

Function

The SYCON 2802, based on the SYCON series, is an online analyser for the automatic determination of water parameters using the colorimetric titration method. Adding an indicator to the water sample produces a colour reaction. Depending on the indicator used, the device evaluates the intensity of the colour. The SYCON 2802 calculates the concentration of the water constituent based on the colour change of the sample during the addition of the indicator. The device can only determine one parameter at a time. The parameter and measuring range are determined by the indicator used.

General specifications

Parameters	Value / Range	
Power	(230 VAC version)	100 - 240 VAC (50/60 Hz)
	(24 V AC/DC version)	21.6 - 26.4 V AC/DC (50 Hz)
Power consumption	25 VA (maximum) 8 VA (measurement mode) 3.5 VA (standby)	
Load capacity	Load capacity of relays with internal power supply 1 A from terminals 1 to 4 Load capacity of relays with external power supply 2.5 A	
Protection	Open wall mounting	IP43
	Mounting in housing	IP54
Storage temperature	0 °C - 45 °C	
Ambient temperature	10 °C - 45 °C	
Measured water temperature	5 °C - 40 °C	
Air humidity	20 - 90 % RH (without ice or condensation)	
Inlet water pressure	min: 0.5 bar - max: 5 bar / recommendation 1 - 2 bar	
Inlet water in general	Clear, colourless, free of solids, without gas bubbles	
Water quality requirements for measuring water hardness	pH:	4 - 10
	Iron:	< 3 ppm
	Copper:	< 0.2 ppm
	Aluminium:	< 0.1 ppm
	Manganese:	< 0.2 ppm
	Acid capacity:	KS 4.3 < 5 mmol/l



Note on oxidising agents:

Oxidising agents such as calcium hypochlorite, chlorine, chlorine dioxide, sodium hypochlorite or ozone above the limits permitted in "TrinkwV 2012" attack the dye contained in the indicator and interfere with the measurement. An accurate determination of the water hardness is therefore no longer guaranteed. An activated carbon filter upstream of the analysis device can remove these oxidising agents from the sample water, enabling the water hardness to be determined correctly.

The capacity of an activated carbon filter is depleted during operation. The activated carbon filter must therefore be replaced at regular intervals. The effectiveness of the activated carbon filter can be checked using Caldur® test kits.



SYCON 2802 in detail

Technical data

Parameter	Value / Range	
Installation	Wall mounting in closed rooms	
Dimensions	Without housing:	274 x 275 x 129 mm (W x H x D)
	With housing:	332 x 345 x 190 mm (W x H x D)
Weight	Without housing:	approx. 2.0 kg
	With housing:	approx. 4.0 kg

Analysis characteristics

Parameters	Value / Range		
Measurement method	Titration with colour change		
Measuring range	Total hardness	Carbonate hardness	
	°dH	0.012 - 30	0.3 - 22.5
	°f	0.021 - 53.6	0.5 - 40.2
	ppm CaCO ₃	0.21 - 535.7	5.4 - 401.8
	mmol/l	0.0021 - 5.36	0.11 - 8.04
	°e	0.015 - 38.6	0.39 - 28.9
	°Ж	0.0043 - 10.7	0.21 - 16.1
	The measuring range is defined by the indicator used. The entire measuring range of the total hardness is achieved by using different indicators. <i>(The following units are available for the analysis value: °dH, °f, ppm CaCO₃, mmol/l, °e, °Ж these are shown on the display).</i>		
Accuracy	Measurement accuracy: ± 5% of the maximum measured value of the indicator used Repeatability: ± 2.5% of the maximum measured value of the indicator used Please note: Depending on the ingredients in the water, shifts in the measured value may occur, which affect the measuring accuracy. In such cases, we recommend performing a hardness measurement by manual titration and calibrating the analysis device to this measured value.		
Current interface	± 0.3 mA		
Indicator consumption	Approx. 0.05 - 0.5 ml / analysis, depending on the measured water hardness		
Measuring time	Approx. 3 min, depending on the water hardness and the set rinsing time		
Number of analyses	Approx. 10,000 analyses / 500 ml indicator for soft water. Consumption depends on the measured water hardness and the indicator used.		
Shelf life of indicators	At least 2 years if stored properly (below 25 °C, in a dark place)		
Water consumption	Approx. 1 l/analysis at 2 bar Water consumption varies depending on the inlet pressure and the set rinsing time.		



