Technical
Information
TI 091C/07/e

Waste water monitoring station *systec CE 35*

Weather-proof measuring station for continuous measurement and registration of pH value, temperature, conductivity, redox, oxygen, turbidity and flow featuring fully automatic waste water sampling

Areas of application
The SYSTEC waste monitoring station is suitable for installation both indoors and outdoors. It includes all components required for measurement, logging and sampling i.e. pipe system, pumps, assemblies, sensors, measuring instruments, recorders, sampling device.

Communal area:
- Sewage plant effluent
- Process optimisation
- Computation of waste water charges for different originators

Industrial area:
- Breweries
- Beverage industry
- Pulp manufacturing
- Milk processing
- Fish farming

Environmental protection
- Water monitoring
- Seep water monitoring (e.g., waste disposal sites)

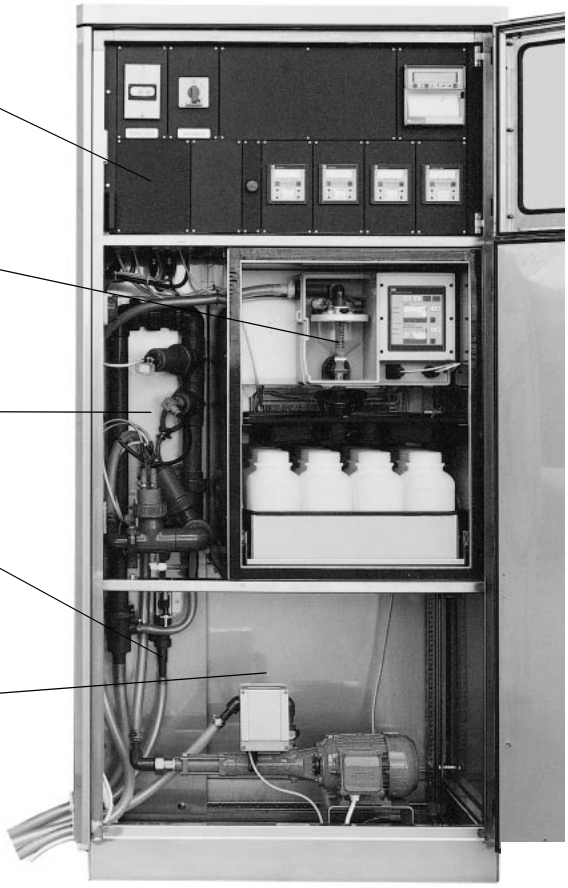
Benefits at a glance
- Continuous measurement of most important parameters: pH, temperature, conductivity, redox, turbidity, oxygen, flow rate
- Uniform operating concept
- Sampling programmable by volume, time or event
- Documentation with maximum value recording, statistical evaluation and daily report for operator log
- Weather-resistant, double-walled, insulated stainless steel thermostatically controlled cabinet assures safe operation under all weather conditions
- Reliable operation due to automatic sensor cleaning, dry running protection, clogging detection
- Can be equipped with an RS 485 interface

Quality made by
Endress+Hauser

ISO 9001

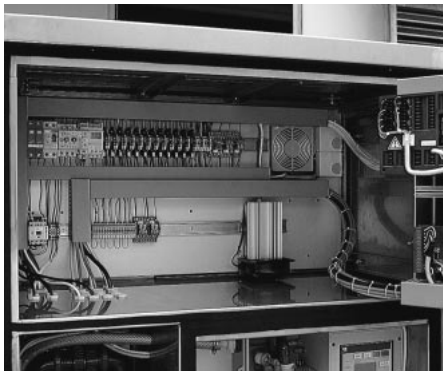
Endress+Hauser
Nothing beats know-how

Design



Basic construction
The base frame of the measuring cabinet consists of rolled special strip steel tubing with a separate perforated strip.
This system forms a stable frame to which all components are anchored.
Advantages:
- Strong base construction, can be transported with a fork lift
- Ring bolts can be installed for transportation
- Damaged exterior parts can be easily replaced
- Adaptable mounting system, ideal for installation of supplementary equipment

Electronics section
The electronic components are clearly arranged in the upper cabinet section.
A heater and cooling fan keep the cabinet at the correct temperature to assure optimal reliability and long service life of all components.
Areas reserved at the front and wiring levels are prepared for convenient installation of additional devices, such as a modem or PLC, etc.



Design

Water is allowed for sensor cleaning in the wet section. Preparations for installing a water cock for fresh water - if available - have been made.

Wet section
The second, completely enclosed area is the L-shaped wet section in the lower left part of the cabinet. The sensors and assemblies are mounted at working height next to the sampler to assure easy access.
The lower part contains the fresh water connection, water cock, cleaning system and blocking detector. An eccentric screw pump has proven to be a good solution for medium supply in most cases. If the cabinet has been ordered with a medium pump, this pump should be mounted in the lower part of the cabinet on the base to be prepared by the operator. The pump is protected against dry running and overload. A thermostat-controlled heater prevents damage due to freezing.

