

آگهی مناقصه عمومی

پتروشیمی امیرکبیر در نظر دارد یک دستگاه رنومتر کاپیلاری را خریداری کند . لذا از کلیه اشخاص حقیقی و حقوقی واجد شرایط دعوت میگردد ظرف مدت 10روز کاری از تاریخ چاپ آگهی نسبت به ایمیل درخواست خود به H.SORI@AKPC.IR اقدام نمایند .

* تمامی پیشنهادات فنی باید به مهر و امضای شرکت ارسال کننده رسیده باشد.

توجه مهم :

1- شرکت های پیشنهاد دهنده باید ORGIN کالا و همچنین سازنده تجهیز و همچنین ترم پرداخت و ترم تحویل و مدت زمان تحویل درخواست فوق الذکر را در پیشنهاد فنی خود مشخص نمایند.

2- بدیهی است به پیشنهاداتی که موارد فوق را رعایت ننمایند ترتیب اثر داده نخواهد شد.

3- شرکت تامین کننده بایستی قابلیت نصب و راه اندازی در محل پتروشیمی امیر کبیر و تعهد آموزش عملیاتی و قابلیت خدمات پس از فروش و تامین قطعات یدکی و گارانتی دستگاه را داشته باشد.

شایان ذکر است پس از بررسی پیشنهادات فنی موارد به اطلاع شرکت های ارسال کننده پیشنهادات اعلام خواهد شد.

درخواست خرید / ساخت

APDRe - 0040365



شرکت پژوهش‌های ملی (سای عام)

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**HIGH PRESSURE CAPILLARY RHEOMETER
RHEOGRAPH 120**



012.01.3

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Introduction

The RHEOGRAPH 120 is an innovative High Pressure Capillary Rheometer, according to DIN 54811, to determine the flow behavior and viscosity of thermoplastics and rubbers. This capillary rheometer is a result of more than 30 years of experience gained with the various machine generations in the field of rheological capillary rheometry.

The technical highlights

- Constant high piston force 120 kN
- Single or twin barrel system: 9,55, 12, 15, 20, 25 or 30 mm design
- Dynamic speed range: 1:800000
- High dynamic piston acceleration: 0-40 mm/s in 0.6 s
- Position acquisition: high resolution encoder (0.0000016 mm)
- Increased pressure transducer sensitivity: resolution increased by 10 times comparing to the previous model
- Automatic pressure transducer identification: Plug & Test

Additional features of the RHEOGRAPH 120:

- Windows database software for parameter setting and online monitoring via Ethernet, as well as free definable test evaluation
- Commissioning, 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 400°C (500°C optional), 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 with easy exchangeable test barrel
- Test barrel and options fitting with up to 5 pressure transducers as well as up to 3 force transducers
- Drive torque monitoring and display
- Infinitely variable manual piston drive control
- Operation modes constant speed, constant pressure/force or PVT measurement and Script procedure controlling
- Determination of apparent resp. real shear stress by real test pressure measurement
- Automatic test data acceptance and setting of the next specification value after stabilization of test data
- PVT measurement isobaric or isothermal
- Static and dynamic die swell measurement

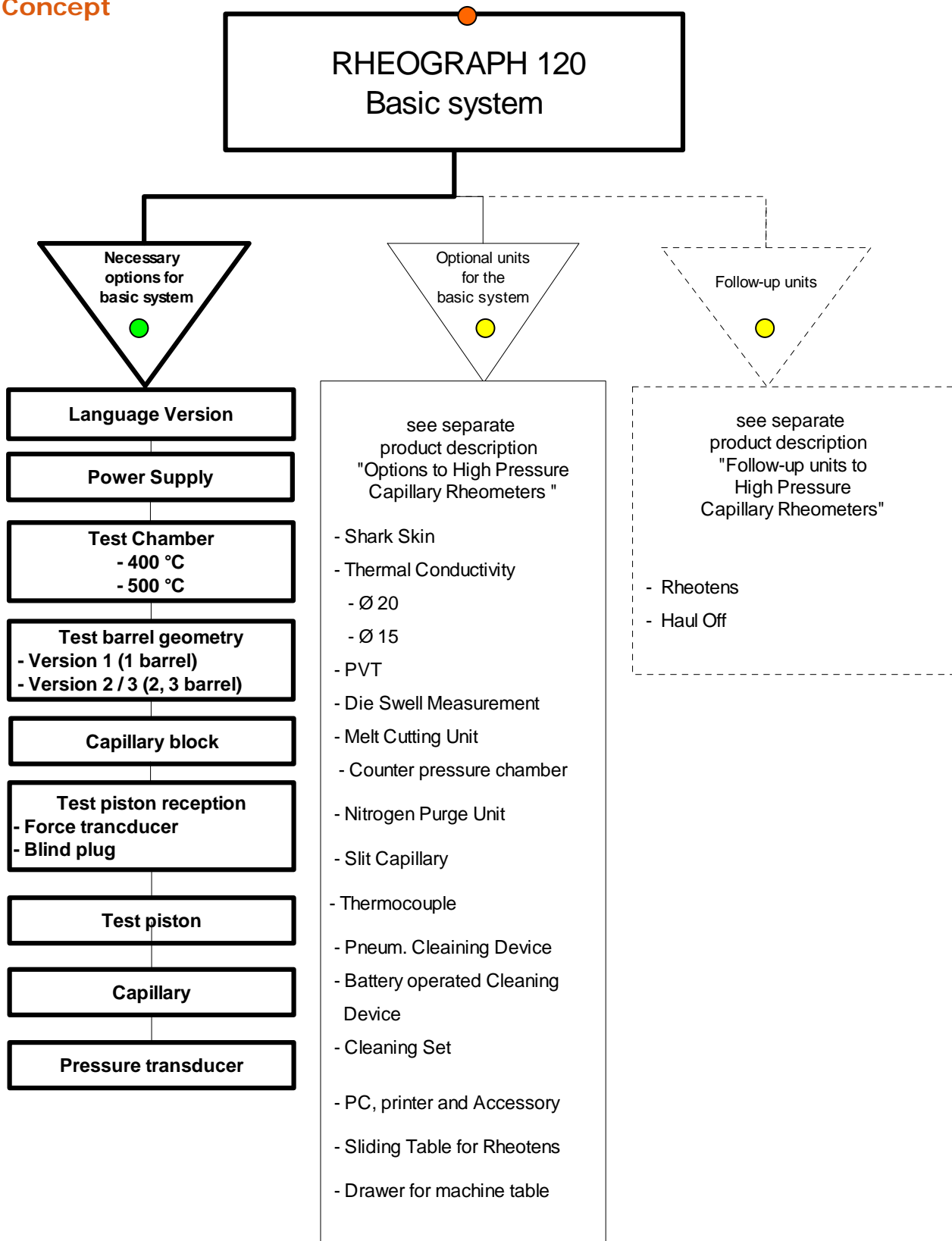
Application

The test unit must only be used to determine the flow characteristics and viscosity of thermoplastic polymers and rubbers (usage to the intended purpose).

Plastics pellets or powder are/is melted in a heated test cylinder and pressed out of a capillary with a test piston and a constant force or speed.

The RHEOGRAPH 120 is used in the field of research and development as well as for quality control and inspection of received goods.

Concept



Legend:

- Basic system
- Necessary options: These units are necessary
- Optional units: Choice of measurement enhancing additional sub systems

Optional units

The basic test device is no functioning instrument without adding the following optional units:

- Power Supply
 - English Version or German Version
 - Test chamber design 1 with
 - Test barrel set
 - Heating
 - Capillary block
 - Test piston
 - Test piston reception with/without force transducer
 - Test piston holder
 - Capillary
- or
- Test chamber design 2 and 3 with
 - Test barrel set with capillary block
 - Heating
 - Test piston
 - Force transducer or blind plug
 - Capillary
 - Pressure transducer (s)

Options

The GÖTTFERT High Pressure Capillary Rheometers are already equipped with large basic functions.

