viscosity

HIGH-PRESSURE CAPILLARY RHEOMETER PVT 500

012.01.6

GÖTTFERT
THIS IS RHEOLOGY

Contents

Introduction

The test device is used to determine the material-specific dependence of the specific volume of pressure and temperature. Measurements can be made at pressures of up to 2500 bar. The innovative air cooling system allows temperatures up to 500 °C and cooling rates up to 30 K/min.

These data are particularly important for the simulation of injection molding processes.

Furthermore, the measurement results allow a precise description of the shrinkage behavior during the cooling phase in extrusion.

Optionally, the determination of the thermal conductivity can be extended.

This test device is the result of more than 50 years of experience gained with the preceding numerous generations in the field of rheological capillary rheometry.

The technical highlights

- Constant high piston force 20 kN
- Test barrel diameter 9.5 mm, maximum pressure 2500 bar
- Dynamic speed range: 0.0001 - 30 mm/s (0.006 – 1800 mm/min)
- Position acquisition by high resolution encoder (0.000053 mm)
- New air-cooling system, cooling-rate max. 30 K/min
- Integrated tempering jacket
- PVT measurement isobaric or isothermal
- Optimized test chamber, low heat supply necessary

Additional features of the PVT 500:

- Windows database software “LabRheo” for parameter setting and online monitoring via Ethernet, as well as free definable test evaluation with “WinRheo II”
- Start up, test data recording and current status indication via integrated 14.48 cm (5.7“) color-QVGA-touch screen
- Compact and service friendly design with easily accessible components
- Temperature range up to 500 °C, temperature control algorithm, resolution 0.01 °C
- 5 temperature calibration data sets each with separate control parameters for optimal adaptation over the full temperature range
- Integrated timer for automatic heat up
- Electrically heated test chamber
- Drive torque monitoring and display
- Infinitely variable manual piston drive control
- Automatic test data acceptance and setting of the next specification value after stabilisation of test data
- Thermal conductivity measurement TCM (optional)
- Script-Generator for automated measurement of PVT/TCM measurements
- Power supply 1 x 230 V (three-phase is not required)

Application

The test device is used to determine the specific volume of the same sample as a function of temperature and pressure, the so-called PVT measurement method.

The measurements can be either isobaric or isothermal.

For a PVT measurement, the test barrel must be closed at the lower end.
A defined quantity of test material is filled into the test barrel and melted in the heated test cylinder.

Afterwards, the material is compressed with a test piston and the piston force is changed at constant temperature (isothermal PVT measurement).

For isobaric PVT measurements, the material is also compressed with a test piston and the temperature is changed at constant piston force.

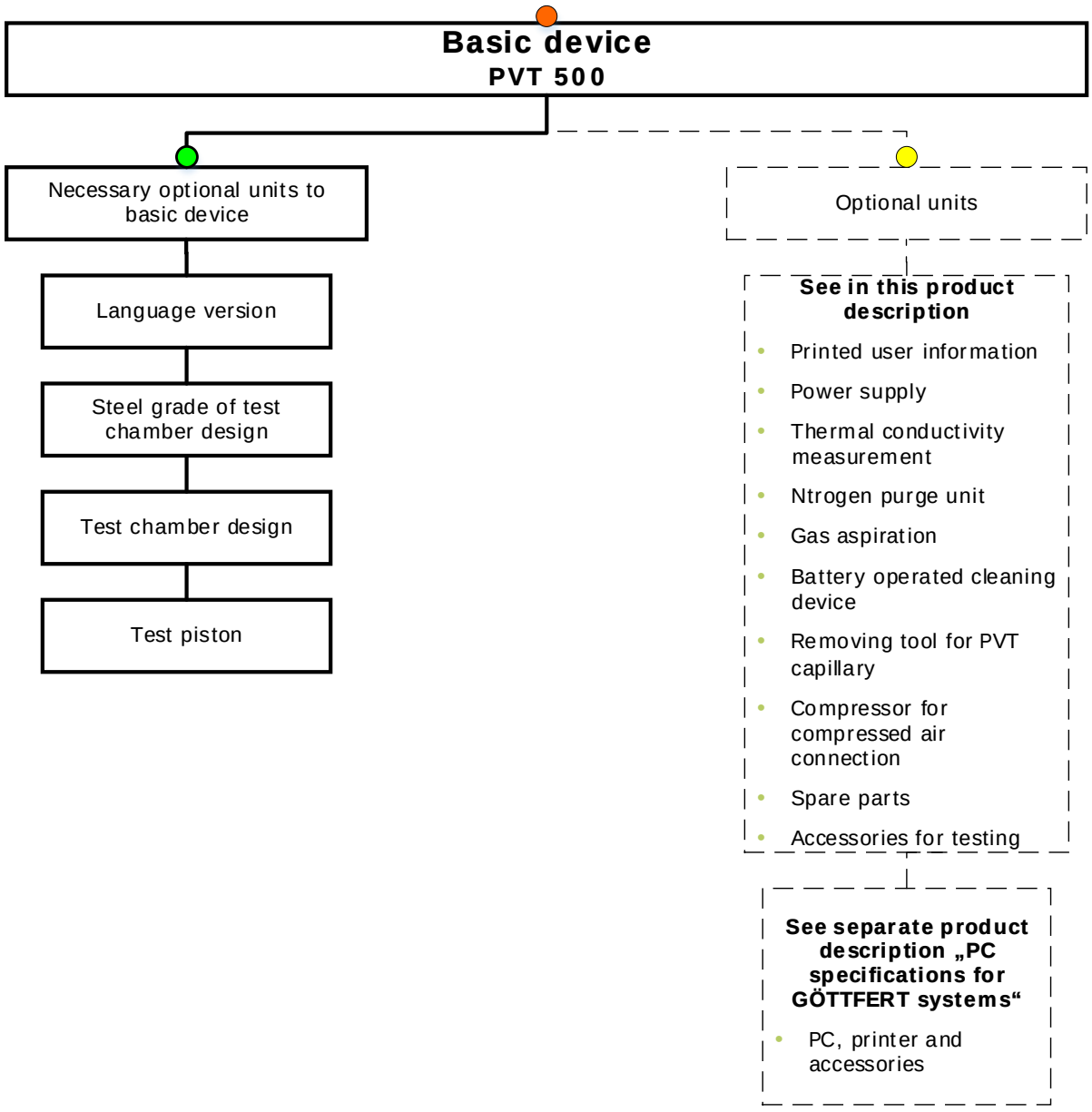
The resulting volume change is recorded via the change in position of the piston and displayed in PVT diagrams.