SYCON 2802 in detail

Inputs/outputs , 24 V AC/DC and 230 VAC versions

Parameters	Value / Range
4 relay outputs	max. 250 VAC / VDC 1 A as potential-free outputs NC/NO The relays provide the following functions: • Limit value alarm 1 • Limit value alarm 2 • Device error • Analysis active with switchable delay time • Indicator message • Sample pump • Maintenance interval
2 signal inputs	Galvanically isolated contact input • Start analysis • Water meter • Flow monitor • Interval reset • Error reset
Analogue output	0 - 20 mA / 4 - 20 mA Resolution: < 100 µA Max. load: 750 Ω
RS-485	Modbus RTU protocol



Register and programming of the interface can be found in the separate manual for Modbus RTU

Maintenance intervals

Interval	Maintenance
Every 6 months	Cleaning the measuring chamber
	 At high ambient and water temperatures or with water containing high levels of organic matter, the cleaning intervals may need to be shortened.
Every 30,000 analyses or after 2 years of operation	Cleaning the measuring chamber (as above) Installation of maintenance kit: Replacement of the peristaltic pump cartridge and seals. Resetting of the maintenance counter.



SYCON 2802 in detail

Indicators for monitoring total hardness

Designation Indicator	°dH	Measuring range ppm CaCO ₃	°f	Item 500 ml bottle	Item 4 x 500 ml bottles
H25-0.02	0.012 - 0.12	0.21 - 2.14	0.021 - 0.214	32-084	32-484
H25-0.05	0.02 - 0.2	0.36 - 3.57	0.036 - 0.357	32-084	32-484
H25-0.1	0.03 - 0.3	0.54 - 5.36	0.054 - 0.536	32-084	32-484 135
H25-0.2	0.06 - 0.6	1.1 - 10.7	0.11 - 1.07	32-084	32-484 145
H25-0.3	0.09 - 0.9	1.6 - 16.1	0.16 - 1.61	32-084	32-484 155
H25-0.5	0.15 - 1.5	2.7 - 26.8	0.27 - 2.68	32-084	32-484 165
H25-1	0.3 - 3.0	5.4 - 53.6	0.54 - 5.36	32-084	32-484 175
H25-2	0.6 - 6.0	10.7 - 107.1	1.1 - 10.7	32-084	32-484 185
H25-3	0.9 - 9.0	16.1 - 160.7	1.6 - 16.1	32-084 195	32-484 195
H25-5	1.5 - 15	26.8 - 267.9	2.7 - 26.8	32-084	32-484 205
H25-10	3	53.6 - 535.7	5.4 - 53.6	32-084	32-484 215

(The following units are available for the analysis value: °dH, °f, ppm CaCO₃, mmol/l, °e, °Ж these are shown on the display).

Indicators for monitoring carbonate hardness

Design Indicator	°dH	Measuring range mmol/l	°f	Item 500 ml bottle	Item 4 x 500 ml bottles
C25-1	0.3 - 7.5	0.11 - 2.68	0.5 - 13.4	32-086	32-486 125
C25-1.5	0.5 - 11.5	0.16 - 4.11	0.8 - 20.5	32-086 135	32-486 135
C25-2	0.6 - 15.0	0.21 - 5.36	1.1 - 26.8	32-086	32-486 145
C25-3	0.9 - 22.5	0.32 - 8.04	1.6 - 40.2	32-086 155	32-486 155

(The following units are available for the analysis value: °dH, °f, ppm CaCO₃, mmol/l, °e, °Ж these are shown on the display).



The measured value to be monitored should be as close as possible to the middle of the indicator's measuring range.

One bottle of indicator is sufficient for approx. 10,000 analyses if the measuring point is in the lower range of the indicator type used.