Our extensive option program provides a more detailed characterisation of the test materials as well as supplementing accessories to the completion of the basic equipment.

- Shark Skin
- Thermal conductivity *
- PVT *
- Die swell measurement
- Manual or automatic melt cutting unit
- Counter pressure chamber
- Nitrogen purge unit
- Slit die
- Thermocouple
- Pneumatic cleaning device or battery operated cleaning device
- Cleaning set
- Machine table
- Drawer for machine table
- PC, printer and accessory
- Sliding table for Rheotens

*

GÖTTFERT offers PVT measurements according DIN 17744 isotherm in a temperature range up to 450°C and isobar up to 400°C.

This upper limit provides now the possibility to measure and evaluate also the most technical plastics and especially fluor polymers.

Out of an intensive development work the temperature range for thermal conductivity measurement could be increased up to 450°C. Also here the advantage is given to test technical polymers in that wide area.

Follow-up units

These follow-up units can be operated in connection with the Rheograph 120

- Rheotens or Haul-Off-system for the determination of melt extensionability

Details and information to the individual options and follow-up units you will find in the separate product descriptions "Options for High Pressure Capillary Rheometers" and the Follow-up units.

Set-up

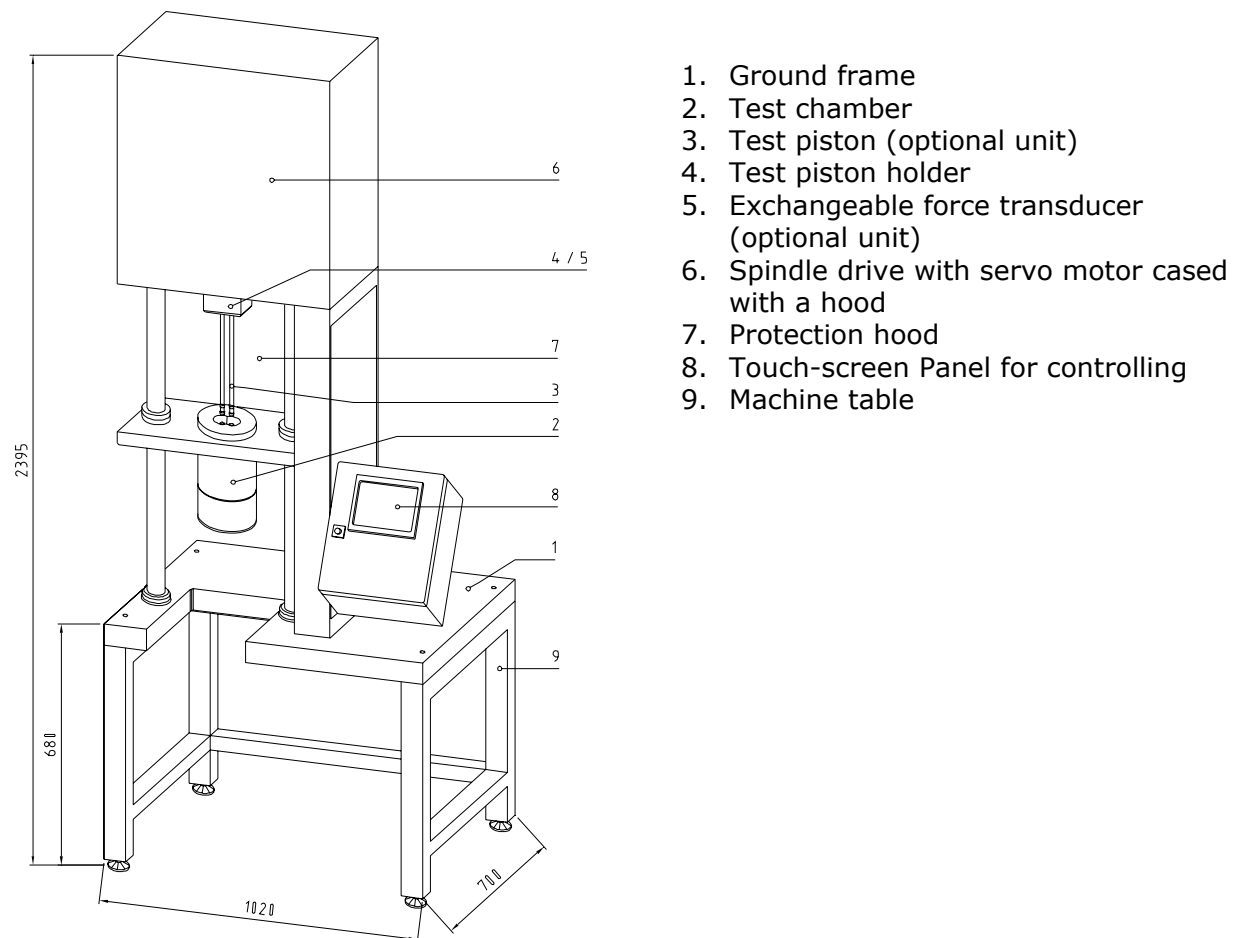


Figure: Total view of the RHEOGRAPH 120

The RHEOGRAPH 120 consists of the following components:

Frame

The machine body of RHEOGRAPH 120 is designed in a stable frame resp. column type construction in order to cope with the high test forces. Test chamber, electronics and test piston drive are located separately.

Test piston drive

The test piston drive is made via a double ball screw shaft, activated by a servo motor with a sprocket belt gear.

Sprocket belt gear, ball screw shaft and cylinder rod are located in one housing. The cylinder rod guide is free of lubricant.

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.

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).

Connections: Digital/analogue I/O units via CAN bus
 PC via Ethernet
 Special options via RS232

Safety system

- Comprising of a plastic protective hood (transparent) around the test piston according to VGB 4. 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, pressure transducer and force transducer monitoring
- Touch protection of hot test chamber via reflector cover

PC-Software LabRheo

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".

Accuracy of pressure measurement

The pressure transducer signal at the RG 25, RG 75, RG 120 can be displayed with a resolution of 0.005 % from nominal range, that means 0.1 bar with a 2000 bar transducer.

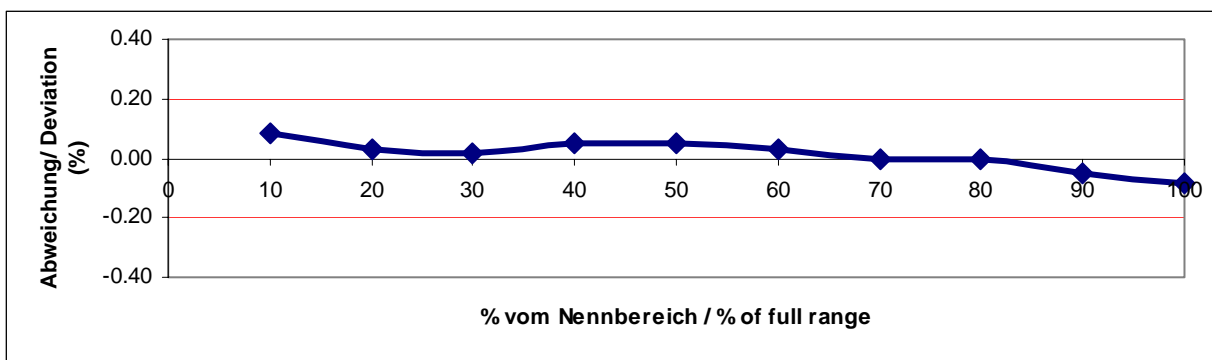
All GÖTTFERT pressure transducers are re-calibrated manually to ensure highest accuracy.

To guarantee reproducibility according to ISO9001, certified measuring and test equipment by the DKD are used during this calibration.

The created test reports are delivered together with the transducer.