Robust, easy-to-service measuring points
Hygienically perfect: There is no skin contact with the medium during sensor cleaning

The modular design measuring system consists of threaded tubing and assembly elements. Union nuts join the sensor holders to the flow assemblies, tough O-rings provide pressure-tight sealing. The union nut is simply unscrewed and the sensor removed along with its holder for checking, cleaning and routine calibration. The measuring system is pressure-resistant and cannot overflow.

Sampling section
The majority of the electricity consumed by sampling devices is due to cooling. The sampling section of the CE 35 station is located in an encapsulated, insulated box providing dual insulation from the environment, thus reducing operating costs. The thermostat-controlled heating and cooling system allows accurate temperature adjustment (factory setting according to DIN 38 402: 4 °C).

Measured value acquisition

Internal measured value acquisition
The wet section of the "complete measurement" variant includes all the components required to measure the parameter in question:
- Tubing system
- Flow assemblies
- Sensors

The pump automatically draws in the medium to be measured. The eccentric screw pump normally used is equipped with a dry-running protection with a variable shutoff delay to prevent damage to the pump.

From the pump, the measuring water passes through a pipe system with a uniform, large cross section that contains the pressure-tight flow assemblies and sensors.

Advantages:
Uniform cross section guarantees constant flow rate and minimal deposits. Large cross section guarantees insensitivity to soiling.

Float assembly with oxygen measuring electrode

External measured value acquisition
The location of the measuring sensors can be selected for each parameter. In the case of internal monitoring points, the sensors are located in the cabinet. However, it may be necessary to measure outside the cabinet, i.e., directly in the medium (in a tank, channel or pipe).

Examples:
- ☐ Long suction distances may affect the accuracy of oxygen measurement
- ☐ Mechanical pre-cleaning devices may influence medium turbidity

In these cases, the location(s) suitable for measurement and the required sensors, holders or process assemblies can be discussed with our application consultants.

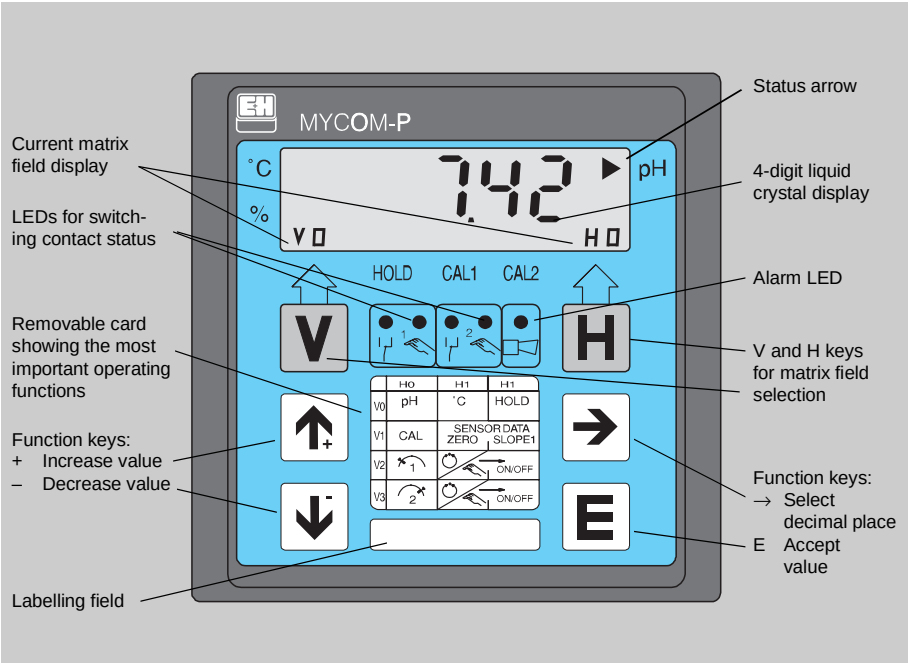
The range of products offered by Endress+Hauser, the largest manufacturer of analytical measuring products for industrial applications, comprises a wide selection of process-oriented sensors and assemblies.

Measured value processing, evaluation and monitoring

Reliability

The measuring transmitters evaluating the signals are independent, autonomous units. The failure of one unit does not cause the complete measuring system to fail.
The comprehensive monitoring functions implemented in the CE 35 measuring station set new standards for reliability.

In addition to general, system-related checks, the individual measurements are checked by self-monitoring functions much like those we offer for sophisticated process measurement applications. This increases operational reliability and is extremely important for safety and environmental protection.



Common features of all measurements:

State-of-the-art microprocessor-based measuring transmitters from the Mycom series

- Large liquid crystal measured value display
- Status and switching status indicators
- Error diagnosis system
- Galvanically separated 0/4 ... 20 mA measuring signal output
- Hold function for calibration and cleaning
- Serial RS 485 interface (option)
- Interference resistance according to NAMUR/IEC 801
- Matrix operating concept

Measured value processing, evaluation and monitoring

pH and temperature measuring system

The pH assembly in the CE 35 station is mounted in a siphon trap arrangement which assures a water level
sufficient to keep the pH electrode wet even when the station is switched off. For cleaning, the water can be drained

The pH measuring transmitter Mycom CPM is equipped with a separate temperature current output. A type XT 150 display unit with two adjustable limit contacts is used for temperature display and monitoring.
The additional XT 150 for temperature display and monitoring is not needed if the pH measuring transmitter with the serial RS 485 is used.