Especially for injection molding simulation calculations, the determined data can be further processed with the Tait evaluation.

The PVT 500 is used in research and development as well as in quality and incoming goods inspection.

Important: Because of the high temperatures hazardous melt gases can be produced during the measurement. Therefore a suitable, sufficiently dimensioned exhaust system is necessary at the installation sight.

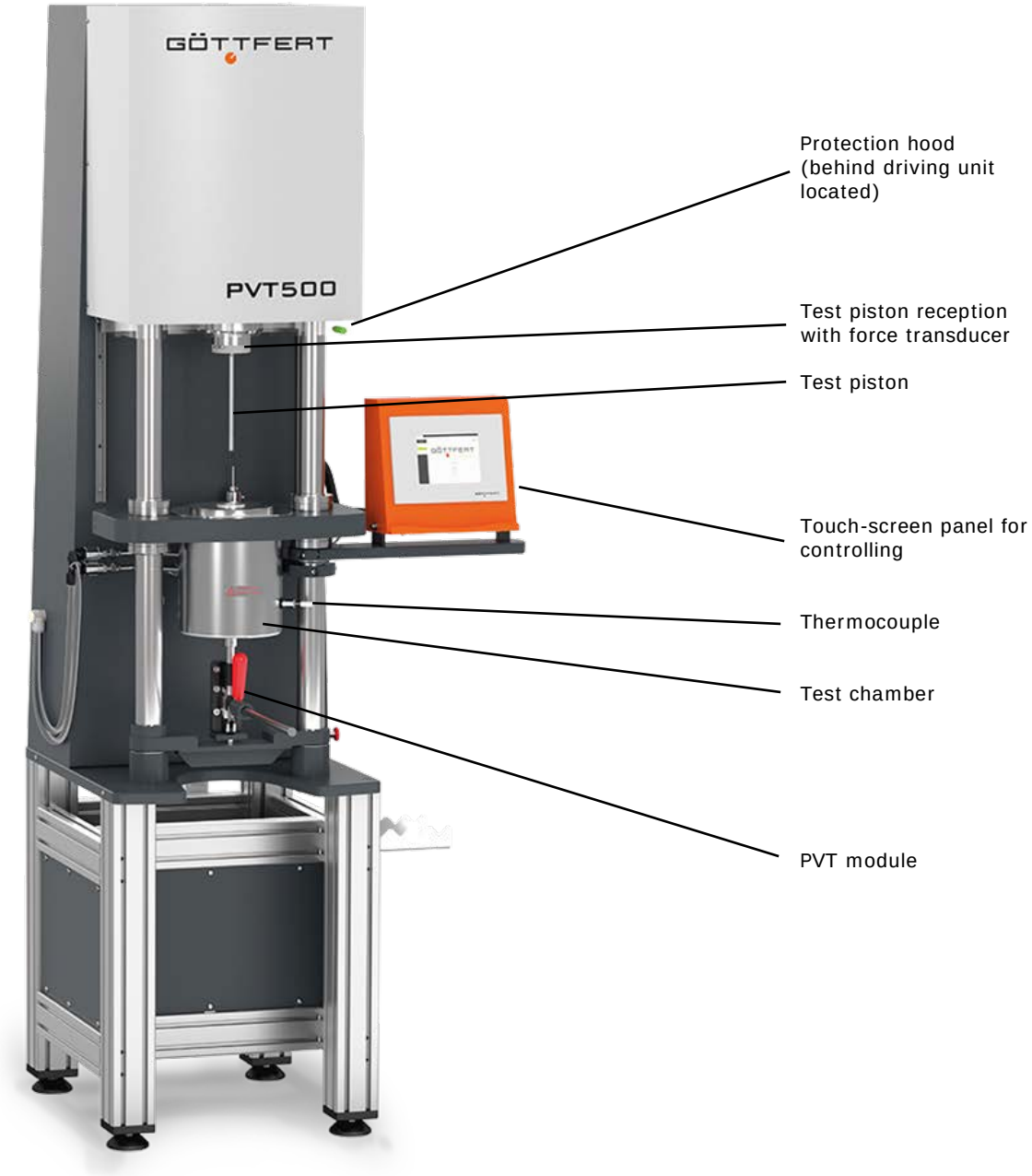
Device configuration



Legend:

Basic system	
Necessary options:	These options are required in addition to the basic unit
Optional units/Follow up units:	Choice of measurement enhancing additional sub systems

Set-up



Picture: Overall view of PVT 500

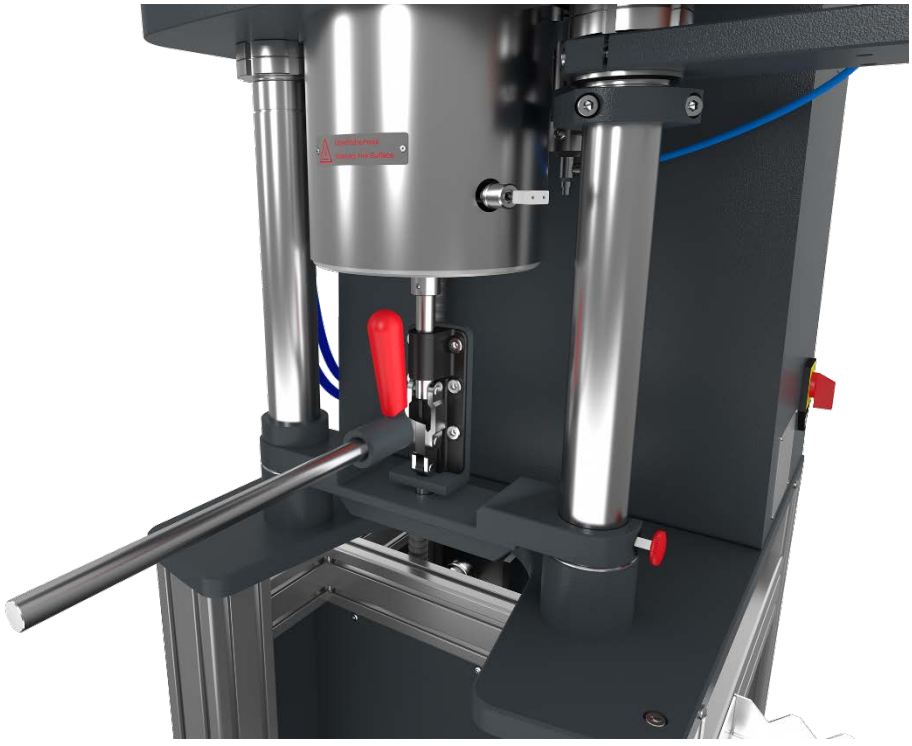
The PVT 500 consists of the following components:

Machine body
The stable construction of the machine body ensures, that the occurring high test forces are absorbed reliable. Test chamber, electronics and test piston drive are located separately.

Test piston drive
The test piston drive is made via a ball thread spindle, activated by a servo motor with a toothed belt drive.
Toothed belt drive, ball thread spindle and cylinder rod are located in one housing. The cylinder rod guiding is free of lubricant.

Test chamber heating
The test chamber temperature is controlled by a special temperature control algorithm. The resolution of the set temperatures is 0.1 °C. During the test, the temperatures are displayed on the screen with a 0.01 °C resolution.

PVT Module
To close the test barrel for the PVT measurement. Consists of locking lever, cross bar, capillary nut L=20, capillary L/D=12/1, capillary nut wrench.



Air cooling
Air cooling system to cool down the test chamber. Cooling rate max. 30 K/min.

Thermocouple
To measure the temperature at the barrel entrance.

Force transducer 20 kN
Incl. Test piston reception

Controlling
A panel PC with real time processing system controls the device. All service operations at the device can be handled via touch-screen display (14.48 cm (5.7“), QVGA color).
The connections of the digital and analogue I/O units are performed via CAN bus, additional units are connected by RS232. The test device is connected to the PC via Ethernet.

Safety system

- Polycarbonat-protection hood (transparant) to cover the dangerous zone around the test piston according to EN ISO 12100:2010 risk assessment and analysis; EN ISO 14119:2013 locking mechanism connected with separating protection units; EN 953:1997/A1:2009 separating protection units. For cleaning and filling of the test barrel the hood can be opened. The piston can move only, when the hood is closed

- Test piston overload detection via torque and force transducer monitoring

- Touch protection of hot test chamber via reflector cover

PC-Software LabRheo and WinRheoII
With the PC program “LabRheo” the setting of parameters, the performance of the measurements, as well as the evaluation of the raw data can be carried out by data bases.
The advanced rheological evaluation is performed with the established Software “WinRheo II”.
Further details, as well as requirements of the PC you will find in the separate product descriptions “LabRheo” and “WinRheo II”.

Technical Data

Standards	
Standards	ISO 17744 ASTM D5930 (optional) ISO 22007-1 (optional)

Test chamber	
Test chamber	Single barrel system

Test barrel	
Geometry	9.55 mm + 0.01 mm
Length	170 mm
Option	Corrosion-, wear- and acid resistant design

Test piston	
Geometry	9.53 + 0.01 mm
Length	200 mm
Option	Interchangeable Corrosion-, wear- and acid resistant design

Capillaries	
Length Diameter Ø	12 + 0.005 mm Ø 1 ± 0.005 mm
Material	Carbide
Cleaning temperature	Max. 550 °C

Control	
Local	via Touchscreen PC, heating and material extrusion without PC connection possible
PC (Option)	LabRheo Program, WinRheo2 Program, connection via LAN

Heating	
Temperature range	5 °C above room temperature up to 500 °C (932 °F)
Sensors	Pt100 1/3DIN
Heater circuits	2
Controller	Special algorithm
Resolution	0.01 °C
Variation over time in usable range	Less ± 0,2 °C
Spatial distribution in usable range (0-70 mm before the capillary)	60 up to 300 °C: < 0,5 °C 301 up to 400 °C: < 1,0 °C

Drive	
Motor	Servo drive with high resolution EnDat interface
Resolution position	0.000053 mm
Lowest speed	0.0001 mm/s (0.006 mm/minute)
Highest speed	30 mm/s (1800 mm/minute)
Motor force range	20 kN permanent

Position correction
To increase accuracy, the elasticity / deformation of the frame, drive train and force transducer is calculated and automatically corrected as a function of the piston force during PVT measurements.

Force transducer	
Range	20 kN
Accuracy	0.4 % in 1 % - 100 % of the nominal range, 0.8 % < 1 % of the nominal range
Resolution	0.005 %
Force transducer	automatic zero calibration

Power supply	
Voltage	1x 230 V AC (1L + N + PE) Other variants of power supply on request. In case of deviating standard power supply, an additional isolating transformer box is supplied.
Tolerance	+10 % / -14 %
Frequency	50 Hz - 60 Hz
Protective earthing	Earth resistance less than 5 Ohm
Short-time breaks	less than <10 msec
Power consumption	Approx. 3600 VA
Important: Please note that a residual current circuit breaker (RCD) connected in series in the company network must be a selective RCD. In addition, this should also be clarified in advance with your local network operator.	

