



多参数电极 Electrodes

pH mV $\mu\text{S}/\text{cm}$ mS/cm O_2 Cl_2 ISE NTU

pH和氧化还原复合电极使用说明

贮存¹

pH 和氧化还原组合电极存储在该介质中，该介质填充在传感器的参考系统中。它是 3 mol/l 或饱和的 KCl 溶液，它在浇水帽中。pH 和氧化还原复合电极不得存放在去离子水中。

校准¹

1. 用去离子水冲洗传感器。
2. 将传感器浸入隔膜完全润湿的缓冲溶液中。
3. 确保传感器和缓冲液采用相同的温度值。
4. 在更换到下一个缓冲液之前，用去离子水冲洗传感器。处理用过的缓冲溶液。

注意传感器和测量仪器的说明书。

清洗¹

用水清洁传感器的隔膜、玻璃膜或铂金盘，并用纸巾擦干。

油性和有机污染物：用乙醇冲洗传感器。

蛋白质污染：将传感器浸入胃蛋白酶清洁溶液中，使隔膜完全润湿。

清洁后，用去离子水冲洗传感器并将其放入储存液中。

在下次测量之前必须进行校准。

建议¹

斜率减小且响应时间较慢的 pH 复合电极可以用特殊溶液进行修复。传感器的玻璃膜最多浸入修复溶液中 2 分钟。隔膜绝对不能被弄湿。然后用去离子水冲洗传感器并在其储存溶液中保存 1 小时。在下次测量之前必须进行校准。

¹ 存储、缓冲、清洁和修复溶液的订购代码打印在第 33 页。

参比电极和 pH 组合电极的订购信息

参比电极

有插头或带插头的固定电缆可用。 请根据以下内容设置您的选择：

SE/KE...	-	X	-	X000	-	X	-	X
								P = additional hex nut PG 13.5
								H = banana plug
								U = binder connector
								F = stripped ends
								K = standard cable length ¹ (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
								SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
								L = S7 coaxial lab plug head
								Marking of basic type

Example: SE20 with 3 m special cable length, banana plug and screwable thread PG 13.5 = **SE20-SK030-H-P**

不带温度传感器的 pH 复合电极

有插头或带插头的固定电缆可供选择。 请根据以下内容设置您的选择：

EG...	XXX	-	X	-	X000	-	X	-	X
									P = additional hex nut PG 13.5
									U = binder connector
									B = BNC-plug
									G = Cinch-plug
									D = German DIN-plug
									F = stripped ends
									K = standard cable length ¹ (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
									SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
									L = S7 coaxial lab plug head
									Continuation of the marking (e. g. 153)
									Marking of basic type (EGA/EGC)
									A = normal glass
									C = HT-glass (for strong alkaline mediums)

Example: EGA151 with 3 m special cable length and BNC plug = **EGA151-SK030-B**

带温度传感器的 pH 复合电极

有插头或带插头的固定电缆可用。 请根据以下内容设置您的选择：

EG...	XXX	-	X000	-	X	-	X	-	X
									X = with Pt 1000
									Y = with Pt 100
									Z30 = with NTC 30 kΩ
									P = additional hex nut PG 13.5
									U = binder connector
									BH = BNC-banana plug
									BG = BNC-Cinch plug
									BM = BNC-German MiniDIN plug
									DH = DIN-banana plug
									F = stripped ends
									K = standard cable length ¹ (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
									SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
									Continuation of the marking (e. g. 142)
									Marking of basic type (EGA / EGC)
									A = normal glass
									C = HT-glass (for strong alkaline mediums)

Example: EGAT173 with Pt 100, 12.50 m special cable length and stripped ends = **EGAT173-SK125-F-Y**

¹ 提供以下标准电缆长度：1 m、2 m、5 m、10 m 和 15 m

氧化还原复合电极、电导率电极、氧传感器的订购信息

氧化还原(ORP) 复合电极

有插头或带插头的固定电缆可用。 请根据以下内容设置您的选择：

MC/EM...	-	X	-	X000	-	X	-	X
----------	---	---	---	------	---	---	---	---

P = additional hex nut PG 13.5
U = binder connector
B = BNC-plug
G = Cinch-plug
D = German DIN-plug
F = stripped ends
K = standard cable length ¹ (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
L = S7 coaxial lab plug head
Marking of basic type

Example: EMC133 with 5 m standard cable length and German DIN plug = **EMC133-K050-D**

带温度传感器的电导率电极

有可用的插头或固定电缆。 请根据以下内容设置您的选择：

LTG/LTC...	-	X000	-	X	-	X
------------	---	------	---	---	---	---

P = additional hex nut PG 13.5
U = binder connector
F = stripped ends
K = standard cable length (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
Marking of basic type

Example: LTG1/23 with 12.50 m special cable length and stripped ends = **LTG1/23-SK125-F**

带温度传感器的氧气传感器

有插头或带插头的固定电缆可供选择。 请根据以下内容设置您的选择：

MF...	-	X000	-	X	-	X
-------	---	------	---	---	---	---

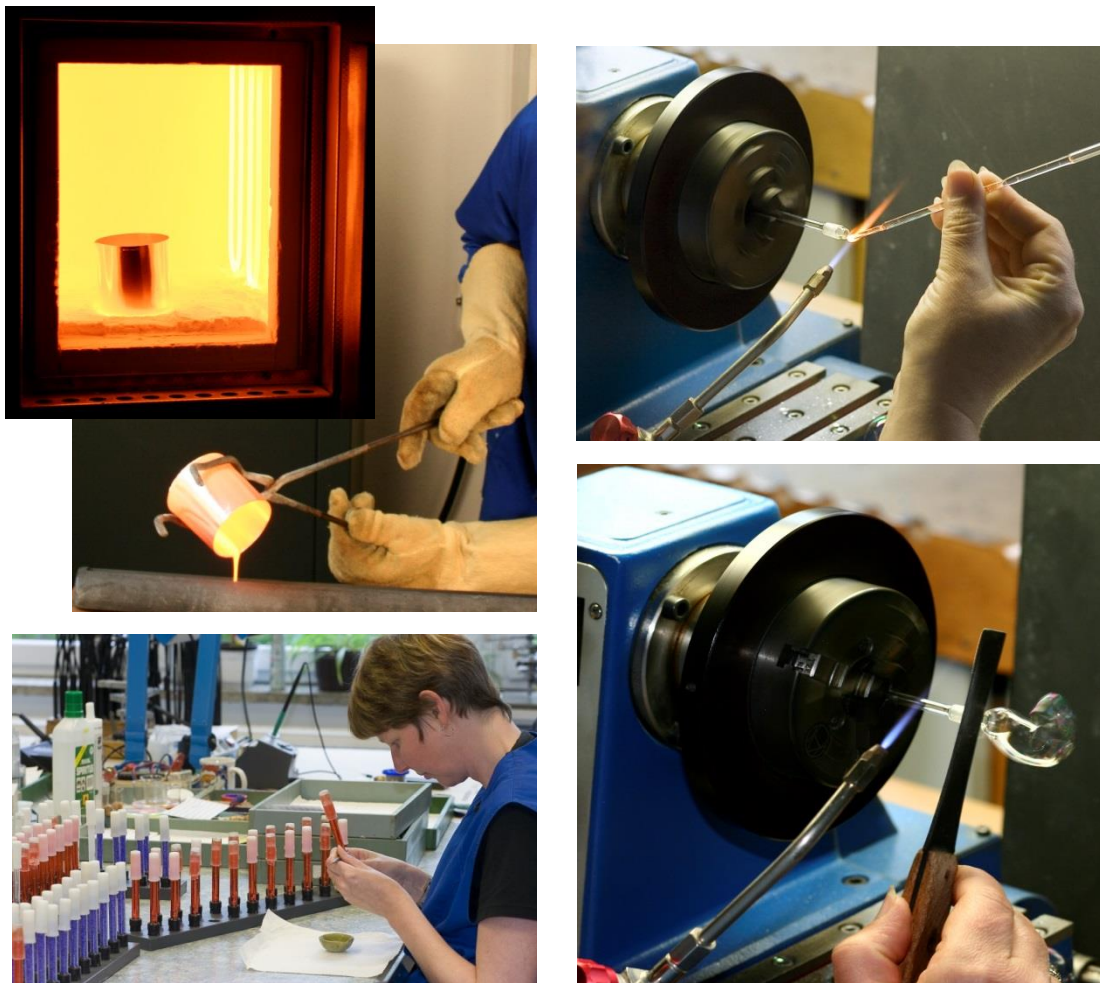
P = additional hex nut PG 13.5
U = binder connector
F = stripped ends
K = standard cable length ¹ (additional setting of wished standard cable length, e. g. K010 for 1 m or K100 for 10 m)
SK = special cable length (additional setting of wished special cable length, e. g. SK015 for 1.50 m or SK155 for 15.50 m)
Marking of basic type

Example: MF41N with 10 m standard cable length and multipin plug = **MF41N-K100-U**

