry.



Dear Sirs and Madames,

We are pleased to calculate the power requirements of your galvanic bath *free of charge*.

For this we need the following information:

Bath- internal dimensions: Length mm = alternatively round container
 Width mm = Diameter mm =
 Hight mm = Hight mm =

Hight of liquid level: normal mm =
 minimal mm =

Target- Time to heat up: h =

Bath- starting temperature °C =

Simply omit the fields that you can not specify.

Bath- operating temperature °C =

Type of liquid =

Density kg/l =

Boiling point °C =

Material of throughput =

Starting temperature °C =

throughput kg/h =

Exhauster on the bath m/s = none / 0,5 / 1,0 / 2,0

Air movement in the room = none / light / medium / stronly / extreme

Room temperature °C =

Bath surface not, partially or completely covered:

Also, we can consider a bath cleaning, bath circulation, process heat or bath installations and re-pumping tanks if you give us appropriate information.

Container construction:

Side walls: Wall thickness mm = Bottom:Wall thickness mm =

Material =

Material =

Insulation: Insulating material: insulation thickness mm =

For multi-layer containers, we ask you to continue the list of wall thickness / material from inside to outside.

Company details: Company

Address

Contact Person

Tel.-No. Fax-No.

E-Mail



Please fill out this form and fax or email us.

Rules of thumb and guiding principles

1. In acidic baths, glass, quartz and porcelain tubes as coats are usually resistant.
In hydrofluoric acid only PTFE tubes/sheaths are resistant.
2. In alkaline baths Steel, Stainless steel and Titanium tubes/sheaths are usually resistant.
3. PTFE- immersion heaters are mostly resistant, but sensitive to drying and impact or high temperatures.
4. In the case of short-term drying
Glass-, Porcelain- and PTFE- immersion heaters will be damaged,
Steel-, Stainless steel-, Titanium- and Quartz- immersion heaters will not be damaged.
5. Impact- and shock-sensitive
are Glass-, Quartz-, Porcelain- and PTFE- immersion heaters,
but not Steel-, Stainless steel- and Titanium immersion heaters.
6. Metal coats live from oxide. Small additions (eg, glazing agents, pickling degreasers and unwanted impurities) often reduce the formation of the oxide and lead to failure of the metal sheath, although according to list the metal sheath should be resistant.
7. Hydrochloric acid and sulfuric acid corrode stainless steel sheaths as well as titanium sheaths.
8. In electrolytic nickel baths, copper sulfate baths and baths for the production of gravure- and textile printing cylinders immersion heaters with titanium sheath are particularly suitable.

Key to the resistance list

- not resistant
- (+) conditionally resistant The information is given without guarantee
- + resistant and excludes any liability.

 Direct current on metal jacket can be prevented by a capacitor in the earth wire.

3 mm for steel, 3 mm wall recommended. With thick mantle coating can be removed with coarse tool

anodisch Connection of the metal sheath with the anode increases the resistance and prevents precipitation.