Obligatory:
The Sensor Check System detects cracks and fractures on the electrode

Monitoring

- Electrode status detection with slope and zero evaluation
- SCS = Sensor Check System detects electrode defects such as cracks, breakage, cable defects
- The electrode status data can be read on the instrument or via the interface

Oxygen measuring system

- ☐ Amperometric three-electrode measuring principle with potentiostat (self checking reference system)
- ☐ No zero calibration
- ☐ One-point calibration at the press of a button
- ☐ Automatic temperature and air pressure compensation
- ☐ Membrane-covered sensor
- ☐ No zero current
- ☐ Safe membrane replacement via a bayonet lock

Monitoring

- Self-monitoring of sensor functions (e.g. membrane breakage)

Turbidity measurement

- ☐ 90-degree scattered light method according to ISO 7027/DIN 38404
- ☐ Automatic zero adjustment
- ☐ Input sensitivity is automatically adapted

Air bubbles can render the turbidity measurement inaccurate. The CE 35 station prevents this in two ways:

- Optimal arrangement of turbidity sensor in the upper part of the vertical pipe section. The time the air bubbles dwell in the sensor area is minimal due to medium flow and the bubbles' buoyancy
- An intelligent plausibility evaluation of the measuring signal detects and suppresses air bubble effects

Measured value processing, evaluation and monitoring

Conductivity measurement
The measuring principle and sensor selected are based on decades of experience gained by Endress+Hauser in waste water technology. The conductivity measurement is distinguished by the following features:
- Robust, easy-to-clean sensor
- Soiling-repellent sensor design
- Wide measuring range
- Automatic temperature compensation via built-in Pt 100 sensor

Supplementary measurements
If the parameters listed above do not cover all your individual requirements, Endress + Hauser offer a wide range of supplementary measuring and control equipment that can be integrated in the measuring station at the factory. For example:

- ☐ Fill level
- ☐ Flow
- ☐ Dissolved chlorine
- ☐ Pressure
- ☐ Temperature
- ☐ Humidity
- ☐ Gas detection
- ☐ Controllers

Flow example:
Prosonic FMU 861
Ultrasound measuring transmitter for flow measurement in open channels or at measuring weirs with level registration accurate to the millimetre. The linearisation curves of all commonly used standard channels and weirs are programmed and can be recalled. The flow volume is added up and indicated on the built-in volume flow counter.

Further benefits:
- Creep volume suppression
- Separate storm water indication on external counters
- Volume-dependent control of sampling device

Sampling

Sampling
The sampling system consists of the functional unit **Liqui-Box a** with a distribution unit and bottle holder.
Benefits at a glance:
- ☐ Manual sampling of fluids by pressing a button
- ☐ Automatic sampling controlled by time, volume or event
- ☐ Vacuum principle
- ☐ Pump does not contact fluids
- ☐ Dual protection in metering system Large cross section tubing, minimal risk of clogging

If special demands are placed on sampling, a sampling device **Liqui-Box d** with an extended performance spectrum is available. This control features numerous user programmable functions and can even be adapted to individual conditions by custom software.
Additional characteristics of the Liqui-Box d:
- Volume-proportional sampling via 4 ... 20 mA current input
- 6 switchable sampling programs
- 3 programmable alarm and status signalling relays
- Programmable control inputs
- Plain-text operator guidance

Data registration Data transmission

Measured value registration
Registration and logging can be covered by a wide range of printers and recorders from the Endress+Hauser delivery program, e.g. the three or six channel colour recorder **Mega-Log TN** featuring a star-shaped colour print mechanism and underlaid "safety-line" that continues recording when the colour pens are used up. But the Mega-Log offers much more, e.g.:
- ☐ Evaluation of analogue signals for minimum, maximum and mean values via selectable time periods and periodic printing

The **Memo-Log** data manager registers and stores four analogue measured values on a memory card. This data is additionally evaluated for MIN/MAX and mean value at selectable intervals. Two counter inputs on the Memo-Log permit malfunction logging, e.g. pump failure, clogging or group alarm.
- Credit card-size memory card according to PCMCIA standard
- With RS 485/422 interface
- Measured data evaluation and archiving on a standard PC with a reading device

Data registration Data transmission

Data transmission
The data transmission method chosen depends on several factors:
- Local conditions
- Amount of data to be transmitted
- Transmission speed
- Reliability of transmission

The Systec CE 35 measuring station supports several different transmission methods to cover individual needs.