Compressed air supply Chamber cooling	
Compressed air connection	6 to 10 bar; 900 l/min
Nominal width	Min. 9 mm
Compressed air quality	Filtration grade 5µm or finer, Water- and oil-free, according to ISO8573-1:2010 (6:4:4)
Compressed air consumption during cooling	approx. 500 l/min at 4 bar approx. 600 l/min at 5.5 bar

Ambient conditions	
Ambient temperature	+ 10 °C up to + 40 °C
Air humidity	max. 90 % not-condensing
Protection class	IP20

Sound pressure level	
Sound pressure level	< 59 dB (A)

Dimmensions	
Width	710 mm
Depth	800 mm
Height	2000 mm
Weight	approx. 350 kg (basic test device without options)

Frame (Test chamber)	
Machine stiffness (essential for PVT measurements)	130 kN

Finish	
Machine body	Anthracite grey RAL 7016
Hood	Light grey RAL 7035
Display housing	Pure orange RAL 2004

Protection	
Protection hood	Transparent plastic protection hood with non-contact safety contact to cover the hazardous area
Test piston	Test piston overload detection
Touch protection	Touch protection of hot test chamber via reflector cover

Calculations for options
Thermal conductivity

Export functions
Export to Excel®, tables and graphics with copy paste to MS Office® or other programs via clipboard

Note
Please pay attention to the fact that the device is equipped with microprocessors. In order to guarantee a trouble free operation, the power supply must be free of interferences. Should there occur any interference you have to connect line filters resp. mains stabilizers on line side.

Supplied accessories

PVT 500

1	User information (available on serviceCONNECT)
1	CD-ROM „LabRheo“
1	CD-ROM „WinRheo II“
2	Transport rails
2	Keys for main switch
1	Patch cable (LAN)
1	Touch Screen Stick for PDAs
1	Mirror for magnetic base
1	Feeder
1	Shovel
1	Can of graphite paste
1	Pair of tweezers
1	Brass brush
1	Reel of cleaning tape
1	Quick release coupling and hose socket for compressed air connection
1	Tool tray
1	Mains cable
1	Pair of heat protection gloves size 9
1	Reference material (500 g)

Order information

Basic device

PVT 500
Basic device consists of:

- Power supply 230 V / 50-60 Hz
- Machine table
- PC-Software “LabRheo”
- PC-Software “WinRheo II”

Order number 5.33.5200

Necessary optional units to basic device:

Language version

Markings and user information* in the selected language.

English Version
Order number 5.33.502

German Version
Order number 5.33.501

*** Standard scope of supply user information:**

- Operating manual
- Technical documentation
- Program documentation (Software)
- Calculation basis

The documentation included in the scope of delivery is supplied exclusively in English or German. Further languages on request.

Note:
Any further order related documents are available on request. Invoicing will be made at actual effort/expense basis. Please contact us for details.

Digital user information

Please note that the user information is provided digitally on our "serviceCONNECT" service platform. This must be downloaded! For a printed version of the User information, see section "Printed User information".

Steel grade of test chamber design

You can chose among 2 test chamber designs made of “steel grade 3” and “steel grade 4”. Each of them is equipped with a test barrel set D 9.55 mm of the same material grade.

Steel grade	Hardness	Abrasion resistance	Acid resistance	Temperature range / Test material
Steel grade 3	★★★	★★★	★★★★	Up to 500 °C, e.g. PVDF (up to 250 °C), PVC, PLA, Bio Polymers
Steel grade 4 (Standard)	★★★★★	★★★★★	★★★	Up to 500 °C, e.g. PEEK, and >30% glas fibre filled PA6, PPT and PP

★ = less suitable
★★★★★★ = very good suitable

Please contact us for more details.

Test chamber designs

The complete test chamber consists of the test barrel-set including compressing piston prepared for the installation of the following test pistons. Please order the test pistons separately. Cleaning tools according to the type of steel grade and tool for exchanging the sealing ring are included, too.
The test chamber is electrically heated via a temperature controller with 2 heating circuits, temperature range up to 500 °C. The chamber is equipped with a tempering jacket made of hardened steel.

Test chamber design steel grade 4
Incl. test barrel-set diameter 9.55 mm steel grade 4
Order number 5.33.520

Test chamber design steel grade 3
Incl. test barrel-set diameter 9.55 mm steel grade 3
Order number 5.33.521

Test Piston

Corresponding to the test barrel set the suitable (material specific) test piston must be selected during new- or retrofitting order procedure.
The test piston must fit to the test barrel. Important is not only the diameter and the length, but especially from which material (steel grade) both parts are made from. Both parts must be made from the same material.

The **test piston with teflon sealing** (PTFE with 60 % bronze content) is especially suited for low viscose medias, like polyolefines, partly also polyamids, polycarbonates and polyester with a melt temperature higher than 120 °C. The recommended temperature range is from 100 … 300 °C, the length is 200 mm.
Recommended steel grade: Several possible

The **test piston with vespel-sealing** is especially suited for technical plastics, for example LCP, PPS, PEEK and PFA. The recommended temperature range, were the test material is in melt phase is between 300 and 480 °C, the length is 200 mm.
Note: The vespel-sealing is a wear part and must be exchanged in exceptional cases after each measurement.
Recommended steel grade: Several possible

Test piston Ø 9.5 mm with 2x teflon sealing, steel grade 4
Order number 5.33.5110

Test piston Ø 9.5 mm with vespel-sealing, steel grade 4
Order number 5.33.5111

Test barrels are also available in the steel grade 3.

Load factor for test piston

Depending on the steel grad and diameter

Steel grade	Test piston diameter (mm)
	9,55
3	18 kN 2500 bar
4 (Standard)	18 kN 2500 bar

○ Additional optional units

Printed user information

A complete set of printed user information, each in a DIN A4 ring binder. The user information is also available as download on serviceCONNECT.

English version
Order number 5.33.504

German version
Order number 5.33.503

Further languages on request.

