Extruder KSZ**DK12**

(Extrude = press thermoplastic material through a nozzle)

It is a so-called wire-ectruder, pressing a plastic wire through a heated nozzle. The feed of the wire is coordinated by the control unit i.e. the software with the axis movements.

Thus the machine resp. the coordinate table becomes a 3D-printer -

being "multi-talented" with the slogan:

- You can print a lot, but not all!
- You can mill a lot, but not all!

The milling machine becomes a printer and vice versa by just a few actions.

Basis for the printing process is a 3D-body, saved in an **STL**-file.

The colour of the housing may differ !

Prerequisites for the use of the extruder:

- **The machine** resp. the coordinate table **must be prepared** for 3D-printing, you need:
  - The MultiController control unit MCS in version IF6.2
    - Axis controller for the C-axis with firmware from *.*.44.*
    - Extended C-axis connection
    - SPS-controller with extruder adaptation

  All systems since 2016 have been prepared this way.

- **A relating software equipment**:
  - Software ***nccad9*** from application key *.*.**64.100** (short-update available)
    CAD/CAM/CNC-program in full version with all 3D-functions available.

    Standard since autumn 2018

- **Complete list of extruder delivery content** according to order and delivery slip:
  - Extruder with fixing material
    - connection cable depending on machine
  - Nozzle 0,4 mm, assembled
  - 1 reel filament (Bio-plastics PLA, colour, approx. 750g, 1,75 mm diameter)
  - Wire holder for filament reel (depending on machine)
  - Filament guidance with holder (depending on machine)
  - Underlayer for Y-table
    - depending on machine
  - Software ***nccad9*** must be available, otherwise you need to order an update/upgrade of an older version.
    For licence holders of ***nccad9*** the required version is available as a short-update for download.
    Universal version for milling and printing.
    - Assistants to operate the 3D-print functions.

Machines since October 2016 are generally prepared for 3D-printing (Engraving: *Ready for 3D-Print*), **older machines** can be modified (please contact us).
Complete 3D-printing machines are available, supporting milling applications as well.
Please contact us or get informed by our HomePage .

Technical data

Mechanical equipment	
Type	Solid mechanics on Alu-ground plate with stepper motor
Heating	Insulated resistance heating unit with temperature sensor
Dimensions H x W x D	app. 230 x 100 x 60 mm
Weight	approx. 800 g
Connection	
Supply voltage	24 V / max. 0.8 A
Connection cable	Depends on utilised machine (imperative indication of type of machine)
Connection plug	15 pol Dsub plug
Plastic dispensing	
Material	Bio-plastics PLA (PolyLactid) – Filament 1,75 mm diameter Please pay attention to our filament recommendation ! (Different material leads to different results)
Melting temperature	approx. 200 °C , can be modified via Override-knob, within limits
Nozzle diameter	0,4 mm
Printing volume with nozzle 0.4	approx. 4,8/ cbmm/sec
Standard feed plastic wire	F100 >>> Wire speed approx. 2 mm/sec
Transport-ratio	Stepper motor-Transport reel : Filament = approx. 8 : 1

Software

From the idea to the printed piece.....

1. Get/make STL-file	Open the delivered example file Download of a body as STL-file … or Application of a 3D CAD-program with STL-export - free programs in the Internet (e.g. 123D or ScetchUp) - 3D-Bundle with SolidWorks for schools (available through MAXcomputer) - 3D CAD existing (industrial business)
2. Calculate the printer movements and generate CNC-file	Application of a so-called *Slicer* - free programs in the Internet (Slic3r currently recommended)
3. Open the CNC-file with *nccad8*/CNC or more	***nccad*** adapts the file automatically to the delivered extruder-surrounding and allows a simulation of the printing movements in 3D-view
4. Prepare printing and execute	Assembly/check of the underlay Teach-In of the workpiece zeropoint (WZP) Prepare the plastic wire Start printing
Help …..	A short instruction in printing is part of the delivery Inside nccad/Help the extruder application is described, too.