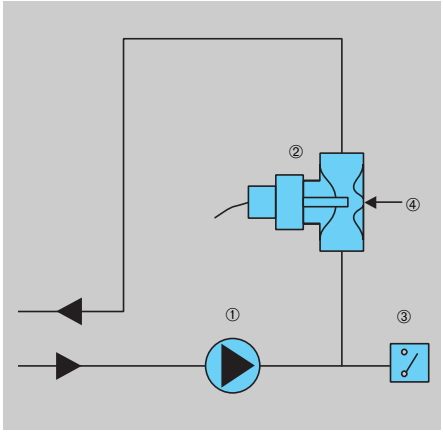
Current signals, contacts
The simplest way to transfer measuring signals and system status is still to lay individual cables for analogue current signals and floating signal contacts. The floating signal contacts and high-performance current outputs (max. load: 600 ohm) guarantee high transmission quality.

Serial data transmission using RS 485
The RS 485 interface offers elegant, high-performance data transmission. The maximum line length is 1 km. A shielded cable with 3 wires is required. All measuring transmitters equipped with an RS 485 interface can be connected directly.

Alarm and other status signalling contacts can be connected to the RS 485 using an interface card. Another advantage of this interface is that it is not restricted to measured value transfer but also allows all instrument parameters to be read and - provided they are variables - changed (for example: measuring ranges, limits, etc.).

Remote waste water monitoring
Data transmission is of particular interest for remote locations, escpecially in water quality monitoring. These applications are best covered by the remote waste water monitoring system. All measured values and system status are acquired and stored by the remote monitoring CPU in the measuring station. The remote monitoring system then transmits the data to the PC in the control room at adjustable intervals. The type of data transmission is universal and can be adapted to local conditions. Possible transfer media are:
- Dedicated line
- Telephone line plus modem
- Mobile radio telephone network

Function monitoring



The blocking detector detects blocking right at the beginning by the pressure increase in the system

① Feed pump
② Measuring point with sensor and possible dirt accumulation
③ Blocking detector
④ Sensor cleaning

Blocking detector
Deposits reducing the tubing cross section are removed by the increased flow rate in the affected places. Dirt, deposits and blocking not removed by the self-cleaning effect can be detected and signalled at an early stage by the blocking detector that monitors the pressure in the tubing. Coarse filtering at the intake is recommended for protection against coarse parts, such as paper, leaves, small branches, etc.

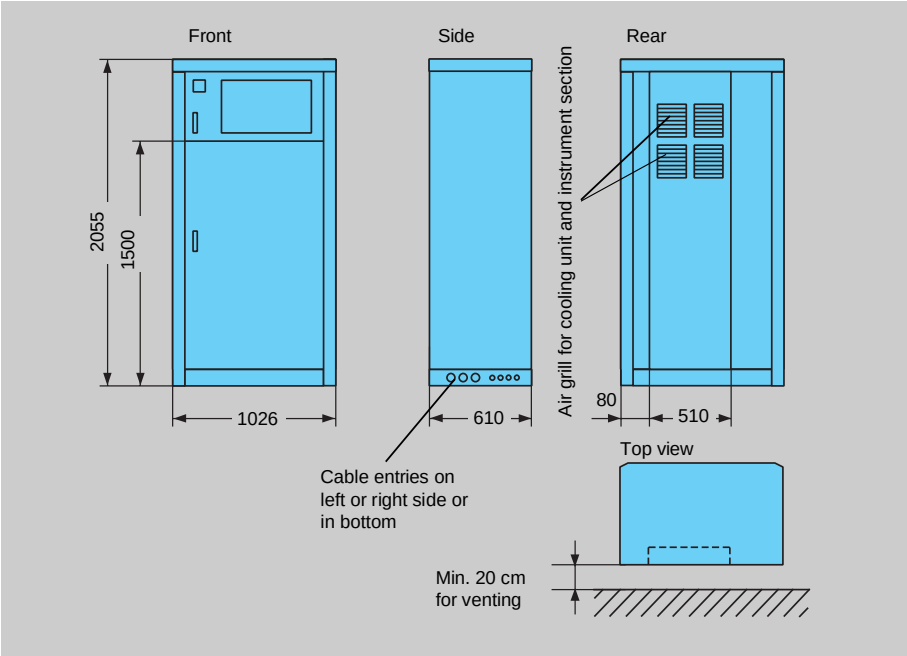
The **group alarm** option provides general information on the function of the entire measuring station. Several faults and monitoring functions are signalled via a single floating break contact, the group alarm contact:
- Fault signalling contacts from all instruments
- Faults in sampling system
- Pump dry running
- Pump motor circuit breaker
- Blocking detector

Additional monitoring functions can be added to the measuring station. For example:
- Door switch (vandalism)
- Safety monitoring functions
- Temperature monitoring (frost protection, heating)

Supplementary documentation

Upon request, we gladly supply separate documents containing detailed and specific information on the measuring cabinet devices described here, for example: sensors, measuring transmitters, sampling devices, recorders, etc.

