

INDUSTRY F421

SPECIFICATION



PRINTING

Print technology:	FFF
Build volume:	380 × 380 × 420 mm (60 648 cm ³)
Min. layer height:	50 µm
Number of printheads:	2, purging system
Nozzle diameter:	0.5/0.5 mm or 0.4/0.4mm
Filament diameter:	1.75 mm
Printhead temperature:	500°C
Buildplate temperature:	180°C
Chamber temperature:	180°C (active heating)
Filament chamber temperature:	50°C
Achievable part accuracy:	Parts are printed with an accuracy of 0.125 mm or 0.0014 mm/mm, whichever is greater. Accuracy in Z-axis includes an additional tolerance of 0.000/+ layer height.

SPEED

Travel move:	1000 mm/s
Printing speed:	up to 400 mm/s

DIMENSIONS AND MASS

External dimensions:	1900 × 940 × 900 mm
Mass:	365 kg

CONSTRUCTION

Chassis:	steel
External:	steel and vacuformed ABS, chamber lined with satin stainless steel
Build surface:	borosilicate glass / vacuum sealed plastic sheets

ENVIRONMENT

Working temperature:	18-30°C
Storage temperature:	-20-54°C

POWER

Power requirements:	- 230V 1ph with 32A (3n+p+e) IEC 60309 plug (recommended) - 230V 1ph 20A direct connection
Max power draw:	4600 W
Average power draw:	1500 W
Communication:	ethernet, Wi-Fi, USB drive

SOFTWARE

Slicing software:	3DGence SLICER 4.0
Cloud based services:	3DGence CLOUD

SAFETY

Advanced Filtration Unit:	yes, optional
Sensors:	main chamber door, top access hatch, thermal sensors, emergency switch
UPS device:	yes, optional
Others:	software access overdrive - remote shut down

INDUSTRY F421

MODULES

M280

TEMPERATURE:

up to 280°C

NOZZLE DIAMETER:

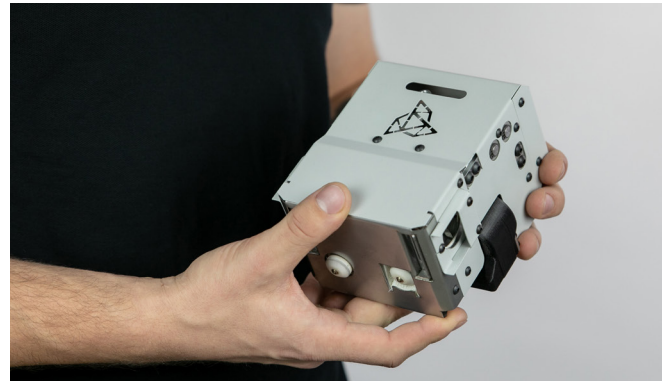
0,5 mm/0,5 mm

MODEL MATERIAL:

PLA, ABS, ABS-ESD, ASA, PA6,
PA-CF

SUPPORT MATERIAL:

ESM-10, HIPS



M360

TEMPERATURE:

up to 360°C

NOZZLE DIAMETER:

0,4 mm/0,4 mm

MODEL MATERIAL:

LEXAN, PC, PC-ABS, PEKK-CF,
ULTEM 9085

SUPPORT MATERIAL:

ESM-10



M500

TEMPERATURE:

up to 500°C

NOZZLE DIAMETER:

0,4 mm/0,4 mm

MODEL MATERIAL:

PEEK, PEKK, VICTREX AM™ 200

SUPPORT MATERIAL:

ESM-10



Flexibility and performance

Job-specific printing
modules and developed
printing profiles

I INTRODUCTION

1. INTRODUCTION

Thank you for choosing the 3DGence INDUSTRY F421 printer. This User Manual provides clear information on the industrial 3D printer to guarantee the highest quality of printing as well as long-term repeatable and safe operation of the printer.

The User Manual contains information necessary for proper and safe use of the printer. Read the entire User Manual carefully before using the printer.

The printer must not be used by persons who have not read this manual. Improper use may damage the device, cause injury or even put the operator’s life at risk.

Before you start using the 3DGence INDUSTRY F421 printer you must read the entire User Manual and follow the guidelines contained therein as well as observe warranty terms and conditions published on the manufacturer’s website www.3DGence.com.



Exercise caution when using the device due to the residual risk which could not be eliminated by the inherently safe design, safety measures and additional protective measures. Pay attention to marking and hazard warnings, i.e. stickers on the mechanical parts of the device, messages on the LCD display, light signals of the signal tower lights and audible warnings. Their meanings are described in this User Manual.