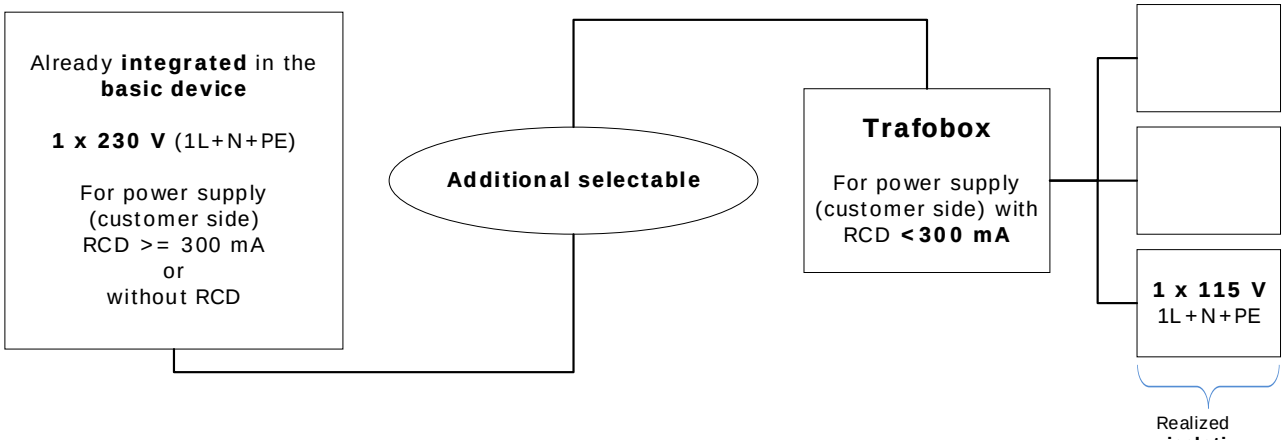
Power supply

As standard, the PVT 500 is supplied with an already integrated power supply of 1 x 230 V (1L+N+PE).

This mains connection is suitable for a power supply* (customer side) with a residual current circuit breaker (FI / RCD (with leakage current> = 300 mA)).

Optionally can be selected:

- Trafo box with a customer-supplied residual current circuit breaker <300 mA leakage current and other supply voltage (see graphic).



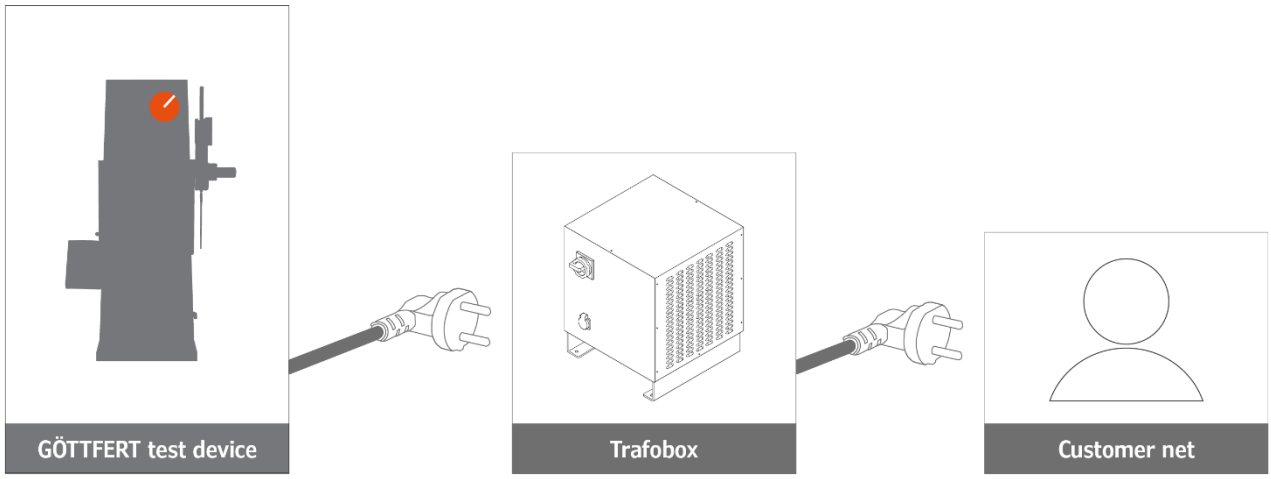
By using an isolating transformer, operation in a primary network with residual current device (RCD) < 300 mA is possible.

Scope of delivery:

- Isolating transformer
- Housing (IP54 or IP23) with main switch, transformer protection switch, insulation monitoring, Protective contact socket as well as mains connection cable.

Note:
Please note that a fuse "Characteristic C" must be available when connecting a transformer box to the customer network! Clarify this in advance also with your local network operator!
(N) = The neutral conductor can be connected by the customer. This is not necessary, because the transformer provides the neutral conductor for the test device.

Layout



Example view for power supply connection

Power supply 1 x 230 V, 1L+N+PE, 50/60 Hz

Technical Data	
Input voltage	1 x 230 V AC (1L +N + PE)
Frequecy	50/60 Hz
Permissible voltage fluctuations	+/- 10 % (permissible range: 207V…253V)
Output voltage	1 x 230 V AC (1L + N + PE)
Power consumption (primary side)	

Dimensions Trafobox IP23	
Width	
Depth	
Height	
Order number	On request

Dimensions Trafobox IP54	
Width	
Depth	
Height	
Order number	On request

Power supply 1 x 200 V, 1L+N+PE, 50/60 Hz

Technical Data	
Input voltage	1 x 200 V AC (1L +N + PE)
Frequecy	50/60 Hz
Permissible voltage fluctuations	+/- 10 % (permissible range: 103,5V…126,5V)
Output voltage	1 x 230 V AC (1L + N + PE)
Power consumption (primary side)	4000 VA

Dimmensions Trafobox IP23	
Width	
Depth	
Height	
Order number	On request

Dimensions Trafobox IP54	
Width	500 mm
Depth	500 mm
Height	600 mm
Order number	5.30.507

Power supply 1 x 115 V, 1L+N+PE, 50/60 Hz

Technical Data	
Input voltage	1 x 115 V AC (1L +N + PE)
Frequecy	50/60 Hz
Permissible voltage fluctuations	+/- 10 % (permissible range: 103,5V…126,5V)
Output voltage	1 x 230 V AC (1L + N + PE)
Power consumption (primary side)	

Dimmensions Trafobox IP23	
Width	
Depth	
Height	
Order number	On request

Dimensions Trafobox IP54	
Width	
Depth	
Height	
Order number	On request

Other power supplies available on request.