Example for a manual calibration

Sollwerte / Set values		Istwerte / Actual values				
[%]	[bar]	Meßserie 1 <i>Test series 1</i> [bar]	Meßserie 2 <i>Test series 2</i> [bar]	Meßserie 3 <i>Test series 3</i> [bar]	Mittelwert <i>Mean value</i> [bar]	Abweichung <i>Deviation</i> [%]
10	20	20.5	20.0	20.0	20.17	0.08
20	40	40.2	40.0	40.0	40.07	0.03
30	60	60.1	60.0	60.0	60.03	0.02
40	80	80.1	80.1	80.1	80.10	0.05
50	100	100.1	100.1	100.1	100.10	0.05
60	120	120.1	120.0	120.1	120.07	0.03
70	140	140.0	140.0	140.0	140.00	0.00
80	160	160.0	160.0	160.0	160.00	0.00
90	180	180.0	179.8	179.9	179.90	-0.05
100	200	199.9	199.85	199.82	199.86	-0.07



Technical Data

Standards	ISO 11443 - ASTM D 3835 - DIN 54811 - ASTM D 5930 (option) - ISO 17744 (option) ASTM D 5099 (option)
Barrel	
Diameter	9.55 +0.01mm (0.376 inches)
Diameter	12.0 +0.01mm (0.4724 inches)
Diameter	15.0 +0.01mm (0.5906 inches)
Diameter	20.0 +0.01mm (0.7874 inches)
Diameter	25.0 +0.01mm (0.9843 inches)
Diameter	30.0 +0.01mm (1.1811 inches)
Length	256 mm (10.08 inches)
Design	single - twin - triple barrel
Interchangeable	YES, option
Material	Nitrided hardened steel
Other options	Corrosion (Inconel) and wear resistant design
Capillaries	
Diameter	0.1 - 6 mm (0.00394 - 0.23 inches) ± 0.005 mm
Test piston	
Diameter	9.53 +0.01 mm (0.3752 inches)
Diameter	11.99 -0.01 mm (0.4720 inches)
Diameter	14.99 -0.01 mm (0.5902 inches)
Diameter	19.99 -0.01 mm (0.787 inches)
Diameter	24.99 -0.01 mm (0.9839 inches)
Diameter	29.99 -0.01 mm (1.1807 inches)
Length	285 ± 0,2 mm (11.22 inches)
Control	
Local	Touch-screen IPC, heating and material extrusion without PC connection possible
PC	LabRheo program, connection via LAN
Heater	
Temperature range	5°C above room temperature up to 400°C (752°F), optional up to 500°C (932°F)
Sensors	PT100 1/3DIN
Heater circuits	3
Controller	special algorithm
Resolution	0.01°C

Variation over time in usable range	less $\pm 0.2^{\circ}\text{C}$
Spatial distribution in usable range:	60 up to 300 $^{\circ}\text{C}$: < 0.5 $^{\circ}\text{C}$ 301 up to 400 $^{\circ}\text{C}$: < 1.0 $^{\circ}\text{C}$

Drive

Motor	Servo drive with high resolution EnDat interface
Resolution position	0.000016 mm
Resolution speed	0.000016 mm/s (0.00096mm/minute)
Lowest speed	0.00005 mm/s (0.003 mm/minute)
Highest speed	40 mm/s (2400 mm/minute)
Range	1:800.000
Realizable shear rate test range	10^{-4} to 10^7 (depending on test barrel and capillary configuration)
Realizable viscosity test range	1 mPas (10^{-3}) to 10^8 Pas (depending on capillary and pressure transducer) This means that test measurements from aqueous solutions up to rubber and metal compounds are possible.

Position correction

Automatic position correction of deformation of frame, drive, force transducer for PVT measurement

Pressure transducers

Connection	CAN bus, max. 5 transducers
Range	20 - 2500 bar (290 - 36260 PSI)
Accuracy	0.2%
Identification of transducer range and calibration data	automatic when transducer is connected
Zero calibration	automatic
Resolution	0.005 %

Force transducers

Range	50, 75 or 120 kN
Accuracy	0.4% in 1% - 100% of the nominal range 0.8% < 1% of the nominal range
Zero calibration	automatic
Resolution	0.005 %

Power supply

Voltage	3 x 400V, 3L + N + PE // 3 x 230V, 3L + PE no N other on request
Tolerance	$\pm 10\%$

Frequency	50 Hz // 60 Hz
Protective earthing	Earth resistance less than 5 Ohm
Short-time breaks	less than 10 msec
Power consumption	approx. 5 kW
Ambient conditions	
Ambient temperature	+ 10°C up to + 40° C (50°F up to 104°F)
Air humidity	max. 90 % not-condensing
Dimensions	
Width	1020 mm (40.16 inches)
Depth	700 mm (27.56 inches)
Height (with machine table)	2395 mm (94.29 inches)
Weight	approx. 700 kg (1544 pounds)
Frame (test chamber)	
Machine stiffness (essential for PVT measurements)	360 kN
Finish	
Front and cover plate	light grey RAL 7035
Test chamber hitch	grey-brown RAL 8019
Protection	Protective door with double contacts
Evaluation of data	with LabRheo / WinRheo II program
Rheological corrections	Rabinowitsch-Weissenberg, Bagley (linear, non linear), Mooney (wall slip), Heat dissipation, Hagenbach, Gleissle
Models	Ostwald de Waele (Power law), Münstedt, Carreau Winter, Cross, Sabia, Yasuda
Temperature shift	Arrhenius, WLF, Carreau-WLF, Carreau-Arrhenius, Cross-WLF, Cross Arrhenius
Various calculations	Normal stress difference, Extensional viscosity and stress (Cogswell), NNI-Coefficient (non Newton Index) correlation to molecular weight and molecular weight distribution
Calculation for options	Die swell, PVT calculation isobar and isothermal diagrams with Tait equation for Mouldflow and C-mould calculations, Thermal conductivity, Counter pressure chamber, Analysis of flow instabilities (Sharkskin), export of compuplast software, extensional viscosity of Rheotens with Wagner model and for haul-off

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 RHEOGRAPH 25 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.

Residual Current Rating

The Rheograph is operated via a servo amplifier in the drive. Residual current protection devices with error current rating ¹⁾ of ≥ 100 mA can be used. It may happen that faulty activations occur:

- when connecting servo amplifiers to the power line (shorttermed single or two- phase operation by contact chatter in the mains contactor)
- by higher frequented discharge currents appearing during operation with longer motor cables
- by strong asymmetries of the 3-phase-current system

¹⁾

The ratings indicated by the manufacturers of the protective switches are to be seen as max. values, where the protective switch surely releases.

Usually the protective switch releases already at 60% of the residual current rating.

Supplied accessories

Rheograph 120

- | | |
|---|---|
| 1 | CD-ROM „LabRheo“ and 1 CD-ROM „WinRheo II“ |
| 1 | User information consisting of operating manual, technical documentation, program documentation and calculation basis (on CD-ROM) |
| 1 | Operating manual (printed version) |
| 2 | Keys for main switch |
| 2 | Keys for cabinet |
| 1 | Cover disk |
| 1 | Mirror for magnetic base |
| 1 | Feeder |
| 1 | Shovel |
| 1 | Cleaning tool for pressure transducer with bore ½"-20 UNF-B |
| 1 | Tube graphite paste |
| 1 | Set fuses |
| 1 | Set wrenches |
| 1 | Pair of tweezers |
| 1 | Brass brush |

Order Information

RHEOGRAPH 120

Basic device

Order number..... 5.30.000

Necessary optional units to basic device:

Language version and user information

English Version

Marking and user information* (on CD) in English, operating manual on paper format.

Order number..... 5.30.003

German Version

Marking and user information* (on CD) in German, operating manual on paper format.

Order number..... 5.30.001

Additional user information* English, on paper format

Complete printed English user information* in single A4 ring binder.

One user information* on CD belongs to standard scope of the basic instrument.

Order number..... 5.30.004

Additional user information* German, on paper format

Complete printed German user information* in single A4 ring binder.

One user information* on CD belongs to standard scope of the basic instrument.