Beständigkeitsliste	Resistance list	Stahl Steel	Glas/ Quarz Glass/ Quartz	Porzellan Porcelain	Edelstahl Stainless Steel	Titan Titanium	PTFE	Incoloy
Abkochentfettung (P3)	Hot degreasing (P3)	+	+	+	+	+	(+)	+
Ameisensäure	Formic acid	-	+	+	-	-	+	+
Ätznatron siehe Entfettungsbad	Caustic soda see degreasing bath							
Ätzbad (Leiterplatten)	Etching bath (printed circuit boards)							
a) Eisen-III-Chlorid-Basis	a) iron-III-chloride base	-	+	+	-	+	+	-
b) Ammoniumchlorid-Basis	b) ammonium chloride base	-	+	+	-	-	+	-
Beizbad	Pickling bath							
a) sauer	a) sour	-	+	+	-	-	+	-
b) fluorhaltig	b) containing fluorine	-	-	-	-	-	+	-
Beizentfetter, Schwefelsäure-Basis	Pickling-degreaser, sulfuric acid base	-	+	+	-	-	+	-
Benzoessäurebad	Benzoic acid bath	-	+	+	+	+	+	+
Bleichlösung, sauer, natriumchloridhaltig	Bleach solution, acidic, containing sodium chloride	-	+	+	-	+	+	-
Bonderbad, Phosphorsäure + Chromsäure	Bonderbath (Bonderizing), phosphoric acid + chromic acid	+	+	+	(+)	+	-	+
Eisen-Zinkphosphat (ohne Flußsäure)	Iron-zinc phosphate (without hydrofluoric acid)	3 mm						
Boraxbad	Boraxbath	-	(+)	(+)	+	-	+	+
Bronzebad, stromlos, sauer	Bronze bath, electroless, acidic	-	-	+	(+)	-	+	-
Brünierbad	Burnishing bath	+	-	-	+	-	(+)	+
natronlaugehaltig	containing sodium hydroxide solution	3 mm						
Cadmiumbad	Cadmium bath							
siehe Kadmiumbad	see „Kadmiumbad“							
Chrombad, elektrolytisch	Chrome bath, electrolytic							
a) sauer	a) sour	-	(+)	+	-	+	+	-
b) fluorhaltig	b) containing fluorine	-	-	-	-	-	+	-
Chromatierbad (chemische Oxidation von Aluminium)	Chromatizing bath (chemical oxidation of aluminum)							
a) sauer	a) sour	-	+	+	-	-	+	-
b) fluorhaltig	b) containing fluorine	-	-	-	-	-	+	-
c) basisch	c) basic	-	-	-	+	-	+	+
Dekapierbad, Schwefelsäure und Salzsäure im Gemisch	Pickling bath, sulfuric acid and hydrochloric acid in a mixture							
a) ohne Flußsäure	a) without hydrofluoric acid	-	+	+	-	-	+	-
b) mit Flußsäure	b) with hydrofluoric acid	-	-	-	-	-	+	-
jedoch ohne Beizentfetter	but without pickling-degreaser	-	-	-	-	-	+	-
Eisenbad, elektrolytisch	Iron bath, electrolytic							
a) sauer	a) sour	-	+	+	-	+	+	-
b) fluorhaltig	b) containing fluorine	-	(+)	(+)	-	-	+	-
Eisen-III-Chloridbäder	Iron-III-chloride bath (Ferric chloride baths)	-	+	+	-	+	+	-
Eisen-II-Chloridbäder	Iron-II-chloride bath (Ferric chloride baths)	-	+	+	-	+	+	-
Eloxalbad	Anodising bath							
a) Schwefelsäure, Oxalsäure und Chromsäure im Gemisch	a) sulfuric acid, oxalic acid and chromic acid in a mixture	-	+	+	-	-	+	-
b) phosphorsäurehaltig	b) containing phosphoric acid	-	(+)	(+)	-	-	+	-
c) salpetersäurehaltig	c) containing nitric acid	-	(+)	(+)	-	-	+	-
Entfettungsbad, elektrolytisch, auf Ätznatron- und Sodabasis	Degreasing bath, electrolytic, based on caustic soda and soda							
a) kathodisch	a) cathodic	+	(+)	(+)	+	+	+	+
b) anodisch	b) anodic	+	(+)	(+)	-	-	+	+
Entwickler, photographische Entwicklung	Developer, photographic development	-	+	+	(+)	(+)	+	+
Essigsäurebad	Acetic acid bath	-	+	+	+	+	+	+
Fettbad	Fat bath	+	-	-	+	-	-	+
Flußsäure	Hydrofluoric acid	3 mm	-	-	-	-	+	-
Fluxbad, ohne Fluor (Ammoniumchlorid mit Zinklauge)	Flux bath, without fluorine (ammonium chloride with zinc leach	-	+	+	-	(+)	+	-
mit Fluor	with fluorine	-	-	-	-	-	+	-
Gelbchromatieren ohne Fluor (Aluminium)	Yellow chromating without fluorine (aluminum)	-	+	+	+	-	+	+
mit Fluor	with fluorine	-	-	-	-	-	+	-
Gelb- und Glanzbrennen	Yellow and shiny burn							
Gemisch von Schwefelsäure, Salzsäure und Salpetersäure	Mixture of sulfuric acid, hydrochloric acid and nitric acid	-	+	+	-	-	+	-