Thermal conductivity measurement

Simulation in industrial processing like injection moulding is commonly used to optimize moulded parts. Rheological and PVT-data from the plastic or elastomer materials are used to simulate flow and shrinkage during the process. Also for optimizing heat transfer the data for thermal conductivity are necessary. Where heat transfer is not fully optimised cycle times can be longer than necessary and hot spots can occur leading to high scrap rates. Further rheological and PVT-data are temperature dependant where deviations in the simulated temperature history due to inaccurate thermal conductivity data can result in deviation of calculated flow lines and shrinkage.
The data for thermal conductivity are generally determined far from processing conditions or an expensive additional device for measurement is necessary. Here the thermal conductivity probe for the PVT 500 is a good value option.

TCM Electronic
Elektronic- and Wiring works
Order number 5.33.512

TCM Test piston
Test piston for thermal conductivity measurement (D=9.5 mm)
Order number 5.33.511

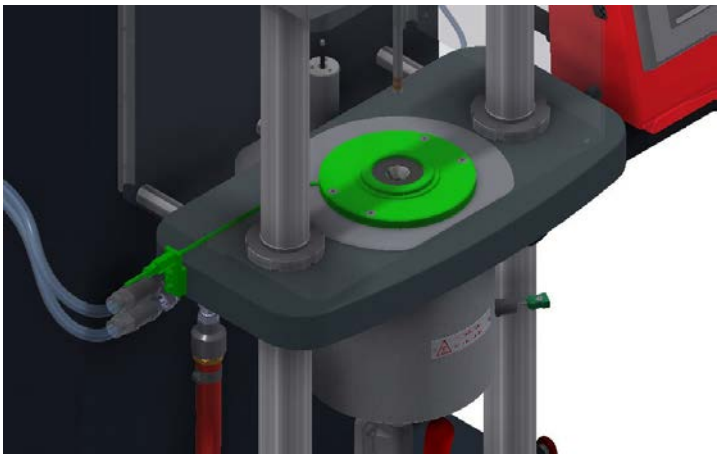
TCM Software
Software for thermal conductivity measurement
Order number 6.91.1001

Important: The test piston for thermal conductivity is designed for a maximum pressure of 100 bar!

Nitrogen purge unit

To attach to the feeding bore of the test chamber. Consisting of a clamp ring with connection part for the nitrogen gas. The testing material has to be conditioned and fed by the customer.

The nitrogen purge unit is incl. pressure controller.
Please note that the nitrogen must be provided by the customer.
Note that the min. inlet pressure is 0.3-3 bar.

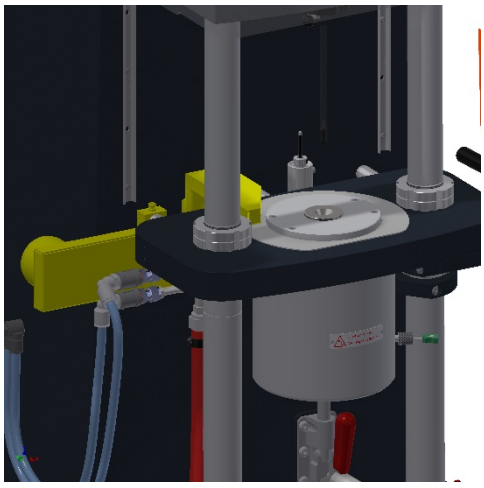


Picture 1: Nitrogen purge unit PVT 500

Nitrogen purge unit
Order number 5.33.513

Gas aspiration

During measurement it is possible that health concern gases can be occurring (depends of temperature and test material). To reduce this considerably, we recommend the use of aspiration, possibly with filter system. The exhaust connection has a diameter of 70 mm and the room volume behind the protection hood above the test chamber is approx. 80 dm³.



Picture 2: Gas aspiration above the test chamber

Gas aspiration above the test chamber
Order number 5.33.5036

Battery operated cleaning device

With the following cleaning tools the cleaning of the test barrel can be performed faster and easier as when comparing to the manual cleaning devices, especially for hard and sticky testing materials.

Angled cleaning device (accu-driven)
For an easy cleaning of the test barrel. A coupling to attach the cleaning sets is integrated:
Technical data:

- 12 V nominal voltage
- 0-800 min-1 idling speed
- Torque 12 Nm
- Clock/counter clock wise rotation
- Overload protection
- Weight 1.1 kg

The delivery contains:

- 1 Accu charger 220-240 V
- 2 Spare accumulators 12 V; 1,5 Ah
- 1 Coupling

Order number 5.11.180

Angled Cleaning device (accu-driven)
Identical with order number 5.11.180, but in 115 V design.
Order number 5.11.181

Cleaning tools

Cleaning brush with coupling part
Steel version, for the pre-cleaning of the test barrel, with coupling part for the pneumatic cleaning device and the angled cleaning device (accu driven)

Order number 5.03.188

Cleaning piston
Brass brush with hinge part, for cleaning the test barrel with the cleaning
tape or the tape blanks. The delivery contains also the coupling part, as well as the insert with spin for the pneumatic cleaning device and the angled cleaning device.

Order number 5.03.189

Cleaning tape and cut pieces

Cleaning tape (nature)
Recommended for all RHEOGRAPH devices for cleaning of standard polymers.

- Material: 100 % cotton, nature, coil design
- Rough surface structure
- Width 50 mm, length 100 m
- Thickness approx. 0.4 mm
- Maximum temperature influence: 350 °C
- Maximum residence time at Tmax: 5 seconds

Order number 4.50.749

Cleaning tape (nature, soft)
Identical as 4.50.749, but design „soft“
The tape design is a bit softer and more suitable for specific testing materials.

- Material: 100 % cotton, nature, coil design
- Rough surface structure
- Width 50 mm, length 100 m
- Thickness approx. 0.4 mm
- Maximum temperature influence: 350 °C
- Maximum residence time at Tmax: 5 seconds

Order number 4.50.764

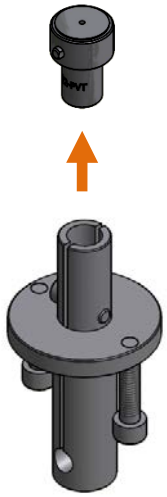
Steel wool
Recommended for cleaning specific testing materials in temperature ranges, where the upper described cotton material can not be used anymore.

