

Datasheet for the Xplore MC 5, 5 ml twin screw micro compounder

(All information subject to change without notice)



MC5 DESCRIPTION & SPECIFICATIONS

Design features	This quality instrument is designed for reliable and fast screening of viscous polymer formulations. It is equipped with a divisible extruder barrel and two conical, co-rotating, detachable extruder screws, providing excellent mixing in a short time. The barrel is extremely wear resistant (64 hRc) and specially heat treated and coated (hardness 2000 Vickers) to guarantee reproducible results over many years. The screws (56 hRc) are also surface hardened (hardness 1000 Vickers). Due to the hardness of the barrel and screws, these are abrasion resistant to ceramic materials, metal particles and carbon nano fibers. The barrel and screws have a chemical resistance between pH 0 and 14, up to 450 °C. A non-stick, solid carbide bypass valve provides the option for recirculation or extrusion. In the co or counter rotating option an integrated, manually adjustable drive gear box is provided (no gear exchange needed). The MC 5 can be combined with one of Xplore's shaping instruments (film line, fiber line, injection moulding instrument).
Dimensions	Width 70 cm, depth 40 cm, height 83 cm, weight: 95 kg. Barrel width: 60 mm, depth 50 mm, height 133 mm. Mixing volume: 5 ml. Screw length: 216 mm, mixing length 107.5 mm, diameter: 14 - 5.5 mm.
Main drive	Continuous, digital rpm adjustment (speed range: 1 to 400 rpm) by means of a DC drive. Values of rpm and vertical force are displayed on the touch screen. The maximum torque is 6 Nm per screw, drive power: 550 Watt. Optionally, a high torque version is available with 8 Nm maximum screw torque and speed range 1 to 300 rpm.
Vertical force measurement	A force sensor measures the vertical force exerted by the melt on the barrel. The instrument is protected against overload of vertical force by a maximum force of 5 kN. This is equal to a head pressure of ca. 200 bar. From vertical force and rpm, rheological data can be retrieved with Xplore's proprietary rheological software.
Heating system	2 x 3 separately controlled heating zones (8 heating cartridges, 6 thermocouples), each with an adjustable temperature range (temperature gradient possible within the barrel). Maximum operating temperature is 400°C (optionally 450°C), which is protected by 2 extra thermocouples (safety). Heating time from 80°C to 240°C is less than 10 min. A melt temperature measurement is included and the barrel temperature can be so controlled to maintain a given melt temperature.
Supply voltage	208 - 240 Vac / 50 - 60 Hz.
Hopper	Hand operated front hopper, capacity 6 ml.

MC5 DESCRIPTION & SPECIFICATIONS (CONTINUED)

Cooling unit	A water cooling unit allows rapid cooling, which decreases time between experiments. It also enables our proprietary, fast and effective cleaning cycle. With water cooling it takes less than 10 min from 240°C to 80°C (less than 35 min with air cooling). Cooling water consumption should be at least 5 l/min at 20°C inlet temperature.
Controls	A color touch screen control panel is integrated in the instrument housing.
Standard accessories	One set of operating tools and user manual.

Optional software

A PC is needed with minimum Intel core i3 processor, minimum 2 GB RAM, CD drive, minimum 100 MB free hard disk space and one free USB port. A PC is *not included* in the scope of supply. The software operates under Windows XP, Win 7. The screen resolution is 1024 x 768 pixels, screen aspect ratio is 4:3.

All process parameters can be acquired with our proprietary data acquisition and computer control software (option MC.00.1.90). In addition they can be displayed graphically during an experiment, which simplifies operations. These data can be stored as excel file. Set points can be controlled by software via the PC, similar to control via the touch screen. Finally, standard processing conditions can be stored and retrieved to facilitate reproducible processing.

Our proprietary rheological software (option MC.00.1.92) generates the following additional data during processing: screw torque in the melt and melt viscosity, shear rate and shear stress, all averaged over the length of the screw. This software package is based on an analysis of the rheology in the barrel by prof. H.E.H. Meijer, TU Eindhoven, Netherlands.



MC5 CURRENT PRICES
(excluding VAT)

Ref.	Description
MC.05.0.00	Price of standard instrument, described above, including one set of screws and packaging

PRICES OF OPTIONAL SOFTWARE

Ref.	Description
MC.00.1.90	Process data visualization, control and acquisition (via PC)
MC.00.1.92	Rheological software and process data visualization, control and acquisition (via PC)

PRICES OF ADDITIONAL OPTIONS

Ref.	Description
MC.05.3.11	1 Set of standard spare screws (co rotating)
MC.05.4.22	Co and counter rotating drive (gear shift, incl. safety fence, excl. screws)
MC.05.3.14	1 Set of counter rotating screws
MC.05.2.21	Safety fence for co-/counter- screws
MC.05.2.85	Vari-batch barrel (recirculation channel at 3 or 5 ml)
MC.05.5.40	Transfer connector for IM 5.5 transfer unit
MC.05.1.94	Maximum operating temp increased to 450°C
MC.05.5.21	Manual front feeder
MC.05.5.31	Water cooled top hopper for powders or continuous feed (steel)
MC.05.3.12	Screws for continuous feed with water cooled top hopper
MC.05.3.13	Extended screws for continuous feed with water cooled top hopper
MC.05.2.20	Safety fence for barrel