Resistance list

Beständigkeitsliste	Resistance list	Stahl Steel	Glas/ Quarz Glass/ Quartz	Porzellan Porcelain	Edelstahl Stainless Steel	Titan Titanium	PTFE	Incoloy
Gelbsäurebad	Yellow acid bath	-	-	-	+	+	-	+
Glänzbath, chemisches	Brightening bath, chemical							
a) Phosphorsäure und Salpetersäure im Gemisch	a) phosphoric acid and nitric acid in a mixture	-	(+)	+	(+)	-	+	+
b) wie oben + Schwefelsäure	b) as above + sulfuric acid	-	(+)	+	(+)	-	+	(+)
Goldbad, elektrolytisch	Gold bath, electrolytic							
a) sauer	a) sour	-	+	+	-	(+)	+	-
b) cyanidisch	b) cyanidic	-	(+)	(+)	+	+	+	+
Heißspülbecken	Hot rinsing bath	-	+	+	+	+	-	+
Härteöl ~ siehe Fettbad	Hardening oil ~ see fat bath							
Indiumbad, elektrolytisch	Indium bath, electrolytic							
a) sauer	a) sour	-	+	+	-	-	+	-
b) cyanidisch	b) cyanidic	-	(+)	(+)	+	+	+	+
c) fluorhaltig	c) containing fluorine	-	-	-	-	-	+	-
Kadmiumbad, elektrolytisch	Cadmium bath, electrolytic							
a) sauer	a) sour	-	+	+	-	-	+	+
b) cyanidisch	b) cyanidic	-	(+)	(+)	+	+	+	+
c) fluorhaltig	c) containing fluorine	-	-	-	-	-	+	-
Kalilaugenbad	Potassium hydroxide bath	(+)	-	-	(+)	+	-	(+)
Kaliumpermanganat	Potassium permanganate	-	+	+	+	+	+	+
Kalkmilch (Kaliumhydroxid mit Wasser)	Lime milk (Potassium hydroxide with water)	+	-	-	-	+	+	-
Kochsalzlösung, natriumchloridhaltig	Saline, containing sodium chloride	-	+	+	-	+	+	(+)
Königswasser, Gemisch von Salzsäure und Salpetersäure	Aqua regia, mixture of hydrochloric acid and nitric acid	-	+	+	-	-	+	-
Kupferbad, elektrolytisch	Copper bath, electrolytic							
a) sauer	a) sour	-	+	+	-	+	+	+
b) cyanidisch	b) cyanidic	+ 3 mm	-	-	+	+	+	+
c) fluorhaltig	c) containing fluorine	-	-	-	-	-	+	-
Kupferbad, stromlos sauer	Copper bath, electroless sour	-	+	+	-	+	+	-
Kupfersulfat	Copper sulphate	-	+	+	-	+	+	+
Laugen	Alkalis							
a) pH-Wert < 11	a) pH < 11	+	-	-	+	+	-	+
b) pH-Wert > 11	b) pH > 11	(+)	-	-	+	+	-	+
Lötwasserbad, salzsäurehaltig	Soldering water bath, containing hydrochloric acid	-	+	+	-	-	+	-
Messingbad, stromlos chemisch	Brass bath, electroless chemical							
a) sauer	a) sour	-	+	+	-	(+)	+	-
b) cyanidisch	b) cyanidic	-	(+)	(+)	+	(+)	+	+
Methansulfonsäure	Methanesulfonic acid	-	+	+	+	+	+	+
Milchsäure	Lactic acid	-	+	+	+	+	+	+
Natriumsulfat	Sodium sulphate	-	(+)	(+)	+	-	+	+
Natronlauge	Caustic soda	+	-	-	+	+	+	+
Nickel-Depassivierungsbad	Nickel depassivation bath	-	+	+	-	-	+	-
Gemisch von Natriumhydrogensulfat, Natriumchlorid und Eisensulfat	Mixture of sodium hydrogen sulfate, sodium chloride and iron sulfate							
Nickelbad, elektrolytisch	Nickel bath, electrolytic					 oder anodisch or anodic		
a) chlorid- und sulfathaltig	a) containing chloride and sulphate	-	+	+	-	+	+	-
b) fluorhaltig	b) containing fluorine	-	-	-	-	-	+	-
Nickelbad, stromlos chemisch	Nickel bath, electroless chemical							
a) sauer	a) sour	-	(+)	+	-	+ anodisch anodic	+	+ anodisch anodic
b) alkalisch	b) alkaline	-	-	-	-	(+)	+	-
Ölbath: siehe Fettbad	Oil bath: see fat bath							
Oxalsäure	Oxalic acid	-	+	+	-	-	+	-
Paraffinbad	Paraffin bath	+	-	-	+	-	-	+
P3-Laugenbad	P3-alkaline bath	(+) Rost rust	-	-	(+)	-	-	+
Perchloräthylenbad	Perchloroethylene bath							
Leistung kleiner als 1,5 W/cm² meist indirekt über Heizpatrone	Power less than 1,5 W/cm² mostly indirectly via heating cartridge	-	-	-	(+)	-	-	+