- Very elastic, long-fibered and tear resistant
- Not damage to the test barrel
- Maximum temperature influence: 500 °C
- Maximum residence time at Tmax: 20 seconds

Order number 1.43.112

Removing tool for PVT capillary

For easy removing of PVT-Capillary with strongly adhering test materials



Removing tool for PVT capillary
Order number 5.32.295

Compressor for compressed air connection

External compressor for air cooling of the PVT 500.

Technical Data:

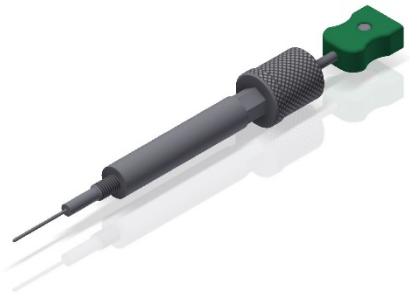
• Model:		780-90
• Boiler size (L):		90
• Boiler pressure (bar):		10
• Suction capacity (L/min):		780
• Delivery quantity (L/min):		520
• Rotation speed (U/min):		1200
• Sound pressure level LWA/dB:		97/78
• Motor KW/PS:		4/5,5
• Volt/HZ:		400/50
• Dimensions	(mm):	1070 x 390 x 800
	(inch):	42 x 15 x 31
• Weight	(kg):	85
	(Pounds):	187

Mobile reciprocating compressor for PVT 500
Reciprocating compressor for compressed air connection of the PVT 500
Order number 4.60.038

Spare parts

Thermocouple

To measure the melt temperature at the inlet of the capillary a thermocouple NiCr-Ni Type K `class 1´ is used. Melt temperature fluctuations are recorded very accurately as the remaining wall is very thin.



Thermocouple „Type K“
Thermocouple for PVT 500

Order number 5.33.638

Sealing ring for test piston

Necessary as replacement for worn sealing rings.

PTFE-sealing
based on **Teflon** (PTFE with 60 % bronze content) is especially suited for low viscose medias, like polyolefines, partly also polyamids, polycarbonates and polyester with a melt temperature higher than 120 °C. The recommended temperature range is from 100 … 300 °C, depending on polymer (e.g. PEEK) temperatures to approx. 400 °C can also be reached.
Note: The PTFE-sealing is a wear part and must be exchanged in exceptional cases after each measurement.
Order number 5.33.5106

VESPEL-sealing
especially suited for technical plastics, for example LCP, PPS, PEEK and PFA. The recommended temperature range, were the test material is in melt phase is between 300 and 400 °C. Note: The vespel-sealing is a wear part and must be exchanged in exceptional cases after each measurement.
Order number 5.33.5114

Tool for changing the sealing

Tool for changing the sealing
Tool for changing the test piston sealing (D=9.5 mm)
Order number 5.29.993

Accessories for testing

Reference material
PE granules M80064 (1 kg) for checking and verification of the correct test data acquisition.
The delivery includes the specification for melt index testing devices as well as the one for the high pressure capillary rheometer.

Order number 4.58.302

Heat protecting gloves
Heat isolation up to 350 °C, high cut resistance.

Size 7
Order number 1.44.218

Size 9
Order number 1.44.217

Safety glasses
Very comfortable to wear, good adaptability by multi adjustability, glass made from high-impact polycarbonate, colour: orange/dark blue

Order number 1.40.131

PC, Printer and Accessories

For visualization and for the operation of GOETTFERT testing devices personal computers (PC's), with the Microsoft Windows® operating system, are used.

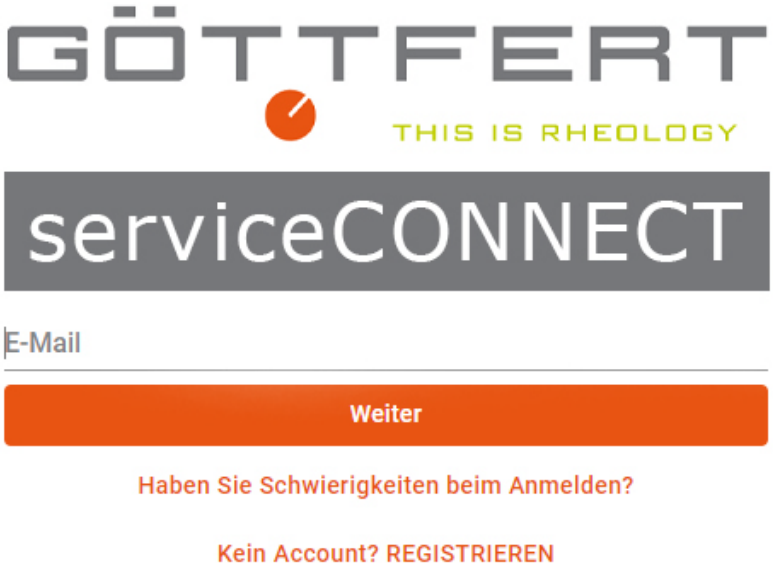
Details and closer information you will find in the separate product description "PC Specifications for GOETTFERT systems".

Service platform serviceCONNECT

serviceCONNECT is a platform for your GÖTTFERT testing instrument. The service solution enables our users to send service requests for the test equipment to the GÖTTFERT customer service quickly, easily and specifically.
After a simple registration you will have an insight into many service topics around your testing device and will benefit from our High Quality Service.

- Preferred service processing
- Quick and easy registration of your test device
- Easy and fast communication with chat and video function
- Direct line to our service experts
- Documents related to the device, e.g. operating manual, circuit diagrams, spare parts lists available for downloading

For more information about serviceCONNECT, please visit our homepage at
https://www.goettfert.com/services/serviceconnect



Note: In order to take advantage of the best possible and fast service from GÖTTFERT, we recommend immediate registration with serviceCONNECT when a test device is put into operation.

Note

PC hardware

GÖTTFERT GmbH provides full warranty for the function of machines that have been supplied as complete system that means with PC and printer by GÖTTFERT. PC means generally the complete system comprising of PC, monitor, keyboard, interfaces, mouse and if applicable joysticks.
Principally, we do not give a functioning guarantee for connecting externally supplied PCs and printers (non-GÖTTFERT supply).