¹ 提供以下标准电缆长度：1 m、2 m、5 m、10 m 和 15 m

用于实验室和过程的 Meinsberg 电极

- ⌚ 自 1945 年以来，电化学传感器在 Meinsberg（萨克森/德国）开发和制造
- ⌚ 由经验丰富的化学家、设计工程师、技术人员和吹玻璃工组成的创新团队实现了高可靠性、灵活性和质量。
- ⌚ 本目录介绍了我们用于测量 pH 值、氧化还原电位、电导率、溶解氧、氯和温度的标准传感器系列，适用于实验室和过程应用。
- ⌚ 在目录的第一部分，您可以找到单独配置的实验室测量传感器。这些实验室电极可提供插头或电缆连接。此外，可以选择电缆长度和电缆插头。不同传感器（参比电极、pH 和氧化还原组合电极、电导率电极和氧传感器）的订购关键在折叠书封面中说明。
- ⌚ 在目录的第二部分，您可以找到专为过程中的在线测量而设计的传感器。这些过程电极始终配备螺纹 PG 13.5 的插头连接器，以便轻松安装在浸入式或流通式外壳中。订购代码显示在传感器图片下方的“过程电极”一章中。



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1. 实验室和工艺应用的电极选择表 (pH, 氧化还原, 电导率, 氧, 氯)

	水族馆	水溶液	生物技术 (发酵罐)	化妆品	饮用水	饮料	电镀	现场测量	高 pH 体系	低离子介质
EGA121	•	•								
EGA131	•									
EGA133	•							•		
EGA142	•							•		
EGA150, EGAT150	•	•				•				
EGA151, EGAT151	•	•				•				
EGA153		•			•	•	•			
EGA161				•	•					•
EGA173, EGAT173					•	•	•			
EGA184										
EGA186										
EGA193, EGAT193					•	•	•			
EGA233							•			
EGA81										
EGC151									•	
EGC151I/S									•	
EGS150I			•						•	
EGS173, EGST173										
OGA 201										
EMC133	•							•		
EMC173		•			•	•	•			
EMC30										
EMC33		•				•	•			
LTC0,35/23								•		
LTC1/23	•					•		•		
LTG0,1/23					•					•
LTG1/23		•			•	•				
LVV0,1/23					•					•
MF39										
MF39T										
MF41N	•				•			•		
CL4					•					
CS4, CP4					•					

粗标记的pH电极配有温度探头。您可以在Pt 100, Pt 1000 或者 NTC 30 kΩ之间进行选择。

奶酪或肉类中的 渗透测量	土壤中的渗透测量	过程化学	海水	小体积样品	肥皂水	表面活性剂 (e. g. 造纸)	游泳池	废水 / 污水	水溶性漆	页码	
										实验室	过程在线
			•							10	
			•							10	
			•				•			10	21
			•							11	
			•		•		•			11, 12	21
		•	•		•			•			21
		•	•						•	12	22
•		•	•					•	•		22
			•	•						13	
		•	•	•				•	•	13	
			•					•			23
	•		•					•			23
			•							13	
		•	•							11	
		•	•								23
		•	•								24
		•	•					•	•		24
						•				12	
			•				•			14	25
			•		•		•	•			25
			•		•					14	
			•				•	•	•		25
		•	•		•			•		15	26
										15	
										16	26
					•		•			16	26
		•									27
								•			27
		•	•					•			27
			•							17	28
											29
							•				29

2. pH-和氧化还原复合电极的技术数据

下表中显示的所有组合电极都配备有 Ag/AgCl 参比电极。

pH复合电极

型号	电极杆材质	电极长度 (mm)	电极直径 (mm)	电极下端直径 (mm)	温度传感	隔膜形状	参比内电解液 (KCl溶液浓度)
EGA121	plastic	120	12	12	yes	cylinder	fluid (3 M)
EGA131	plastic	120	12	12	no	ball	fluid (3 M)
EGA133	plastic	120	12	12	no	cylinder	gel (3 M)
EGA142	plastic	120	12	12	yes	cylinder	gel (3 M)
EGA150	glass	120	12	12	no	cylinder	gel (3 M)
EGAT150	glass	120	12	12	yes	cylinder	gel (3 M)
EGA151	glass	120	12	12	no	cylinder	fluid (3 M)
EGAT151	glass	120	12	12	yes	cylinder	fluid (3 M)
EGC151	glass	120	12	12	no	cylinder	fluid (3 M)
EGC151I/S	glass	120	12	12	no	cylinder	fluid (saturated)
EGA153	glass	120	12	12	no	cylinder	gel (3 M)
EGA161	glass	120	12	12	no	cylinder	fluid (3 M)
EGA173	glass	120	12	12	no	cylinder	gel (3 M)
EGAT173	glass	120	12	12	yes	cylinder	gel (3 M)
EGA184	glass	120	12	6	no	spear	gel (3 M)
EGA186	glass	170	12	6	no	cylinder	fluid (3 M)
EGA193	glass	120	12	12	no	ball	gel (3 M)
EGAT193	glass	120	12	12	yes	ball	gel (3 M)
EGA233	Plastic	120	12	12	No	Cylinder	gel (3 M)
EGA81	glass	120	12	12	no	spear	fluid (3 M)
EGS150I	glass	120	12	12	no	ball	pressurized gel, with KCl reserve
EGS173	glass	120	12	12	no	half ball	gel (3 M)
EGST173	glass	120	12	12	yes	half ball	gel (3 M)
OGA201	glass	120	12	17	no	flat	fluid (3 M)

隔膜	隔膜数量	pH 范围	温度范围 (°C)	压力(bar)	样品最小电导率 (μS/cm)	最小浸入深度 (mm)	页码
ceramic	1	2 ... 11	-5 ... 60	pressureless	100	15	10
ceramic	2	0 ... 14	-5 ... 80	pressureless	100	15	10
ceramic	2	0 ... 14	-5 ... 80	< 6	100	15	10, 21
ceramic	2	0 ... 14	-5 ... 80	pressureless	100	15	11
ceramic	1	0 ... 14	-5 ... 80	< 6	100	22	21
ceramic	1	0 ... 14	-5 ... 80	< 6	100	22	21
ceramic	1	0 ... 14	-5 ... 80	pressureless	100	22	11
ceramic	1	0 ... 14	-5 ... 80	pressureless	100	22	12
ceramic	1	0 ... 14	-5 ... 100	pressureless	100	22	11
ceramic	1	0 ... 14	-5 ... 100	pressureless	100	22	23
ceramic	3	0 ... 14	-5 ... 80	< 6	100	22	21
flexible sleeve junction	1	0 ... 14	-5 ... 80	pressureless	20	32	12, 22
ring shaped sleeve junction	1	0 ... 14	-5 ... 80	< 6	50	27	22
ring shaped sleeve junction	1	0 ... 14	-5 ... 80	< 6	50	27	22
ceramic	2	2 ... 11	-5 ... 60	pressureless	100	15	13
ceramic	2	2 ... 11	-5 ... 60	pressureless	100	15	13
ring shaped PTFE junction	1	0 ... 14	-5 ... 80	< 10	100	27	23
ring shaped PTFE junction	1	0 ... 14	-5 ... 80	< 10	100	27	23
ceramic double junction	2	0 ... 14	-5 ... 80	< 6	100	15	23
ceramic	3	0 ... 14	-5 ... 60	pressureless	100	22	13
ceramic	1	0 ... 14	0 ... 140	< 12	100	22	24
ring shaped sleeve junction	2	2 ... 13	0 ... 100	< 6	50	22	24
ring shaped sleeve junction	2	2 ... 13	0 ... 100	< 6	50	22	24
ceramic	1	2 ... 11	-5 ... 60	pressureless	100	2	12

redox combination electrodes

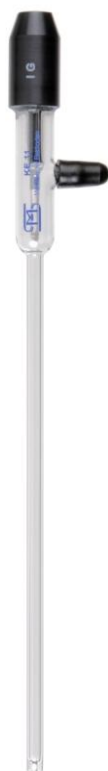
型号	电极杆材质	电极长度 (mm)	电极直径 (mm)	金属电极	参比内电解液 (KCl溶液浓度)
EMC133	plastic	120	12	platinum disc	gel (3 M)
EMC173	glass	120	12	platinum disc	gel (3 M)
EMC30	glass	120	12	platinum disc	fluid (3 M)
EMC33	glass	120	12	platinum disc	gel (3 M)

隔膜	隔膜数量	pH 范围	温度范围 (°C)	压力(bar)	样品最小电导率 (μS/cm)	最小浸入深度 (mm)	页码
ceramic	2	± 2000	-5 ... 80	< 6	100	15	14, 25
ring shaped sleeve junction	1	± 2000	-5 ... 80	< 6	50	17	25
ceramic	1	± 2000	-5 ... 80	< 6	100	12	14
ceramic	1	± 2000	-5 ... 80	< 6	100	12	25

3. 实验室电极

3.1 参比电极

KE10, KE11



KE11

- 用于小体积测量的甘汞电极
- 长期稳定（具有饱和 KCl 溶液和 KCl 储备的电解质）
- 轴径：5 mm
- 可提供标准玻璃锥 (NSK 7) → 使用相应的套管气密安装在腐蚀测量池中