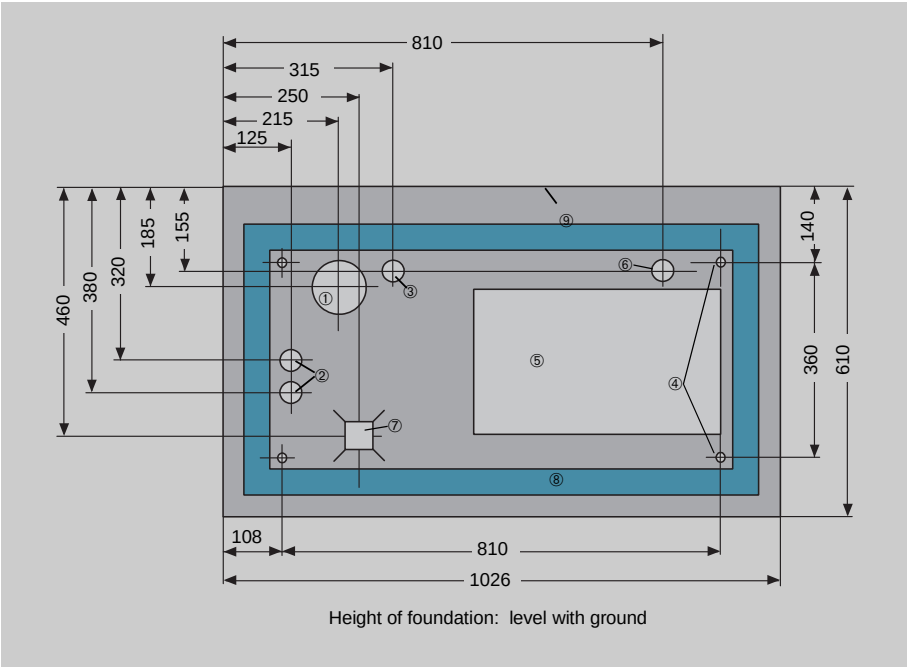
Dimensions Installation



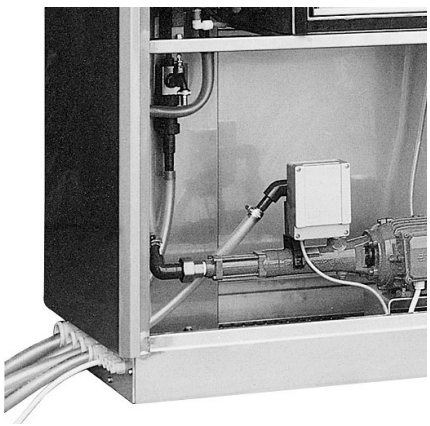
Dimension diagram

Drawing of base

① Measuring water inlet and outlet
② Best position for cable entry from below
③ Fresh water supply line
④ Positions for threaded bolts (M8 x 20) or plugs (M8, 4 x)
⑤ Pump installation area
⑥ Condensed water line from above (cooling unit) Lay hose to drain if required
⑦ Cleaning water drain
⑧ Seal base of switch cabinet towards foundation during installation
⑨ External dimensions of cabinet



The drawing of the base shows practical locations for the drain and cable and tubing entries. Of course, cables and hoses can also be passed through the removable sheet metal blanks provided for this purpose on the right and left sides of the base.
Water spills in the wet section during cleaning and calibration work are normal. In order to make sure this water can run off freely, the place of installation chosen for the measuring station should have a drain with the required gradient. If such a drain exists, the wet section can be hosed off and cleaned.