If the customer provides the PC by himself, GÖTTFERT cannot guarantee the troublefree functioning of PC and GÖTTFERT unit. Service work, which will be essential due to appearing problems in regard to configuration, serial interfaces, connection cables, communication etc. do not belong to the warranty obligations and will therefore be invoiced on an actual expense basis.

The PC must be sent to GOETTFERT prior to final inspection.
The final inspection test in house GOETTFERT of the relevant rheometer will be performed only with the customer PC, which will be used onsite for operation, to guarantee a trouble-free operation of the total system. In order to being able to prepare the PC best possible for operation with the rheometer, please make sure that the PC is sent to GOETTFERT on time.

Some GÖTTFERT devices require the application of PC extension cards. By default they are executed in full construction height, consequently the application of a mini Tower PC is necessary. If the customer provides a PC in „Small-Form-Factor“ format by himself, then low profile extension cards have to be used.
Please refer with the order if a PC with low profiles extension slots shall be used! GÖTTFERT is checking if low profile cards are available for the requested application and will offer these extension cards. Please specify the brand and type of the used PC when placing the order!

Due to the various printer executions that are available on the market, we do not give any function guarantee for printers not supplied by GÖTTFERT. Support for possible adjustments will be charged on an actual expense basis.

PC operating system and configuration

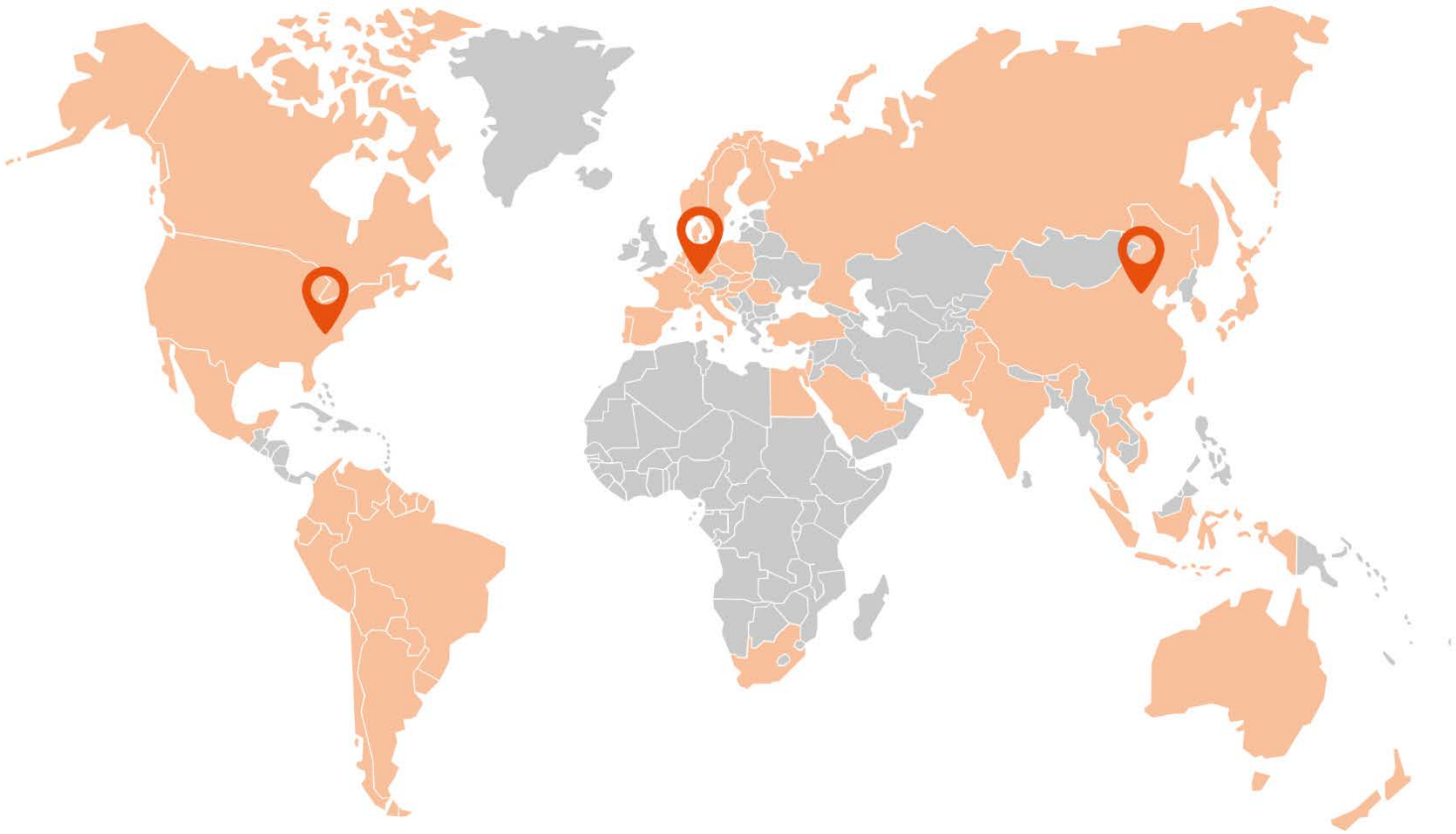
The PC with Microsoft Windows operating system is delivered by GÖTTFERT with Windows standard settings. The operator is responsible for the security settings (anti-virus, firewall, update, etc.) and their functionality and must ensure that they are properly set up. Please note that the PC can restart itself with the standard settings of the Windows Updates. This can interrupt a running measurement.
GÖTTFERT does not assume any liability for malfunctions caused by Windows security settings!

LAN configuration

The required IP addresses have to be provided at the latest on the day of commissioning if you want to integrate the test machine, the PC or the printer into your network. Let your IT ensure that the network is configured accordingly.

All data are based on rated voltage and standard frequency as well as a surrounding temperature of +20°C (+68 °F).
Subject to change due to technical developments.
Images may deviate from the original.

THIS IS RHEOLOGY



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