SE10, SE11



SE10NSK7

- 带有 Ag/AgCl 参比系统的参比电极，用于极小体积的测量
- 长期稳定（具有饱和 KCl 溶液和 KCl 储备的电解质）
- 轴径：5 mm
- 通过移除套筒连接器轻松清洁
- 标准玻璃锥 (NSK 7) 可用 → 用于气密安装在腐蚀测量单元中，带有相应的套管

Type	KE10	KE11	SE10	SE11
Shaft	glass, Ø 12/5 mm	glass, Ø 12/5 mm	glass, Ø 12/5 mm	glass, Ø 12/5 mm
Shaft length	155 mm	155 mm	155 mm	155 mm
Reference system	calomel	calomel	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve
Bridge electrolyte	-	-	-	-
Diaphragm	sleeve junction	1 x ceramic	sleeve junction	1 x ceramic
Temperature range	-5 ... 60 °C	-5 ... 60 °C	-5 ... 80 °C	-5 ... 80 °C
Minimum immersion depth	10 mm	10 mm	10 mm	10 mm
Application	small volume sample, aqueous solutions	small volume sample, aqueous solutions	small volume sample, aqueous solutions	small volume sample, aqueous solutions
Electrical connection	4 mm banana socket	4 mm banana socket	4 mm banana socket	4 mm banana socket
Order code/ Order key	KE10, KE10NSK7	KE11, KE11NSK7	SE10, SE10NSK7	SE11, SE11NSK7

SE20, SE21



SE21-L

- 带有 Ag/AgCl 参比系统的参比电极，用于与离子选择性电极相关的测量
- 长期稳定（具有饱和 KCl 溶液和 KCl 储备的电解质）
- 轴径：12 毫米

SE20EB, SE21EB



SE20EB-L

- 带有 Ag/AgCl 双结参比系统的参比电极，用于在关键介质中进行测量
- 与离子选择性电极相关的测量
- 长期稳定（具有饱和 KCl 溶液和 KCl 储备的电解质）
- 桥电解质由客户定义

SE20	SE21	SE20EB	SE21EB
glass, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
120 mm	120 mm	150 mm	150 mm
Ag/AgCl	Ag/AgCl	Ag/AgCl	Ag/AgCl
fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve	fluid (saturated) with KCl reserve
-	-	customer request	customer request
flexible sleeve junction	1 x ceramic	flexible sleeve junction (outside), 2 x ceramic (inside), (double junction reference system)	1 x ceramic (outside) 2 x ceramic (inside), (double junction reference system)
-5 ... 100 °C	-5 ... 100 °C	-5 ... 100 °C	-5 ... 100 °C
20 mm	10 mm	20 mm	10 mm
polluted or low ionic mediums	aqueous solutions	polluted mediums, strong acids and bases	critical mediums (strong acids and bases)
S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable
Refer to the left book cover!	Refer to the left book cover!	Refer to the left book cover!	Refer to the left book cover!

所有电极都可以根据插头连接器、电缆长度、插头和螺纹 PG 13.5 进行配置（请参阅左侧书皮！）。S7 同轴实验室插头头的连接电缆如第 18 页所示。

3.2 pH 复合电极

EGA121



EGA121-K010-F-X

- 袖珍型 pH 复合电极
- 集成温度传感器
- 可再填充的电解质
- 坚固的塑料轴，带有集成的 pH 膜保护

EGA131



EGA131-L

- 用于游泳池和水族馆水的 pH 组合电极
- 坚固的塑料轴，带有集成的 pH 膜保护
- 可再填充的电解质

EGA133



EGA133-L

- 游泳池和水族馆水用 pH 复合电极
- 坚固的塑料轴，带有集成的 pH 膜保护
- 凝胶电解质

Type	EGA121	EGA131	EGA133
Shaft	plastic, Ø 12 mm	plastic, Ø 12 mm	plastic, Ø 12 mm
Shaft length	120 mm	120 mm	120 mm
Temperature sensor	Pt 1000(X) or Pt 100 (Y) or NTC 30 kΩ (Z30)	-	-
Membrane shape	cylinder	ball	cylinder
Reference system	Ag/AgCl	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	fluid (3 M)	fluid (3 M)	gel (3 M)
Diaphragm	1 x ceramic	2 x ceramic	2 x ceramic
Isopotential point	7.0 ± 0.3	7.0 ± 0.3	7.0 ± 0.3
pH range	2 ... 11	0 ... 14	0 ... 14
Temperature range	-5 ... 60 °C	-5 ... 80 °C	-5 ... 80 °C
Minimum immersion depth	15 mm	15 mm	15 mm
Application	field measurements, aquarium water, surface water, swimming pools, waste water, environmental analysis	field measurements, aquarium water, surface water, swimming pools	field measurements, aquarium water, surface water, swimming pools
Electrical connection	fixed cable	S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable
Order key	Refer to the left book cover!	Refer to the left book cover!	Refer to the left book cover!

EGA142

EGA142-K010-F-X

- 袖珍型 pH 复合电极
- 集成温度传感器
- 低维护
- 坚固的塑料轴，带有集成的 pH 膜保护

EGA151, EGC151

EGA151-L

EGA151:

- 实验室和饮料行业通用的 pH 复合电极
- 可再填充的电解质
- 玻璃轴可以很好地清洁

EGC151:

- pH 复合电极，用于在具有极端 pH 值的热 (100 °C) 介质中进行测量
- 可再填充的电解质
- 玻璃轴可以很好地清洁

EGA142

plastic, Ø 12 mm
120 mm
Pt 1000 (X) or Pt 100 (Y) or
NTC 30 kΩ (Z30)
cylinder
Ag/AgCl
gel (3 M)
2 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
15 mm

field measurements, aquarium water,
surface water, swimming pools, waste
water, environmental analysis

fixed cable

Refer to the left book cover!

EGA151

glass, Ø 12 mm
120 mm
-
cylinder
Ag/AgCl
fluid (3 M)
1 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
22 mm

aquarium water, beverages,
environmental analysis

S7 coaxial lab plug head, fixed cable

Refer to the left book cover!

EGC151

glass, Ø 12 mm
120 mm
-
cylinder
Ag/AgCl
fluid (3 M)
1 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 100 °C
22 mm

hot (100 °C) mediums with extreme pH
values

S7 coaxial lab plug head, fixed cable

Refer to the left book cover!

所有电极都可以根据插头连接器、电缆长度、插头和螺纹 PG 13.5 进行配置（请参阅左侧书皮！）。S7 同轴实验室插头头的连接电缆如第 18 页所示。

EGAT151

EGAT151-K010-F-X

- 袖珍型 pH 复合电极
- 集成温度传感器
- 可再填充的电解质
- 玻璃轴可以很好地清洁

EGA161

EGA161-L

- 用于低离子介质和化妆品中测量的 pH 复合电极
- 可再填充的电解质
- 灵活的套管接头

OGA201

OGA201-L

- 用于测量表面的 pH 复合电极，例如：纸
- 平膜

Type	EGAT151	EGA161	OGA201
Shaft	glass, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
Shaft length	120 mm	120 mm	120 mm
Temperature sensor	Pt 1000 (X) or Pt 100 (Y) or NTC 30 kΩ (Z30)	-	-
Membrane shape	cylinder	cylinder	flat
Reference system	Ag/AgCl	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	fluid (3 M)	fluid (3 M)	fluid (3 M)
Diaphragm	1 x ceramic	flexible sleeve junction	1 x ceramic
Isopotential point	7.0 ± 0.3	7.0 ± 0.3	7.0 ± 0.3
pH range	0 ... 14	0 ... 14	2 ... 11
Temperature range	-5 ... 80 °C	-5 ... 80 °C	-5 ... 60 °C
Minimum immersion depth	22 mm	32 mm	2 mm
Application	aquarium water, surface water, swimming pools, waste water, environmental analysis	low ionic mediums, cosmetics	pH measurements on surfaces, e. g. paper
Electrical connection	fixed cable	S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable
Order key	Refer to the left book cover! ¹	Refer to the left book cover!	Refer to the left book cover! ²

¹ pH 复合电极 EGAT151 也可用于 HT 玻璃 (EGCT151)。EGCT151 可用于具有极端 pH 值的热 (100 °C) 介质。

² OGA201 不能配备螺纹 PG 13.5 (P)。

EGA81



EGA81-L

- 用于土壤渗透测量的 pH 复合电极
- 隔膜

EGA184



EGA184-L

- 用于肉类和奶酪渗透测量的 pH 复合电极
- 内部凝胶电解质 (可以在所有位置进行测量)
- 隔膜

EGA186



EGA186-L

- 用于小体积测量的 pH 复合电极
- 轴径: 6 毫米
- 可再填充的电解质

EGA81

glass, Ø 12 mm

120 mm

-

spear

Ag/AgCl

fluid (3 M)

3 x ceramic

7.0 ± 0.3

0 ... 14

-5 ... 80 °C

22 mm

viscous mediums, samples of soil

S7 coaxial lab plug head, fixed cable

Refer to the left book cover!

EGA184

glass, Ø 12/6 mm

120 mm

-

spear

Ag/AgCl

gel (3 M)

2 x ceramic

7.0 ± 0.3

2 ... 11

-5 ... 60 °C

15 mm

penetration measurements in food

S7 coaxial lab plug head, fixed cable

Refer to the left book cover!