Beständigkeitsliste	Resistance list	Stahl Steel	Glas/ Quarz Glass/ Quartz	Porzellan Porcelain	Edelstahl Stainless Steel	Titan Titanium	PTFE	Incoloy
Phenolsulfonsäurebad	Phenolsulfonic acid bath	-	+	+	+	(+)	+	+
Phosphatierbad, Eisen- und Zinkphosphat siehe Bonderbad	Phosphating bath, iron and zinc phosphate see Bonderbath (Bonderizing)							
Phosphorsäurebad a) Konzentration < 60%	Phosphoric acid bath a) concentration < 60%	-	-	+	+	(+)	+	+ bis / up to 85°C
b) Konzentration > 60%	b) concentration > 60%	-	-	+	-	-	+	+ bis / up to 85°C
Photobäder siehe Entwickler, photographisch	Photo baths see developer, photographic							
Platinbad, elektrolytisch sauer	Platinum bath, electrolytic acid	-	+	+	-	-	+	+
Rhodiumbad, elektrolytisch a) Schwefelsäure-Basis	Rhodium bath, electrolytic a) Sulfuric acid base	-	+	+	-	+	+	+
Salpetersäure a) Konzentration < 50%	Nitric acid a) concentration < 50%	-	+	+	+	+	+	+
b) Konzentration > 50%	b) concentration > 50%	-	+	+	-	-	+	+
Schwefelsäure a) Konzentration < 3%	Sulfuric acid a) concentration < 3%	-	+	+	-	-	+	-
b) rauchend (Oleum)	b) fuming (oleum)	-	+	+	-	-	+	-
Salzsäure	Hydrochloric acid	-	+	+	-	-	+	-
Schwarzfärbebad, Salpetersäure mit Eisenchlorid	Black dye bath, nitric acid with ferric chloride	-	+	+	-	-	+	-
Sealingbad = entsalztes Wasser	Sealing bath = desalinated water	-	+	+	(+) Fremdrost extraneous rust	-	+	+
Seewasser	Seawater	-	+	+	-	+	+	(+)
Silberbad, elektrolytisch cyanidisch	Silver bath, electrolytic cyanide	-	(+)	(+)	+	+	+	+
Spülwasser a) alkalisch	Dishwater a) alkaline	(+)	(+)	(+)	+	+	+	+
b) sauer	b) sour	-	+	+	-	-	+	-
c) flußsäurehaltig	c) containing hydrofluoric acid	-	(+)	(+)	-	-	+	-
Trichloräthylenbad Leistung < 1,5 W/m² meist indirekt beheizt	Trichlorethylene bath Power < 1,5 W/m² usually heated indirectly	+	-	-	(+)	+	-	+
Wasserbad	Water bath	Rost/rust						
a) Leitungswasser	a) tap water	(+)	+	+	+	+	-	+
b) Seewasser	b) seawater	-	+	+	-	+	+	-
c) destilliert	c) distilled	-	+	+	(+)	+	+	+
d) entionisiert	d) deionized	-	+	+	(+)	+	+	+
e) entsalzt	e) desalinated	-	+	+	(+)	(+)	+	+
Wasserstoffperoxid	Hydrogen peroxide	-	+	+	+	+	+	+
Weinsteinsäurebad = Weinsäure	Tartaric acid bath = tartaric acid	-	+	+	+	+	+	+
Zinkbad, elektrolytisch a) sauer	Zinc bath, electrolytic a) sour	-	+	+	-	+	+	-
b) cyanidisch	b) cyanidic	-	(+)	(+)	+	+	+	+
c) fluorhaltig	c) containing fluorine	-	-	-	-	-	+	-
d) basisch	d) basic	+	(+)	(+)	+	+	+	+
Zinnbad, elektrolytisch a) Schwefelsäure-Basis	Tin bath, electrolytic a) Sulfuric acid base	-	+	+	-	+	+	-
b) cyanidisch	b) cyanidic	+	(+)	(+)	+	+	+	+
c) flußsäurehaltig	c) containing hydrofluoric acid	-	-	-	-	-	+	-
Zinnbad, stromlos, sauer	Tin bath, electroless, acidic	-	+	+	-	-	+	-
Zitronensäurebad	Citric acid bath	-	+	+	+	(+)	+	+