2. TECHNICAL SPECIFICATION OF THE DEVICE

The 3DGence INDUSTRY F421 printer is an industrial device designed for printing spatial models of thermoplastics based on three-dimensional models. The device can print durable models using the following technical materials: ABS, PC, PEEK. The system of interchangeable printing modules allows for a quick module change depending on the material required for printing. The use of an actively heated working chamber guarantees high quality and dimensional conformity of printed models. During printing the materials are stored in a stable environment thanks to the use of a heated material chamber. The air filter used in the device separates odours and ensures safe printer use. The technical specification of the device is presented in tab. 1.

Table 1 Technical specification of the 3DGence INDUSTRY F421 printer

DIMENSIONS AND WEIGHT	
Printer dimensions (width x depth x height)	915 x 980 x 1890 mm
Maximum printer dimensions with the top cover open, the door open, and the material chamber open (width x depth x height)	1500 x 1763 x 2230 mm (without signal tower lights) 1570 x 1763 x 2430 mm (with signal tower lights)
Printer packaging (width x depth x height)	1200 x 1000 x 2064 mm
Printer weight without packaging and accessories	~ 350 kg
Printer weight with packaging and standard accessories	~ 490 kg
Printer weight with packaging and full set of additional accessories (UPS with battery, filtration unit, signal tower lights)	~ 551 kg
ENVIRONMENT	
Operating temperature	18 – 30°C 30% to 70% relative air humidity, non-condensing
Storage temperature	-20 – 54°C 10% to 85% relative air humidity, non-condensing
Printer’s sound pressure level when idle	Less than 57 dB
Printer’s sound pressure level when printing	59 dB


Installation site height	It should not exceed 2000 m above sea level
POWER SUPPLY	
European connection requirements	Plug 3 ph 32 A IEC 60309 / 1 ph 20 A directly
US connection requirements	Phase-to-phase (2x120V, ϕ 180°) 20A NEMA 6I-20P plug
UK connection requirements	1ph 32A IEC 60309 plug
Power cord length	2,8 m
Voltage	230V AC (210-250V AC)
Frequency	50-60 Hz
Maximum power draw of the printer without additional accessories	20 A
Maximum power input of the printer without additional accessories	4600 W
The maximum power draw of the printer with a full set of accessories	20 A
TEMPERATURES	
Temperature of module hotends (max.)	500°C
Heatbed temperature (max.)	180°C
Printing chamber temperature (max.)	180°C
Material chamber temperature (max.)	50°C
SPEED	
Idle movement speed (max.)	1000 mm/s with an acceleration of 3000 mm/s ²
Print speed for working movements (max.)	400 mm/s
CONNECTIVITY	
Communication	Ethernet, WiFi, USB
Camera	2MP resolution camera built in working chamber, images transferred to 3DGence CLOUD every 5 seconds or on refresh request
PRINTING MODULES	
printing modules	3 interchangeable printing modules (M280, M360, M500)
Number of hotends	2
Hotend diameter available for device implementation	Moduł M280: 0,5 mm Moduł M360: 0,4 mm Moduł M500: 0,4 mm
3D PRINTING	
Technology	FFF (Fused Filament Fabrication)
Workspace (width x depth x height)	380 x 380 x 420 mm
Workspace volume	60 648 cm ³
Filament diameter	1,75 mm
Minimum diameter of filament spool core	50 mm
Maximum diameter of filament spool core	270 mm
Maximum spool thickness	90 mm
Maximum load on spool holder	2,5 kg
Model materials available for device implementation	ABS, ASA, PLA, PC, PEEK, PEKK, PA6, PA-CF
Support materials available when implementing the device	HIPS, ESM-10
Third party materials	Supported
Printing process settings	Editable factory presets
Typical dimensional accuracy	In X, Y, Z axes: 0.125 mm or 0.0014 mm/mm, whichever is greater. Additionally, Z axis error to be assumed: - 0, +1 layer height.
SOFTWARE	
Print manager	3DGence SLICER 4.0