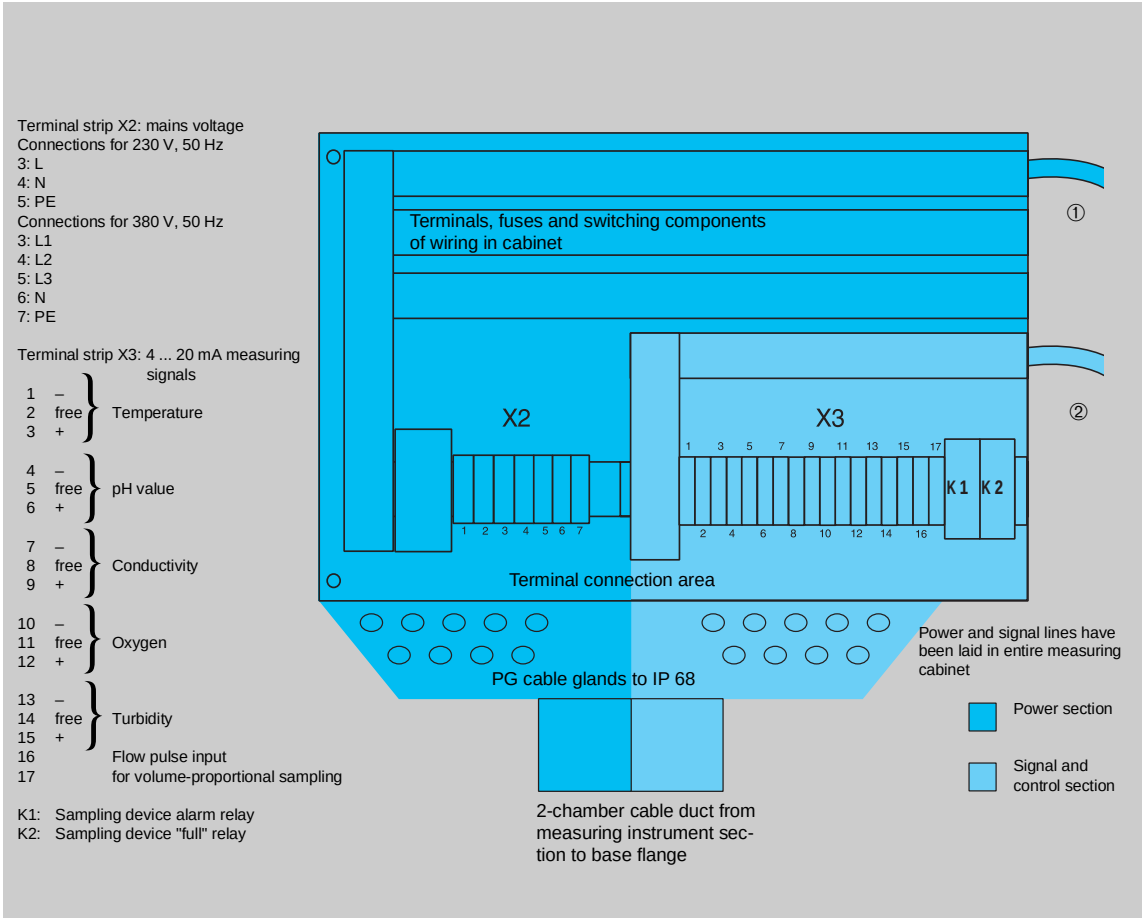


Electrical connections

The measuring cabinet is completely wired internally. All the connections, fuse protection and wiring for recorders and measuring systems are in place. All built-in units are protected by means of disconnector fuse terminals with a signal lamp. The mains cable passes from the wet section through a Pg cable gland to the electronics section where it is connected to a terminal block.

Depending on the mains voltage selected, the following terminals are available:
Mains voltage 230 V:
terminals L1, N, PE
Mains voltage 380 V:
terminals L1, L2, L3, N, PE

Measuring signals, limit contacts and other signals are available directly at the measuring transmitters' plug-in screw terminal strips.



Arrangement of components and terminals on the mounting plate in the electronics section. The drawing shows the fully equipped unit.

Outlets towards front swing frame:
① Power section

② Control and signal section

Checklist for project planning

Electrical
- Power consumption: max. 1500 W
- Meas. signals are available at terminals as 4 ... 20 mA current signals
- Limit and alarm contacts are provided by the instruments in question
- All cables are connected in the electronics section in the top part of the cabinet
- Make sure lengths of connecting cables are sufficient

Physical
- Weight: max. 320 kg
- Plan in a drain for cleaning water drainage as shown in the drawing of the base

Hydraulic
- Protect hydraulic lines from freezing
- Sampling hose should not form a siphon trap; run sampling hose through side wall if necessary

Permissible media
- Prevent entry of coarse dirt particles in the measuring system to avoid clogging
- Abrasive ingredients (e.g. sand, gravel, etc.) may damage the eccentric screw pump
- pH of measuring water should be pH4 ... pH12; more aggressive media may cause corrosion on pump and cabinet

Environmental
- Install weather protection cover when mounted outdoors
- Front should preferably face north (to assure optimal readability of indicators)

