

Model PA-CSB COD sample digester systems

Equipment configuration for simultaneous digestion of up to 6 or 12 COD samples according to EN/DEV and ISO 6060. Systems consist of the following components:

- Microprocessor-controlled TRS 300 time/temperature regulator with COD program
- Precision heating block CSB/E for RG2 vessels
- Holding frame E/B for RG2 sample vessels
- Cooling bath KW/N with mounting for E/B frame
- Sample vessels RG 2
- Air-cooled condensers LK 1
- Condenser stand LS for LK condensers

Article	Order No.
PA-CSB 6	80 48 80000
COD digester system for up to 6 simultaneous samples	
① PA-CSB 12	80 48 80001
COD digester system for up to 12 simultaneous samples	



①

Model PB-CSB/M for complete COD analysis

Complete workstations for simultaneous determination of up to 6 or 12 COD samples according to EN/DEV and ISO 6060. Manual reagent addition and titration.

A workstation consists of the following:

- Microprocessor-controlled TRS 300 time/temperature regulator with COD program
- Precision heating block CSB/E for RG 2 vessels
- Holding frame E/B for RG 2 sample vessels
- Cooling bath KW/N with mounting for E/B frame
- Multi-position magnetic stirrer SM 12/N to fit vessel frame E 12/B (only with PB-CSB 12/M)
- Sample vessels RG 2
- Set of 12 magnetic stirrer bars MRST 2
- Boiling chips SIST 100, 100 g
- COD air-cooled condenser LK 1
- Condenser stand LS for LK condensers
- Set of 12 PTFE std. taper joint sleeves PTFE 29
- Transport carrier TS CSB for vessel frame E/B
- Manual titration station HT 1

Article	Order No.
PB-CSB 6/M	80 48 80002
Complete COD workstation for up to 6 simultaneous samples	
② PB-CSB 12/M	80 48 80003
Complete COD workstation for up to 12 simultaneous samples	



②

COD heating blocks only in conjunction with controller TRS 300

Precision heating blocks for 6, 12, or 24 samples. Surface heating for particularly even temperature distribution over all sample positions. Enclosure made of powder-coated steel and stainless steel. Non-hazardous temperatures of the enclosure surface thanks to the sophisticated insulation of the heating block.

Continuous grooves in the floors of the bores simplify sample handling and increase user safety:

- The grooves provide pressure compensation when the sample vessels are inserted. Thus, even precisely fitting vessels are easy to insert in the bores for user-friendly handling of the vessel frame.
- Traces of fluids on the outer walls of the sample vessels evaporate instantly when the samples are inserted into the heated block. The grooves discharge the steam and prevent glass breakage as a consequence of cracked vessels.
- In case of vessel overflow, the sample will flow off through the grooves, reducing the risk of acid damaging the heating block.

Technical data:

	CSB 6/E	CSB 12/E	CSB 24/E
Sample positions:	6	12	24
Maximum temperature:	299°C	299°C	299°C
Power consumption:	800 W	1500 W	2000 W

Article	Order No.
CSB 6/E	10 48 21006
COD acc. to ISO Precision heating block thermostat for 6 test tubes RG, 20 – 300°C	
③ CSB 12/E	10 48 21012
COD acc. to ISO Precision heating block thermostat for 12 test tubes RG, 20 – 300°C	
CSB 24/E	10 48 21024
COD acc. to ISO Precision heating block thermostat for 24 test tubes RG, 20 – 300°C	



③

Programmable Temperature and Time Controller TRS 300

Programmable controller for behrotest® digestion blocks

behr single-button operation for particularly fast and easy programming. Menu in local language. 10 freely configurable programs for block temperature and digestion time. The TRS 300 has a special, factory preset CSB program (chemical oxygen demand of water/ COD). In CSB/COD mode, it heats to a temperature 20°C above the specified setpoint temperature. After sample insertion, the setpoint temperature increased by 20°C is retained for another 6 minutes. This procedure ensures compliance with the ISO specification of heating to 148°C within 10 minutes, and simultaneously provides for an extremely constant temperature during the subsequent reaction process. With the Windows software comprised in the delivery, the user can transmit application-specific time/temperature profiles through the RS232 interface bi-directionally between one or several units (TRS 300) and one PC. Furthermore, the RS232 interface allows for transmission of temperature data from the unit to the PC while the unit is operating. If required, the data may be saved and printed out in form of a diagram.

In case of short-circuits or temperature sensor failure, the connected units will be switched off by means of the integrated safety functions.

Article	Order No.
④ TRS 300	10 48 20300
Temperature and time controller, microprocessor-controlled unit, up to 10 temperature-and-time combinations can be programmed	

behrotest® Manual Titration Station HTI 1

The manual titration station HT1 consists of

- a burette with digital display, and
- a magnetic stirrer with accurately frame for COD sample vessels.

A screen is used as a neutral background, allowing the user an accurate identification of the color change at the end of titration. Thus, the user carries out all titrations under similar optical conditions, increasing the accuracy and reproducibility of the results. The exact positioning of the sample vessel in the rack on the top of the magnetic stirrer also contributes to this result. The inclined side panels of the screen provide an additional protection from lateral glare. COD pursuant to ISO, EN, and DEV.