Order number..... 5.30.002

* The user information contains:

Operating manual, technical documentation, LabRheo program documentation and calculation basis.

Power supply

Following power supplies are available:

Power supply 400V; 3L/N/PE ~50Hz

Voltage: 3 x 400V, 3L + N + PE

Permissible voltage fluctuations: +/- 10%

Frequency: 50 Hz

Power consumption: approx. 5 kW

Order number..... 5.29.005

Power supply 230V; 3L/PE/ ~60Hz

Voltage: 3 x 230V, 3L + PE without N

Permissible voltage fluctuations: +/- 10%

Frequency: 60 Hz

Power consumption: approx. 5 kW

Order number..... 5.29.205

Other power supply voltages available on request.

Selection for test chamber type and force measurement

	Test chamber type	Pressure/Force limit values	Force measurement
1	Test barrel D 9,55 mm	At 12 kN Maximum of allowed pressure 1675 bar	50KN (75KN) (120KN)
	Test barrel D 12 mm	At 20 kN Maximum of allowed pressure 1770 bar	
	Test barrel D 15 mm	At 32 kN Maximum of allowed pressure 1800 bar	
	Test barrel D 20 mm	At 60 kN Maximum of allowed pressure 1910 bar	75KN (120KN)
	Test barrel D 25 mm	At 96 kN Maximum of allowed pressure 1955 bar	120KN
	Test barrel D 30 mm	At 120 kN Maximum of pressure 1697 bar	
2	Test barrel 2 x D 12 mm	At 2x20 kN Maximum of allowed pressure 2x1770 bar	50KN (75KN)
	Test barrel 2 x D 15 mm	At 2x32 kN Maximum of allowed pressure 2x1800 bar	
	Test barrel 1 x D 15 mm 1 x D 12 mm	At 32+20 kN Maximum of allowed pressure 1800 bar Maximum of allowed pressure 1770 bar	
	Test barrel 3 x D 12 mm	At 3x20 kN Maximum of allowed pressure 3x1770 bar	
	Test barrel 1 x D 15 mm 2 x D 12 mm	At 32+2x20 kN Maximum of allowed pressure 1x1800 bar Maximum of allowed pressure 2x1770 bar	
3	Test barrel 2 x D 20 mm	At 2x60 kN Maximum of allowed pressure 2x1910 bar	50KN (75KN)
	Test barrel 3 x D 15 mm	At 3x32 kN Maximum of allowed pressure 3x1800 bar	
	Test barrel 3 x D 20 mm	At 3x40 kN Maximum of allowed pressure 3x1272 bar	

1 Test Chamber Design 1

Single Barrel Design for Test Barrels Ø9,55; Ø12; Ø15; Ø20; Ø25; Ø30

The test chamber is electrically heated via a temperature controller with 3 heating circuits. Temperature distribution over the usable test barrel length: $\pm 0,5^{\circ}\text{C}$.

The test chamber consists a test piston reception and can be equipped with various test barrels, test pistons and dependent on the capillary type with different capillary blocks.

The test piston reception with and/or without force transducer must be selected additionally.

Test Chamber Design 1

Order number..... 5.29.336

1 Test Barrel Set

With melt pressure bores with a thread $\frac{1}{2}$ "-20 UNF at the outlet of the test barrel. With cleaning tools for the relevant test barrel diameter, comprising of a brass scraper , a piston for cleaning the test barrel, a steel brush and a tamping piston. Please select a suitable test barrel set.

Diameter 9,55 mm

Test Barrel Set Ø 9.55

Order number..... 5.29.349

Diameter 12 mm

Test Barrel Set Ø12

Order number..... 5.29.337

Test Barrel Set Ø12 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.338

Test Barrel Set Ø12 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under $+60^{\circ}\text{C}$ and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.339

Diameter 15 mm

Test Barrel Set Ø15

Order number..... 5.29.340

Test Barrel Set Ø15 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.748

Test Barrel Set Ø15 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under $+60^{\circ}\text{C}$ and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.342

Diameter 20 mm**Test Barrel Set Ø20**

Order number..... 5.29.343

Test Barrel Set Ø20 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.344

Test Barrel Set Ø20 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.345

Diameter 25 mm**Test Barrel Set Ø25**

Order number..... 5.29.346

Test Barrel Set Ø25 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.347

Test Barrel Set Ø25 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.348

Diameter 30 mm**Test Barrel Set Ø30**

Order Number 5.29.301

Test Barrel Set Ø30 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.389

Test Barrel Set Ø30 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.390

1 Test Barrel Set pluggable

Several test barrels sets can be chosen (for test chamber design 1).

For the modification of two test barrel sets the option "Test Barrel Set pluggable" is required additionally.

Test Barrel Set pluggable

Heating bands and Pt100-temperature sensors with connectors, additional temperature calibration, modification parts for two test barrel sets, design 400°C with tempering jacket

Order number..... 5.29.144

More designs "Test Barrel Set pluggable" on request.

1 Heating

Test chamber heating, comprising of heater element, reflector jacket and temperature sensor PT 100 DIN for the required temperature range.

Please select a heating.

Heating up to 400°C for Test Barrel Set standard and corrosion resistant

Order number..... 5.29.310

Heating up to 400°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.352

Heating up to 500°C for Test Barrel Set standard and corrosion resistant

Order number..... 5.29.257

Heating up to 500°C for Test Barrel Set tempering jacket, stainless steel

Order number..... 5.29.354

1 Capillary Block

For round hole capillaries up to 30 mm Length. With capillary nut, capillary wrench, heater element, reflector jacket, PT 100 temperature sensor and 2 thermocouple bores.

Please select a capillary block suitable for the heating and the barrel set.

Capillary Block up to 400°C; L= ≤30 mm

Order number..... 5.29.247

Capillary Block up to 400°C; L= ≤30 mm with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.356

Capillary Block up to 500°C; L= ≤30 mm

Order number..... 5.29.357

Capillary Block up to 500°C; L= ≤30 mm with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.358

1 Test Piston reception

The **Test Piston receptions without Force transducer** are equipped with a blind plug, which can be later on replaced by the force transducer.

The **Test Piston receptions with Force transducer** are equipped with a precision force transducer for the relevant measuring range with following technical data:

- Accuracy class 0,02
- Total deviation (in regard to actual value)
 - 0,4% within test range 1% up to 100%
 - 0,8% within test range 0,4% up to 1%

Please select a test piston reception.

Test Piston reception without Force transducer

(prepared for 120 kN Force transducer)

Order number..... 5.30.111

Test Piston reception without Force transducer

(prepared for 50/75 kN Force transducer)

Order number..... 5.30.124

Test Piston reception with 120 kN Force transducer

incl. Measuring amplifier CAN-Bus Module

Order number..... 5.30.105

Test Piston reception with 75 kN Force transducer

incl. Measuring amplifier CAN-Bus Module

Order number..... 5.30.125

Test Piston reception with 50 kN Force transducer

incl. Measuring amplifier CAN-Bus Module

Order number..... 5.29.396

1 Capillaries

Round Hole Capillaries for Test Chamber Design 1

Single Barrel Design D = 9,55 mm up to 30 mm

Each capillary has a bore hole to receive a thermocouple Fe-Const. to measure the test temperature in the inlet of capillary.

Capillaries with 30 mm length have a second bore hole to receive a second thermocouple to measure the test temperature in the outlet of capillary.

Capillaries with a length up to 10 mm are completely made of hard metal.

Capillaries with more than 10 mm length consist of a hard metal insert and a hardened steel jacket.

Note: all capillaries with a length of < 20 mm have for constructional reasons a total outer length of 20 mm, whereas the inner length is equal with the indicated measuring length.