EGA186

glass, Ø 12/6 mm

170 mm

-

cylinder

Ag/AgCl

fluid (3 M)

2 x ceramic

7.0 ± 0.3

2 ... 11

-5 ... 60 °C

15 mm

small volume samples

S7 coaxial lab plug head, fixed cable

Refer to the left book cover!

所有电极都可以根据插头连接器、电缆长度、插头和螺纹 PG 13.5 进行配置 (请参阅左侧书皮!)。S7 同轴实验室插头头的连接电缆如第 18 页所示。

3.3 氧化还原复合电极

EMC133



EMC133-L

- 游泳池和水族馆用水氧化还原组合电极
- 机械稳定的铂金盘
- 带有集成传感器保护的坚固塑料轴

EMC30



EMC30-L

- 用于实验室和肥皂水中一般应用的氧化还原复合电极
- 机械稳定的铂金盘
- 可再填充的电解质
- 玻璃轴可以很好地清洁

Type	EMC133	EMC30
Shaft	plastic, Ø 12 mm	glass, Ø 12 mm
Shaft length	120 mm	120 mm
Measuring electrode	platinum disc Ø 5 mm	platinum disc Ø 5 mm
Reference system	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	gel (3 M)	fluid (3 M)
Diaphragm	2 x ceramic	1 x ceramic
Measuring range	± 2000 mV	± 2000 mV
Temperature range	-5 ... 80 °C	-5 ... 80 °C
Minimum immersion depth	15 mm	12 mm
Application	field measurements, aquarium water, surface water, swimming pools	raw water, soap water, environmental analysis
Electrical connection	S7 coaxial lab plug head, fixed cable	S7 coaxial lab plug head, fixed cable
Order key	Refer to the right book cover!	Refer to the right book cover!

所有电极都可以根据插头连接器、电缆长度、插头和螺纹 PG 13.5 进行配置（请参阅左侧书皮！）。S7 同轴实验室插头头的连接电缆如第 18 页所示。

3.4 电导率电极

LTC0,35/23



- 袖珍型电导率电极
- 4 电极技术
- 测量范围广：
1 $\mu\text{S}/\text{cm}$... 500 mS/cm
- 集成温度传感器
- 坚固的塑料轴

LTC0,35/23-K010-F

LTC1/22 or LTC1/23



- 用于袖珍式仪表和水族箱的电导率电极
- 2 电极技术
- 坚固的塑料轴
- 石墨电极可以很好地清洁
- 集成温度传感器

LTC1/23-K010-F

Type	LTC0,35/23	LTC1/22 or LTC1/23
Shaft	plastic, Ø 12 mm	plastic, Ø 12 mm
Shaft length	120 mm	120 mm
Electrode material	graphite	graphite
Temperature sensor	Pt 1000	LTC1/22: Pt 100 LTC1/23: Pt 1000
Measuring principle	4-electrode technology	2-electrode technology
Cell constant	0.33 $\text{cm}^{-1} \pm 5 \%$	1 $\text{cm}^{-1} \pm 20 \%$
Measuring range	1 $\mu\text{S}/\text{cm}$... 500 mS/cm	1 $\mu\text{S}/\text{cm}$... 100 mS/cm
Temperature range	-5 ... 80 °C	-5 ... 80 °C
Minimum immersion depth	20 mm	15 mm
Application	drinking water, surface water, waste water, sea water, industrial process water, acids, bases	drinking water, surface water, waste water, sea water
Electrical connection	fixed cable	fixed cable
Order key	Refer to the right book cover!	Refer to the right book cover!

所有电极均可根据插头连接器、电缆长度和螺纹 PG 13.5 进行配置（请参阅右侧书皮！）

LTG0,1/22 or LTG0,1/23

LTG0,1/23-K010-F

- 用于在低离子介质中测量的电导率电极 例如：蒸馏水
- 2 电极技术
- 低电导率值：
0.1 $\mu\text{S/cm}$... 200 $\mu\text{S/cm}$
- 长期稳定的铂电极
- 集成温度传感器

LTG1/22 or LTG1/23

LTG1/23-K010-F

- 用于游泳池和饮料行业测量的电导率电极
- 2 电极技术
- 测量范围广：
1 $\mu\text{S/cm}$... 100 mS/cm
- 长期稳定的铂电极实现在关键介质中的测量
- 集成温度传感器

Type	LTG0,1/22 or LTG0,1/23	LTG1/22 or LTG1/23
Shaft	glass, Ø 12 mm	glass, Ø 12 mm
Shaft length	120 mm	120 mm
Electrode material	platinum (8x17 mm)	platinum (3x4 mm)
Temperature sensor	LTG0,1/22: Pt 100 LTG0,1/23: Pt 1000	LTG1/22: Pt 100 LTG1/23: Pt 1000
Measuring principle	2-electrode technology	2-electrode technology
Cell constant	0.1 $\text{cm}^{-1} \pm 20 \%$	1 $\text{cm}^{-1} \pm 20 \%$
Measuring range	0.1 $\mu\text{S/cm}$... 200 $\mu\text{S/cm}$	1 $\mu\text{S/cm}$... 100 mS/cm
Temperature range	-5 ... 100 °C	-5 ... 100 °C
Minimum immersion depth	35 mm	25 mm
Application	low ionic mediums (distillation plants, ion exchanger)	drinking water, surface water, waste water, sea water, swimming pools, beverages
Electrical connection	fixed cable	fixed cable
Order key	Refer to the right book cover!	Refer to the right book cover!

所有电极均可根据插头连接器、电缆长度和螺纹 PG 13.5 进行配置（请参阅右侧书皮！）

3.5 氧传感电极

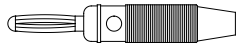
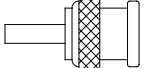
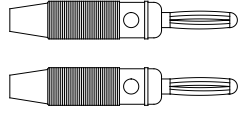
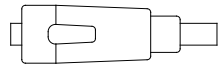
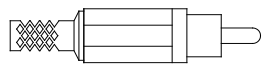


Type	MF41N
Shaft	plastic, Ø 12 mm
Shaft length	120 mm
Cathode	platinum
Anode	Ag/AgCl
Temperature sensor	Pt 1000
Measuring principle	amperometric (Clark)
Signal in air	100 ... 130 nA
Response time in N ₂	t ₉₀ < 30 s
Flow rate	> 9 cm/s
Measuring range	0 ... 20 mg/l, 0 ... 200 % air saturation
Temperature range	-5 ... 45 °C
Minimum immersion depth	30 mm
Application	field measurements, aquarium water, surface water, sea water
Electrical connection	fixed cable
Order key	Refer to the right book cover!

所有电极均可根据插头连接器、电缆长度和螺纹 PG 13.5 进行配置（请参阅右侧书皮！）

3.6 实验室电极连接线

提供以下标准电缆长度：1 m、2 m、5 m、10 m 和 15 m 可以使用特殊电缆长度。

order code	cable	1. cable end	2. cable end	sensors
Koax1	Ø 3 mm, coax	4 mm banana plug 	stripped ends	参比电极
Koax2	Ø 3 mm, coax	S7/S8 cable socket 	stripped ends	pH复合电极 氧化还原复合电极
Koax3	Ø 3 mm, coax	S7/S8 cable socket 	German DIN plug 	pH复合电极 氧化还原复合电极
Koax4	Ø 3 mm, coax	S7/S8 cable socket 	4 mm banana plug 	参比电极
Koax5	Ø 3 mm, coax	S7/S8 cable socket 	BNC plug 	pH复合电极 氧化还原复合电极 2电极电导率电极 氧传感器
Koax6	Ø 5 mm, coax	S7/S8 cable socket 	2 x 4 mm banana plug 	2电极电导率电极 温度传感器
Koax7	Ø 3 mm, coax	S7/S8 cable socket 	Cinch plug 	pH复合电极 氧化还原复合电极

例如: 测量电缆 Koax3, 标准电缆长度为 1 m = Koax3/1

4. 工艺过程电极

4.1 温度传感电极

Pt100I, Pt1000I



- 铂金温度传感器，符合 DIN EN 60751，A 级
- 长期稳定
- 玻璃轴可以很好地清洁
- 用于电化学参数的温度补偿

Pt1000I

Type	Pt100I	Pt1000I
Shaft	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm
Temperature sensor	Pt 100 platinum temperature sensor in accordance with DIN EN 60751, class A	Pt 1000 platinum temperature sensor in accordance with DIN EN 60751, class A
Temperature range	-10 ... 100 °C	-10 ... 100 °C
Pressure	< 6 bar	< 6 bar
Application	fluids	fluids
Electrical connection	S8 coaxial plug head with thread PG 13.5	S8 coaxial plug head with thread PG 13.5
Order code	Pt100I	Pt1000I