Resistance list, please see the German translation in → → →

Acetic acid bath
Alkalis
a) pH < 11
b) pH > 11
Anodising bath
a) sulfuric acid, oxalic acid and chromic acid in a mixture
b) containing phosphoric acid
c) containing nitric acid
Aqua regia, mixture of hydrochloric acid and nitric acid
Benzoic acid bath
Black dye bath, nitric acid with ferric chloride
Bleach solution, acidic, containing sodium chloride
Bonderbath (Bonderizing), phosphoric acid + chromic acid
Iron-zinc phosphate (without hydrofluoric acid)
Boraxbath
Brass bath, electroless chemical
a) sour
b) cyanidic
Brightening bath, chemical
a) phosphoric acid and nitric acid in a mixture
b) as above + sulfuric acid
Bronze bath, electroless, acidic
Burnishing bath
Containing sodium hydroxide solution
Cadmium bath
See „Kadmiumbad“
Cadmium bath, electrolytic
a) sour
b) cyanidic
c) containing fluorine
Caustic soda
Caustic soda see „Entfettungsbad“ degreasing bath
Chromatizing bath (chemical oxidation of aluminum)
a) sour
b) containing fluorine
c) basic
Chrome bath, electrolytic
a) sour
b) containing fluorine
Citric acid bath
Copper bath, electroless sour
Copper bath, electrolytic
a) sour
b) cyanidic
c) containing fluorine
Copper sulphate
Degreasing bath, electrolytic, based on caustic soda and soda
a) cathodic
b) anodic
Developer, photographic development
Dishwater
a) alkaline
b) sour
c) containing hydrofluoric acid
Etching bath (printed circuit boards)
a) iron-III-chloride base
b) ammonium chloride base
Fat bath
Formic acid
Flux bath, without fluorine (ammonium chloride with zinc leach)
With fluorine
Gold bath, electrolytic
a) sour
b) cyanidic
Hardening oil ~ see „Fettbad“ fat bath
Hot degreasing (P3)
Hot rinsing bath
Hydrochloric acid
Hydrogen peroxide
Hydrofluoric acid
Indium bath, electrolytic
a) sour
b) cyanidic
c) containing fluorine
Iron bath, electrolytic
a) sour
b) containing fluorine
Iron-III-chloride bath (Ferric chloride baths)
Iron-II-chloride bath (Ferric chloride baths)