Diameter 0.5 mm

Capillary L/D = 5/0,5

With 0,5 mm diameter, 5 mm Length

Order number..... 4.23.350

Capillary L/D = 10/0,5

With 0,5 mm diameter, 10 mm Length

Order number..... 4.23.351

Capillary L/D = 15/0,5

With 0,5 mm diameter, 15 mm Length

Order number..... 4.23.352

Capillary L/D = 20/0,5

With 0,5 mm diameter, 20 mm Length

Order number..... 4.23.353

Capillary L/D = 30/0,5

With 0,5 mm diameter, 30 mm Length

Order number..... 4.23.271

Diameter 1 mm**Capillary L/D = 0/1**

With 1 mm diameter, 0 mm Length, only for D=12 mm with 1-barrel-design

Order number..... 4.23.529

Capillary L/D = 0/1

With 1 mm diameter, 0 mm Length, only for D=15 mm with 1-barrel-design

Order number..... 4.23.743

Capillary L/D = 5/1

With 1 mm diameter, 5 mm Length

Order number..... 4.23.355

Capillary L/D = 10/1

With 1 mm diameter, 10 mm Length

Order number..... 4.23.270

Capillary L/D = 15/1

With 1 mm diameter, 15 mm Length

Order number..... 4.23.365

Capillary L/D = 20/1

With 1 mm diameter, 20 mm Length

Order number..... 4.23.274

Capillary L/D = 30/1

With 1 mm diameter, 30 mm Length

Order number..... 4.23.272

Capillary L/D = 40/1

With 1 mm diameter, 40 mm Length.

In order to apply capillaries L = 40 the capillary locking flange 5.29.595 or 5.29.594 is required.

Order number..... 4.23.359

Diameter 2 mm**Capillary L/D = 0/2**

With 2mm diameter, 0 mm Length, only for D=15 mm with 1-barrel-design

Order number..... 4.23.744

Capillary L/D = 5/2

With 2 mm diameter, 5 mm Length

Order number..... 4.23.356

Capillary L/D = 10/2

With 2 mm diameter, 10 mm Length

Order number..... 4.23.278

Capillary L/D = 20/2

With 2 mm diameter, 20 mm Length

Order number..... 4.23.279

Capillary L/D = 30/2

With 2 mm diameter, 30 mm Length

Order number..... 4.23.273

Capillary locking flange for Round Hole Capillaries for 40 mm Length, Standard

Order number..... 5.29.594

Capillary locking flange for Round Hole Capillaries for 40 mm Length, by version with tempering jacket, stainless steel

Order number..... 5.29.595

Further capillary geometries – also with entry angle – on request.

2 Test Chamber Design 2**Multi-Barrel Design for test barrel systems 2xØ12; 2xØ15; 1xØ12/1xØ15; 3xØ12; 2x Ø12/1x Ø15**

The test chamber is electrically heated via a temperature controller with 3 heating circuits.

Temperature distribution over the usable test barrel length: $\pm 0,5^{\circ}$ C.

The test chamber consists a test barrel reception and can be equipped with various test barrels and test pistons. The test piston reception is already installed, the force transducer can be chosen additionally.

Test Chamber Design 2

Order number..... 5.29.405

2 Test Barrel Set

2-or 3 barrel design for round hole capillaries up to 30 mm length, each with melt pressure measuring bore with thread 1/2"-20 UNF at the outlet of the test barrels and a thermocouple bore Fe-Const at the inlet of the capillary for measuring the temperature.

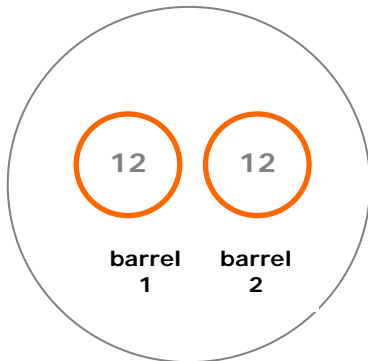
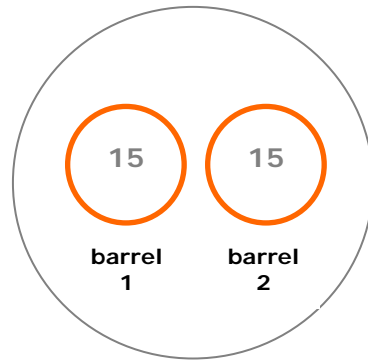
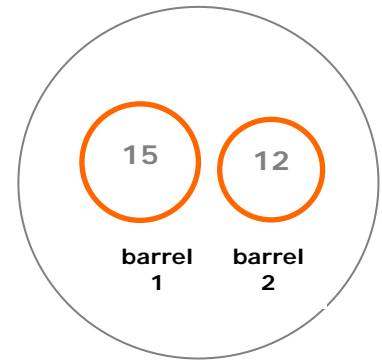
Each test barrel set consists of necessary capillary nuts and capillary nut wrenches.

With cleaning tools for the relevant test barrel diameter, comprising of a brass scraper, a piston for cleaning the test barrel, a steel brush and a tamping piston.

Please select among the below a suitable Test Barrel Set.

2-Barrel design

Front view (user side)

Test barrel set 2x12 mm**Test barrel set 2x15 mm****Test barrel set 1x15 mm / 1x12 mm****Diameter 2 x 12 mm****Test Barrel Set 2xØ12**

Order number..... 5.29.309

Test Barrel Set 2xØ12 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.361

Test Barrel Set 2xØ12 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.362

Diameter 2 x 15 mm**Test Barrel Set 2xØ15**

Order number..... 5.29.363

Test Barrel Set 2xØ15 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.364

Test Barrel Set 2xØ15 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.365

Diameter 1 x 15 mm / 1 x 12 mm**Test Barrel Set 1xØ15/1xØ12**

Order number..... 5.29.366

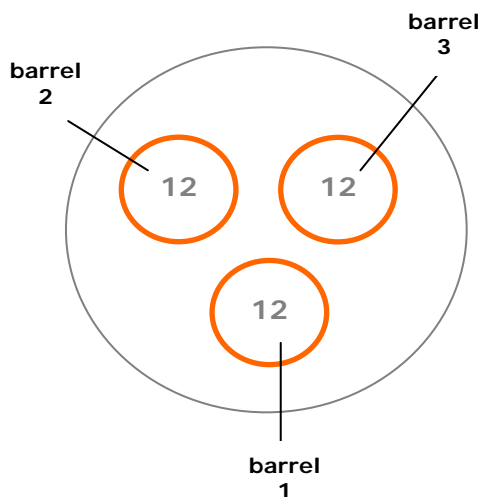
Test Barrel Set 1xØ15/1xØ12 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)
Order number..... 5.29.367

Test Barrel Set 1xØ15/1xØ12 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.
Order number..... 5.29.368

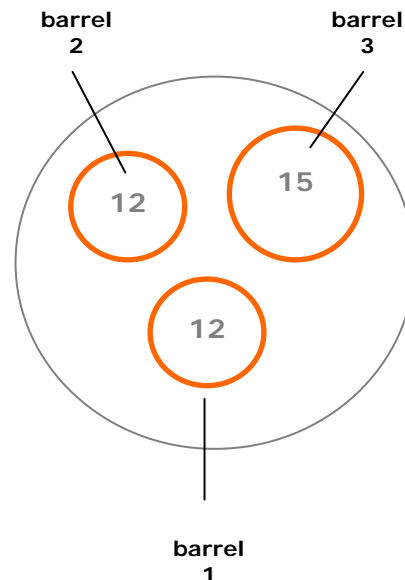
3-Barrel design

Front view (user side)

Test barrel set 3x12



Test barrel set 2x12 mm / 1x15



Diameter 3 x 12 mm

Test Barrel Set 3xØ12
Order number..... 5.29.399

Test Barrel Set 3xØ12 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)
Order number..... 5.29.400

Test Barrel Set 3xØ12 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.
Order number..... 5.29.401

Diameter 2 x 12 mm / 1 x 15 mm**Test Barrel Set 2xØ12/1xØ15**

Order number..... 5.29.402

Test Barrel Set 2xØ12/1xØ15 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.29.403

Test Barrel Set 2xØ12/1xØ15 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.29.404

2**Heating for Test barrel**

Comprising of heater element, reflector jacket and temperature sensor PT 100 DIN for the required temperature range.