带螺纹 PG 13.5 的 S8 同轴插头的连接电缆如第 30 页所示。

4.2 pH 玻璃电极和参比电极

GA151I



GA151I

- 用于在水溶液中测量的 pH 玻璃电极
- 与参比电极 SE23I 一起测量

SE23I



SE23I

- 用于水溶液测量的参比电极
- 结合 pH 玻璃电极 GA151I 或离子选择性电极进行测量
- 凝胶电解质和 3 个 KCl 储备管
- 低维护

Type	GA151I	SE23I
Shaft	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm
Temperature sensor	-	-
Membrane shape	cylinder	-
Reference system	-	Ag/AgCl
Electrolyte (KCl)	-	gel (3 M)
Diaphragm	-	3 x ceramic
Isopotential point	7.0 ± 0.3	-
pH range	0 ... 14	-
Temperature range	-5 ... 80 °C	-5 ... 80 °C
Pressure	< 6 bar	< 6 bar
Minimum conductivity of the medium	-	100 µS/cm
Application	aqueous solutions	aqueous solutions
Electrical connection	S8 coaxial plug head with thread PG 13.5	S8 coaxial plug head with thread PG 13.5
Order code	GA151I	SE23I

4.3 pH 复合电极

EGA133I



EGA133I

- 游泳池和水族馆水用pH复合电极
- 坚固的塑料轴，带有集成的 pH 膜保护
- 凝胶电解质

EGA150I



EGA150I

- 游泳池和水族馆水用pH复合电极
- 凝胶电解质

EGAT150VP



EGAT150VP-X

- 饮料行业pH复合电极
- 集成温度传感器
- 凝胶电解质

EGA153I



EGA153I

- 废水和电镀用pH复合电极
- 3 个陶瓷隔膜
- 带有 KCl 储备管的凝胶电解质

EGA133I

plastic, Ø 12 mm
120 mm

-

cylinder
Ag/AgCl
gel (3 M)
2 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
< 6 bar
100 µS/cm

raw water, waste water,
surface water, swimming
pools
S8 coaxial plug head with
thread PG 13.5

EGA133I

EGA150I

glass, Ø 12 mm
120 mm

-

cylinder
Ag/AgCl
gel (3 M)
1 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
< 6 bar
100 µS/cm

raw water, waste water,
surface water, swimming
pools
S8 coaxial plug head with
thread PG 13.5

EGA150I
EGC150I

EGAT150VP

glass, Ø 12 mm
120 mm
Pt 1000 (X) or Pt 100 (Y) or
NTC 30 kΩ (Z30)

cylinder
Ag/AgCl
gel (3 M)
1 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
< 6 bar
100 µS/cm

surface water, soap water,
beverages
Variopin plug head with
thread PG 13.5

EGAT150VP-...
EGCT150VP-...

EGA153I

glass, Ø 12 mm
120 mm

-

cylinder
Ag/AgCl
gel (3 M)
3 x ceramic
7.0 ± 0.3
0 ... 14
-5 ... 80 °C
< 6 bar
100 µS/cm

heavily waste water,
electroplating
S8 coaxial plug head with
thread PG 13.5

EGA153I
EGC153I

PG 13.5 螺纹插头的连接电缆在第 30 页上有说明。

EGA161L/PG

EGA161L/PG

- 用于低离子介质的 pH 复合电极
- 侧管实现与电解液容器的连接
→ 不断流出电解液
- 灵活的套管接头

EGA173I

EGA173I

- 用于重污染废水和电镀的 pH 组合电极
- 环形套筒接头
- 带有 KCl 储备管的凝胶电解质

EGAT173VP

EGAT173VP-X

- 用于重污染废水和电镀的 pH 组合电极
- 环形套筒接头
- 带有 KCl 储备管的凝胶电解质
- 集成温度传感器

Type	EGA161L/PG	EGA173I	EGAT173VP
Shaft	glass, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm	120 mm
Temperature sensor	-	-	Pt 1000 (X) or Pt 100 (Y) or NTC 30 kΩ (Z30)
Membrane shape	cylinder	cylinder	cylinder
Reference system	Ag/AgCl	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	fluid (3 M)	gel (3 M)	gel (3 M)
Diaphragm	flexible sleeve junction	ring shaped sleeve junction	ring shaped sleeve junction
Isopotential point	7.0 ± 0.3	7.0 ± 0.3	7.0 ± 0.3
pH range	0 ... 14	0 ... 14	0 ... 14
Temperature range	-5 ... 80 °C	-5 ... 80 °C	-5 ... 80 °C
Pressure	< 1 bar with pressure load at side tube connector	< 6 bar	< 6 bar
Minimum conductivity of the medium	20 µS/cm	50 µS/cm	50 µS/cm
Application	low ionic mediums, drinking water with low conductivity	drinking water, water soluble lacquers, electroplating, waste water	low ionic mediums, heavily polluted waste water, electroplating
Electrical connection	S7 coaxial lab plug head with thread PG 13.5 (shaft)	S8 coaxial plug head with thread PG 13.5	Variopin plug head with thread PG 13.5
Order code	EGA161L/PG	EGA173I EGC173I	EGAT173VP-... EGCT173VP-...

带有 HT 玻璃 (C) 的 pH 复合电极可用于具有极端 pH 值的热 (100 °C) 介质。

EGA193I

- 用于测量废水中的 pH 组合电极
- 聚四氟乙烯接头
- 带有 KCl 储备的凝胶电解质
- 最大压力：10 bar

EGA193I

EGAT193VP

- 用于测量废水中的 pH 组合电极
- 聚四氟乙烯接头
- 带有 KCl 储备的凝胶电解质
- 最大压力：10 bar
- 集成温度传感器

EGAT193VP-X

EGA233I

- pH 复合电极，用于测量所谓的“电极毒素”（硫化物）
- 双结参考系统
- 凝胶电解质

EGA233I

EGC151I/S

- 用于过程化学（制糖业）中无压应用的 pH 组合电极
- 高达 100 °C 的热稳定性
- 长期稳定（含有饱和 KCl 溶液和 KCl 储备的电解质）

EGC151I/S

EGA193I

glass, Ø 12 mm

120 mm

-

ball

Ag/AgCl

gel (3 M) with
KCl reserve

ring shaped PTFE junction

7.0 ± 0.3

0 ... 14

-5 ... 80 °C

< 10 bar

100 µS/cm

drinking water, water soluble
lacquers, electroplating,
waste waterS8 coaxial plug head with
thread PG 13.5

EGA193I

EGC193I

EGAT193VP

glass, Ø 12 mm

120 mm

Pt 1000 (X) or Pt 100 (Y) or
NTC 30 kΩ (Z30)

ball

Ag/AgCl

gel (3 M) with
KCl reserve

ring shaped PTFE junction

7.0 ± 0.3

0 ... 14

-5 ... 80 °C

< 10 bar

100 µS/cm

drinking water, water soluble
lacquers, electroplating,
waste waterVariopin plug head with
thread PG 13.5

EGAT193VP-...

EGCT193VP-...

EGA233I

plastic, Ø 12 mm

120 mm

-

cylinder

Ag/AgCl

gel (3 M)

4 x ceramic

7.0 ± 0.3

0 ... 14

-5 ... 80 °C

< 6 bar

100 µS/cm

waste water, electroplating,
mediums in so called
„electrode toxins“S8 coaxial plug head with
thread PG 13.5

EGA233I

EGC151I/S

glass, Ø 12 mm

120 mm

-

cylinder

Ag/AgCl

fluid (saturated) with
KCl reserve

1 x ceramic

7.0 ± 0.3

0 ... 14

-5 ... 100 °C

pressureless

100 µS/cm

hot (100 °C) mediums with
extreme pH valuesS8 coaxial plug head with
thread PG 13.5

EGC151I/S

EGA151I/S

插头连接器的连接电缆如第 30 页所示。

EGS150I



EGS150I

- 用于过程化学测量的 pH 组合电极
- 热稳定性高达 140 °C
- 最大压力：12 bar

EGS173I



EGS173I

- 用于重污染废水的 pH 组合电极
- 环形套筒接头
- 带有 KCl 储备的凝胶电解质

EGST173VP



EGST173VP-X

- 重污染废水的 pH 复合电极
- 环形套筒接头
- 带有 KCl 储备的凝胶电解质
- 集成温度传感器

Type	EGS150I	EGS173I	EGST173VP
Shaft	glass, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm	120 mm
Temperature sensor	-	-	Pt 1000 (X) or Pt 100 (Y) or NTC 30 kΩ (Z30)
Membrane shape	ball	half ball	half ball
Reference system	Ag/AgCl	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	pressurized gel, with KCl reserves	fluid (3 M)	gel with KCl reserve
Diaphragm	1 x ceramic	ring shaped sleeve junction	ring shaped sleeve junction
Isopotential point	6.8 ± 0.3	7.0 ± 0.3	7.0 ± 0.3
pH range	0 ... 14	2 ... 13	2 ... 13
Temperature range	0 ... 140 °C	0 ... 100 °C	0 ... 100 °C
Pressure	< 12 bar	< 6 bar	< 6 bar
Minimum conductivity of the medium	100 µS/cm	50 µS/cm	50 µS/cm
Application	process chemistry, high temperatures	drinking water, waste water	drinking water, waste water
Electrical connection	S8 coaxial plug head with thread PG 13.5	S8 coaxial plug head with thread PG 13.5	Variopin plug head with thread PG 13.5
Order code	EGS150I	EGS173I	EGST173VP-...