Technical data

Application	waste water in neutral range without abrasive ingredients; coarse particles must be prevented from entering the measuring system by selecting a suitable location for sample withdrawal or by installing a coarse filter
Installation	outdoors or in rooms free of aggressive vapours but not in locations subject to explosion hazard!
Protective cabinet	internal special steel frame with mounting hole grid, double outside walls with 30 mm insulation, special steel V2A (1.4301)
Temperature range, ingress protection	–20 °C ... +50 °C, IP54
Voltage supply	400 V/230 V/115 V 50 Hz
Power consumption	
Instruments	max. 163 W
Heaters	max. 640 W
Cooling unit	max. 300 W
Medium pump	370 W
Total power consumption	max. 1500 W
Electronics section	in separate upper part of cabinet, insulated and sealed, fully conditioned by heater and cooling fan; swing frame with measuring instruments and operating elements
Fuse protection	r.c.c.b., all instruments are separately protected
Option	overvoltage protection for voltage supply/current signals
Measuring instruments	separate, independent measuring lines; intelligent microprocessor-based measuring transmitters, Mycom series
Safety functions	error diagnosis system
Measuring signal output	4 ... 20 mA, galvanically separated
Hold function	for calibration and cleaning
Measured value display	7-segment LCD, 4 digits, height = 10 mm
Status indication	LEDs, red or red/green
pH measuring range	0.00 ... 14.00, can be spread as required
pH resolution	0.01 pH
pH electrode	Orbisint
Redox measuring range	0 ... ± 1000 mV
Conductivity measuring range	factory setting: 0 ... 2.0 µS/cm
Conductivity measuring cell	CLS 21
O_2 display range	0 ... 20 mg/l, 0 ... 200 % SAT
O_2 resolution	< 0.5 % of upper range value
Oxygen sensor	COS 3
Turbidity display range	selectable within 0 ... 999.9 ppm or 0 ... 4000 NTU
Turbidity resolution	< 0.5 % of upper range value
Turbidity sensor	CUS 1
Flow measurement	Prosonic FMU 861
Connectable sensors	one Prosonic FDU 8 ... (nom. meas. range 5 ... 25 m)
Analogue outputs	4 ... 20 mA, switchable to 0 ... 20 mA, R_{Lmax} 600 Ω
Registration	6 channels: Megalog type TN-H1AAA00A6111111
or Memo-Log type	4 channels: RD10-HAA 1A1111C0
Memory card	256 kByte SRAM to PCMCIA and JEIDA 4.x
Storage period	max. 6 years
Sampling section	encapsulated, double wall V2A with add. 30 mm insulation
Temperature control	factory setting: 4 °C (adjustable between –5 °C and 28 °C) automatic defrosting of cooling system
Sampling	liqui-box functional unit
Function	intelligent microprocessor-based sampling control for manual, timed, volume and event-controlled sampling
Sample distribution	rotary cock with distribution pan 12 receptacles, each holding 2.5 l (made of PE), convertible to 1 x 30 l, 4 x 10 l, 24 x 1 l
Dosing	volume per sample adjustable from 20 ml to 350 ml
Analysis/wet section	in-line measurement with flow assemblies, with removable electrode holder
Pipe system	PVC, adhered and screwed
Pipe diameter	42 mm (uniform)
Permissible measuring water temperature range	0 ... 50 °C
Pressure resistance	6 bar at 20 °C

Frost protection	thermostat-controlled 300 W heater
Measuring water inlet connection	3/4"
Measuring water outlet connection	1"
Meas. water withdrawal	self-priming eccentric screw pump, continuously operating
Delivery rate	720 l/h
Suction height	5 m
Dry running protection	TSP 010 805
Motor circuit breaker	400 V: 1 ... 1.6 mA/230 V: 1.6 ... 2.4 mA
Blocking detector	Cerabar PTC 133, adjustable pressure switch
Automatic electrode cleaning system	
Cleaning principle	spray nozzles installed in assemblies
Cleaning intervals	user-adjustable via program sequencer

Notes on ordering system

Sampling device:

- ☐ Order option "K" (without sampler): entire sampling section is omitted (sampling control, distributor, bottles, heater, cooling unit, etc.). This version also comes without the encapsulated special steel box that would hold the sampling system.
- ☐ Unless specified otherwise, the options include the "Liqui-Box-a" sampling control.

All measurements:

- ☐ Complete meas.: The measuring cabinet contains all components required for measurement: sensor, assembly, cables, measuring transmitters installed and ready to operate
- ☐ Meas. transmitter: This option is intended for operation with external sensors (e.g., directly installed in tank, channel, water) and only includes the completely pre-wired measuring transmitter

pH and temperature measurement:

- ☐ Equipment: pH and temperature measuring transmitter Mycom with 4 ... 20 mA outputs
  pH indication on measuring transmitter
  Temperature indication on a separate XT 150 display unit
- ☐ If ordered with RS 485, the measuring transmitter does not have the 2nd current output for temperature.
  The separate temperature display unit XT 150 is also omitted.

Mains voltage/pump

- ☐ **Operator-supplied pump means that the pump is not included in the scope of delivery**
- ☐ **Operator-supplied pump, electrical pump protection and terminals provided: the pump is not included in the scope of delivery**
  A motor circuit breaker (1 – 1.6 A for 400 V, 1.6 ... 2.4 A for 230 V) and the terminals required to connect an operator-supplied pump are installed and completely wired.

How to order

Waste measuring station Systec CE 35

Sampling system

K	Without sampling section
M	Sampler with 1 30 l PE container
N	Sampler with 4 10 l PE bottles
O	Sampler with 12 2.5 l PE bottles
D	Sampler Liqui-Box d with 12 2.5 l PE bottles
P	Sampler with 24 1 l PE bottles
Y	Special version

pH and temperature measurement

1	No pH and temperature measurement
2	Complete pH and temperature measurement
4	Complete pH and temperature measurement with RS 485
6	Complete pH and temperature measurement with signal lightning protection
9	Special version

Conductivity measurement

1	No conductivity measurement
2	Complete conductivity measurement
4	Complete conductivity measurement with RS 485
6	Complete conductivity measurement with signal lightning protection
9	Special version

Redox measurement

1	No Redox measurement
2	Complete redox measurement
4	Complete redox measurement with RS 485
6	Complete redox measurement with signal lightning protection
9	Special version