Please select a heating.

2- Barrel version:**Heating up to 400°C** for Test Barrel Set Standard and corrosion resistant

Order number..... 5.29.311

Heating up to 400°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.369

Heating up to 500°C for Test Barrel Set Standard and corrosion resistant

Order number..... 5.29.370

Heating up to 500°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.371

3- Barrel version:**Heating up to 400°C** for Test Barrel Set Standard and corrosion resistant

Order number..... 5.29.409

Heating up to 400°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.410

Heating up to 500°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.411

Heating up to 500°C for Test Barrel Set with tempering jacket, stainless steel

Order number..... 5.29.412

2 Test Piston Holder

2-barrel-design:

Test Piston Holder 2-barrel-design

Order number..... 5.29.413

3-barrel-design:

Test Piston Holder 3-barrel-design

Order number..... 5.29.414

2 Force transducer

The Test Piston holder can be equipped with a force transducer or a blind plug, which can be later on replaced by the force transducer.

The precision force transducers for the relevant measuring ranges have following technical data:

- Accuracy class 0,02
- Total deviation (in regard to actual value)
 - 0,4% within test range 1% up to 100%
 - 0,8% within test range 0,4% up to 1%

Please select a force transducer or the blind plug.

The force transducer is mounted at the test piston holder from test piston 1 (barrel 1).

If the force transducer should be used for another test piston, please inform us when ordering!

Force transducer 50 kN incl. Measuring amplifier CAN-Bus Module

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.415

Force transducer 75 kN incl. Measuring amplifier CAN-Bus Module

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.416

Blind Plug

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.417

2 Capillaries

Round hole capillaries for Test Chamber Design 2

2-and 3 Barrel design D = 12 mm and 15 mm

Each capillary with $L > 5\text{mm}$ has a bore hole to receive a thermocouple Fe-Const. to measure the test temperature in the inlet of capillary.

Capillaries are completely made of hard metal.

Note: all capillaries with a length of $< 20\text{ mm}$ have for constructional reasons a total outer length of 20 mm , whereas the inner length is equal with the indicated measuring length.

Diameter 0.5 mm**Capillary L/D = 0/0,5**

With 0,5 mm diameter, 0 mm Length, only for D=15 mm with multi-barrel-design

Order number..... 4.23.675

Capillary L/D = 2,5/0,5

With 0,5 mm diameter, 2,5 mm Length

Order number..... 4.23.676

Capillary L/D = 5/0,5

With 0,5 mm diameter, 5 mm Length

Order number..... 4.23.677

Capillary L/D = 10/0,5

With 0,5 mm diameter, 10 mm Length

Order number..... 4.23.678

Capillary L/D = 15/0,5

With 0,5 mm diameter, 15 mm Length

Order number..... 4.23.679

Capillary L/D = 20/0,5

With 0,5 mm diameter, 20 mm Length

Order number..... 4.23.680

Capillary L/D = 30/0,5

With 0,5 mm diameter, 30 mm Length

Order number..... 4.23.681

Diameter 1 mm**Capillary L/D = 0/1 for D = 12 mm**

With 1 mm diameter, 0 mm Length

Order number..... 4.23.654

Capillary L/D = 0/1 for D = 15 mm

With 1 mm diameter, 0 mm Length

Order number..... 4.23.742

Capillary L/D = 2,5/1

With 1 mm diameter, 2,5 mm Length

Order number..... 4.23.682

Capillary L/D = 5/1

With 1 mm diameter, 5 mm Length

Order number..... 4.23.683

Capillary L/D = 10/1

With 1 mm diameter, 10 mm Length

Order number..... 4.23.684

Capillary L/D = 15/1

With 1 mm diameter, 15 mm Length

Order number..... 4.23.685

Capillary L/D = 20/1

With 1 mm diameter, 20 mm Length

Order number..... 4.23.655

Capillary L/D = 30/1

With 1 mm diameter, 30 mm Length

Order number..... 4.23.686

Capillary L/D = 40/1

With 1 mm diameter, 40 mm Length.

In order to apply capillaries L = 40 the capillary nut 5.29.513 is required.

Order number..... 4.23.687

Diameter 2 mm**Capillary L/D = 0/2**

With 2 mm diameter, 0 mm Length, only for D=15 mm with multi-barrel-design

Order number..... 4.23.688

Capillary L/D = 10/2

With 2 mm diameter, 10 mm Length

Order number..... 4.23.689

Capillary L/D = 20/2

With 2 mm diameter, 20 mm Length

Order number..... 4.23.690

Capillary L/D = 30/2

With 2 mm diameter, 30 mm Length

Order number..... 4.23.691

Capillary L/D = 40/2

with 2 mm diameter, 40 mm Length

Order number..... 4.23.692

Capillary nut for Capillary up to 5 mm Length

Order number..... 5.29.625

Capillary nut for Capillary with 40 mm Length

Order number..... 5.29.513

Further capillary geometries – also with entry angle – on request.

3 Test Chamber Design 3**Multi-Barrel Design for test barrels 3xØ15; 2xØ20; 3xØ20**

The test chamber is electrically heated via a temperature controller with 3 heating circuits.

Temperature distribution over the usable test barrel length: $\pm 0,5^{\circ}$ C.

The test chamber consists a test barrel reception and can be equipped with various test barrels and test pistons. The test piston reception is already installed, the force transducer can be chosen additionally.

Test Chamber Design 3

Order number..... 5.30.137

3 Test Barrel Set2- or 3-barrel design for round hole capillaries up to 30 mm length, each with melt pressure measuring bore with thread $\frac{1}{2}$ "-20 UNF at the outlet of the test barrels and a thermocouple bore Fe-Const at the inlet of the capillary for measuring the temperature.

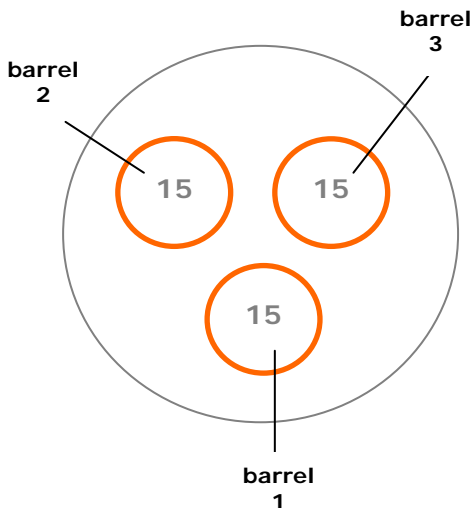
Each test barrel set consists of necessary capillary nuts and capillary nut wrenches.

With cleaning tools for the relevant test barrel diameter, comprising of a brass scraper, a piston for cleaning the test barrel, a steel brush and a tamping piston.
Please select among the below a suitable Test Barrel Set.

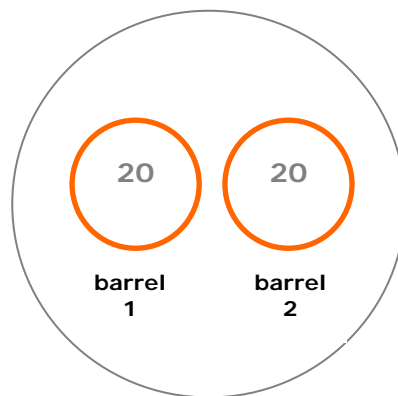
2- or 3-barrel design

Front view (user side)

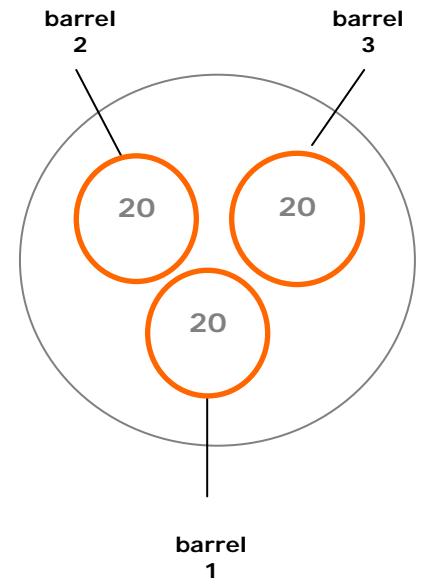
Test barrel set 3x15



Test barrel set 2x20



Test barrel set 3 x 20



Diameter 3 x 15 mm

Test Barrel Set 3xØ15

Order number..... 5.30.140

Test Barrel Set 3xØ15 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.30.141

Test Barrel Set 3xØ15 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.