„Beständigkeitsliste“

Essigsäurebad
Laugen
a) pH-Wert < 11
b) pH-Wert > 11
Eloxalbad
a) Schwefelsäure, Oxalsäure und Chromsäure im Gemisch
b) phosphorsäurehaltig
c) salpetersäurehaltig
Königswasser, Gemisch von Salzsäure und Salpetersäure
Benzoessäurebad
Schwarzfärbepbad, Salpetersäure mit Eisenchlorid
Bleichlösung, sauer, natriumchloridhaltig
Bonderbad, Phosphorsäure + Chromsäure
Eisen-Zinkphosphat (ohne Flußsäure)
Boraxbad
Messingbad, stromlos chemisch
a) sauer
b) cyanidisch
Glänzbath, chemisches
a) Phosphorsäure und Salpetersäure im Gemisch
b) wie oben + Schwefelsäure
Bronzebad, stromlos, sauer
Brünierbad
Natronlaugehaltig
Cadmiumbad
Siehe Kadmiumbad
Kadmiumbad, elektrolytisch
a) sauer
b) cyanidisch
c) fluorhaltig
Natronlauge
Ätznatron siehe Entfettungsbad
Chromatierbad (chemische Oxidation von Aluminium)
a) sauer
b) fluorhaltig
c) basisch
Chrombad, elektrolytisch
a) sauer
b) fluorhaltig
Zitronensäurebad
Kupferbad, stromlos sauer
Kupferbad, elektrolytisch
a) sauer
b) cyanidisch
c) fluorhaltig
Kupfersulfat
Entfettungsbad, elektrolytisch, auf Ätznatron- und Sodabasis
a) kathodisch
b) anodisch
Entwickler, photographische Entwicklung
Spülwasser
a) alkalisch
b) sauer
c) flußsäurehaltig
Ätzbath (Leiterplatten)
a) Eisen-III-Chlorid-Basis
b) Ammoniumchlorid-Basis
Fettbad
Ameisensäure
Fluxbad, ohne Fluor (Ammoniumchlorid mit Zinklauge)
Mit Fluor
Goldbad, elektrolytisch
a) sauer
b) cyanidisch
Härteöl ~ siehe Fettbad
Abkochtentfettung (P3)
Heißspülbecken
Salzsäure
Wasserstoffperoxid
Flußsäure
Indiumbad, elektrolytisch
a) sauer
b) cyanidisch
c) fluorhaltig
Eisenbad, elektrolytisch
a) sauer
b) fluorhaltig
Eisen-III-Chloridbäder
Eisen-II-Chloridbäder