Oxygen measurement

1	No oxygen measurement
2	Complete oxygen measurement
3	Oxygen measuring transmitter
4	Complete O_2 measurement with RS 485
5	O_2 measuring transmitter with RS 485
6	Complete O_2 measurement with signal lightning protection
7	O_2 measuring transmitter with signal lightning protection
9	Special version

Turbidity measurement

1	No turbidity measurement
2	Complete turbidity measurement
3	Turbidity measuring transmitter
4	Complete turbidity measurement with RS 485
5	Turbidity measuring transmitter with RS 485
6	Complete turbidity measurement with signal lightning protection
7	Turbidity measuring transmitter with signal lightning protection
9	Special version

CE 35- ☐☐☐☐☐☐☐☐☐☐☐☐ **⇐ complete order code**

Complete (...) measurement:
All components required for measured value acquisition (flow assembly, sensor, cable, measuring transmitter) are installed in the measuring cabinet and ready to operate.

Measuring transmitter:
These versions of the waste measuring station are only equipped with the measuring transmitter. The sensor, holder, etc., must be ordered separately.

How to order

Waste measuring station Systec CE 35 – continued

Additional measurements
1 No additional measurements
2 Pulse counter for volume registration
3 Prosonic flow-rate meter
4 Mounting position prepared for 144 x 144 mm unit
5 Installation of measuring transmitter provided (DIN dimensions of 96 x 96 or 144 x 144 mm)
9 Special version

Registration
A External registration
B Event printer Primo Event
D 3-channel recorder (pH, T, conductivity)
E 6-channel recorder
F Mounting position prepared for 144 x 144 mm unit
G 4-channel memory card recorder
Y Special version

Mains voltage/pump
2 230 V/operator-supplied pump
3 400 V/operator-supplied pump
4 230 V/eccentric screw pump
5 400 V/eccentric screw pump
6 230 V/operator-supplied pump, el. pump protection and terminals installed
7 400 V/operator-supplied pump, el. pump protection and terminals installed
9 Special version

Electrical cabinet equipment
A Basic electrical system
B Blocking detector
C Lighting, power outlet
D Mains overvoltage protection, lighting, power outlet
E Blocking detector, mains overvoltage protection, lighting, power outlet
F Lighting, power outlet, group alarm
Y Special version

Mechanical cabinet equipment
A Basic V2A mech. equipment, insulated
B Door catches
Y Special version

Cleaning
1 No cleaning system
2 Cleaning with fresh water, manual
3 Cleaning with fresh water, automatic
4 Cleaning with Chemoclean
9 Special version

The measuring station requires a frost-proof service water line with a pressure of approx. 3 bar if the "cleaning" option is ordered.

CE 35- ☐☐☐☐☐☐☐☐☐☐☐☐ **⇐ complete order code**

Accessories

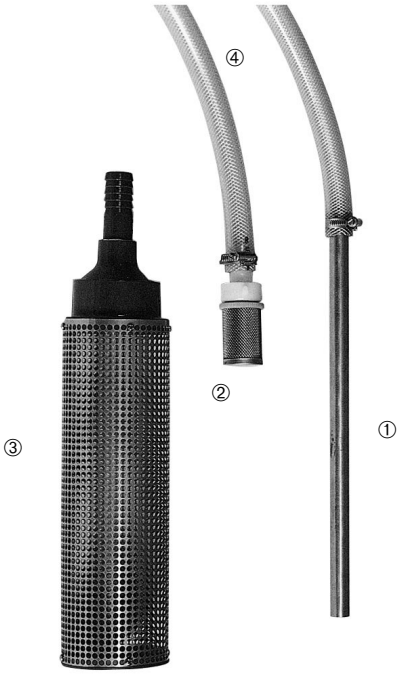
☐ **Weather protection cover**
Order no. 500 618 14
For additional protection when station is installed outdoors
Material: stainless steel

☐ **Intake lance with rotatable mount and ¾" mounting flange for measuring water withdrawal**
Order no. 500 662 16
With ¾" hose connector, mounting flange
Ø 12 cm,
with 3 holes (Ø 11 mm)
Material: stainless steel 1.4301
Lance:
Length: 1.16 m

☐ **Intake hose end pipe** ①
Order no. 500 662 02
Pipe adding weight at intake site:
Outside: Ø 19 mm
Inside: Ø 16 mm
Length: 40 cm
Material: stainless steel 1.4301

☐ **Measuring water filter** ③
Order no. 500 662 10
Coarse particle filter at intake site, 4.5 mm mesh, with ¾" hose connector
Dimensions: Ø 9.5 cm x 43.5 cm
Material: PVC,
stainless steel 1.4301

☐ **Sampler filter** ②
Order no. 500 662 12
Coarse particle filter at sampler intake, 1 mm mesh, with ¾" hose connector
Dimensions: Ø 4 cm x 11 cm
Material: PVC,
stainless steel 1.4301



☐ **Intake hose** ④
Order no. 500 662 14
for measuring water and sampler, spiral reinforcement, ¾"

☐ **Drain hose**
Order no. 500 662 15
for meas. water, fabric reinforcement, 1"

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