Order number..... 5.30.142

Diameter 2 x 20 mm

Test Barrel Set 2xØ20

Order number..... 5.30.143

Test Barrel Set 2xØ20 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)

Order number..... 5.30.144

Test Barrel Set 2xØ20 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.
Order number..... 5.30.145

Diameter 3 x 20 mm

Test Barrel Set 3xØ20
Order number..... 5.30.146

Test Barrel Set 3xØ20 corrosion resistant for Polymers with abrasive and corrosive Additives (Steel grade No. 3)
Order number..... 5.30.147

Test Barrel Set 3xØ20 with tempering jacket, stainless steel for connecting an external tempering unit (e.g. thermostat). The tempering jacket is divided into two tempering circuits (top and bottom). The circuits can be connected serial, parallel or separately. This option is recommended for standard measurements at temperatures under +60°C and especially for PVT measurements in all temperature ranges.
Order number..... 5.30.148

3 Heating

Heating for Test barrel

Comprising of heater element, reflector jacket and temperature sensor PT 100 DIN for the required temperature range.

Please select a heating.

2-Barrel design:

Heating up to 400°C for Test Barrel Set standard and corrosion resistant
Order number..... 5.30.149

Heating up to 400°C for Test Barrel Set with tempering jacket, stainless steel
Order number..... 5.30.150

Heating up to 500°C for Test Barrel Set Standard and corrosion resistant
Order number..... 5.30.151

Heating up to 500°C for Test Barrel Set with tempering jacket, stainless steel
Order number..... 5.30.152

3-Barrel design:

Heating up to 400°C for Test Barrel Set Standard and corrosion resistant
Order number..... 5.30.153

Heating up to 400°C for Test Barrel Set with tempering jacket, stainless steel
Order number..... 5.30.154

Heating up to 500°C for Test Barrel Set standard and corrosion resistant
Order number..... 5.30.155

Heating up to 500°C for Test Barrel Set with tempering jacket, stainless steel
Order number..... 5.30.156

3 Force transducer

The Test Piston receptions can be equipped with a force transducer or a blind plug, which can be later on replaced by the force transducer.

The precision force transducers for the relevant measuring ranges have following technical data:

- Accuracy class 0,02
- Total deviation (in regard to actual value)
 - 0,4% within test range 1% up to 100%
 - 0,8% within test range 0,4% up to 1%

Please select a force transducer or the blind plug.

The force transducer is mounted at the test piston holder from test piston 1 (barrel 1).

If the force transducer should be used for another test piston, please inform us when ordering!

Force transducer 50 kN incl. Measuring amplifier CAN-Bus Module

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.415

Force transducer 75 kN incl. Measuring amplifier CAN-Bus Module

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.416

Blind plug

Installed in test piston holder at test piston 1 (Barrel 1)

Order number..... 5.29.417

3 Capillaries

Round hole capillaries for Test Chamber Design 3

2- and 3-Barrel design D = 15 mm and 20 mm

Each capillary with $L > 5\text{ mm}$ has a bore hole to receive a thermocouple Fe-Const. to measure the test temperature in the inlet of capillary.

Capillaries are completely made of hard metal.

Note: all capillaries with a length of $< 20\text{ mm}$ have for constructional reasons a total outer length of 20 mm , whereas the inner length is equal with the indicated measuring length.

Diameter 0.5 mm

Capillary L/D = 0/0,5

With 0,5 mm diameter, 0 mm Length

Order number..... 4.23.693

Capillary L/D = 2,5/0,5

With 0,5 mm diameter, 2,5 mm Length

Order number..... 4.23.694

Capillary L/D = 5/0,5

With 0,5 mm diameter, 5 mm Length

Order number..... 4.23.695

Capillary L/D = 10/0,5

With 0,5 mm diameter, 10 mm Length

Order number..... 4.23.696

Capillary L/D = 15/0,5

With 0,5 mm diameter, 15 mm Length

Order number..... 4.23.697

Capillary L/D = 20/0,5

With 0,5 mm diameter, 20 mm Length

Order number..... 4.23.698

Capillary L/D = 30/0,5

With 0,5 mm diameter, 30 mm Length

Order number..... 4.23.699

Diameter 1 mm**Capillary L/D = 0/1**

With 1 mm diameter, 0 mm Length

Order number..... 4.23.700

Capillary L/D = 2,5/1

With 1 mm diameter, 2,5 mm Length

Order number..... 4.23.701

Capillary L/D = 5/1

With 1 mm diameter, 5 mm Length

Order number..... 4.23.702

Capillary L/D = 10/1

With 1 mm diameter, 10 mm Length

Order number..... 4.23.703

Capillary L/D = 15/1

With 1 mm diameter, 15 mm Length

Order number..... 4.23.704

Capillary L/D = 20/1

With 1 mm diameter, 20 mm Length

Order number..... 4.23.705

Capillary L/D = 30/1

With 1 mm diameter, 30 mm Length

Order number..... 4.23.706

Capillary L/D = 40/1

With 1 mm diameter, 40 mm Length.

In order to apply capillaries L = 40 a capillary nut 5.30.160 is required.

Order number..... 4.23.707

Diameter 2 mm**Capillary L/D = 0/2**

With 2 mm diameter, 0 mm Length

Order number..... 4.23.708

Capillary L/D = 10/2

With 2 mm diameter, 10 mm Length

Order number..... 4.23.709

Capillary L/D = 20/2

With 2 mm diameter, 20 mm Length

Order number..... 4.23.710

Capillary L/D = 30/2

With 2 mm diameter, 30 mm Length

Order number..... 4.23.711

Capillary L/D = 40/2

With 2 mm diameter, 40 mm Length

Order number..... 4.23.712

Capillary nut for capillaries 40 mm Length

Order number..... 5.30.160

Capillary nut for capillaries 5 mm Length

Order number..... 5.30.168

Further capillary geometries – also with entry angle – on request.

Optional units for all 3 Test Chamber Designs**1 2 3 Test Piston**

The **standard test piston** made from completely hardened tool steel can be used for the most common materials. The maximum temperature is 500°C.

The **test piston in reinforced design** is available for measurements higher than 2000 bar. The maximum temperature is 500°C.

- Maximal permissible force 25 kN
- Maximal pressure 2200 bar (with 12 mm barrel)

The **test piston** made from **corrosion resistant tool steel** can be used for materials with abrasive and corrosive additives. The maximum temperature is 500°C.

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...240°C, the length is 285 mm.

The **test piston with Vespel-sealing** is especially suited for technical plastics, like LCP, PEEK or PA66. The recommended temperature range is from 240...300°C, the length is 285 mm.

The **test piston with HP-system-sealing** is especially suited for the testing of low viscous media and for the PVT measurement. It is mainly used for media being in liquid state at room temperature. The HP-system-sealing comprises of an active and a passive sealing system. The passive sealing system is made of various high performance polymers. The active sealing system is made mainly of sintered materials on basis of PTFE. The HP-system-sealing seals liquid and gas media. The length of this test piston is 285 mm.

The special characteristics of the HP-system-sealing are:

- High lifetime at high wear resistance
- Lowest possible friction value
- No clatter (Slip-Stick) at low rates
- No sticking to the tread area also after a longer standstill
- Operation temperature up to +180°C
- Operation pressure up to 2000 bar
- Max. speed is 40 mm/s

More test piston materials, temperature ranges and sealing systems on request.
Please select one or several test pistons suitable to the test barrel.