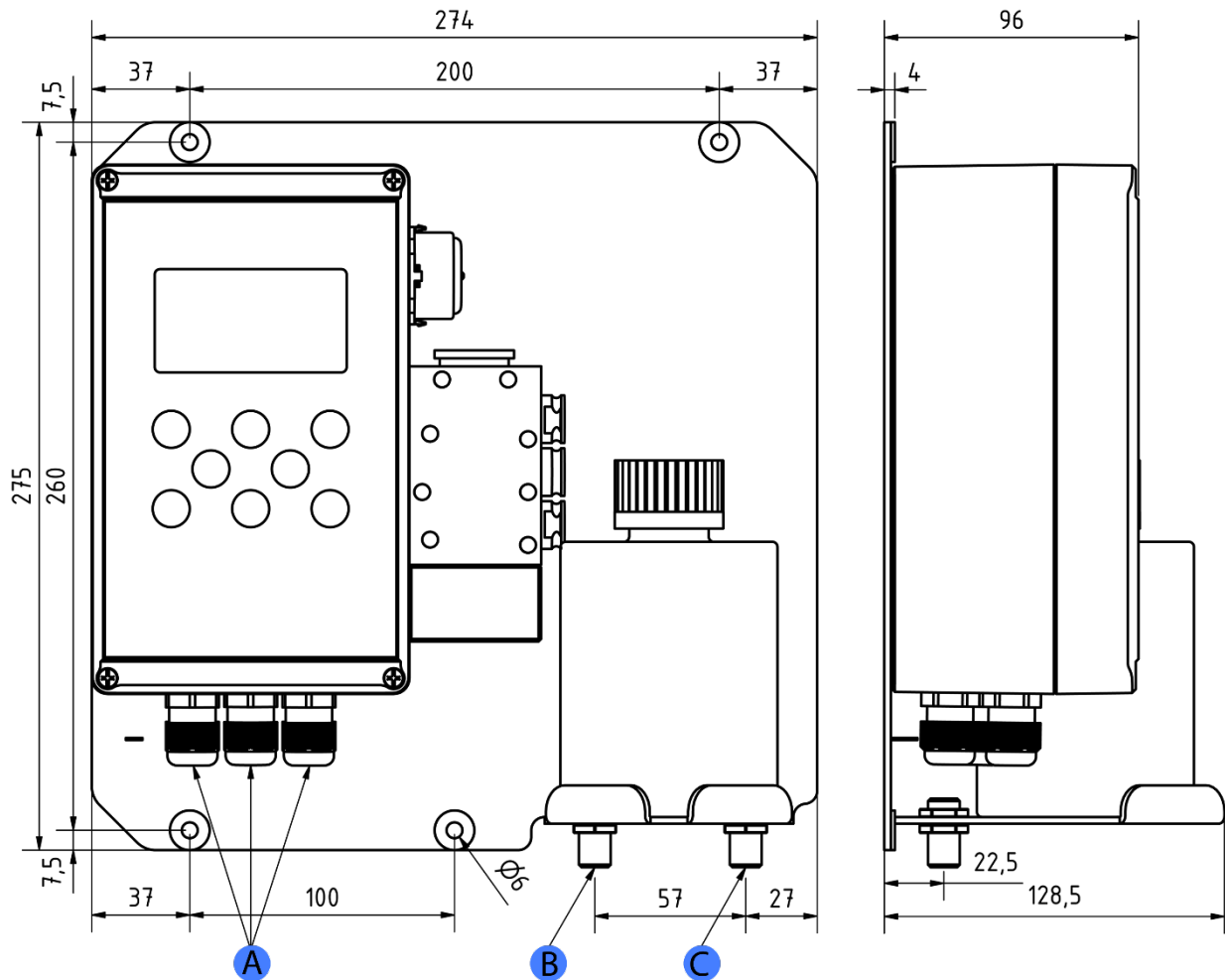
The exact number of analyses possible with one indicator bottle depends on the respective degree of hardness and the indicator used.



SYCON 2802 in detail

Drawing of wall bracket

The SYCON 2802 must be installed upright. The wall bracket has four 6 mm holes for mounting the analyser.