插头连接器的连接电缆如第 30 页所示。

4.4 氧化还原复合电极

EMC133I



EMC133I

- 游泳池和水族馆用水氧化还原组合电极
- 机械稳定的铂金盘
- 带有集成传感器保护的坚固塑料轴
- 凝胶电解质

EMC173I



EMC173I

- 废水和电镀用氧化还原复合电极
- 机械稳定的铂金盘
- 环形套筒接头
- 带有 KCl 储备管的凝胶电解质

EMC33I



EMC33I

- 游泳池和养鱼用氧化还原组合电极
- 机械稳定的铂金盘
- 凝胶电解质

Type	EMC133I	EMC173I	EMC33I
Shaft	plastic, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm	120 mm
Measuring electrode	platinum disc Ø 5 mm	platinum disc Ø 5 mm	platinum disc Ø 5 mm
Reference system	Ag/AgCl	Ag/AgCl	Ag/AgCl
Electrolyte (KCl)	gel (3 M)	gel (3 M)	gel (3 M)
Diaphragm	2 x ceramic	sleeve junction	1 x ceramic
Measuring range	± 2000 mV	± 2000 mV	± 2000 mV
Temperature range	-5 ... 80 °C	-5 ... 80 °C	-5 ... 80 °C
Pressure	< 6 bar	< 6 bar	< 6 bar
Minimum conductivity of the medium	100 µS/cm	50 µS/cm	100 µS/cm
Application	raw water, waste water, surface water, swimming pools	drinking water, water soluble lacquers, electroplating, waste water	raw water, waste water, surface water, swimming pools
Electrical connection	S8 coaxial plug head with thread PG 13.5	S8 coaxial plug head with thread PG 13.5	S8 coaxial plug head with thread PG 13.5
Order code	EMC133I	EMC173I	EMC33I

带螺纹 PG 13.5 的 S8 同轴插头的连接电缆如第 30 页所示。

4.5 电导率电极

LTC0,35/23



LTC0,35/23VP

- 用于废水和海水的电导率电极
- 4 电极技术
- 测量范围广：
1 $\mu\text{S}/\text{cm}$...
500 mS/cm
- 坚固的塑料轴

LTG0,1/22 or LTG0,1/23



LTG0,1/23VP

- 用于在低离子介质中测量的电导率电极
例如：蒸馏水
- 2 电极技术
- 低电导率值：
0.1 $\mu\text{S}/\text{cm}$...
200 $\mu\text{S}/\text{cm}$
- 长期稳定的铂电极
- 集成温度传感器

LTG1/22 or LTG1/23



LTG1/23VP

- 用于游泳池和饮料行业测量的电导率电极
- 2 电极技术
- 测量范围广：
1 $\mu\text{S}/\text{cm}$...
100 mS/cm
- 长期稳定的铂电极实现在关键介质中的测量
- 集成温度传感器

Type	LTC0,35/23	LTG0,1/22 or LTG0,1/23	LTG1/22 or LTG1/23
Shaft	plastic, Ø 12 mm	glass, Ø 12 mm	glass, Ø 12 mm
Immersion length	120 mm	120 mm	120 mm
Electrode material	graphite	platinum (8x17 mm)	platinum (3x4 mm)
Temperature sensor	Pt 1000	LTG0,1/22: Pt 100 LTG0,1/23: Pt 1000	LTG1/22: Pt 100 LTG1/23: Pt 1000
Measuring principle	4-electrode technology	2-electrode technology	2-electrode technology
Cell constant	$0.33 \text{ cm}^{-1} \pm 5 \%$	$0.1 \text{ cm}^{-1} \pm 20 \%$	$1 \text{ cm}^{-1} \pm 20 \%$
Measuring range	1 $\mu\text{S}/\text{cm}$... 500 mS/cm	0.1 $\mu\text{S}/\text{cm}$... 200 $\mu\text{S}/\text{cm}$	1 $\mu\text{S}/\text{cm}$... 100 mS/cm
Temperature range	-5 ... 80 °C	-5 ... 100 °C	-5 ... 100 °C
Pressure	< 6 bar	< 6 bar	< 6 bar
Application	waste water, sea water, industrial process water, acids, bases	low ionic mediums (distillation plants, ion exchanger)	drinking water, surface water, waste water, sea water
Electrical connection	Variopin plug head with thread PG 13.5	Variopin plug head with thread PG 13.5	Variopin plug head with thread PG 13.5
Order code	LTC0,35/23VP	LTG0,1/22VP LTG0,1/23VP	LTG1/22VP LTG1/23VP

插头连接器的连接电缆如第 30 页所示。

4.6 氧传感电极

LVV0,1/23



LVV0,1/23VP

- 坚固的不锈钢电导池
工业应用
- 在低离子介质中的测量
例如：蒸馏水
- 2 电极技术
- 低电导率值：0.1 $\mu\text{S}/\text{cm}$
200 $\mu\text{S}/\text{cm}$
- 集成温度传感器



LVV0,1/23VP-S

LVV0,1/23

stainless steel, Ø 12 mm
120 mm
stainless steel
Pt 1000

2-electrode technology

0.1 $\text{cm}^{-1} \pm 20\%$
0.1 $\mu\text{S}/\text{cm}$... 200 $\mu\text{S}/\text{cm}$
-5 ... 100 °C
< 6 bar
low ionic mediums (distillation
plants, ion exchanger)

Variopin plug head with thread
PG 13.5
LVV0,1/23VP

MF39, MF39T



MF39VP

MF39VP:

- 废水氧传感器
- 集成温度传感器
- 坚固的塑料轴
- 膜头可更换

MF39TVP:

- 用于海水和过程化学的氧传感器
- 钛合金设计，耐腐蚀
- 集成温度传感器
- 坚固的塑料轴
- 膜头可更换

Type	MF39	MF39T
Shaft	plastic, stainless steel, Ø 18 mm	plastic, titanium, Ø 18 mm
Immersion length	120 mm	120 mm
Cathode	platinum	platinum
Anode	Ag/AgCl	Ag/AgCl
Temperature sensor	Pt 1000	Pt 1000
Measuring principle	amperometric (Clark)	amperometric (Clark)
Signal in air	100 ... 130 nA	100 ... 130 nA
Response time in N ₂	t ₉₀ < 70 s	t ₉₀ < 70 s
Flow rate	> 9 cm/s	> 9 cm/s
Measuring range	0 ... 60 mg/l, 0 ... 200 % air saturation	0 ... 60 mg/l, 0 ... 200 % air saturation
Temperature range	-5 ... 45 °C	-5 ... 45 °C
Pressure	< 3 bar	< 3 bar
Application	drinking water, aqua- rium water, surface water, waste water	sea water, corrosive mediums
Electrical connection	Variopin plug head with thread PG 16	Variopin plug head with thread PG 16
Order code	MF39VP	MF39TVP

插头连接器的连接电缆如第 30 页所示。

MF41NVP



MF41NVP

- 用于淡水和海水养鱼的氧传感器
- 耐腐蚀
- 集成温度传感器
- 坚固的塑料轴
- 膜头可更换

MF441



MF441-K010-F

- 用于堆肥厂的氧传感器
- 集成温度传感器
- 不锈钢设计
- 膜头可更换

Type	MF41N	MF441
Shaft	plastic, Ø 12 mm	stainless steel, Ø 18 mm
Immersion length	120 mm	shaft length: 105 mm
Cathode	platinum	platinum
Anode	Ag/AgCl	Ag/AgCl
Temperature sensor	Pt 1000	Pt 1000
Measuring principle	amperometric (Clark)	amperometric (Clark)
Signal in air	100 ... 130 nA	60 ... 80 nA
Response time in N ₂	t ₉₀ < 30 s	t ₉₀ < 180 s
Flow rate	> 9 cm/s	-
Measuring range	0 ... 20 mg/l, 0 ... 200 % air saturation	0 ... 20 mg/l, 0 ... 200 % air saturation
Temperature range	-5 ... 45 °C	-5 ... 80 °C
Pressure	< 1 bar	< 1 bar
Application	aquarium water, surface water, sea water	oxygen measurements in composting plants
Electrical connection	Variopin plug head with thread PG 16	fixed cable
Order code/ Order key	MF41NVP	Refer to the right book cover! ¹

插头连接器的连接电缆在第 30 页上有说明。氧传感器 MF441 可以根据电缆长度和插头进行配置（请参阅右侧的书皮！）

¹ The MF441 can not be equipped with thread PG 13.5 (P).