Technical data:

Voltage:	230 V AC/115 V AC
Frequency:	50/60 Hz
Weight:	approx. 3.5 kg
Dimensions in cm (W x D x H):	approx. 33 x 20 x 60

Article	Order No.
⑤ HTI 1	10 48 30300
Manual titration station, with digital burette and magnetic stirrer	

Boiling Stones

behrotest® boiling stones are made from a ceramic material. Compared to conventional boiling stones made of glass, they provide optimum protection against defervescence due to their porosity and their shape, even with badly blended samples.

behrotest® boiling stones are chemically pure and guarantee unadulterated results when determining the COD.

Article	Order No.
⑥ Boiling stones, content 100 g	80 48 30700

Automatic COD Metering Unit DS 20

Metering unit to automate and accelerate the metering of potassium chromate solution and sulphuric acid when preparing COD samples. Metering in a maximum of 12 samples simultaneously. Integrated series magnetic stirrer with 12 sample places.

- Metering in optimal time intervals: The metering of sulphuric acid is carried out in several processes, the samples are thus constantly cooled and stirred. This method accelerates the preparation of samples and at the same time prevents non-standard overheating of the samples during addition
- Safety for the user: Due to the automatic addition of reagent there is no risk at any time of coming into contact with chemicals
- Practice-oriented and user friendly software: The complete programming of the behr DS 20 is very easy to use and user-friendly with the Windows user interface

Article	Order No.
⑦ DS 20	10 48 24402
for up to 12 samples simultaneously, incl. burettes and cooling trough	



Fully automatic metering unit/titrator DT 20

Dosing:

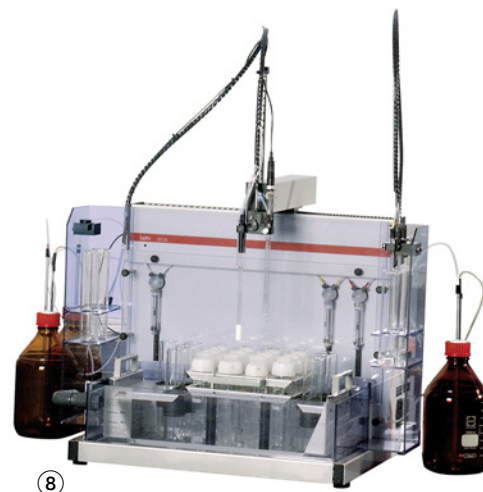
Time-optimized COD interval dosing. The metering of sulphuric acid is carried out in several processes, the samples are thus constantly cooled and stirred. This method provides for faster sample preparation while preventing a non-standard overheating of samples during addition.

Titration:

Freely programmable „methods“, f.e. end point titrations, equivalence point titrations, linear, dynamic, and quasi-dynamic titrations. Different, password-protected user levels. Graphic printout with 1st and 2nd derivative. Freely selectable printout of sample data. Compliance with all national COD standards is possible with the „methods“. Instead of the commonly known over-titration, the behr-specific dynamic titration guarantees the exact end-point recognition, even in the case of the typical COD edge steepness, and thus particularly accurate test results.

Safety for the user: Due to the automatic addition of reagent there is no risk at any time of coming into contact with chemicals.

- Practice-oriented and user friendly software: The complete programming of the behr DS 20 is very easy to use and user-friendly with the Windows user interface.



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Article	Order No.
8 DT 20	10 48 24420
Fully automated dispensing and titration for COD specification pursuant to ISO. Simultaneous dispensing and titration in maximum 12 samples. Automatic extraction of the titrated samples. Particularly easy and user-friendly operation with Microsoft Windows user interface with Access database for further processing of sample data.	

COD cooling trough

The cooling trough prevents the overheating of the COD samples during the critical addition of sulphuric acid. In addition, it is used to cool the samples after the heating phase. COD acc. to ISO, EN and DEV.

Article	Order No.
Cooling trough for E 6/B insert frame	10 48 30042
Cooling trough for E 12/B insert frame	10 48 30043
Cooling trough for 2 E 12/BV insert frames	10 48 30044
Insert frame for 6 vessels E 6/B	10 48 30001
Insert frame for 6 vessels E 12/B	10 48 30002
Insert frame for COD 24/E and autom. COD dosing/titrator unit E 12/BV	10 48 30003
Stands for 6 COD air coolers LS 6	10 48 30051
Stands for 12 COD air coolers LS 12	10 48 30052

Series magnetic stirrer for COD cooling trough

The continuously adjustable COD series magnetic stirrer with 12 stirring points is used to mix the samples during the metering process. Due to its watertight casing and also its external power supply and control, it is suitable for use under water.

Article	Order No.
Series magnetic stirrer for E 12/B insert frame	80 48 30048

COD metering funnel

The COD dosing funnel is placed on top of the COD reaction vessels. It simplifies the simultaneous addition of sulphuric acid to several samples. Combined with a cooling trough and a serial magnetic stirrer, it greatly improves safety and reliability and significantly eases the user's workload.

Article	Order No.
9 Metering funnel, 30 ml, for sulphuric acid	80 48 30200

HCl-absorber

To expel chloride, e.g. when determining the COD of sea water.

Article	Order No.
10 HCL absorber to expel chloride above 1000 mg/ltr. (without stopper)	80 48 30071



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