1 : Drilling plan for mounting the analyser without housing

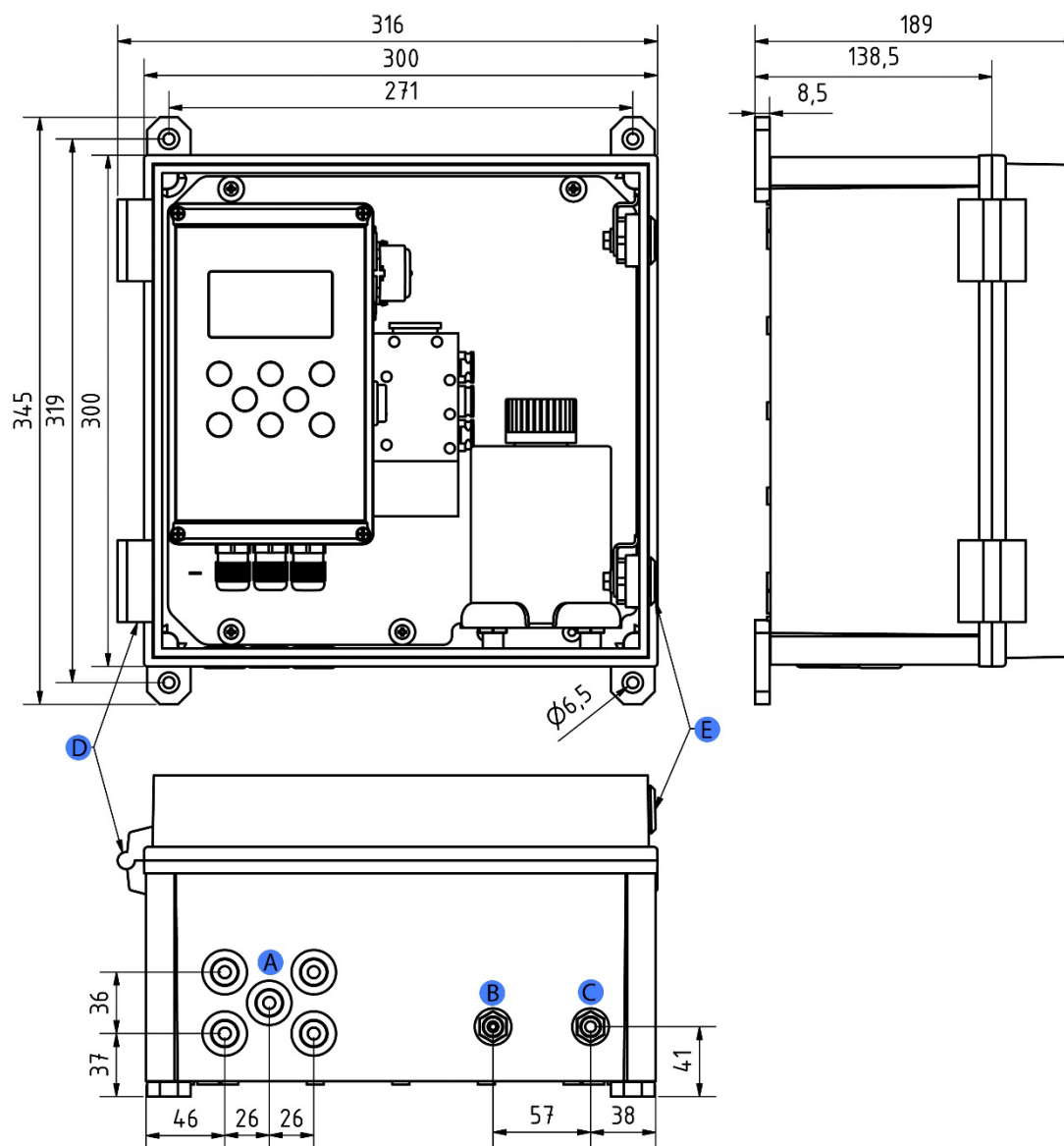
Position	Description
A	Cable glands for electrical connection
B	Water inlet connection for hose with 6 mm outer diameter
C	Water drain connection for hose with 6 mm outer diameter

SYCON 2802 in detail

Wall mounting with housing

The analyser is optionally supplied with a matching housing. The package includes 4 mounting brackets with 6.5 mm holes, which are attached to the rear of the housing.

To open the device, the available space should be at least 450 x 350 mm (W x H).



2 : Drilling plan for mounting the analysis device in the housing

Position	Description
A	Cable glands for electrical connection
B	Water inlet connection for hose with 6 mm outer diameter
C	Water drain connection for hose with 6 mm outer diameter
D	Door hinge
E	Door locks

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