Systems supported by print manager	Windows, macOS
Updates to print settings	Automatic
Printer supported file formats	.3dg
Cloud system	3DGence CLOUD
DESIGN	
Design	Freestanding, fitted with castor wheels for easy handling
Frame	Steel
Door	Double-layer pane with circulation passive cooling
Drive	Stepper motors with position feedback in closed loop
Linear elements (XY and Z axes guide systems)	XY: linear guides and drive belts Z: linear guides and ball screw
Material feeding system (extruders)	2 direct drive interchangeable extruders with flow diagnostics
Electronics	<ul style="list-style-type: none"> • Numeric control board based on 32 bit ARM cortex architecture • User interface board based on 32 bit ARM cortex architecture • Material chamber management board based on 32-bit ARM cortex architecture
Heatbed surface	<ul style="list-style-type: none"> • Glass heatbed • Possible tool-free replacement of the heatbed surface, without the need to replace/disconnect the heater
Material chamber	<ul style="list-style-type: none"> • Closed, heated to help to keep proper material moisture content • 2 model material bays and 2 support material bays
Material loading system	Automatic material loading system located in the material chamber
Material marking system	SMM system based on NFC tags displaying the amount of material remaining on the spool
Heated material chamber	Yes
Lighting in the printing chamber	2 x LED G9
Display	10,1" IPS capacitive with a resolution of 1280 x 800 px
XY axis positioning resolution	0.008 mm
Z axis positioning resolution	0.006 mm
SAFETY	
Filters	Advanced filtration unit (3-stage filter - preliminary/hepa/carbon)
Door	Electric lock, software lockable
Systems	<ul style="list-style-type: none"> • Overcurrent circuit breaker • Printer emergency shutdown system compliant with safety standards EN ISO 13849, EN 62061, IEC 61508, cat. 2 shutdown • Emergency power isolation system of the power supply unit for drives and modules • Emergency power isolation system for the logic power supply unit • Software shutdown system of the printer which can be confirmed by the user • Door open detection system • Top cover open detection system • Additional temperature sensors of high-power heat sources (chamber, table) • Heatbed surface presence detection system • Force sensor-based system to prevent collision







	with the heatbed or the workpiece
ADDITIONAL ACCESSORIES	
Signal tower lights	3 colour lights and audible alarm
UPS for emergency power supply	6KVA with a 72VDC battery with a capacity of 9 Ah
Active air filter of the print chamber	Advanced filtration unit (3-stage filter - preliminary/hepa/carbon)
CERTIFICATION	
Compliance with standards	Electromagnetic Compatibility (EMC) Directive 2014/30/EU. Radio Equipment (RED) Directive 2014/53/EU Machinery Directive 2006/42/EC Harmonised standards: EN 61326-1:2012 EN 61326-1:2013 EN 301 489-1 v2.2.3:2019-11 EN 301 489-3 v2.1.1.2019-03 EN 55032:2015 + AC2016 EN 300 330 v.2.1.1 EN 6024-1:2010
Marking	CE, FCC, IC

2.1. Device identification

The printer can be identified by the serial number on the rating plate on the rear side of the printer (Fig. 1). The serial number can also be checked on the device display. When sending a request via the 3DGence CLOUD platform, the 3DGence technical support department will automatically receive the serial number in the printer ticket. The serial number begins with the symbol: S/N F421 and should be provided when contacting the 3DGence technical support department.



www.3dgence.com

Name	3D PRINTER			
Model	INDUSTRY F421	Input	230V~50-60Hz	
S/N	F421 19001	H/W	1,0	
Max power	4,6 kW	Weight	~350 kg	
MADE IN POLAND	 <small>CERTIFIED</small>	<small>Safety Regular Production Surveillance</small>  <small>www.tuv.com ID 000002346</small>	<small>3DGence Sp. z o.o. Graniczna 66 44-178 Przystawice Poland</small> <small>Manufactured: 2021</small>	

Contains Transmitter Module FCC ID/IC : 2AU79-SHM01 / 25678-SHM01

Fig. 1 Device rating plate

3. FFF TECHNOLOGY

The FFF (Fused Filament Fabrication) technology, implemented in the 3DGence INDUSTRY F421 printer, operates on the principle of layer-by-layer deposition of thermoplastic on the heatbed, thus bonding it with previous layers. This material is a

consumable for the printer. The thermoplastic material is used in the form of a filament with a precisely defined diameter, wound on a spool (Fig. 2). The 3DGence INDUSTRY F421 printer uses only the filament with the diameter of 1.75 mm.

The 3DGence INDUSTRY F421 printer can use many types of technical materials. A Certified Materials Database has been developed for 3DGence printers, accessible at www.3dgence.com. The database contains a list of all materials tested and recommended by 3DGence, for which printing settings have been prepared in the dedicated 3DGence SLICER 4.0 software. 3DGence recommends that the filaments from the Certified Material Base should be used. These materials are supported by the SMM system of the 3DGence INDUSTRY F421 printer and they make it possible to achieve accurate print parameters, ensure automatic detection of the material type and, consequently, guarantee the highest print quality. More information on the SMM system can be found in section III, subsection 6.

3DGence does not limit the use of non-certified materials. However, the application of such materials prevents the use of the SMM system. 3DGence is not responsible for the quality of prints made of materials other than those listed in the Certified Material Base and for any damage caused by the use of such materials as well as it does not provide support for the quality of the prints made of filaments other than those listed in the Certified Material Base.



Fig. 2 Sample material spool with SMM tag