4.7 氯传感器电极

CL4



CL4

- 用于游泳池和饮用水处理的氯传感器
- 游离氯
- 系统取决于 pH 值

CS4, CP4



CS4

- 用于游泳池和饮用水处理的氯传感器
- 系统对 pH 值的依赖性非常低

- CS4:**
- 自由氯

- CP4:**
- 总氯

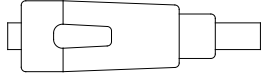
Type	CL4	CS4	CP4
Shaft	plastic, Ø 25 mm	plastic, stainless steel, Ø 25 mm	plastic, stainless steel, Ø 25 mm
Immersion length	120 mm	120 mm	120 mm
Measuring principle	amperometric 2-electrode system	amperometric working potentiostatic 3-electrode system	amperometric working potentiostatic 3-electrode system
Measuring range	CL4: 0.001 ... 2 mg/l CL4H: 0.005 ... 2 mg/l CL4N: 0.05 ... 20 mg/l	CS4: 0.001 ... 2 mg/l CS4H: 0.005 ... 2 mg/l CS4N: 0.05 ... 20 mg/l	CP4: 0.001 ... 2 mg/l CP4H: 0.005 ... 2 mg/l CP4N: 0.05 ... 20 mg/l
pH range	pH 6 ... 8	pH 4 ... 12	pH 4 ... 12
pH dependency	in correlation with the dissociation curve of HOCl; pH 7.2 ... 7.4 recommended	about 10 % slope reduction per pH unit	about 10 % slope reduction per pH unit
Flow rate	30 l/h recommended	30 l/h recommended	30 l/h recommended
Temperature range	5 ... 45 °C (temperature compensated)	5 ... 45 °C (temperature compensated)	5 ... 45 °C (temperature compensated)
Pressure	< 1 bar	< 0.5 bar	< 0.5 bar
Application	swimming pools, drinking water, sea and process water	swimming pools, drinking and process water	swimming pools, drinking and process water
Electrical connection	CL4: 4 ... 20 mA, 2-wire connection CL4H, CL4N: -100 mV per mg/l, 4-pin plug connection	CS4: 4 ... 20 mA, 2-wire connection CS4H, CS4N: -100 mV per mg/l, 4-pin plug connection	CP4: 4 ... 20 mA, 2-wire connection CP4H, CP4N: -100 mV per mg/l, 4-pin plug connection
Order code	CL4 CL4H CL4N	CS4 CS4H CS4N	CP4 CP4H CP4N

氯传感器的连接电缆在第 30 页上有说明。其他测量范围可根据要求提供。

4.8 过程工艺连接电缆

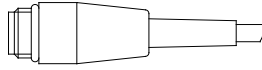
提供以下标准电缆长度：1 m、2 m、5 m、10 m 和 15 m 可以使用特殊电缆长度。

工艺用电缆（同轴电缆）

order code	cable	1. cable end	2. cable end	sensors
K43	Ø 5 mm, coax	S7/S8 cable socket 	stripped ends	pH复合电极 氧化还原复合电极 2电极电导率电极 氧传感器、温度传感器
K43Pt	Ø 5 mm, coax	S7/S8 cable socket 	stripped ends (divided shield, divided core)	用于带 4 线输入的测量仪器的温度传感器

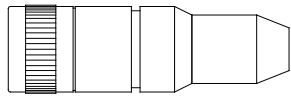
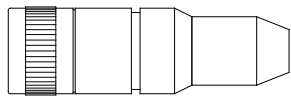
Example: measuring cable K43 with 5 m standard cable length = **K43/5**

Signal cables for chlorine sensors

order code	cable	1. cable end	2. cable end	sensors
C2000	Ø 3 mm, 2 wires	stripped ends	stripped ends	带电流输出的氯传感器
K100.1	Ø 5 mm, 4 wires	4-pin plug 	stripped ends	带电压输出的氯传感器（4 针）

Example: signal cable C2000 with 6 m special cable length = **C2000/6**

Cables for process (multipin cable)

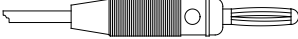
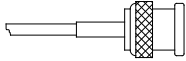
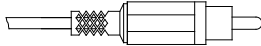
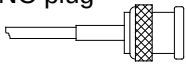
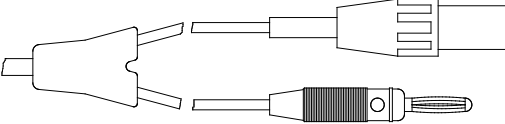
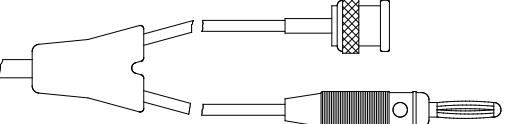
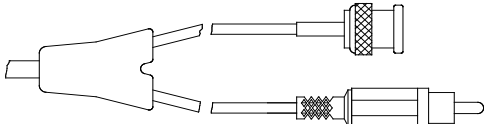
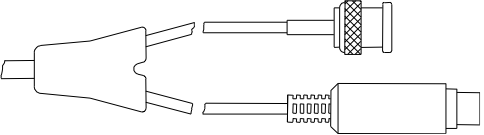
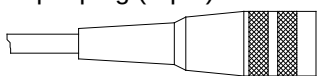
order code	cable	1. cable end	2. cable end	sensors
KVP	Ø 7.5 mm, 1 coax, 1 shield, 6 wires	Variopin socket 	stripped ends	2电极电导率电极 pH 复合电极 带温度传感器的氧传感器
KVPLF4	Ø 7.5 mm, 1 coax, 1 shield, 6 wires	Variopin socket 	stripped ends	4电极电导率电极

Example: multipin cable KVP with 10 m standard cable length = **KVP/10**

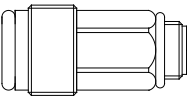
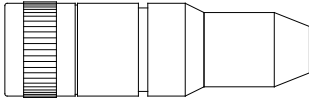
5. 电气和过程工艺连接 (电缆、插头连接器、螺纹 PG 13.5)

Meinsberg 电极配备固定电缆（可提供长度和插头）或插头，用于实验室和工艺应用。

带固定电缆的传感器

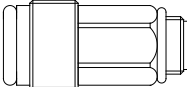
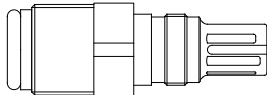
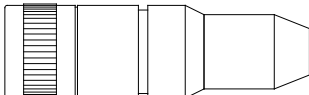
type of sensor	Kabeltyp	cable plugs
参比电极	one-wire cable	4 mm banana plug - stripped ends 
pH/氧化还原复合电极	coaxial cable	- DIN plug - BNC plug - Cinch plug - stripped ends   
2电极电导率电极 氧传感器	coaxial cable	- BNC plug - stripped ends 
带温度传感器的 pH 复合电极	triaxial cable	- German DIN plug and 4 mm banana plug (Y-cable) - BNC plug and 4 mm banana plug (Y-cable) - BNC plug and Cinch plug (Y-cable) - BNC plug and German MiniDIN plug (Y-cable) - stripped ends    
oxygen sensor with temperature sensor	6-pin cable	- stripped ends - multipin plug (6-pin) - stripped ends 

带插头的传感器

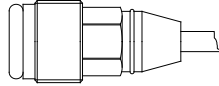
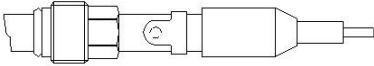
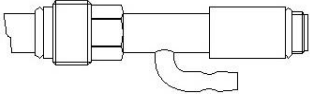
type of sensor	plug connector
pH combination electrode, redox combination electrode, 2-electrode conductivity cell, oxygen sensor, temperature sensor	S7 coaxial lab plug head  S8 coaxial plug head with thread PG 13.5 
pH combination electrode, 2-electrode conductivity cell, 4-electrode conductivity cell, oxygen sensor with temperature sensor	Variopin plug head with thread PG 13.5 

由于使用不同的插头连接器系统，我们的传感器与全球几乎所有测量仪器兼容。

不同插头连接表

plug heads	cable socket
S7 coaxial lab plug head 	S7/S8 cable socket 
S8 coaxial plug head with thread PG 13.5 	S7/S8 cable socket 
Variopin plug head with thread PG 13.5 	Variopin socket 

带螺纹 PG 13.5 的过程连接

screwable thread PG 13.5	example	application
PG 13.5 head 	EGA133-K010-F-P with fixed cable and thread PG 13.5 (head)	gel filled pH-/redox combination electrode, conductivity cell and oxygen sensor with fixed cable
PG 13.5 shaft 	EGA161-K010-F-P with fixed cable and thread PG 13.5 (shaft)	fluid filled pH combination electrode and reference electrode with fixed cable or plug head
PG 13.5 shaft 	EGA161L/PG with S7 coaxial lab plug head and thread PG 13.5 (shaft), side arm	