Resistance list, please see the German translation in → → → →

Lactic acid
Lime milk (Potassium hydroxide with water)
Methanesulfonic acid
Nickel bath, electrolytic
a) containing chloride and sulphate
b) containing fluorine
Nickel bath, electroless chemical
a) sour
b) alkaline
Nickel depassivation bath
Mixture of sodium hydrogen sulfate, sodium chloride and iron sulfate
Nitric acid
a) concentration < 50%
b) concentration > 50%
Oil bath: see „Fettbad“ fat bath
Oxalic acid
P3-alkaline bath
Paraffin bath
Perchlorethylene bath
Power less than 1.5 W/cm²
Mostly indirectly via heating cartridge
Phenolsulfonic acid bath
Phosphating bath, iron and zinc phosphate
See „Bonderbad“ (Bonderizing)
Phosphoric acid bath
a) concentration < 60%
b) concentration > 60%
Photo baths
See „Entwickler, photographisch“ developer, photographic
Pickling bath
a) sour
b) containing fluorine
Pickling bath, sulfuric acid and hydrochloric acid in a mixture
a) without hydrofluoric acid
b) with hydrofluoric acid
But without pickling-degreaser
Pickling-degreaser, sulfuric acid base
Platinum bath, electrolytic acid
Potassium hydroxide bath
Potassium permanganate
Rhodium bath, electrolytic
a) Sulfuric acid base
Saline, containing sodium chloride
Sealing bath = desalinated water
Seawater
Silver bath, electrolytic cyanide
Sodium sulphate
Soldering water bath, containing hydrochloric acid
Sulfuric acid
a) concentration < 3%
b) fuming (oleum)
Tartaric acid bath = tartaric acid
Tin bath, electroless, acidic
Tin bath, electrolytic
a) Sulfuric acid base
b) cyanidic
c) containing hydrofluoric acid
Trichlorethylene bath
Power < 1,5 W / m²
Usually heated indirectly
Water bath
a) tap water
b) seawater
c) distilled
d) deionized
e) desalinated
Yellow acid bath
Yellow and shiny burn
Mixture of sulfuric acid, hydrochloric acid and nitric acid
Yellow chromating without fluorine (aluminum)
With fluorine
Zinc bath, electrolytic
a) sour
b) cyanidic
c) containing fluorine
d) basic

„Beständigkeitsliste“

Milchsäure
Kalkmilch (Kaliumhydroxid mit Wasser)
Methansulfonsäure
Nickelbad, elektrolytisch
a) chlorid- und sulfathaltig
b) fluorhaltig
Nickelbad, stromlos chemisch
a) sauer
b) alkalisch
Nickel-Depassivierungsbad
Gemisch von Natriumhydrogensulfat, Natriumchlorid und Eisensulfat
Salpetersäure
a) Konzentration < 50%
b) Konzentration > 50%
Ölbad: siehe Fettbad
Oxalsäure
P3-Laugenbad
Paraffinbad
Perchloräthylenbad
Leistung kleiner als 1,5 W/cm²
Meist indirekt über Heizpatrone
Phenolsulfonsäurebad
Phosphatierbad, Eisen- und Zinkphosphat
Siehe Bonderbad
Phosphorsäurebad
a) Konzentration < 60%
b) Konzentration > 60%
Photobäder
Siehe Entwickler, photographisch
Beizbad
a) sauer
b) fluorhaltig
Dekapierbad, Schwefelsäure und Salzsäure im Gemisch
a) ohne Flußsäure
b) mit Flußsäure
Jedoch ohne Beizentfetter
Beizentfetter, Schwefelsäure-Basis
Platinbad, elektrolytisch sauer
Kalilaugenbad
Kaliumpermanganat
Rhodiumbad, elektrolytisch
a) Schwefelsäure-Basis
Kochsalzlösung, natriumchloridhaltig
Sealingbad = entsalztes Wasser
Seewasser
Silberbad, elektrolytisch cyanidisch
Natriumsulfat
Lötwasserbad, salzsäurehaltig
Schwefelsäure
a) Konzentration < 3%
b) rauchend (Oleum)
Weinsteinsäurebad = Weinsäure
Zinnbad, stromlos, sauer
Zinnbad, elektrolytisch
a) Schwefelsäure-Basis
b) cyanidisch
c) flußsäurehaltig
Trichloräthylenbad
Leistung < 1,5 W/m²
Meist indirekt beheizt
Wasserbad
a) Leitungswasser
b) Seewasser
c) destilliert
d) entionisiert
e) entsalzt
Gelbsäurebad
Gelb- und Glanzbrennen
Gemisch von Schwefelsäure, Salzsäure und Salpetersäure
Gelbchromatieren ohne Fluor (Aluminium)
Mit Fluor
Zinkbad, elektrolytisch
a) sauer
b) cyanidisch
c) fluorhaltig
d) basisch