Diameter 9.55 mm

Test Piston Ø9.55 Standard

Order number..... 5.09.100

Test Piston Ø9.55 with Teflon-sealing

Order number..... 5.12.170

Diameter 12 mm

Test Piston Ø12 Standard

Order number..... 5.09.101

Test Piston Ø12 with Teflon-sealing

Order number..... 5.12.116

Diameter 15 mm

Test Piston Ø15 Standard

Order number..... 5.09.102

Test Piston Ø15 with Teflon-sealing

Order number..... 5.12.175

Test Piston Ø15 with Vespel-sealing

Order number..... 5.12.412

Test Piston Ø15 with HP-system-sealing

Order number..... 5.12.408

Diameter 20 mm

Test Piston Ø20 Standard

Order number..... 5.29.610

Test Piston Ø20 with Teflon-sealing

Order number..... 5.29.616

Test Piston Ø20 with Vespel-sealing
Order number..... 5.29.613

Test Piston Ø20 with HP-system-sealing
Order number..... 5.29.611

Diameter 25 mm (not to be used at multiple test barrel system)

Test Piston Ø25 Standard
Order number..... 5.09.230

Test Piston Ø25 with Teflon-sealing
Order number..... 5.09.231

Test Piston Ø25 with Vespel-sealing
Order number..... 5.29.665

Test Piston Ø25 with HP-system-sealing
Order number..... 5.09.235

Diameter 30 mm (not to be used at multiple test barrel system)

Test Piston Ø30 Standard
Order number..... 5.29.296

Test Piston Ø30 with Teflon-sealing
Order number..... 5.29.392

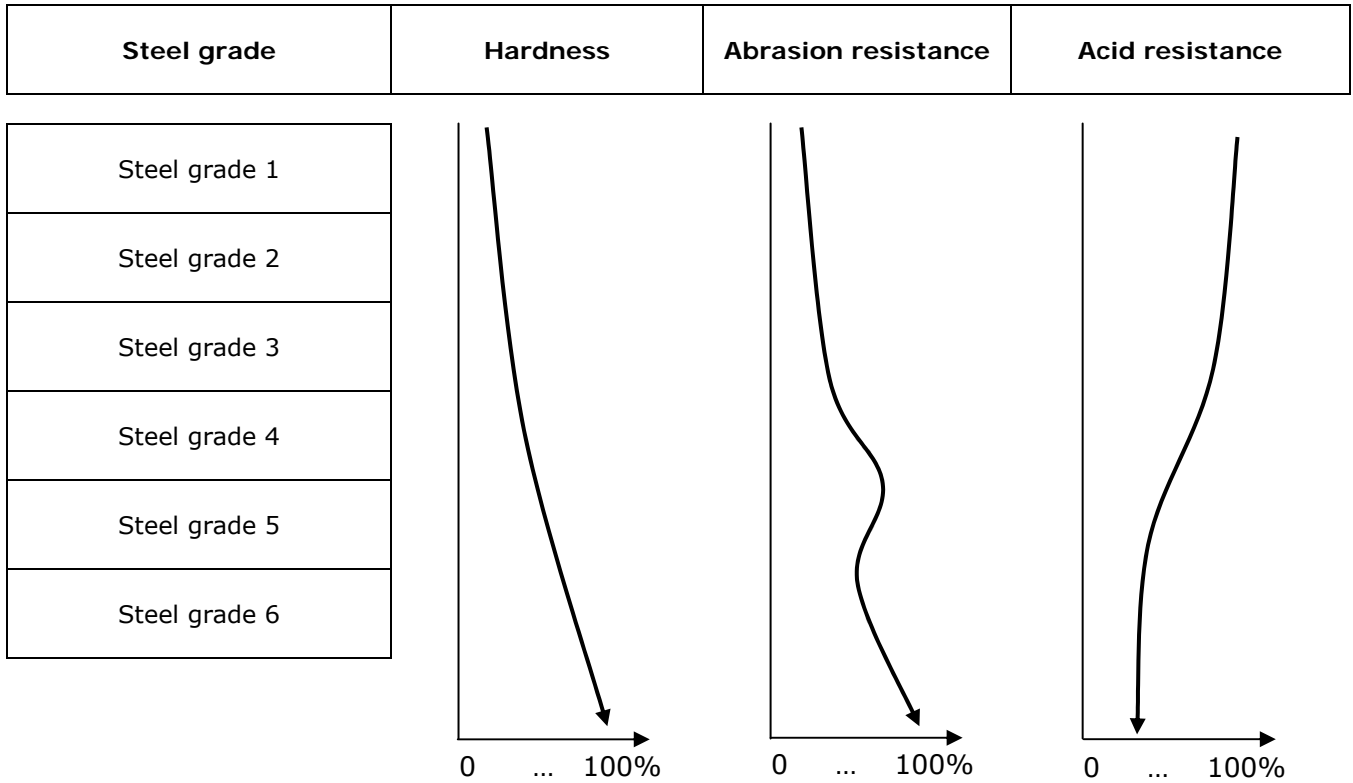
Test Piston Ø25 with Vespel-sealing
Order number..... 5.29.666

Test Piston Ø30 with HP-system-sealing
Order number..... 5.29.393

Steel grades

This graphic shows the possibility to select according to the application out of different steel grades. If no information was given to us during the order procedure we will select **steel grade No. 5** automatically.

Applicable steel grade types, comparison table:



For more details please contact us.

1 2 3 Test pressure transducer

For determination of test pressure one or more pressure transducers with CAN bus supply are necessary.

Suitable transducers can be ordered from GOETTFERT.

Maybe that foreign products can be installed. But they has to be checked by GOETTFERT and prepared for the CAN bus.

The special calibrated transducers with integrated limit control guarantees a resolution of $\pm 0,2$ % from end value.

Up to 400°C:

Test pressure transducer 0 - 2000 bar Quality class I up to 400°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: 1/2"-20 UNF.

Order number..... 8.81.182

Test pressure transducer 0 - 1000 bar Quality class I up to 400°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: 1/2"-20 UNF.

Order number..... 8.81.181

Test pressure transducer 0 - 1400 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.188
Test pressure transducer 0 - 700 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.187
Test pressure transducer 0 - 500 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.180
Test pressure transducer 0 - 200 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.186
Test pressure transducer 0 - 100 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.185
Test pressure transducer 0 - 50 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.184
Test pressure transducer 0 - 20 bar Quality class I up to 400°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.183
Up to 500°C:	
Test pressure transducer 0 - 2000 bar Quality class I up to 500°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.399
Test pressure transducer 0 - 1400 bar Quality class I up to 500°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.398
Test pressure transducer 0 - 1000 bar Quality class I up to 500°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.397
Test pressure transducer 0 - 700 bar Quality class I up to 500°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.396
Test pressure transducer 0 - 500 bar Quality class I up to 500°C With measuring amplifier for feeding in to the CAN-Bus. Thread: ½"-20 UNF. Order number.....	8.81.395

Test pressure transducer 0 - 200 bar Quality class I up to 500°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: ½"-20 UNF.

Order number..... 8.81.394

Test pressure transducer 0 - 100 bar Quality class I up to 500°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: ½"-20 UNF.

Order number..... 8.81.393

Test pressure transducer 0 - 50 bar Quality class I up to 500°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: ½"-20 UNF.

Order number..... 8.81.392

Test pressure transducer 0 - 20 bar Quality class I up to 500°C

With measuring amplifier for feeding in to the CAN-Bus.

Thread: ½"-20 UNF.

Order number..... 8.81.391

Other pressure transducer ranges are available on request.

Note

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.

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 Götffert. Support for possible adjustments will be charged on an actual expense basis.

Subject to change due to technical developments.

QUALITY COULD NOT BE PROVEN – IT HAS TO BE PRODUCED...

THIS IS RHEOLOGY

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