由于在电极头或轴上安装了螺纹 PG 13.5，我们的传感器可以集成到每个过程中。

6. 标准溶液和电解质

order code	pH 值 25 °C	保质期 (月)	quantity (filled in HDPE bottles)	quality certificate on request
pH buffer solution (acc. NBS and DIN 19266)	1.68 4.01 6.87 9.18	12 12 12 6	250 ml or 1000 ml	X X X X
Industrial pH buffer solution (acc. DIN 19267)	4.65 6.79 9.23	12 12 6	250 ml or 1000 ml	X X X
Laboratory pH buffer solution (STM)	4.0 7.0 10.0	12 12 6	250 ml or 1000 ml	X X X
Triple-Set pH buffer solution (acc. NBS and DIN 19266)	4.01 6.87 9.18	12 12 6	3 x 250 ml	X X X
Triple-Set Laboratory pH buffer solution (STM)	4.0 7.0 10.0	12 12 6	3 x 250 ml	X X X
pH buffer solution, coloured pH 4 red; pH 7 green; pH 9 blue	4.0 7.0 9.0	12 12 6	250 ml or 1000 ml	X X X
Redox buffer solution $U_H = 427 \text{ mV}$ (Pt-Ag/AgCl: 220 mV) $U_H = 675 \text{ mV}$ (Pt-Ag/AgCl: 468 mV)	app. 7 app. 1	6 12	250 ml or 1000 ml	X X
Conductivity standard solution 0.1 N KCl 0.01 N KCl 0.001 N KCl		12 6 6	250 ml or 1000 ml 12.9 mS/cm (25 °C) 1.41 mS/cm (25 °C) 147 $\mu\text{S/cm}$ (25 °C)	X X X
Electrolyte solution KCl solution, saturated KCl solution, 3 mol/l		12 12	250 ml or 1000 ml electrolyte refilling and storage solution for pH/Redox(ORP) combination electrodes and reference electrodes	X X
Electrolyte solution for oxygen sensors Electrolyte II/1 for MF441 Electrolyte VI for MF39, MF40, MF41		12 12	10 x 1 ml or 50 ml	X X
Cleaning solution		12	250 ml pepsin-hydrochloric acid	X

7. 标准溶液的温度范围，参比电极的标准电位

标准缓冲溶液 DIN 19266 或 NBS

T in °C	pH values			
	A	C	D	F
0		4.010	6.984	9.464
5	1.668	4.004	6.951	9.395
10	1.670	4.000	6.923	9.332
15	1.672	3.999	6.900	9.276
20	1.675	4.001	6.881	9.225
25	1.679	4.006	6.865	9.180
30	1.683	4.012	6.853	9.139
35	1.688	4.021	6.844	9.102
38	1.691	4.027	6.840	9.081
40	1.694	4.031	6.838	9.068
45	1.700	4.043	6.834	9.038
50	1.707	4.057	6.833	9.011
55	1.715	4.071	6.934	8.985
60	1.723	4.087	6.836	8.962

技术缓冲溶液符合。DIN 19267

T in °C	pH values		
	TC	TD	TE
0	4.67	6.89	9.48
10	4.66	6.84	9.37
20	4.65	6.80	9.27
25	4.65	6.79	9.23
30	4.65	6.78	9.18
40	4.66	6.76	9.09
50	4.68	6.76	9.00
60	4.70	6.76	8.92
70	4.72	6.76	8.88
80	4.75	6.78	8.85

Meinsberg 实验室缓冲溶液 (STM)

T in °C	pH values		
	4.0	7.0	10.0
0	4.01	7.13	10.65
5	4.01	7.07	10.52
10	4.00	7.05	10.39
15	4.00	7.02	10.26
20	4.00	7.00	10.13
25	4.01	6.98	10.00
30	4.01	6.98	9.87
35	4.02	6.96	9.74
40	4.03	6.95	9.61
45	4.04	6.95	9.48
50	4.06	6.95	9.35

Redox-buffer solution 427 mV; pH 7.0

T in °C	pH value	U _A in mV	U _H in mV
10	7.06	245	462
15	7.04	236	450
20	7.02	228	439
25	7.00	220	427
30	6.98	212	415
35	6.96	204	404
40	6.95	195	391
50	6.95	178	366
60	6.96	160	340

U_A: redox potential measured against Ag/AgCl-reference electrode 3 mol/l KCl

U_H: redox potential measured against standard hydrogen electrode

Conductivity standard solution (KCl)

T in °C	conductivity in mS/cm		
	0.001 N	0.01 N	0.1 N
10		1.020	9.33
15	0.118	1.147	10.48
18	0.127	1.225	11.19
19	0.130	1.251	11.43
20	0.133	1.278	11.67
21	0.136	1.305	11.91
22	0.138	1.332	12.15
23	0.141	1.359	12.39
24	0.144	1.386	12.64
25	0.147	1.413	12.88
30	0.163	1.552	14.12

参比电极的标准电位
(电位 [mV] 参考标准氢电极)

T in °C	„silver chloride“, Ag/AgCl, KCl				„calomel“, Hg/Hg ₂ Cl ₂ , KCl		
	1 mol/l	3 mol/l	3.5 mol/l	saturated	0.1 mol/l	1 mol/l	saturated
0	249.3	224.2	222.1	220.5	333.8	285.4	260.2
5	246.9	220.9	218.7	216.1	334.1	284.7	257.2
10	244.4	217.4	215.2	211.5	334.3	283.9	254.1
15	241.8	214.0	211.5	206.8	334.2	282.7	250.9
20	239.6	210.5	207.6	201.9	334.0	281.5	247.7
25	236.3	207.0	203.7	197.0	333.7	280.1	244.4
30	233.4	203.4	199.6	191.9	333.2	278.6	241.1
35	230.4	199.8	195.4	186.7	332.4	277.0	237.7
40	227.3	196.1	191.2	181.4	331.6	275.3	234.3
45	224.1	192.3	186.8	176.1	330.6	273.5	230.8
50	220.8	188.4	182.4	170.7	329.6	271.6	227.2
55	217.4	184.4	178.0	165.3		269.5	223.6
60	213.9	180.3	173.5	159.8		267.3	219.9
65	210.4	176.4	169.0	154.3		264.8	216.2
70	206.9	172.1	164.5	148.8		262.2	212.4
75	203.4	167.7	160.0	143.3			
80	199.9	163.1	155.6	137.8			
85	196.3	158.3	151.1	132.3			
90	192.7	153.3	146.8	126.9			
95	189.1	148.1	142.5	121.5			

特殊设计

我们也仅根据您的要求在短时间内制造少数特殊设计的传感器电极。

Some examples for sensors in special design:

- 用于控制堆肥厂的氧气/温度传感器
- 用于特殊应用的电导率电极
- 具有特殊长度的传感器
- 参比电极
- 铂电极
- 金电极

由于使用不同的插头连接器系统，我们的传感器与全球几乎所有测量仪器兼容。

Meinsberg 测量仪器和附件：

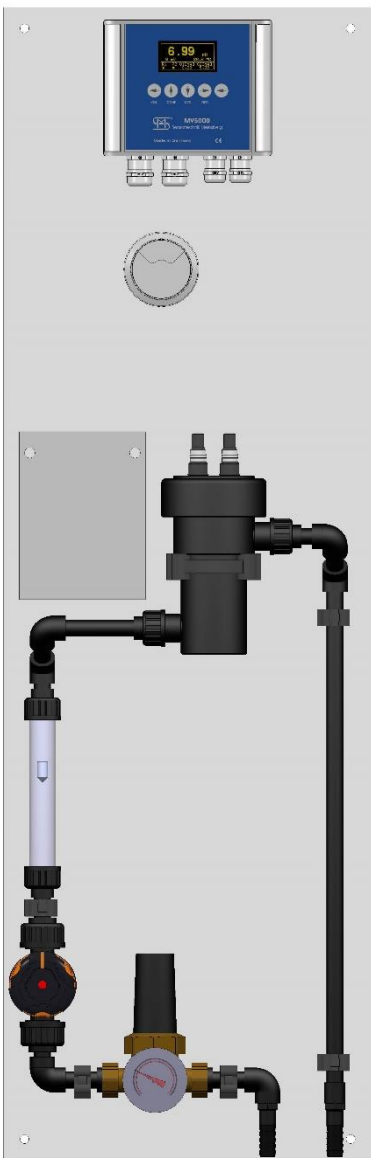
- 实验室多参数系统
- 腐蚀测量单元和恒电位仪/恒电流仪
- 实验室和现场仪器
- pH/氧化还原前置放大器



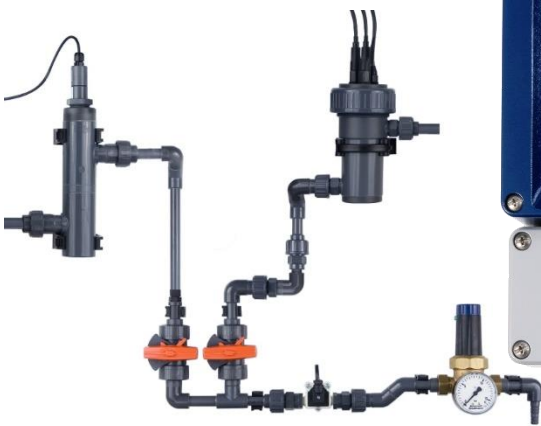
- 发射器和控制器



- 准备好用于饮用水的单参数或多参数系统
- 带保护顶的立柱支架



- 水质测量
- 过程探针组件
- 过程多参数系统



- 1) 植物从根部向上输送水分
- 2) 全球领先的水技术公司

我们是一个全球团队，有着共同的目标：为世界面临的水资源挑战创造先进的技术解决方案。开发能够改善未来用水、节约和再利用方式的新技术是我们工作的核心。我们的产品和服务在公用事业、工业、住宅和商业建筑服务环境中输送、处理、分析、监测和返回环境中的水。Xylem 还为水、电和燃气公用事业提供领先的智能计量、网络技术和高级分析解决方案组合。在 150 多个国家/地区，我们与了解我们的客户建立了牢固、长期的关系，因为我们将领先的产品品牌和应用专业知识强强联合，并专注于开发全面、可持续的解决方案。

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